Wind energy, territory and environmental justice on the northeast coast of Brazil

Dissertation

der Mathematisch-Naturwissenschaftlichen Fakultät

der Eberhard Karls Universität Tübingen

zur Erlangung des Grades eines

Doktors der Philosophie

(Dr. phil.)

vorgelegt von

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Tübingen

2015

Gedruckt mit Genehmigung der Mathematisch-Naturwissenschaftlichen Fakultät der Eberhard Karls Universität Tübingen.

Tag der mündlichen Qualifikation:	28.04.2015
Dekan:	Prof. Dr. Wolfgang Rosenstiel
1. Berichterstatter:	Prof. Dr. Rainer Rothfuß
2. Berichterstatter:	Prof. Dr. Gerd Kohlhepp

ZUSAMMENFASSUNG

Die brasilianische Regierung investiert seit 2002 zunehmend in ein zentralisiertes Model für die Produktion von Windenergie. Als Haupziele sind zu nennen: 1) Die Steigerung der Energieversorgung um das ökonomische Wachstum zu sichern 2) Die Erhöhung des Anteils der erneuerbaren Energiquellen, gemäß der globalen Umwelt-Agenda, im nationalen Energiemix. Auf der einen Seite profitieren Investoren von Großkrediten, die nationale Zulieferindustrie wächst und die Preise der Windenergie werden immer wettbewerbsfähiger. Auf anderen Seite zeigen die Forschungen und soziale Bewegungen, dass dieses Model oft zu Umweltkonflikten und Umweltungerechtigkeit führt. Basierend auf den theoretischen Ansätzen der politischen Ökologie, der Umweltgerechtigkeit und der “governmentality” der Umwelt, stellet sich die Frage in wie weit die aktuelle politische Förderung der Windenergie zur nachhaltigen Entwiklung beiträgt. Auf Grundlage einer mehr-Ebenen und multidimensionalen Perspektive, versuche ich zu untersuchen in wie weit ungleiche Machtbeziehungen zwischen den beteiligten Interessensgruppen zu umweltungerechtichkeiten bei der Installierug von Windparks in Brasilien führen können.

SUMMARY

The main motivation for undertaking this research was to observe a contradiction concerning the model under which the wind power is being implemented in Brazil. On the one hand, investments are growing, prices for wind power production are decreasing, a chain of industries and services is emerging in Brazil to supply wind farms, the percentage of renewable energy sources on the country´s energy mix is growing and, finally, national Carbon dioxide (CO_2) emissions are being reduced. This means a positive framework considering the economic and ecological dimensions on a national scale.

On the other hand, this model has been criticized when it concerns the northeast coast of Brazil – the area where the most investments are concentrated. In this area affected communities, academics, public prosecutors, etc. have highlighted: 1) a disregard for environmental laws; 2) the transfer of negative impacts to inhabitants without appropriate compensations; 3) disrespect for social rights; and 4) disrespect for the territories of traditional populations (Alcântara 2009; Brown 2011; Comissão Pastoral da Terra 2014; Diario do Nordeste 2010; Francisco 2012; Lima 2009; Meireles 2011; Pachioni 2013; Portal do Mar 2012; Rede Brasileira de Justiça Ambiental 2014).

Based on the theoretical approaches of political ecology, environmental justice, and the governmentality of the environment I try to analyze the relationship relationship between unequal power relations and the unequal distribution of costs and benefits of wind farms on the northeast coast of Brazil - focusing on the concept of territory.

ACKNOWLEDGEMENT / AGRADECIMENTOS

Thanks a lot to all those who made this PhD possible, especially to:

Agradeço a todos que de diferentes formas viabilizaram este doutorado, especialmente a:

Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)

Deutscher Akademischer Austauschdienst DAAD

Prof. Dr. Rainer Rothfuß, em especial - foi uma enorme honra e prazer tê-lo como orientador, o melhor orientador para esse doutorado que eu poderia ter.

Prof. Dr. Gerd Kohlhepp, receber seu olhar acurado, generoso e paciente sobre meu processo de trabalho, foi uma honra sem tamanho.

Doktor Rer. Nat. Timo Sedelmeier

Prof. Dr. Volker Hochschild

Prof. Dr. Sebastian Kinder

João Luís Joventino do Nascimento, em especial

Prof. Dr. Antonio Jeovah Meireles

Sra. Edit Joventino do Nascimento e família

Gracy Joventino do Nascimento

Maria Luiza Garcia Rosa, da equipe de apoio :)

Bruno Vasconcelos Santos

Pedro Carvalho de Miranda, em especial, da equipe de apoio :)

Mechthild Ebeling, da equipe de apoio :)

Juliana Nunes, da equipe de apoio :)

Aixa Melo, da equipe de apoio :)

Joana Claro, Leo e Claudio Stenner

Gil Guigon, da equipe de apoio :)

Maria Alice Garcia Rosa

Odile Vasconcelos

Fabio Vasconcelos

Alex Vasconcelos

Gilson Assumpção

Sara Boni

Paulo Rogério

Todas as Pescadoras e Pescadores do Mangue da Comunidade Quilombola do Cumbe

Todos os moradores entrevistados Comunidade Quilombola do Cumbe

Prof. Dr. Paulo Cesar da Costa Gomes

Profª. Drª. Gisela Pires Rio

Prof. Dr. Marcelo Lopes de Souza

Profª. Drª. Iná Elias de Castro

All colleagues from Prof. Dr. Rainer Rothfuß´s Research Group at the University Tübingen

Frau Constanze Christ, Eberhard-Karls Universität Tübingen

Frau Gudrun Dortschy, Eberhard-Karls Universität Tübingen

Frau Dagmar Thumm, Eberhard-Karls Universität Tübingen

Frau Conny Leibfritz, Eberhard-Karls Universität Tübingen

Herr Christian Bick, Eberhard-Karls Universität Tübingen

Todos os membros da Rede Brasileira de Justiça Ambiental

Instituto Terramar, em especial Cristiane Faustino

FASE Rio, em especial Julianna Malerba e Maiana Maia

Heinrich Böll Stiftung Brasil, em especial Dawid Bartelet

OPA Aracati, em especial Jocélia Ribeiro

Sr. Francisco Eliton Albuquerque Meneses

RENAP-CE, em especial Rodrigo de Medeiros Silva

Keith Brower Brown, University of California, Berkeley

Prof. Dr. Xavier Arnauld de Sartre

Dr. Ricardo Marques Dutra, CRESEB, CEPEL

Prof. Dr. Geraldo Martins Tavares, Laboratório de Energia dos Ventos/UFF

Dra. Clarice Campelo Ferraz, GEE, IE, UFRJ

Herr Hanno Brühl, Stadtwerke Tübingen GmbH

Herr Jürgen Simon, Energiegenossenschaft Starkenburg

Prof. Claudomiro Barbosa, UFPA

Prof. Jorge Villar Alé, Centro de Energia Eólica, PUCRS

Frau Elisabeth Kapferer Universität Salzburg

Frau Esther Blume, Universität Würzburg

Frau Cora Arbach, Universität Osnabrück

Prof. Dr. Frank Schüssler

Prof. Dr. Konrad Schliephake

Profª. Drª. Verena Sandner Le Gall

Profª. Drª. Dörte Segebart

Msc. Mahamadou Karamoko Diarra

Archie Macjoyce

João Carlos de Oliveira Souza

Sebastian Franz

Bianca Xavier Mendonça

Adalisa Menghini

Carolina Helena Silva

Pedro Luiz Lima

Renata Meirelles, da equipe de apoio :)

Gabriel Reichenheim

João Lima

Malena Huesca and Robert

Raluca-Ioana Corpădean

Nikolaus Roos

Chetan

Flavia Duarte Braga e Casa de Padre Pio

Marcelo Patury e Alunos do Bhagavad Gita

Alex Berzin and the Berzin Archives

Valéria Pereira

Angel Vianna e EFAV

Soraia Jorge

Newton Bley

Mestre Ferradura e Alunos

Professor Grande e Alunos

Instrutor Marquinho e Alunos

Forró Tübingen/Forró Stuttgart

Quilombolas de luz (por tanta luz)

DEDICATION

Thanks to all those who made this PhD possible.…this process of aiming to perceive, think, feel and act differently in this world. For the sake of a less alienated world. Less alienated from the nature inside us and outside. Less alienated from our inner peace and inner freedom. Less alienated from historical perspectives on injustice. For the sake of a world with equal rights and equal resources distribution, among different groups. For the sake of a world with infinite barrierless distribution of love.

Gratidão por todos que de diferentes formas viabilizaram este doutorado. Foi um privilégio poder dedicar tanto tempo ao estudo... esse processo de buscar perceber, pensar, sentir e agir diferente, por um mundo menos alienado. Menos alienado da natureza, dentro e fora de si; da paz e da liberdade, dentro de si; das perspectivas históricas sobre a injustiça... menos alienado do desejo de paz e liberdade, dentro de cada ser. Para, assim, poder fazer um mundo com igualitária distribuição de direitos e recursos entre diferentes... Um mundo com distribuição infinita, transfronteiriça, de amor.

LIST OF ABBREVIATIONS

ABEP	Brazilian Association of Research Companies
ANA	Brazilian National Agroecology Articulation
BNDES	National Bank for Economic and Social Development
CEPAL	United Nations Economic Commission for Latin America and the Caribbean
CO2	Carbon dioxide
CONPAM	Ceará's Council for Environmental Policy and Management
CONAMA	Brazilian National Environmental Council
CONTAG	Brazilian National Confederation of Agricultural Workers
CPFL	Companhia Paulista de Força e Luz
CPT	Brazilian Pastoral Land Commission
CRESEB	Brazilian Center for Research on Wind and on Solar Energy
EIA	Brazilian Environmental Impact Assessment
EPE	Brazilian Federal Agency for Energy Research
EREC	European Renewable Energy Council
FAO	Food and Agriculture Organization of the United Nations
FHC	Fernando Henrique Cardoso
GEA	Global Energy Assessment
GDP	Gross domestic product
IBAMA	Brazilian Institute of Environment and Renewable Natural Resources
ICMBio	Brazilian Chico Mendes Institute for Biodiversity Conservation

IBRD	International Bank for Reconstruction and Development
IDB	Inter-American Development Bank
IEA	International Energy Agency
IPHAN	Brazilian National Institute of Heritage
ILO	International Labour Organization
IMF	International Monetary Fund
INCRA	Brazilian National Institute of Colonization and Agrarian Reform
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
IUCN	International Union for the Conservation of Nature
MAB	Brazilian Movement of Water Dam-affected people
MASTER	Brazilian Movement of Landless Farmers
MEB	Brazilian Basic Education Movement
MMA	Brazilian Ministry of Environment
MME	Brazilian Ministry of Mining and Energy
MST	Brazilian Landless Workers' Movement
NATO	North Atlantic Treaty Organization
NGOs	Non governmental organizations
OECD	Organisation for Economic Co-operation and Development
PAEG	Brazilian Program for Government Economic Action
PCB	Communist Party of Brazil
PNAE	Brazilian National Program for School Meals
PNAPO	Brazilian National Policy for Agroecology and Organic Production

PNPCT	Brazilian National Policy for the Sustainable Development of Traditional Peoples and Communities
PR	Brazilian Republic Party
PRONAF	Brazilian National Program for Strengthening Family Agriculture
PTB/SP	Brazilian Labour Party/São Paulo State
RAS	Simplified Environmental Report
RBJA	Brazilian Network for Environmental Justice
RENAP/CE/Brazil	Network of Popular Lawyers of Ceará, Brazil
RIMA	Brazilian Environmental Impact Assessment Report
SLA	Brazilian System of Environmental Licensing
Sisnama	Brazilian National Environmental System
SEMACE	State Superintendency of Environment of Ceará
SMCQ	Brazilian National Secretary for Climate Change and Environmental Quality
SNCR	Brazilian National Rural Cadastre System; Sistema Nacional de Cadastro Rural
SUDENE	Brazilian Northeast Development Superintendence
UC	Conservation Unit
UDR	Brazilian Rural Democratic Union
UERJ	University of the State of Rio de Janeiro
ULTAB	Union of Farmers and Agricultural Workers of Brasil
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNDPR	United Nations Development Program Report

UNFCCC	United Nations Framework Convention on Climate Change
WEC	World Energy Council
WCD	World Commission on Dams
WEA	World Energy Assessment
WHO	World Health Organization
WTO	World Trade Organization
WEF	World Economic Forum

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1. INTRODUCTION

The main motivation for undertaking this research was to observe a contradiction concerning the model under which wind power is being implemented in Brazil. On the one hand, investments are growing, the costs of wind power production are decreasing, a chain of industries and services is emerging in Brazil to supply wind farms, the percentage of renewable energy sources in the country´s energy mix is growing and, finally, national Carbon dioxide (CO_2) emissions are being reduced. These contribute to a positive framework considering economic and ecological dimensions on a national scale.

On the other hand, this model has been criticised when concerning the northeast coast of Brazil – the area where the most investments are concentrated. In this area affected communities, academics, public prosecutors, public defenders, Non-Governmental Organizations (NGOs) and some sections of the media have highlighted: 1) a disregard for environmental laws; 2) the transfer of negative impacts to inhabitants without appropriate compensations; 3) disrespect for social rights; and 4) disrespect for the territories of traditional populations. This means a negative framework considering the socio-cultural, economic and environmental dimensions on local and regional scales (Alcântara 2009; Brown 2011; Comissão Pastoral da Terra 2014; Diario do Nordeste 2010; Francisco 2012; Lima 2009; Meireles 2011; Pachioni 2013; Portal do Mar 2012; Rede Brasileira de Justiça Ambiental 2014).

The initial bibliographic survey and secondary data collection soon showed me that the reason for this contradiction was an unequal distribution of the wind farms' costs and benefits across space and among social groups. This preliminary research brought various perspectives to attention concerning the development of the wind energy sector in Brazil. Firstly, that the wind energy sector is seen as a strategic one for the Brazilian energy policy and for the national economic growth policy, and is therefore receiving large public loans with low interest rates.

Secondly, that there is a mainstream discourse linking wind energy to sustainable development in the media, some areas of academic research, national policies in Brazil and Germany, and on the global agendas of various multilateral organisations.

Thirdly that in Brazil, the wind energy sector is mostly developing based on a centralised model of energy production, with large-scale wind farms concentrated on the northeast coast.

Fourthly, that the development of wind energy in Brazil is seen by the government, the media, investors and researchers as relatively successful, due to increased economic competitiveness, technical efficiency and the promotion of the national supply industry (Dutra 2007; Alves 2010).

And finally, as mentioned above, the preliminary research has shown me that the contribution of the wind energy sector to sustainable development is being questioned by academic researchers, NGOs and affected communities, who point to various socio-environmental impacts caused by wind farms. These impacts result in socio-cultural and economic losses to underprivileged groups directly affected by the projects. Therefore, I could observe an unbalanced distribution of the wind farms' costs and benefits among social groups and across geographical areas, as well as the resulting socio-environmental conflicts and the need to question the contribution of such projects to sustainable development.

The definition of "sustainable development" is not consensual, but I understand here that a geographical approach of such a concept must be multi-scalar and multidimensional (Arnauld De Sartre & Berdoulay 2011; Rauch 2009). This means that the local context and the socio-ecological dimension – which seem to show the contradictions of the wind energy model in Brazil – must not be ignored by public polices aiming for sustainable development. The United Nations (UN) assumes that sustainable development has to include the reduction of economic inequality and the participation of affected groups, while promoting environmental preservation and economic development (United Nations 1992). Thus, if wind energy is to be considered sustainable, it must not cause environmental or social damage to directly affected ecosystems or threaten the livelihoods of poor communities.

It is on the basis of these previous assumptions that I have defined the key hypotheses, questions and goals of this research. My main question was: Why is the public policy for promoting wind energy on the Northeast Coast of Brazil, and in the Cumbe community in particular, failing to promote sustainable development and environmental justice?

My main hypothesis was that the public policy for promoting wind energy on the Northeast Coast of Brazil, and in the Cumbe community in particular, is failing to promote sustainable development and environmental justice, mainly due to unequal power relations. In other words, the observed negative socio-cultural, environmental and economic impacts of Brazilian wind farms, which lead to an unequal distribution of their costs and benefits, are mainly caused by unequal power relations among interest groups.

It is in this sense that, for my research, the concept of environmental justice seemed to better fit the Brazilian framework than the concept of sustainable development, as the first concept politicises the environmental issue and highlights the fact that there is an unequal distribution of the costs and benefits of economic growth, including the so-called green economy.

Based on the main hypothesis I have defined two further hypotheses. The first one is that there is a territorial component that is central to the understanding of the conflicts concerning wind farms, as well as to the understanding of the reasons why wind power policies in Brazil are not succeeding in promoting sustainability and environmental justice. In other words, especially from the perspective of geography, the concept of territory is a useful research tool for answering my main research question.

I have thus decided to analyse the conflicts as territorial disputes. These are here understood as power relations through spatial relations and strategies (Gomes 2002; Souza 2000). These spatial relations of power are here seen as being: 1) formed over history; 2) multidimensional (economic, social, cultural, environmental); and 3) multi-scale (local, regional, national, global) (Rauch 2009; Souza 2000; Rutherford 2007).

The other hypothesis is that the concept of governmentality serves as a useful research tool for analysing power relations and territorial strategies regarding wind energy related conflicts on the northeast coast of Brazil. I assume that the governmentality approach could contribute to the analysis of power relations among relevant groups of interest, on multiple scales; and to the analysis of the reasons why the model of wind energy production in Brazil has not been contributing to sustainable development or to environmental justice (Rutherford 2007).

It is important to mention that scale is a key concept for my research, because the analysed power relations and territorial strategies are formed based on local, regional, national and global scales. Scale is here understood as a theoretical tool – a spatial analytical frame that alters the content and the meaning of the phenomenon studied (Castro 2000). In this sense, each scale of approach highlights different issues, groups of interests and networks of social, cultural, economic and environmental relationships; and different scales are mutually influencing each other.

Based on the abovementioned assumptions and on the assumption that power relations are reproduced not only through formal institutions and laws, but also through informal practices and tacit rules, as well as through knowledge, discourses and subjective values (Agrawal 2006), I have defined my spatial frame and formulated my research questions

and goals. I have selected the Cumbe community for undertaking my case-study, located in the municipality of Aracati, state of Ceará, NE region of Brazil. This choice is based mainly on the fact that the conflict regarding the installation of the wind farm in this community took place in the region (NE) and the state (Ceará) with the largest installed capacities in Brazil, and with the highest levels of expected growth as a result of future investments, at the time I was starting my research. Thus, I saw the relevance of analysing the problems occurring in this context in order to contribute to the avoidance of future conflicts.

My main research goals were firstly to understand the main causes of the current framework of environmental injustice on the northeast coast of Brazil, based on the case-study. Secondly, my goal was to question a discourse legitimated by (international, national, regional and local) public agencies, sectors of the media and multilateral organisations, among others, that links wind energy to sustainable development based on an uncritical approach. Thirdly, my goal was to analyse power relations and to define the main groups of interest and power strategies that influence the territorial dispute in the case-study. Finally, my goal was to propose necessary changes in public wind power policies to ensure sustainable development and environmental justice.

In order to achieve these goals, based on a constructivist perspective, I conducted a literature survey, secondary data surveys on statistical reports and on the media, field research observation, and semi-structured and narrative interview (annex).

Concerning the relevance of this research, I understand firstly that energy is a core issue on the global agenda, based on the fact that energy is seen as a key element for the promotion of economic growth, human development and environmental preservation. The damages caused by an increasing use of fossil resources, encouraged by national public policies and loans from multilateral organisations, have greatly contributed to climate change, hindering economic growth due to their socioeconomic costs. In this sense, wind energy appears in the global discursive framework of sustainable development as a key solution for enabling further economic growth and the increased supply of energy based on a renewable source free of CO2 emissions.

In Brazil the government has been providing increasingly high loans with low interest rates for this sector, and aims to keep supporting the expansion of this market in the country, in order to ensure an increased energy supply based on renewable energy, and thus ensure economic growth while attending to the global agenda of tackling climate change. The effects on the territory are numerous. Some examples are the emergence of a new supply chain of industries and services affecting regional economies; effects on the touristic

landscape of the northeast coast of Brazil, affecting the tourist sector and land prices; the need to plan necessary infrastructure such as the construction of new transmission lines, the need to enhance processes of environmental licensing, the need to develop the country's wind turbine technology, etc. All these issues open possibilities for academic research using various approaches, especially for the geographic approach concerning the relations of the issues to space, regions, networks, territories and places. Thus, research on wind energy and its contribution to sustainable development is currently relevant from both global and national perspectives, for society in general (and its different groups of interest) and for academic research.

Secondly, this research is relevant as it questions a discourse that links wind energy to sustainable development based on an uncritical approach. In this sense, I would like to point out the contradiction of the current neoliberal economic model: it is based on massive production and consumption, thus producing severe environmental damages and requiring an ever-increasing supply of energy - which is again the source of further environmental damages (Heynen & Robbins 2005; Prieto 2009). The so-called green industry, including wind energy, is seen as a form of compensation for this contradiction as it would ensure sustainable development. Nevertheless, in practice, both the traditional economic sectors and the so-called green economy aim towards capital accumulation based on similar strategies: large-scale projects based on land concentration and the overexploitation of manpower and of natural resources (Delgado 2010; Fairhead et al. 2012).

These strategies are ensured by the dissemination of neoliberal policies that make environmental and labour regulations flexible, especially in developing countries, while concentrating power over nature among multilateral organisations and big business through the financing of nature. The main effects of this are increased environmental damage and economic inequality among countries, social classes, ethnic groups and genders.

Within the various discourses, sustainable development and trust in the role of the market and technological advancement to promote the tackling of climate change mask several important facts: the unequal distribution of environmental costs and risks among social classes and underprivileged ethnic-racial minorities; the unequal contribution to climate change made by different countries and social groups in both the past and the present; unequal access to resources; unequal participation in the decision-making processes regarding, for example, environmental and economic policies; the continued promotion of unsustainable ways of life by national and global policies and discourses that encourage massive production and consumption (Prieto 2009; Rutherford 2007).

The wind energy sector in Brazil has been provoking socio-environmental conflicts and disrespecting the territories, livelihoods and knowledge of traditional communities. Thus, I understand the relevance of critically analysing both the regulative and discursive frameworks of wind power in Brazil, in order to identify and understand the possible causes for these socio-environmental conflicts, and thus contribute to the effective implementation and extension of democratic principles and rights foreseen by the Brazilian Constitution of 1988, *Constituição da República Federativa do Brasil 1988*, and by the 2007 National Policy for the Sustainable Development of Traditional Peoples and Communities*, Decreto N. 6040/* 2010, among other relevant laws and policies that exist to promote sustainable development in Brazil.

This work is divided into six chapters. First of all I will present the methodological approach and theoretical framework of the research. Then I continue with a discussion about Brazilian land and territorial disputes and their relation to my research. The next chapter focuses on the relationship between wind energy and the global political and economic agenda. Then I analyse the national regulative framework affecting wind power policies. Finally I will present the case study. Let us look, first of all, at the methodological approach that I have adopted.

2. METHODOLOGICAL APPROACH

In order to elaborate the research project that directed the present work, I have conducted a preliminary survey of academic literature, media and statistical reports, interviews with experts, and previous field research. I have also taken part in two academic congresses on related themes in Germany. My main focus was on the following issues: the different geographical approaches to energy issues, sustainable development policies, the acceptance of wind energy in Germany and in Brazil, the advantages and challenges of both decentralised and centralised energy production, energy-related land conflicts in Brazil, and wind energy policies in Brazil and Germany.

This preliminary research brought various perspectives to attention concerning the development of the wind energy sector in Brazil:

1) The wind energy sector is seen as a strategic one for the Brazilian energy policy and for the national economic growth policy, and is therefore receiving large public loans with low interest rates;

2) There is a mainstream discourse linking wind energy to sustainable development in the media, some areas of academic research, national policies in Brazil and Germany, and on the global agendas of various multilateral organisations;

3) In Brazil, the wind energy sector is mostly developing on a centralised model of energy production, with large-scale wind farms concentrated on the northeast coast;

4) The development of wind energy in Brazil is seen by the government, the mainstream media, investors and researchers as relatively successful, due to increased economic competitiveness, technical efficiency and the promotion of the national supply industry (Dutra 2007; Alves 2010);

5) The wind energy sector's contribution to sustainable development is being questioned by academic researchers, NGOs and affected communities, who point to various socio-environmental impacts caused by wind farms. These impacts result in socio-cultural and economic losses to underprivileged groups directly affected by the projects.

Therefore, I could observe an unbalanced distribution of the wind farms' costs and benefits among social groups and across geographical areas, as well as the resulting socio-environmental conflicts and the need to question the contribution of such projects to sustainable development.

The definition of “sustainable development” is not consensual, but I understand here that a geographical approach of such a concept must be multi-scalar and multidimensional (Arnauld De Sartre & Berdoulay 2011; Rauch 2009). This means that the local context and the socio-ecological dimension – which seemed to show the contradictions of the wind energy model in Brazil – must not be ignored by public policies aiming for sustainable development. The UN assumes that sustainable development has to include the reduction of economic inequality and the participation of affected groups, while promoting environmental preservation and economic development (United Nations 1992). Thus, if wind energy is to be considered sustainable, it must not cause environmental or social damage to directly affected ecosystems or threaten the livelihoods of poor communities.

It is on the basis of these previous assumptions that I have defined the key hypotheses, questions and goals of this research. These have changed during the research, as new data and theoretical approaches have become incorporated and previous analyses reinterpreted. The first project aimed at comparing the frameworks of the development of the wind energy sectors in Germany and Brazil and their different levels of contribution to sustainable development, as well as proposing a decentralised model of wind energy production in Brazil that would be more democratic and equitable. Afterwards, I chose instead to focus on a deeper analysis of the causes of the failures in the Brazilian framework that have been highlighted by social movements, researchers, etc. I have considered that in order to suggest solutions for achieving sustainability on a local scale, I needed to better understand the failures of the current model, as well as the related socio-environmental conflicts and their causes.

I made this choice as I recognised that the conflicts concerning wind farm acceptance in Brazil and in Germany concerned largely different frameworks. The two main differences are: 1) extremely unequal power relations among interest groups in Brazil, so that groups suffering the negative externalities of wind farms possess little political power to have their demands heard and attended to; 2) a more flexible environmental regulation in Brazil, so that wind energy companies tend to transfer environmental externalities to communities living near the projects; 3) the historical lack of an agrarian reform and a current loose land regulation in Brazil that leads to a territorial struggle between, on one side, traditional communities living in areas of collective use that although being ancestrally occupied are not formally recognised through land titles, and on the other side, private investors aiming to exploit the natural resources in those lands and to expropriate these areas from the traditional communities.

Thus, my main hypothesis was that the public policy for promoting wind energy on the Northeast Coast of Brazil, and in the Cumbe community in particular, is failing to promote sustainable development and environmental justice, mainly due to unequal power relations. In other words, the observed negative socio-cultural, environmental and economic impacts of Brazilian wind farms, which lead to an unequal distribution of the costs and benefits of wind power farms, are mainly caused by unequal power relations among interest groups.

It is in this sense that the concept of environmental justice seemed to better fit the Brazilian framework than the concept of sustainable development, as the first concept politicises the environmental issue and highlights the fact that there is an unequal distribution of the costs and benefits of economic growth (reflecting unequal power relations), including the so-called green economy.

Thus I have defined two secondary hypotheses:

1) There is a territorial component that is central to the understanding of the conflicts concerning wind farms, as well as to the understanding of the reasons why wind power policies in Brazil are not succeeding to promote sustainability and environmental justice. In other words, especially from the perspective of geography, the concept of territory is a useful research tool for answering my main research question.

I have therefore decided to analyse the conflicts as territorial disputes. These are here understood as power relations defined through spatial relations and strategies (Souza 2002). These spatial relations of power are seen here as being: a) formed throughout history; b) multidimensional (economic, social, cultural, environmental); and c) multi-scale (local, regional, national, global) (Rauch 2009; Souza 2000; Rutherford 2007).

2) The concept of governmentality serves as a useful research tool for understanding the reasons why the model of wind energy production in Brazil was not contributing to sustainable development or to environmental justice. I assumed that the governmentality approach could contribute to the analysis of power relations among the different groups of interest involved, on multiple scales. This approach comprehends an analysis of power relations focused on formal and informal regulative and discursive frameworks.

Based on the abovementioned assumptions and on the assumption that power relations are reproduced not only through formal institutions and laws, but also through informal practices and tacit rules, as well as through knowledge, discourses and subjective values

(Agrawal 2006; Dubash 2006; Watts 2005), I have defined my temporal and spatial frames and formulated my research questions and goals.

2.1. TEMPORAL AND SPATIAL FRAMES

I have selected the Cumbe community for undertaking my case-study, located in the municipality of Aracati in the state of Ceará in the NE region of Brazil. This choice is firstly based on the fact that the conflict regarding the installation of the wind farm in this community took place in the region (NE) and the state (Ceará) with the largest installed capacities in Brazil, and with the highest levels of expected growth as a result of future investments, at the time I was starting the research. Thus, I saw the relevance of analysing the problems occurring in this context in order to contribute to the avoidance of future conflicts.

Secondly, the choice was based on the fact that in this community there was a heated conflict that gained public visibility on a national scale due to a judicial dispute involving the Federal Prosecution Service, the wind energy company Bons Bentos S.A, the IPHAN, the IBAMA, Brazilian Institute of Environment and Renewable Natural Resources (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis) and the SEMACE, among others (Ministério Público Estadual do Ceará 2009; Ministério Público Federal 2010a; Ministério Público Federal 2010b). These facts demonstrated the social relevance of the case and its great complexity. A complex case-study could be helpful in order to encompass as much as possible the interest groups involved in the process of wind farm installation in Brazil, and to identify as much as possible the strategies that are used to reproduce unequal power relations in the territories experiencing conflict.

It is important to highlight here that I understand that a case-study might not necessarily be directly transposable to other cases. Nevertheless, I believe that the theoretical and methodological approaches used in this research may be adapted by other researches, thus contributing indirectly to the understanding of wind farm conflicts occurring in other communities in Brazil (Baxter 2010).

The use of a case-study analysis does not hinder a multi-scale understanding of the conflict. On the contrary, the interest groups and the power strategies they use to secure their territories, are considered on the basis of their different scales of influence (Rauch 2009).

The time frame of the case-study analysis lasts from 2008, when the conflict started, until the present day. Nevertheless, as the power relations are here seen as part of multidimensional, multi-scale and historical processes (Dubash 2006; Agrawal 2006; Rutherford 2007), different time frames are used for the analysis of the land regulation, environmental regulation and energy regulation pertinent to my work.

We may now move on to research questions and goals:

2.2. RESEARCH QUESTIONS AND GOALS

Main question

Why is the public policy for promoting wind energy on the northeast coast of Brazil, and in the Cumbe community in particular, failing to promote sustainable development and environmental justice?

Secondary questions

How relevant is the concept of territory to the understanding of the conflicts over wind farms on the northeast coast of Brazil?

Who are the main groups of interest involved in the conflict regarding the wind farm in the Cumbe community?

What are the main strategies adopted by each interest group, and how do they contribute to environmental injustice and reveal unequal power relations?

Main Goal

With a focus on the concept of territory and on the theoretical approach of the "environmental governmentality", to understand the main causes of the current framework of environmental injustice on the northeast coast of Brazil, based on the case-study.

Secondary Goals

1) To question a discourse (diffused mainly by international, national, regional and local governmental agencies, mainstream media, private firms and by multilateral organisations) that links wind energy to sustainable development based on an uncritical approach.

2) To analyse power relations and to define the main groups of interest and power strategies that influence the territorial dispute in the case-study.

a. To analyse the power of each group of interest to influence the phases of wind farm development (regulation, planning, financing, previous environmental licensing, environmental licensing, and environmental inspection during construction and during operation) through the following power strategies: production of rules/ institutions; production of knowledge/discourses; production of subjective values.

b. To analyse the abovementioned power strategies according to a multi-scale analysis of goals and effects.

c. To analyse the contribution of the abovementioned power strategies to the four dimensions of sustainable development (economic, political, socio-cultural and environmental).

3) To propose necessary changes in public wind power policies to ensure sustainable development and environmental justice.

2.3. METHODOLOGICAL PROCEDURES

In order to achieve these goals, I have conducted:

1) A literature survey on the theoretical approaches of “political ecology”, “ecological modernisation”, “governmentality of nature”, “neo-liberalisation of nature” and “environmental justice”.

2) A literature survey on the Brazilian agrarian issue through a historical analysis.

3) A literature survey on “the territorialisation of social struggle” in Brazil and on the interdisciplinary field of “social cartography”.

4) Literature and secondary data surveys on statistical reports and on the media, concerning energy policies and in particular wind energy policies: globally, in Brazil, and in Ceará and Aracati. Special focus was given to the model of decentralised wind energy production in Germany and in Brazil.

5) Preliminary field research in July 2011 in Cumbe and in Rio de Janeiro, including three interviews with experts.

6) Three months of field research from September to November 2013 in Brazil, during which I conducted field research observation and semi-structured and narrative interviews, and took part in two conferences as a listener. This included two separate visits to the Cumbe community, one lasting ten days and the other seven days (during this time I was hosted by a family in Cumbe and visited the city of Aracati for undertaking interviews with representatives of the municipal power. I also spent five days conducting interviews in Ceará's capital, Fortaleza, four days in Vitória observing the Brazilian Network for Environmental Justice (Rede Brasileira de Justiça Ambiental, RBJA) meeting, and the rest of the time in Rio de Janeiro conducting interviews, literature surveys, interview transcriptions and analysis of the field research.

7) I have visited three events related to decentralised wind energy production in Germany, as a listener:

a) 2nd International Conference on Micro Perspectives for Decentralised Energy Supply, Berlin, February 2012.

b) Meeting of the Energy Cooperative, Energiegenossenschaft Starkebourg, Darmstadt, May 2012.

c) Regional Conference on Energy and Environment, Regionalkonferenz Energie & Umwelt, June 2012, Mannheim.

8) Participation (sharing my research in oral presentations and receiving feedback) in academic congresses in Germany and Austria on the following themes: energy and geography; social-environmental conflicts in Latin America; local knowledge and local development; neo-colonialism and geography.

9) Participation as a listener at three meetings in Brazil in 2013:

a) 5th National Meeting of the Brazilian Environmental Justice Network (RBJA), Vitória, August 2013.

b) 4th Environment Conference of the State of Rio de Janeiro, IV CEMARJ, Rio de Janeiro, September 2013.

c) Event promoted by the European Union Comisison for Brazil and the Brazilian Special Secretary for Human Rights of the Presidency of the Republic about the Book"Ten faces of the struggle for Human Rights in Brazil", Fortaleza, September 2013.

2.4. SOCIAL AND ACADEMIC RELEVANCE

Firstly I understand that energy is a core issue on the global agenda, based on the fact that energy is seen as a key element for the promotion of economic growth, human development and environmental preservation. The damages caused by an increasing use of fossil resources, encouraged by national public policies and loans from multilateral organizations, has greatly contributed to climate change, hindering economic growth due to its socioeconomic costs. In this sense, wind energy appears in the global discursive framework of sustainable development as a key solution for enabling further economic growth and the increased supply of energy based on a renewable source free of CO2 emissions.

In Brazil the government has been providing increasingly high loans with low interest rates for this sector, and aims to keep supporting the expansion of this market in the country, in order to ensure an increased energy supply based on renewable energy, and thus ensure economic growth while attending to the global agenda of tackling climate change. There are numerous effects on the country. Some examples are the emergence of a new supply chain of industries and services affecting regional economies; effects on the touristic landscape of the northeast coast of Brazil, affecting the tourist sector and land prices; the need to plan necessary infrastructure such as the construction of new transmission lines, the need to enhance processes of environmental licensing, the need to develop the country's wind turbine technology, etc. All these issues open possibilities for academic research using various approaches, especially for the geographical approach concerning the relations of these issues to space, regions, networks, territories and places. Thus, research on wind energy and its contribution to sustainable development is currently relevant from both global and national perspectives, for society in general (and its different groups of interest) and for academic research.

Secondly, this research is relevant as it questions discourses that link wind energy to sustainable development based on an apolitical approach. In this sense, I would like to point out the contradiction of the current neoliberal economic model: it is based on massive

production and consumption, thus producing severe environmental damages and requiring an ever-increasing supply of energy - which is again the source of further environmental damages. The so-called green industry, including wind energy, is seen as a form of compensation for this contradiction, as it would ensure sustainable development. Nevertheless, in practice, both the traditional economic sectors and the so-called green economy aim towards capital accumulation based on similar strategies: large-scale projects based on land concentration and the overexploitation of manpower and of natural resources (Delgado 2010; Fairhead et al. 2012).

These strategies are ensured by the dissemination of neoliberal policies that flexibilise environmental and labour regulations, especially in developing countries, while concentrating power over nature among multilateral organizations and big business through the financing of nature. The main effects of this economic model are increased environmental damage and economic inequality among countries, social classes, ethnic groups and genders (Delgado 2010; Fairhead et al. 2012).

Within the various discourses, sustainable development and trust in the role of the market and of technological advancement to promote the tackling of climate change mask several important facts: the unequal distribution of environmental costs and risks among social classes and underprivileged ethnic-racial minorities; the unequal contribution to climate change made by different countries and social groups in both the past and the present; unequal access to resources; unequal participation in the decision-making processes regarding, for example, environmental and economic policies; and the continued promotion of unsustainable ways of life by national and global policies and discourses that encourage massive production and consumption (Prieto 2009; Rutherford 2007).

The wind energy sector in Brazil has been provoking socio-environmental conflicts and disrespecting the territories, livelihoods and knowledge of traditional communities. Thus, I understand the relevance of critically analysing both the regulative and discursive frameworks of wind power in Brazil, in order to contribute to the effective implementation and extension of democratic principles and rights foreseen by the Brazilian Constitution of 1988, *Constituição da República Federativa do Brasil 1988,* and by the National Policy for the Sustainable Development of Traditional Peoples and Communities, *Decreto N. 6040/ 2010*, among other relevant laws and policies that are meant to contribute to the promotion of sustainable development in Brazil.

Thirdly it should be mentioned that despite the fact that an increasing number of geographers are studying issues related to renewable energy (Schüssler 2009), in Brazil these mostly regard biofuels and hydropower. Thus, at the time I began my research in

2011, there existed very little academic research on wind energy in Brazil, especially from the perspective of human geography, apart from Meireles 2011 and Brown 2011. I was able to find relevant academic studies focusing on wind farms in Brazil mainly from the perspective of environmental planners, engineers and economists (Dutra 2007; Godoricht 2012; Lage 2001; Tavares 1998).

I will now present the methodological approaches used in my research.

2.5. METHODOLOGICAL APPROACHES

The present work is based on a constructivist approach of social sciences, which instead of aiming to explain phenomena or reveal truths, aims at possible interpretations of social issues (Guba & Lincon 1994; Willis 2007). This interpretation will construct the research object and is: 1) contained within the historical and socio-cultural context experienced by the researcher; and 2) guided by a certain tradition of scientific thought and practice, which implies the choice of theoretical approaches, methodological procedures and concepts historically developed within one or more fields of academic research (Guba & Lincon 1994; Willis, 2007).

I was mainly inspired by the reflections of Bourdieu (Bourdieu 1972; Bourdieu 1980) concerning the scientific practice and the relationship between the researcher and the object of research. His key argument is that the researcher should be aware of their own practice and of the procedures that they adopt in order to construct their research object. In this sense, he criticises three main modes of knowledge construction in the social sciences. The first one is phenomenological knowledge, which assumes a participant relationship between the researcher and the researched and a familiarity with the studied environment. Based on the “lived experience” the researcher will report particular cases that are not reducible to the generalisation of theories. The criticism here is that the researcher does not reflect on his own practice or his own point of view (Bourdieu 1980; Thiry-Cherques 2006).

The second criticism is directed towards the objectivist knowledge that assumes, instead of a familiarity, a complete distance and exteriority in the relationship between researchers and researched. According to this perspective, the social world is ruled by a system of objective relations (economic, linguistic, etc) independent from individual consciences and wills. The researcher’s duty is to reveal the objective relations determining the practices of individuals (Bourdieu 1980). In this case the researcher imports to the research object the principles of his relationship with the object. The perspective of the subject that interprets

the speaker is privileged in relation to the perspective of the subject that speaks (Bourdieu 1980).

In this sense an ethnologist would interpret all observed social interactions as symbolic exchanges. Another example given by Bourdieu is that of architects building spaces that consider an objective rationality that does not fit in with the practices of the citizens for whom they were constructed. A third criticism of Bourdieu is against "praxeological knowledge", which despite reflecting on scientific practice is still looking for the objective structures of the social world (Bourdieu 1980).

Instead what he proposes is the analysis of "concrete cases theoretically constructed" (Bourdieu 1980). He realises that the theoretical elaboration is a "program of perception and of action". The researcher selects concepts and methods, meaning that they take a position among many possible theoretical and methodological positions within the social sciences and within the strands of a particular academic discipline. These concepts must be set against the social practices that are being studied and re-evaluated, so that their usefulness can be tested.

Based on these principles, in order to plan, undertake and *a posteriori* analyse my interviews, I was guided by the work of Demaziere and Dubar (2009), whose positions are very close to those of Bourdieu (1972; 1980) exposed here. They understand that: 1) the researcher will construct their object of study based on their research questions; 2) they have to be aware of the methods they are using; 3) they have to remain open to logics presented by the interviewed in their discourses, even if they have to re-think the choice of concepts and their previous hypotheses; and 4) the particularities found in the empirical cases have to be understood in their historical and current symbolic contexts, but may be analysed through processes of comparison, classification of unit, and the identification of general common features that inform us about logics that are socially shared among larger groups and contexts (Demazière & Dubar 2009).

They affirm that the researcher has to search for concepts that correspond to the social environment studied, and that this openness must be retained during the field research and the interviews. Afterwards, a process of systematisation, through the drawing of analogies and of the resulting categories, allows generalisations to be made. A further confrontation between the data and analysis on one hand, and other, wider, macro data and theorisations on the other hand, is necessary in order to understand what is at stake in the relationships observed (Demazière & Dubar 2009).

In this sense, I identify my work as a geographical approach to the unequal distribution of the benefits and burdens of wind farms in Brazil (across area and among social and ethnic groups) and the resulting socio-environmental conflicts, through their territorial dimension. In this sense my research object may be defined as the relationship between unequal power relations and the unequal distribution of costs and benefits of wind farms on the northeast coast of Brazil – with a focus on the concept of territory. In order to construct this object, I have chosen some theoretical and methodological approaches that guided my interpretation.

The first one is the multi-scale and multidimensional analysis offered by the geographer Theo Rauch (2009). Rauch published a book on developing policies in which he is mostly concerned with the creation of strategies and instruments for a more effective management of political, economic, social and environmental problems, especially in developing countries (Rauch, 2009). He bases his arguments on his vast personal experience with development cooperation programs as well as on a theoretical analysis of the social challenges that his experiences showed him (Rauch, 2009).

Inspired by the ideas of Bourdieu, his theoretical approach tries to achieve a synthesis of two main currents of sociological theory, that is, structuralism and social action theory (Rauch 2009). He looks at the relations between the manoeuvring space for social actors and the social and economic conditions which deny or offer them opportunities. He sees such relations not as being determined by main structures such as the rule of the global market, nor by social action such as local social movements or consumer choice, but as resulting from historical and context-specific circumstances. In each context, the structure and the actors' choices will influence each other in a different way (Rauch 2009, p. 127).

Another key aspect of the author's approach is that he believes that in each studied case the economic, institutional, social and ecological dimensions have to be considered, as well as the different scales influencing them. He goes further, pointing out that the different dimensions constantly influence each other. For example, the global demand for fossil fuels and for crops is the cause of serious socio-cultural and environmental damages in particular regions of Brazil. These are, respectively, the restriction of the fishing areas of artisanal fisherman on the coast (Rougemont & Peres 2012) and the reduction of biodiversity and the land expropriation caused by monocultures in the Centre-West region of Brazil (Pietrafesa & Santos 2014).

In this sense, Rauch claims that most local actors have no access to or influence on the higher levels of political or economic action such as competitive regional markets (Rauch 2009). Development policies should therefore always consider all scales and dimensions,

even if there is one main scale of influence. For example, in the case of accessing income possibilities for poor farmers in developing countries, it is not enough to create fairer rules for global trade between countries if farmers do not receive the financial and technical support needed to enable them to offer better products that could compete on the global market. Such support should come from national and regional governments. Also, farmers should be locally empowered to represent their interests through social civic organisation, so that they can influence the formulation of the public policies that affect them.

I have therefore tried to apply this historically contextualised multi-scale and multi-dimensional perspective to the analysis of the main causes of environmental injustice promoted by the installation of wind farms in Brazil. In order to go deeper into the study of the power relations and territorial strategies causing environmental injustice, I have mainly used the following interdisciplinary theoretical approaches: political ecology, environmental justice and governmentality. In common they: 1) account for both larger structures of power and specific conjectures of social action and resistance; 2) acknowledge the role of institutions and rules as well as the role of discourses and knowledge in reproducing power relations; and 3) offer evidence of how policies are biased towards the interests of groups who use their economic power to conduct political lobbies.

Political ecology highlights the contradiction between the discourses and practices of the multilateral organisations that concentrate decision power. Environmental justice studies highlight the socio-spatial capital strategies for transferring the costs of economic growth to underprivileged social and ethnic-racial groups while (increasingly) concentrating benefits in the hands of the elite. It shows how these benefits are spatially concentrated not only in developed countries but also in the rural areas, cities and neighbourhoods of developing countries receiving more public investments and less environmentally polluting activities.

The approach of governmentality pays particular attention to the role played by subjective values in influencing people's relationships to institutions, rules, legitimate knowledge and official discourses, and in this way influencing people's interests and practices. These subjective values are thus the target of dispute among groups who compete to ensure that the values that correspond to their interests are diffused and receive public visibility and acceptance, and that legitimacy is given to the legal protection of these interests through the law and through public policies. One example is the historically excessive value given by Brazilian legislation to private property in comparison to the right to the common use of ancestrally occupied lands and the right of adverse possession (Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013).

In this sense, on one hand the corporative policies of wind energy firms and the discourse of multilateral organisations and of environmental agencies diffuse an apolitical approach to a global environmental crisis, as a global challenge affecting everyone equally, to be tackled by the green economy based on an economicist vision of sustainable development, as we will see later. On the other hand, critical social movements and academic researchers highlight a contradiction: the logic of economic growth is causing environmental damages and inequalities among classes, ethnic-racial groups and genders, and proposes a model of compensation which, instead of proposing alternative modes of production and ways of living aiming at greater respect for the principles of social justice and for the limits of nature, uses neoliberal strategies to ensure the concentration of capital.

These social movements have instead been resisting this model, pointing out its contradictions and limits, as well as struggling, for example, for public support of agro-ecological systems of food production and models of decentralised renewable energy production and policies or, for example, for the recognition by public institutions of the cultural identities of indigenous people and quilombolas, so that they can have access to social assistance programs or develop special educational programs for their children (e.g. Pronera, National Program of Education on Agrarian Reform). Nowadays, despite advances made within Brazilian legislation, the power of underprivileged groups to achieve this support and recognition is still very limited, especially due to land and territorial issues, as we will see.

In order to go deeper into the analysis of power strategies, according to the governmentality approach, I have adopted during my field research the method of semi-structured and narrative interviews that I will present later. In line with a constructivist perspective, my analysis has sought to relate the role of the subjective dimension of power to the role played by socio-cultural, political and economic structures defined for example by national economic policies. This analysis was mainly based on: the work of economists, historians and geographers on land regulation and related economic policies in Brazil; academic work on energy planning, energy policies and wind power policies in the world and in Brazil; and on statistical reports, laws and official documents.

Based on the constructivist approach presented above, I understand that the authors' choices and my interpretation of the data were influenced by my academic background, and guided by my own research questions and goals. The analysis of documents and interviews is based on the constructivist approach described above, which assumes them to be historically situated, with meanings that are not closed, but instead are processes

that must be understood in the context of the practices that give meaning to these words, and build discourses (Bourdieu 1972; Bourdieu 1980; Demazière & Dubar 2009). While analysing laws and documents, I have tried to be aware of who produced the data, for which stated purposes, in which historical context and from which geographical scale and territory. I have analysed the discourses presented by these texts as strategies of power that seek to justify certain practices and policies (Agrawal 2006; Watts & Peet 2006a).

The social scientists Demazière and Dubar (2009) show us how to adopt qualitative interviews that are centred on subjects. For Demazière and Dubar (2009) the words of people are a relevant source of knowledge for understanding social phenomena: through speech, people produce and sometimes become aware of various conceptions of themselves and of the world. The words of the interviewed people report their own practices. The authors highlight that people's speech is not transparent or self-explanatory but rather a complex construction of meanings. Therefore it has to be analysed based on clear and retraceable procedures. Nevertheless, the analysis is always provisional and incomplete (Demazière & Dubar 2009).

They propose a qualitative method of interview analysis based on a semiological analysis of narratives aiming to interpret the discourse of the interviewed concerning the issue being discussed. It seeks to identify and classify the sequences of occurrences described by the discourse of the interviewed, the actors and the arguments. These are put in relation to each other and the researcher tries to account for the subjective values that the speaker uses to describe them, so that the researcher will link them to a particular belief system to be compared with those of other interviewed people. The goal is not to understand the individual psychological trajectory of the interviewed as related to their beliefs. Instead the goal is to reflect on the socially shared subjective values that they present (influenced by their experience with institutions, by their social class and the place where they live, among other factors) while linking these to the description of the practices and choices of the interviewed.

In my case study, through the narrative interviews, I mainly wanted to understand: 1) people's subjective experiences of the implementation of the wind farms and of the impacts caused by the wind farms; 2) people's subjective experiences of the power relations among interest groups relevant to the conflict being studied; 3) people's appropriation of the concept of territory and the relevance or otherwise of the territory to the conflict regarding wind farms, for the interviewees; and 4) people's appropriation of the concept of sustainable development. I applied the method of Demazière and Dubar (2009)

to the analysis of key interviews until I could identify key groups of discourses that I believe were representative of the wider sphere of interviews.

These authors firstly underline the choice for a non-directive interview, which is primarily defined as one not structured around closed questions. This applies when the goal of the research is not to collect precise information about the precise succession of events, but rather to retrace what is important for the interviewee, understand their reasons, analyse their justifications and explore the significant points of their discourses. The researcher tries to facilitate the free and argued expression of the logic of the subject, and of their way of reconstructing their past experiences and of anticipating their possible futures.

The questions formulated for the interviews were guided by these research goals: 1) to understand the main causes of the current framework of environmental injustice on the northeast coast of Brazil, based on the case-study; 2) to question a discourse legitimated by (international, national, regional and local) public agencies, sectors of the media and multilateral organisations, among others, that links wind energy to sustainable development based on an uncritical approach; 3) to analyse power relations and to define the main groups of interest and power strategies that influence the territorial dispute in the case-study; and 4) to propose necessary changes in public wind power policies to ensure sustainable development and environmental justice.

In order to achieve these goals, and to test the research hypotheses, the interviews consisted of two parts. The first part was intended to be a narrative interview based on a non-directive approach not structured around closed questions, as a more subjective engagement of the interviewed was required. This part of the interview was based on one single open question that sought to open the possibility for the construction of a narrative by the interviewed. Further questions which were not previously planned were posed during the interview, in order to clarify misunderstandings and encourage the interviewed to further develop their arguments.

When the interviewed concluded their discourse regarding the opening question, or when I observed that new relevant arguments had stopped appearing, I moved on to the semi-structured questionnaire. Regarding the subjective appropriation of the concepts of territory and sustainable development, I firstly waited to see if they would appear without a directive question, during the narrative interview. Afterwards, I would mention them in the semi-structured questionnaire in order to be able to compare the arguments in the two parts of the interview and the arguments among interviewees.

The second part of the interview was based on semi-structured questionnaires and aimed to collect information regarding events, laws, policies, the roles of institutions, and the appropriation of concepts. Based on literature survey, document analysis and preliminary interviews, I focused on key events classified as the planning, regulation, financing, environmental licensing and environmental inspection of wind farms, while drawing attention to relevant interest groups and the power relations among them, as well as to the adopted power strategies. The three stages of the governmentality of the wind farms, as presented in chapter 6, appeared more clearly *a posteriori*, as a result of interview analysis and inspired by the work of Arun Agrawal (2007) on environmental policies in India.

The questions were not necessarily posed in the same order, because in each interview new relevant questions were posed, as they seemed to be relevant to the research goals according to the group being interviewed. The durations of the interviews varied from roughly half an hour to an hour. A total of 76 interviews were made considering all groups.

In Cumbe I selected the interviewed while seeking to represent all the differences of gender, age, profession and house location within the community. Also I aimed to interview some key figures such as the largest local businessman and the community teacher, as well as the workers and representatives of the companies CPFL and SUZILON responsible for the farms affecting the case study. I conducted around ten preliminary interviews, before reformulating my interview plans. Then I made roughly forty interviews with inhabitants of the Cumbe community and employees of the wind farms, until I noticed that new elements in their discourses began to disappear.

The interviews were recorded with the agreement of the interviewed and later transcribed including notes to point out the interruptions and interferences that occurred during the interviews. During the field research I also made observations while walking through the community, focusing mainly on the relationships between inhabitants (friendships, family relations, subordinate labour relations etc), and between inhabitants and the wind farm workers, as well as on the possible territorial strategies adopted by various interest groups, such as the enclosure of the area of dunes beside the wind farm. Every night I would take notes recalling the interviews and trying to relate them. By that time I was also preparing an article on the theoretical basis of my research, which helped me to confront concepts, theoretical approaches and the discourses and practices analysed in the field research.

Even though I chose to adopt a constructivist approach in my work, I have used three main references concerned with participant observation in order to guide my procedures during the field research and the observation of the social practices in the Cumbe community: Becker 1958; Crang and Cook 2007; Lüders 2005. Even though I understand that my

position as a researcher, and also my research questions themselves, impose a perspective on the object of research (which means that I did not aim towards an effective participation or a full familiarity with the social practices that I have observed), the academic contribution of ethnographies regarding participant observation has guided my practice and helped me to reflect on it during the construction of the object of my research. Also Lüders (2005) assumes that the distance between observer and observed is inevitable, and proposes three stages for the participant observation.

In this sense my field research concerned three main stages: the preparation of my research hypothesis; setting goals and questions, while defining the groups who I planned to interview; and developing the plan of interviews. A second part followed, where I presented myself to the interviewed (assuming that my presence would affect their discourses and behaviours) and tried to observe their practices and take note of them, while remaining open to the possible emergence of new issues that could change my research hypothesis. Regarding this part, it is important to keep a diary where the researcher takes notes of their observations, based on key questions. In my case the key questions regarded: 1) what evidences there are of power relations among inhabitants, interest groups and representatives of wind energy companies; and 2) what evidences there are of territorial strategies among interest groups.

According to Crang and Cook (2007), some relevant questions should be: Who was present at that moment? What did I see them doing and hear them talking about? How did they appear to be interacting with one another?

Regarding my participation in interactions in that setting, further questions are: “Who introduced me to whom?” and “How did they describe what I was doing”? In my case I have introduced myself to most of the interviewed, explaining that I was conducting research in Germany on the impacts of the wind farms on the Cumbe community. I was being hosted by a key activist for the rights of the fishermen (who was a teacher and researcher born in the community, with a critical view towards the local practices of both the wind energy company and some shrimp farmers). I did not interview the family who were hosting me (to whom I became personally very close) in order to avoid extremely biased interviews in comparison to those made with other inhabitants.

The third part of the participant observation was an *a posteriori* reflection on my experience and on how to relate the practices and discourses observed to the concepts and theoretical approaches that I was using during the research. A key question was: “What were my first impressions and how have they changed” (Crang & Cook 2007)? In Cumbe, for example, I did not expect to find internal conflicts regarding the acceptance of

the wind farms. Based on my previous research I had believed that, aside from the large landowners, there would be a consensual discourse critical of the methods of the wind farm's implementation in the community (as highlighted in some academic and newspaper articles that I had analysed before the field research). Nevertheless, as we shall see, this was not the case.

Still concerning the interviews, Demazière and Dubar (2009) affirm that speech is constructed during interaction with the researcher. This means that the context in which the interview takes place and the relationship established between the interviewer and interviewed are influencing the production of the narrative (Demazière & Dubar 2009). The interview is based on a contract of trust where the interviewed accept that their stated opinions will enable others to better understand them as a member of a contextualised group. From the perspective of the interviewer, there is no promise to provide therapeutic help or to solve social or economic problems.

There exists only the respect for the words of the interviewed and the opportunity for them to express themselves concerning the theme that is explained at the beginning of the interview. The researcher encourages the interviewed to express their worldviews, tries to understand and valorise them, and tries to stimulate the interviewed to appropriate themselves of their own symbolic world, suspending all judgement. Still for Demazière & Dubar (2009), the research involves respect for people's words, experiences and the argumentative logic they develop during the interview. Using these authors' approach, particular interest is shown to the structures of meaning engaged in the discourse constructed by the interviewed, which is seen as an expression of social patterns.

2.6. OPERATIONALISATION AND PARTIAL CONCLUSIONS

Based on the previous methodological approaches I have operationalised my research method as follows:

1) Theoretical and conceptual analysis of the links between all selected theoretical approaches (political ecology; environmental justice; green governmentality; neo-liberalisation of nature; social cartography) and concepts (territory; scale; sustainable development; environmental justice).
2) Secondary data collection and analysis of the links between: land conflicts, sustainable development and wind energy policies on global, national, regional and local scales.

3) Primary data collection including observation on the field and semi-structured and narrative interviews, aiming to: i) collect information to complement the abovementioned secondary data; and ii) analyse the discourses of the members of different interest groups in order to analyse the socially constructed subjective dimensions of power relations and power strategies concerning the installation of the wind energy farms in the case-study.

The analysis of the primary data (according to the abovementioned research goals) was based on the following categories of analysis:

a) Interest Groups:

a.1) government representatives
a.2) wind energy companies
a.3) inhabitants of the Cumbe community – considering internal conflicts and groups of support (social movements, NGOs, academic researchers and the media).

b) Power strategies:

b.1) Institutions/rules/policies;
b.2) Discourses/knowledge;
b.3) Subjectivities.

c) Phases of the wind farm development

c.1) Regulation
c.2) Planning
c.3) Previous Licencing
c.4) Financing
c.5) Environmental Licensing
c.6) Environmental Inspection during construction work
c.7) Environmental Inspection during operation

d) Scale of analysis

d.1) Local
d.2) Regional
d.3) National
d.4) Global

e) Dimension of sustainable development

e.1) Socio-cultural
e.2) Economic
e.3) Political
e.4) Environmental

4) Constant attempts to confront the theoretical approaches and concepts on one hand, and the secondary and primary data analysis on the other hand, in order to test the research hypothesis and develop possible answers to (or redefine) the research questions and goals.

This process resulted on the creation of an additional category of analysis, inspired on the work of Agrawal 2006. This category of analysis guided the further use of the above-mentioned categories of analysis and the writing process:

a) “Changing governmentalities

a.1) Stage 1: Initial phases of the wind farm development; Strong lack of information and participation (regarding Cumbe´s inhabitants); Greater internal consensus ´for` the wind farm.
a.2) Stage 2: Construction of the wind farm; Temporary increased power of Cumbe´s inhabitants to struggle for their territory and to give national visibility to the conflict; Greater internal consensus `against´ the mode of implementation of the wind farm.
a.3) Stage 3: Operation of the wind farm; Wind energy company ´s good neighborhood policies X struggle for territorial rights; Internal conflict opposing groups for and against the wind farm.

Thus, it is through establishing links between the production of regulative frameworks (formal and informal), the production of knowledge and discourses, and the production of common subjective values – used as power strategies by different interest groups (acting locally, regionally, nationally or globally) – that I have developed a case study analysis, based on the analysis of changing governmentalities, searching for the causes of a territorial dispute (concerning wind farms) that occurs on a very unequal basis (as previous researchers have affirmed and I have seen in the field research). Let us now look at the theoretical basis of the research.

3. THEORETICAL BASIS

3.1. INTRODUCTION

The main motivation for undertaking this research was to observe a contradiction concerning the model under which the wind power is being implemented in Brazil. On the one hand, investments are growing, prices for wind power production are decreasing, a chain of industries and services is emerging in Brazil to supply wind farms, the percentage of renewable energy sources on the country´s energy mix is growing and, finally, national Carbon dioxide (CO_2) emissions are being reduced. This means a positive framework considering the economic and ecological dimensions on a national scale.

On the other hand, this model has been criticized when it concerns the northeast coast of Brazil – the area where the most investments are concentrated. In this area affected communities, academics, public prosecutors, public defenders, Non governmental organizations (NGOs) and part of the media have highlighted: 1) a disregard for environmental laws; 2) the transfer of negative impacts to inhabitants without appropriate compensations; 3) disrespect for social rights; and 4) disrespect for the territories of traditional populations (Alcântara 2009; Brown 2011; Comissão Pastoral da Terra 2014; Diario do Nordeste 2010; Francisco 2012; Lima 2009; Meireles 2011; Pachioni 2013; Portal do Mar 2012; Rede Brasileira de Justiça Ambiental 2014). This means a negative framework considering the socio-cultural, economic and environmental dimensions on local and regional scales.

The initial bibliographic survey and secondary data collection soon showed me that the reason for this contradiction was an unequal distribution of the wind farms' costs and benefits on space and among social groups. This is why I have decided to focus on this contradiction and inequality, and on the socio-spatial processes that produced it. For this purpose, I have decided to undertake a case study in a community where this contradiction and inequality were strongly present. The idea is to consider the multi-scale groups related to the wind farm, their interests and strategies of power and their capacity to influence the decisions, policies and practices that affect them.

There were three key theoretical foundations that allowed me to structure this analysis: “environmental justice”, “political ecology” and “environmentality”. All of them are interdisciplinary, criticize the concept of sustainable development, explore the relations

between power and environment and pay certain attention to spatiality; moreover, the three complement each other in this analysis.

The main argument of this chapter is that the sustainability of the exploitation of wind power in Brazil has been strongly dependent on the high level of concentration of power over resources on all scales.

3.2. SUSTAINABLE DEVELOPMENT

“Sustainable Development” is an expression used and disseminated in the institutional and academic fields as well as informal contexts. What I have observed is that it may assume a different meaning with different strategic purposes according to the expression's context of use and the “speaker”.

Multilateral organizations and governmental agencies have been using it to legitimate policies. The industrial, service, and financial sectors have been using it as a marketing strategy to add value to their activities and products. The academic debate has been trying to define it according to different thematic and ideological approaches, from biological and engineering sciences to political and social sciences, as well as from more neoliberal to more critical approaches to economic development models.

In addition, NGOs and grassroots movements have been using or criticizing the concept in order to legitimate their practical and symbolic strategies of struggle. The media has been using it to legitimise or delegitimise all those previous conceptions. In daily life, subjects have been making different appropriations of this variety of definitions in an informal way. What I have perceived is that most of the inhabitants of the case study community had never heard it or had heard it but did not have a definition in mind.

Apparently, the official discourses to which they have been exposed have been associating wind energy with ideas of clean energy and progress, instead of associating it with the specific idea of sustainable development. I would suggest that the reason for this is the fact that “clean” and “progress” are both ideas that were already part of most inhabitants' vocabulary before the arrival of the wind farms. Those words are very often heard in the media concerning the environment or concerning infra-structural projects. Based upon the interviews, the idea of progress has been connected to jobs and infra-structural enhancement, which are two central necessities in the community.

Among the NGOs and grassroots movements interviewed - all of whom are engaged with principles of social justice - the concept has been seen as an empty concept “used for unsustainable purposes”. There are two main criticisms that are usually mentioned. Firstly, that the concept puts economic growth as a priority disconnected to social and environmental goals, while social and environmental principles are considered as barriers to development.

The second main criticism made by social movements and NGOs concerning the concept of sustainable development is that it does not address the contradiction between neoliberal economic growth on one hand, and social equity and environmental balance on the other, masking the fact that privileged groups and countries concentrate the benefits of this model, while underprivileged groups and countries mainly bear its costs. Therefore, the concept has been rejected as a Northerly perspective and as a strategic discursive tool; instead, they have been working with the concept of environmental justice, as they affirm that it better fits their political vision and political positioning. Nonetheless, let us leave this concept for later and proceed to discuss “sustainable development”.

As for the private sector, after an analysis of the interviews, I would suggest that there is a shared view of an economic growth that takes environmental protection into consideration due to acknowledgement of climate change contention. Also present was the idea of benefiting the local community with jobs and environmental education programs.

If we consider how the most influential multilateral institutions use the concept, we find a large contradiction. On the one hand, there is a fairly advanced and committed discourse in terms of social justice, whereas on the other, they use their power to implement neoliberal measures such as the flexibilization on environmental laws and the commodification of nature, which leads to greater social, economic and environmental inequalities in terms of access to resources and exposure to environmental impacts and risks (Heynen & Robbins, 2005; Watts & Peet 2006a).

Reflecting the first positioning of multilateral institutions, the United Nations, according to the report of the United Nations Conference on Sustainable Development 2012 (United Nations 2012a) and the United Nations Development Program Report 2013 (UNDPR) (United Nations Development Program 2013), acknowledges that: 1) environmental risks and damages affect mainly poorer countries and communities; 2) development policies have to target people as the top priority, and not economic growth; 3) patterns of consumption in the global north have to be reduced as they are not sustainable; 4) equal participation of gender, class and ethnic groups on the creation of policies and projects is a condition for sustainable development; 5) poverty eradication and promoting “inclusive and

equitable economic growth" are "essential requirements for sustainable development"; 6**)** inequitable access to land is a cause for rural poverty and for unequal social and economic power relations that undermine democracy (United Nations 2012a; United Nations Development Program 2013).

The UNDPR 2013 also recognizes the need to attend to citizens´ demands for a greater capacity of influencing policy-making. It identifies that to adapt to the contemporary needs and contexts, important transformations may be necessary and mentions past experiences such as when

> *"(…) governments in the North responded to demands from civil society and labor unions to regulate the market and extend social protection so that the market served society rather than society being subservient to the market"* (United Nations Development Program 2013, p. 94).

On the other hand, multilateral institutions work to ensure that neoliberal economic and political measures are maintained and expanded all over the world (Watts & Peet 2006a). The UN itself promotes the financing of nature, which is the cause for unequal distribution of power over resources, land expropriation and land grabbing, which means greater economic and social disparities and less political participation in the world (Heynen & Robbins 2005; Dearden 2013).

The environmental justice approach not only criticizes the concept of sustainable development but shows, through concrete cases, how this model of economic growth is based on an unequal distribution of its benefits and costs among countries, cities and social and ethnic groups. Let us now look at this criticism in more detail.

3.3. ENVIRONMENTAL JUSTICE

The term "environmental justice" may refer to a grassroots movement and also to an interdisciplinary academic field that has emerged from this movement. The environmental justice movement has given visibility to a fact: "Environmental degradation is not democratic" (Acselrad et al. 2009, p. 11). Environmental justice is a bottom-up movement resulting from an alliance between grassroots environmental and civil rights movements including educators and scientists (Bullard 2014). According to Acselrad et al. (2009), "environmental inequality" manifests itself in two ways, or environmental injustice occurs through two processes: 1) unequal protection against environmental risks; and 2) unequal access to environmental resources. In the first case, it results from unequal or a lack of environmental policies that expose, or allow market practices to expose, poorer and ethnic

minorities to the environmental costs of economic development. Let us initially explore this first process and how it unfolds.

The same authors point out that according to capital interest, underprivileged social groups and ethnic minorities have to: 1) bear the risks and damages of environmental impacts on their work places and places of living; and 2) bear the economic and symbolic burdens of displacement (Acselrad et al. 2009, p.32). The main cause for this is that they have less capacity to influence decision-making.

Those ideas emerged in the 1960s among popular grassroots movements in the United States that perceived the necessity to articulate the agenda for social rights with the agenda for environmental protection (Acselrad et al. 2009; Bullard 2014). The fact that environmental impacts were unequally distributed was reported by a number of studies showing that the geographical distribution of pollution in the United States was made according to class and even more strongly according to race (Acselrad et al. 2009; Bullard 2014).

A second key contribution of the movement for environmental justice was to criticize the dominant view that centers the environmental debate on the ideas of scarcity and waste and ascribes the market the key role in regulating environmental issues (Acselrad et al. 2009, p.15), especially given that it opposes the discourse of ecological modernization. As this discourse has a central place on the global environmental agenda, I will now briefly explore it.

According to Mol (2000), ecological modernization emerges as a theory in the field of environmental sociology in an attempt to account for transformations that were occurring in institutions and social practices in the 1980s in Western European countries. The author believes that these shifts revealed a real commitment of society to combat the environmental crisis. This commitment was expressed by structural changes in the way industries, governments and multilateral organizations addressed environmental issues.

Mol (2000) states that, despite the diversity of perspectives, ecological modernization theory generally perceives a number of concrete positive results of these transformations. They mainly point out that economic growth with low or no environmental degradation is possible through: 1) technological innovation that focuses on prevention of damages; 2) reduced use of resources and reduced emissions; 3) greater influence of the market and multilateral institutions on the management of resources; and 4) environmentally correct consumption (Mol 2000; Milanez 2009).

On the other hand, the limits of the concept have been pointed out from different perspectives. Less critical scholars point out that the solutions proposed by the ecological modernization could hardly be applied in developing countries. In the case of Brazil, Milanez (2009) highlights: 1) the limited capacity of technological innovation; 2) a tradition of corrective solutions instead of preventive ones in the industrial sector and 3) a tendency for economic specialization on productive sectors that use resources intensively.

Mol (2000) also highlights that the consumption of environmentally correct products is a challenge in Brazil because this practice is not culturally impregnated and because income remains very concentrated. More radical views are found concerning the environmental justice debate; therefore, let us now return to its analysis.

The main criticism from the viewpoint of environmental justice is that the discourse of ecological modernization masks the social, economic, environmental and spatial disparities that result from unregulated economic growth. According to Acselrad et al. (2009), ecological modernization naturalizes the current development model, as it does not put into question political choices that define who benefits and who bears the costs of economic growth. Key questions that are masked are: “what is produced, how is it produced and for whom” (Acselrad et al. 2009)? Other questions that are not addressed are: why is it that “environmental policies and practices result in unfair, unjust, and inequitable outcomes?”; “What groups are most affected? Why are they affected? Who did it? What can be done to remedy the problem? How can the problem be prevented” (Bullard 2014)?

Instead of addressing those core issues, ecological modernization formulates the environmental crisis in an apolitical manner as a global problem affecting everyone equally, which can be solved essentially through market-driven managerial and technological solutions (Rutherford 2007; Zhouri 2008). By contrast, the discourse of environmental justice advocates increased state regulation with higher social-environmental commitment and the greater participation of underprivileged groups in policy-making and territorial planning (Bullard 2014; Capek 1993).

The authors highlight the main reasons for the concentration of negative environmental impacts in areas where ethnic minorities and the economically underprivileged live: 1) low land prices are attractive for investors; 2) a lack of political power to stop the project when the community decides to oppose it; 3) a lack of popular opposition due to low levels of political organization; 4) the tendency to accept high social and environmental burdens against promises of employment due to high levels of local unemployment; 5) the tendency to accept high social and environmental burdens against promises of small infra-structural

enhancements due the lack of local public investments; 6) the lower spatial mobility of local inhabitants due to high land prices and the discrimination found in other areas, which means that they cannot easily move away to safer areas; and 7) the lack of participation of those minorities in political decision-making processes (Acselrad et al. 2009; Bullard, 2014).

They argue that:

> (..) *market forces and discriminatory practices of governmental agencies worked in an articulated manner for the production of environmental inequalities". Public policies would offer support to these perverse market practices* (Acselrad 2009, p. 21).
>
> "(...) *forças de Mercado e práticas discriminatórias das agências governamentais concorriam de forma articulada para a produção das desiguladades ambientais*" (Acselrad 2009, p. 21).

They describe an important shift concerning the strategies of capital accumulation, given that the deregulation of social, economic and environmental rules lead to a greater spatial mobility of capital, under the condition of reduced barriers for capital flows, more flexible labor and environmental laws (Acselrad 2010; Bullard & Smith 2002). This greater spatial mobility of investors imposes increased competition among places and people to attract jobs and consequently weakens labor unions and critical social action (Acselrad et al. 2009, p. 134). The authors describe a strategy used by firms called "locational blackmail", including how this strategy works and reinforces spatial segregation and environmental injustice.

According to Acselrad et al. (2009), there are two main mechanisms under which locational blackmail works. On the one hand, municipalities want to increase tax collection and job offers, as this increases their financial and hence political power as well as their popularity. In order to reach this goal, they are willing to flexibilize local labor laws and environmental laws because they fear that otherwise another municipality will attract the investment. Therefore, cities with low revenues and high unemployment rates will be particularly vulnerable to locational blackmail.

On the other hand, inhabitants are ready to bear some environmental losses, which are usually underestimated in the official information provided to the community, lured by the promises of jobs and infra-structural benefits promised by investors.

Within a municipality, the investor will tend to install himself in neighborhoods where: 1) land prices are low; 2) the political power of inhabitants is low and repression against social movements is high; and 3) public investments are low so that the population suffers

from lack of basic services and infrastructure and will be willing to accept some environmental loss in exchange for gains in those sectors lacking investment. This means that the locational blackmail is more disadvantageous for poorer communities and poorer municipalities, which have less bargaining power and are willing to accept higher costs in exchange for small benefits to "win" the locational competition (Acselrad et al. 2009, p. 136). Also, those with less mobility are most affected by social-environmental risks (Acselrad et al. 2009; Bullard 2014).

Moreover, when the activity is already installed in one place and the civic society starts to become organized to pressure the firm to assume social and environmental responsibilities and compromises, the firm tends to blackmail the decision-makers, saying that they will move away to another place, thus reducing municipal tax revenues and increasing unemployment (Acselrad et al. 2009, p. 136).

Supposedly communities and governments have the "free choice" to accept or reject the project. In reality, what they have is a choice between what would be "less worse":

> *(…) between precarious and risky labor conditions or no work at all; between some level of growth under predatory conditions and no growth or very low growth* (Acselrad et al. 2009, p. 137).

In this sense, workers are placed in competition with each other, and the main instrument that they have to compete with is the renunciation of acquired rights. Moreover, poorer countries and municipalities will compete with each other (Acselrad et al. 2009, p. 138), concerning which one offers the most flexible conditions to attract investors.

Another critical point is the fact that locational blackmail has the capacity to disorganize social movements and their methods of pressure against this unequal distribution of development costs and benefits (Acselrad et al. 2009, p. 145). Social-environmental movements lose parts of their basis because they are accused of banishing (Acselrad et al. 2009, p. 137) and preventing the advent of employment, progress and development. As the authors explain, that is why the transference of social-environmental costs of economic growth frequently occurs with the consent of affected communities and governments (Acselrad et al. 2009, p. 138). In this sense, the authors understand that large investors have an exaggerated power of influence over policies of territorial regulation as well as over the population´s degree of acceptance of environmental risk. This problem was observed during the field work in the case study community.

In order to tackle this problem, the key factors are: 1) better access to information about environmental risks and impacts of projects; and 2) the exchange of this information

among affected groups, in order to facilitate a critical analysis of the current development model and propose alternatives that avoid the locational blackmail and destructive locational competition among workers and municipalities (Acselrad et al. 2009, p. 139; Zhouri 2008; Bullard 2014).

This involves:

> *(…) an alliance between unions, social movements, landless peasants, indigenous communities, small family farmers, fishermen, "quilombolas" communities and periphery´s urban social movements to avoid the weakening of acquired rights* (Acselrad et al. 2009, p. 140).

The idea is to build a critical capacity that opposes a culture of rights to the logic of locational competition. The environmental justice discourse establishes three main principles of environmental justice: 1) the right to a "safe, sane and productive environment" for everyone, independent of their social class, race or ethnic identity, considering the ecological, economic, political, social and aesthetic dimensions of the environment; 2) the right of every worker to have a "safe, sane and productive environment" without having to choose between his rights or unemployment; 3) the right of every inhabitant to be free of the environmental dangers of productive activities (Acselrad et al. 2009, p. 17).

A landmark for the movement was the First National People of Color Environmental Leadership Summit, held in 1991 in Washington, with 650 grassroots and national leaders from around the world (Bullard 2014). The idea was to redefine the environmental issue based upon three main perspectives (Bullard 2014). The first one is to include its inherent political dimension. The second one is to relate the usual global and national scalar approach (where environmental problems affect all nations and people equally) to a local scale where everyday life takes place. In this way they show that the conditions that groups experience in their environments such as home, work, school and place of leisure, are defined by political choices, often taken without the participation of underprivileged groups. In this sense, inequality is institutionalized through the unequal enforcement of environmental laws in space according to class, status and ethnicity (Bullard 2014).

Thirdly, they show that this unequal enforcement of environmental laws is legitimated by official studies, statistics and reports based on so-called objective science (Bullard 2014; Zhouri 2008). Those studies hide the values that lay behind decisions to invest in infra-structural enhancements and environmental protection in one area and facilitate the location of polluting activities in another (Bullard 2014). As we will see later, this

perspective is very similar to the approach of the interdisciplinary field of environmentality with regard to official knowledge and discourses.

In this sense, one of the key demands of the environmental justice movement was that reports of environmental impacts start to include affected underprivileged groups as co-producers to integrate a social approach of impacts into a biological one (Acselrad et al. 2009; Bullard 2014; Zhouri 2008). These reports would allow the evaluation of the "environmental equity" of public policies and economic activities (Acselrad et al. 2009, p. 27; Bullard 2014).

In Brazil, the reports must include the evaluation of social impacts. Nevertheless, they do not include affected groups such as co-producers, and they are usually made by scientists from the field of exact sciences (biology, geomorphology, engineering, physical geography), as I could observe analyzing Environmental impact assessment/Environmental impact assessment report Environmental impact assessment/Environmental impact assessment report (EIA/RIMAS) and through interviews with environmental agencies and an environmental consulting agency. People´s knowledge concerning the economic and symbolic values of resources and places is not properly taken into consideration.

Militants and academics already saw, in the 1980s, how these local problems were part of a broadened process that determines the relations between environmental risk, poverty and ethnicity around the world. They understood that the solution was not the exportation of environmental injustice to other places and countries, but rather that toxic pollution is acceptable for no one. In this sense, the organization of national networks is a very important strategy to avoid the simple displacement of problems to other areas where people are less capable of representing their interests (Acselrad et al. 2004, p. 27; Capek 1993). Beyond that there are attempts to internationalize the movement (Acselrad et al. 2004, p.28; Wallker & Bulkeley 2006)

Acselrad et al. (2004) identify two fronts of struggle. One is a concrete front in which there is an attempt to affect the distribution of power over natural resources, land and territories in order to influence the practical distribution of environmental damages in space and among social and ethnic groups. The other front is a symbolic and discursive struggle about the definition of values of justice, social representations and statistical categories. These values and representations play a key role in power distribution as they legitimate rules, policies and practices, where some groups are highlighted and others are marginalized or even made invisible.

The main strategies adopted are marches, road blockades, petitions, lobbies, finding of facts and elaboration of reports, hearings and debates with affected communities (Acselrad et al. 2004, p.23; Bullard 2014). Concerning the subjective struggle, the acknowledgement and confirmation of the racially- and socially-based unequal distribution of environmental costs associated with research and reports were a starting point for preparing a discursive struggle with the diffusion of new concepts and terms such as "environmental racism" and "environmental injustice", all pointing out that those suffering from spatial segregation will usually have to bear the greatest portion of environmental costs.

As a reaction, opponents try to disqualify testimonies and reported cases, for example of intoxication, as being scientifically unproven or statistically irrelevant. Another argument used against the environmental justice movement is that they endanger local employment opportunities and that spatial segregation is a result of individuals' choices, given that they did not invest in their human capital, which would provide them with spatial mobility (Acselrad et al. 2004, p. 31).

Environmental justice studies point out that in a capitalist economy of free markets, the benefits of production and its costs on the environment and on human health are distributed according to social classes (Acselrad et al. 2004; Acselrad et al. 2009; Bullard & Smith 2002; Bullard 2014; Gould 2004; Walker & Bulkeley 2006). Benefits will concentrate in the hands of those who concentrate riches, and are thus able to afford the better products, services, houses (in neighborhoods with high land prices) and means of professional qualification (which would provide them with access to better-paid and safer jobs). This framework is also related to the fact that those who concentrate riches have greater political power due to their easier access to, and influence on, political decision-making in their favor.

According to Gould (2004), people who detain capital exercise this influence as they: 1) determine capital investments; 2) control the creation and distribution of employment; 3) finance election campaigns; and 4) may pay bribes to government officials (Gould 2004, p.74). Consequently, they are able to ensure privileges and transfer the costs of investment and policies to the most disadvantaged social classes and marginalized ethnic groups (Gould 2004, p.70). The author explains how the unequal distribution of economic and political power reinforce each other and work both for the unequal distribution of environmental risks and public health risks among social groups (Gould 2004, p.75). Therefore, one of the main demands of the environmental justice movement is the effective participation of all social groups in the process of elaboration of public policies

and the planning of private investments, based on the local knowledge of affected groups - without discrimination of class, race, ethnicity or gender, among others (Bullard 2014; Acselrad et al. 2009).

Another key argument of environmental justice studies is that it is possible to transfer the environmental costs of economic development to poorer people and the respective places due to socio-spatial segregation, which allows richer people to live and work in areas distant from environmental and health risks (Gould 2004; Acselrad et al. 2004; Bullard 2014; Bullard & Smith 2002). This works in two ways. On the one hand, industrial activities are usually developed on land with low market value, allowing reducing production costs. As poorer people can only afford to live in areas of low cost, those activities will tend to install themselves where poorer people live. This tendency can easily unfold as the affected groups have no adequate political power to influence the respective land use policies. The authors also explain that polluting activities will not only search for less expensive places but also for places where they expect that the power to resist will be low.

Sometimes resistance does not manifest itself because people are attracted by promises of jobs and infra-structural enhancement. As Gould (2004) explains, it is not that richer people are more concerned with the environment and with their health, but that since they have their basic needs accounted for, they do not need to bargain for their access to good health or a well-cared-for environment in exchange for basic services and infrastructure, nor for low paid and risky jobs (as they may have better ones; Gould 2004, p. 73). We also have to consider that poor people can hardly afford to move away to other places that offer better conditions (Acselrad et al. 2009).

On the other hand, once a polluting activity is installed, it will reduce land prices and attract poorer people who have no choice other than to live in less attractive areas of greater exposure to environmental and health risks (Acselrad et al. 2009, p.72). Nevertheless, if a polluting activity is installed in a neighborhood where richer people live, they will employ their greater capital to oppose it. In rich neighborhoods, we usually find lawyers, politicians and academics with greater political influence than the working class who are found in poorer neighborhoods (Acselrad et al. 2009, p.74).

In this sense, the more that social groups are privileged, the more they will benefit from economic growth, whereas the more they are marginalized, the more they will suffer from the respective negative consequences, especially impacts on the environment and health (Bullard & Smith 2002; Bullard 2014; Acselrad et al. 2004; Acselrad et al. 2009; Gould 2004).

As I have mentioned at the beginning of this sub-chapter, besides the transfer of environmental risks, there is a second mechanism of environmental injustice. This is the unequal access to resources (Bullard & Smith 2002; Acselrad et al. 2004; Acselrad et al. 2009), which unfolds in two ways. Firstly, considering world consumption, it is poorer people who consume fewer goods and less electricity and food: and therefore, it is they who cause less harm to the environment (United Nations Development Program 2013).

Secondly, we have to consider unequal rights of the use of and access to land and its natural resources; affecting mainly traditional groups whose livelihoods depend directly on ancestrally occupied territories and their natural resources (Acselrad et al. 2009; Cruz 2013). Some authors have been using the term “neoliberalization of nature” to describe how inequality occurs (Birch et al. 2010; Heynen & Robbins 2005; Fairhead et al. 2012). They observe new strategies that emerge under a global neoliberal economic regime, which are being used by powerful economic and political groups in order to ensure their control over natural resources. I believe that here a brief presentation of this analytical framework will enrich the discussion.

Neoliberalization of Nature

Authors who use the term “neoliberalization of nature” while analyzing new forms of nature appropriation by the market under neoliberal economic systems, belong to different fields of social sciences, including a large number of geographers (Backer 2009; Birch et al. 2010; Fairhead et al. 2012; Heynen & Robbins 2005; Igoe & Brockington 2007). This approach involves an analysis of new ways to conceive, control, distribute, manage and produce nature (Heynen & Robbins 2005); of the main economic, political, socio-cultural and ecological effects of these processes; and of the main actors involved.

These authors usually point out the following processes, resulting mainly from two factors regarding nature: new governance systems and new property systems. Of the first we may observe the deregulation and “reregulation” of “environmental arenas of governance” which include: 1) the transference of “decision-making” authority and resource management to the private sector, to NGOs and to global multilateral organizations; 2) the flexibilization of environmental laws (Heynen & Robbins 2005).

Regarding the second factor, which is “new systems of property regarding nature”, it occurs in the following ways, which are often interlinked: 1) the privatization of natural resources that were long under the power of governmental authorities such as water, oil reserves and mineral resources; 2) the commodification of nature, which means creating value and prices for ecosystems - that are then turned into marketable products and

services that may be traded on finance markets (theoretically in order to be better conserved); and 3) the enclosure of lands and its resources for monocultures or large power plants – including the enclosure of common resources in the name of "conservation" projects. This last process evicts communities and small farmers from their territories and lands (Fairhead et al. 2012; Heynen & Robbins 2005).

Fairhead Fairhead et al. (2012) highlight a particular form of enclosure, which is the appropriation of land and resources for environmental ends – what they call "green grabbing". Some examples are land appropriation for biodiversity conservation, biofuels, biocarbon sequestration, ecosystem services and ecotourism, in the name of "sustainability" and "conservation". The author describes it as the "transfer of ownership, use rights and control over resources that were once privately or publicly owned, from the poor (or everyone including the poor) into the hands of the powerful" for green ends (Fairhead et al. 2012, p. 238). As an example, the author mentions the appropriation of lands for palm oil plantations "not only for commercial biofuels but for carbon-neutral fuel" (Fairhead et al. 2012, p.239).

Another example that I may point out here, is the case of some wind power plants on the northeast coast of Brazil, where access to land and to resources with economic and socio-cultural values is restricted or denied, and where social rights and environmental rules are disrespected in the name of sustainable development. Media and academic researchers have already highlighted conflicts and cases of environmental justice related to the installation of wind farms in the following municipalities of the northeast coast of Brazil: Aracati- CE; Acaraú – CE; Bitupitá- CE; Camocim-CE; Caraço-CE; Trairí– CE; São Goncalo do Amarante- CE; Trairí- CE; Galinhos – RN; Macau e Guamaré –RN; Caetité-BA; e Igaporã – BA (Francisco 2012; Portal do Mar 2012; Comissão Pastoral da Terra 2014; Meireles 2011; Pachioni 2013).

The interdisciplinary field that studies the "neoliberalization of nature", as well as the three main theoretical approaches analyzed here on this chapter (environmental justice, political ecology and governmentality), also develops a critical point of view against the discourses of "sustainable development" and of "ecological modernization". Another point of approximation is that they also demonstrate the key role played by the production of scientific knowledge and the key role played by the concentration of power under global institutions (eg. International Monetary Fund - IMF, World Trade Organization - WTO, World Bank etc.) in reproducing neoliberal discourses, neoliberal governance systems and neoliberal practices being adopted in different parts of the world.

Authors admit that the capitalist economic system always was dependent on the appropriation of lands and resources causing the destruction of nature and exploitation of humans (Fairhead Fairhead et al. 2012; Heynen & Robbins 2005). The main differences among the neoliberal regime concern: 1) the technological capacity to destroy nature; 2) the discourses, knowledge and techniques that are used to support the appropriation and alienation of resources from the majority of the population (in the name, for example, of climate change contention through carbon-trading); 3) the new actors that emerge (beside older actors such as governmental agencies) and cooperate in multiple scales (eg. ecotourism companies, GIS service providers; green NGOs; commodity traders and consultants, among others); 4) the key role played by the finance market on the power relations between actors representing the different sectors of economy (finance, services, industry, agro-business, governmental institutions and civic society (Backer 2009; Birch et al. 2010; Fairhead et al. 2012; Heynen & Robbins 2005; Igoe & Brockington 2007).

Looking at Latin America in general and Brazil in particular, some authors linked to the environmental justice approach have observed how, during the last thirty years, capitalist ways of production have been increasing their pressure on non-capitalist ways of nature exploitation such as artisanal fishing, small scale agriculture and community-based extrativism; and over their territories, in the search for new frontiers of expansion (Cruz 2013; Heynen & Robbins 2005; Santos 2010).

In this sense, authors analyzing the neoliberalization of nature see that not only in Latin America, but in various parts of the world, its effects are the destruction of nature and environmental injustice, an argument that leads us back to the discussion of what “environmental justice” is.

In Brazil, the main groups targeted by the expansion of capital are indigenous, quilombolas (descendants of slaves who resisted domination, creating autonomous territories of resistance called Quilombos), extrativist communities and small farmers (Acselrad et al. 2009; Cruz 2013). Their lands have been expropriated by big business as well as by energy- and infrastructure-related public investments that forcefully displaced them (Acselrad et al. 2009; Cruz 2013; Heynen & Robbins 2005). Sometimes, even if there was no forced removal from their autochthonous lands, those projects severely affect the territories of these groups and thus their economic and socio-cultural life, to such an extent that their existence in their territories is made unviable. This is the usual consequence of the transference of social-environmental costs of large-scale and polluting infrastructure investments and the restriction of access to key natural resources and symbolic places in the affected areas.

Besides that, these groups have been excluded by public policies; their rights and territories have not been properly recognized by the judiciary power; their history has been made invisible by both mainstream knowledge and the media (Acselrad et al. 2009; Cruz 2013; Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013).

In this sense, those communities are usually part of the poorest and most underprivileged groups of society and are thus those with less capacity to resist the pressure on their territories by big business. This process occurs because big business has the political and financial backing of the government through facilitated licenses, the flexibilization of environmental and labor laws, the offer of infra-structural benefits, tax reductions and low interest public loans. These traditional population groups are negatively affected for two main reasons: 1) they occupy territories that are targeted by the capital due to the market value of their natural resources; and 2) they are neither integrated into the capitalist production chains of exploration as a formal labor force, nor as consumers (Acselrad et al. 2009).

Here again the perspective of environmental justice meets the perspective of the neoliberalization of nature when they oppose to neoliberal discourses of sustainability that ignore the inherent contradictions between unregulated economic growth and nature. It is pointed out that among the discourse of sustainability lies the contradiction between an "economy of growth" and an "economy of repair" based on the "logic of repair":

> *"(…) unsustainable use "here" can be repaired by sustainable practices "there", with one nature subordinated to the other (…) The damage inflicted by economic growth generating unsustainable resource thus creates the basis for the new growth economy of repair"* (Fairhead et al. 2012, p. 242).

What the interdisciplinary theoretical approaches of "environmental justice" and of the "neoliberalization of nature" show us is that both - the economy of growth that transfers the negative environmental externalities to marginalized social-ethnic groups, and the economy of repair, that restricts the access to resources to privileged groups - produce environmental injustices (Acselrad et al. 2004; Acselrad et al. 2009; Bullard & Smith 2002; Fairhead et al. 2012; Heynen & Robbins 2005; Walker & Bulkeley 2006). The reason for this is that the environmental issue is a result of an economic system that produces socio-environmental disputes "opposing different forms of nature appropriation" (Acselrad et al. 2004, p.129) and opposing different groups of interest with unequal political power to represent themselves (Acselrad et al. 2004; Capek 1993; Bullard & Smith 2002; Fairhead et al. 2012; Walker & Bulkeley 2006).

The question we may pose ourselves now is how the levels of political power and participation with which different social and ethnic groups can represent themselves, their interests and identities in public arenas, is so unequal. The approaches of “Political ecology” and “Governmentality” will help us to answer this question.

3.4. POLITICAL ECOLOGY

Political ecology, as well as the other theoretical approaches upon which this work is based, is concerned with the contradictions between economic growth and nature. The particular point of view that this approach offers concerns the key roles played by formal institutions and mainstream discourses on the concentration of power over nature. Case studies usually undertake a multi-scale analysis conflicts over nature access and use, showing the local and regional influence of global institutions and of their discourses on local and regional environmental politics (Rangan & Kull 2009; Krings 2008; Watts 2004; Watts & Peet 2006a).

Political ecology appeared during the 1970s as a new theoretical approach to environmental problems, no longer seeing them as resulting primarily from population growth, inefficient management or inappropriate technology, but rather as a social phenomenon that originated from the unequal distribution of political and economic power over resources (Watts & Peet 2006a; Krings 2008).

Political ecology research usually looks at the mechanisms that allow the concentration of power and privileges among neoliberal institutions and market agents, that open frontiers to the expansion of capital around the world, and that promote the neoliberalization of nature, causing environmental injustices (Heynen & Robbins 2005; Rangan & Kull 2009; Krings 2008; Watts 2004; Watts & Peet 2006a). As the authors point out, these mechanisms work essentially through new forms of confinement, which means control over resources, knowledge and the labor force, leading to a dispossession of rights for the majority of people.

According to Watts and Peet (2006a, p. 4), political ecology has to acknowledge two processes involved in the evolution of Capitalism during the last three decades. One is the intensification of environmental problems due to the expansion and generalization of the technology sector, bringing industrialization to most developing countries; and the other is the deregulation of the economy. The second one is a greater social concern about the environment, resulting in the appearance of a number of green discourses.

These two processes are related to an important contradiction within neoliberal capitalism (Heynen & Robbins 2005; Rangan & Kull 2009; Krings 2008; Watts 2004; Watts & Peet 2006a). On the one hand, there is the inevitability of economic growth, upon which all social classes depend, given that it creates jobs, income and consumption. Politics depends on it because it concerns popular interest and, moreover, almost all parties' campaigns tend to be financed by large economic corporations, meaning that political parties from both the left and the right are to some extent growth-oriented (Watts & Peet 2006a).

On the other hand, neoliberal capitalism is affected by the inevitability of the environmental consequences of unregulated economic growth (Heynen & Robbins 2005; Rangan & Kull 2009; Krings 2008; Watts 2004; Watts & Peet 2006a). Several strategies to find a way out of this contradiction emerge from state and governance institutions and civic society. Here many authors agree that environmental discourses that try to reconcile economic growth with the environment is one of the central strategies. The most widespread are "sustainable development" and "ecological modernization" which have been discussed earlier in this chapter and are both based on the pursuit of a supposed "green" economic growth.

Here is where some researchers adopt a more radical critical point of view than others. Less radical views focus on the necessity to modify power relations over nature, especially through two main measures: more regulation (and a socially and environmentally committed one) of the state over the market; and the effective participation of socially and culturally marginalized groups in political decision-making processes. More radical authors directly question the main goal of the capitalist economic model which is "economic growth". They will try to show how it is impossible to have a socially equal and environmentally balanced world keeping current patterns of production and consumption (Prieto 2009; Watts & Peet 2006b).

Prieto (2009) shows how economic growth is only possible though the production and reproduction of social inequalities among social classes and among countries. He argues that there is a close relationship between PIB growth and increased energy consumption, higher emissions of polluting gases and accelerated exploitation of natural resources. An important factor that he points out is that:

> *(…) 20% of the inhabitants of the so called developed countries consume 80 % of the world´s energy and consequently of the resources, while the rest 80% of humanity has to comply with the 20% of the remaining resources* (Prieto 2009, p. 77).

The main strategy that allows these patterns of growth and inequality, as environmental studies also show, is the transference of activities that are highly polluting and intensive in the consumption of energy to poorer countries – while developed countries that dominate the world´s finance and commerce achieve high GDP, concentrating activities related to the financial sector and to the sector of services (Prieto 2009.).

The author also criticizes discourses that support the use of renewable sources of energy as a solution to environmental issues but do not criticize current models of economic production and consumption (Prieto 2009). As both environmental justice and political ecology studies show us, at the core of the environmental issue there remains a political issue of unequal power relations, defining not only which sources of energy will be privileged, but also for what they will be used and for whom they will be beneficial.

That argument leads us back to the discussion about the contradiction between economic growth and nature. According to Watts and Peet (2006b), the second strategy to solve the capitalist system's contradiction is a rearrangement of the regulatory framework, giving more power to global governance institutions – such as the World Trade Organization (WTO) and the International Monetary Fund (IMF) – under the pretext that they are able to ensure economic growth while promoting environmental regulations and social justice (Watts & Peet 2006b).

Watts and Peet (2006b) talk about "masking devices", saying that the WTO's role is more about taking control over economic decisions, claiming environmental concern and calming social critics, while often ruling against environmental restrictions. With the WTO being one of the most powerful institutions of the global economy, signing its agreement has almost become a *condition sine qua non* for participating in the global economy. Moreover, multilateral agreements concerning environmental issues that the WTO encourages are not being enforced. Nonetheless, this strategy has opened space for social protest against global mechanisms that concentrate power in some places, benefitting only specific groups of interest (Watts & Peet 2006b, p. xv).

A key discussion for political ecology is the distribution of power over resources and how this has affected the environment and livelihoods, especially those of underprivileged groups (Watts & Peet 2006a, p. 4). According to Krings (2008) political ecology studies have a especial relevance in developing countries as in these countries we still find several groups whose livelihoods depend directly on natural resources. Conflicts usually involve multi-scale actors and interests, and result from interdependent historical, ecological, economic, political and social processes (Krings 2008, p. 5).

A case study that provided important guidance for developing my case study has been presented by Dubash (2006). The author offers an example of how research following the approach of political ecology may analyze problems of resource management, showing that a lack of or dysfunctional market regulation reproduces social exclusion and unbalanced power relations (Dubash 2006, p. 219). His approach focuses on a more historical and local view concerning how such markets are shaped, in order to understand their functioning and their socio-economic and environmental impact. Presenting the case of water markets in western India, he shows how these markets are influenced by different processes such as the creation of political institutions, social practices, natural characteristics and historical circumstances on global, national, regional and local scales (Dubash 2006, p. 218).

Dubash (2006) argues that this procedure first questions the view of the market as an abstract, efficient and independent mechanism of regulation, highlighting its relations to and dependence on social and political factors. Secondly, it considers the influence of ecological processes – in relation to social processes – concerning the shape of markets (Dubash 2006, p. 219). Dubash (2006) does not take a stance for or against the private management of resource markets, but rather for a stronger commitment to economic regulation and to activity on social issues (Dubash 2006, p. 222). He believes that this should be the main goal of resistance struggles over the commodification of water.

Despite initially being based on local and national movements, international civil society networks and institutions such as the World Comission on Dams (WCD) were also created in the context of the use of water as a resource. These institutions have never achieved their goal to effectively ensure consideration of the rights of underprivileged groups when providing orientation for planning the use of water and, more broadly, to “re-embed economic decisions in social life” (Dubash 2006, p. 223). Nevertheless, their establishment has opened up a broader debate and brought new ideas into the political arena regarding water usage, providing new political space for local civil society movements.

Weiss (2010, p. 21-36) presents a similar perspective from the point of view of the energy market. He argues that this market is largely a result of social and political processes based on specific conflicts of interest. Moreover, that it is determined by concrete factors such as the availability of infrastructure, resources and labor force, rather than by abstract economic processes of market regulation. He also emphasizes that these markets are not only built up on a global scale, following the same rules, but also on smaller scales that are influenced both by context-based and global processes.

Weiss (2010) has analyzed the development of the renewable energy sector in developed countries, from the perspective of regulation theory (Weiss 2010, p. 21-36). According to him, especially in the 1990s and 2000s scarcity, high prices and the environmental costs of fossil resources reduced profit rates within the energy sector. Two responses to this crisis were, according to the author, the liberalization of the energy market and the expansion of the sector of renewable sources, providing new profit opportunities and reducing, at the same time, environmental pressure (Weiss 2010, p. 29-30).

However, opinions diverge concerning the question of what are the main forces driving the sector of renewable energy. Some talk about a centralized model according to which large and traditional firms own the renewable sector, centralizing decisions (Weiss 2010, p. 27). Their main strategies are scale effects and the reduction of political barriers to the implementation of large energy projects. Other authors talk about a decentralized model according to which profits and decisions are decentralized among smaller firms (Weiss 2010, p. 26). In the latter economic efficiency, environmental balance and participative policies tend to meet.

Here, it is relevant to underline that, according to Weiss (2010), these models may also coexist depending on the context. The models should not be seen as simple adaptations to production factors, but rather viewed in a deeper sense as the result of complex processes of negotiation among actors (Weiss 2010, p. 28). According to this author, these two models might also coexist. Effectively, investors adopt differentiated strategies in each place to profit from the particular social, economic, political and environmental framework.

We may observe that in Brazil large companies (private and public, national and foreign) profit from flexible environmental regulation, invest in large-scale projects with sometimes high negative socio-ecological impacts at the local level (Francisco 2012; Portal do Mar 2012; Comissão Pastoral da Terra 2014; Meireles 2011; Pachioni 2013) and receive the support of national and international funds based upon the mainstream conception of sustainable development, as we will see here later.

For some groups, according to a researcher from the Center for Research on Wind and on Solar Energy (CRESEB), there are several advantages of the current Brazilian regulatory system in the wind energy sector, which is based upon public auctions. First of all, this neoliberal approach stimulates competitiveness with the effect that wind power has even become the second cheapest source of electric energy after large scale hydropower. Second, it promotes the domestic industry, based on a nationalization index that requires projects to use a certain percentage of national products and services to have access to more attractive national funding schemes. Nevertheless researchers show (Brown 2011;

Lima 2009; Meireles 2011), and my initial analysis confirms, that from the perspective of environmental justice, this regulation favors the interests of energy markets and of some interest groups to the detriment of others, as we will see later.

Having considered the analysis of the relations between power and nature from the perspectives of environmental justice and political ecology, the point of view of "environmentality" or "governmentality of the environment" will now be presented, showing its particular contribution to this debate.

3.5. ENVIRONMENTALITY

The concept of "environmentality" will provide further orientation to our study of the environmental politics of wind energy in the state of Ceará. This approach uses the Foucaultian concept of "governmentality" in order to analyze particular techniques used for the government of nature (Agrawal 2006; Rutherford 2007). This concept regards the following key questions: "What constitutes the art of governing?", "How is power exercised?" and "What are the mechanisms that ensure that power is accepted and respected" (Foucault 1978)?

The author defines "governmentality" simultaneously as a process, a tendency and a set of techniques of government (Foucault 1978). It is a historical process that substituted the model of a "territorial State" of the sixteenth century by a "State of government" that emerged in the nineteenth century. In order to understand how power is exercised in our current society, Foucault analyses the differences between the "art of being sovereign" - that ensured the maintenance of "territorial States" - and the "art of governing".

The art of sovereignty was destined to control territories and subjects and ensure the public interest (seen as the absolute submission to law), based on a mercantilist economy that enriched the sovereign and centered on the government of the economy - understood at that time as the management of families and their houses, goods and wealth.

As mentioned here, Foucault (1978) also sees governmentality as a tendency. The tendency to which he refers is a tendency that has affected the Occidental world from the nineteenth century on: the appearance of the "art of governing", or the dissemination of the "State of government", or "governmentalization" of the States, as we know them nowadays.

The “art of governing” is destined to control populations in their relations to “things” (natural resources, territories, cultural patterns, climate, epidemics, etc), to ensure that the finality of each “thing” is achieved through specific tactics (eg. public health and birth control campaigns), and is based on the government of the economy (political economy – economy centered on the population), whose goal is to increase the population's wealth, improve health, etc (Foucault 1978).

The historical landmark that was responsible for this transformation was the demographic expansion that occurred in the eighteenth century along with processes of monetary accumulation and increases in agricultural production. This historical fact has transformed the rationality of the art of governing (Foucault 1978).

This transformation derives from the acknowledgement of the fact that the population has its own behavior and that its processes are irreducible to the ones that occur in families (eg. the behavior of epidemics, work rates and wealth rates). From this moment on, the family ceases to be a model for the economy and starts to be seen a segment of the population – an instrument used especially to produce statistics about the population, but not the main goal of economy (Foucault 1978).

This has meant the birth of “political economy”, the economy centered on the population, and one of the main techniques and sciences of government aiming to “improve the lives of people, increase their wealth, their life-time, their health” etc (Foucault 1978). The fact that the population starts to be the main goal of the techniques of government is related to the acknowledgement that the population is “puissance”. It is through the population that the government may alter birth rates or influence the kind of professional occupation that will be developed in one area – in this way driving people´s actions, without their awareness.

> *The population will appear as subject of needs, of aspirations, but also as an object in the hands of the government, conscious in front of the government of what it wants and unconscious, as well, of what it is induced to do (or of what the government makes it do). The interest, as awareness of each of the individuals constituting the population, and the interest as interest of the population, whatever may be the individual interests and aspirations of those who compose it, that is what the fundamental target and instrument of the government of populations will be. Birth of an art or, in any case, of tactics and techniques that are absolutely new* (Foucault 1978, p.25).
>
> *“La population va apparaître comme sujet de besoins, d'aspirations, mais aussi comme objet entre les mains du gouvernement, consciente en face du gouvernement de ce qu'elle veut et inconsciente, aussi, de ce qu'on lui fait faire. L'intérêt, comme conscience de chacun des individus constituant la population, et l'intérêt comme intérêt de la population, quels que soient les intérêts et les aspirations individuels de ceux qui la composent, c'est cela qui va être la cible et l'instrument fondamental du gouvernement des populations. Naissance d'un art*

> *ou, en tout cas, de tactiques et de techniques absolument nouvelles"* (Foucault 1978, p.25).

It is in this sense that Foucault defines governmentality, besides as a process and a tendency, also as a "set of techniques of government". Foucault has showed the centrality of techniques aiming to affect the interests of the individuals in order to control their practices and therefore the population´s behavior. Some examples are surveillance techniques, statistics and public campaigns aiming to affect patterns of consumption or birth rates (Foucault 1978). I believe that this citation above reveals a key argument about how power is exercised and about how certain techniques of power are relevant to understand power constellations. I also believe that this understanding is the essence of the concept of governmentality that was taken by some authors interested in understanding the government of nature under neoliberal capitalist systems, defining this interdisciplinary approach called "environmentality".

Agrawal (2006) provides a historical analysis of changes in environmental politics implemented by the British government in the Indian City of Kumaon. He observes that new environmental regulations were created as a response to new demands and new ideas of which resources should be exploited or protected (Foucault 1978). In order to implement these changes the central government, based on its powerful position as regulatory force, had to adopt specific strategies. Firstly, it had to create new rules, institutions and policies. Secondly, it had to promote new environmental discourses, specific knowledge and statistics that would sustain and legitimise these rules. Thirdly, such discourses had to reach people´s subjectivities in relation to the environment. This idea is based on the fact that in order to change people´s behavior you have to reach peoples´ subjectivities - which drives people´s practices.

It assumes that what drives people´s practices, for example whether people will respect a new rule or not, or whether people will use a public space as expected by urban planners and public managers, is not only an external rationality, but is also a set of subjectivities which are socially and culturally constructed. These subjectivities are related to desires, identities, emotions and beliefs about for example what is tolerable and what is desirable (Berdoulay et al., 2010; Demazère & Dubar 1997). These subjectivities are socially and culturally constituted according to individual experiences of different social and cultural contexts (Demazère & Dubar 1997).

Agrawal (2006) has observed that the rules only start to be respected once individuals change: for example the way they subjectively valued the forest; their subjective appropriation of the concept of conservation; and their relation to the new rule and to the

government. Many people started to feel part of the government once local forest councils were created, including local inhabitants, on the surveillance of the law. In this sense the government has produced rules, discourses of conservation and political institutions in order to produce new interests among the people, affecting their subjective perception of the rules – and therefore affecting their practices (Agrawal 2006, p. 194).

We can see that the approach of environmentality adds to the approach of political ecology a more accurate analysis of the subjectivity as a strategy of power. However, to better comprehend this approach, it is important to acknowledge four arguments highlighted by Rutherford (2007) in order to avoid a superficial or simplistic analysis of the dimension of governmentality.

Power is produced

The first argument is that power is not only achieved through repression, but it is also produced through discursive and institutional processes. The reason for this is that some powerful institutions control the production of commonly recognized knowledge that can serve to legitimise rules. Additionally, powerful institutions also control the production of surveys about people´s behaviors and opinions. Based on this knowledge, these institutions are able to produce discourses that adapt to people's current subjectivities, inducing them to produce new attitudes or to reproduce the current ones.

This process of affecting people´s attitudes and opinions involves the creation of a vision of joint interests between those who devise the laws and those targeted by them (Agrawal 2006, p. 193). As a result, people start to actively contribute to the reproduction of rules in their daily practices. In this sense, power may be defined as relations which allow one to determine the conduct of the other according to its interests. Those relations are produced based on a number of tactics (Berten 1981).

Power is contested

The second argument is that efforts to generate rules, discourses and subjectivities by powerful institutions do not always lead to the expected results. They are contested, adapted and transformed while being produced and reproduced at different scales, in different locations, by institutions and individuals. In this sense, there is always deviation when rules determined by central powers come up against informal institutions, tacit rules and a variety of practices.

Power and visibility

The third argument is based upon the following idea: official data, maps, reports, educational programs and marketing campaigns are instruments that provide images of what reality is and who is part of it, what its main problems are and for whom, what the causes are, how to tackle them and for whose benefit. In this sense, the point here is to show that not all subjectivities are given visibility and may be represented in the displayed picture – as they are excluded from mainstream discourses, statistical categories, official maps and public policies.

The case study analysis of this research work will show the importance of producing environmental knowledge, considering local knowledge and beyond, taking into account the perspective of underprivileged groups to achieve environmental justice.

Power and spatiality

The argument here is that power does not operate "outside of spatiality" (Rutherford 2007). Here the concept of territory gains particular relevance as it refers to a space which is determined by power relations (Souza 2000). This means that decision makers cannot expect to implement environmental policies in an "empty" space (Arnauld De Sartre & Berdoulay 2011); rather, they have to acknowledge that there is a complex space and its dynamics depend on symbolic and material disputes around the use of territories (Acselrad & Viégas 2013, p. 37).

Furthermore, groups disputing power in one territory may come from the local, regional and/or global arenas, seeking different interests and maintaining different identities and discourses. In this sense, the ability to produce discourses, giving more visibility to one scale to the detriment of others, always relates to certain disputes of interests.

As Rutherford (2007, p. 296) explains:

> *"Indeed, what the World Watch Institute, among other organizations, does is produce the truth of a global environment under threat, rescaling the debate upward to erase specificity and difference."*

He shows how powerful institutions can bias environmental discourses to hide controversial issues. By restricting the debate to the global scale, the idea of one undisputed global challenge and goal is sustained, most injustices and contradictions regarding smaller scales are neglected and specific environmental policies are justified. As political ecology writers warn us, rather than making environmental politics more democratic, these policies turn them into instruments of power for privileged groups. This

is why it is important to analyze knowledge and discourse as being embedded in power relations and space, as well as being reproduced through individual subjectivities and interests.

Using this framework to analyze the case study, it becomes apparent that areas and resources that were not targeted by federal regulations are now under government scrutiny. This shift relates to global and national economic and environmental factors that have resulted in new energy policies to promote wind power bringing new dynamics, new actors and new conflicts. These policies – supported by the production of knowledge and of attitudes – have contributed to the occurrence of cases of environmental injustice in several communities on the northeastern coast of Brazil (Francisco 2012; Portal do Mar 2012; Comissão Pastoral da Terra 2014; Meireles 2011; Pachioni 2013).

3.6. PARTIAL CONCLUSIONS

In this chapter we have seen how the logic of economic growth oriented to mass production and mass consumption based on the overexploitation of labour and of nature, while reducing regulation over nature and labour rights, has been showing its contradictions: climate change is an effect of the neoliberal capitalist model and is simultaneously a threat to this model. The logic of the economy of protection appears as a solution that would ensure further economic growth based on so-called “sustainable development”. Sustainable development would be promoted by a green economy (e.g. the renewable energy industry) with further deregulation concerning nature (e.g. the financing of natural resources) and the concentration of decision power over the economy and over the management of natural resources under multilateral organizations and big business.

These two logics are followed simultaneously, as though the second one could compensate for the damages caused by the first. Nevertheless, both are based on large-scale projects that enclose and concentrate land and capital, and overexploit nature and labour, based on the transference of negative externalities (e.g. the location of polluting industries and solid waste landfills in poor urban peripheries) to poorer groups and underprivileged ethnic minorities. The result is further environmental degradation mainly affecting these groups, who possess less political power to represent their interests.

In this sense, in order to evaluate wind energy's contribution to “sustainable development” in Brazil, I see the need to approach this concept critically. The concept of environmental justice, as it highlights the fact that the environmental issue is essentially a political issue,

appears to better fit the purposes of my research - especially in the context of Brazilian society, where the disparity between various groups' powers to represent their interests is extremely high. Therefore the risk of suffering environmental injustice is extremely concentrated in peripheral spaces, and among underprivileged social classes and ethnic-racial groups.

Nevertheless, as the concept is still functional for use on the global agenda and in national policies and laws, and receives support from the alternative discourses of critical researchers, it will here be used and understood as a process based on three interdependent goals: the reduction of socio-economic inequalities (among classes, genders and ethnic-racial groups); environmental preservation; and political participation, especially of groups directly affected by policies and investment projects (Arnauld De Sartre & Berdoulay 2011; Loureiro 2012; Rauch 2009; Interview with Rodrigo de Medeiros Silva, RENAP/Brazil/ CE, 12/09/2013; Interview with Julianna Malerba, FASE/Brazil/RJ 28.20.2013; Interview with Dawid Bartelet, Heirich-Böll Stiftung/ Brazil/RJ, 17.10.2013).

4. THE STRUGGLE FOR LAND AND FOR TERRITORY IN THE BRAZILIAN COUNTRYSIDE

4.1. INTRODUCTION

As we saw in the last chapter through different theoretical approaches, the evolution of capitalism has shown that capital has the tendency to expand its frontiers in the search of new markets, bringing with it the dilapidation of nature and the exploitation of Man's labour (Acselrad et al. 2009; Fairhead et al. 2012; Heynen & Robbins 2005; Watts & Peet 2006a). This is a key strategy to ensure the concentration of added value extracted from capital, from labour and from land and its natural resources – thus producing socio-economic and environmental inequalities locally, nationally, regionally and globally (Acselrad et al. 2009; Fairhead et al. 2012; Heynen & Robbins 2005; Watts & Peet 2006a).

The capitalist system in its most recent phase, characterized by neoliberal regimes, shows an "evolved and more destructive form of capitalism" (Heynen & Robbins 2005). It has increased its capacity to explore nature and manpower, based on technical and technological advances, on further land expropriation and the enclosure of natural resources, ensured by the concentration of decision power among multilateral organizations that impose neoliberal agendas for the deregulation of markets, of labour relations and of nature (Acselrad et al. 2009; Fairhead et al. 2012; Heynen & Robbins 2005; Watts & Peet 2006a).

Since the acknowledgement of the dangerous and costly environmental effects of capitalism and the emergence of a so-called green economy, we have been able to clearly observe two different capitalist economic logics (Fairhead et al. 2012). One is based on an "economy of growth" which transfers the negative environmental externalities of economic activity to marginalized social and ethnic groups. Looking at the Brazilian countryside we may identify this economic logic guiding the agribusiness sector.

Brazilian agribusiness emerged in the 1970s with the technical modernization of the agriculture and livestock sectors (Delgado 2010; Pitta & Mendonça 2014). It is financed by public loans, based on the large property and technological packets controlled by transnational enterprises, and results from an association between the agricultural and livestock sectors with the finance capital (Delgado 2010; Pitta & Mendonça 2014). The agribusiness sector was the key sector of the Brazilian economy in the 1980s and again from 2000 onwards, when Brazil assumed an economic model focused on primary exportations, with important social and environmental consequences, as we will see here.

The other logic of the current capitalist system – complementary to the first logic - is based on an economy of repair, that restricts access to resources to privileged groups “for the sake” of nature preservation, producing environmental injustices, as we saw in the last chapter (Acselrad et al. 2004; Acselrad et al. 2009; Bullard & Smith 2002; Fairhead et al. 2012; Heynen & Robbins 2005; Walker & Bulkeley 2006). Regarding the Brazilian countryside we may identify a number of sustainable projects that fit into this logic, such as wind farms, eucalyptus monocultures and sugar cane monocultures for biofuels for example (Carbon Trade Watch 2012; Brown 2012; Pietrafesa & Santos 2014).

Both logics are causing environmental injustices in the Brazilian countryside and cities, and are related to the issue of the present research, as we will see here. Based on literature, field-research, semi-structured and narrative interviews, I can identify two main inter-related reasons for why underprivileged groups living in rural areas affected by wind farms on the northeast coast of Brazil, have been made extremely vulnerable to the interests of large investors: 1) Global increase of demand for natural resources under neoliberal flexibilization of labour, environmental and market rules; and 2) National land conflicts among interested parties under unequal political conditions, based on: a) juridical insecurity regarding the property rights of the peasantry; and b) the non-recognition of the territories of traditional communities.

Access to land is directly dependent on land use regimes and land property regimes. These are mostly dependent on national and international laws, agreements and policies - concerning not only agrarian issues, but also economic and environmental issues - that vary historically and spatially. In this chapter we shall see how this global process concerning the evolution of capitalism and its way of regulating, distributing and producing nature unfolds in the context of Brazil. Thus, we will look at the way national agrarian laws and institutions, as well as economic and agricultural policies, have been defining access to land and its natural resources.

Traditional communities affected by the wind farms on the northeast coast of Brazil are especially vulnerable to the interests of investors, due to the fact that they do not possess legal ownership of areas of collective use. I believe therefore that in order to understand current conflicts related to the installation of wind farms on the northeast coast of Brazil, we have to understand how power relations have been determining access to land in this region, taking the national and the international contexts into consideration as well.

As we saw in the last chapter, a regulative framework is usually legitimated by discourses and subjective ideas. In the case of environmental regulations, these depend on discourses and subjective values concerning nature, lands and territories, what their

values are, to whom they should be accessible, and for which purposes and by whom they should be used.

Agrarian reform is an unsolved challenge in Brazil and despite the attempts of some interest groups to reduce its visibility, there is an ongoing debate and social struggle in the country regarding land distribution and agricultural policies, as well as regarding the recognition of the territories of traditional communities (Brasil de Fato 2015; Comissão Pastoral da Terra 2014; Girardi 2008; Merlino & Mendonça 2012; Silva 2014). Civic society groups, government representatives, the media, academics and social movements present different ideological discourses about the subject and political strategies to achieve their interests, as we will see.

The extreme relevance of this debate is revealed by the number of cases of violence and even murders related to land conflicts in Brazil (Comissão Pastoral da Terra 2014; Gonçalves & Cuin 2014). Conflicts may result from the economy of growth or from the economy of protection as well. When they result from the economy of protection, conflicts are related to a global process named by some scholars as “green grabbing” - which means a peculiar kind of land appropriation which claims to be for the sake of sustainable development, as described in the last chapter. This is the case of land appropriation for wind farms for example (Brown 2012), and it is a relatively recent process occurring more intensely over the last thirty years during which climate change and its correlation to the use of fossil resources have become acknowledged (Heynen & Robbins 2005; Acselrad & Viégas 2013).

Nevertheless, the roots of land conflicts in Brazil lay deeper in Brazilian history, affecting a number of groups with different characteristics and demands. Aiming to understand how current power relations have been determining the unequal distribution of costs and benefits of wind farms on the northeast coast of Brazil, we will briefly analyse in this chapter how multi-scale power relations have been historically determining the unequal appropriation of resources, lands and territories in the country.

Based on academic works in the fields of geography, history and economics that examine the Brazilian agrarian issue, I have identified six historical events of great influence for their concrete consequences on land legislation, land uses, land access and land prices. Furthermore, these concrete changes have also stimulated renewed theoretical approaches to the issue and new political discourses - reconfiguring the political struggle and the social pressure for new concrete changes (Bruno 1995; Filho 2007; Delgado 2010; Oliveira 2009; De Salis 2008; Fernandes 2008; Fernandes 2013; Girardi 2008; Holston 1993; Pitta & Mendonça 2014; Quintans 2008; Stédile 2005).

The main historical events highlighted in the researched literature are:

1) The abolition of slavery in Brazil at the end of the nineteenth century;

2) The first political proposals for agrarian reform during the period between the two military dictatorships, 1945-1964;

3) The Brazilian dictatorial government and its agrarian reform project;

4) The implementation of the Brazilian Constitution of 1988, *Constituição da República Federativa do Brasil*, *1988;*

5) The conservative modernization of the Brazilian countryside in the 1970s;

6) A greater level of integration between agribusiness and finance capital from 2000 onwards.

We shall now briefly analyse the consequences of these events in terms of power relations and access to land.

Many authors seem to agree that an extremely high land concentration that excludes most of the population from access to land and to its resources, is a permanent feature of the evolution of the Brazilian agrarian issue; they also agree on the fact that an effective agrarian reform still hasn't been undertaken by any government in that country (Filho 2007; Delgado 2010; Delgado 2005; Oliveira 2010; Fernandes 2013; Girardi 2008; Pitta & Mendonça 2014).

The construction of analytical and critical thought about the land issue in Brazil and the recognition of the necessity of agrarian reform are relatively recent in the country´s history. The first public proposal for agrarian reform in Brazil was made in 1946, by the Communist Party of Brazil (Partido Comunista do Brasil) on the occasion of the elaboration of a new Constitution. There were two main reasons for this delayed social debate and the ensuing resistance movement (Stédile 2005).

The first reason was the fact that the country was colonised and remained a slave-holding colony for roughly 300 years, preventing underprivileged social classes from organising themselves (as they were dependent on and oppressed by the landlords) and delaying as well the creation of educational and research institutions (as these were not in the interests of the metropolis's mercantilist accumulation of capital) (Stédile 2005). The second reason was the fact that since the country´s independence and transformation into a republic, it has experienced two military dictatorships which have repressed any critical thought or political movement (Stédile 2005).

We will now try to summarize, with evidence, the critical positioning in relation to the Brazilian agrarian issue, following the temporal line of these five historical landmarks. The purpose is to understand how power relations have been determining the creation of rules, discourses and subjective values concerning land use and access, which have contributed to the current framework of environmental injustice related to the installation of large-scale wind farms on the northeast coast of Brazil.

Academics from the fields of history, social sciences, law, anthropology, economics and geography, who are concerned with the agrarian issue in Brazil, have been studying the evolution of legislature that regulates property rights and defines the goals and means of agrarian reform. What these studies universally reveal is: 1) the elaboration of the law, as well as its further application, is a historical process defined by power relations and manipulated by class interests (Quintans 2008, Filho 2007, Holston 1993, Motta 1996; Thompson, 1976); 2) in Brazil these relations are very unequal and serve the needs of an agrarian elite and the agribusiness sector, including national and international speculative capital; and 3) the agrarian issue is still a major challenge in Brazil, as it is the source of socio-economic inequality, cultural oppression and environmental damage (Bruno 1995; Filho 2007; Delgado 2010; Oliveira 2010; De Salis 2008; Fernandes 2013; Girardi 2008; Holston 1993; Pitta & Mendonça 2014; Quintans 2008).

Let us now look at the evolution of the Brazilian agrarian issue, beginning with the first historical landmark that I have selected for analysis: The Land Law of 1850.

4.2. ABOLITION OF SLAVERY AND THE LAND LAW OF 1850

At the time of the Portuguese colonisation of the lands of what nowadays form the Brazilian territory, there were about 300 different tribal groups, totalling roughly 5 million people whose lives were based on the collective use and ownership of land. Nowadays, they are estimated to number about 900 thousand, because of the colonial genocide and continued oppression and violence against Brazilian indigenous people until today, as we will see (Souza Santos 2014). The colonial power, through its military and economic supremacy, has implemented its political power and its monopoly over the lands (Souza Santos 2014; Acselrad et al. 2009). The Portuguese Kingdom gave hereditary land concessions to Portuguese capitalists who were to use them in order to produce commodities for sale in the metropolis and generate profits (Souza Santos 2014; Acselrad et al. 2009). That is how the system of plantations was implemented, based on large properties (so called “latifúndios”) and slave manpower, exploring mainly agricultural

products (especially sugar cane, cotton and coffee), but also cattle and minerals, in order to supply the external demands of the metropolis (Gadelha 1989; Wright 2012).

Political intentions to turn the land into purchasable merchandise appeared as early as 1843 with a bill representing the interests of the rural class who wished to protect their property rights and monopoly (Projeto 94 sobre Terras e Colonização 10.06.1843; Project 94 about Lands and Colonization) (Gadelha 1989). The idea was: 1) to implement land prices and taxes, prohibiting poor migrants from becoming landowners and ensuring that they would instead form a labour force dependent on the rural elite; 2) to stop squatters from acquiring land titles or occupying further lands; and 3) to spatially concentrate manpower in the areas of agricultural production on the Brazilian coast. The bill was not passed until seven years later, during which time coffee producers had seized large-scale landholdings (Gadelha 1989).

In 1850, pressure from the British government to abolish slavery forced the implementation of the Law for the Abolition of the Slave Trade in Brazil (04.09.1850) (Gadelha 1989). It was the first step of a process that continued with the law for the freedom of new-born children of slave mothers (Lei do Ventre Livre), not implemented until 1871, and with the full abolition of slavery (Lei Aurea) in 1888. But already in 1850, under the threat that freed slaves, and migrants attracted to substitute slaves, would become landowners instead of selling their work force in the plantations, the abovementioned bill was approved some days after the Slave Trade Abolition, known as the Land Law (18.09.1850). It was the legal basis that has excluded the majority of the population - including indigenous people, former slaves and poor European migrants - from having access to land (Acselrad et al. 2009; Gadelha 1989; Stédile 2005).

These two laws are historical landmarks in the process of the development of capitalism in Brazil. Both laws ensure: 1) that the land is transformed into merchandise, purchasable only by those who had accumulated capital - therefore that the land was exclusively used by privileged social groups; 2) the creation of free and cheap labour dependent on landowners, who survive by selling their work power; 3) the appropriation of the means of production by capital in Brazil; and 4) the maintenance of a very concentrated and unequal agrarian structure in Brazil, as well as the maintenance of the economic and political power of large scale landowners (“latifundiários”) (Acselrad et al. 2009; Gadelha 1989; Wright 2012).

The indigenous territories and the Quilombos were the last areas where the collective use of resources and the collective ownership of territory survived the expansion of capitalist social relations (Acselrad et al. 2009). Nevertheless, as their property wasn´t legally recognized, these territories were constantly under threat, as they still are, despite some

advances achieved by the Brazilian Constitution of 1988, *Constituição da República Federativa do Brasil 1988*. In this sense, most of the manpower was kept dependent on the elites, as workers had to sell their labour in order to survive (Acselrad et al. 2009).

Acselrad et *al.* (2009) describe this phase as a process of extensive capitalist expansion. It was based on the advance of capital over new lands, on technological enhancement and on the expansion of the scale of production. The main negative consequences were: 1) land speculation, land concentration and restriction of access to natural resources in order to implement large-scale investments and monocultures (e.g. hydropower, mining extraction, transport infrastructure etc.); 2) threats to the social diversity of the Brazilian countryside, because collective forms of the appropriation of territory were gradually displaced or eliminated; 3) the homogenization of the biophysical properties of the lands in order to implement monocultures; and 4) environmental damages to rivers, forests and soils for the implementation of energy projects and for the exploitation of commodities (Acselrad et al. 2009). In this sense, this extensive model has reduced the bio-physical, socio-cultural, and economic diversity of land use.

This framework was intensified with the incipient process of industrialization and urbanization in Brazil during the first half of the twentieth century. The result was the intensification of peasant movements fighting for land redistribution and access to resources (Acselrad et al. 2009; Gadelha 1989). This leads us to the second historical landmark that helps us to understand the contemporary Brazilian agrarian issue.

4.3. THE 1950S AND THE FIRST AGRARIAN REFORM PROJECTS IN BRAZIL

The Brazilian peasantry was initially formed by two processes (Stédile 2005). One was the migration of roughly two million poor European peasants between 1888 and 1930, attracted by the Portuguese Kingdom to work on small lands for agriculture in the South of Brazil (migrants could buy small farms and become small landowners) or to work for the owners of coffee farms in the Brazilian Southeast. A second process was the occupation of remote lands that were not targeted by the metropolis, far away from the coast - as most of the 'plantations' were located on the coast, due to the proximity of the exporting ports. This process was undertaken by "mestizos" (the population resulting from miscegenation between indigenous and African populations and European migrants and their descendants) who, due to the Land Law of 1850, could not own property. These peasants migrated to the hinterlands of the Northeast, and to the states of Minas Gerais and Goiás.

In these regions they have illegally occupied lands and implemented individual or collective uses of territories that remained undisputed by capital (Stédile 2005).

The consolidation of the peasantry as a social class and the expansion of the rural proletariat were important factors for the formulation of a critical vision about the agrarian issue in Brazil (Stédile 2005; Lamarão 2005). Other social, economic and political factors that accompanied the so-called bourgeois revolution, such as an incipient industrialization, the organization of labour unions, the approval of labour regulations, the expansion of universal rights and the first public universities, have also contributed to the formulation of critical thought on the country´s agrarian problems (Stédile 2005; Lamarão 2005).

The first proposition for agrarian reform was developed with the end of the Brazilian dictatorship of President Vargas (1937-1945) in 1946, at the time of the formulation of a new Constitution. The proposal was presented by one of the members of the Constituent Assembly, Luis Carlos Prestes, as leader of the PCB (Partido Comunista do Brasil), the Communist Party of Brazil. Nevertheless, the first law for agrarian reform would only be approved years later, in 1964.

In 1950 the conservative sector of the Catholic Church also published a document in favour of agrarian reform, aiming to contain the influence of the PCB in the countryside. It highlights the difference between an "*agrarian reform of a ´communist´ character and agrarian reform seen as fair, which obeyed Christian principles*". (Uma) "*reforma agrária de cunho "comunista" e a reforma agrária tida como justa, que obedecia aos desígnios cristãos*") (De Salis 2008, p.46).

It favoured expropriations only on the state´s lands, to be paid in cash, preserving the property´s rights. It also supported laws guaranteeing the rights of rural workers in order to avoid rural migration to the cities, where workers could not all be absorbed as manpower by the industry, and where they would become marginalized citizens susceptible to the discourses of communist movements.

During this decade, some sectors belonging to the right wing of politics also formulated a discourse on the agrarian reform. The main motivations were to:

> *(…) enhance and rationalize agricultural production and at the same time, use it as a preventive measure against the advance of communist ideas* (De Salis 2008, p. 12).
>
> *(...) potencializar e racionalizar a produção agrícola e, ao mesmo tempo, utilizá-la enquanto medida preventiva contra o avanço das idéias comunistas"* (De Salis 2008, p. 12).

In this sense, with either revolutionary or conservative tendencies, civic society, social movements, the State, the Catholic Church, political parties and intellectuals were all discussing the issue (Bruno 1995; De Salis 2008).

In the 1950s, conflicts over land intensified as a result of some changes occurring in the countryside. These varied in each region but concerned mainly the implementation of new technologies and new cultivations, the substitution of agriculture for livestock, land-grabbing and growing dissatisfaction among land leasers and farm workers regarding their working conditions and land contracts. All these factors working together or separately caused the expulsion of small landowners and squatters as well as the release of manpower into the countryside. A number of social movements arose in the countryside with a variety of discourses and demands according to each region and context (De Salis 2008).

There seemed to be a relatively common agreement on the necessity of implementing agrarian reform. Nevertheless, questions regarding its means and purposes were the subject of major debates and political struggles.

Despite a variety of discourses, the struggle was mainly polarized on two projects. One was a conservative project aiming to modernize Brazilian agriculture, preserving as much as possible its agrarian structure in order to ensure the full development of capitalism. This was supported by the large employers, large farmers, businessmen, military representatives supporting the political coup, right-wing political parties and the conservative part of the Catholic Church.

On the other side, there was a revolutionary project aiming to profoundly transform Brazil's agrarian structure based on principles of justice and equality (supported by the Brazilian Communist Party (PCB) and other political parties, social movements, intellectuals, and the part of the Catholic Church (since the 1970s) that was linked to socialist ideals and Liberation Theology. This polarization may be seen as a reflex reaction to international polarization in the context of the Cold War, reflecting opposing ideologies and concepts of development, as well as different class and group interests (De Salis 2008).

In 1951 President Vargas created a National Commission for an agrarian policy elaborating the guidelines for agrarian reform in Brazil. The principles of expropriation for social interests and land taxes aiming to discourage unproductive land tenure caused its emphatic rejection among conservatives, and the guidelines were thus rejected by Congress (De Salis 2008). Nevertheless, social claims for agrarian reform kept rising, so that during the next presidential election of 1955, Kubitschek, who would govern Brazil from 1956 to 1961 (Dicionário Histórico Biográfico Brasileiro, 2001), announced his intention of implementing far-reaching changes in the countryside.

Once elected, President Kubitschek faced, among his own party, strong opposition to his ideas on agrarian reform. In order to avoid losing political support, he changed his approach to the agrarian issue. His proposal for agrarian reform became a project of rationalization and technological modernization of agricultural production in the Brazilian countryside. An example of this was the creation of the SUDENE in 1959 (Superintendência do Desenvolvimento do Nordeste; Northeast Development Superintendence), a public agency responsible for planning development policies for the Northeast region, in order to reduce extreme poverty and social conflicts and to integrate the region into the national economy, without aiming to interfere in its unequal agrarian structure (Oliveira 2014).

During the 1960s peasant movements promoted land occupations, land expropriation and the creation of settlements in the States of Rio Grande do Sul, Pernambuco and Rio de Janeiro, pressuring the federal and state governments to recognise the necessity of agrarian reform. Thus, during the 1960s, the agrarian issue gained public visibility and centrality in the political structure (Oliveira 2014). It was a period of formulation of various political programs and theses concerning the agrarian reform (Bruno 1995; Silva 2013; Grynszpan 2014).

Kubitschek's successor, President Jânio Quadros, organized an informal group to define the guidelines for agrarian reform, but he resigned in the context of a political and economic crisis, without having accomplished any of its goals (Costa 2014; De Salis 2008). His successor, João Goulart announced the implementation of the so-called Base Reforms, which included banking, tax, urban, administrative, agrarian and university reforms as well as the extension of voting rights to the illiterate and subordinate patents of the armed forces, as well as a broader state intervention in economic life (Ferreira 2015). He also supported the creation of labour unions, such as the CONTAG (National Confederation of Agricultural Workers), that was officially recognized in January 1964, and approved the Rural Worker Statute, approved in 1963 (Estatuto do Trabalhador Rural) (Grynszpan 2014).

Agrarian reform was the highlight of the Base Reforms and at this point the conflicts and debates around this issue became heated (Grynszpan 2014). On one hand, once again, the opposition to agrarian reform showed strong resistance (De Salis 2008). On the other hand, simultaneously, a number of important peasant organizations (for example Union of Farmers and Agricultural Workers of Brasil (ULTAB), Ligas Camponesas, Movement of Landless Farmers (MASTER) and the Basic Education Movement (MEB) which were created in the early 1960s, supported it (Bruno 1995; Silva 2013).

The main discourses proposing a redistributive agrarian reform were those of the PCB, the CEPAL (United Nations Economic Commission for Latin America and the Caribbean), the PTB/SP (Partido Trabalhista Brasileiro, Brazilian Labour Party/São Paulo State), the peasant movements that designed a unified proposal in 1961, and President João Goulart in 1964 (who was overthrown by the military coup in the same year) (Stédile 2005; Delgado 2005). He organized work groups that were to design a proposal of agrarian reform to be voted on by Congress.

The main impasse for the formulation of new agrarian legislation concerned how land expropriations should be compensated for (Bruno 1995; Silva 2013; De Salis 2008). According to the Constitution of 1946, *Constituição dos Estado Unidos do Brasil 1946*, *título V, art. 147*, *parágrafo 1,* land expropriations should be paid for by the government in cash. Those with left-oriented views understood that this would represent an obstacle for the implementation of agrarian reform, as it would require more financial means than the government could afford. Instead they proposed a Constitutional Amendment ensuring that the payments would be made with public debt bonds (Bruno 1995; De Salis 2008). While Goulart was trying to advance the process of land reform implementation, conservative groups were organizing a strong movement of opposition to his government based on the idea that it represented the threat of socialism in Brazil.

In March President Goulart called upon the population to back a political rally in support of the Base Reforms (Comício das Reformas, 13 March 1964). It won the support of labour unions, workers' organizations, public servants, military personnel and students (Lamarão 2005). The president´s support for these reforms and his open stance of tackling the privilege of a minority elite, provoked resistance from the conservative parties and the business sector, who feared the loss of their privileges. This resistance gained the support of a conservative middle class who seemed to fear that Goulart would implement a communist regime in Brazil (Lamarão 2005; Bruno 1995).

On the 31st of March 1964, alleging that there was a necessity to contain an internal communist threat against the country´s safety and capitalist order, the Army took power and implemented a dictatorship that lasted for 21 years, repressing all kinds of critical expression, thought and social organization with violence and murders realized by the state´s apparatus (Lamarão 2005; Reis 2010).

4.4. THE LAND STATUTE UNDER THE MILITARY DICTATORSHIP

Although this appears contradictory, it was a dictatorial government (the first government, ruled by Castelo Branco) that approved the first law for land reform in Brazil (Bruno 1995).

However, instead of representing more left-oriented views of the goals and means of agrarian reform, the land reform project that was approved, known as Estatuto da Terra (Land Statute) represented what was at that time called a “Christian and democratic” view (Bruno 1995, p.7). This view, shared by the former presidents Vargas and Kubitscheck, was based on the belief of some sectors of society that the Brazilian agrarian structure was an obstacle to the industrial and economic development of the country (De Salis 2008).

That was the view defended by President Castelo Branco, a military representative from the moderate side of the army, with good relations with the United States, which played a key role in the political articulation of the military coup (Costa 2014). His government´s main goal was to overcome the ongoing national economic crisis and stimulate the development of capitalism in Brazil. In order to do that, he focused on three key strategies: 1) the control of inflation (especially through the so-called PAEG, the Program for Government Economic Action); 2) the modernization of agriculture; and 3) a change in foreign policy to become more aligned with the United States (De Salis 2008). All of this required reforms to be undertaken by ministries formed of civilians and both moderate and hard-line military representatives.

Beyond the goal of weakening the social movements in the countryside, the Land Statute aimed at promoting the development of capitalism in Brazil. This strategy was based on the belief that capitalist development in the country depended on a change of its agrarian structure - which would enable a “substantial increase in the production capacity of agriculture and the creation of a prosperous middle class in the countryside”.

The consequences would be:

> *(…) containment of inflation resulting from increased demand for agricultural products, induced by increasing demand for raw materials”; 2) “the increase of export levels and thereby the increase of domestic savings”; and 3) “the increase of the consumer market, especially to support the growth of domestic industry and reduce the rural exodus, seen as a direct result of the degradation of the condition of life for both rural workers, as of small landholders* (De Salis 2008, p. 222).

Castelo was aiming to combine a better system of land distribution with: 1) technical support and agricultural credits for farmers (including small ones); 2) regularization of land tenure and lease agreements; 3) land taxation to discourage land speculation; and 4) colonization of less populated areas in the North and Midwest in order to integrate these regions into the Brazilian economy and send the excessive population of the Northeast to these areas (Bruno 1995; De Salis 2008).

Opposition came once again from the most hard-line militaries, the conservative parties and the employer class. They argued that the real problem in the Brazilian countryside was

not related to the issues of land access and land property, and that the land concentration was no obstacle for the modernization of agriculture or for the capitalist development of the economy. According to this perspective, the real cause for the existence of unproductive large properties ("latifúndios") was the lack of state investment in infrastructure and lack of policies aiming to support the modernization of agriculture (Bruno 1995).

Conservative groups were trying to preserve the large properties ("latifúndios"), questioning the peasants' labour rights, the definition of the social function of the land and the land taxes, saying that the Land Statute was imposing limits to the possibility of expanding the large-scale capitalist enterprises in the countryside (Bruno 1995). The president faced strong opposition before the project was approved in November 1964. In the end he was able to approve the law amendment that would allow the payment for land expropriation with public debt bonds instead of with cash payment. Nevertheless the general focus of the land reform based on principles of justice and distribution was shifted into a focus on the legitimation of large properties ("latifúndios") as long as they fit into the category of "farming business" or "agricultural enterprise" (empresa agrícola).

The agricultural enterprise was elected as a model whereby the social function of the land was being fulfilled. It emerged (…) *as a support base, the place of excellence and the corollary of rational land use, profitability and national development* (De Salis 2008, p.24).

The category "family farming", despite being criticized by the opposition who considered it unproductive, was included on the land statute as well, as the land module used to calculate land dimensions and land taxes (De Salis 2008; Bruno 1995).

The agriculture business, based on large properties, was to ensure the productivity of agriculture and economic development, without having to interfere in the agrarian structure. These would be the first steps for the so-called conservative modernization of Brazilian agriculture, which mainly occurred in the 1970s, as we will see later (Bruno 1995; De Salis 2008).

After the approval of the Land Statute in November 1964 the government faced practical obstacles for its implementation. The work of property registration, zoning and preparation of the tax system, in addition to bureaucratic problems, prevented the organization of the National Agrarian Reform Plan as well as the expropriations in the priority areas, the legalization of land possession, colonization, discrimination of public lands and taxation (De Salis 2008).

In 1967, facing unpopularity and opposition, President Castelo was replaced by Costa e Silva without having achieved concrete advances in the implementation of agrarian reform (Costa 2014). The new president elected by Congress was part of the hard-line military

faction, and defined a new political position towards the agrarian issue. That is, the unequal agrarian structure was not seen as an obstacle for the development and modernization of agriculture, and in this sense the term “agrarian reform” is reduced to an agricultural policy and to colonization programs (De Salis 2008, p.187).

Particularly from the next government of President Medici (1969-1974) onwards, special focus was given to the colonization of the so-called “empty spaces” in the North region that were to be occupied by the surplus populations of other areas (Bruno 1995; De Salis 2008). Moreover, processes of expropriation of unproductive farms and land taxation were left to a second plan, or abandoned altogether, in some regions. Instead of ensuring land expropriation and new settlements, planning programs in the northeast aimed at: 1) sending the surplus population to work on infrastructure projects related to the colonization process of the Amazonia region, in order to reduce the pressure for land distribution in the Northeast; and 2) supporting the installation of large-scale agricultural business in the region (Bruno 1995; De Salis 2008).

These measures reflected three main concerns of the military government: 1) to increase national production by expanding the so-called “agricultural frontier” to the north; 2) to ensure the military defence of national borders through the colonization of the so-called empty spaces of the northern region; and 3) to reduce social and economic problems related to land conflicts in the northeast region, as well as integrating the national economy (De Salis 2008). It is mostly in this sense that the following programs were created: the Plan for National Integration in 1970 and the Program for Land Distribution and Incentive for Agribusiness in the North and Northeast in 1971. This also formed the background to the creation of the INCRA (National Institute for Colonization and Agrarian Reform), which has been responsible for implementing agrarian reform in Brazil up to the present day (De Salis 2008).

The government invested strongly in public credits and financing, in order to ensure the mechanization and technological advance of agriculture, leaving for a second plan the issues of land registration and land taxation, as these were seen as obstacles for the development of large-scale agricultural business (De Salis 2008). This framework occurred in Amazonas and other areas, and as a result, conflicts regarding land-grabbing and land property increased in the country during the 1970s. These problems intensified due to fact that in this period the mechanization and modernization of the countryside greatly increased unemployment and the expropriation of the lands of small landowners and squatters (De Salis 2008).

The intensification of struggle over land stimulated the articulation of social resistance in the countryside and the appearance of new actors with new discourses who tried to use

the land statute in their favour. In particular the CONTAG (National Confederation of Agricultural Workers; Confederação Nacional dos Trabalhadores na Agricultura), the CPT (Pastoral Land Commission; Comissão Pastoral da Terra) and the MST (Brazilian Landless Workers' Movement; Movimento dos Trabalhadores Sem Terra) started to develop new interpretations of the Land Statute based on the principles of justice and redistribution (De Salis 2008; Delgado 2005; Movimento dos Trabalhadores Rurais Sem-Terra 2009).

The CPT and MST, are still two key land movements today, which have been giving support to resistance from traditional communities on the northeast coast of Brazil against environmental injustices encouraged by the installation of large-scale wind farms (Portal do Mar 2012). In the 1970s, these movements started to diffuse among the peasantry a critical position against the government, and the need to undertake land expropriations and promote settlement projects (De Salis 2008). Despite seeing the Land Statute as a bourgeois law, they will use it, as well as its notion of the "social function of the land" in order to pressurise the government for land expropriations (De Salis 2008).

The 1980s were a period of gradual democratization of the country. In 1987 a Constitutional Assembly was nominated to develop the new democratic constitution of Brazil, implemented in 1988. The MST was an important source of pressure for land reform in the Constituent Assembly (Movimento dos Trabalhadores Rurais Sem-Terra 2009). Conservative groups representing the interests of the large landowners were also very organized and influential in their attempts to avoid the creation of distributive land reform (De Salis 2008). A particularly influential conservative group was the landlords' association UDR (Rural Democratic Union; União Democrática Ruralista) – which is still very influential in the Brazilian Congress today.

This organization was founded in 1986 and affirmed that its main goals were "*the preservation of property rights and the maintenance of order and respect for the laws of the country*" (União Democrática Ruralista 2014). According to the UDR, during the Constitutional Assembly of 1987 – 88 in which they led the development of the new and current Brazilian Constitution of 1988, *Constituição da República Federativa do Brasil 1988,* landowners felt the need to organize themselves to try to influence the Congress to create a law that would secure the property right (União Democrática Ruralista 2014). They affirm that "at the time, a political wing of the radical left wanted to end this right with the explicit goal of implementing a communist system in Brazil" (União Democrática Ruralista 2014).

The final text of the Constitution was the result of a political struggle (Filho 2007; De Salis 2008; Quintans 2008). Concerning land rights, some academics and some of those

interviewed for my research, who support a distributive system of agrarian reform that ensures the rights of the peasantry and socio-ethnic minorities to their territories, Brazilian Constitution of 1988, *Constituição da República Federativa do Brasil 1988,* as a great achievement. Nevertheless, what is usually criticized is the fact that the Constitution is not being applied due to neglect from the executive powers, the conservative ideological positions of the judiciary powers involved in the interpretation and application of the law, and the excessive lobbying influence of the agribusiness over the three powers (legislative, executive and judiciary) (Canuto 2012; Oliveira 2010; Girardi 2008; Motta 1996; Holson 1993; Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013; Interview with Rodrigo de Medeiros Silva, RENAP/Brazil/ CE, 12/09/2013; Movimento dos Trabalhadores Rurais Sem-Terra 2014; Quintans 2008).

Let us now briefly analyse the main concrete effects of the Brazilian Constitution of 1988, *Constituição da República Federativa do Brasil 1988,* on the land access of underprivileged groups in the countryside.

4.5. THE BRAZILIAN CONSTITUTION OF 1988, CONSTITUIÇÃO DA REPÚBLICA FEDERATIVA DO BRASIL, 1988

The Brazilian Constitution of 1988, *Constituição da República Federativa do Brasil 1988, título VII, cap. III*, contains a special chapter for the "Land Property Policy and Agricultural Policy of Land Reform". It recognizes the social function of the property and the Federal State as the responsible entity for expropriating the lands which do not fulfil its social function.

According to the Brazilian Constitution of 1988, *Constituição da República Federativa do Brasil 1988, título VII, cap. III*:

> *The social function is met when the rural property complies simultaneously, according to criteria and standards prescribed by law, with the following requirements:*
>
> *I. rational and adequate use;*
>
> *II. appropriate use of available natural resources and preservation of the environment;*
>
> *III. compliance with the rules governing labour relations;*
>
> *IV. exploitation that favours the well. being of owners and workers.*

Besides this specific policy the Brazilian Constitution 1988, *Constituição da República Federativa do Brasil 1988, título VII, cap. III,* ensures, among the fundamental rights and

guarantees, that although the right to property is guaranteed, property shall observe its social function, otherwise it may be expropriated by the Federal State with fair compensation.

The Brazilian Constitution 1988, *Constituição da República Federativa do Brasil 1988,* also ensured the creation of a law that would regulate the constitutional devices of agrarian reform, which happened later, in 1993 with the Law 8.629/1993, *Lei 8.629/1993*. Regarding the expropriation of rural land for purposes of agrarian reform, a complementary law, *Lei Complementar N. 76/1993*, was created in the same year. A critical point is the fact that the Brazilian Constitution 1988, *Constituição da República Federativa do Brasil 1988*, and these laws still preserve the right to large properties ("latifúndios"), as it prohibits expropriations of lands considered productive, even if they don't fulfil all the requirements of the social function of the land (Quintans 2008).

Quintans (2008) has analysed the stance of the judiciary power of Rio de Janeiro, as well as the decisions of the supreme federal court, regarding processes of land expropriation for agrarian reform claimed by the INCRA involving the MST. He has observed that the only cases of land expropriation accepted by the magistrate were those justified by the economic aspect of the social function of the land (its unproductivity), denying for example requests for land expropriation due to the use of slave labour (Quintans 2008). Delgado also identifies this problem (Delgado 2005, p. 18).

Also Quintans (2008) discovered that between 1996 and 2005, the MST, undertook thirty-two land occupations in the State of Rio de Janeiro. In twenty-one cases, the landowner obtained a judiciary preliminary injunction for property reintegration. Analysing these cases, he observes that while some judiciary decisions considered the occupations illegal, understanding the property right as absolute, others saw it as a legitimate form of popular pressure, understanding the property through the principle of the social function (Quintans 2008) Nevertheless, the first interpretation was favoured, showing the conservative stance of the magistrate in Rio de Janeiro, which complied with the discourse of the landlords.

The author shares the same vision expressed here before, that laws are the result of power struggles, as she states:

> *Judicial decisions are not mere applications of the law to concrete cases, but rather the judicial act is the creation of the law of the concrete case. The judge from his subjectivity – towards their values, their ideology - determines the interpretation that will be applied to each specific situation* (Quintans 2008, p.6).
>
> *"As decisões judiciais não são meras aplicações da lei ao caso concreto, ao contrário, o ato judicial é a criação do direito do caso concreto. O juiz a partir de sua subjetividade - seus valores, sua ideologia - determina a interpretação que será aplicada em cada situação específica"* (Quintans 2008, p.6).

In this sense what is considered legal or illegal will also depend on a historical context that reveals the political and economic power constellation of a certain society (Quintans 2008; Holston 1993; Thompson, 1976). Researchers reveal that land occupation was a common practice throughout the history of the Brazilian territorial occupation (Holston 1993). During the colonial period land did not have much value, partly because it was abundant and partly because in order to make it rentable, many slaves were required, which was expensive. The main mechanism used to ensure the occupation of the Brazilian territory was land concessions, called “sesmarias”, given by the Portuguese Kingdom to settlers who were able to afford to cultivate it, under the condition of its growth into a productive land (Holston 1993).

Two problems are identified in this system. Firstly, many “sesmarias” were given without the definition of its frontiers, which was the source of several disputes, sometimes involving violent conflicts. Secondly, before as well as after independence, the laws concerning land rights were made so complex that only those who were already in power could dominate them (Holston 1993).

The agrarian elite occupied vast lands, extending their properties and legalizing what had been illegal, controlling the access to land not only through violence but also by controlling the creation and application of the law (Holston 1993) Their children were the ones who could afford to study in Portugal and come back to fulfil the most important charges as legislators, judges, public administrators and local governors, who could manipulate legal and political decisions in their favour. Holston (1993) shows how a great number of large farms in Brazil are the results of historical processes of legalized land-grabbing.

An excess of laws, administrative procedures and government offices, including contradictory law devices, worked to benefit this agrarian elite, which concentrated political power. When we examine the current laws and the stance of the magistrate, regarding current land conflicts, we can observe how laws concerning property rights are still very complex and confusing today. The author sees this not only as a strategy that facilitates corruption, but a strategy used deliberately by the elite in order to conduct conflicts and keep them within the judiciary arena, to extend the duration of juridical processes, and create juridical impasses so that, due to an irresolution, a political decision ultimately interferes with the case.

As mentioned here before, the Land Law of 1850 turned land occupation into an illegal act, because it established that property could only be ensured by purchase and acquisition of a land title. The Brazilian Constitution 1988, *Constituição da República Federativa do Brasil 1988*, ensured the social function of the land and the creation of a law that regulates the mechanisms of land expropriation for social interests. Despite these two changes: 1)

land occupation continues to be a common practice, tolerated only when committed by privileged groups who manage to legalize what was considered illegal through processes of land-grabbing; 2) land expropriation for public interest is still a mechanism that faces resistance from those who apply the law (Holston 1993; Quintans 2008; Delgado 2005).

Nowadays, the practice of land occupation is a strategy used both by underprivileged groups who do not have access to land and by large landowners, large enterprises and speculators using land-grabbing strategies to extend their properties (Delgado 2010; Oliveira 2010; Fernandes 2013; Girardi 2008; Holston 1993; Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013; Interview with Rodrigo de Medeiros Silva, RENAP/Brazil/ CE, 12/09/2013; Quintans 2008; Stédile 2005). When it comes to an attempt to legalize the occupation or to a land dispute, it is only privileged groups who can afford to pay for the various bureaucratic procedures involved in land-grabbing. Also they are the ones with greater political power to influence the decisions of the judiciary. The main force in Brazilian society nowadays that has been achieving progress in the transformation of this framework of unequal access to land are the social movements that give visibility to the social function of the land and legitimacy to land occupations in areas which are not fulfilling the land´s social function determined by the law (Girardi 2008; Holston 1993; Quadros 2014a).

The regulative framework of the land in Brazil, as implemented by the Brazilian Constitution 1988, *Constituição da República Federativa do Brasil 1988*, is both a reflection and a reflector of the political economy that has guided the occupation, the use, and the distributive and productive models of land in the Brazilian countryside, especially since the 1970s, as we will examine next.

4.6. THE BRAZILIAN "CONSERVATIVE MODERNIZATION"

As mentioned, the 1970s were a period of modernization of the Brazilian countryside "based on the substitution of the technical base of agriculture using industrial inputs" (Pitta & Mendonça 2014, p. 48). Agriculture started using new industrialized inputs such as fertilizers and improved seeds, and new industrial machinery such as tractors and harvesters, and became integrated into other industries, such as beverages, alcohol, paper, tobacco, textiles and oilseed for example (Delgado 2005). It was financed by subsidized public loans, based on the rise of the public external debt and established the agribusiness in Brazil (Delgado 2005; Pitta & Mendonça 2014).

The 1980s were a period of economic crisis and great increase of the external debt. Additionally, after the Mexican moratorium there was a reduction of international liquidity

and loan availability in Latin America. In Brazil this period was called the “lost decade” (“década perdida”), as there was an extreme fall in economic growth and a huge increase of inflation and unemployment (Marangoni 2012**)**.

One of the main political strategies used to tackle this crisis was to invest in the exportation of primary products in order to generate income, reduce the deficit of the trade balance and help pay back the external debt (Marangoni 2012; Delgado 2010; Sauer & Leite 2012). From that moment on, mechanized agriculture, mining and livestock became priorities for public policies and credit lines, providing the major part of Brazilian exports and playing a core role in the national economy. This framework still reflects the situation today (Marangoni 2012; Delgado 2010; Sauer & Leite 2012).

Two criticisms of this economic model are relevant here. The first one regards the process of modernization of agriculture and understands that it was a conservative modernization that left important negative consequences, which will be shown later in this chapter. The second criticism concerns the political strategy to focus the national economy on the primary sector for exportation, as a strategy for paying public debts and regulating the commercial balance – also with relevant negative consequences, environmental damage and socio-cultural inequality being the two most important in the context of this study (Delgado 2010; Pitta & Mendonça 2014; Quadros 2014a).

The term “conservative modernization” was first employed to describe the industrialization of Germany and Japan, which were based on political pacts between the bourgeoisie and the traditional landlord elites – unlike the French and English Revolutions, which majorly disrupted the economic and political structures of the ancient regimes (Pires & Ramos 2009). In Brazil, the term was used to describe a different process in a completely distinct context.

What authors usually refer to when using the term are mainly the following simultaneous processes: 1) the technical modernization of agriculture, promoted by large capital; 2) the maintenance of the concentrated agrarian structure; 3) political pacts between the national bourgeoisie and the ancient rural elite, which preserve the latter’s political power and privileges, thus hindering the access of underprivileged groups to land, capital, work and citizenship; 4) land expropriation of small farmers, increasing rural-urban migration and liberating lands for the expansion of agribusiness (Pires & Ramos 2009; Delgado 2005; Stédile 2005).

This process, which occurred mainly from the mid-1960s to the late 1970s, is based on the ideological position concerning the Brazilian agrarian issue, as described here earlier, which believed that the modernization of Brazilian agriculture did not require a distributive form of agrarian reform. This position was the one that prevailed during most of the military

dictatorship and that designed public policies in support of the conservative modernization. Most public agricultural credit was exclusive to big producers, so that only they could afford to incorporate the new technologies and supplies sold by multinationals and integrate themselves into the productive chains of the agribusiness complex (Delgado 2005; Delgado 2010).

In the context of this economic crisis, industry and the cities were not able to absorb the free labour expelled from the countryside, which is an important negative impact of this model of agricultural modernization. Other key impacts were: the maintenance of an extremely unequal agrarian structure in the country; the exclusion of the peasantry from access to land, adequate public policies, credit and citizenship; and an extreme increase in the public debt to the IMF, which benefited big business (Delgado 2010; Oliveira 2010; Fernandes, 2013; Quadros 2014a; Girardi 2008).

The second criticism that I wish to highlight here regards the political strategy to use the agribusiness in terms of exportation as a solution to public debts and thus control the commercial balance. This strategy first openly emerged in the 1980s in order to deal with the debt crisis, was employed again in 1998 (under the second mandate of president Fernando Henrique Cardoso, (FHC) to tackle a currency crisis, and was repeatedly employed during the subsequent mandate of Lula and the current mandate of Dilma Roussef (Delgado 2010; Quadros 2014a; Liebgott 2012; Sauer & Leite 2012).

In the 1990s this strategy was temporarily abandoned (1994-1999) (Delgado 2005). During this period there was a relative weakening of agricultural policies and credits, and of investment in commercial infrastructure and research concerning agriculture (Delgado 2005; Delgado 2010). It was also a period of monetary stabilization and of important neoliberal measures such as privatizations and liberalization of the agricultural markets, in accordance with the requirements of the IMF following new loans. The price of agricultural products decreased and land prices decreased as well. Additionally, the national currency was high, which did not favour agricultural exportations.

The currency crisis of 1998 devalued the national currency (Real) and repositioned the agribusiness in the centre of external macroeconomics and of agricultural policies. Some authors concerned with the current Brazilian agrarian issue show us that this shift in external macroeconomics affects the Brazilian economy as a whole. The necessity of paying debts stimulates the expansion and mechanization of monocultures and with it the expropriation and concentration of land, the release of manpower and the degradation of work conditions, which means stronger competition among rural workers who ultimately have to submit themselves to the worst labour conditions.

Thus, a new arrangement of the Brazilian political economy may be observed, where land income emerges as a key form of the extraction of the economic surplus, based on the integration of agrarian and finance capital. Researchers pay particular attention to this aspect of the Brazilian agrarian issue. It reflects the current situation, which is why it will be examined presently in more detail. We will see that the new arrangement includes new elements of the agrarian issue: high levels of land speculation and new agents disputing territories (the agribusiness in a new form more integrated to finance capital) (Delgado 2005; Delgado 2010).

4.7. AGRIBUSINESS AND SPECULATIVE CAPITAL IN THE BRAZILIAN COUNTRYSIDE

Since 2000, Brazil inclusion in the International Labour Division is clearly centred on its exportation of primary products. This inclusion responds, on one hand, to a rise in the global demand for primary products (especially soya, corn, meat, sugar, coffee, leather and tobacco), stimulated to a large extent by the Chinese market. On the other hand, it responds to a national economic crisis that occurred in 1999, caused by foreign capital flight and a devaluation of the national currency, which increased the deficit in the national current account (Delgado 2005; Delgado 2010).

In 2000, the main goal of the government was to reduce the high current account deficit, caused by the crisis of 1999, by increasing the exportation of primary products and thus increasing foreign trade revenues (Pitta & Mendonça 2014; Delgado 2005). This political strategy has been implemented to the current day. The average value of exports rose from 50 billion dollars during the period 1995 – 99 to 200 billion dollars by 2010 (Pitta & Mendonça 2014). This led to a relative reduction of manufactured products as a percentage of exports in relation to basic and semi-manufactured products (from the agribusiness and mining industries) (Delgado 2010).

A core aspect of this model is a very close relation between agribusiness and finance capital as mentioned above (Delgado 2010; Pitta & Mendonça 2014). Some historical moments were especially relevant for the constitution of the finance sector, both globally and in Brazil. In the 1950s, under North American economic primacy, there was a de-regulation of the credit system. The privatization of financing services and a concentration of capital under banks, insurance companies and pension funds, were all important first steps (Delgado 2010; Marques & Nakatani 2013).

In the 1970s the capitalist economies of the developed nations survived an over-accumulation crisis. However, capital migrated to peripheral countries, seeking less

expensive and new consumer markets, labour, the appropriation of raw materials, and also financial markets where they could offer credits and make profits through interest rates. This movement was allowed by a wave of de-regulation of the international financing system and of the international market of commodities, thus facilitating the circulation of products and capital (Marques & Nakatani 2013).

It is in this context that the Brazilian agribusiness was initially formed, with the presence of foreign investors and strong state support through subsidized credits for large-scale farmers. This closeness between agribusiness and finance capital could be observed during the dictatorship years and returned markedly during the first decade of the 2000s, when land prices were suffering a major rise, commodity prices were high, the national currency was devalued and the government was focusing international macroeconomics on the primary sector (Delgado 2010; Marques & Nakatani 2013; Pitta & Mendonça 2014; Sauer & Leite 2012; Oliveira 2009).

In 2008 the effects of an international economic crisis were felt in Brazil, and the role of the finance capital in the country´s land market was intensified. Facing the context of international economic instability, a number of foreign investors from other sectors (e.g. financing, automotive and oil companies) looked for new sources of income, through capital fusions and acquisitions in the Brazilian countryside (Delgado 2010; Marques & Nakatani 2013; Pitta & Mendonça 2014; Sauer & Leite 2012; Oliveira 2010).

These investors aimed to increase assets in the form of machines, lands and subsidiaries. This is a strategy commonly used by companies in order to increase their potential to apply for new credits, based on the fact that creditor agents use the assets of a company as a parameter to decide on loans. The higher the credits received by the company, the larger the amount it may speculate on the finance market, thus generating above-average profits that are often higher than the profits made from productive activity. Profits may be invested afterwards in the production again, by purchasing machines and lands at opportune times (Pitta & Mendonça 2014). As we will see on Chapter 6, among the shareholders of the wind firm CPFL (that owns the wind farm observed in my case-study), are a large Brazilian construction company (also owning cement industries), several Brazilian Pension Funds and Global Investment Banks.

In this sense, nowadays, the so-called productive sector often has to create debts through loans, in order to afford investment in production and purchase new lands and machinery. Today there is a prevalence of finance capital in several economic sectors which are considered productive. This is why it is difficult nowadays to separate financial from productive capital. At every moment, capital invests in the finance or productive sector, depending on chances to make more profit (Pitta & Mendonça 2014).

That is how agribusiness in Brazil is today integrated into finance capital, which also invests in the land market, in pension funds, in various other sectors and often in different countries, through holdings and subsidiaries, acting on a global scale (Pitta & Mendonça 2014). Economists describe this as a recurrent strategy in the evolution of capitalism, where capital alternates between investing in the productive sector and in the finance sector, according to phases of crisis and capital accumulation, which are inherent in the capitalist system (Pitta & Mendonça 2014; Marques & Nakatani 2013; Sauer & Leite 2012). A further recurrent strategy in periods of crisis is the geographical expansion of capital into new markets, advancing its spatial frontier. As we can see, these processes have been affecting the Brazilian economy, the Brazilian agricultural and land markets, and consequently the Brazilian agrarian issue.

In the Brazilian context, over the last few decades this process has been subsidized by the government. The public rural credit given to the agribusiness in Brazil has increased more than fivefold, rising from 21 billion Reais in 2003/04 to 136 billion Reais in 2013/14 (Ministério da Agricultura, Pecuária e Abastecimento 2013, p. 24).

This framework of association of the agribusiness sector with the national and international finance sector may also be seen as part of a lager process of increase of land demand and land-grabbing in the world (Sauer & Leite 2012). This process intensified after the world economic crisis of 2008, which has caused a rise in the demand for commodities and a rise in their prices. The tendency of capital's increased search for farmland and thus for crops, biofuels, forests and trade is not a new phenomenon. A study conducted by the World Bank (2011) observes a rising tendency in the global cultivated area from 1961 to 2007, motivated by three factors:

- "*Demand for food, feed, pulp, and other industrial raw materials, driven by growth of population and income*
- *Demand for biofuel feed stocks as a reflection of policies and mandates in key consuming countries*
- *Shifts of production of bulk commodities to land-abundant regions where land may be cheaper and the scope for productivity growth higher than in traditional producing regions already operating at the productivity frontier*" (World Bank 2011, p.11).

In this context, in Brazil since the 1980s, following a global tendency particularly affecting developing countries in Latin America, there has been an expansion of four activities in which Brazil assumes nowadays one of the leading positions as a provider for the global

market: 1) the monoculture of soy; 2) the monoculture of sugar cane for ethanol; 3) forestry for wood and pulp production; 4) cattle for meat commercialization (World Bank 2011).

This expansion was the result of a process of liberalization of markets and trade which found favourable conditions in countries such as Brazil, Argentina, Paraguay and Uruguay, where there is a relative abundance of land, plus "higher prices, improved technology, and lower transport costs" (World Bank 2011, p.16). From 2008 onwards there has been an intensification of this process, as the World Bank report affirms:

> *"The magnitude and often speculative nature of land transactions observed recently has caught many actors by surprise. Demand for land acquisition continues and may even be increasing. At the same time, scarcity of information on what is happening encourages speculation on a large scale"* (World Bank 2011, p. 141).

According to the World Bank, there are two main factors attracting investors´ interest when comparing the countries receiving investors willing to buy lands: those that are land abundant and those with weak land governance. The report warns that this second factor "*increases the risk that investors acquire the land essentially for free and in neglect of local rights, with potentially far-reaching negative consequences*" (World Bank 2011, p.55).

According to the report, the main negative impacts of increased land and farm demand are (World Bank 2011):

1) Land price rises as a result of the rise in global demand;

2) Deforestation for cattle production and other environmental damages, caused by monocultures and mining activities such as land degradation and disrespect for environmentally protected areas;

3) Land-grabbing, leading to: a) land expropriation of small farmers and traditional communities without proper consultation or compensation; b) land concentration "with average farm sizes of more than 1,000 ha." (World Bank 2011, p. 17) - especially in the context of developing countries with loose land regulation where many small farmers and traditional communities such as indigenous people and quilombolas risk "losing land on which they have legitimate, if not formally recognized, claims" (World Bank 2011, p.xxxii).

4) The release of rural workers in the agribusiness, due to the implementation of mechanized rather that labour-intensive production, thus aggravating poverty in the countryside;

5) Privileges for large-scale investors in terms of access to public subsidies, land and resources, in comparison with small landholders.

The main methods of tackling these problems, as suggested by the World Bank, include good governance, political transparency, and citizens' consultation and participation, targeting food security, socio-economic distribution, respect for land rights and environmental sustainability. As we have already analysed in the last chapter, under the current global capitalism regime multilateral organizations present contradictory discourses. On one hand, they support neoliberal reforms in developing countries which include: 1) the flexibilization of labour, social and environmental rights; and 2) the commodification and financing of natural resources.

These two measures bring poorer people and ethnic-racial minorities vulnerable of losing their rights, as discussed in the last chapter (Acselrad et al. 2009; Heynen & Robbins 2005). The discourse linked to these measures argues that these are the only possible paths to economic growth, progress and stability, generating development, employment and well-being (Watts & Peet 2006a). It corresponds to a so-called economy of growth (Fairhead et al. 2012).

The economy of growth has been developing based mainly on: 1) high production and consumption levels (Cohen 2002; Prieto 2009; United Nations 2013); 2) a production that is intensive in its use of land, energy and other natural resources, but not labour-intensive – mostly transferred to developing countries (United Nations 2013; Galss 2011; World Bank 2011); 3) the intensive use of agrochemicals and fossil energy, which pollutes water, air and soils and endangers workers' health and also the health of the general population (especially poorer populations) (Londres 2011; Rede Brasileira de Justiça Ambiental 2014; Global Energy Assessment 2012; 4) niche sectors of high technology located mostly in developed countries (United Nations Development Program 2000; Cohen 2002; Lage & Processi 2013); 5) fusion of finance capital with industrial and agricultural capital, having great spatial mobility and great influence upon national economies (Pitta & Mendonça 2014; Sauer & Leite 2012; Vitali et al., 2011); 6) niche luxury markets for a growing millionaire population (Castro 2013). The main results are environmental injustices and a widening gap between the world's rich and poor (Acselrad et al. 2009; Rede Brasileira de Justiça Ambiental 2014; Oxfam 2014; Oxfam 2015).

On the other hand, the World Bank and other multilateral organizations such as the WTO and the United Nations Organization System support sustainable development programs, targeting poverty reduction, food security, political participation, labour rights and respect for traditional communities (Watts & Peet 2006a; Food and Agriculture Organization of the United Nations 2013; United Nations Framework Convention on Climate Change 2015). This discourse of sustainable development is used as a marketing strategy by the so-called economy of protection (Fairhead et al. 2012; Watts & Peet 2006a). The economy of

protection involves (Fairhead et al. 2012; Mol 2000; Milanez 2009; Rutherford 2007; Zhouri 2008): 1) social and environmental responsibility in the market; 2) technical and technological solutions to reduce the consumption and degradation of natural resources (e.g. renewable sources of energy and shifts in the production line that reduce resource waste); 3) environmentally conscious consumption; and 4) the financing of natural resources. However these arguments and solutions neither question nor tackle: 1) excessive patterns of consumption; 2) the excessive power of the global market over national economies; or 3) distributive issues concerning the social, economic and environmental benefits and burdens of economic growth (Watts & Peet 2006a; Rutherford 2007).

Both economic logics may be interpreted as complementary parts of the current neoliberal capitalist system, which presuppose poor public regulation of the economy, natural resources and labour relations (Fairhead et al. 2012). This discussion shows how there is a mutual influence between global and national issues, which are relevant for understanding the unequal distribution of the benefits and burdens of the installation of wind farms on the northeast coast of Brazil. Later on, we will see that these mutual relations include regional and local levels as well.

In this region, vast lands are being disputed between the wind power sector and the touristic sector, increasing the pressure on traditional communities and the natural resources that are indispensable for their economic and socio-cultural ways of living (Portal do Mar 2012). This framework cannot be understood separately from the contradictions between the logics of neoliberal economic growth and of “sustainable development”. Neither can it be understood without looking at the Brazilian agrarian issue, which is linked to these global economic dynamics.

Three main factors have created the conditions for a stronger integration between agribusiness and speculative capital and for an increase of land speculation in Brazil (Delgado 2005; Delgado 2010; Glass 2011; Girardi 2008; Oliveira 2009; Pitta & Mendonça 2014; Sauer & Leite 2012; World Bank 2011).

1) The deregulation of land markets and a loose control of public lands and of lands which do not fulfil their social function;
2) The widespread offer of rural credits and subsidized public funds which contribute to increasing land prices;
3) The high global demand for commodities.

In this process of fusion between speculative capital and agribusiness, the extraction of land revenue derived from land speculation becomes one of the main sources of profit for

those who own lands and concessions for the exploitation of natural resources such as water, mineral and oil reserves (Delgado 2010; Pitta & Mendonça 2014). This process has dangerous consequences. It stimulates land appropriation by capital without long-term compromise with ecological preservation and the social development of the territory (Delgado 2010; Quadros 2014a; Pitta & Mendonça 2014; Oliveira 2009; Sauer & Leite 2012; World Bank 2011).

It also creates new territories: those defined by the logic of speculative agents based on the global markets. Land speculators usually act in multiple sectors through different companies (industrial; agricultural; services; or financial, including banks and insurance companies) and in different parts of the world, according to the most advantageous investment at the time (Pitta & Mendonça 2014) – acting as if the territories were empty and contained no social, economic or political issues or conflicts (Arnauld De Sartre & Berdoulay 2011; Acselrad & Viégas 2013; Interview with the Director of the Heinrich-Böll Stiftung Brasil/RJ, 17.10.2013; Junior & Alves 2010). The territory of the Brazilian countryside, far from being an empty space, consists of the various territories of the peasantry and traditional communities with interests, livelihoods, ways of life and modes of territorial appropriation which diverge from the large capitalist mode of territorial appropriation and from the agribusiness model (Acselrad & Viégas 2013; Canuto 2012; Comissão Pastoral da Terra 2014; Arnauld De Sartre & Berdoulay 2011).

This economic model, based on the specialization of primary products for export, is seen as a limit to development. These are the key reasons why (Delgado 2005; Delgado 2010; Articulação Nacional de Agroecologia 2014; Quadros 2014a; Quadros, 2014b; Oliveira 2009; Pitta & Mendonça 2014; Sauer & Leite 2012):

1) It preserves external economic dependence on foreign demand and foreign capital;

2) It contributes to the relative reduction of the exportation of manufactured products and leaves the technical innovation of the industrial system for a second plan;

3) It fails to balance the currency account deficit in the long term;

4) It is not economically sustainable in the medium term either, because it is mostly based on the dilapidation of non-renewable natural resources.

5) It increases land values, land speculation, land concentration and land revenues concentration, based on loose land regulation and credits for big investors;

6) It generates little employment and leads to the precariousness of working conditions without salary increases;

7) It stimulates, especially in areas beyond the agribusiness frontier, the maintenance of a great number of lands controlled by the agribusiness as unproductive lands, which: a) does not fulfil the social function of the land; and b) increases land prices, thus hindering agrarian reform and making it more expensive, and aggravating territorial disputes with the peasant movement and with traditional communities.

8) It leads to an over-exploitation of natural resources in the short term:

a. On one hand, new lands are incorporated into the territory of the agribusiness, and its resources will be overexploited with the use of technological packages. On the other hand, in already exploited areas there is an intensification of the use of agrochemical products, endangering workers and damaging nature.

b. The sector generates an intensive consumption of both water and energy, which also results in high CO2 emissions (Montoya et al. 2013; Agência Nacional de Águas 2014).

9) This model is unable to socially distribute wealth.

Concerning the last argument, the authors show how this model poses a distributive problem (Delgado 2005; Delgado 2010; Articulação Nacional de Agroecologia 2014; Glass 2011; Quadros 2014a; Oliveira 2010; Pitta & Mendonça 2014; Vezzali 2006; Sauer & Leite 2012). On one hand, land owners, reservoir owners and capital owners privately appropriate surplus land speculation and the production of commodities based on the private appropriation of natural resources.

I have gathered some data that helps us, in a simplified and brief way, to visualize the dimension of distributive inequality in Brazil, the causes for which lie, of course, in far deeper social, economic and political issues that I could not embrace in this work. According to the Brazilian Family Budget Survey 2008/09 (Instituto Brasileiro de Geografia e Estatística 2010) 39% of the families live with an average monthly income of R$ 762,72 (roughly 268,64 US Dollars using the conversion of the Brazilian Central Bank, Banco Central do Brasil 18.02.2015). Looking at the consumption patterns, some items show an extremely high inequality. The items “having home property”, “having health insurance and plans”, and “attending private schools” show a Gini Index (which measures the concentration rate from 0 to 1) higher than 0.7, almost reaching the maximum concentration index (Instituto Brasileiro de Geografia e Estatística 2010).

If we look at ethnic-racial minorities, the average household expenditure of white families (considering the colour of the reference person of each family) was 89% higher in comparison with black families and 79% higher in comparison with brown families. In the Brazilian census, people have the choice to define themselves as white, black, brown,

indigenous or yellow (Japanese, Chinese, Koreans etc) (Instituto Brasileiro de Geografia e Estatística 2010).

Poverty was significantly lower Brazil in 2012 (15,09% of the population) as it was in 2001 (35,09%) (Avila 2014). Nevertheless, inequality still is extremely high: The 0,9% richest concentrate between 59,90% and 68,49% of the wealth (Avila 2014). According to the Consulting Firm Capgemini/RBC Wealth Management, in the same year, influenced by the prosperity of the commodities sector due to an increase in global prices, Brazil was the country that showed the highest increase in the number of millionaires (people with more than one million dollars available for investment) (Chade 2012).

With an increase of 6.5%, the country had 165 millionaires in 2012, occupying eleventh place in the global ranking of countries with the largest numbers of millionaires (Chade 2012). Alongside this process, the market for luxurious products such as jet planes and helicopters is expanding in Brazil (Castro 2013).

On the other hand, in 2014, according to new parameters classifying social classes in Brazil, adopted by the Brazilian Association of Research Companies (ABEP), which includes not only income, but also the kind of habitation and access to education and public services such as sanitation, among other criteria, 68% of Brazilians belong to the three lower social classes C, D and E, and the other 32% to classes A and B (Chiara 2014).

In 2014 the country had 40.45 million people living in conditions of extreme poverty (unable to meet the consumption of their necessary alimentation, according to the patterns of the World Health Organization (WHO) and the Food and Agriculture Organization (Food and Agriculture Organization of the United Nations), and a further 28.69 million people living in poverty (earning less than 60 US Dollars a month) (Jornal O Globo 2014).

To bring us back to our discussion, researchers show how an economic model centred on the agribusiness for exportation poses a distributive problem (Delgado 2005; Delgado 2010; Articulação Nacional de Agroecologia 2014; Quadros 2014a; Oliveira 2010; Pitta & Mendonça 2014; Vezzali 2006; Sauer & Leite 2012). If on one hand privileged groups privately appropriate the benefits of agribusiness, on the other hand the social and environmental costs of land expropriation, overexploitation of natural resources and precarious labour conditions are transferred to society in general. I would add that they are not democratically transferred to society as a whole. Instead, these costs are mostly transferred to underprivileged groups, as was examined here in the last chapter, through the theoretical approach of environmental justice, and as we will see further in regarding the case-study of this research.

Compensations, although necessary, are not enough to cover the environmental damages and the degradation of working conditions (Delgado 2010). Fairer tributary systems and social policies could encourage a more democratic distribution of the economic surplus of this model, but would not address the root causes of the problems (Delgado 2010). Critics of this model widely believe that its challenges and alternatives concern not only the agricultural model but also the development model (Carneiro et al. 2012; Delagado 2010; Articulação Nacional de Agroecologia 2014; Fernandes 2013; Girardi 2008; Quadros 2014a; Londres 2011; Movimento dos Trabalhadores Rurais Sem-Terra 2014; Rede Brasileira de Justiça Ambiental 2014).

We may see how the lack of agrarian reform associated with loose regulation of the land market is a very dangerous combination from the point of view of social justice and peace in the countryside, when the main source of the national economy's economic surplus depends in great part on the land revenue. From the perspective of environmental justice, there are three major direct negative consequences of this model on the Brazilian countryside (Carneiro et al. 2012; Delgado 2010; Articulação Nacional de Agroecologia 2014; Fernandes 2013; Girardi 2008; Quadros 2014a; Quadros 2014b; Londres 2011; Movimento dos Trabalhadores Rurais Sem-Terra 2014; Rede Brasileira de Justiça Ambiental 2014; Pitta & Mendonça 2014; Sauer & Leite 2012):

1) The increase of pressure for land concentration; aggravating the peasantry´s struggle for agrarian reform;

2) The overexploitation of nature and the increase of pressure to concentrate control over natural resources in the hands of a few economic actors; threatening the territories of traditional communities and the preservation of ecosystems which are vital for the environment and for their mode of life;

3) A worsening of working conditions in the countryside and the overexploitation of rural labour (excessive working hours, exposition to agro-toxics that are injurious to health; precarious seasonal labour contracts during the harvest time).

A distinct process that is also a part of this economic model is the appropriation of lands for energy projects based on progress in edge technology (e.g. Pre-Salt layer oil exploitation) (Delgado 2010). In comparison with agribusiness it has the advantage that it incorporates and favours larger technological advance and stimulates the development of edge industrial chains that may induce the emergence of new products and new markets (Delgado 2010)

Nevertheless, these energy projects are also directly overexploiting natural resources (Delgado 2010) and threatening the livelihoods, territories and identities of traditional

communities living from fishing in coastal areas (Conselho Nacional de Segurança Alimentar e Nutricional 2014; Ideas 2013). Additionally, we need to consider that these energy projects are implemented, in great part, to supply energy for the agribusiness and mining industries, which are intensive in the use of energy (as we will look at further). Therefore, the social and environmental costs of this kind of overexploitation of natural resources are also related to the economic model based on primary exports. In this sense, beside the agribusiness and mining, two sectors of energy exploitation provide the basis for this model of primary exportation: petroleum oil and hydropower (Ideas 2013; Articulação Nacional de Agroecologia 2014; Rede Brasileira de Justiça Ambiental 2014).

I believe that wind energy appears in this context as a complementary renewable source of energy for hydropower, seen as strategic for the government, in order to ensure the increase of energy supply based on a sustainable energy mix. In this sense the wind energy sector is related to this economic model, as it is supported by public policies that aim to increase energy supply based on "sustainable sources of energy" which are implemented through large-scale and, often, non-sustainable projects.

Non-sustainable projects have mainly arisen on the northeast coast of the country, where they damage the ecosystems of coastal dunes and threaten the territories of fishing communities (Meireles 2011). This contributes to the increase of land demand, land values, land speculation, land expropriation and rural conflicts which are already a growing issue for traditional communities in Brazil who are oppressed by the advance of the agribusiness frontier (Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013).

All these sectors (agribusiness, mining, oil, hydropower, wind power) operate based on: 1) the monopolization of land and natural resources, which increases disputes over land and over land incomes; 2) the support of public credit; 3) an external demand for commodities, which demands increasing energy (Bombard 2012; Carneiro et al. 2012; Delgado 2005; Delgado 2010; Articulação Nacional de Agroecologia 2014; Movimento dos Trabalhadores Rurais Sem-Terra 2014; Quadros 2014a; Oliveira 2010; Pitta & Mendonça 2014; Quintans 2008; Rede Brasileira de Justiça Ambiental 2014; Sauer & Leite 2012). Let us now see how this reflects on the Brazilian agrarian structure and the resulting land conflicts.

4.8. THE BRAZILIAN COUNTRYSIDE TODAY: LAND CONCENTRATION AND CONFLICTS

As we saw here before, although the Brazilian Constitution 1988, *Constituição da República Federativa do Brasil 1988,* has ensured the fulfilment of the social function of

land, there is a discrepancy between the juridical right and its concrete application. Interacting with the framework of global economic restrictions and mistaken internal political choices regarding the Brazilian external economic policy, as briefly analysed here, some authors identify the loose regulation of rural property as the main reason for the reproduction of unequal land distribution in Brazil (Delgado 2010; Delgado 2005; Sauer & Leite 2012; World Bank 2011; Pitta & Mendonça 2014):

Three main pieces of evidence support this argument:

1) Land expropriations for social interest have until now only followed the economic principle (productivity) of the social function of the land, ignoring environmental (compliance with environmental laws) and social principles (appropriate labour conditions) (Delgado 2005; Oliveira 2010; Girardi 2008).

2) The Rural Territorial Tax, which should be progressive concerning unproductive lands, is mostly neither charged nor supervised (Delgado 2005).

3) A large part of the national territory is loosely regulated: in 2003, 71.7% of the national territory was categorized as “private areas self-declared in accordance with the social land function according to the SNCR” (National Rural Cadastre System; Sistema Nacional de Cadastro Rural) or as “unproductive private areas” and “unoccupied government lands” (Delgado 2010).

The so-called “private areas self-declared as being in accordance with the social land function, according to the SNCR” were self-declared and based on the productivity indicators of the INCRA from the 1970s, thus not considering the significant technological advances that have taken place since then (Delgado 2005; Ministério do Desenvolvimento Agrário 2005). The Law, *Lei N. 8.629/1993*, which regulates instruments for the implementation of agrarian reform, determined the periodic update of these indictors, taking technological advances and regional development into account (Ministério do Desenvolvimento Agrário 2005).

Nevertheless, the agribusiness lobby has constantly opposed attempts to update the data (Delgado 2005; Medeiros 2010). In 2009, after the announcement by the government that the new indicators would be published, strong opposition was articulated. In 2010 it was still not published and the Brazilian Federal Public Ministry, Ministério Público Federal, presented a civil action against the Union and the INCRA to ensure the updating of the data (Ministério Público Federal 2010c).

Besides that, the INCRA´s category “terras devolutas” or “public unoccupied lands” ignores a great number of lands in irregular situations, such as grabbed lands that are not supervised because they are not registered in the INCRA land cadastre (Delgado 2005).

These three pieces of evidence show how a large amount of land is kept under loose regulation in Brazil, for the benefit of the agribusiness sector.

As a result of this loose land regulation, land concentration in Brazil remains high. The last three Agricultural Censuses (1985, 1995-96 and 2006) show that Brazil still has high levels of land concentration (Instituto Brasileiro de Geografia e Estatística 2012).

> *While the rural properties of less than 10 ha occupy less than 2.7% of the total area occupied by rural properties in the last three Agricultural Censuses, the area occupied by rural properties of more than 1000 ha concentrate more than 43.0% of the total area in the same period* (Instituto Brasileiro de Geografia e Estatística 2012, p. 107).

The Gini Index which measures land concentration remained high in the same period, varying from 0.856 in 1995 to 0.858 in 2006 (Instituto Brasileiro de Geografia e Estatística 2012). Considering the 2006 Census alone,

> *(…) less than ten hectares establishments constitute about 50% of the total number of rural properties, but cover only about 2% of the surveyed area". Additionally, "12% of family farming establishments have an area of less than 1 ha* (Glass 2011, p.5).

Some regional differences reflect different processes of territorial occupation. In the South the land concentration is lower, reflecting the historical colonization of that region by Italian and German migrants. In contrast, the Northeast Region and more recently the Centre-West Regions (with the exception of some areas) show high levels of land concentration. This is related to the modernization of the countryside, based on the production of commodities, particularly the expansion of soy, corn and cotton monocultures. In the Amazon, in areas where there is an expansion of the frontier of the large-scale soy and cattle farms, land concentration is also very high (Glass 2011, p.110).

Statistics show how much the pressure undertaken by social movements through occupations increases the number of rural settlements undertaken by the government (Girardi 2008). An important challenge for this struggle for agrarian reform in Brazil was instituted by the legal act *Medida Provisória 2.027-38 / 2000*, substituted by the *Medida Provisória 2.109-52/2001* in 2001. By this means, the second government of the President FHC prevented occupied rural properties from being eligible for rural settlements, and prohibited every citizen who participated in any land occupation from benefiting from the Agrarian Reform Programs. The result was a drastic reduction of the number of families involved in occupations and of the number of settled families as well (Girardi 2008).

Nevertheless, when comparing the number of rural settlements of both FHC political mandates (1995-98 and 1999-2002) with both political mandates of president Lula (2003-10), who was elected with the support of left-wing social movements, we observe a stability, which disappointed expectations of increase (Giradi 2012; Quadros 2014a). The

current Dilma government (2011-2014), which was formed by the same political party as Lula (PT), has even shown a decrease in the number of rural settlements (Liebgott 2012; Quadros 2014a). According to the leader of the MST, João Pedro Stédile, this is due to the facts that conservative political forces have a stronger influence and that she possesses less charisma and less capacity to oppose the media and other dominant interests (Quadros 2014a).

Another indicator of the conservative aspect of the agrarian policies is not only the number of settled families, but also their locations and the nature of the land that is being designated to the agrarian reform settlements (Girardi 2008; Quadros 2014a). The social movements target regions of consolidated settlement, where the infrastructure for production, the consumer market and access to basic public services are more advantageous, increasing opportunities for peasant agriculture to become successful. Nevertheless, the government privileges settlements in regions beyond the frontier of the capital, the center-west and the South-Amazon region (Girardi 2008; Quadros 2014a).

Besides that, even in these areas, the origin of the land used for the settlements is also problematic (Girardi 2008; Quadros 2014a). These are not the results of the expropriation of lands that do not fulfil their social function, which would reduce land concentration. Instead, the government's settlements are mainly the result of: 1) the recognition of ownership; 2) settlement on public lands; and 3) the recognition of areas of environmental preservation. None of the cases alters the unequal character of the country´s agrarian structure (Girardi 2008; Quadros 2014a).

It is in this sense that peasants and traditional communities have been struggling for the right to their territories, the right to citizenship, the access to public policies and credits and the right to political manifestation without criminalization (Fernandes 2013; Rede Brasileira de Justiça Ambiental 2014; Articulação Nacional de Agroecologia 2014; Oliveira 2010). The barriers to these rights sometimes take the form of violence. The so-called traditional communities, as well as the peasantry which does not want to be subordinate to the agribusiness, are seen as obstacles to progress, as their way of living does not fit into the frames of capitalist development. In this sense, a number of actors try, sometimes even using violence, to place restrictions on the territories of the traditional communities and peasants, and to restrain their political struggle.

Between 2000 and 2012, 116 different rural movements have undertaken 8,789 land occupations in Brazil, of which 23 social movements realized 253 land occupations in 2012 (Núcleo de Estudos, Pesquisas e Projetos da Reforma Agrária 2012). Land occupation is their key strategy, but other strategies include camping, road blockades, concentration in public spaces, marches and walks, public building occupation, private building occupation,

pilgrimage, audience, fasting, hunger strikes, leafleting, surrounding of constructions, etc (Núcleo de Estudos, Pesquisas e Projetos da Reforma Agrária 2012).

The Pastoral Land Commission (Comissao Pastoral da Terra) publishes annual reports on countryside conflicts in Brazil, revealing the statistics of violence in the countryside. There are several forms of violence, legal as well as illegal ones. Illegal ones are usually committed by "farmers, rural entrepreneurs, grabbers, loggers and miners" on the forms of "land evictions, murders, attempted murders, aggressions and death threats" (Merlino & Mendonça 2012, p. 1). So-called legal forms of violence are committed by public power, through prisons, judicial evictions and omissions of executive and judiciary power, and through law projects, supported by the legislative powers, which attempt to restrict hard-won rights (Comissão Pastoral da Terra 2014). In 2013, 34 people were murdered (15 of which were indigenous people), 15 people suffered murder attempts (10 of which were indigenous people) and 241 people have received death threats (33 of which were indigenous people) in the Brazilian countryside as a result of social struggle for land and territorial rights (Merlino & Mendonça 2012).

The omission of executive and judiciary powers is the most common form of "legal violence" (Núcleo De Estudos, Pesquisas E Projetos Da Reforma Agrária 2012; Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013; Comissão Pastoral da Terra 2014) and a key barrier to the implementation of agrarian reform (Delgado 2005). It occurs when respect for the rights and territories of underprivileged groups, and the enforcement of agrarian, labour and environmental rules, are not ensured (Delgado 2005; Comissão Pastoral da Terra 2014; Núcleo de Estudos, Pesquisas e Projetos da Reforma Agrária 2012). This point of view is also shared by the public defender interviewed for this research, who is involved in negotiations between the wind farms and fishermen in my case study (Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013).

According to him, omissions of executive power are a key cause of environmental conflicts in the region. In most cases, we cannot affirm whether it occurs deliberately as a result of the pressures of capital and the deals made between capital and representatives of public power involving private and political interests, or whether it occurs out of pure negligence. Either way, once environmental control agencies (on all levels: national, state and municipal) allow the disrespect of environmental laws and traditional communities whose livelihoods depend directly on the use of and access to natural resources that are being damaged or illegally appropriated, these communities form resistance (Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013; Interview with Jocélia Ribeiro, OPA Aracati/CE/Brazil, 08.11.2013).

The main strategy adopted by the rural social movements is land occupation (Girardi 2008). The targeted areas are mostly unproductive lands, public unoccupied lands and lands where labour or environmental laws are being disrespected (Girardi 2008). In recent years (2000-12), 116 different social movements have undertaken land occupations in Brazil, 23 of them in the year 2012 (Núcleo de Estudos, Pesquisas e Projetos da Reforma Agrária 2012). The movements who concentrate the most families in occupations are the MST, the CONTAG and indigenous movements (Núcleo de Estudos, Pesquisas e Projetos da Reforma Agrária 2012).

By defending the enforcement of certain rules and won rights, social movements assume a very vulnerable position that should be assumed by the public power (Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013). Resistance is a difficult and dangerous path because it affects, without the protection of the state apparatus, the interests of powerful groups with great economic and political influence (Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013; Interview with Rodrigo de Medeiros Silva, RENAP/Brazil/ CE, 12/09/2013; Interview with Jocélia Ribeiro, OPA Aracati/CE/Brazil, 08.11.2013). These groups may use their political influence and lobby strategies to ensure that the state – sometimes using “legal forms of violence” – acts in defence of private interests (Interview with Rodrigo de Medeiros Silva, RENAP/Brazil/ CE, 12/09/2013; Interview with Jocélia Ribeiro, OPA Aracati/CE/Brazil, 08.11.2013). Besides that, the representatives of capital whose interests are being threatened also use the violent strategies mentioned above.

During my fieldwork I could also observe that once a large-scale investment arrives in a territory of traditional communities, violence is often not committed directly by the investor nor under his command, but by local inhabitants who receive better compensations, or by smaller business owners who benefit from the investment and aim to weaken local social resistance to it, fearing to lose benefits. Frequently communities suffer an internal division, sometimes highly conflictive, among those who support the investor and those who are opposed to it, as we will see in the case-study analysis.

In response to the reality of violence, the Federal Government has had since 2004 a Program of Protection of Human Rights Defenders (Secretaria de Direitos Humanos 2014). It aims to “ensure the protection of people who are at risk or threat due to their role in promoting or defending human rights”. The main leader struggling against the environmental injustices encouraged by the wind farms and by shrimp farming in the Cumbe Community (the case study community of this research) had to be included in this Program in 2010 (Nações Unidas no Brasil 2013).

It is important to highlight that the people mainly affected by the advance of the agribusiness frontier and by large-scale energy projects and infrastructural projects in the Brazilian countryside are not only peasants but also a variety of groups known as "traditional communities". The group mainly affected by the wind farm Bons Ventos in my case study is a traditional community. A great number of its inhabitants are artisanal fishers, and since December 2014 the community has been recognized as a territory of Quilombolas (Diário Oficial da União 2014).

Brazilian traditional communities are estimated to make up about 4.5 million people, occupying roughly a quarter of the national territory according to data from 2007 (Simonetti 2007).

> *Only in the Amazon there are 280 indigenous peoples, as well as 357 "quilombola communities" and thousands of rubber tappers, riverside communities and ´babaçu´ collectors among others. There are also many more across the country* (Simonetti 2007, p.1).
>
> *"Só na Amazônia existem 280 povos indígenas, além de 357 comunidades quilombolas e milhares de seringueiros, ribeirinhos e babaçueiros. Mas há muito mais pelo país afora"* (Simonetti 2007, p.1).

Brazilian traditional communities are mainly found in the following regions: 1) the "**Legal Brazilian Amazon**" Region – including the states of Acre, Amapá, Amazonas, Mato Grosso, Pará, Rondônia, Roraima, Tocantins and part of Maranhão - (Superintendência do Desenvolvimento da Amazônia 2014); 2) the "**Cerrado**" Region – states of Goiás, Tocantins, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Bahia, Maranhão, Piauí, Rondônia, Paraná, São Paulo e Distrito Federal, part of Amapá, Roraima and Amazonas (Ministério do Meio Ambiente 2015); 3) the "**Meio-Norte**" Region – including the states Maranhao and part of Piauí – (Empresa Brasileira de Pesquisa Agropecuária 2014); 4) the "**Semi-Árido**" Region - including the states Alagoas, Bahia, Ceará, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, Sergipe e norte de Minas Gerais (Ministério do Desenvolvimento Social e Combate à Fome 2014); and 5) the **Coastal Zones**, where we find a number of communities of artisanal fishers, as well as quilombolas, indigenous people and other groups (Comissão Pastoral da Terra 2013; Portal do Mar 2012).

The key role of these groups in preserving biodiversity, due to their sustainable ways of life and their ability to relate economically and socio-culturally to nature, has long been recognized and is nowadays a key topic on the global political agenda (Instituto do Patrimônio Histórico e Artístico Nacional 2000; Pereira & Diegues 2010; Toledo 2001; United Nations 1992). This concern appears as a result of an increased concern with the environment and is influenced by an academic field called "ethno-conservation", which appeared in the 1950s, that focuses on relations between traditional communities, traditional knowledge and nature conservation (Pereira & Diegues 2010). These issues are

deeply linked to political questions about the value, ownership and preservation of this knowledge (Pereira & Diegues 2010).

Another dimension of this issue that has important political consequences, concerns the question of whether nature should be *preserved* and protected from human interference, including from traditional communities, or whether nature should be *conserved* precisely by these communities whose ways of living protect nature against the overexploitation of the capitalist system through traditional knowledge and sustainable uses of resources (Pereira & Diegues 2010).

In this sense, in 1970, the International Union for the Conservation of Nature (IUCN)

> *(…) worked hard to avoid nature protection leading to the expulsion and disintegration of the populations bounded to the concerned spaces* (Arnauld De Sartre & Berdoulay 2011, p. 117).
>
> *"(…) a fortement oeuvré pour éviter que la protection de la nature ne mène à l expulsion et à la déstructuration des espaces concernés"* (Arnauld De Sartre & Berdoulay 2011, p. 117).

In 1986 this organization linked the fate of traditional people to nature conservation, for the promotion of sustainable development. Two years later the IUCN stated that it

> *(…) characterizes traditional communities as minorities outside of the market who possess thorough knowledge about their environment* (Arnauld De Sartre & Berdoulay 2011).
>
> *"(…) caractérise les peoples traditionnels comme des minorities qui se trouvent en dehors du marché et qui détiènnent une conaissance approfondie de leur environnement"* (Arnauld De Sartre & Berdoulay 2011).

In 1992 the UN recognized the role and lifestyles of indigenous and traditional communities and their knowledge in conserving natural resources, and committed all contracting parts of the Convention on Biological Diversity to respect and preserve their knowledge and practices (United Nations 1992).

In Brazil, the recognition of the rights of traditional communities and the creation of public policies aiming to attend to their demands and preserve their territories, culture, knowledge and citizenship is a recent process, with some achievements and many challenges as we will briefly show now.

4.9. THE AGRARIAN ISSUE AND TRADITIONAL COMMUNITIES

In Brazil the first regulation that aimed to ensure the preservation of distinct forms of social and cultural organizations was the Brazilian Constitution 1988, *Constituição da República Federativa do Brasil 1988*, but the territorial rights were envisaged only for indigenous and

quilombolas peoples (Arnauld De Sartre & Berdoulay 2011; Simonetti 2007). Probably based on the prior existence of indigenous people on the national territory before the colonial occupation, the recognition of their territorial rights was accepted and put into practice before the recognition of the quilombolas´ and other traditional communities´ territories (Arnauld De Sartre & Berdoulay 2011).

In 1989, through Convention 169 of the International Labour Organization (ILO), the international scene pressured national governments to assume the responsibility of protecting the rights and integrity of tribal and indigenous populations, which reinforced the necessity to apply the constitutional rights of the indigenous people and quilombolas (Arnauld De Sartre & Berdoulay 2011; Simonetti 2007). The Brazilian Senate endorsed this Convention in 2002, contributing one year later to the Decree Law 4887/2003, *Decreto 4887/2003*, which regulates the process of recognising and titling of quilombolas' territories, as provided by the Brazilian Constitution 1988, *Constituição da República Federativa do Brasil 1988* (Arnauld De Sartre & Berdoulay 2011; Simonetti 2007). In 1990 as a result of the struggle of rubber tappers, the first extractive reserve was created in the Brazilian Amazon (Arnauld De Sartre & Berdoulay 2011; Instituto Chico Mendes de Conservação da Biodiversidade 2014). These emblematic achievements contributed to the struggle for more visibility and for the guarantee of the rights of all traditional communities.

Before that,

> *(…) the exclusion for centuries of traditional people from the country´s policies for economic and social promotion has resulted in rural exodus, slums in urban centres, increased poverty and environmental degradation* (Simonetti 2007, p.2).
>
> *"(...) A exclusão dos povos tradicionais das políticas de promoção econômica e social do país, por séculos, resultou em êxodo rural, favelização nos centros urbanos, aumento da pobreza e degradação ambiental"* (Simonetti 2007, p.2).

A significant and wider achievement occurred in 2007 when Brazilian society formally recognized for the first time the "existence of traditional populations in all their diversity" (Simonetti 2007). The federal government then implemented the National Policy for the Sustainable Development of Traditional Peoples and Communities, Política Nacional de Desenvolvimento Sustentável dos Povos e Comunidades Tradicionais (PNPCT), *Decreto 6040/2007*.

According to the *Decreto 6040/2007,* its main goals are:

> *Art. 2 The PNPCT aims to promote the sustainable development of people and traditional communities, with emphasis on the recognition, strengthening and guarantee of their territorial, social, environmental, economic and cultural rights, with respect for and appreciation of their identities, their forms of organization and their institutions.*

> *"Art. 2 A PNPCT tem como principal objetivo promover o desenvolvimento sustentável dos Povos e Comunidades Tradicionais, com ênfase no reconhecimento, fortalecimento e garantia dos seus direitos territoriais, sociais, ambientais, econômicos e culturais, com respeito e valorização à sua identidade, suas formas de organização e suas instituições".*

It defines traditional communities and their territories as follows:

> *I - Traditional Peoples and Communities: culturally different groups who recognize themselves as such and possess their own forms of social organization, which occupy and use territories and natural resources as a condition for their cultural, social, religious, ancestral and economic practices, using knowledge, innovations and practices generated and transmitted by tradition.*
>
> *II - Traditional Territories: the space necessary for the cultural, social and economic reproduction of traditional peoples and communities, whether used permanently or temporarily, observed with regard to indigenous peoples and quilombolas respectively, the provisions of articles 231 of the Constitution and 68 of the Temporary Constitutional Provisions and other regulations.*
>
> *" I - Povos e Comunidades Tradicionais: grupos culturalmente diferenciados e que se reconhecem como tais, que possuem formas próprias de organização social, que ocupam e usam territórios e recursos naturais como condição para sua reprodução cultural, social, religiosa, ancestral e econômica, utilizando conhecimentos, inovações e práticas gerados e transmitidos pela tradição;*
>
> *II - Territórios Tradicionais: os espaços necessários a reprodução cultural, social e econômica dos povos e comunidades tradicionais, sejam eles utilizados de forma permanente ou temporária, observado, no que diz respeito aos povos indígenas e quilombolas, respectivamente, o que dispõem os arts. 231 da Constituição e 68 do Ato das Disposições Constitucionais Transitórias e demais regulamentações (...)".*

These groups introduce a new dimension to the agrarian issue, which is the relevance of the cultural dimension of the relation with the land, placing the concept of "territory" in the core of the struggle (Cruz 2013). Regarding the community used as case study in my research, located in Ceará state, in the Northeast Region of Brazil, peasants and traditional communities of the coastal zone organized themselves in 2012 for a Seminar called "Wind Power: Conflict and Environmental Injustice in the Coastal Zone (Portal do Mar 2012).

Different groups were represented including peasants, artisanal fishers, quilombolas, indigenous groups, social movements and partners. They *denounced recurrent cases of environmental injustice related to the installation of wind farms in the region, damaging ecosystems and privately appropriating the territories of these traditional communities that used to be spaces of common use* (Portal do Mar 2012). It demonstrates how, for the sake of so-called "development", wind farms´ "*implementation exacerbates the social and environmental problems caused by predatory industrial fishing, mass tourism, port facilities, oil industry, shrimp farming, monoculture, land speculation and land-grabbing*" (Portal do Mar 2012).

In 2013 traditional communities gathered again in Ceará in order to articulate their political struggles and publicly express their indignation at what they call an agrarian reform for the benefit of big business (Comissão Pastoral da Terra 2013). At this meeting – the First Meeting of the Traditional People and Communities of the State of Ceará (1º Encontro dos Povos e Comunidades Tradicionais do Estado do Ceará) – a number of groups were represented: peasants, indigenous people, “quilombolas”, extrativists, artisanal fisherman, pastoral and rural organizations, and partners (Comissão Pastoral da Terra 2013).

They denounced the fact that the government, although elected on a promise of support to labour causes, is on the contrary allowing the expropriation of peasants´ and traditional communities´ lands by powerful private enterprises. These enterprises involved the following sectors: mining, agribusiness, shrimp farming, wind energy, predatory tourism and real estate speculation, the Industrial and Port Complex of Pecém and aquaculture projects (Comissão Pastoral da Terra 2013).

Both meetings described a framework that may be seen as a framework of environmental injustice, where large-scale projects said to bring “development” instead simultaneously cause environmental damages and expropriate the territories of underprivileged groups, negatively affecting their livelihood, dwellings, health and culture.

As we can see, what is at stake in these two contexts is not only land and distributive issues, but also territorial and identity issues. These struggles have been interpreted as being part of a broader movement of the transformation of the rural social struggle in Latin America, which has been evident from the 1980s onwards (Cruz 2013; Acselrad 2010; Acselrad & Viégas 2013). Some authors talk about a process of the “territorialization”, “ethnicization” and “environmentalization” of social struggle. Let us briefly look at this process and its features - because social resistance to the model of the implementation of wind farms in the northeast coast of Brazil is here understood as a part of this process.

4.10. THE ENVIRONMENTALIZATION AND ETHNICIZATION OF THE AGRARIAN ISSUE

The 1980s represent a period of re-democratization in southern Latin America, which offered the possibility for oppressed actors - historically made invisible by public policies, official knowledge, government statistics and the mainstream media - to emerge in the political sphere (Cruz 2013; Souza Santos 2010). That is how in Brazil, a revitalized peasant movement (e.g. the MST and Via Campesina) and a number of traditional communities such as the indigenous people, quilombolas, extrativist populations, forest populations and Riverain populations among others (índios, quilombolas, ribeirinhos,

pescadores artesanais, quebradeiras de coco de babaçu, castanheiros, ceringueiros, varzeiros, etc.) – have started to organize themselves to pressure the government for their recognition and their right to reproduce their livelihoods in their home territories (Cruz 2013; Souza Santos 2010).

This process is led by "new" political subjects with new political agendas, new strategies of struggle, and new discourses (Cruz 2013; Souza Santos 2010). These new social movements have in general three features in common: 1) the demand for the recognition of their ethnic and racial identities; 2) the demand for the recognition of their territories; and 3) the defence of environmental protection and of the common use and access to the natural resources to which they are economically and culturally linked (Cruz 2013; Souza Santos 2010).

As mentioned the traditional communities of the state of Ceará gathered together for a first official meeting, in 2013 (Comissão Pastoral da Terra 2013). Their open letter says:

> *We reject the projects of death that are encroaching on Ceará: the mining, agribusiness, shrimp farming, wind energy, predatory tourism and real estate speculation, the Industrial and Port Complex of Pecém, the privatization of Union waters for aquaculture projects and plastic tanks, among others. These projects are destroying the environment. From the moment these projects are imposed on our territories, we are unable to keep producing, because their facilities advance and destroy the areas where we plant our clearings, we raise our animals, we perform extrativism and go fishing. Landless and homeless, how are we going to live? Forced to migrate, how do we ensure the permanence of our identity?* (Comissão Pastoral da Terra 2013)
>
> *"Repudiamos os projetos de morte que avançam sobre o Ceará: as minerações, o agronegócio, a carcinicultura, as eólicas, o turismo predatório e especulação imobiliária, o Complexo Industrial e Portuário do Pecém, a privatização das águas da União para projetos de aquicultura, as cisternas plástico, dentre outros. São projetos destruidores do meio ambiente. A partir do momento em que estes projetos são impostos aos nossos territórios, somos impedidos de continuar produzindo, pois suas instalações avançam e destroem as áreas onde plantamos nossos roçados, criamos nossos animais, realizamos nosso extrativismo e pescamos. Sem terra e sem casa, como vamos viver? Forçados a migrar, como vamos garantir a permanência de nossa identidade?"* (Comissão Pastoral da Terra 2013)

Currently, the notions of "recognition", "identity", "buen vivir" (living well) and the "right to difference" are some of the ideas forming their discourses. For the sociologist Boaventura de Sousa Santos, these movements emerging in the last 30 years in Latin America address different "cosmovisions" and different conceptions of development (Souza Santos 2010). These traditional communities are struggling for the recognition of multi-nationalities in one nation, for a citizenship of indigenous people, for a system of social justice which also represents historical justice (considering historical oppression against indigenous populations) and for participation. It is about a transition from ancient and new forms of

colonialism that have been exercised over these populations, to self-determination - inside the constitutional frameworks of a democratic nation (Souza Santos 2010).

These groups introduce new elements to the political agenda and their dialogue with the academic discourse introduces new elements to the theoretical discussion about justice and social emancipation (Cruz 2013). It adds to the traditional arguments for more equality, against exploitation and socio-economic marginalization, new arguments for the recognition of difference and for equal political participation. Thus, it provides evidence for other dimensions of the social subordination to which underprivileged groups are submitted – beyond the economic dimension - through institutionalized hierarchies of value and status (Fraser 2007).

As we will see later, looking at my case study we may observe the difficulty faced by traditional communities in: 1) ensuring their rights to the possession and use of ancestrally occupied lands and territories, in the face of ideological opposition from the judiciary powers for example; 2) ensuring their right to appropriate information and participate in decisions regarding projects that affect their territories; and 3) their right to have their identities and local knowledge taken into consideration by public policies and by investment projects affecting their territories.

It becomes clear how there are “institutionalized patterns of cultural value” (“padrões institucionalizados de valoração cultural”) which influence “the relative position of social actors” (posição relativa dos atores sociais) and “prevent parity of participation, positioning some actors as inferior, excluded, discriminated or invisible” (“impedem a paridade de participação, posicionando alguns atores como inferiores, excluídos, discriminados ou invisíveis”) (Fraser 2007).

In this sense, some authors suggest that the meaning of justice needs to embrace simultaneously: 1) the struggle for equality – the fair distribution of the benefits of economic development and equal access to natural resources; and 2) the struggle for recognition - equal social recognition and political representation and participation of all ethnic, racial, religious, sexual, and cultural identities (Fraser 2007; Cruz 2013).

These new claims are seen as a strategic response to the advance of the economic frontier, of rural modernization and of colonization processes over traditional territories (Acselrad 2010; Acselrad & Viégas 2013; Cruz 2013). The territories represent the register of historical occupation and the possibility to maintain livelihoods, ways of life, regimes of property based on collective use, and deep knowledge of ecosystems and cultural identities (Acselrad 2010; Acselrad & Viégas 2013; Cruz 2013).

The claims are for

> *(…) the recognition by the State of another juridical order, an alternative matrix of normativity that may ensure diverse modalities of territorialization which do not fit entirely inside the capitalist property model and the individual liberal right model* (Cruz 2013, p. 163).
>
> *"(...) reconhecimento por parte do Estado de uma outra ordem jurídica, uma matriz de normatividade alternativa que possa garantir as diversas modalidades de territorialização que nao se enquadram inteiramente dentro do modelo da propriedade capitalista e do direito liberal individual"* (Cruz 2013, p. 163).

As we saw earlier in this chapter, this alternative perspective may be defended based on the Brazilian Constitution 1988, *Constituição da República Federativa do Brasil 1988*. Nevertheless, a proper regulation of its practical application is incomplete and the ideological openness and the recognition of these groups from judges and public prosecutors is still rare (Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013; Interview with Rodrigo de Medeiros Silva, RENAP/Brazil/ CE, 12/09/2013).

A specific academic field called "social cartography" is currently trying to enter dialogue with this new process and empower these new political subjects (Acselrad & Viégas 2013). "Social cartography" may be defined as:

> *(…)* the appropriation of techniques and ways of modern cartographic representation by social groups historically excluded from decision-making processes (Acselrad & Viégas 2013, p.17).
>
> *"(...) a apropriação de técnicas e modos de representação cartográficos modernos por grupos sociais historicamente excluídos dos processos de tomada de decisao"* (Acselrad & Viégas 2013, p.17).

Acselrad & Viégas (2013) have registered 284 experiences in Brazil which were labelled as "social cartography or participative mapping" between 1992 and 2012. These projects: 1) substitute a colonialist and homogenizing attitude which has historically erased the cultural and ethnic differences of the Brazilian society; and 2) inaugurate a new way of depicting space, where nature is politicized and relations of domination between interest groups are revealed.

Thus, the maps produced by "social cartography" question the national maps and the census categories produced by government agencies like the Instituto Brasileiro de Geografia e Estatística (Instituto Brasileiro de Geografia e Estatística; Brazilian Institute for Geography and Statistics) and the INCRA – because these legitimate plans and projects of territorial ordering disregard a number of socio-cultural groups. These maps, census categories, projects and plans disregard: 1) the relation (socio-economic and cultural-symbolic) of these groups to space and its natural resources; 2) the interests of these groups which are inscribed in their territories; and 3) the resulting conflicts – socio-territorial conflicts caused by unequal power relations (Acselrad & Viégas 2013).

As we saw in the last chapter, according to the interdisciplinary approach of the "governmentality of the environment", there are three main strategies of power over nature: 1) rules/policies; 2) knowledge/discourses and; 3) subjectivities (Agrawal 2006). The production of knowledge and discourses is a key strategy of power, as it legitimates rules and policies and induces people not only to accept, but also to identify with and support these rules and policies (by this means, affecting people´s subjectivities) (Agrawal 2006; Rutherford 2007). It is also in accordance with this logic that social cartography, by giving visibility and representation to traditional communities, gives them the legitimacy to protest to society in general for their recognition, and to protest to the government for their rights to ancestrally occupied territories (aiming to influence rules and policies) (Acselrad & Viégas 2013).

In order to be an instrument of empowerment, social cartography must

> *(…) ensure the participation and autonomy in the production and use of the cartography, as well as the legal recognition of the traditional knowledge given or shared during the production" of the maps* (Acselrad & Viégas 2013, p 39).

This aspect is relevant, because in the Brazilian rural territorial dispute, different agents, including private investors, use this instrument as a way of better knowing the targeted territories and implementing domination strategies. NGOs and firms may finance these kinds of projects targeting the restriction or even the appropriation of territories (Acselrad & Viégas 2013, p. 21) - instead of promoting empowerment (increased power of representation of groups of interests) (Rauch, 2009).

During the field work I have discovered that the wind firm concerned in my case study was planning to undertake a "participative mapping" in a community affected by the wind farm. Although I could not obtain any more information on this matter, one may form the hypothesis that it revealed a firm territoriality: which is here understood as a strategy to ensure power over the territory (Souza 2000; Gomes 2002).

So far we have seen how, with the evolution of capitalism, the contradiction between economic growth and environmental destruction has stimulated the appearance of new policies and regulations. We have seen new knowledge and discourses, as well as new subjectivities. Particularly since 1990, policies and regulations have promoted the so-called "green economy", legitimated by the discourse of sustainable development and supported by individuals who identify with the image of an "engaged consumer" who contributes to tackling a global "environmental crisis". In this context, the production of wind power energy, as it is a renewable source of energy, started to expand more rapidly in the world, including in Brazil from 2000 onwards (Global Wind Energy Council 2014).

This period also corresponds to a process of neoliberalization of the global economy, which means the flexibilization of markets and of environmental and labour regulations (Fairhead et al. 2012; Heynen & Robbins 2005). In this sense the so-called green economy, through large-scale projects subject to few regulations, has been contributing to cases of environmental injustice, despite claiming to be sustainable (Fairhead et al. 2012; Heynen & Robbins 2005). In the context of Brazil, this problem is even more serious, especially due to five inter-related factors: 1) the lack of agrarian reform; 2) the historical process of conservative modernization of the countryside; 3) the flow regulation of land property; 4) an economy centred on the exportation of commodities; and 5) the global increase in the demand of farmlands for producing commodities and for speculation (Delgado 2005; Delgado 2010; Fernandes 2013; Girardi 2008; Gonçalves & Cuin 2014; Oliveira 2009; Pires & Ramos 2009; Pitta & Mendonça 2014; Stédile 2005; World Bank 2011).

This context increases pressure on lands and natural resources – resources which are used by the agribusiness and by the mining sectors, or for projects that claim to be sustainable but cause local environmental impacts and expropriate land from underprivileged groups (e.g. eucalyptus monocultures and some wind farms) (Carbon Trade Watch 2012; Delgado 2010; Brown 2012; Pietrafesa & Santos 2014; Pitta & Mendonça 2014).

These lands are not empty, and these resources have been preserved and used in a non-predatory manner by traditional communities and peasants (Cruz 2013; Arnauld De Sartre & Berdoulay 2011; Pereira & Diegues 2010; Interview with the Director of the Heinrich-Böll Stiftung Brasil/RJ, 17.10.2013). Although they may be partially dependent on the market, their mode of production is usually defined as pre-capitalist, because in general: 1) The labour force and the natural resources in general are not transformed in commodities; 2) the land regime is not based on private property; 3) the natural resources and the territory are conditions for both their subsistence and their cultural identity (Pereira & Diegues 2010; Canuto 2012).

In this sense, instead of being willing to adhere to capitalist projects, these groups have alternative projects of development, property regimes and concepts of quality of life (Canuto 2012; Cruz 2013; Quadros 2014a; Souza Santos 2010). Consequently: 1) the territories of these groups have been targeted by Capital; 2) the communities have suffered pressure and even violent acts aiming to allow the advance of the frontier of big business (Núcleo de Estudos, Pesquisas e Projetos da Reforma Agrária 2012). A reflection of this framework is the fact that since 2005, the territories of traditional populations have become increasingly targeted by Capital, and have suffered more cases

of violence than the peasant movements (Canuto 2012; Gonçalves & Cuin 2014; Comissão Pastoral Da Terra 2014; Anjos 2014).

We must not forget that these two groups are related. For many traditional communities, family agriculture is one of the key livelihoods. In this sense, traditional communities are included in the National Program for Strengthening Family Agriculture (Pronaf), which offers funds for individual or collective projects that generate income for family farmers and agrarian reform settlers. The main prerequisites for receiving funds are: living in a rural area or close to one; having no more than four fiscal modules of land – according to the modules defined by the INCRA for each municipality – of which a minimum area must be used for plantation; having a monthly family income that does not exceed 1.5 times the minimum salary; using mostly family labour and belonging to the family of the manager of the property (Banco da Amazonia 2015; Secretaria de Políticas de Promoção da Igualdade Racial Agricultores Familiares 2014; Secretaria de Estado da Agricultura, Abastecimento e Desenvolvimento Rural 2012; Ministério do Desenvolvimento Agrário 2015). Besides that, some of the members of the peasant movements of landless workers are former members of traditional communities evicted from their territories (Gonçalves & Cuin 2014).

In 2011, of the 805 land conflicts, 482 involved traditional populations and of the total number of people threatened with death due to land conflicts, 72% were members of traditional communities or their supporters (Merlino & Mendonça 2012). In 2013, 61.3% of the murders related to land conflicts in the Brazilian countryside were members of traditional communities or their supporters. These communities represent 60% of the social categories involved in land conflicts in the same year (Gonçalves & Cuin 2014).

These problems are aggravated by the omission of public power in implementing the agrarian reform, the PNPCT-2007, environmental laws, and other national and international regulations that ensure the rights of rural populations (Canuto 2012; Londres 2011; Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013). When looking at those responsible for the conflicts, we may see that 81.1% were caused by private power – by farmers, land-grabbers, loggers, entrepreneurs and miners - through murder and land evictions, or by public power trough prisons and land evictions. Only 18.9% of the land conflicts were provoked by social movements through land occupations and land camps (Gonçalves & Cuin 2014).

The global and national economic and political contexts discussed thus far are furthermore increasing the ability for investors to grab lands, sometimes even receiving legitimacy and financial support like carbon credits, if the project claims to be “sustainable” – constituting the so-called “green grabbing” – the case for example of eucalyptus monocultures and

wind farms (Carbon Trade Watch 2012; Brown 2012; Pietrafesa & Santos 2014). Further problems found in the Brazilian countryside contribute to increasing the imbalance of power.

Two of the main problems are: 1) the lack of public services, infrastructure and employment; and 2) competition among local governors to attract investments and taxes. These problems allow investors to bargain high environmental damages for a few low-paid and dangerous jobs and small infra-structural enhancements (Acselrad et al. 2009; Bullard 2014).

As a consequence, peasants and indigenous and traditional communities - who have been historically expropriated from their lands and territories and made invisible by official statistics and official cartography (Cruz 2013; Acselrad & Viégas 2013; Toledo 2001), whose rights are hardly recognized by the judiciary power, as we have seen here before - become much more susceptible to bearing the costs of both the economy of growth (e.g. agribusiness and mining) and the economy of protection (e.g. wind farms, hydropower) in the Brazilian countryside. But these groups also have a history of struggle, along with the peasant movement, as we have seen, and both are creating new development pathways for the Brazilian countryside. Next I will briefly present the main principles and strategies of these alternative pathways.

4.11. ALTERNATIVES TO THE AGRIBUSINESS MODEL

For the MST, ´s leader, the traditional struggle, based only on occupations that aim towards land distribution, is not enough to face current challenges (Quadros 2014a). Their main goal nowadays is the contribution to the discussion and formulation of an alternative society´s project for Brazil - which depends on the alteration of the correlation of the forces of society. In this sense he presents four main strategies:

1) Education in the countryside. According to Stédile (Quadros 2014a), “knowledge” is a strategy even more important than land. One of the MST, ´s main achievements is the fact that nowadays, as a result of the pressure of social movements, there are 2000 schools in the rural settlements and 3800 students in university courses for people who work for the Agrarian Reform and for the development of the rural settlements – as part of the public program PRONERA (National Education Program for the Agrarian Reform) implemented in 1998, initially for the promotion of literacy among both young people and adults (Quadros 2014a; Instituto Nacional de Colonização e Reforma Agrária 2014).

2) Implementing the changes that they expect for the Brazilian countryside, mainly based on Agroecology projects aiming to ensure the country´s food security. Therefore the key targets are: a) the production of food for the national market; b) the avoidance of poisonous products that contaminate the soils, waters and air, and endanger health through the contamination of workers and food; c) a basis on cooperatives that enable small farmers to industrially process their agricultural products and to have access to the consumer market (Quadros 2014a).

3) Strengthening alternative family farming based on Agroecology and small-scale agro-industry (Quadros 2014a). Here it is important to underline that in the 1990s, rural social movements and researchers started to criticize the concept of family farming, as it started to become employed for neoliberal public policies and defended by those sections of academic research taking neoliberal approaches (Fernandes 2013). This tendency aims at inserting family farming into the Brazilian agribusiness model, and therefore implies that peasants are subordinated to big business – Capital's technological packages, systems of production and distribution, and prices (Fernandes 2013).

4) Alliances between the urban working class and young people, in order to incite debate on an alternative project for the country. It is about constructing a substitute model for the current societal model where the forces that dictate to society are national and international capital, especially the financing sector, which is supported by the communications sector and the state, both of which are highly malleable by the private interests of powerful groups (Quadros 2014a).

The criticism of the excessive power over the national economy exerted by the national and international finance sector, in alliance with the national media and supported by the public apparatus – e.g. National Bank for Economic and Social Development, Banco Nacional de Desenvolvimento Econômico e Social (BNDES), through financing for the agribusiness to the detriment of small peasants; the IBAMA through omission regarding the abuse of environmental laws committed by big business; INCRA through flow land regulation favouring land speculation – is shared by some authors concerned with agrarian reform (Oliveira 2010; Fernandes 2013; Girardi 2008; Pitta & Mendonça 2014; Delgado 2005; Delgado 2010; Movimento dos Trabalhadores Rurais Sem-Terra 2014; Quadros 2014a; Girardi 2008).

It is in this sense that social movements have been struggling to oppose the discourse presented by the mainstream media and by the government, that Brazil is the "world barn" (Anjos 2014). The mainstream media has been diffusing a positive image of the agribusiness as being very productive and essential for the production of food, as well as of large-scale energy projects as being an inevitable aspect of development,

corresponding to the image of Brazil as a world barn and a country using sustainable energy resources (Garcia 2013; Tentardini 2011; Calixto 2013). The real environmental, economic and cultural effects of these projects are not discussed, nor are alternative pathways evidenced (Anjos 2014).

Thus social movements have been trying to attract attention to the risk posed to society´s health by the use of poison in the agribusiness, and trying to show that alternative paths of economic production, socio-cultural relations and nature appropriation are possible and are already being locally implemented (Anjos 2014; Movimento dos Trabalhadores Rurais Sem-Terra 2014; Movimento dos Trabalhadores Rurais Sem-Terra 2014; Ministério do Desenvolvimento Agrário 2014; Rede Brasileira de Justiça Ambiental 2014; Articulação Nacional de Agroecologia 2014).

The agribusiness is not producing food for the country, but mainly crops for exportation, which reduces the level of production of basic food, such as beans, for Brazilians (Anjos 2014; Silva & Mendonça 2012; Girardi 2008). Besides other problems caused by the economic model centred on the agribusiness sector oriented to the external market, as mentioned before in this chapter, here are some of the main negative consequences of the agribusiness model in Brazil:

1) Threats to the environment. This occurs mainly through: a) the overexploitation of natural resources – the agribusiness is responsible for 70% of Brazilian water consumption and is the economic sector which consumes the most energy per generated income and per worker (Agência Nacional De Águas 2014; Montoya et al. 2013); b) deforestation for cattle production and monocultures (Fernandes 2013); c) biodiversity reduction, due to monocultures and the increasing reproduction of insects and diseases (Santos 2015; Quadros 2014b); d) the poisoning of soils and water with agrochemicals (Fernandes 2013; Santos 2015; Quadros 2014b); and e) long-distance transport and conservation of products which consume energy and increase polluting gas emissions (La Via Campesina 2014).

2) Threats to food security. The World Food Summit of 1996 defined food security as existing “when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life”. The concept includes “both physical and economic access to food that meets people's dietary needs as well as their food preferences” (World Health Organization 2014). The agribusiness reduces the area of plantation of food in Brazil and produces food contaminated by agrochemicals, which are dangerous for people’s health (Londres 2011; Quadros 2014a).

3) Increases in land demand and land speculation – this concentrates land and increases land conflicts, land expropriation and violence against peasants and traditional communities in the countryside (Comissão Pastoral da Terra 2014; Delgado 2010; Pitta & Mendonça 2014).

4) The intensification of labour exploitation, which worsens rural labour conditions and maintains slave labour as part of its strategy of production (Delgado 2010; Movimento dos Trabalhadores Rurais Sem-Terra 2014). One example is the fact that in the period of January to September 2014, more than 300 rural establishments using slave labour were detected by the Federal Police, with the labourers being freed (Silva 2014). Nevertheless, from the Brazilian Constitution 1988, *Constituição da República Federativa do Brasil 1988,* that established the social function of the land, until September 2014, no farms were expropriated for using slave labour (Silva 2014; Quintans 2008).

5) The reduction of the absorption of rural manpower, increasing migration to the cities where migrants will be part of the "industrial reserve army" and increase the population living in slums ("favelas") (Londres 2011; Silva & Mendonça 2012; Stédile 2005; Simonetti 2007)

Instead, small peasant agriculture produces more food, with more diversity, using less poisoning agrochemicals and employing more manpower (Ministério do Desenvolvimento Agrário 2014; Santos 2015; Silva & Mendonça 2012; Movimento dos Trabalhadores Rurais Sem-Terra 2014). In 2011, in response to the pressure of social movements and social civic organizations, the UN decreed 2014 to be the first International Year of Family Farming, IYFF (Ano Internacional da Agricultura Familiar), to be organized by the Food and Agriculture Organization of the United Nations (Ministério Do Desenvolvimento Agrário 2014). The UN recognized the key role for this sector to ensure food security. The world contains about 3 billion family farmers, peasants and indigenous people, who produce 70% of the world's food (Ministério do Desenvolvimento Agrário 2014).

In 2013, during the 33 Food and Agriculture Organization of the United Nations Regional Conference for Latin America and the Caribbean, the director of the Inter-American Institute for Cooperation on Agriculture (IICA) declared that

> *(…) family farming is the economic activity with the greatest potential to increase the supply of food in the region, reduce unemployment and remove from poverty and malnutrition the most vulnerable people in rural area.* (Food and Agriculture Organization of the United Nations 2013).
>
> *"(...) a agricultura familiar é a atividade econômica com o maior potencial para aumentar a oferta de alimentos da região, reduzir o desemprego e retirar da situação de pobreza e de desnutrição a população mais vulnerável das zonas rurais"* (Food and Agriculture Organization of the United Nations 2013).

In Brazil, although family farmers and indigenous and peasant agriculture occupy only 24.3% of the cultivated area and receive only 14% of the rural credits, they represent 84.4% of the rural properties, they produce 70% of the food consumed by the Brazilian people, and employ 74.4% of the persons employed in agricultural establishments (Ministério do Desenvolvimento Agrário 2014; Movimento dos Trabalhadores Rurais Sem-Terra 2014; Glass 2011; Silva & Mendonça 2012;).

Meanwhile, 1% of the landowners control 46% of the lands in Brazil (Glass 2011). As we can see, the agribusiness: 1) owns more land (76%) (Glass 2011; Central Única de Trabalhadores 2014); 2) Receives More Credits From The government; and 3) gains more support from the mainstream media in building a positive public image, based on the belief in their necessity for the country´s economy and for food security (Anjos 2014). Nevertheless they: 1) produce less food; 2) employ less people; and 3) cause more environmental damage (Glass 2011; Delgado 2010; Londres 2011).

The use of technological packages has led to a decrease in the profits of agribusiness (Londres 2011). For this reason, the profitability of the agribusiness sector depends nowadays greatly on: 1) public financing; 2) economies of scale, which means large properties and monocultures; and 3) the transference of externalities, such as for example, the costs of environmental damages and health treatments which are not met by the sector (Londres 2011).

These technological packages include chemical fertilizers, hybrid and genetically modified seeds and pesticides offered by the chemical industries (Santos 2015). Brazil is the world´s largest importer of pesticides and its legislation still allows the import of 10 types of poisons which are prohibited in Europe and the United States (Santos 2015; Quadros 2014b). In Brazil in 2013 the population´s average exposure to Agrotoxics was 5 litres per person per year.

In Mato Grosso, the leading Brazilian state producer of grains (Instituto Brasileiro de Geografia e Estatística 2013), this exposure has reached 136 litres, according to a group of researchers from the Federal University of Mato Grosso (UFMT) (Quadros 2014b; Santos 2015). The agrotoxics´ exposure may occur through direct contact during work, through the environment (e.g. rivers and rain) or through alimentation (Santos 2015). Agrotoxics, either directly or through loss occurred during pulverization, contaminate food, soils, rivers and groundwater, so that through precipitation the agrotoxics return to the surface in the form of rain (Quadros 2014b; Santos 2015).

Health researchers link exposure to agrotoxics to the intoxication and contamination of breast milk, cancer, damage to the reproductive and endocrinal systems, and genetic problems among new-born babies (Quadros 2014b; Santos 2015). The problem is mainly

related to the agribusiness model, and to the omission of public power in implementing the Brazilian Law 7802/89, which defines the legislation for pesticides in Brazil. Monocultures reduce biodiversity, increasing the occurrence or insects and diseases in plantations that demand the use of high levels of poisons. Also, transgenic seeds have shown resistance to pesticides and therefore have been responsible for an increase in the use of Agrotoxics (Santos 2015).

Regarding the loose enforcement of law, this problem is related to the fact that roughly 22% of the Brazilian Senate and roughly 37% of the Federal Chamber of Deputies are part of the so-called "ruralist caucus" (Bancada Ruralista) (Brasil de Fato 2014). This is an interest group within the Brazilian Congress that lobbies in favour of the interests of the agribusiness sector. Their members may be agribusiness entrepreneurs themselves, or be politically financed by the agribusiness sector, or have an ideological affinity with members of the sector. They belong to many different political parties, but are committed to vote according to the group´s positions when the voting issue affects their interests. The group bargains for control over important parliamentary commissions and undertakes political pressure on the executive and judiciary (Brasil de Fato 2014; Vigna 2001).

There were two important moments that helped to build a political resistance to the Bancada Ruralista, occurring in 2012 (Embrapa 2012a; Câmara 2012a). Firstly, the National Parliament Commission was launched on the 8th of August 2012 in the Chamber of Deputies, the parliamentary front for the Development of Organic Production and Agroecology. The aim was to:

> *(…) stimulate a debate among parliamentarians, social movements and the executive branch in favour of healthy alimentation and free of agrochemicals.* (Antunes 2012)

Also, the goal was stimulate discussion on:

> *(…) food and nutrition security, social participation and empowerment, respect for traditional knowledge, sustainable use of natural resources and the socialization of agroecological knowledge* (Cruvinel 2012).

On the 20th of August 2012, the National Policy for Agroecology and Organic Production – PNAPO, *Decreto N. 7794/ 2012*, was implemented – with the main goal to contribute to the:

> *(…) sustainable development and quality of life of the population, through sustainable use of natural resources and the supply and consumption of healthy foods.*

According to the National Policy for Agroecology and Organic Production or "Política Nacional de Agroecologia e Produção Orgânica/PNAPO*", Decreto N. 7794/ 2012,* agroecological production is:

> *one that seeks to optimize the integration of productive capacity, use and conservation of biodiversity and other natural resources, ecological balance, economic efficiency and social justice.*

The RBJA and the National Agroecology´s Articulation (Articulação Nacional de Agroecologia) propose a new model for the development of the Brazilian countryside, based on family farming and Agroecology, as we can see in this quotation from a study published by both organizations:

> *Agroecological farming systems, in contrast (with the agribusiness), are adapted to the reality of family farming and strengthen the proposal of another model of development for the countryside, which foresees the distribution of lands and decentralized production, and may employ a lot of manpower, boost economies and supply local markets with healthy foods. It is in defence of this type of agriculture that we fight: an agriculture that respects workers and rural populations, consumers, our children, the planet* (Londres 2011, p.24).
>
> *"Os sistemas agroecológicos, ao contrário, são adaptados à realidade da agricultura familiar e reforçam a proposta de um outro modelo de desenvolvimento para o campo, que prevê a repartição das terras e a produção descentralizada, que possa empregar muita mão de obra, dinamizar economias e abastecer mercados locais com alimentos saudáveis. É em defesa deste tipo de agricultura que lutamos: uma agricultura que respeite o trabalhador e as populações rurais, os consumidores, as nossas crianças, o planeta"* (Londres 2011, p.24).

These organizations support an agrarian reform with land distribution, tied to agricultural research oriented towards family farming, technical assistance, crop assurance programs, support for marketing and credit, which are the main envisaged solutions to ensure efficient, low cost production of healthy food, with low environmental impact (Londres 2011, p.174).

Two governmental programs have already represented advances in this sense (Londres 2011). The Program for Food Acquisition (Programa de Aquisição de Alimentos, PAA), established in 2003, "*promotes access to food for people experiencing food insecurity and promotes social and economic inclusion in the field through the strengthening of family farming*" (Ministério do Desenvolvimento Social e Combate à Fome 2014).

The National Program for School Meals (Programa Nacional de Alimentação Escolar, PNAE) ensures the provision of school meals and nutritional education campaigns in public and philanthropic schools and community organizations (Fundo Nacional de Desenvolvimento da Educação, 2014). Since 2009, 30% of the program´s budget has been invested in the direct purchase of family farming products (Fundo Nacional de Desenvolvimento da Educação, 2014). Thus, both programs strengthen family farming units, collective production experiences, and the storage, processing and sale of organic and agroecological products. But these are still limited in their amplitude and in the volume of available resources (Londres 2011).

Civic society has created an articulation called the National Agroecology Articulation (ANA) in order to (Articulação Nacional de Agroecologia, 2014):

1) Exchange knowledge and experiences of Agroecological projects around the country;

2) Build resistance to the advance of the agribusiness and the large-scale infrastructural projects and mining projects in the territories of the peasantry and the traditional communities, and to the violence used in this process;

3) Ensure the implementation of public policies which consider, respect and preserve the diversity of biomes and of the ethnic cultural groups (including their livelihood, their culture and their traditional knowledge) in the Brazilian territory;

4) Struggle for appropriate education and professionalization projects for rural youth;

5) Ensure the democratic access to, and management of, natural resources;

6) Ensure equal rights of gender;

7) Build new agrofood systems based on efficiency and social justice for the production of healthy food and for providing food security;

8) Contribute to the construction of a fairer and more democratic society.

Their third meeting, occurring in 2014, gathered more than 2100 people including peasants, traditional communities, social movements, researchers and students among others, from the countryside and from the city, who are building new experiences of land use, of management of natural resources and of agricultural production and distribution (Articulação Nacional de Agroecologia, 2014). Therefore, I choose to conclude this discussion with the following quotation:

> *Many of these ´new´ characters, now protagonists, were seen as social forces that belonged to the past and that inevitably would be incorporated or simply disappear into the capitalist modernization process that the region has experienced over the last fifty years. Contrary to this diagnosis, peasants and people from indigenous and African-descended backgrounds, far from being anachronistic characters, become protagonists of the invention and construction of different possible futures* (Cruz 2013, p. 122).
>
> *"Muitos desses ´novos´ personagens agora protagonistas, eram tidos como forças sociais que pertenciam ao passado e que inevitavelmente, seriam incorporados ou, simplesmente, desapareceriam no processo de modernização capitalista que a regiao tem vivenciado nos últimos cinquenta anos. Contrariando esse diagnóstico, camponeses, indígenas, afrodescendentes, longe de serem personagens anacrônicos, tornam-se protagonistas da invenção e da construção de outros possíveis futuros"* (Cruz 2013, p. 122).

With this quotation I end my brief analysis of the Brazilian agrarian issue and its possible relationship to the cases of environmental injustice regarding wind farm projects on the northeast coast of Brazil, and offer some partial conclusions.

4.12. PARTIAL CONCLUSIONS

In this chapter we have seen how throughout the history of Brazil no government has implemented agrarian reform, which is critically seen as a means of maintaining the structures of economic and political power. Social movements and researchers have been calling attention to the fact that the land is essential to human existence and its regulation should therefore differ from other resources available for private appropriation (Cruz 2013). Land speculation and land concentration are threats to food security, social justice and environmental preservation. Thus, the fulfilment of the social function of the land should be a condition for the use, possession and ownership of land.

We have also seen that land means more than livelihood, it means territory: a space that ensures different ways of life, linked to cultural values and to ancestral knowledge, relevant for the preservation of biodiversity, for the preservation of ethnic cultural diversity, for ensuring food security and social justice - under alternative systems of land property, of labour relations and of agricultural production and distribution. Territories are also spaces defined by power relations, if we recall the geographical definition of the concept (Souza 2000; Gomes 2002).

In the Brazilian countryside, multiple territories overlap, reflecting different interests, different production models and even the different projects of society, of groups with different kinds of economic and political power. The overlapping territories of the Brazilian countryside represent thus a very unequal struggle. Based on the governmentality approach of power relations (discussed in the last chapter), this discrepancy of power may be analysed through the unequal capacity of each group to influence the production of laws or policies, of knowledge or discourses and of subjective positions - which justify individual practices in accordance with or in resistance to rules, polices and official discourses and official knowledge.

As we have seen, the capitalist system, under the neoliberal regime, has been increasing its capacity to overexploit nature and human labour while concentrating wealth, land, natural resources and decision power - which allows big business to transfer the negative social and environmental consequences of this model to underprivileged groups. This economic model contains an inherent contradiction: the pursuit of economic growth (by

overexploiting natural resources and human labour) and the environmental and social consequences of this economic growth.

These two dimensions of Capitalism may be seen in two types of economy: the economy of growth and the economy of protection. Apparently laws, policies, discourses, and a new subject should ensure the compensation of the economy of growth based on the economy of protection, as we have seen in the last chapter. The economy of protection is based on the concept of sustainable development and includes, among other factors: environmental global agreements, public support for the green industry and for renewable sources of energy, the discourse of climate change as a global challenge and an apolitical system of environmental education which diffuses the values of an engaged global citizen who adopts sustainable measures of consumption.

As we saw in the last chapter, these measures do not address the unequal contribution to and the unequal distribution of the environmental damages among countries and social groups, nor does it question current patterns of production and consumption, which are based on the degradation of nature and of human labour.

What researchers have been calling attention to, is that both the economy of growth and the economy of protection have been using similar strategies around the world, of profit generation and accumulation – mainly regarding patterns of production and consumption; models of land and nature appropriation, use and valuing; ways of regulating markets and labour; and forms of discourse and knowledge manipulation.

The main common strategies are:

1) Large-scale projects and monocultures;

2) The enclosure of areas of common use, privatization of natural reserves, financing of nature, expropriation of land from peasants and from traditional communities, and nature degradation;

3) The deregulation of markets, fusion of productive and the speculative capital, support of public credits and policies in favour of big business, political lobbying to ensure the further flexibilization of labour and environmental laws, and the containment of social and political resistance;

4) The diffusion of official knowledge and discourses that place the solution to the environmental issue in the hands of the market, technological enhancement and consumers; and the invisibilization of traditional and other alternative kinds of knowledge, cultures and cosmovisions within public policies, official statistics, official maps, legitimated scientific reports and the mainstream media.

Under this global context, the insertion of Brazil into the International Labour Division as an exporter of primary products reinforces the dynamics of the overexploitation of land, nature and labour, as well as land speculation. The agribusiness sector and large-scale mining projects, as well as large-scale energy projects, necessary to supply the demand of these two energy-intensive sectors, have caused several cases of environmental justice around the country.

There is an imbalance in the distribution of the benefits and burdens of these projects, showing unequal levels of power between groups at the expense of economically and socio-culturally marginalized groups. As we have seen here, and will see in the case-study as well, large investors are better considered by policies, are more influential on the creation of laws and their application, have more influence on the mainstream media and have their interests better represented in official scientific reports, maps, statistics and official environmental education programs. This framework applies to the so-called economy of protection as well – including the wind energy sector in Brazil, as some researchers, social movements, traditional communities and parts of the media have been reporting.

The groups mainly affected by the economic model based on the exportation of commodities in Brazil, are traditional communities who have been living from natural resources while preserving the different natural biomes of the country, which are being increasingly targeted by big business seeking raw material, mainly for the mining, agribusiness and energy sectors.

In the case of wind farms, most of the cases of environmental conflicts involve traditional communities on the northeast coast of Brazil. These groups have been resisting the cases of environmental injustice, joining a wide social struggle of peasant and traditional communities around the country. They struggle for a distributive system of land reform, for the recognition of collective forms of land use and ownership and of different identities and ways of life, for alternative forms of production, and for equal terms of political participation and representation by public policies.

Let us now analyse the specific regulative framework affecting wind power polices in the global scale and analyse to which degree it contributes to the promotion of environmental justice and of democratic sustainable development in general and in Brazil.

5. WIND ENERGY AND THE GLOBAL AGENDA

5.1. INTRODUCTION

As we have already seen, the development of Capitalism, based on fossil resources under a neoliberal regulation of the economy and the environment, has led to scarcities and price increases in these resources, as well as to the process of global warming and climate change (in interaction with high patterns of production and consumption increased by technological advance, including more recently the industrialization of developing countries) (Heynen & Robbins 2005; Weiss 2010; Watts & Peet 2006a). The so-called economy of growth has developed an economy of protection responsible for protecting the environment, mainly based on the market free initiative, on technologies to reduce the use and waste of resources for example, and on the role of consumers in demanding ecologically correct products (Fairhead et al. 2012; Rutherford 2007).

This economic logic is based on the concept of sustainable development that may be used to justify the monopolization of the control over natural resources, including the privatization and financing of nature, as well as land speculation and expropriation in developing countries abundant in land and in biodiversity (Fairhead et al. 2012; Watts & Peet 2006a). In this sense, the concept involves the necessary social and environmental costs of an even more necessary economic growth, which benefits privileged groups, being transferred to underprivileged groups (Fairhead et al. 2012; Watts & Peet 2006a). It is traduced by large-scale renewable energy projects, global instruments supporting projects of carbon sequestration and a loosely regulated financial speculation market which does not correspond to concrete effects on nature or on the climate change contention (Brown 2011; Brown 2012; Carbon Trade Watch 2012; Pietrafesa & Santos 2014).

It is in this context that wind energy has appeared as an alternative energy source that should contribute to the reduction of CO2 emission and to sustainable development worldwide (Dutra 2007; Weiss 2010). In Brazil the sector emerges in the same context, with strong support from the government, and aims to increase the energy supply in order to ensure economic growth while complying with the global environmental agenda (Dutra 2007). Although a recent development, this sector is growing very rapidly and exerts a growing influence on the territorial organization of some regions of Brazil (Meireles 2011; Portal do Mar 2012).

Despite the fact that my position in this research is for wind energy, as a key alternative resource to fossil and nuclear power due to their social and environmental risks, I see the importance of creating a regulative framework for this sector, so that it may indeed contribute to a sustainable development as understood here in this research. That is, a sustainable development conducted alongside the conservation of local ecosystems, the reduction of social inequalities and the democratic political participation of affected groups in decision processes (Loureiro 2012; Rauch, 2009).

Instances of environmental justice regarding wind farms have been reported by social movements, environmental NGOs, researchers and sections of the media (Brown 2011; Comissão Pastoral da Terra 2014; Francisco 2012; Portal do Mar 2012; Meireles 2011; Pachioni 2013). This research considers that cases of environmental injustice reveal unequal power relations and pay special attention to the spatial dimension of these relations through the concept of territory. Thus I try to analyse how and why this inequality arises - considering the links between different scales and different formal and informal regulative frameworks where groups of power adopt their strategies to ensure their territories (its limits, access, practices and the use of its natural resources).

We have seen how historically in Brazil, an elite has been influencing the creation and application of laws and public policies which favour a certain model of territorial occupation of the Brazilian countryside, based on the non-implementation of agrarian reform and for the benefit of the large businesses that invest in monocultures for exportation and in land speculation – based on public credits and loose land regulation (Delgado 2010; Fernandes 2013; Girardi 2008; Gonçalves & Cuin 2014; Oliveira 2009; Pitta & Mendonça 2014). This model makes peasants and traditional communities susceptible to losing the lands and territories that represent their rights to full citizenship, reduce social inequalities and recognise and preserve ethnic and cultural diversity (Gonçalves & Cuin 2014).

This is the context in which the wind power sector is being implemented in Brazil. Let us now analyse how the specific regulative framework, regarding wind power on global and national scales, interacts with this context, contributing or not to sustainable development as we understand it in this research, and to environmental justice.

5.2. ENERGY-RELATED GLOBAL REGULATIONS AND DISCOURSES

In order to understand the expansion of wind farms and of policies that support this sector, we have to consider the role played by energy in general in the global political agenda, and the role played by renewable energy sources in this agenda – which is the context where

wind energy policies emerge. Currently, energy consumption grows by approximately 2% per year, 80% of which is tied to fossil fuels (Global Energy Assessment 2012). An increase in renewables as a share of global primary energy is expected: from 30% as at 2012 to 75% in 2050 (Global Energy Assessment 2012).

Energy is at the centre of global debates on three main issues: 1) economic growth; 2) human development; and 3) environmental sustainability and climate change. With each of these themes, the concerns, goals and strategies vary according to the context and the economic and political ideologies of those taking part in the debates. I will present some data and facts about regulative frameworks, as well as discourses from influential organizations, which are producing knowledge and influencing people´s subjective positions towards these three inter-related issues, economic growth, sustainability and human development, and the role played by energy in these relations.

"*Energy is the "oxygen" of the economy and the life-blood of growth…*" (World Economic Forum 2012, p.2). These are the words of a member of the World Economic Forum (WEF), the Chief Executive Officer of Royal Dutch Shell (Netherlands), the Energy Community Leader of the World Economic Forum in 2011. These words open a report published by the WEF, for their Energy Industry Partnership Program. This program aims to gather Chief Executive Officers and senior executives of the world's leading companies and select energy ministers to "define and address critical issues facing the industry" (World Economic Forum 2012, p.2).

The Program affirms its compromise with the "promotion of sustainable social development based on economic progress" (World Economic Forum 2012). Their report of 2012 supports sustainability, while defending the role of a deregulated market, of technological enhancement and of the traditional fossil industry along with the renewable ones, in achieving it. This view may be interpreted as being aligned with the discourse of ecological modernization as discussed here in Chapter 2. Indeed, energy is a key factor for economic growth, as "it fuels productive activities, including agriculture, commerce, manufacture, industry, and mining" (United Nations Development Program 2000).

Furthermore, energy is not only crucial for industrial development and economic growth, but also central to the environmental debate. In 1992, at the occasion of the United Nations Conference on the Environment and Development in Rio de Janeiro, the importance of energy as a tool for achieving sustainable development was acknowledged. During this conference, "*more than 175 governments committed to Agenda 21, the programme for achieving human-centred sustainable development"* (United Nations 1997)*,*

based on the idea of meeting present needs without compromising the right of future generations to meet their needs as well (United Nations 1997).

Agenda 21 affirmed, in 1992, that energy systems were not meeting the needs of the majority of the population and that the continuity of "business as usual" could compromise the environment and the future of coming generations. In the same year, the United Nations Framework Convention on Climate Change Energy addressed the link between fossil fuel energy and global warming through greenhouse gas emissions. Energy was again identified as the central issue of achieving sustainable development, at a United Nations General Assembly Special Session in 1997 (United Nations Development Program 2000).

In 1998 the United Nations Development Program (UNDP), the United Nations Department of Economic and Social Affairs (UNDESA) and the World Energy Council (WEC) initiated the World Energy Assessment (WEA), "*a report that should give input for the UN Rio Plus Ten meeting in 2002*", with an: "*analysis of the social, economic, environmental, and security issues linked to energy supply and use*" (United Nations Development Program 2000, p. i). The World Energy Assessment understands sustainable energy *"not simply as a continuing supply of energy, but as the production and use of energy resources in ways that promote—or at least are compatible with—long-term human well-being and ecological balance"* (United Nations Development Program 2000, p.3).

The third key issue related to energy is human development. According to the WEA's vision, although access to safe and efficient energy services does not in itself drive economic and human development, the lack of this access can be a severe constraint on development. Energy services are essential for adequate food, shelter (including lighting and the maintenance of comfortable temperatures), clothing, water, sanitation, medical care (e.g. refrigerated vaccines, emergency and intensive care), schooling, access to information (e.g. radio, television, electronic mail, the World Wide Web) and transport. Lack of energy is considered to be one dimension of poverty. The energy dimension of poverty is called energy poverty and refers to: "*the absence of sufficient choice in accessing adequate, affordable, reliable, high-quality, safe, and environmentally benign energy services to support economic and human development"* (United Nations Development Program 2000, p.44).

Besides these three main dimensions of the debate about energy, energy is also a security issue. The energy demands of countries usually exceed those countries' capacities for internal production, so that disputes over access to energy resources and the issue of control over routes of energy distribution have been the main reasons for a number of

political tensions and conflicts. Therefore, energy has been at the centre of foreign policies and has historically influenced the definition of the political borders of the world map (United Nations Development Program 2000). NATO (North Atlantic Treaty Organization) conducted a report on energy security in 2014 discussing the global challenges for energy security.

The main challenges mentioned by NATO are: 1) Dependence on oil and gas imports in Europe; 2) rising energy demand in growing economies like China and India; 3) "*political instability in many energy-producing and transit states*"; 4) "*territorial disputes involving the quest for energy and other resources*"; 5) "*terrorist attacks against refineries, pipelines and power plants; piracy along critical maritime choke points*"; 6) "*cyber attacks against smart power grids and control systems*"; and 7) the logistical and financial burden of energy supply for military operations (North Atlantic Treaty Organization 2014). The Global Energy Assessment described energy security as: "increased diversity and resilience of energy supply and reduced global interdependence via reduced import/export balances" (Global Energy Assessment 2012, p. 6).

Economic growth, environmental protection, social development and security are all interrelated dimensions of the energy issue, as we will briefly examine in this chapter. In 2005, the IPCC (Inter-Governmental Panel for Climate Change) observed the need of "a comprehensive science-based assessment of the global energy system" (Global Energy Assessment 2012). In order to attend to this demand, in 2006, the International Institute for Applied Systems Analysis, in cooperation with academia, business and intergovernmental organizations among others, founded the Global Energy Assessment (GEA), sponsored by the World Bank, the UN Development Program, the UN Environmental Program and the World Energy Council, among other international and national organizations.

The Global Energy Assessment (GEA) realises that energy is central to addressing the major challenges of the 21st century which are described as: 1) climate change; 2) social and economic development; 3) human well-being; 4) sustainable development; and 5) global security. Coinciding with the Year of "Sustainable Energy For All", as declared by the UN General Assembly, the Global Energy Assessment Report of 2012 was titled "Towards a Sustainable Future". It looks at the main challenges for ensuring "affordable, safe, secure and environmentally sound energy systems" for all (Global Energy Assessment 2012, p. xv).

Let us now briefly analyse the first challenge and later on discuss the others. The first challenge established by the Global Energy Assessment is the providing of affordable energy services for the well-being of the entire human population (7 billion people in 2012),

projected to be 9 billion people by 2050. Here, in order to avoid a simplistic discourse based on demographic explanations for the need to increase energy supply, we have to consider that, besides population growth, the world's energy growth is nowadays mainly driven by: 1) economic growth in developing countries; and 2) high levels of consumption in the developed countries (Cohen 2002; Global Energy Assessment 2012).

The economic growth of developing countries requires increasing amounts of energy, mainly as a result of their specialization in energy-intensive economic sectors producing mainly for exportation, reflecting the International Labour Division. Developed countries have exported to developing countries major industrial sectors which are highly pollutant and resource-intensive, while keeping the cutting-edge industry in their own territories and centring their economies on the services sector (United Nations Development Program 2000; Cohen 2002). Also, developed countries possess more efficient energy systems that reduce energy consumption in industry, urban transport systems and buildings for example (United Nations Development Program 2000).

Thus, developing countries increased their share of global commercially-distributed energy use from 13% in 1970 to almost 30% in 1998 (United Nations Development Program 2000). Nevertheless, this:*"has not resulted in more equitable access to energy services between developed and developing countries"* (United Nations Development Program 2000, p. 33). If we look at per capita consumption of primary energy, in the United States (330 gigajoules) it was eight times higher in 1995 than the consumption of an average Sub-Saharan African (40 gigajoules). In Africa and Asia, per capita energy use in that year still made up less than 10 percent of per capita use in North America (United Nations Development Program 2000).

Despite technological advances regarding energy efficiency, patterns of energy consumption in developed countries, and also of privileged groups in developing countries, are based on unsustainable lifestyles (Cohen 2002; United Nations Development Program 2000). For example, between 1983 and 1998, the per capita residential energy consumption of the USA increased mainly due to: 1) an increase in the physical size of the average dwelling; 2) an increase in the use of electrical products (e.g. computers, videocassette recorders, microwave ovens and telecommunications equipment); and 3) an increase in the use of individual transport (including the increased consumption of sport utility cars that consume lots of energy) (United Nations Development Program 2000).

It is also important to point out that 80% of the energy consumption growth in the world originates from fossil fuels (Global Energy Assessment 2012). In this sense, although developed countries may have less energy-intensive economies, due to energy efficiency

in their productive sectors for example, energy use, depending on the sources of energy used, may have a more negative impact on the environment through the emission of polluting gases (Cohen 2002).

Finally, we have to consider that in developing countries there is a huge gap between the consumption of energy among social classes (Cohen 2002). Usually most people do not have access to or cannot afford a pattern of energy consumption that is enough to satisfy their basic needs of alimentation, health, habitation and education. In 2012, there were still 1.4 billion people in the world without access to electricity and 3 billion people who cooked with solid fuels on open fires or simple stoves, which is extremely damaging to health, especially the health of women and children (Global Energy Assessment 2012). Annually, there are roughly 3.8 million premature deaths attributed to exposure to household air pollution, related to non-communicable diseases including strokes, ischaemic heart disease, chronic obstructive pulmonary disease and lung cancer (World Health Organization 2012). On the other hand, in developing countries an elite minority maintains patterns of consumption of products and services comparable to those in developed countries (Global Energy Assessment 2012).

Here critical researchers concerned with the links between energy and sustainability have been posing some key questions like: To which uses is energy being put? To which demands is it attending? Who is using it? And especially, who is deciding on these issues? (Cohen 2002; Cornerhaus, 2012; Rede Brasileira de Justiça Ambiental 2014).

In Brazil for example, the industrial sector consumes about 32% of the energy and 50% of the electricity, of which 30% is restricted to six sectors: cement, steel, aluminium, ferro-alloys, petrochemicals, and paper and cellulose (Instituto Sócio-Ambiental 2015). Besides being intensive in energy consumption, these sectors generate products with low added value, which sell for low prices on the international market and generate few jobs (Instituto Sócio-Ambiental 2015). As we have seen, this is part of the Brazilian model of the exportation of commodities, which includes agribusiness as a key sector, another energy-intensive sector (Montoya et al. 2013).

The Africa Energy Outlook, published by the International Energy Agency (IEA) in 2014, has observed an increase in investment in the Sub-Saharan energy supply. Nevertheless, two-thirds of the total investments since 2000 have been used for developing resources for export. More than 620 million people in the region (two-thirds of the population) live without electricity, and nearly 730 million people rely on dangerous, inefficient forms of cooking. On the other hand, *“this region stands on the front line when it comes to the impacts of*

climate change, even though it continues to make only a small contribution to global energy-related carbon dioxide emissions" (International Energy Agency 2014, p.1).

The data concerning inequalities and the questions presented above reveal that at the centre of the challenges of economic growth, climate change, social development and energy sustainability is a need to address the distribution of: 1) wealth, resources, and conditions of well-being (and also the equal recognition of cultural identities, as we saw in Chapter 3); 2) the responsibilities for the over-exploitation of nature; and 3) power to influence political decisions. As we have already seen in chapter 2, there is an attempt to displace the environmental problem and the debate upon sustainability, from the socio-political arena to the economic-technical one, based on a trust in the capacity of the market and of technical and technological improvement to solve problems (Rutherford 2007; Hildyard *et al.*, 2012). Both strategies have failed to address the problem of socio-economic inequality and of environmental degradation in the world (Fairhead et al. 2012; Heynen & Robbins 2005; Weiss 2010; Watts & Peet 2006; Oxfam 2014; Cohen 2002).

The international non-governmental organization Oxfam has worked since 1995 with partners around the world to "help create lasting solutions to the injustice of poverty" (Oxfam 2015). In 2014 it published a report on global socio-economic inequality called "Even it up, time to end extreme inequality", that we will partially examine here. This report was endorsed by the former UN Secretary-General Kofi Annan and by the winner of the Nobel Prize for Economics Joseph Stiglitz among other researchers and social activists, and was assisted and revised by Andrew Berg, Assistant Director of the IMF Research Department, among others. In 2015 Oxfam released another report called "Wealth, having it all and wanting more".

Two facts are to be highlighted here from this last report. The first regards the powerful influence of big business over politics. The economic sectors accumulating the most wealth in the world are the financial, insurance, healthcare and pharmaceutical sectors. The report has observed the exorbitant amounts spent by these sectors on political lobbying in the USA and the EU in 2012 and 2013, and a likewise exorbitant increase in their collective wealth during this period. In the USA the finance sector is the largest source of campaign contributions to the country's federal candidates and parties. The following numbers put this framework in evidence:

> *"During 2013, the finance sector spent more than $400m on lobbying in the USA alone…. their collective wealth of US billionaires has increased from $535bn to $629bn; an increase of $94bn, or 17% in a single year. (…) In the EU, an estimated $150m is spent by financial sector lobbyists towards EU institutions every year. Between March 2013 and March 2014, the number of billionaires in*

> *the EU with activities and interests in the financial sector increased from 31 to 39, an increase in collective wealth of $34bn, to $128bn"* (Oxfam 2015).

Similarly, as observed in the last chapter in the case of Brazil, where economic policies, land regulation and environmental regulations are being highly influenced by the agribusiness sector, in the case of the United Sates and the EU, this report shows the excessive power of large capital over key economic political decisions, through lobbying. The billions spent by companies on lobbying activities with policymakers and lawmakers in Washington and Brussels, are mainly aimed at federal budget and tax issues and "are a calculated investment".

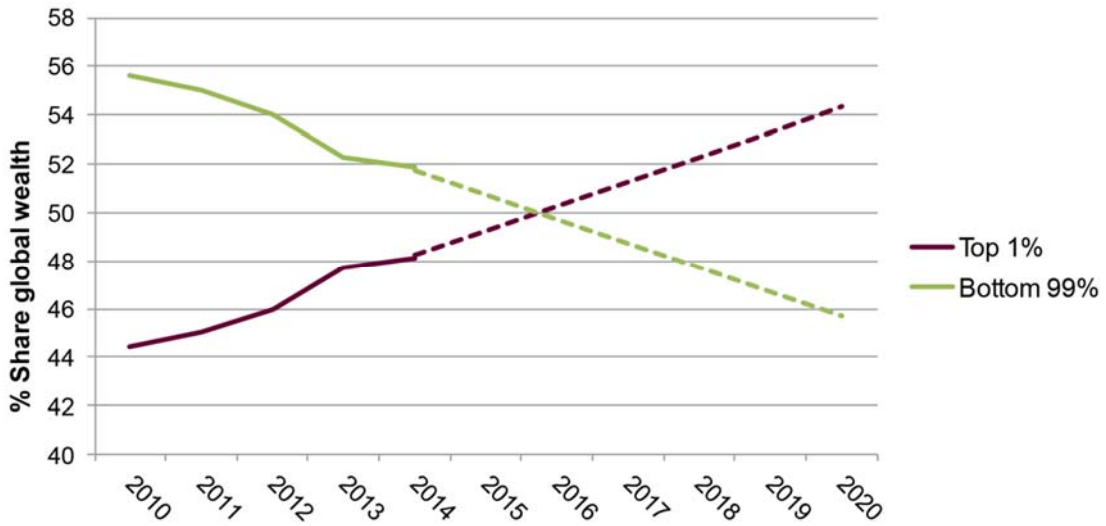
> *"The expectation is that these billions will deliver policies that create a more favourable and profitable business environment, which will more than compensate for the lobbying costs"* (Oxfam 2015, p.9).

In this sense, public funds that should attend the interests of the majority of the population are being invested to perpetuate the interests of a privileged minority. The second fact of the Oxfam report to be highlighted here concerns the increase of wealth concentration in the world, reflecting this framework. The gap between the rich and poor has been increasing, particularly during the last 30 years with the global process of the neoliberalization of economies. During the 1980s and 1990s there was a major expansion of big business from developed countries into developing ones, and a wave of IMF loans to the poorer countries on the condition of a compromise to implement so-called "structural reforms" - meaning finance and trade liberalization, privatizations, rapid reductions in public spending and the flexibilization of labour laws (Oxfam 2015).

Inequality between countries has been increasing since the 1980s, with a slight slowing of this increase from 2002 onwards, mainly due to economic growth in developing countries, particularly in China. Nevertheless, worldwide inequality of individual wealth and the inequality among people inside countries have continued to increase since 1980. In Asia, Africa, Latin America and countries from the former Soviet bloc, most countries have increased poverty and inequality rates compared to then. Since 2000 the case of Latin America has differed, because progressive social and economic policies, resulting from social pressure, have been reducing inequality in many countries (Oxfam 2015). In Brazil, although poverty and inequality have decreased significantly, inequality among social classes and among ethnic racial groups still is extremely high. The 0,9% richest concentrate between 59,90% and 68,49% of the wealth (Brasil em Debate, 2014). In 2012 the country has occupied eleventh place in the global ranking of countries with the largest numbers of millionaires (Chade 2012). In South Africa inequality is higher nowadays than at the end of the Apartheid period (Oxfam 2014).

"Nowadays, seven out of 10 people live in countries where the gap between rich and poor is greater than it was 30 years ago". Since the global economic crisis initiated in the USA in 2007 with hypothec markets, the gap has increased even further (Oxfam 2014). While the finance sector (those considered "too big to fail") has received large amounts of public support, citizens have been suffering with further neoliberal measures. Since 2010 the richest 1% of adults have increased their share of global wealth (Oxfam 2014). The graphic below shows the evolution of the difference in wealth between the richest 1% and the remaining 99% of the world´s population since 2010.

Figure 1. SHARE OF GLOBAL WEALTH OF THE TOP 1% AND BOTTOM 99% RESPECTIVELY



Source: Oxfam 2015

"In 2014, the richest 1% of people in the world owned 48% of global wealth, leaving just 52% to be shared between the other 99% of adults on the planet". Of that 52% of wealth, 94.5 % remains in the hands of the richest 20%, while the other 80% of the population is left with the remaining 5.5%. If the current tendency continues, "by 2016, the top 1% will have more than 50% of the total global wealth (Oxfam 2014, p.2).

The report emphasizes how inequalities occur not only among social classes, but also among geographical regions, genders and racial-ethnic groups.

> *"In Mexico, the maternal mortality rate for indigenous women is six times the national average. (…) In Australia, Aboriginal and Torres Strait Islander Peoples are disproportionately affected by poverty, unemployment, chronic illness and disability; they are more likely to die young and to spend time in prison"* (Oxfam 2014, p.10).

Also, worldwide, women occupy the lowest paid and most precarious jobs. The report also demystifies the idea of the "American dream", according to which a certain level of economic inequality is acceptable because Capitalism gives equal opportunities for all to reach decent levels of well-being, if one works and studies hard. Based on this logic, "rich people are wealthier because they deserve it and work harder than others". On the contrary, the report's data shows a strong correlation between extreme inequality and low social mobility. The children of the poor are mostly condemned to remain poor, even in the US, as economic poverty reflects on poor education and poor access to health, among many other disadvantages which uphold the gap between the privileged and underprivileged from generation to generation.

Inequality is neither seen as inevitable nor as accidental, but as "the result of deliberate policy choices" (Oxfam 2014, p.12). There are two main factors said to be responsible for the extreme growth of inequality in the world: "market fundamentalism" and the domination of politics by elites. The term "market fundamentalism" refers to the "belief that sustained economic growth only comes from reducing government interventions and leaving markets to their own devices". Criticism of this belief, which refers to the negative socio-economic results of this model, has a long tradition in various fields of social sciences (Fairhead et al. 2012; Heynen & Robbins 2005; Oxfam 2014; Spínola 2008). Unregulated markets will tend to concentrate wealth and overexploit labour and nature (Delgado 2010; Dubash 2006; Heynen & Robbins 2005). Also the expansion of the market into new fields, such as the financing of natural resources, has proved to cause unequal access to land and resources, harming nature and the rights of traditional communities (Carbon Trade Watch 2012; Fairhead et al. 2012).

Solutions require multi-sectors and multi-scale strategies. Part of the solution envisaged by Oxfam is: "a global agreement to eradicate extreme inequality by 2030; national inequality commissions; public disclosure of lobbying activities; freedom of expression and a free press; free access to public services like health and education for all by 2020; ensuring fair minimum wages for all and diminishing the distance from the extremely high executive rewards; among others (Fairhead et al. 2012, p.22).

Arguments defending the need to reduce inequalities follow two main directions. One is based on moral principles and a search for justice. At present, hundreds of millions of people suffer from hunger. Meanwhile, according to the Food and Agriculture Organization of the United Nations (2011):

> *"Even if just one quarter of the food currently lost or wasted globally could be saved, it would be enough to feed 870 million hungry people in the world. Per*

> *capita waste by consumers is between 95-115 kg a year in Europe and North America, while consumers in sub-Saharan Africa, south and south-eastern Asia, each throw away only 6-11 kg a year"* (Food and Agriculture Organization of the United Nations 2011).

Thus, inequality and lack of justice is neither inevitable nor a result of demographic growth, but a political issue.

In another direction lies the argument that inequalities have to be tackled not only for moral reasons but also because they are a barrier to economic growth and a risk for all. Data shows how economic inequality has been hindering economic development and also causing increases in crime and violent conflicts, threatening everyone (Oxfam 2014).

The vision Oxfam presented in their Report of 2014 was for a more regulated form of capitalism. "*With regulation, capitalism can be a very successful force for equality and prosperity*" (Oxfam 2014, p.9). They also believe that "*some inequality is necessary to reward talent, skills and a willingness to innovate and take entrepreneurial risk*" (Oxfam 2014, p.9.). Nevertheless they emphasise the urgent need to tackle current extreme economic inequality for moral reasons and because it has been undermining growth and progress.

Despite not focusing on energy or environmental issues, the Oxfam report gives a very concrete outlook on how economic and political power are unequally distributed, how neoliberal policies reinforce inequalities, and how national economies are influenced by global political and economic dynamics. These dynamics of power reproduction help us understand the mechanisms behind the excessive influence of big business on national economic policies, and also in environmental and land regulation, favouring green-grabbing in developing countries, as was discussed in the last chapter.

As exposed in the last chapter, the conflicts regarding wind farms in Brazil are seen as part of the resistance of traditional communities against the increased pressure placed by large capital (including the green industry) on land, territories and natural resources, for the sake of sustainable development. This occurs in a context of poor recognition of the property rights of the Brazilian peasantry and traditional communities, due to a lack of agrarian reform, which is nowadays mainly determined by Brazil's inclusion in the International Labour Division as an exporter of commodities, attending to the interests of the elite agribusiness and finance sectors.

Producing commodities for exportation based on large scale monocultures and mining requires increasing energy, and wind energy is seen as a key strategy to attend to this demand (Montoya et al. 2013; Dutra 2007). Wind energy projects, despite being described

as sustainable by the Brazilian government and by the mainstream media, are transferring social and environmental burdens to underprivileged groups (Meireles 2011; Brown 2011).

Let us go back to the main challenges concerning energy sustainability, as envisaged by the Global Energy Assessment in 2013. A second challenge is to improve living conditions and enhance economic opportunities, particularly for people without access to electricity and those cooking with solid fuels, in order to achieve universal access to modern energy services by 2030. Another challenge is to increase energy security for all nations, regions and communities, through the diversification and resilience of the energy supply, reducing dependence on imported oil. A fourth challenge is to reduce energy systems' greenhouse gas emissions in order to limit global warming to less than 2°C above pre-industrial levels. The fifth is to reduce indoor and outdoor air pollution from fuel combustion and their impacts on human health (Global Energy Assessment 2013).

Wind power may contribute to achieve all of these, as it is free from emissions and can be adapted to centralized large-scale grids but also used in isolated energy systems, either alone or combined with other sources, where people still do not have access to electricity (usually where it would be costly to establish a connection with the centralized power network) (Global Energy Assessment 2012; Global Wind Energy Council 2013; Cumbers 2013). Still, what will define whether or not wind power will contribute to sustainable development in all its economic, social, political and environmental dimensions, reducing economic inequalities, empowering communities, implementing participative planning and preserving affected ecosystems, is a political issue (United Nations Research Institute for Social Development 2013; Mallon 2006). As we are seeing in this work, it is a political issue defined through power relations, which has to be analysed trough the global, regional, national and local scales.

Critical research on energy and sustainability, NGOs and social movements have all been saying that green technologies and free markets don't do this "job" by themselves (Dubash 2006; Mallon 2006; Portal do Mar 2012; Rede Brasileira de Justiça Ambiental 2014; United Nations Research Institute for Social Development 2013). If we look at the discourse of the World Economic Forum regarding the deregulation and the role of technology in solving economic and environmental problems, we can see how it is closer to the discourse of ecological modernization, and less concerned with equality issues (Acselrad et al. 2009; World Economic Forum, 2012).

Wind power projects receiving carbon credits (an instrument implemented and supervised by the United Nations Convention on Climate Change) due to their contributions to the reduction of CO2 emissions and supposed contribution to sustainable development have

been, in some parts of Brazil, endangering ecosystems that protect the environment against climate change (Meireles 2011). They have been restricting access to areas of collective use, measures which were implemented without effective participation processes (Meireles 2011; Brown 2011; Brown 2012).

As we saw in the last chapter, this framework has been motivating the organization of social movements that question the way wind farms are being implemented (Portal do Mar 2012). Sharing a similar vision to academics and NGOs concerned with the links between energy and environmental justice, they point out the fact that technologies and economic efficiency are not applied in an empty space, but in territories defined by social and cultural diversity, power relations and socio-political conflicts (Arnauld De Sartre & Berdoulay 2011; Acselrad & Viégas 2013; Interview with the Director of the Heinrich-Böll Stiftung Brasil/RJ, 17.10.2013; Junior & Alves 2010). This paragraph extracted from an open letter written by communities and social movements of the coastal zones of the Northeast Region affected by wind farms exposes this point of view:

> *Despite having a discourse focused on clean technologies, the exploitation of wind requires the occupation of large areas of land for the installation of the generating towers and the implementation of logistical infrastructure: roads, long vehicles for the transport of equipment, the flow of heavy machinery and processing units. Considering that these areas are not demographic voids and that the logistical implementation requires major interference with the environment, this occupation cannot occur without causing serious social and environmental impacts* (Portal do Mar 2012).
>
> *"Apesar de trazer um discurso focado em tecnologias limpas, a exploração dos ventos exige a ocupação de amplas áreas de terras para instalação das torres geradoras e implementação de infraestrutura logística: estradas, veículos longos para transporte de equipamentos, fluxo de maquinário pesado, e unidades de processamento. Considerando que esses espaços não são vazios demográficos e que a implementação logística exige alta intervenção nos ambientes, essa ocupação não pode se dá sem provocar graves impactos sociais e ambientais"* (Portal do Mar 2012).

Thus, these actors have been calling attention to the need to implement policies and projects considering their social, cultural, political and environmental dimensions. This implies the need of state regulation in order to ensure that investments (private or public) will take into consideration local knowledge and multi-scale power relations that define the territories being affected, as we saw in chapter 3 and will see through the case study analysis in the last chapter of this work.

Once the state omits itself, letting private capital act without significant regulations, the tendency is that the already existing unequal power relations in the territories targeted for investments will persist or even become more unequal (Acselrad et al. 2009; Bullard 2014; Delgado 2010; Interview with Francisco Eliton Albuquerque Meneses, Public Defender of

Aracati, 07.11.2013). The main effects are: externalities will not be assumed by the responsible firms and instead be transferred to poorer and marginalized populations; and 2) profits and benefits will remain concentrated among those who own more economic and political power (Delgado 2010).

The benefit of consuming electricity for example is not equally distributed among countries or among social classes. A PhD research paper on Energetic Planning from the Federal University of Rio de Janeiro, which deals with energy consumption, development and the environment, investigated the relationship between consumption patterns, production and technology). Cohen (2002) analysed the consumption of energy by different social classes in eleven Brazilian cities. She discovered that the total annual average consumption of energy per household, as studied in 1995-96, amounted to 177.6 GJ, including the indirect energy corresponding to acquired goods and services. While the class with the highest income consumed 629.5 GJ per household per year, the class with the lowest income consumed only 32.1 GJ per household per year. Cohen's conclusions reveal a similar perspective as the one adopted by the Oxfam report presented here and by other authors used in the theoretical debate of this thesis.

From the main conclusions of Cohen's (2002) work it is interesting here to highlight that the environmental problem is intrinsically connected to the current model of development. Contradictorily, current mass production and consumption patterns have been based on high levels of CO2 emissions and the dilapidation of natural resources, which ultimately hinder economic growth. She observes firstly how the model of production not only attends to consumers' demands, but also creates demands in order to ensure continued consumption and economic growth. Therefore, the market produces and standardizes consumers' necessities and desires (for example through the constant obsolescence of products that have to be substituted by new ones), without considering the environmental limits of production. This development model is also based on a neoliberal ideology that affirms that the economy is ruled by its own laws which should not be disturbed by state intervention, and that the market naturally leads to an equitable organization of society´s production and trades (Cohen 2002).

This model is based on an excessive trust in technology, on orthodox economic models, and on a utilitarian rationality. According to this rationality, it is almost as if the finality of a new technology were in itself. In other words, new technologies are developed considering productive efficiency and profit increase - without considering the extent to which these technologies attend to social needs and values that are beyond the logic of profit and efficiency.

Lifestyles and patterns of consumption are thus reproduced through patterns of production, ensured by neoliberal economic and political regulations (globally implemented by multilateral organizations, such as the WB and the IMF) and by an International Division of labour (Cohen 2002; Delgado 2010; Watts & Peet 2006a; Oxfam 2014). This model has not been able to address the social and environmental problems of inequality as we may all observe and as we have briefly exposed here through various data (Global Energy Assessment 2012; International Energy Agency 2000; Oxfam 2014; Oxfam 2015).

Cohen (2002) also highlights the fact that the relationship between techniques and values is a very complex one, where values create technologies and technologies influence values. Nevertheless, techniques and technologies are not to be seen as "liberating solutions" or "oppressive mechanisms" in themselves. Regarding energy systems for example, she joins other actors previously mentioned here, and asks: For what, and whom, does this energy exist? To which demands does it attend?

Energy systems are built to attend to the demands of the current model of development that causes environmental degradation. Thus as Cohen (2002) says, the environmental issue is determined by political choices regarding the model of economic development. Therefore, there is not only one possible way of tackling the environmental crisis and making energy systems more sustainable. As we saw in the last chapter while analysing Brazilian land issues, there are already a number of alternative ways of life, modes of production, models of land property and lifestyles. These are based on alternative values that do not fit into modes of mass production and consumption or their main strategies of efficiency (like land concentration and the intensive use of agrochemicals in the agribusiness despite their negative consequences on labour conditions and public health, for example).

Regarding energy production and consumption, there are also alternative models to traditional fossil fuels and nuclear power generation. Wind power, solar power, hydropower, geothermal, biofuels and biomass for thermal power plants are currently the most-used resources to complement and replace traditional fossil and nuclear energies (Global Energy Assessment 2012).

Nevertheless, large-scale renewable energy projects (e.g. large hydropower plants, biomass monocultures and wind farms) have been reproducing patterns of mass production, environmental destruction and unfair distribution of costs and benefits among social and ethnic groups, so that instead of representing alternatives, they have been reinforcing previous economic and political strategies to ensure profits (e.g. the deregulation of markets and of labour laws), and reinforcing the already known effects

(social and environmental) of the traditional energy sector (e.g. land-grabbing and sometimes even disrespect for local environmental ecosystems) (Carbon Trade Watch 2012; Brown 2012; Meireles 2011; Portal do Mar 2012).

As we saw in Chapter 2 with the studies on the water market in India (Dubash 2006) and the renewable energy market in Europe (Weiss 2010), markets are more a result of social and political interests and struggles than a result of abstract economic processes of regulation. Also they are a result of multi-scale processes from the global to the local, which are all mutually influenced.

The global development of renewable sources, occurring more significantly from the 1990s onwards, is seen as a result of increased oil prices and acknowledgment of the link between fossil fuels and climate change (Weiss 2010; United Nations Development Program 2000; Dutra 2007). It has occurred alongside a process of liberalization of the energy markets. Both processes are seen as strategies to enable new profits and reduce environmental pressure (Weiss 2010, p. 29-30). Indeed, as we have seen in the present chapter, the 1990s was a period when the energy issue became included in the global environmental agenda and in the expansion of neoliberal policies.

What is particularly interesting about Weiss's (2010) approach, as presented in Chapter 2, is how he observes the two main patterns of production and consumption of renewable energy in developed countries. One is a centralized model according to which big firms, often from the traditional energy source sector, invest in the renewable sector (Weiss 2010, p. 27).

Their main economic and political strategies are scale effects and the reduction of political barriers to the implementation of big energy projects. On this model, production, decisions and profits are centralized, both spatially and socially. Another tendency is the decentralized production of renewable energy, based on local and regional projects. On this model, the production, profits and decision-making process are better distributed across space and between social groups. Projects usually encourage economic efficiency, environmental balance and participative policies.

These two models are observed worldwide and although the decentralized model is predominant, both may also coexist, and will vary according to the variation of environmental, social, political and economic conditions in space (Weiss 2010). Some important factors are: the distribution of natural conditions (wind, sun, water), which model is favoured by public policies and loans, and the flexibility of the environmental rules which

control the effects of large-scale projects, among others (Weiss 2010). In Brazil, I could observe the strong predominance of the centralized model, as we will discuss later on.

Concerning the decentralized model of wind power production, I highlight here three projects that show interesting ways of producing renewable energy while committing to sustainability and environmental justice. Let us look at them now.

5.3. THREE ALTERNATIVE PROJECTS OF ENERGY PRODUCTION

The first alternative project that will present here is undertaken by the NGO Yansa, and creates large-scale wind power projects which are intended to serve the necessities and goals of the community who is hosting the project (Hoffmann 2012; Yansa 2015) The wind farm is owned by the community, which retains control over their land, resources and profits. Decisions regarding where to produce and how to invest profits are taken collectively (Yansa 2015).

The project is located in Mexico. Profits come from selling the energy to the government of Mexico, in long term contracts, for fixed prices. The first Yansa project was located in the city of Ixtepec and the wind farm occupied an area of about 1000 hectares, with an installed capacity of 100 MW (15% of the total electricity consumption of the state of Oaxaca), produced by 44 towers, each 80 to 100 meters high, 500 meters distant from households (Hoffman, 2012).

The profits are equally split between the NGO and the community. Usually the community uses profits for diversifying economic opportunities in order to avoid the dependence on wind power as a unique source of income. This improves the local quality of life. The profits earned by the NGO (after settling loans from the institutional investors needed to launch the projects) are invested in new community-based wind farms in other areas.

Another interesting model of wind power production is WindAid, promoted by the NGO Windempowerment, aimed at off-grid rural electrification. The project develops locally-built small wind turbines installed in households or public facilities like schools. One example is the project located at Playa Blanca, Piura, Peru, installed in 2012 (Windempowerment 2015).

Wind turbines of 500 Watt Peak HAWT are installed in the households of those who are willing. For maintenance, monthly fees which correspond to the same value as, or less than, what has been paid for candles, kerosene or comparable sources of energy, are paid

by the end user (equivalent to 7 British Pounds per household). The money goes to a community-run fund and covers all maintenance costs (Windempowerment 2015).

WindAid trains an installation team and a maintenance technician from the community, thus generating local jobs. The NGO volunteers finance the turbines and the material and installation costs. The "community provides food, housing, and drinking water for all WindAid volunteers and workers during installation" (Windempowerment 2015). Regarding the abovementioned project in Peru, the NGO highlights a lack of support from governmental agencies despite promises of contributions, but observes the great interest and collaboration of the community's inhabitants (Windempowerment 2015).

The NGO collaborators aim to contribute to sustainable, community-based rural electrification. Their volunteer work is based on:

> *"Building and sharing financial and human resource connections, performing joint technical research, sharing technical information and collaborating on key vendor relationships, strengthening understanding of business and social models for effective implementation of small wind technology". Their main principles are: collaborative work, acceptance of different views, and efforts to build consensus on decision"* (Windempowerment 2013).

A further example of alternative modes of wind power generation is a German cooperative for small-scale wind power projects in the state of Hessen, called "Energiegenossenschaft Starkenburg, eG" (Starkenburg 2014). Their goal is to contribute to the development of all types of renewable energy, benefiting as many citizens as possible in the region, increasing regional chains of profit generation. Founded in 2010 by thirteen citizens from South Hessen, it currently boasts 615 members, four installed projects of small-scale wind farms (respectively 2 MW, 4 MW, 15 MW and 12 MW) and one solar power project (Starkenburg 2014).

They are independent from the government, banks and energy enterprises. To be able to take part in one project, members of the cooperative have to invest 2000 Euros, corresponding to two shareholdings of 100 Euros and a loan of 1800 Euros. All projects have been ensuring advantageous returns. The profits are equally shared and all decisions are taken based on the democratic structure of the cooperative (Starkenburg 2014). Other decentralized projects in Germany use different models in cooperation with municipal governments or with energy distributors, varying also from local to regional scales, and varying in the model of participation (affected groups may participate in decision-making processes without having to invest their own capital) (Bundesverband Wind Energie 2012; Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit, 2012).

In general the main goals are to produce sustainable sources of energy on participative and democratic bases, fuelling the regional economy by privileging regional economic partners (Agentur Für Erneuerbare Energien 2011; Bundesministerium Für Verkehr, Bau Und Stadtentwiklung 2011; Bundesverband Wind Energie 2012; Starkenburg 2014; Blume 2010; Cumbers 2013). Participation in the planning and decision-making processes, as well as in profits, is considered a key factor as this increases local acceptance (Blume 2010). Usually, these projects include three factors, which are not present among those shown here earlier: available capital to invest in the cooperative; a culture of entrepreneurship; and know-how (offered by the groups that conceive the ideas of the projects and invite participants) (Blume 2010).

The question of whether renewable energy could supply 100% of the energy demand is an open question with different arguments coming from different actors (Blume 2010). The question of whether renewable energy should be developed based on centralized or decentralized models is also polemical (Blume 2010; Ibrahim et al. 2008). In both cases, many factors are involved.

The main factors observed through literature research (Ibrahim et al. 2008; Agentur Für Erneuerbare Energien 2011; Bundesministerium für Verkehr, Bau und Stadtentwiklung 2011; Bundesverband Wind Energie 2012; Starkenburg 2014; Blume 2010), experts' interviews (Interview with Hanno Brühl, Manager of the Department for Renewable Energy and Energy Efficiency of the Public Energy Enterprise of Tübingen, Germany, 2012; Interview with Jürgen Simon, Wind energy planner of the Energy Cooperative Starkenburg, Germany, 2012); and participation in energy-related academic and business seminars and congresses (see page 26) are:

1) The geographical distribution and availability of different energy sources like wind, sun, lands for biomass, fossil resources, uranium for nuclear power, etc. (in the places and periods of the year, and on the days, that they are required);

2) The costs of production of each source, including costs of avoiding or reducing already caused environmental accidents and environmental pollution;

3) The technical and technological challenges of storing and transporting energy while producing less waste;

4) The costs of constructing transmission lines to connect new energy projects to the centralized network, and costs to increase the capacity of the current centralized network;

5) The most effective and context-adapted economic regulative systems for contracting energy, based on the establishment of energy prices (feed-in tariff) or on energy quotes (energy auctions);

6) The best economic models of energy pricing considering all interested parties (energy producers, distributors, industry, the service sector, the transport sector, agriculture and mining, households including the socially underprivileged, government);

7) Negotiation with the energy sectors that would lose parts of their industry if society decided to drastically reduce or entirely banish various types of energy (e.g. Germany's decision to move away from nuclear power after the national social pressure that followed the nuclear tragedy in Japan in 2011);

8) Energy efficiency and the links between energy and: transport systems; industrial models; building strategies; and food production and distribution models;

9) Contributions to tackling the urgent challenges of the global political agenda which are closely related to energy issues as seen here before: 1) climate change; 2) food security (e.g. green-grabbing for producing biofuels, which reduces family-farmed food production; threats to artisanal fishing due to oil accidents and competition for access to the sea in areas of oil duct passage and near to ports for oil ships); and 3) extreme economic inequality, including gender and ethnic-racial inequality (e.g. energy access, job creation, labour conditions, etc.);

10) Contributions to sustainability a core issue for global debate on development: including the reduction of poverty and inequality, political participation and environmental preservation; and how to ensure environmental justice and a fair distribution of the costs and benefits of energy production;

11) In the case of Brazil, contributions to attend to the demands of social movements for a distributive system of land reform that respects traditional territories, identities, livelihoods and knowledge.

The key factor lying behind all these factors is a political one. The development of fossil, nuclear or renewable energy, based on centralized or decentralized production, is based on public policies to support, in one or another direction: 1) the development of research and technical and technological improvements; 2) the development of industries and services that supply the energy sector; 3) the construction of the necessary and best-

adapted infrastructure; and 4) systems of loans, tax reductions and price subsidies for energy companies.

Decisions regarding each one of these factors mentioned above will either meet or oppose the interests of various socio-cultural groups, on a global, regional, national or local scale. These decisions are the result of power struggles, which usually occur on very unequal and unfair bases, as researchers, NGOS, social movements and the media have all shown (Acselrad et al. 2009; Bullard 2014; Glass 2011; Movimento dos Trabalhadores Rurais Sem-Terra 2014; Oxfam 2014; Quintans 2008; Rede Brasileira de Justiça Ambiental 2014; World Bank 2011).

Based on the approach of "environmental governmentality" (Agrawal 2006; Rutherford 2007) as presented in chapter 2, I understand that decisions related to the energy sector are implemented through public policies and rules and official statistics and discourses that try to influence the way people act by influencing them subjectively – for example so that individuals accept government decisions and private investments affecting their lives in the name of progress or sustainability. Once people are subjectively convinced that the rules and policies meet their interests as well (because progress will supposedly benefit all), they will tend to respect established rules and patterns of behaviour.

It is in this sense that governments, multilateral organizations and large firms invest in producing knowledge and building discourses that will legitimate their public and corporative policies. This is also why actors who resist hegemonic discourses and practices – such as neoliberal practices and discourses based on ecological modernization* – also invest in producing alternative knowledge and discourses. Producing knowledge and discourses is also a power strategy, linked to the strategies of producing rules and policies, and of influencing people's interests.

As the approaches of governmentality argue, power is contested and reproduced through multiple scales and multiple actors, including informal institutions and tacit and temporary rules (Rutherford 2007) – as we will see in the case-study analysis. What we have observed in our case study and what was also evidenced through data and literature analysis in the last two chapters of this thesis, is that different groups possess different capacities to influence the creation of laws and policies.

The lobbying influence of a multinational bank investing in the agribusiness sector in Brazil, or of a multinational investment bank with shares in a wind farm in Brazil, is not comparable to the lobbying influence of a traditional community or a group from a landless

camp. It is thus under unequal power constellations that political decisions are made, and these decisions may work to reinforce or challenge inequality.

(*footnote: As presented in chapter 2, referring mainly to apolitical solutions to environmental problems based on technological enhancement, a free-market and a conscientious consumer (Acselrad et al. 2009; Bullard 2014; Rutherford 2007; Zhouri 2008).

Here it is important to underline the fact that, as seen in chapter 3, the struggles of social movements that have arisen since the 1980s in Latin America are not only for the redistribution of wealth and against the status quo's notions of well-being (e.g. the elite's patterns of consumption or individual private property). These actors are fighting for the right to define new values that will guide Constitutional Laws and Rights, that will guide the judiciary systems' representatives' ways of thinking and judging, that will guide public policies, that will guide politicians' agendas, and that will guide multilateral organization investments (Souza Santos 2014; The Corner House 2012).

Social moments are struggling so that new ways of thinking and acting emerge based on alternative notions of well-being – thus influencing patterns of production, land use, land property, food production and distribution, and energy production and consumption as well (Articulação Nacional de Agroecologia 2014; Londres 2011; Rede Brasileira De Justiça Ambiental 2014; Degrowth 2010; Quadros 2014a).

Actors promoting the development of renewable energy strongly criticise public funding and multilateral organizations' support of the fossil energy sector (Greenpeace 2014; Casey 2013). The World Bank has recently recognized that it has been privileging this sector. In 2011 this institution released a document called "World Bank Energy Strategy Review". Here is an extract of the document:

> *"Fossil fuel lending continues to play a dominant role in the World Bank's overall energyportfolio, despite recent increases in lending for new renewables and energy efficiency. World Bank Group fossil fuel funding for FY2010 hit a new record high of $6.6 billion, a 116% increase over the previous year. Of this total, coal-based power hit a record high of $4.4billion, a 356% increase over the previous year. Such investments lock developing countries into coal-based energy for decades to come. The Bank's total lending for new renewable energy and energy efficiency combined also hit a record of $3.4 billion, but the Bank's support for coal alone still far surpasses this benchmark"* (World Bank 2011).

And they add:

> *"The Bank's funding may be even more heavily weighted in favour of fossil fuels than reported because the World Bank does not provide accurate accounting for*

> *fossil fuel development through related infrastructure, policy lending, and financial intermediaries"* (World Bank 2011).

Through these paragraphs we may see how global policies - linked to local, regional and national policies - are influencing the behaviour of investors and patterns of energy consumption. Regarding decentralized energy production and the challenge of expanding energy access, this same report says:

> *"While energy access is a stated priority of the Bank, it more typically supports large scale generation and export-oriented energy models, that fail to reach the poor. A recent study shows that none of the 26 fossil fuel projects funded by the Bank in FY 2009 and 2010 clearly identify access for the poor as a direct target of the project. The Bank and the authors of the study agree that no coal or oil projects examined can be classified as improving energy access. This includes the controversial Eskom loan approved in 2010. Therefore, the Bank is engaged in some extremely problematic projects including large coal power plants, rather than supporting projects which are more directly related to its core mandate of reducing poverty and helping the 1.5 billion people without access to energy."* (World Bank 2011)

As we have seen in chapter 2, researchers who approach the environmental issue through the perspective of "political ecology" observe that multilateral organizations concentrate an enormous amount of decision power over national policies - affecting the regulation of various productive sectors and of the finance sector, labour and the environment - based on extremely contradictory discourses. Nevertheless, the discourses that ultimately produce more effective practical consequences (being implemented through rules, sanctions and conditions in loan contracts) are the ones based on neoliberalism and ecological modernization (Watts & Peet 2006).

On one hand we see discourses and projects that are called sustainable (Ministério do Desenvolvimento Agrário 2014; Food and Agriculture Organization of the United Nations 2013), and on the other hand we see the neoliberalization of markets and of nature based on fossil energy and large-scale renewable energy, which increase inequalities and the overexploitation of nature (United Nations Framework Convention on Climate Change 2012; Brown 2011; Brown 2012). On one hand we see critics of the consumption model of developing countries (UN Human Development Report 2013), and on the other hand we see the support of large finance and productive capital to the detriment of social policies, and to the detriment of the support of alternative small-scale economic projects (Oxfam 2014; World Bank 2011).

We may observe this contradiction in the other three energy reports analysed here – the WEF Energy Vision Update (2012), the International Energy Assessment (International Energy Agency 2000) and the Global Energy Assessment (Global Energy Assessment 2012). On one hand, they show how current energy systems based on investments in

large-scale fossil fuels and nuclear power have not been able to ensure energy security or tackle energy poverty.

On the other hand the envisaged solutions, rather than looking at strategies to transform unequal power relations based on energy solutions that are based on the needs of those in energy poverty, creating local economic opportunities through cooperatives and based on participative processes, are mainly technological and conservative, regarding neoliberal principles and regarding the interests of the fossil energy and nuclear energy sectors (e.g. cleaner fossil fuel technologies, carbon capture and storage (Global Energy Assessment 2012, p. 8).

What seems to be a consensus among most discourses, including conservative and critical ones, is: 1) that there exists a need to integrate measures regarding the energy efficiency of transport systems, the building sector, industrial production and energy collection, conversion and end-use; 2) that there exists a need to combine the uses of different sorts of renewable sources of energy; and 3) that public subsidies play a key role in the renewable sector (the share in comparison to other sources is not a consensus) including support for research on renewable energy.

The international NGO Greenpeace requests governments to "*phase out all subsidies for fossil fuels and nuclear energy*" (Greenpeace 2012). In 2012 they released their fourth report, *Energy Revolution* (Greenpeace 2012) produced in partnership with the Global Wind Energy Council (GWEC) and the European Renewable Energy Council (EREC). Its goal is to provide pathways for protecting the climate by phasing out fossil fuels and cutting CO2 emissions while ensuring energy security. According to the report, "*if the current rate of growth in the renewable energy sector is maintained, wind and solar energy would overtake coal in electricity production in less than 15 years*" (Greenpeace 2012). Also they affirm that renewable energy could employ up to 8 million people by 2020, compared to the coal industry's 2.8 million (Greenpeace 2012).

Greenpeace (2012) sees the need to detach economic growth from the consumption of fossil fuels, by implementing renewable solutions. "*The scale of the challenge requires a complete transformation of the way we produce, consume and distribute energy, while maintaining economic growth*" (Greenpeace 2012). In this sense, the focus is not on a criticism of the model of economic growth, but the need to respect nature's limits by implementing renewable sources of energy, giving priority to decentralized energy systems (Greenpeace 2012).

Their main goals include "*phasing out all subsidies for fossil fuels and nuclear energy*"; to "*increase research and development budgets for renewable energy and energy efficiency*"; and to "*reform the electricity markets by guaranteeing priority access to the grid for renewable power generators*" among others. It includes instruments of emissions trading, which have been criticized by academics and NGOs for their increased speculative character, losing correspondence with concrete emissions and for rewarding projects which are not sustainable from a local perspective (Carbon Trade Watch 2012; Brown 2011) The recommendations also include more information for consumers on product labels so that they can choose more environmentally-sound products (Greenpeace 2012).

In 2014 the German Greenpeace website published an article reporting a meeting that took place at the University of Leipzig (Germany) in that year called "Degrowth" (Greenpeace 2014). The International "Degrowth" Conferences gather academics, activists and practitioners who are trying to develop "*proposals toward an alternative, ecologically sustainable and socially equitable degrowth society*" (Degrowth 2010). In this article Greenpeace assumes that there is an internal unsolved debate regarding their critical position to the current model of economic growth (Greenpeace 2014).

The Conference in Leipzig was the fifth organized by the Group "Research & Degrowth" (R&D). R&D is "*an academic association dedicated to research, training, awareness raising and events organization around degrowth*" (Degrowth 2015). They support diverse "degrowth strategies for achieving social equity and ecological sustainability", including: 1) grass-roots action and institutional interventions; 2) academic and practical work; 3) the building of alternatives and opposition to environmentally and socially destructive projects and policies; and 4) local and international level work (Degrowth 2015).

The term first appeared in France, with the word "décroissance" used in texts reflecting on the 1972 report of the Club of Rome (a non-profit organization analysing global development challenges) called *The Limits to Growth* (Degrowth 2015). Nevertheless, the term became an activist slogan from 2001 onwards, at first in European countries. In 2008, at a conference in Paris, "degrowth" was defined as a field of academic research contributing to debates on international civil society. Their scientific committee contains Joan Martinez-Alier, Professor in the Department of Economics and Economic History in the Universitat Autònoma de Barcelona (Spain) and Serge Latouche, an emeritus professor of economics at the University of Paris-Sud (France) (Degrowth 2015).

The R&D association includes practitioners, activists and researchers interacting in multiple scales, including trade unions, political movements, political parties, "*people and collectives which both contributed to the rise and conceptualization of the movement and*

which adopt degrowth as the horizon of their action" (Degrowth 2015). Collaborators come from the areas of agroecology, environmental justice, environmental conflicts and the defence of territory (against infrastructures, real estate speculation, etc), solidarity economy, feminism, eco-villages, alternative mobility (bicycles, etc), urban gardens, non-violence and pacifism, anti-advertisement, and preventive and alternative medicine, among others (Degrowth 2015). R&D interacts mostly with social movements from the Global North, like "Indignados" and "Occupy Wall Street", but also with social movements from the Global South like the Via Campesina (a rural social movement mentioned here in chapter 2) (Degrowth 2015).

Regarding the discussion of my research I would like to highlight some of their proposals:

> *"support for environmental justice movements of the South that struggle against resource extraction; introduction of global extractive moratoria in areas with high biodiversity and cultural value, and compensation for leaving resources in the ground; decommercialization of politics and enhancement of direct participation in decision-making; promotion of small scale, self-managed not-for-profit companies; defence and expansion of local commons and establishment of new jurisdictions for global commons; establishment of integrated policies of reduced working hours (work-sharing) and introduction of a basic income; institutionalization of an income ceiling based on maximum-minimum ratios; discouragement of overconsumption of non-durable goods and under-use of durables by regulation, taxation or bottom-up approaches; abandonment of large-scale infrastructure such as nuclear plants, dams, incinerators, high-speed transportation; conversion of car-based infrastructure to walking, biking and open common spaces (…)"* (Degrowth 2010).

These proposals are polemic. They affect, for example, the interests of many powerful economic actors, such as nuclear power companies or oil companies interested in exploiting resources that would be left on the ground. Also they affect the lifestyles of many people who would not be ready, for example, to renounce the use of individual cars. The supporters of R&D affirm that these proposals are not utopian, arguing for example that *"new redistributive taxes will address income inequality and finance social investments and discourage consumption and environmental damage, while reduced working hours with a reinforced social security system will manage unemployment"* (Degrowth 2010).

Here are some sentences where R&D describe their point of view.

> *"By 'degrowth' we understand a downscaling of production and consumption in the industrialized states that increases human well-being and enhances ecological conditions and equity on the planet. We want a society in which humans live within their ecological limits, with open, connected and localized economies. (…)*
> *A society in which resources are more equally distributed through new forms of democratic institutions. Such societies will no longer have to "grow or die. (…)*
> *Material accumulation will no longer hold a prime position in the population's cultural imaginary. The primacy of efficiency will be substituted by a focus on sufficiency. Innovation will no longer focus on technology for technology's sake*

> *but will concentrate on new social and technical arrangements that will enable convivial ways of life"* (Degrowth 2015).

They conclude their open letter affirming that no unique recipe is intended; rather they intend to open the debate for the construction of various alternatives to current economic growth-based development. I could not deepen my analysis of the R&D approach and include their academic work due to lack of time, and I do not intend here to judge their arguments and proposed strategies. Instead, this movement´s general point of view is here presented in dialogue with other, already presented, points of view. They all seem to touch on common key questions and issues related to my research.

These are: What are the driving forces determining the choice to produce large-scale wind energy in Brazil? How are these driving forces related to models of mass production and mass consumption? To which extent are these models based on a rationality of efficiency that approaches technologies and market regulative models as though they could be disconnected from their political, social, cultural and territorial dimensions? How is all this, on a global scale, leading to: extreme economic inequality, continued energy poverty, and the continued overexploitation of nature? How is all this, on the northeast coast of Brazil, leading to territorial conflicts with small fisher communities struggling for the recognition of their livelihoods, their territories and their identities?

We will now leave these questions open and move on to the presentation of various data regarding the wind energy sector more specifically.

5.4. THE RECENT GLOBAL DEVELOPMENT OF THE WIND ENERGY SECTOR

Here we continue our analysis with the viewpoint of the IEA. This autonomous organization was founded in response to the 1973-74 oil crises, aiming to ensure access to global oil supplies for its member countries and others (International Energy Agency 2015). Although this was and remains a core goal, the IEA, has expanded its work, including nowadays all energy resources. The governing board is composed of energy ministers from each member country (29 countries in all) (International Energy Agency 2015).

The organization´s focus is on four main issues: energy security, economic development, environmental awareness and worldwide engagement. They work on a global level, in co-operation with industry, international organizations and non-member countries in order to promote energy policies. They claim to be "at the heart of global dialogue on energy, providing authoritative and unbiased research, statistics, analysis and recommendations".

The IEA is funded by its 29 member countries and the revenue generated from the IEA´s publications (International Energy Agency 2015).

In 2013, according to the IEA´s World Energy Outlook, "*fossil-fuel consumption subsidies worldwide amounted to $548 billion*", "*over four times the value of subsidies to renewable energy and more than four times the amount invested globally in improving energy efficiency*" (International Energy Agency 2014). Speaking at the annual meeting of the European Wind Energy Association, the IEA Chief Economist affirmed that *"fossil fuel subsidies (…) are effectively an incentive to pollute and as such are public enemy number one to sustainable energy development"* (Casey 2013). The representative of the IEA complemented his argument by criticizing the fact that subsidies keep fossil fuels artificially cheap and refuting a common argument that fossil fuel subsidies protect the poor. He affirmed that 80% of fossil fuel subsidies go to middle and high income households (Casey 2013).

Regarding wind energy, in his opinion, the main challenges are the "lack of predictability of government policies and public acceptance" (Casey 2013). Acceptance problems should "be tackled with communication of the community gains and with best possible engineering practices" (Casey 2013). As we will see in the case study analysis, the challenges faced by the wind power sector differ greatly in Brazil from the ones faced in developed countries, and vary within Brazil as well, according to regional and local contexts.

Let us now look at some data on wind power on a global scale. The Global Wind Energy Council is:

> *"a member-based organization, representing over 1,500 companies, organizations and institutions in more than 70 countries, including manufacturers, developers, component suppliers, research institutes, national wind and renewables´ associations, electricity providers, finance and insurance companies"* (Global Wind Energy Council 2015).

The GWEC is funded by membership fees. It includes all national wind industry trade associations from established and emerging markets, including the Brazilian ABEEÓLICA (Global Wind Energy Council 2015). The key role in producing knowledge and discourses to ensure the political representation of a group´s interests, discussed here earlier, is shown on the GWEC, website:

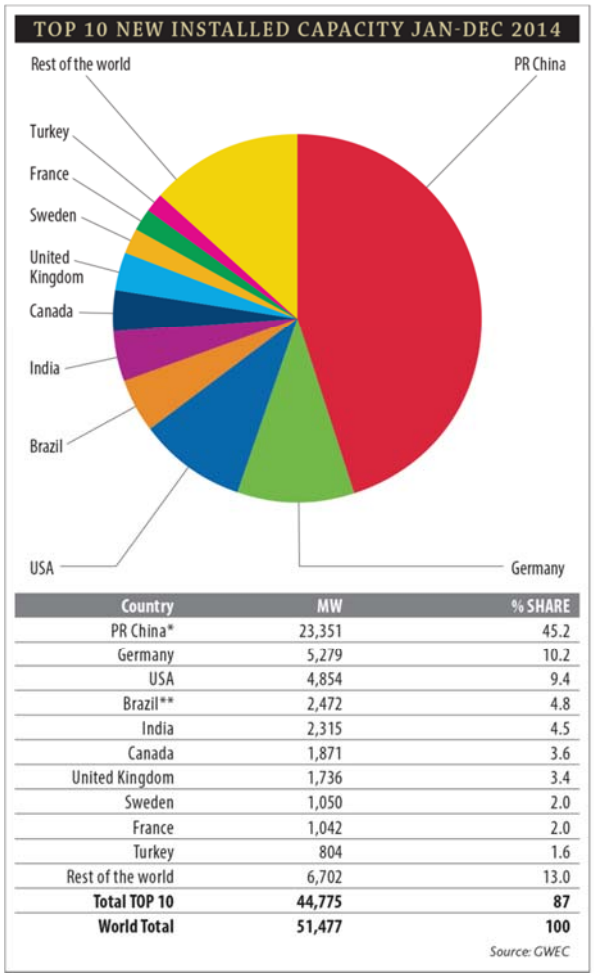
> *"GWEC, works at the highest international political level to create a better policy environment for wind power, educating local and national governments and international agencies about the benefits of wind power"* (Global Wind Energy Council 2015).

The idea is to show that wind power is a “clean” power that provides substantial environmental and economic benefits (Global Wind Energy Council 2015). They work with the UNFCCC (United Nations Framework Convention on Climate Change), the IEA, international financial institutions, the Intergovernmental Panel on Climate Change (IPCC) and the International Renewable Energy Agency (IRENA), representing the global wind industry and advocating for new policies “that will ensure that the wind energy sector will reach its full potential in as wide a variety of markets as possible” (Global Wind Energy Council 2015).

The GWEC understands that fossil fuel subsidies and the lack of effective global climate policies are the greatest challenges to wind power competitiveness. Nevertheless, national and regional policies have been overcoming these challenges (along with the increased acknowledgment of the environmental costs of fossil resources) (Global Wind Energy Council 2015). The wind energy market is growing, as this source of energy is reaching very competitive prices worldwide, notably in Brazil, South Africa, Mexico and Turkey (Global Wind Energy Council 2013). The largest installed capacities are in the Organisation for Economic Co-operation and Development (OECD) countries, especially China, the USA and Germany, and these markets are still dynamic. Nevertheless, the market´s future expansion is expected mostly in Latin America, Asia and Africa, related to economic growth (Global Wind Energy Council 2013)

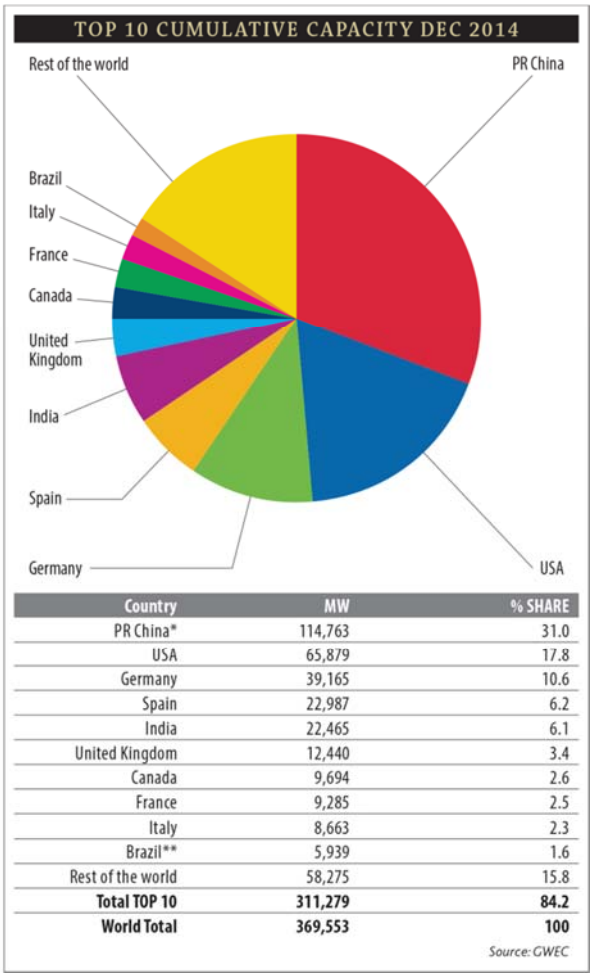
As these two graphics show, China currently has the world’s largest installed capacity with 114,763 MW, and added the largest capacity in 2014 (23,351 MW added capacity) followed by the USA with 65,879 MW installed capacity (third place in added capacity with 4,854 MW), and Germany with 39,165 MW (second place in added capacity with 5,279 MW). Brazil gained prominence in the ranking of new installed capacity during 2014, lying in fourth place for adding 4,472 MW to the national electrical system, ending the year with roughly 6GW of total installed capacity. This has put Brazil into tenth place in the ranking of the world´s largest wind energy producers. Globally, after a slowdown over the past few years, 2014 was a record year for annual installations, reaching 44% growth with over 50 GW of added wind-generating capacity. The total world cumulative installation was 369,553 MW (Global Wind Energy Council 2014).

Figure 2. TOP 10 NEW INSTALLED CAPACITY JAN-DEC 2014 + TOP 10 CUMULATIVE INSTALLED CAPACITY DEC 2014



Country	MW	% SHARE
PR China*	23,351	45.2
Germany	5,279	10.2
USA	4,854	9.4
Brazil**	2,472	4.8
India	2,315	4.5
Canada	1,871	3.6
United Kingdom	1,736	3.4
Sweden	1,050	2.0
France	1,042	2.0
Turkey	804	1.6
Rest of the world	6,702	13.0
Total TOP 10	**44,775**	**87**
World Total	**51,477**	**100**

Source: GWEC



Country	MW	% SHARE
PR China*	114,763	31.0
USA	65,879	17.8
Germany	39,165	10.6
Spain	22,987	6.2
India	22,465	6.1
United Kingdom	12,440	3.4
Canada	9,694	2.6
France	9,285	2.5
Italy	8,663	2.3
Brazil**	5,939	1.6
Rest of the world	58,275	15.8
Total TOP 10	**311,279**	**84.2**
World Total	**369,553**	**100**

Source: GWEC

Source: Global Wind Energy Council 2014.

Two key arguments of GWEC, for the need to increase wind energy are the need to tackle climate change and the high increase in global power demand (Global Wind Energy Council 2013). They show that while “the power sector accounts for around 40% of global CO2 emissions”, “wind does not emit carbon dioxide or other air pollutants”; and “within three to six months of operation, a wind turbine has offset all emissions from its construction, to run virtually carbon free for the remainder of its 20 year lifetime” (Global Wind Energy Council 2013).

The IEA estimated how much CO2 emission could be saved from wind energy production, based on the typical amount of CO2 emitted by producing one kWh of wind power. According to the IEA, on average 600g/kWh of carbon dioxide reduction can be obtained from wind generation, although individual countries’ emissions vary. “In 2008, wind energy saved 157 million tons of CO2 globally, which corresponds to around 16% of the total Kyoto target for 2008” (Global Wind Energy Council 2013). “By 2020, wind power could

prevent more than 1 billion tonnes of carbon dioxide from being emitted each year by dirty energy - equivalent to the emissions of Germany and Italy combined" (Global Wind Energy Council 2013).

Forecasts are that "*wind power could reach 2,000 GW by 2030, and supply up to 17-19% of global electricity, creating over 2 million new jobs and reducing CO2 emissions by more than 3 billion tonnes per year. By 2050, wind power could provide 25-30% of global electricity supply*" (Global Wind Energy Council 2014).

Offshore wind energy production still represents a small share of wind energy's installed capacity (an average of 2% of the global wind energy installed capacity in 2008), as it is a relatively new technology whose costs will be reduced in the future (Global Wind Energy Council 2013). In 2008 more than 90% of offshore wind power was installed in northern Europe (the North, Baltic and Irish Seas and the English Channel) (Global Wind Energy Council 2013). In Brazil, due to the significant availability of wind onshore and due to the high costs (in comparison with onshore wind farms), public policies and the market are targeting onshore wind energy production (Ricardo Marques Dutra, Researcher of the Brazilian Reference Center for Wind and Solar Energy, 22 July 2011, Rio de Janeiro, Brazil).

We will look at the policies and discourses related to wind energy particularly in Brazil, in the next chapter, when analysing the case study. Here we conclude our brief analysis of energy-related global data, regulations and discourses.

5.5. PARTIAL CONCLUSIONS

In this chapter we have seen how energy is a key issue on the global agenda and how it affects various groups of interest with different discourses concerning the key challenges faced by the energy sector and concerning the targets and strategies that need to be implemented. Multilateral organizations focus the debate on energy around three main issues: economic growth, human development and climate change.

We can observe a mainstream discourse according to which the "inevitable" search for economic growth justifies the "inevitable" continued use of fossil resources (highly subsidised by governments and multilateral organizations) and the continued implementation of large-scale renewable energy projects (encouraged and rewarded by multilateral organizations through instruments that implement the financing of nature, such as carbon credits) that should offset the environmental damages caused by the use of

fossil resources. Both energy sectors, attending to the increasing demand generated by economic growth, have been encouraging environmental injustices (e.g. land expropriation and the degradation of local ecosystems, affecting mainly underprivileged groups).

The current model of economic growth is based on massive production and massive consumption, ensured by neoliberal policies (globally diffused by multilateral organizations) that allow the overexploitation of nature and of manpower - especially in developed countries, where international capital profits from the abundance of land and from the flexibilization of agrarian, labour and environmental laws. Despite economic growth (particularly in developing countries) and technological advances that enhance energy efficiency (mainly in developed countries), access to energy services between developed and developing countries and between social classes within developing countries is still extremely unequal. On the other hand, developing countries and underprivileged groups are the most affected by the negative environmental consequences of current patterns of consumption and production.

The discourse affirming that an unregulated market and technological advancement are able to promote sustainable development reveals its contradiction. Economic growth has encouraged extreme inequality among regions, social classes, genders and ethnic-racial groups. Alternative discourses and projects exist, are numerous and also vary in their political perspectives, goals and strategies. Some of them have shown that: 1) private property, massive consumption and profit generation are not the only possible values to guide the organization of social life and of political economy; 2) the concentration of capital and land based on centralized large-scale energy projects, monocultures and massive industrial production are not the only ways to organize economic production.

Furthermore, social movements, critical NGOs and academics have been showing how alternative ways of organizing economic, political and socio-cultural life (e.g. decentralized energy production and small-scale farming based on collective properties) are possible, but that the main obstacle they face is the inequality (among social and ethnic-racial groups) of the political power needed to implement them. The preservation and effective enforcement of already existing laws – ensuring the territorial and land rights of underprivileged groups - and the creation of new ones when necessary; the creation of policies that ensure infrastructure, credits, technical support and research focused on alternative models of food and energy production; and access to education for underprivileged groups, including the legitimation of traditional knowledge and the production of knowledge by underprivileged groups; all depend on a dispute over power – which occurs on an extremely unequal basis.

On a global scale, as in Brazil, policies and rules are highly manipulated by lobby groups who use their economic power to ensure that policies and rules preserve their privileges. The wind sector is a lobby group struggling to increase its influence on global and national policies and official discourses, in order to win social acceptance and create a positive regulative environment for the geographical extension and economic growth of this market.

I agree here with academics, social movements and NGOs who affirm that the market should be shaped and ruled by public regulations and that these should be defined according to a democratic political debate based on equal rights and recognition among social groups, gender and ethnic-racial groups (Dubash 2006; Mallon 2006; Portal do Mar 2012; Rede Brasileira De Justiça Ambiental 2014; Cumbers 2013).

Current technologies and techniques of wind power generation present two main principles that may be used for achieving environmental justice, when used in the context of policies and regulations created with the goal of environmental justice: 1) the possibility of producing energy without producing toxic waste or emitting polluting gases; and 2) the possibility of producing energy based on small-scale decentralized projects – promoting a more equitable distribution, among regions and social groups, of decision power and profits.

How these potentials are to be used in each national, regional and local context, depends on the regulative framework defined globally and in each context as well. As Rauch (2009) explains, sustainable policies and projects defined on one scale will not reach full effectiveness if they are not supported by corresponding changes on other scales. Also economic policies need to be coordinated with environmental, socio-cultural and political ones. In this sense the solutions to the cases of environmental injustice regarding wind farms in Brazil require multiple strategies, aiming ultimately to overcome unequal power relations, as we will see in the next chapter.

6. THE NATIONAL REGULATIVE FRAMEWORK AFFECTING CONFLICTS OVER WIND FARMS ON THE NE COAST OF BRAZIL

6.1. INTRODUCTION

So far we have looked at the theoretical basis that allows us to understand current processes of land-grabbing for the sake of sustainable development, based on the logic of an "economy of environmental protection" that complements the logic of the "economy of growth". We have seen how the economy of growth, under neoliberal reforms, is based on the concentration of land and the overexploitation of nature and labour, especially in developing countries. These processes in Brazil reinforce a framework of historical environmental injustice, which has been making traditional communities and their territories increasingly vulnerable to the aims of large national and international capital.

In Brazil, the public executive, legislative and judiciary powers have in general been negligent in their enforcement of the law and biased in the creation of new policies and regulations, reflecting the excessive lobby influence of the agribusiness, in alliance with the finance sector, on national politics. The recent and rapid expansion of the wind energy sector in Brazil reveals this problem, as a number of cases of environmental injustice against traditional communities have been reported on the northeast coast of the country – while investors have been benefiting.

However, traditional communities and peasant movements have been resisting the current national economic model and suggesting alternative modes of production (such as small-scale, family-based, agro-ecological food production and processing) based on alternative land regimes, ways of life, values and identities. These alternatives are articulated as part of a larger global movement that highlights how economic growth based on massive consumption and on the rationality of efficiency, and aimed at capital concentration, has failed to ensure food security and increased both the extreme wealth inequality in the world and the effects of climate change, which threatens everybody, but underprivileged groups in particular.

Energy demand is increasing for the sake of economic growth, and although new techniques and technologies are being implemented (such as energy efficiency and renewable sources of energy), energy poverty and the inequality of access to energy services among countries and among social classes is still extremely high. With regards to

this, critical academics, social movements and various members of civic society have been suggesting alternative models of energy production based on small-scale projects aiming at a more balanced distribution of the benefits and of the decisions related to energy production. We will now examine the extent to which the national regulative framework of energy and environmental policies in Brazil – which influence the way wind farms are planned, licensed and implemented - are contributing to a fairer distribution of the costs and benefits of wind energy farms across geographical areas and among social and ethnic-racial groups.

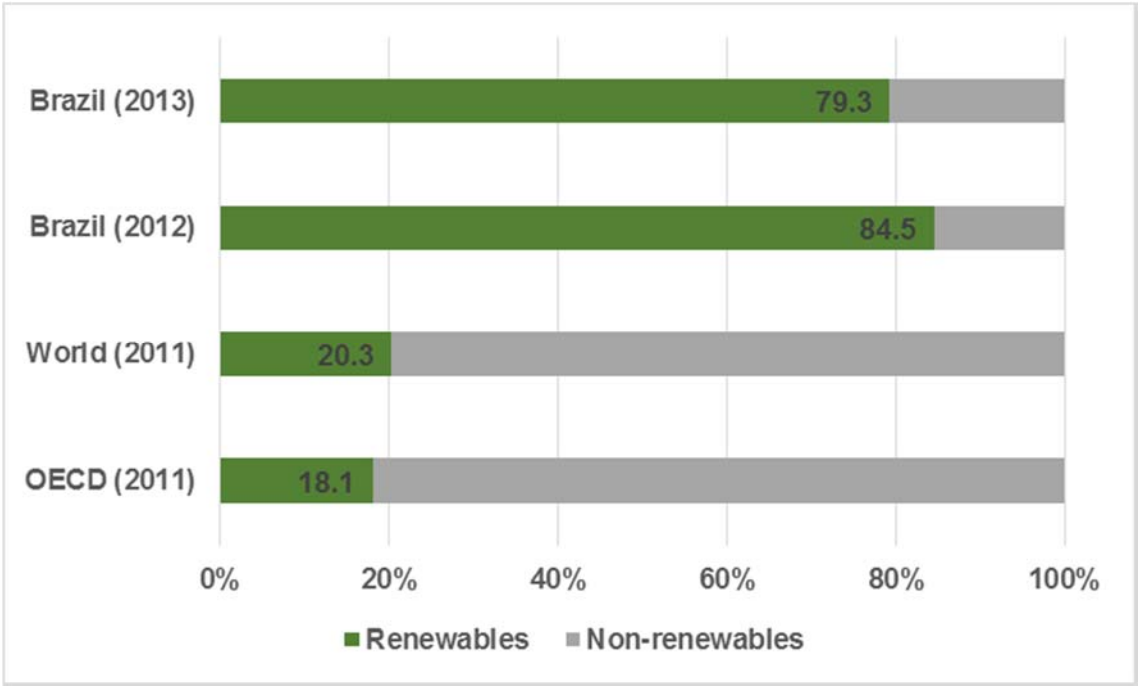
6.2. NATIONAL ENERGY POLICY AND THE NATIONAL ENERGY MIX

According to the the the brazilian public regulative agency for electric power, National Agency for Electrical Power, Agência Nacional de Energia Elétrica (ANEEL), the large potential of the approximately 8.5 million square kilometres of national territory and its seven thousand kilometres of coast could provide, in terms of hydraulic, wind, solar and biomass energy, enough power to secure Brazil's entire energy supply (Agência Nacional De Energia Elétrica 2002). In 2012 this country reached fourth position in the world rankings of both renewable energy production (behind China, India and USA) and the share of renewable energy in the energy mix (behind Iceland, Norway and Gabon) (Carta Maior 2014).

As we can see in these two figures, the participation of renewable energy sources within the Brazilian energy mix and electricity mix are among the highest in the world, representing respectively 41% and 79.3% of the total amount. The decrease occurring in Brazil from 2012 to 2013 was due to unfavourable hydrological conditions and an increased use of thermoelectric power (Empresa de Pesquisa Energética 2014b).

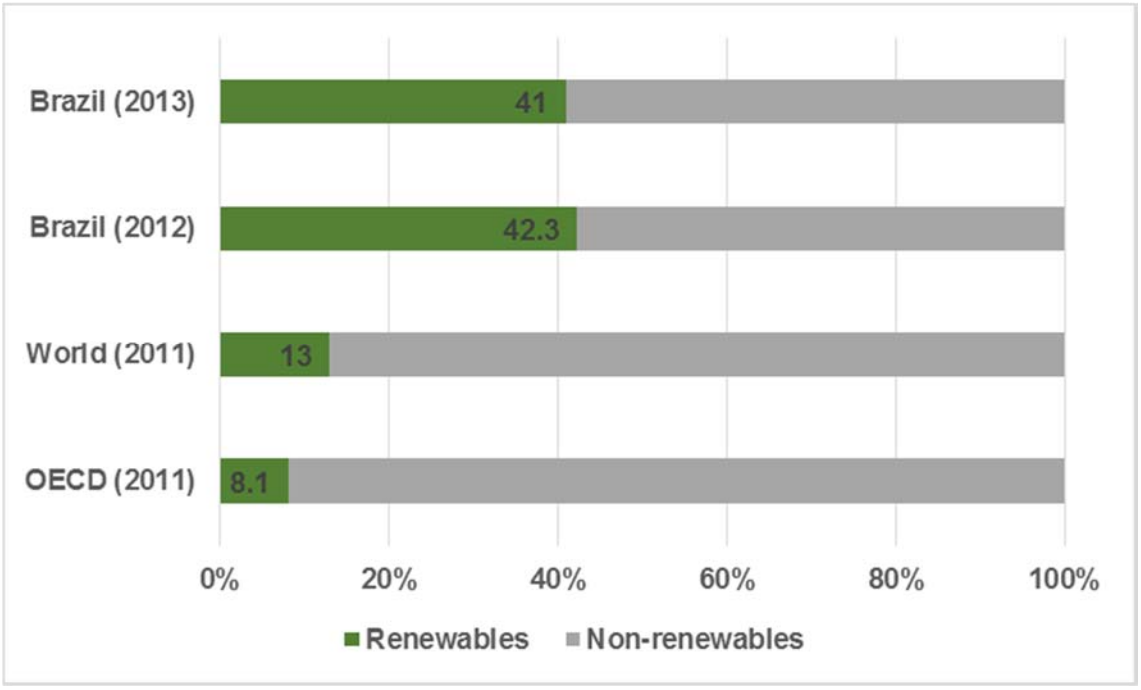
Observing the energy mix, we see that petrol oil and oil products constitute the major part of the energy mix, with 39.4% in 2013. These are followed by sugarcane biomass (16.1%), natural gas (12.8%), hydropower (12.5%), firewood and charcoal (8.3%), black-liquor and other renewables (4.2%), mineral coal (5.6%) and uranium (1.3%) (Empresa de Pesquisa Energética 2014b). Electricity represents 17.1% of Brazil's total energy consumption, divided among hydropower, natural gas, oil products, biomass, coal and coal products, nuclear and wind energy, as this diagram shows.

Figure 3. *PARTICIPATION OF RENEWABLES IN THE ENERGY MIX*



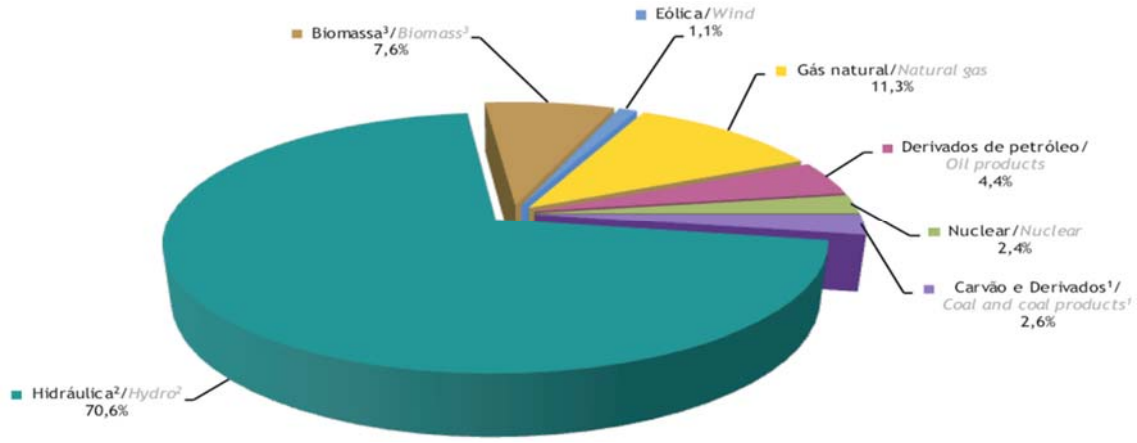
Source: Empresa de Pesquisa Energética 2014, year 2013.

Figure 4. *PARTICIPATION OF RENEWABLES IN THE ELECTRICITY MIX*



Source: Empresa de Pesquisa Energética 2014a, year 2013

Figure 5. BRAZILIAN ELECTRICITY MIX



Source: Empresa de Pesquisa Energética 2014b, Year 2013.

Observing the Brazilian electricity mix, we see that hydropower makes up more than half of the electricity produced. Despite being a renewable source, hydropower shows significant territorial impact. The construction of large and costly dams and reservoirs often affects the livelihoods of traditional communities and ecosystems, leading to land expropriation and to environmental damages (Agência Nacional de Energia Elétrica 2002; Arnauld De Sartre & Berdoulay 2011). Additionally, this source of energy depends on the unreliability of rainfall (Agência Nacional de Energia Elétrica 2002). Droughts have already caused power rationing crises in the country. Historically, another relevant aspect of the Brazilian energy system was the lack of access to electricity, especially in rural areas and the North Region (Rodrigues, 2006). Those living without access to electricity usually lived in areas with the lowest IDH and were members of low income families (Ministério de Minas e Energia 2014).

The first national programs of rural electrification appeared at the beginning of the 1970s, coordinated by the INCRA and the Ministry for Agriculture (Rodrigues 2006). Nevertheless, the creation of a legal model for rural electrification occurred after the Brazilian Constitution 1988, *Constituição da República Federativa do Brasil 1988*. It declared that the distribution of energy was an essential public service, which was the responsibility of the federal government (Rodrigues, 2006). In 2010, 1.3% of Brazilian households did not have access to electricity. In rural areas this percentage reached 7.4%, and in rural areas of the North Region there was an extreme difference: here, 24.1% of households did not have access to electricity, followed by the Northeast (7.4%) and the Centre-West (6.8%) (Instituto Brasileiro de Geografia e Estatística 2010).

According to the Brazilian Ministry of Mining and Energy, MME, the most recent program, called “Luz para Todos” reached 15.3 million rural inhabitants between 2003 and 2014

(Ministério e Minas e Energia 2014). Low income families, as well as indigenous and quilombolas groups, have access to low tariffs that may reach a 100% discount of their consumption up to 50 KW per Month (Ministério de Minas e Energia 2014). Access to electricity is seen by the government as a service that contributes to the enhancement of access to health services, education, the water supply and sanitation services (Ministério de Minas e Energia 2014).

In this sense, the main goals of national energy politics are: 1) to increase the energy supply and diversification of the energy mix, based on sustainable resources; and 2) to ensure universal access to electricity (CRESEB / CEPEL 2001, p. 10). The participation of so-called “alternative renewable energy” sources such as wind, biomass, photovoltaic and small hydropower plants in the national energy mix is still limited, but their shares have been growing (Agência Nacional De Energia Elétrica 2002). According to the ANEEL, the following are their shares within the Brazilian electricity installed capacity, considering the power plants in operation: biomass about 9%; wind energy 3.83%; solar energy 0.01%; and small-scale hydropower plants 3.54%, (Agência Nacional de Energia Elétrica 2015). Fossil resources represent about 17%, uranium 1.3%, imports 5.73% and the rest is made up of traditional hydropower plants (Agência Nacional de Energia Elétrica 2015).

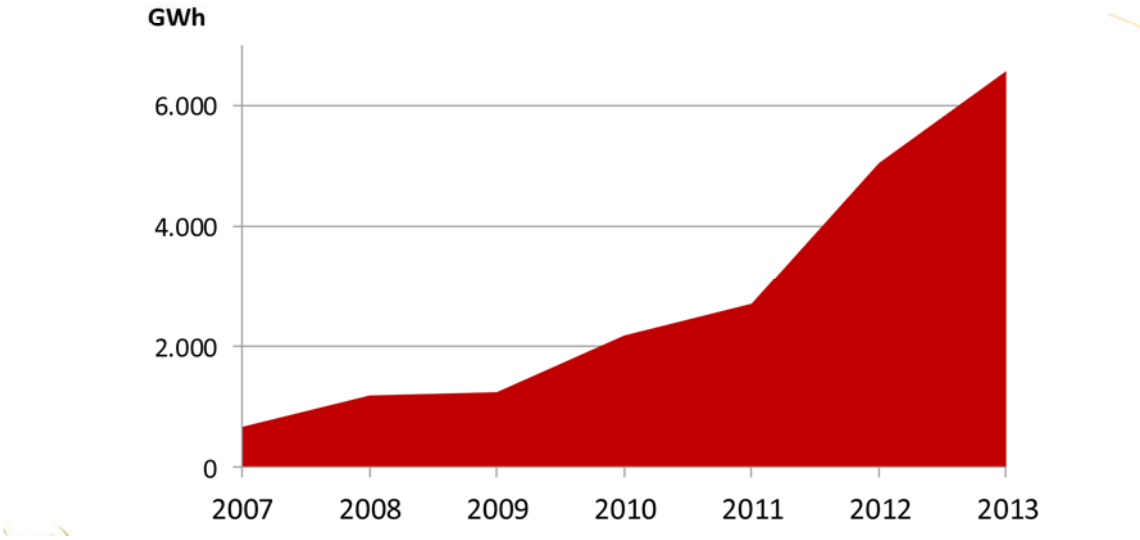
Based on the data of the Federal Agency for Energy Research, EPE, (Empresa de Pesquisa Energética), wind energy generation in Brazil rose from 663 GW in 2006 to 6576 GW in 2013 (Empresa de Pesquisa Energética, 2014), as we can see in the graphic below. According to researchers from the Centre for Research on Wind and Solar Energy (CRESEB) (Interview with Ricardo Dutra, 22 July 2011, Rio de Janeiro), and to researchers of the BNDES (Lage & Processi 2013), the expansion of wind power in Brazil corresponds to a search by international capital for new markets following an international financial crisis, as we have seen in the two last chapters.

In 2014, according to the EPE (Empresa de Pesquisa Energética 2015), the sector continued to grow, showing an increase of 126.7%, rising from 2.181 MW to 4.945 MW. This continued increase was based on the support of public policies and loans, as we will see later on. In a global context some events were decisive to the establishment of new patterns and rules for energy production in Brazil.

Figure 6. BRAZILIAN WIND POWER INSTALLED CAPACITY IN MW FROM 2007 TO 2013

em GWh

2007	2008	2009	2010	2011	2012	2013	Δ 13/12
663	1.183	1.238	2.177	2.705	5.050	6.576	30,2%



Source: Empresa de Pesquisa Energética 2014, Year 2013.

In 1972 the United Nations Conference on the Human Environment in Stockholm highlighted the need to implement measures to protect and improve the human environment (United Nations Environment Program 1972). Since 1986 the role of atomic energy in the world energy mix has been questioned and partly revised (Dutra 2007). Until then, it was seen as a source that, besides being renewable, was free of carbon dioxide emissions. After the atomic power plant accident in Chernobyl, Ukraine, the social and environmental safety of nuclear power started to become seriously questioned (Dutra 2007). A number of environmentally aware groups developed in Europe and the US in the 1980s, which pressured governments to invest in alternative energy sources (Dutra 2007).

In 1988 the United Nations Environment Program created the Intergovernmental Panel on Climate Change (IPCC) charged to collect and provide data from governmental research on climatic change around the world. The first IPCC report in 1990, the Panel on Climate Change, gave evidence of the urgent need to face climatic change. It was the motivation for the creation of the United Nations Framework Convention on Climate Change (UNFCCC) during the 1992 UN Conference in Rio de Janeiro. This convention became the key international basis for controlling human influence on the world's climate. Its ultimate objective is to stabilize greenhouse gas concentrations "at a level that would prevent

dangerous anthropogenic interference with the climate system" (United Nations Framework Convention on Climate Change 2015).

As we have seen, the importance of energy as a tool for achieving sustainable development was acknowledged at the United Nations Conference on the Environment and Development in Rio de Janeiro in 1992. Its Agenda 21 represented a commitment among more than 175 countries "*for achieving human-centred sustainable development"* (United Nations Development Program 2000). It recognized the fact that energy systems were not meeting the needs of the majority of the population and that the continuity of "business as usual" could compromise the environment and the future of coming generations.

Furthermore, in the same year, the UNFCCC addressed the link between fossil fuel energy and global warming through greenhouse gas emissions. Energy was again identified as the central issue of achieving sustainable development, at a United Nations General Assembly Special Session in 1997 (United Nations Development Program 2000). The second IPCC report of 1995 formed the basis of the adoption of the Kyoto Protocol in 1997.

The Kyoto Protocol established the commitment of all signatory states. Its main goal is the reduction of greenhouse gas emissions based on the principle of "common but differentiated responsibilities" to be shared by developed and non-developed countries. Industrialized countries and some Central and Eastern European transitional economies, who were considered to be responsible for most past and current greenhouse emissions (called Annex I countries), were expected by the year 2000 to reduce emissions to 1990 levels. The Kyoto Protocol became enforced in 2005 (United Nations Framework Convention on Climate Change 2015). Only some of the Annex I countries have achieved the required level of emission reduction (United Nations Framework Convention on Climate Change 2015).

These initiatives, occurring on a global scale, particularly started to have more relevant effects on the Brazilian wind power sector from the first decade of the 21st century onwards. Brazil's first efforts to make the energy mix more sustainable occurred in the 1970s, but this was mainly driven by economic reasons rather than environmental ones. The federal government then created a policy to promote the production of fuel alcohol from sugar cane. The so-called "Proalcool" (National Program for Fuel Alcohol) aimed at protecting the national economy from the high oil prices that followed the petroleum crisis of 1973 (Barros et al. 2009). Its consequences are still quite visible today. In 2010, 23% of the country's light vehicle fleet had a flexible fuel technology, which was able to consume

both alcohol and gasoline (Losekann & Lilela 2010). In addition, Brazil reached in the same year worldwide leadership in the export of ethanol, closely followed by the United States (Ministério da Agricultura, Pecuária e Abastecimento 2010).

A landmark moment in Brazil's process of the constitution of its energy system was the creation, in 1996, of the ANEEL. During the 1990s as already mentioned, Brazil undertook a wave of privatization - affecting, among others, the energy sector - and created regulatory agencies through which the state acts as a regulator rather than an executor (Santos & Xavier 2009). In 1997 a new plan, the National Energy Policy, better known as the Petroleum Act, defined the goal of the diversification of the energy mix, in order to achieve nationwide access to electricity and sustainability (Santos & Xavier 2009). For the first time, the vision of a possible future energy scarcity and the threat of climatic change started to become part of an integrated energy policy in Brazil (Santos & Xavier 2009).

Dutra (2007) shows how the global environmental agenda began to exert greater influence over Brazilian policy after the ECO 92, although the process developed slowly. After hosting the second United Nations Conference on the Human Environment in Rio de Janeiro in 1992, Brazil conducted pilot projects on solar photovoltaic energy and wind energy, and signed agreements to adopt German and North American technologies (Dutra 2007).

However it took some time until the first successful steps establishing a renewable energy policy were implemented. The Program of Support to Alternative Energy Sources, PROINFA (Programa de Incentivo às Fontes Alternativas de Energia), was implemented in 2002 to promote the development of renewable energies in Brazil, more specifically wind power, biomass and small hydroelectric plants (Costa 2006; Dutra 2007).

Parallel to this initiative the government promulgated, in 2004, the New Model for the Electricity Sector, whose goal is to ensure stable rules, safety and special tariffs within the industry that produces and distributes electricity (Dutra 2007). This included a set of measures aimed at establishing a safer and more attractive environment for investors. This new law established the goal of reducing spatial inequalities, while considering each region's particularities and comparative advantages (in terms of availability of renewable and non-renewable resources, potential for technological development, necessity of environmental protection and the instruments available for the promotion of socio-economic development) (Passeggi 2009).

Here it is important to highlight that, as social movements, researchers and NGOs have demonstrated, social and environmental factors are often left to a second plan when it

comes to energy projects such as large-scale hydropower plants, sugar cane monocultures for biofuels and large-scale wind farms – for the sake of so-called "progress", "sustainable development" and economic growth (Acselrad et al. 2009; Brown 2011; Arnauld De Sartre & Berdoulay 2011; Pietrafesa & Santos 2014, Interview with the Director of the Heinrich-Böll Stiftung Brasil/RJ, 17.10.201; Rede Brasileira de Justiça Ambiental 2014; Portal do Mar 2012; Zhouri 2008).

Dutra (2007) analysed the Brazilian wind power sector from the perspective of energetic planning, in his PhD research at the Federal University of Rio de Janeiro. According to him, despite being the target of some criticism, the PROINFA demonstrated the new government's willingness to diversify the Brazilian energy mix. The PROINFA aimed to diversify the energy mix, increasing the energy security of the national energy system through investment in renewable sources (Agência Nacional de Energia Elétrica 2012; Costa 2006). It ensured feed-in tariffs, stable 20-year contracts, and public loans offered by the federal development bank BNDES. The program was coordinated by the MME and the first wind energy projects were contracted in 2004 (Costa 2006).

The first phase involved 3300 MW for projects in biomass, small hydroelectric plants and wind energy. The second phase established that 10% of the national energy demand should be supplied by renewable energy sources (Dutra 2007). From 2007 the PROINFA received extra funds from the Growth Acceleration Program, the so-called PAC 1, implemented by the Federal Ministry of Planning.

Dutra, (2007) highlights the key role played by the state through the establishment of clear rules and policies for renewable energy. According to him, regarding wind power, these policies have not only stimulated the generation of a cleaner source of energy, but also promoted the development of a number of industries and services that supply the wind sector. A central aspect of the PROINFA was the rule that established a minimum "nationalization index" of wind turbine equipment (the percentage of equipment that had to be made in Brazil), a rule used in order to promote the national industry and also to encourage foreign companies to settle in Brazil. The index was 60%, to be fulfilled with the implementation of the projects, and which had to be met in order to receive public loans from the national development bank BNDES. At the end of 2012 BNDES implemented new rules, as a result of which companies now have more time to meet the requirements related to the nationalization of products (Ministério de Minas e Energia, 2015; Banco Nacional de Desenvolvimento Econômico e Social 2012).

According to the BNDES the goal is to

> *(…) gradually increase the local content of wind turbines, promoting the fabrication in the country of components with high technological content and which are labour intensive, in order to make the national industrial park more sophisticated and generate qualified jobs* (Banco Nacional de Desenvolvimento Econômico e Social 2012).

I have been unable to analyse the effects of this change, because at the time I conducted my fieldwork and interviews with experts in Brazil, the rule was still only recent. The most recent data found on this issue is an article published by two BNDES researchers in June 2013, concerning wind power policies and the sector's supply chain (Lage & Processi 2013). It highlights the fact that, despite the "nationalization index", the national industry that supplies this sector is still restricted to the assembly of the main components, while the research and technological innovation sectors remain located in the companies' headquarters (Lage & Processi 2013).

A wind turbine is composed of its tower, blades and the nacelle, which is the key part as it contains the power generator and the wind turbine's technology (Lage & Processi 2013). The industries forming the wind power sector's supply chain with unities installed in Brazil are mainly producing blades (two Brazilian companies Tencies and Aeris) and towers (Gestamp from Spain; and the nationals Engebasa e a Tecnomaq). The main suppliers of nacelles in Brazil are the foreign companies Enercon (German), Impsa (Argentinian), GE (USA) and Suzlon (Indian) that are providing wind turbines for the wind farm concerned in my case-study (Lage & Processi 2013).

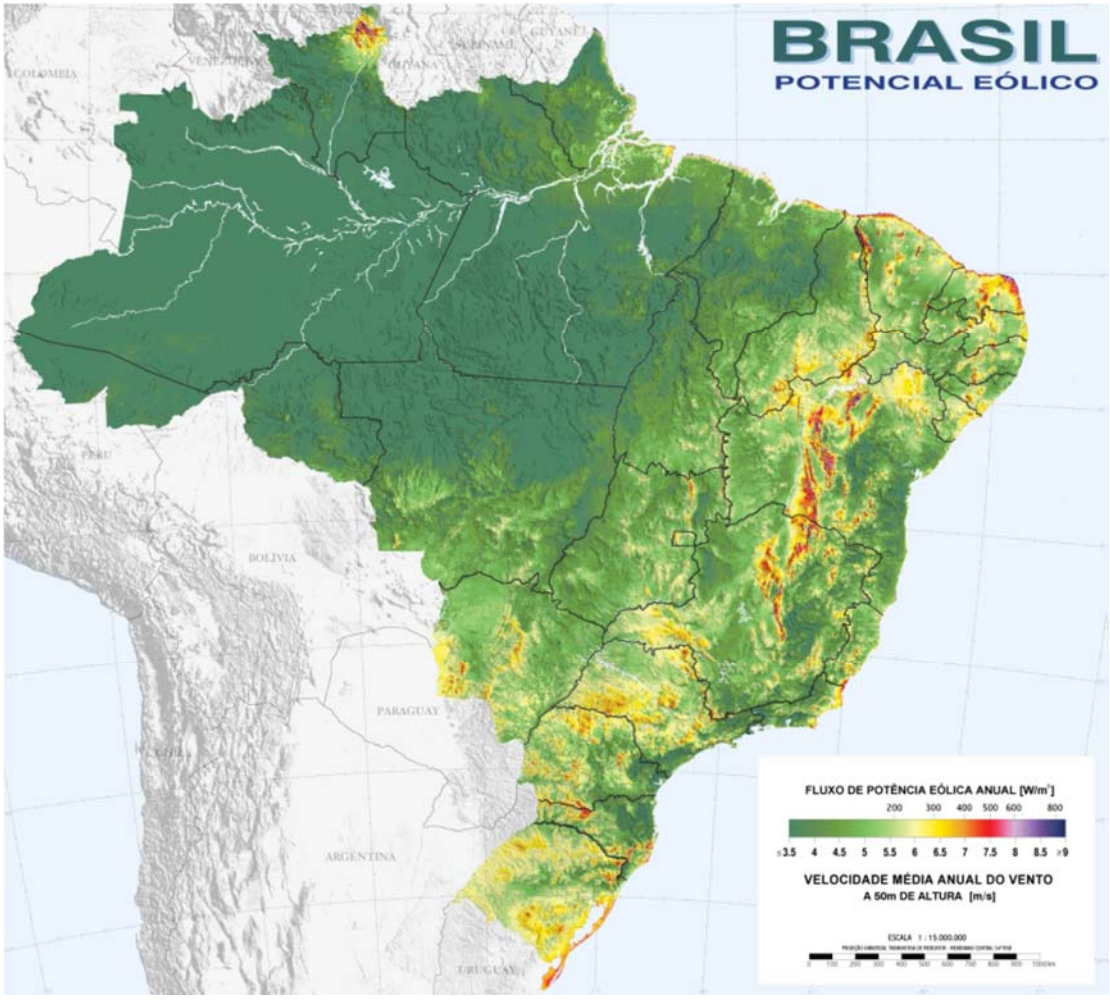
At the time of the article's publication (2013), eight manufacturers had unities installed in Brazil, producing pieces for the wind turbines and/or assembling them: Wobben (Enercon), Wind Power Energia (Impsa), GE, Alstom, Gamesa, WEG, Vestas and Siemens. The companies Acciona and Suzlon had plans to install unities in the country as well (Lage & Processi 2013) The plan to produce a completely national wind turbine was announced by the WPE, which despite being controlled by the Argentinian company Impsa, is developing a large part of the technologies and research in Brazil. The countries with the largest wind turbine manufacturing companies are Denmark, China, Germany, the USA, India and Spain (Lage & Processi 2013).

Regarding wind power policies, the autors highlights that, since 2009, public auctions have replaced the feed-in tariff established by the PROINFA as a new regulatory instrument for the wind sector (Lage & Processi 2013). The initial price is defined by the ANEEL, and the most competitive offer wins the contracts. The auctions for renewable energy include wind power, biomass and small hydropower plants, are organized by the Commercial Chamber

for Electricity (CCEE) and are regulated by the ANEEL. Wind energy companies offer energy, and electricity distribution companies buy it, through 20-year contracts. The energy will be added to the SIN (Sistema Interligado Nacional), the national integrated electrical grid. The PAC 2 (2011-2014) continued to invest in wind farms through the BNDES.

If we compare the better wind conditions shown in the first map (Figure 7) below - those areas in red and purple - with the regional map of Brazil (Figure 8), we can observe how these areas are particularly concentrated in the Northeast Region. The areas located in the north-eastern state of Maranhao are mostly isolated areas which are not suitable for the centralized model of production based on large-scale farms to be connected to the SIN (Ricardo Marques Dutra, Researcher of the Brazilian Reference Center for Wind and Solar Energy, 22 July 2011, Rio de Janeiro, Brazil). Thus, the states that attract the most investment in the Northeast Region are Ceará, Rio Grande do Norte and Bahia (Empresa de Pesquisa Energética 2014b).

Figure 7. BRAZILIAN WIND POWER POTENTIAL



Source: Centro de Referência para Energia Solar e Eólica Sérgio Brito 2001.

Figure 8. BRAZIL'S TERRITORIAL DIVISION INTO FIVE REGIONS ACCORDING TO THE IBGE

Map Legend: Norte/North; Nordeste/Northeast; Sudeste/Southeast; Sul/South; Centro-Oeste/Centre-West

Source: Instituto Brasileiro de Geografia e Estatística 2015.

In January 2014 the Northeast accounted for 78% of the wind power generated in the SIN, while the South and Southeast concentrated 20% and 2% respectively (Empresa de Pesquisa Energética 2014b). Ceará was leading the new investments and concentrated the largest installed capacity of wind power until the beginning of 2014 (Souza 2014). In 2014 the state of Rio Grande do Norte overtook Ceará and currently possesses the largest installed capacity and number of wind farms (Souza 2014).

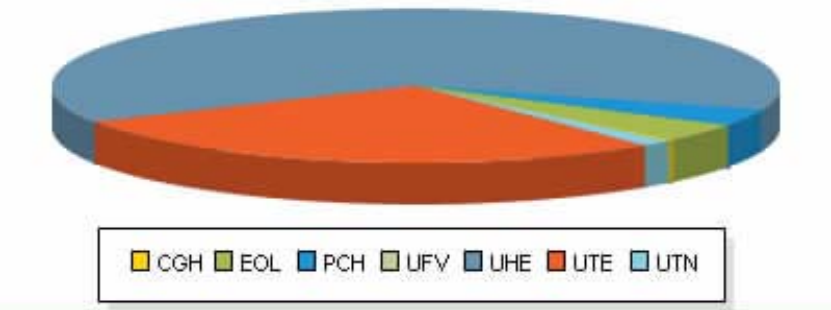
At the end of 2014, the ranking of states with the largest installed capacity of wind power was as follows: Rio Grande do Norte (NE) with 1,723 MW (60 wind farms); Ceará (NE) with 1,201 MW (41 wind farms), Bahia (NE) with 842 MW (33 wind farms), Rio Grande do Sul (South) with 715 MW, and Santa Catarina (South) with 222 MW (Empresa de Pesquisa Energética 2014b).

In the Northeast, projects have received loans from the Northeast's development bank, BNB (Banco do Nordeste do Brasil) – a public bank oriented towards regional development (Diario do Nordeste 2011). In this region, 61% of the municipalities present low Human Development (PNUD 2013). In addition, the interior portion of its territory is marked by an annual long dry period, so that irrigation programs to mitigate the problem require a great amount of energy. The goals of BNB's policy of supporting wind energy are to reduce the energy dependence of the northeast, to generate employment and to improve the education of the manpower in the region (Serpa 2009).

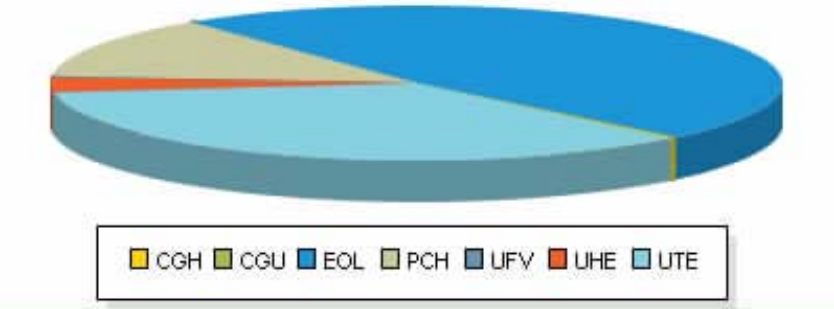
Brazil today has a total of 3,610 electricity generation projects in operation, totalling 134.342,397 KW of installed capacity of electrical power (Agência Nacional de Energia Elétrica 2015). For the coming years, an addition of 36.672,776 KW to the country's generation capacity is planned, produced by 202 projects currently under construction and 582 other contracted projects whose construction has not yet begun. Considering the amount of energy expected from the electricity generation projects under construction, wind power represents 14.63% of the country's overall total, and 48.02% of the total energy of projects which have not yet started construction (the majority of the expected potential, overtaking hydropower) (Agência Nacional de Energia Elétrica 2015). Comparing the following diagrams we can see the expected increase in wind energy projects over the coming years:

Figure 9. ELECTRICITY POWER PLANTS IN OPERATION (A) AND ELECTRICITY POWER PLANTS NOT YET UNDER CONSTRUCTION (B)

(a)



(b)



CGH	Central Hydroelectric Generator /Central Geradora Hidrelétrica
CGU	Undi Power Plant /Central Geradora Undi-elétrica
EOL	**Wind Power Plant**/ Central Geradora Eólica
PCH	Small Hydro Power Plant/ Pequena Central Hidrelétrica
UFV	Solar Photovoltaic Power Plant/ Central Geradora Solar Fotovoltaica
UHE	Hydro Power Plant/ Usina Hidrelétrica
UTE	Thermo Power Plant/ Usina Termelétrica
UTN	Thermo-nuclear Power Plant/ Usina Termonuclear

Source: Agência Nacional de Energia Elétrica 2015

Currently Brazil has 238 wind energy power plants authorized by ANEEL, with a supervised power capacity of 5.139,489 KW, representing 3.83 % of the total supervised power.

The main advantages of wind energy in general are firstly that it is a source of energy that generates no waste, gas pollution or radioactive waste (Dutra 2007). Secondly, the

technology linked to the energy sector has been developing continuously, making it increasingly efficient and profitable (Global Wind Energy Council 2015). Thirdly, it may be produced based on decentralized energy systems, profiting from the seasonal and daily variations of the availability of wind according to location and favouring more democratic models of wind farm planning and management – where decisions and profits are more equally distributed across geographical areas and social groups (based on cooperatives, local and regional private investors, public companies, NGOs etc (Agentur für Erneuerbare Energien 2011; Bundesministerium für Verkehr, Bau und Stadtentwiklung 2011; Bundesverband Wind Energie 2012; Starkenburg 2014; Blume 2010).

Additionally, wind farms in general create a large number of new temporary as well as stable jobs during their construction and through the maintenance of equipment and the growth of chain industries and support services (Dutra 2007). According to the GWEC, (Global Wind Energy Council 2015), a wind turbine consists of more than 8000 parts, which means that many jobs are created in the supply chain of all these parts. Also according to the GWEC, (Global Wind Energy Council 2015), in 2012 “approximately 670.000 people were employed directly or indirectly in the global wind power industry” (“from manufacturing to services and development”). “In Brazil alone, 15.000 new jobs were created by the wind industry in 2012” (Global Wind Energy Council 2015). Later we will see how this data obscures important problems when looking at the local scale, namely on the northeast coast of Brazil.

In general, some negative factors concerning the wind power sector also have to be considered, such as: 1) shadows during the day, light during the night and noise produced by the turbines which disturbs inhabitants living near wind farms; 2) effects on the landscape which create conflicts with those living from tourism in places with touristic potentials; 3) the death of migratory birds due to collision with turbines; and 4) dependence on the variation of wind, which does not necessarily correspond to fluctuation of the daily and annual demand for wind power (Schwahn 2000; Interview with Hanno Brühl, Manager of the Department for Renewable Energy and Energy Efficiency of the Public Energy Enterprise of Tübingen, Germany, 2012; Interview with Jürgen Simon, Wind energy planner of the Energy Cooperative Starkenburg, Germany, 2012).

Nevertheless, in developed countries these problems have been tackled with greater levels of participation, enhanced planning and technological advancement. Some examples are: 1) a) new turbines that reduce the noise that they used to produce, which had disturbed local inhabitants, and b) better planning of the location of the turbines, in order to avoid shadows being cast over houses; 2) planning that avoids birds’ migratory

routes, thus reducing bird deaths caused by wind farms; and 3) new technologies that enhance the efficiency and capacity of batteries capable of storing the surplus wind energy (Dutra 2007; Junior, 2009; Schwahn 2000). Regarding tourism, the wind farms have in some places been attracting new tourists and school groups willing to visit the facilities and gain information about this source of "sustainable" energy (Austrian Wind Energy Association 2015; previous field work in Canoa Quebrada, Ceará, Brazil, July 2011; field work in Cumbe, Ceará, Brazil, November 2013).

In the particular case of Brazil, there are four main challenges from the perspective of the investors. The first one is the gap between the construction of wind farms and the construction of transmission lines that connect the wind farms to the SIN (Elizondo et al. 2014). The problem was discussed at a public hearing in 2013 (Câmara, 2013), during which the MME recognized the failures that had occurred in 28 wind farms in the Northeast Region and represented a monthly loss to the government of roughly 11.5 million US Dollars (33 million Reais) (Câmara, 2013).

The company responsible for the construction of the transmission lines, the public company Companhia Hidro Elétrica do São Francisco (CHESF), was fined roughly 4 million US Dollars (11.5 million Reais). According to CHESF the main problem was the fact that the public auctions for the transmission lines occurred only some time after the auctions of energy sale, delaying the construction of the transmission lines. Besides that, mistaken evaluations of the construction plans and the excessive rules on the process of environmental licensing were mentioned as well (Câmara, 2013). Here it is important to highlight how the discourse advocating progress and economic growth frequently sees environmental licensing as a barrier, instead of understanding the environmental issues as an integrated aspect of development.

Further challenges are the lack of qualified manpower (Tribuna do Norte 2014) and the still incipient supply chain of products and services for the Brazilian wind sector, as we have just seen (Agência Brasileira de Desenvolvimento Industrial, 2014). A Mapping of the Productive Chain of the Wind Industry in Brazil was published in 2014 by the Brazilian Agency for Industrial Development (Agência Brasileira de Desenvolvimento Industrial) and the Ministry of Development, Industry and Foreign Trade, which shows the increasing relevance of the sector for the national economy (Agência Brasileira de Desenvolvimento Industrial, 2014). Since it is not the focus of my research, I will not be expanding on the analysis of this data.

One advantage of wind energy production specific to the Brazilian energy system should be underlined: wind patterns have a seasonal variation that complements the seasonal

variation of the main electrical power source of the Brazilian energy mix, which is hydropower (Dutra 2007). While water reserves are low during the dry periods, this is when wind potential attains its highest levels (Dutra 2007). This factor increases the national energy security.

Thus, by investing in wind energy, the government aims to reduce the dependence on hydropower, which increases energy security; to reduce national CO2 emissions, complying with the global environmental agenda for climate change containment and sustainable development; and to increase the energy supply in order to ensure economic growth (Dutra 2007).

In 2012 alone, the BNDES issued about 1.4 billion dollars in loans for wind power projects (Folha de São Paulo, 16.01.2013). As we have seen, wind energy prices are declining and investments are growing, strengthening a centralized model of wind energy production based on large-scale projects. That constitutes a positive framework if we consider that the national market has been continuously growing. Nevertheless, in the region receiving the largest share of investments (the northeast coast of Brazil), these investments have been criticized by the poor communities affected, academic researchers, public prosecutors and environmental NGOs. They question the licensing of wind projects in environmentally protected areas called APP (Area of Permanent Protection), the enclosure of areas of common use, which disrespects the territories of traditional communities, and a number of resulting environmental injustices.

According to Antonio Jeovah de Andrade Meireles, a geography professor at the Federal University of Ceará, most problems occurring in wind projects in Ceará could be avoided if the choice of the wind farms' location effectively took into account not only economic benefits from the point of view of the investors, but also the environmental and social impacts of projects (Fernandes 2009). Areas with wind speeds of 6 m/s located behind (and not above) the sand dunes would cause less negative impact on the local ecosystems and on the livelihoods of local communities, but investors rejected them in favour of areas above the dunes, where wind reaches speeds of 8 m/s. Also public prosecutors stated their concerns about the way that projects from future Auctions for Alternative Energy would be implemented (Fernandes 2009).

At the time I began this research, in November 2010, Ceará concentrated most of the wind projects constructed and under construction, and most conflicts with local communities - indicating cases of environmental injustices. I could observe an imbalance in the distribution of the wind farms' costs and benefits, which were later highlighted by affected communities in the states of Rio Grande do Norte and Bahia. We will now analyse the

regulative framework concerning environmental licensing in general and of wind farms in particular, to examine the extent to which it contributes to environmental justice.

6.3. NATIONAL ENVIRONMENTAL POLICY AND THE WIND POWER SECTOR IN BRAZIL

On a national scale, besides looking at the regulative framework regarding energy in general and wind energy in particular, I will look at the regulative framework concerning how governmental environmental management guides the way investors plan and implement their wind projects in the country. I will therefore analyse key official documents, such as legal provisional measures, legislative resolutions and governmental reports that affect the planning, licensing and implementation of wind farms in Brazil.

Explicit environmental policies concerned with environmental conservation and preservation did not emerge until the 1970s (Acselrad et al. 2009). They are the result of internal pressure from social groups that, despite not being identified as environmental movements, protested against local cases that could be described as cases of environmental injustice * – and also the result of influence from the global political agenda. An environmental discourse was emerging globally, concerned mainly with the limits of growth. After the United Nations Conference on the Human Environment in 1972, like many other countries, Brazil created its first federal environmental agency, the SEMA, Secretaria do Meio Ambiente (Acselrad et al. 2009).

These groups were made up of peasants, members of traditional communities and the inhabitants of the peripheries and slums, who suffered from the transference of environmental damages to their neighbourhoods and territories, and from processes of land speculation and land expropriation. These three processes, usually working together, have pushed these groups out and forced them to live in areas near waste dumps, areas without sewage treatment, areas near polluting fabrics, or areas where they can only farm near to where monocultures use agrochemicals that poison soils and water (Acselrad et al. 2009). Also due to lack of options, underprivileged groups are driven to work in dangerous conditions where toxic substances endanger their health and pollute the environment (Acselrad et al. 2009).

When the SEMA emerged during the dictatorship it initially kept itself very distant from social demands. Later on, two important steps for environmental policy were the creation of the National Environmental System (Sisnama) and the National Environmental Council, Conselho Nacional do Meio Ambiente (CONAMA), in 1981, which achieved the integration

of explicit and implicit environmental policies, such as agricultural, industrial and energy policies among others (Acselrad et al. 2009).

Thus during the 1970s and 1980s, instead of aiming to deal with the conflictive disputes over the appropriation of natural resources, instead of supporting the various groups of interest with alternative projects and development ideas, environmental policy emerged as a way of containing social pressure and ensuring the appropriation of the environment by the state and by private capital, in order to ensure the building of large infrastructural works, the "conservative modernization" of the countryside (mentioned in Chapter 3) and the development of Brazil's industry, which all occurred during this period (Acselrad et al. 2009).

With the democratization of the country, the Brazilian Constitution 1988, *Constituição da República Federativa do Brasil 1988,* achieved three important steps for the social-environmental struggle: It declares: 1) that the environment is a common good (and therefore subject to equal access and whose appropriation must take into account the interests of the entire community); 2) that an ecologically balanced environment is a right of every citizen, and must be guaranteed by the state for both present and future generations (Loureiro, 2012); and 3) that participation is a key goal of public environmental management (Conselho Nacional de Segurança Alimentar e Nutricional 2013).

As we have seen, the democratization of the country allowed the emergence of new political actors - such as indigenous people, quilombolas, rubber tappers, riverside communities and ´babaçu´ collectors among others - struggling not only for an equal distribution of wealth and land, but also for the recognition of their territories and identities (Cruz 2013; Glass 2011). Social movements that criticised the development model in the 1970s and 1980s such as the MST, or the MAB (Movimento dos Atingidos por Baragens; the Brazilian Movement of Water Dam-affected people) reformulated their discourses articulating them to the critical environmental debate (Aceselrad *et al.* 2009; Loureiro 2012). In 2001 the creation of the RBJA, working with environmental issues from the perspective of "environmental justice", gathered together researchers, social movements, indigenous groups, fisher communities, labour unions and quilombolas communities among others, in order to articulate discourses and to coordinate political interventions, as well as to produce knowledge to legitimate their actions (Loureiro 2012).

On the global scale this period corresponds to an increased concern for biodiversity preservation and for climate change contention, which are reflected by some international agreements such as Convention 169 of the (ILO) of 1989, or the UN Convention on

Biodiversity, which took place at the UN Summit in Rio de Janeiro in 1992 (Arnauld De Sartre & Berdoulay 2011). As we have previously noted, this global context influences Brazilian land and environmental regulations: *Decreto 4887/200 and Decreto 6040/2007*.

The acknowledgement of the fact that indigenous groups and other ethnic-racial minorities are essential for biodiversity preservation; that their livelihoods and identities depend on the access to and use of natural resources; and of the responsibility of national governments to guarantee these minorities' rights to sustainable development, to remain in their territories, to preserve their identities and to participate in decisions affecting these territories; has directly influenced the government's environmental management (Acselrad et al. 2009; De Sartre & Berdoulay 2011; Loureiro 2012). These groups' rights would in theory have to be considered by the environmental licensing of all investments and infrastructural works affecting them.

Nevertheless, researchers, environmental movements and critical environmental NGOs have demonstrated: 1) the omission of the government on all scales when it comes to environmental licensing and surveillance; and 2) the ideological inclination of the judicial powers to favour the interests of investors when it comes to judicial conflicts over environmental licensing processes, which is mainly based on two conceptions of the environment: either as an obstacle to economic development and progress, or as an economic opportunity for big business through the privatization, financing and enclosure of natural resources (Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013; Interview with Rodrigo de Medeiros Silva, RENAP/Brazil/ CE, 12/09/2013; Interview with Cumbe inhabitants 2013; Quintans 2008).

In 1989 the current national executive environmental institute, IBAMA, was founded, and the current Brazilian Ministry of Environment, MMA, in 1992. In 2007 the responsibility for the National System of Conservation Unities was transferred from the IBAMA to the Instituto Chico Mendes de Conservação da Biodiversidade, Chico Mendes Institute for Biodiversity Conservation (ICMBio). The ICMBio's role is to implement, propose, manage, supervise and monitor the areas for environmental conservation created by the federal government, the so-called UC (Unidades de Conservação); as well as to conduct research on the preservation and conservation of biodiversity in Brazil (Instituto Chico Mendes de Conservação da Biodiversidade 2014). The ICMBio is attached to the Ministry of Environment and part of the Sisnama (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis 2014).

Currently, the IBAMA's role, among other things, is to: implement national environmental policies; carry out the environmental licensing of projects which affected more than one

state; exercise the power of the environmental police; propose and install environmental quality standards and zoning systems and carry out environmental impact assessment; conduct environmental monitoring and apply administrative penalties (particularly with regard to the prevention and control of deforestation, fires and forest fires); generate and disseminate information relating to the environment; implement environmental education programs; develop the information system and establish criteria for the management of the use of wildlife resource, fisheries and forestry (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis 2014). The IBAMA may work in cooperation with other federal agencies, with Sisnama member states and Municipalities, and with organized civil society, in order "to achieve its objectives, in line with the guidelines of the national environmental policy" (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis 2014).

A further key environmental regulation is the New Forest Code, implemented in 2012 by the law *Lei N. 12.651/2012*, in substitution of the previous law of 1965 (Câmara 2012 b). It is seen, by social movements, critical environmental NGOs, critical academics and sections of the media, as a significant regression from the achieved rights of peasants, traditional communities and indigenous people, and from the preservation of the country's biodiversity, forests and water resources, for the benefit of big business.

After this general overview, which has allowed us to understand the national regulative general framework concerning the development of the Brazilian wind power sector, let us now analyse some laws and reports that are directly related to the planning, licensing and implementation of wind farms in Brazil – aiming to evaluate the extent to which they contribute to environmental justice.

Legislative Resolution, Resolução CONAMAº 237, 1997

The agency responsible for environmental licensing is the IBAMA in the case of projects which affect more than one state. If the impacted area is limited to one single state, and two municipalities, the responsibility lies with that state's environmental body (in our case-study the state of Ceará). According to ***the*** *Resolução Conamaº 237, 1997, Artigos 4, 5 e 6*, when only one municipality is affected, the responsible body is the municipal environmental agency. The federal agency may delegate the licensing process to other spheres or require technical examination from them. Also when the licensing occurs on lower scales it may depend on approval from superior spheres. In the case-study area the agency responsible for environmental licensing was the Environmental Agency of the State of Ceará, SEMACE.

Legislative Resolution, Resolução CONAMA N. 001/1986

Concerning the general definition of environmental impact, the legislative resolution, *Resolução CONAMA N. 001/1986*, includes effects* on public health, security and well-being; social and economic activities; biota; the aesthetic and sanitary conditions of the environment; and the quality of natural resources. What should be underlined here is that the impact of the wind farms on the livelihoods, territories and ways of life of the fishing communities of the northeast coast of Brazil belongs to a wider collection of the wind farms' environmental impacts (Meireles 2011; Brown 2012), although this is often disregarded by official discourse such as informative texts and technical reports put forth by the federal government (Ministério do Meio Ambiente 2014b) and the government of Ceará (Conselho Estadual de Desenvolvimento Econômico do Ceará 2010), or by the mainstream media (Calixto 2013; Brasil 2014).

*(footnote) The abovementioned effects are described by the *Resolução CONAMA N. 001/1986, artigo 1*, as any alteration of the physical, chemical and biological properties of the environment, caused by any form of matter or energy resulting from human activities which directly or indirectly affects (…)".

Brazilian System of Environmental Licensing Evaluation

In 1997 the MMA made an evaluation of the System of Environmental Licensing, Sistema de Licenciamento Ambiental, and initiated a modernization process involving the three government spheres (Ministério do Meio Ambiente, 2013b). The goal was to make the system more efficient, harmonized, decentralized, standardized and transparent. Besides that, they affirmed the necessity of adapting the system to the demands and priorities established by the Brazilian model of economic development (Ministério do Meio Ambiente 2013b). This process was divided into two projects.

The first project targets the strengthening of the licensing process at the state and municipal levels and is financed by the International Bank for Reconstruction and Development (IBRD) (Ministério do Meio Ambiente, 2013b). This Institution is a division of the World Bank and

> *"aims to reduce poverty in middle income countries and creditworthy poorer countries by promoting sustainable development through loans, guarantees, risk management products, and analytical and advisory services"* (International Bank for Reconstruction and Development 2014).

A second project aimed at the improvement of the federal licensing system is financed by the Inter-American Development Bank (IDB). It aims for the reduction of poverty and for

sustainable development in a “climate-friendly way” in Latin American and Caribbean countries (Ministério do Meio Ambiente, 2013b). What conditions were established by those institutions for the projects and what concrete influence they had on the current Brazilian System of Environmental Licensing are still open questions that I cannot answer due to lack of time. Nonetheless I have attempted to contact a member of the World Bank in Brazil, but did not receive an answer. Also, during the field research and through the analysis of literature and media articles I could observe that in the state of Ceará the licensing of wind farms presented a number of problems that will be discussed later.

Legal Act, Medida Provisória 2152-2/2001

What has been very important for the case-study analysis is the legal act, *Medida Provisória 2152-2/2001*, that was approved in the context of an electricity supply crisis that occurred in 2001 in Brazil, following periods of drought. This measure is responsible for the introduction of the so-called simplified environmental reports (Relatório Ambiental Simplificado, RAS), which have been highly criticised for allowing the installation of wind farms on the sand dunes of the northeast coast of Brazil (Meireles 2011).

The legal act, *Medida Provisória 2152-2/2001*, created the Management Board of the Energy Crisis (Câmara de Gestão da Crise de Energia Elétrica – GCE), which is supposed to implement emergency measures to tackle the energy supply crisis (Meireles 2011). The crisis was due to a critical drop in the water levels of reservoirs supplying hydroelectric plants, which are Brazil’s main electricity source. The goals are, among others, the full fulfilment of demand in order to avoid the reduction of economic growth and its impacts on employment and income levels. In this sense, Article 6 Item IV foresees the financing of research on the development of renewable energy (Meireles 2011).

Article 8 establishes that the licensing process will have to take into account the principle of rapidity. The licensing is to be carried out by the responsible agencies, including all formalities and, when necessary, the Report on Environmental Impacts known as the RIMA. It specifies that the “licensing process” will have to be decided within a maximum of four months, and establishes a so-called “simplified licensing process” to be decided within sixty days. The CONAMA was given a deadline of one month to define and publish the specific procedures of the “simplified environmental report” that should be used for the licensing of projects considered to be of low impact. The deadline for the examination of the RAS is sixty days.

Following the prescription of the legal act, *Medida Provisória 2.152-2*, the CONAMA published its Legislative Resolution, *Resolução CONAMA 279/ 2001*, which published four

documents for the “simplified licensing” of low impact projects. These are: 1) the Simplified Environmental Report (RAS) itself; 2) a detailed report of environmental programs; 3) an informative technical meeting (Reuniao Técnica Informativa); and 4) information about systems associated with the electricity project.

The Legislative Resolution, *Resolução CONAMA 279/ 2001,* differentiates its requirements according to phases of the licensing process. These phases are: 1) “previous license”; 2) “installation license”; and 3) “operation licensing”. Accoridng to the Article 3, for the previous licensing, only the first item is obligatory. According to the Article 5, when it comes to the installation license, the second document is obligatory, and also a Declaration of Public Utility. With both licensing steps, additional information may be required according to the case. Relevant questions now are: What does the previous license allow (e.g. participation in public auctions)? Do the meetings include the affected community? We will answer these questions for the case of Ceará while analysing the case-study.

The Informative Technical Meeting is foreseen but not mandatory. Article 8 establishes the possibility for the responsible environmental government body or for civic entities, the Public Prosecution Service, or a group of fifty persons aged 18 years old or over, to request it. The deadline is set at twenty days after the license requirement made by the investor. An important question is whether the interested parts receive enough information before this deadline in order to request a Technical Meeting. In the case-study, due to conflicts with the community, there was a public hearing involving the participation of the Public Prosecution Service, the State Superintendency of Environment of Ceará or Superintendência Estadual do Meio Ambiente do Estado do Ceará (SEMACE), the Bons Ventos S.A. and the community “Cumbe” and neighbour communities, among other participants, as we will see.

Research on Environmental Licensing of Wind Farms, Pesquisa Sobre Licenciamento Ambiental de Parques Eólicos (Ministério do Meio Ambiente 2010)

Another relevant source for the present research was a study elaborated by the National Secretary for Climate Change and Environmental Quality or Secretaria de Mudanca Climática e Qualidade Ambiental (SMCQ), titled “Research on Environmental Licensing of Wind Farms” (Ministério do Meio Ambiente 2010). In 2009, the SMCQ conducted an inquiry with state environmental bodies and with the IBAMA. By that time the system of auctions for wind power was due to be experimented for the first time and the great number of inscriptions created positive expectations from the government. The document states that wind power is a priority sector for the Environmental Ministry and has been the focus of growing interest from investors (Ministério do Meio Ambiente 2010).

It is interesting to observe a comparative table presented in this study, showing how the criteria, the legal basis and the procedures used for the licensing of wind farms varies from state to state. The only state where the criteria “low environmental impact” was mentioned (when representatives were asked about the main criteria for the licensing of wind farms) was the state of Bahia, while the others mention location and energy potential. All states must require environmental reports, nevertheless most of them require only a simple report (in accordance with the legal act, *Medida Provisória 2152-2/200*). A further interesting comparative table shows the stated “potential impacts of wind farms” on each state, according to the environmental agencies of each state. In the state of Ceará, the answer was:

> *(…) increase in energy offer, alteration in the landscape, threats to the fauna, environmental discomfort caused by earth-moving machinery* (Ministério do Meio Ambiente 2010, p. 3).

The socioeconomic problems highlighted by the research of Meireles (Meireles, 2008; Meireles 2009a, Meireles 2009b) and Lima (Lima 2009) were not mentioned. The survey has classified a list of 28 various impacts, in seven types, that were mentioned. In the states of Northeast and South, the SMCQ has identified a particular concern about the location and installation of wind farms, which are being installed in areas of sand dunes. Most of these lands have restrictions of use, as they are areas of permanent protection (Ministério do Meio Ambiente 2010).

When asked by the SMCQ’s researchers about the current impacts of the parks being implemented, Ceará referred to those related to the phase of installation of the towers and bases (Ministério do Meio Ambiente 2010, p. 4).

Regarding this question, none of the states have declared any socioeconomic impacts. What should also be taken into consideration is the fact that in 2009 the installed capacity was still small compared with today. A group of fifteen considerations concerning various impacts that had effectively been observed was identified and regrouped into seven classes. These include very broad classes such as “location”. The location of the wind turbines on top of the sand dunes is the cause of several ecological and socio-economic impacts as Meireles (2011) shows.

A further question posed by the survey concerns the difficulties faced by the state environmental agencies concerning the licensing process of wind farms. The main examples were: “*the absence of specific rules, the need of guidelines for environmental studies and the need to identify suitable areas for the installation of projects*” (Ministério do Meio Ambiente 2010, p. 5).

Ceará has declared that it possesses a lack of information concerning wind power potential and the environmental characteristics of the state. This problem is justified by the fact that the activity there is relatively recent (Ministério do Meio Ambiente 2010). Difficulties in dealing with local resistance or in finding agreement on alternatives to current impacts were not mentioned, although 2009 marked the beginning of conflicts in Cumbe (the case-study community of my research) involving local inhabitants, the Public Prosecution Service, SEMACE and the Wind Energy Company Bons Ventos SA.

A further question concerned envisaged joint solutions between state and federal governments aiming at the increase of wind power participation in the national energy mix. Ceará suggested the "creation of norms for environmental licensing which should consider the peculiarities of the variety of Brazilian regions" (Ministério do Meio Ambiente 2010, p. 7). One of the suggestions highlighted by this survey report was the establishment of guidelines for the designation of priority areas for the implementation of this type of activity. So far, our research has only identified one Brazilian state, RS, with such a project.

The final question was: "What other subjects should be included in a possible normalization for the environmental licensing of the activities of the wind sector?" (Ministério do Meio Ambiente 2010, p. 9). Ceará's answer focused on the consideration of the cumulative impacts of other activities, such as the implementation of touristic hotels in the coastal zone.

In conclusion, the report suggests three measures, which could optimize the environmental licensing process of wind farms. These are:

1) The identification of areas with good wind potential and which are less vulnerable to the environmental impacts of the parks. It is argued that this would give support to environmental agencies in the process of decision-making and would also give support to investors during the planning process.

2) A clear set of norms for wind power projects, which should include areas of protection and the occurrence of further activities of impact in the same areas. It is argued that clear rules should help to mediate eventual conflicts.

3) The dissemination of technical information about the activity of wind power generation through, for example, a virtual internet site offering information, the realization of courses and training for licensing agents among others.

Regarding my interviews, when asked about the main challenges, the interviewed did not complain about lack of information. Nevertheless, by the time I conducted the field

research in November 2013, there was still no classification of areas that were recommended and restricted for wind power. During the interview with two representatives of the SEMACE in Fortaleza (Ceará), they affirmed that after a number of problematic experiences the SEMACE understood that wind farms on top of sand dunes caused high environmental impacts and were avoiding the licensing of wind farms in those areas. Also, as a reaction to the conflicts that had occurred in the Cumbe community, they admitted that wind farms were not low-impact projects and should therefore require the usual EIA/RIMA instead of the simplified RAS reports.

The non-approved law project 1214/2011, Projeto de Lei 1214/2011

In 2011 the law project 1214/2011, *Projeto de Lei 1214/2011*, was presented to the Federal Deputy Chamber, in the Commissions of Mines and Energy, of Finance and Taxation, and of Constitution, Justice and Citizenship - by the federal Deputy Gorete Pereira, elected through the political party Republic Party or Partido da República (PR) in Ceará (Câmara 2013). It aimed to ensure that wind farm companies would have to pay financial compensations to local governments, as hydropower companies and oil producers already do. This instrument could possibly be used for the promotion of local sustainable development, being used to invest in compensatory measures in affected ecosystems, in local infrastructure or in health and education services (Câmara 2013).

The main arguments presented by the law project concerned the negative effects on local tourism, the negative environmental effects related to the death of birds, and the unfair distribution of taxes (in Brazil, electricity taxes are collected at the consume and not in the states that are producing the energy, so that the places receiving the energy receive benefits without carrying the burdens caused by power plants).

The range of social and environmental impacts observed by researchers (Meireles 2008) and highlighted by the Public Prosecution Service of Ceará (Ministério Público Estadual do Ceará 2009) did not mention the fact that those directly suffering from the social, environmental and economic burdens of the wind farms are underprivileged groups. As current research shows, studies have verified that the socio-ecological impacts of wind farms go beyond effects on bird mortality, beyond sound and visual pollution, and affect not only the areas where turbines are installed, but the whole ecosystem of dunes, lagoons, lakes and rivers which are essential for the livelihoods of local communities.

If such a project was approved, in order for it to contribute to sustainable development on a local level, the perspectives, interests, demands, knowledge and discourses of affected traditional communities would have to be at the centre of the definition of how

compensations were allocated, because these groups bear the social, environmental and economic losses derived from the current model of wind power production.

The project was refused, based on various arguments. The first one is the fact that wind energy creates economic benefits on a local scale. These would represent an attractive target for investment, the creation of jobs and an increase in the supply of electricity. Additionally, it is claimed that wind energy is a clean source of energy that should therefore be supported. The document also highlights the fact that wind energy only became competitive due to a program of fiscal incentives promoted by the federal, state and municipal governments. The approval of compensation taxes, according to the commission, would go against this program, which intends to turn Brazil into a world leader in turbine production and wind power production.

Here again, we can observe the fact that those people who are most affected by negative impacts are not also affected by the abovementioned benefits, is not taken into consideration (p.5). A further argument is a legal one, stating that wind power is not mentioned in the Brazilian Constitution, *Constituição da República Federativa do Brasil 1988, título 3, cap. II, art. 20, parágrafo 1,* and therefore does not dispose financial compensation for the exploitation of natural resources.

Complementary Law 140/2011, Lei Complementar N. 140/ 2011

In 2011, President Dilma Russef signed a Complementary Law, *Lei Complementar N. 140/ 2011,* which, in Article 1, sets standards:

> *for cooperation between the Union, the States, the Federal District and the municipalities in administrative actions arising from the exercise of common responsibility for the protection of outstanding natural landscapes, protecting the environment, combating pollution in any of its forms and the preservation of forests, fauna and flora.*

The *Lei Complementar N. 140/ 2011, artigo 3,* establishes, among others, two goals which are very relevant for this research. The first one is to “protect, defend and conserve an ecologically balanced environment, promoting decentralized, democratic and efficient management”. This goal involves two important aspects. One aspect is to work for an ecologically balanced environment. In the case of Cumbe, it could be argued that the licensing of parks on top of sand dunes, leaving aside the threats to local ecosystems, is a matter of scale. In this sense, the reduction of CO2 emissions on national and global scales is given priority and is used as an explanation for excessive permissiveness on a local scale.

The other aspect is to ensure a system of environmental management, which is based on decentralization, democracy and efficiency. Here I make two criticisms. Concerning the aspect of decentralization, wind power policy could include a creation of indicated and prohibited areas for wind farms, to be defined by the state's agencies, as proposed by environmental agencies in the case study presented here. As for the aspect of democracy, this should include the participation of the affected population in the earlier phases of the planning process and also give more feedback and importance to their claims and suggestions.

The second goal to be highlighted is to "ensure balanced socio-economic development with protection of the environment, observing the dignity of the human person, the eradication of poverty and the reduction of social and regional inequalities" – according to the *Lei Complementar N. 140/ 2011, artigo 3*. This touches firstly on one central aspect, which is the relationship between socio-economic development and environmental issues. According to the law, both are to be treated as interdependent and not as they have so far been treated in practice, as if the environment was a barrier to economic development or as merchandise to be appropriated by big business, as has been mentioned earlier.

Besides that, the *Lei Complementar N. 140/ 2011* focuses on problems of human dignity and socio-economic justice and equality, among groups and among regions. According to Brown (2011), despite problems found on the local scale, the economic growth promoted by the wind sector regionally may help to reduce regional inequalities.

Law N. 6 902/1981, Lei N. 6.902/1981

A further instrument for environmental management which applies to the area of wind farms in the Cumbe community is the determination of Areas of Permanent Protection (Áreas de Proteção Permanente, APA). This was established by the Law, *Lei N. 6.902/1981*. Its eighth and ninth articles are dedicated to the APAs. It says that those areas should guarantee the well-being of their human populations and conserve or enhance the local ecological conditions. Respecting property rights, it limits or prohibits altogether the implementation of activities, the functioning of industries, and the development of infrastructural works, when these contaminate water sources or local ecological conditions, or accelerate the erosion of land, or cause a sharp silting of bodies of water. Nevertheless it was not properly considered by the RAS applied for the licensing of the wind farms on the coast of Ceará (Ministério Público Federal 2010a; Ministério Público Estadual do Ceará 2009; Meireles, 2008).

Wind Chart 2009

A further important document is the so-called “Carta dos Ventos”, the Wind Chart (Fórum Nacional Eólico 2009), which was written at the Forum Nacional Eólico, in Natal, Brazil. This Forum is a meeting that has gathered, since 2009, investors in the wind energy sector, legislators, members of the federal and state government executive powers, parliamentarians and researchers. It is aimed at:

> *(…) the integrated accompaniment of the process of auctions designated for the sector, as well as the balancing of its results and lessons aiming to define and consolidate, between the federal and state spheres, public actions and policies aiming to carry out the exploitation of the national wind power potential in an efficient and rational way* (Fórum Nacional Eólico 2009).

The key words are efficiency and rationality, and the word sustainability does not appear among the main goals. The Wind Chart 2009 presents firstly a contextual framework, exposing some arguments and viewpoints concerning the development of the wind power sector in Brazil at that time.

The primary arguments for wind power policies are the large national potential of wind power and the complementarity of wind power to Brazil’s main source of energy, hydropower. What is then normally highlighted is the level of economic development, on national and regional scales, that arises from the expansion of the wind sector. The local scale is not mentioned. This level of development would be reached by national technological improvement, the attraction of industries and suppliers, and the generation of employment and income related to the sector.

Then challenges are recognised concerning technology, efficiency and energy prices and the benefits of the diversification of the power mix and the use of a clean source of energy are opposed. The last point included is the contribution to the National Plan against Climate Change (Plano Nacional sobre Mudanca do Clima), as it increases the proportion of renewable energies in the national energy mix.

As we can see, there is a focus on the economic dimension, concerning factors related to production such as technology advance, efficiency and rationality. The social dimension is considered while highlighting the benefits generated by the wind sector through income and employment levels – which do not necessarily mean the “reduction of inequalities” or the “reduction of poverty”, which are, as we have seen, key aspects of sustainable development as understood by this research.

The ecological dimension is also present in this contextual framework, including the aspects “reduction of pollution” and “contention of climate change”. The social dimension

and the local scale are not directly taken into consideration. The second part of the document outlines the guidelines for the promotion of wind power in the country, which is the main purpose of the first edition of the Forum Nacional Eólico in Natal/RN (National Wind Power Forum). The first one is:"*The articulation and integration of the different federal and state´s instances of the government for the elaboration of plans, projects and programs for wind power in Brazil*"(Fórum Nacional Eólico 2009). The second is "analyse the results of the auction to be realized in the same year, and include the states in the improvement of the process" (Fórum Nacional Eólico 2009).

Along these guidelines, we may see that the economic dimension is very important with its focus on the development of national industries and services. Advances in research and technology, as applied to the sector and to the survey on wind power potential, are also projected. The role of the government is pivotal, offering infrastructural, tax and fiscal incentives to national and foreign investors wishing to invest in the country. The local scale is only directly mentioned as an important scale for the collection of data on wind power potential. Local economic, social and environmental issues are not addressed in this document. The social dimension is considered when it comes to the training of manpower for the new positions created by the sector as it increases its offers of employment.

The ecological dimension is mentioned as a limiting factor to be included in the survey of wind power potential, showing that both profitability and environmental issues are considered important. A political aspect is present in the document, as it recognises the importance of articulating the efforts made by all governmental spheres. Nevertheless, the participation of social movements and other civic organizations in the formulation of rules and policies is not mentioned. Neither is an alternative model of decentralized production.

As a whole the document focuses on the economic dimension, on national and state levels, concerning mainly technological advancement, the development of the country's industrial and service sectors and the creation of skilled employment. This discourse is supported by the argument of climate change mitigation, which concerns the ecological dimension.

A few months after the publication of the Letter of the Winds, on the 8th of December 2009, the MMA organised a meeting with the different states' environmental technicians who were responsible for the licensing of the parks involved in the auction expected to happen at the end of the same year (Ambiente Brasil, 2009). The main requests of the technicians were: 1) a basic term of reference defining basic requirements for the licensing for all states; and 2) the allocation of resources for the creation of an environmental zoning system defining recommended areas for the installation of wind farms. At the time I

conducted the interviews during the field research in 2013, these requests had not yet been met.

The MMA website

Now we will examine the content of the Ministry for the Environment, the MMA's website (Ministério do Meio Ambiente 2014b), which is dedicated to wind energy. Its text justifies the use of this kind of energy, presents the main policy instruments and gives a brief summary of what would be its advantages and disadvantages, with a strong preponderance of the advantages.

Wind energy is described as abundant, renewable, clean and available in many places. According to the vision of the MME, large-scale projects are being planned for connection to the national grid, National Interconnected System or Sistema Interligado Nacional (SIN), and the small-scale projects are seen as suitable for the electrification of isolated systems or communities. The existence of medium- or small-scale projects connected to the SIN, based on decentralized energy production, is not mentioned.

The main presented arguments for wind energy will also be presented here. The first argument to appear in this text concern the substitution of petrol oil; the contribution to the diversification of the national energy mix; and the complementarity to hydropower, which is the main electricity source in Brazil. Then the text dedicates a special section to environmental issues. Two aspects are highlighted. The first one is the reduction of CO2 emissions and the consequent earning of Carbon Credits. Also, wind power is seen as comparatively more efficient than hydropower plants in reducing the emission of polluting gases, based on the fact that big hydropower plants emit CH_4 e N_2O, due to the decomposition of the organic material of the reservoirs, which contributes to global warming.

Besides the above, visual pollution is described as a factor that may be positively or negatively perceived by the population. The text affirms that when people receive economic benefits from the parks or possess environmental awareness, the presence of the turbines on the landscape may be perceived as positive, and even have a positive impact on the tourism sector. As we will see later, in the case of the wind farm Bons Ventos in Cumbe, there were promises of benefits that were not accomplished, and there was no government system for enforcing them. A deal between local inhabitants and the wind company came only after nineteen days of protest and road blockade.

The next aspect to be considered on the MME, website is the impact on fauna, which they affirm can be measured and avoided. As the migration routes of animals are known, planners may adapt the location of the wind turbines to avoid accidents involving birds for example. As seen here before, in Germany this strategy seems to have positive effects (Schwahn 2000).

Noise is also mentioned as a disturbing factor for people and for fauna. In Germany, technological enhancement of the turbines and the respect of a minimum distance between turbines and houses have also been effective. Then the document refers to soil impacts, highlighting the fact that rigorous studies of soil compaction have been made, and that there is no risk of oil contamination in comparison with fossil fuel energy resources. It does not mention problems related to the compaction of sand dunes, degradation of mangroves, or the use of groundwater for the park construction that occurs in the Northeast (Vale do Acaraú 2012; Francisco 2012; Portal do Mar 2012; Comissão Pastoral da Terra 2014; Meireles 2011; Pachioni 2013).

The website also says that the soil used by wind farms may be combined with agriculture and farming. This fact is also reported by the press regarding wind farms in the south and in the interior of the Northeast. Nevertheless, considering land use, the MMA website does not consider the effect of the privatization of public spaces on the livelihoods and social habits of communities reported by researchers and the media (Tosta 2013; Meireles 2011). Additionally the MMA website states that there is no need to clear up the vegetation around the turbines, which is not true for the installation of turbines on top of sand dunes (Meireles 2011). We will now look at another instrument of environmental regulation of the federal government.

The National Environmental Conference

A further instrument of environmental planning is the National Environmental Conference. Its preparatory stage includes several previous local conferences. In 2013 the fourth national Environmental Conference took place in Brasilia. The focus that year was to contribute to the implementation of the National Solid Waste Policy, focusing on: sustainable production and consumption; the reduction of environmental impacts; and employment and income generation (Ministério do Meio Ambiente 2013a). I was unable to attend this conference, but I have attended (only as an observer) the previous conference, which occurred in the State of Rio de Janeiro, at the University of the State of Rio de Janeiro or Universidade do Estado do Rio de Janeiro (UERJ), while I was conducting my fieldwork in Ceará, I attended only on the last day, when the proposals and delegates were

elected to represent the state of Rio de Janeiro at the National Conference that would take place in Brasilia.

Each local conference elects representatives and votes for proposals concerning the National Solid Waste Policy to be taken to a higher level. This leads up to the National Conference. The conference that I took part in as an observer in Rio de Janeiro was the last step before the National Conference. Thus members of the municipal and state environmental agencies, members of the private business sector, members of civic society (including NGO members and members of social movements) and members of traditional communities were elected to represent the state of Rio de Janeiro at the National Conference to take place in Brasilia.

Although the focus was on waste policy - and therefore the main issues and actors involved in my research were not discussed by the Congress - I could observe the structure of political representation, the process of proposal creation and of decision making, and the relationship between members of each group and among groups, in order to observe power relations. I would highlight three main observations regarding the event in Rio de Janeiro. Firstly there exists a power dispute between NGOs and social movements, as both have to agree on the proposals and the choice of delegates who will represent the state of Rio de Janeiro's Civic Society members in the national congress.

Secondly I observed a case where a member of a traditional community was not recognized as such, which left empty the vacancy for the representation of traditional communities. This was due to a mistake in the inscription process (it was not clear if the mistake came from the local environmental agency or from the organizing committee of the Congress. It was not clear if the mistake was deliberate, but the member of the traditional community suggested that it was an attempt to weaken the representation of the fisher community in that region, because the fishers were actively struggling for their rights and against investors' interests there.

A further problem regarding the representation of traditional communities was the fact that governmental agencies complained that traditional communities did not take the initiative to apply to participate in the local conferences. Therefore, the governmental agencies took the initiative to appoint the representatives of the traditional communities to which they had previous contact and links. This means that some of the representatives of traditional communities present at the Conference may represent communities that are politically or ideologically close to the government – although is only a hypothesis that I could not investigate further. It is also important to highlight that I could not observe the extent to which all concerned traditional communities had proper access to information concerning

the Congress and its goals. It should also be pointed out that the MME does not possess a channel of participation, like the MME, the Ministry for Education and the Ministry for Health among others, all do.

Here we conclude our analysis of some of the key documents and laws regulating the planning and environmental licensing of wind farms. Next we will evaluate, on the local scale, the extent to which traditional communities affected by wind farms have the power to influence the planning and implementation processes of wind farms on the Northeast Coast of Brazil, based on a case-study.

6.4. PARTIAL CONCLUSIONS

In this chapter we have seen how wind power is gaining increasing relevance to national energy and environmental policies as this market grows and stimulates the development of a supply chain of industries and services – supported by the federal government through loans and through the flexibilization of environmental regulation. Despite the discourse claiming that the use of wind energy is aimed at sustainable development, in the region where investments are concentrated and where they are expected to continue to increase over the coming years, namely the Northeast coast of Brazil, energy policies focus on a centralized model of wind energy production. This model concentrates land while threatening territories of collective use and the livelihoods of traditional communities.

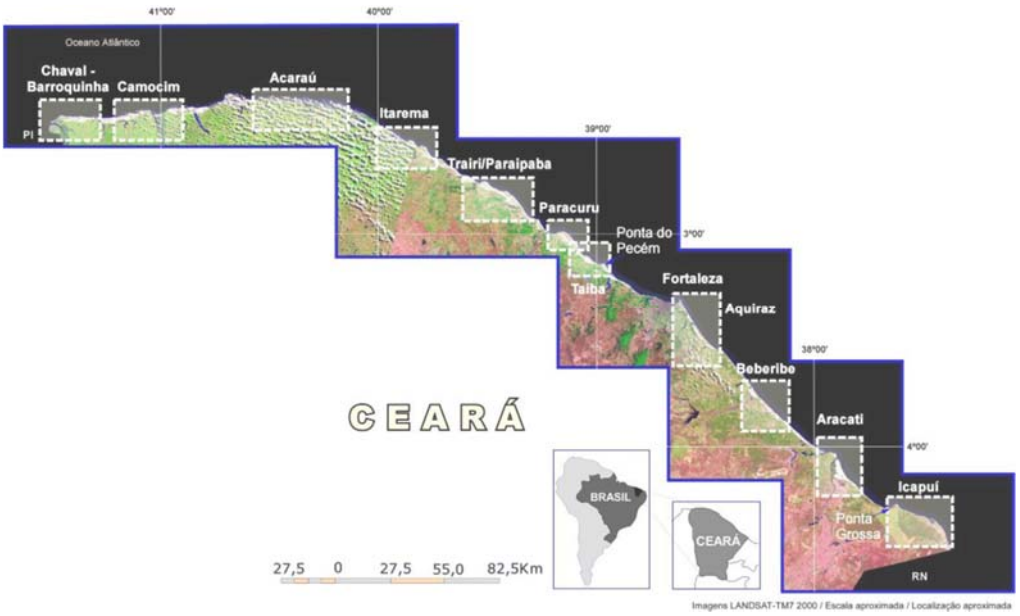
Furthermore, we have seen how there is little space for the participation of affected underprivileged groups in the elaboration of policies and in the planning and licensing of wind farms. Thus the idea of supposed sustainable development present in the discourse of the government and of investors almost leaves the social dimension and the local scale for a second plan, focuses on the environmental (reduction of CO2 emissions) and economic (expansion of the wind energy market and of the national industrial supply chain) dimensions, on a national scale. The result has been an unequal distribution of the costs and benefits of the wind farms on the Northeast Coast of Brazil. We will examine in the next section, how this inequality appears on the local scale.

7. LOCAL SCALE - ANALYSIS OF THE CONTRIBUTION OF WIND FARMS TO ENVIRONMENTAL JUSTICE

7.1. INTRODUCTION

We will now try to complement our multi-scale analysis of the causes of environmental injustice concerning wind farms on the northeast coast of Brazil, based on a case-study. The state of Ceará, as we can see from this satellite image showing the wind farms along the coast, is located in the Northeast of Brazil. The community chosen for my case-study is located in the municipality of Aracati, which is also indicated in the satellite image below.

Figure 10. APPROXIMATE LOCATION OF THE WIND FARMS ON THE COAST OF CEARÁ



Source: Meireles 2011.

The reason why I have chosen the state of Ceará is that, as mentioned, at the time I began my research, this state contained most of the country's wind farms, the largest wind power installed capacity and also the most critics to the projects' implementation process (Alcântara 2009, Meireles 2009a; Meireles 2009b; Lima 2009). During the research, further academic works have been published – in the fields of social sciences, geography and environmental management – with similar critical positions towards the way wind farms are being installed in the state of Ceará (Brown 2011; Brown 2012; Moreira et al. 2009; Meireles et al. 2013).

Ceará has the third largest PIB of the Northeast region, which is mainly constituted of commerce and the processing industry (Banco Nacional de Desenvolvimento Econômico e Social 2010). Depending on the region of the state, activities vary between the textile industry, construction companies, shoe fabrics and tourism among others (ibid.). The state has low hydropower potential and has been historically dependent on the import of energy (Conselho Estadual de Desenvolvimento Econômico do Ceará 2010). Therefore, since the 1990s, the government has been adopting strategies to diversify its energy mix.

The high wind potential of the state led in the early 1990s to an agreement between public companies and a German research institute, with the goal of identifying the wind resources available and the most favourable areas for the deployment of parks (Lage 2001). Later, a partnership between public companies and the financial support of the German government resulted in the first wind farm in Brazil, in Porto Mucuripe (ibid.).

Mucuripe was installed in 1997 and in 2000 a further two wind farms were constructed (Conselho Estadual de Desenvolvimento Econômico do Ceará 2010). According to Lage (ibid), the wind farm at Mucuripe was part of the 1992 Sustainable Development Plan of Ceará, which was created to diversify the energy mix, reduce energy dependence and expand energy access to rural areas for irrigation and water pumping. Lage's (ibid.) Master Thesis evaluated the sustainability of the project for wind power in this state.

At that time, beyond the pilot project, only two private parks were in operation. Her research concluded that the sustainability of the wind projects was unquestionable (ibid.). Only two exceptions were made: 1) the projects did not include the development of research and technology in the state; and 2) society's participation in the discussion of the projects was disregarded or reduced to a survey of people's expectations (ibid.). However, from an economic, social and ecological perspective, Lage identified a very positive scenario that included the preservation of traditional economic activities, respect for local ecosystems and the creation of jobs (ibid.).

Lage (2001) seems to have analysed an incipient framework that differs considerably from the framework analysed in my research. Since then, the installed potential of CE has increased from about 12 MW to 518 MW (Agência Nacional de Energia Elétrica 2011). Nowadays, as we have seen, the negative ecological and socioeconomic impacts of wind farms in CE have been reported to the press by local communities (Diario do Nordeste 2010), by NGOs (Rede Brasileira de Justiça Ambiental 2014), by the Public Ministry (Alcântara 2009) and by social movements (Portal do Mar 2012) and studied by researchers like Brown (2011; 2012), Lima (2009) and Meireles (2008). Another relevant factor, besides the larger amount of wind farms, is the expansion of other activities which

exploit the resources of the coast of CE, such as tourism and shrimp farming, which generate cumulative impacts and aggravate ecological and socioeconomic impacts that are transferred to local communities (Lima 2009).

As these researches show and as interviews that I made during the field research have revealed, the role of the state (federal, the state of Ceará and municipal) in ensuring respect for environmental laws, for the participation of affected communities, and for the rights of traditional communities to preserve their territories, livelihoods and identities, has not been appropriately fulfilled. Next, we will look at these issues in more detail through analysing the case-study.

7.2. DESCRIBING THE CASE-STUDY COMMUNITY

The community chosen for the case-study is called Cumbe. The choice was due to heated conflicts occurring between the wind energy company and inhabitants affected by wind farms, which required the interference of the Federal Public Prosecution Service and gained public visibility in the media (Minsitério Público Federal 2010; Tosta 2013). Cumbe is located on the coast of the municipality of Aracati. Aracati is situated 149 km from the capital, Fortaleza. It currently possesses six installed wind farms. Three companies control the wind sector in the municipality. The Rosa dos Ventos / SA maintains the farms Canoa Quebrada RV (10.5 MW) and Lagoa do Mato (3.23 MW).

The enterprise Bons Ventos SA maintains the farms Canoa Quebrada BV (57 MW), Enacel (31.5 MW) and Bons Ventos (50 MW), which affect the Cumbe community. In 2012 the company Bons Ventos was purchased by another company, CPFL, which today owns these three wind farms that concern my case-study. The Quixaba S.A. owns the wind farm Quixaba (25.5 MW). Together all these wind farms produce 177,730 MW of power (Agência Nacional de Energia Elétrica 2015). Aracati has about 75,285 inhabitants and its most important economic activities are tourism, the export of fish and shrimp, and the production of leather footwear (Banco Nacional de Desenvolvimento Econômico e Social 2010).

Cumbe is a “Quilombola community” (Comunidade Quilombola), a fact that was only recently legally recognised by the federal government, in December 2014 (Diário Oficial da União 2014). Nowadays the area contains roughly 150 families, encompassing 600 inhabitants, who make their living mainly from artisanal fishing, crab hunting and shellfish collection in the mangroves, rivers and the sea; shrimp farming; tourism; subsistence

farming; artisanal embroidery (called “labirinto") and handicraft (with wood, roots and coconut).

Shrimp farming is a form of shrimp aquaculture, using tanks that usually deforest mangroves and use polluting substances that contaminate the water, threatening fauna and therefore the livelihood of artisanal fishermen and fisherwomen (Queiroz, 2007). Shrimp farming is practised by smaller local farm owners as well as large investors, both of whom employ local inhabitants, usually salaried and with formal contracts. Nevertheless, the activity is low-paid, not labour intensive and environmentally harmful (Queiroz 2007; Interviews with Cumbe inhabitants). Probably due to the lack of job opportunities and the local population’s low professional qualifications, shrimp farming is viewed positively by some inhabitants who wish to have salaried jobs. Nevertheless, it is also seen extremely critically by others, particularly by fishermen and fisherwomen. The community has suffered from severe socio-cultural, economic and environmental impacts brought on by the process of water extraction since 1970 and by shrimp farming since 1996 (Interview with João Luís Joventino do Nascimento, researcher, activist and Cumbe´s resident; Interview with Fábio Luiz Rocha, Manager of Environmental Protection Areas of Canoa Quebrada, linked to the Tourism, Culture and Environmental Services Department of Aracati).

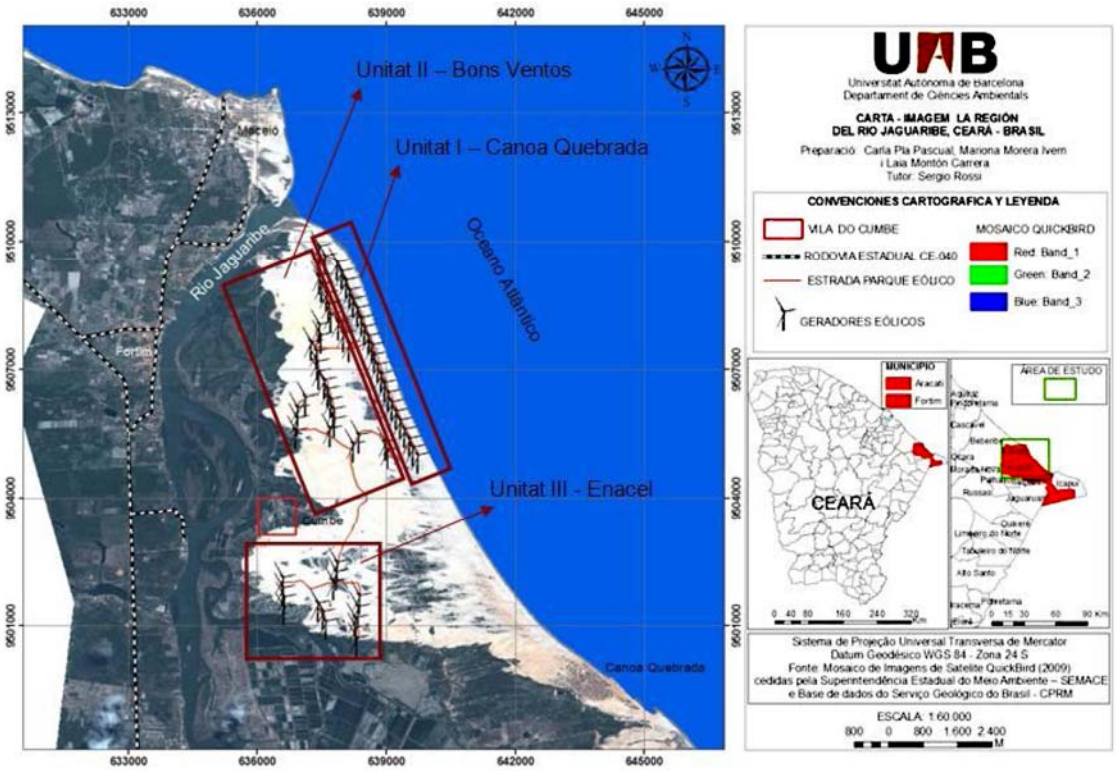
Over recent years, a conflict between a large shrimp-farming investor and artisanal fishers has escalated to the point where the police were called by this businessman and illegally used violence against fishermen and fisherwomen as they refused to leave the territory. This problem is due to a territorial dispute where there are suspicions of land- grabbing during the process that gave ownership of the land to the investor (Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013; observation of a meeting between the fishermen and fisherwomen and lawyers of the MST).

Here we can see how the non-recognition of the territories of traditional communities is one of the main challenges for sustainable development in Brazil. In this respect, the areas that are essential for the livelihoods of fishermen, which have been historically preserved by them, are under threat by a model of resource use which is environmentally harmful and employs few and badly-paid workers, while hindering the livelihoods of many families (Meireles 2011; Interview with the Public Advocate of Aracati and with Cumbe inhabitants).

Cumbe is surrounded by sand dunes, close to natural lakes, mangroves, a river (Jaguaribe) and the Atlantic Ocean, as we can see in this satellite map below.

It has one primary school, no secondary schools, no day-care for children, no hospital, no health facilities, no ambulances, no public transport, low levels of formal education and professional qualification, few job opportunities, many families living in poverty and some in extreme poverty, who receive monthly financial support from the government (Bolsa Família).

Figure 11. CUMBE WIND FARM



Source: Carrera et al. 2012.

As we have seen in chapter 2, all these conditions increase the bargaining power of big business. The investments may offer small benefits to the community (such as the refurbishment of the school building and some low paid jobs), but they first and foremost transfer to the community serious negative social and environmental externalities (Acselrad 2010). The arrival of the wind power firms was announced in 2008, when a discussion forum took place involving community members, environmental agencies, government representatives and wind firm representatives (Interview with Cumbe inhabitants 2013; Interview with João Luís Joventino do Nascimento, researcher, activist and Cumbe´s resident). Many promises of work and service amelioration were made but have not been fulfilled, as we will further examine (Interview with Cumbe inhabitants 2013).

The main institutions and groups involved in the conflict regarding wind farms are the wind energy company CPFL (which bought Bons Ventos in 2012, the previous owner of the three wind farms affecting the Cumbe community), the members of the Cumbe community,

the SEMACE (the public agency of Ceará responsible for environmental licensing, as explained in Chapter 4), the Federal Public Prosecution Service, the Public Prosecution Service of Ceará, and the National Institute of Heritage (IPHAN).

The problem began with the choice of the wind farms' location, which only took technical efficiency into account (based on the fact that on top of dunes, turbines would reach higher altitudes where the wind conditions are more favourable) - disregarding the local social and ecological dimensions of the project (Meireles 2011). The fact that wind farms on top of dunes cause serious socio-environmental damages, is nowadays acknowledged by the SEMACE, by the wind firm CPFL, and by the representative of the Secretary of Tourism, Culture and the Environment in Aracati/CE (Interviews with representatives of SEMACE, CPFL, Secretary of Environment of Aracati, 2013).

I could notice during the interviews in Fortaleza and Aracati that the case of socio-environmental conflict surrounding the wind farm in Cumbe is nowadays publicly known, among governmental agencies, as a bad example of how to install a wind farm. Unfortunately, this has also occurred in a number of other cases on the northeast coast of Brazil (Francisco 2012; Portal do Mar 2012; Comissão Pastoral da Terra 2014; Meireles 2011; Pachioni 2013). According to the CPFL representative, the firm does not construct new wind farms on top of dunes due to social and environmental factors, and due to the costs involved in protecting the wind turbines and roads from the sand that is constantly blown by the winds and accumulated at the base of the turbines and on the roads (Interview with the advisor for communication issues of the CPFL in the Cumbe community, Cumbe, 2013).

According to two other interviewed authorities, wind energy firms are now avoiding the installation of wind farms altogether in the areas of dunes, mainly because competition between the tourism sector and the wind energy sector has increased over recent years, which is leading to land speculation and increases of land price in the "dune fields" on the coast of Ceará (interview with João Falcão, President of the City Chamber and City Councillor of the municipality of Aracati, Interview with Fernando Ximenes, Secretary of the Chamber for Wind Power of Ceará linked to the Development Agency of Ceará). Here it is important to highlight the fact that before the arrival of the wind farms, most areas with sand dunes were of common use, to which no private owners had previously claimed ownership, thus indicating the possibility of land-grabbing in these areas (Interview with Cumbe inhabitants).

Here we can see again how the loose land regulation discussed in Chapter 3 is critical. With regards to this case, and also other similar cases on the northeast coast of Brazil

regarding large investments, traditional communities are losing access to the resources that ensure their livelihoods and their identities. On the one hand we know that the conditions for these groups' sustainable production should be protected by the state, according to the Brazilian Constitution, *Constituição da República Federativa do Brasil 1988* and to the National Policy for the Sustainable Development of Traditional Peoples and Communities, *Decreto 6040/2007*. On the other hand we know that the most primordial of these conditions is the territory (in association with other social and economic policies), but that the processes of recognition of areas of collective use face many challenges. According to the Public Advocate of Aracati and Rodrigo de Medeiros Silva, RENAP/Brazil/ CE, 12/09/2013, ideological openness on the part of the judiciary powers towards this recognition, and towards the rights of traditional communities and quilombolas, is still rare.

Concerning the choice of those areas for the installation of the turbines, the wind firm CPFL claims it possessed a lack of information during the initial phases of the development of the wind energy sector in Brazil (Interview with the advisor for communication issues of the CPFL in the Cumbe community, Cumbe, 2013). Nevertheless, it must be highlighted here that resistance from residents, researchers and the Public Prosecution Service has taken place since the initial phase of construction (Meireles 2008; Interviews with Cumbe inhabitants, Interview with João Luís Joventino do Nascimento, researcher, activist and Cumbe´s resident; Fernandes 2009).

For the APP (Areas of Permanent Environmental Protection, area de Proteção Permanente) manager of Aracati, the problems occurred because of the federal law *Medida Provisória 2152-2/2001*, which established the simplified environmental reports, called RAS, for the licensing of wind farms, as was mentioned here earlier. Thus, the different powers of the interest groups involved in the socio-environmental conflict regarding the wind farms in the Cumbe community to influence the choice of the wind farm's location is one of the causes for the negative impacts that occurred. Let us now look at some of these impacts identified during the installation of the wind farm and during its operation.

Socio-environmental impacts

In general, the installation of wind turbines on top of dunes involves three measures of significant impact (Meireles 2011): 1) the construction of access roads between towers and the controlling and administrative buildings; 2) the need to artificially fix mobile sand dunes, in order to protect the wind turbines and access roads from the accumulation of sand

which naturally and constantly occurs as a result of the wind; and 3) the installation of transmission cables under the surface.

The ecological systems that are mainly affected are: 1) mobile and fixed sand dunes; 2) fluvial-lake systems; and 3) mangroves.

The main ecological impacts are:

1) the compaction (Picture 1), fragmentation and fixation of dunes:

Picture 1. Dune compaction

Source: Field Research, 19.07.11.

2) buried lakes (Picture 2 shows a lake partially buried due to the construction of a road);

Picture 2. Buried lake

Source: Field Research, 19.07.11.

3) degraded mangroves.

The main consequences are: 1) an imbalance in the chain of interdependence between the ecosystems; 2) threats to the local fauna and flora; 3) erosion of the beach; and 4) groundwater damage. These processes were observed both during the period of implementation and during the operation of the farms (Meireles 2011).

Another aspect is worth noting, which is that in this ecosystem there are naturally mobile and naturally fixed dunes. The mobile dunes are constantly suffering wind erosion and the sand is being transported in the direction of the river, which will ultimately transport the sand to the sea, protecting the beach from the rising of sea levels (Meireles 2011). For this reason this ecosystem has been declared by the UN, through the IPCC Panel 2007, as essential to climate change contention and therefore an ecosystem to be preserved. Nevertheless, in order to stop towers and roads from being buried under the accumulations of sand, the wind farm construction project artificially fixes mobile dunes, which interferes with the dynamic of the ecosystem, ultimately resulting in beach erosion. In this sense a project which is supposedly contributing to climate change prevention

through the reduction of global CO2 emissions is on the other hand reducing resilience in the face of climate change (ibid.).

The facts presented above were not found in the official report of the RAS, legitimated by the SEMACE, but rather were produced by a researcher from the Federal University of Ceará (UFC), Meireles (2008), engaged in critically evaluating the implementation of wind farms in the coastal communities of Ceará. He has also identified socioeconomic and socio-cultural impacts that I will present and complement with further impacts observed during the field research and mentioned during the interviews with the inhabitants of Cumbe.

Socioeconomic and socio-cultural impacts

Related to the construction of access roads between towers and the controlling and administrative buildings:

1) Sand dunes must be compacted, reducing the water infiltration and thus reducing the local level of groundwater, threatening the local water supply (Meireles 2011).

2) Several natural lakes that are among the sand dunes had to be buried (Meireles 2011). These lakes were used by the community for leisure (Interviews with local inhabitants).

3) Two small food and beverage stands that were on the sand dunes before the arrival of the wind farm, had to be closed, without fair compensation and despite initial promises made by the wind energy company that they would be allowed to remain in the area. These two facts were mentioned in various interviews with Cumbe inhabitants. In one of the cases the interviewed reported that, because the stand owner refused to obey, two lawyers and police agents were used to coerce him into signing a document accepting the removal of the stand, in which he received an indemnification. The indemnification was not enough to pay the investments that were made, according to this source.

4) An extremely large amount of water is needed to produce the cement for the construction of the bases of the towers. In Cumbe, the wind farms' use of groundwater contributed to the reduction of the water supply. This problem was also reported in other wind farms (Tosta 2013; Goulart 2011).

5) Due to the installation of transmission cables below the ground, the wind firm has prohibited people from walking on the sand dunes, alleging the risk of electrocution. Access to the beach used by fishermen was closed (Picture 3), despite initial promises that

this would not happen (Lima 2009; Interviews with local fishermen). As a consequence, fishermen had to use other paths, adding hours to their daily routes to work. Afterwards their normal routes were partially reopened under the inspection of identity documents and with the accomplishment of certain conditions imposed by the wind energy company, alleging safety reasons (e.g. fishermen not wearing shirts, not bearing identity documents, or driving motorcycles without helmets were not allowed to pass). According to the Public Defender of Aracati, access to the beach is a public road and only public agents may impose conditions on its use (Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013).

Picture 3. Gateway of the Wind Park Bons Ventos

Source: Field Research, 19.07.11.

6) Access to the Cumbe community's cemetery was closed and inhabitants were expected to acquire authorization in order to enter (Interviews with Cumbe inhabitants).

7) Access to the beach used to be, for many inhabitants who didn't own a car or motorcycle, only possible on foot. Now this access is only possible via one dirt road passing through the wind farm and constructed by the wind power firm. People who own cars or motorcycles have mostly viewed this change positively, while other people have

complained about the loss of freedom to walk on the dunes (Interviews with Cumbe inhabitants).

The road used by the wind energy company to access the wind farm was a dirt road, the main road passing through the community. Despite the wind energy company's promises that they would improve the road, this only happened years later, after protests. Meanwhile, a small section of the road that was little used by the community but much used by the wind energy company was enhanced before the protests.

8) During the construction of the wind farm, other problems were caused by the daily movement of heavy load trucks. There were several cases of respiratory diseases among children, caused by the dust produced by the intense circulation of vehicles on the dirt road (Interview with the Public Advocate of Aracati and with Cumbe inhabitants).

9) Several houses were damaged (with cracked walls) by the impact of the movement of trucks. Compensations only occurred after protests and were exclusive to the houses located on the main road (Meireles 2011).

10) The field of sand dunes is an area of archaeological sites where an archaeologist was conducting research. The IPHAN ordered her to make a report detailing the losses represented by the wind firm's project. The report was against the project, but no alternative was presented by the wind energy company. Instead, the IPHAN elected a new researcher who quickly released a positive report (Ministério Público Estadual do Ceará 2009; Quilombo do Cumbe 2009).

11) Conflicts began among Cumbe's inhabitants. Often, large investments that benefit only some inhabitants of one community (with small benefits of low-paid jobs that are usually accepted in contexts of poverty and lack of better options) while threatening the livelihoods of others causes internal conflicts and violence (Interviews with a representative of the RBJA, Rio de Janeiro 2013 and with Cumbe residents, 2013; Debate occurred during the "Meeting Brazil-European Union on Human Rights Defenders", Fortaleza, 2013).

As we can see, this case-study shows a set of mutually influencing ecological, socio-cultural and economic impacts. Meireles (2008) underlines how important it is for projects to be preceded by serious impact studies that contain alternatives to the project. When interviewed by a local media agency, he affirmed that problems like those encountered on the coast of CE could be avoided if the location of parks took into account not only economic benefits for the investors but also the local and regional environmental and

social impacts of the projects (Fernandes 2009). He added that areas with wind speeds of 6m/s behind the dunes – a velocity that still meets profitability patterns according to Dutra (Dutra 2007, p. 223) – would cause less negative impact to the site. However, this was neglected in favour of the areas on top of dunes, where wind reaches more attractive speeds of 8m/s. His statements show us how decisions concerning the position of parks depend on a conflict of interests where the actors' decision-making powers differ considerably.

Investments in the area were financed with public loans from the BNDES, and the BN, Banco do Nordeste do Brasil (Bank for Development of the Northeast), in accordance with the MMA policy that aims at the diversification of the energy mix and the increase of the energy supply to ensure economic growth (Ministério do Meio Ambiente 2014b). The energy produced by the wind farm goes directly to the integrated national system of energy distribution (SIN) and has no direct influence on the inhabitants of Cumbe regarding their access to energy or the price they pay for it (Interview with a representative of the electricity company of Ceará, Coelce, Aracati 2013).

Certainly, the source of the social and economic problems affecting this community lies well beyond the installation of the wind farms. It involves historical injustices (e.g. Brazilian land concentration) and multi-scale issues, including political, social, cultural and economic dimensions that deviate from the particular focus of my research and can therefore not be detailed here. Nevertheless, this research seeks to understand the extent to which the wind farms contribute to sustainable development as understood here, and to environmental justice, or are instead reinforcing local social and economic problems based on the unequal powers of different social and ethnic-racial groups to influence the rules and policies affecting them, and based on the production of knowledge and discourses that legitimate these policies and discourses.

7.3. THE "GOVERNMENTALITY" OF WIND POWER AFFECTING THE CUMBE COMMUNITY

This section seeks to identify how the production of rules/policies/institutions, knowledge/discourse and subjectivities are interrelated, acting on multiple scales and contributing to the concentration of power over resources in our case-study community.

My analysis of the governmentality of the wind sector in the community of Cumbe shows three stages referring to different governmentalities - here understood as power configurations which: are contested and therefore unfinished processes; include formal

and informal rules and groups with unequal power; and are manifested in space, therefore defining territories which are also contested. This analysis was inspired by the work of Arun Agrawal (2007) on environmental policies in India.

The first stage occurs before the installation of the wind farms and reveals a greater consensus within the community (for the installation of the wind farml). The second stage is a period of protests during the installation of the wind farm, which also shows a greater consensus within the community (against the way the wind farm is being implemented). The third and current stage begins with the implementation of good neighbourhood policies by the wind firm and produces important internal conflicts within the community.

At each stage, I have analysed the relevant strategies of power (production of rules, policies and institutions; production of discourses and knowledge; production of subjective values) that I could observe at the different phases of the installation of a wind farm (planning, regulation, financing, environmental licensing and environmental inspection) that may have influenced the case-study. Considering interest groups who act on the global, national, regional and local scales, I was also interested in defining relevant interest groups and relevant scales of analysis. Furthermore, while looking at each strategy of power, I observed which dimension of sustainable development (economic, political, socio-cultural and environmental) was being mostly affected by the strategy of power being analysed. In other words, while analysing strategies of power, I tried to observe which dimensions of sustainable development were being promoted or disregarded.

7.3.1. First Stage – The announcement of the wind farm project

The first stage, referring to the period before the installation of the wind farm and during the initial phase of construction, reveals a greater community consensus for the wind farm. Afterwards, during the construction work, there will again exist a period of greater consensus - but this time in opposition to the way the wind farm is being installed, revealing a negative subjective position regarding the behaviour of the wind power firm in the community.

We shall begin with the first stage, analysing the strategies of power used by the main interest groups involved. Based on the approach of environmental governmentality presented in Chapter 2, I have identified three main types of strategies used in the conflict analysed in the Cumbe community: 1) the creation of new, and use of already existing, institutions, rules (including decisions of the judiciary powers such as public civic lawsuits from the Public Prosecution Service, and informal rules) and public policies, in order to affect practices in the territory; 2) the production of discourses and knowledge to legitimate

practices in the territory; and 3) the influence on people's interests and subjective positions regarding the practices in the territory.

The idea is to try to understand the reason for the environmental injustices related to the wind farms installed in the Cumbe community, that I could verify (through previous literature research, media surveys and preliminary field research and interviews) and that were occurring there and in various other communities of the northeast coast of Brazil. I understand here that the strategies of power and their effectiveness in the territory reveal unequal power relations and injustices that must be identified and analysed in order to be tackled.

1. Institutions, Rules and Policies

We will now analyse, with the focus on the case-study, how institutions make rules that create or aggravate social, ecological and economic problems in Cumbe, instead of promoting sustainable development.

Regulation and Financing

Looking at the regulation and financing of wind farms on the global scale, we may observe a lack of control over local impacts. A study published by Carbon Trade Watch criticises the fact that the wind power company "Bons Ventos" received Carbon Credits despite various serious social and environmental impacts – including the threat to ecosystems that were declared by the IPCC Report 2007 as essential for climate change contention - caused in the Cumbe community. This was legitimated by the discourse of sustainability due to the farm's contribution to the global reduction of CO2 emissions (Brown 2012). Still, considering the local scale as well, the international regulation promoted by the United Nations Convention on Climate Change, which developed the instrument of regulation known as the carbon credit, is failing to fully achieve its goals. Furthermore it legitimates wind energy companies' practices in spite of their disrespect for environmental laws and for the rights of the affected traditional communities.

Here, the ecological dimension on a global scale is privileged over the ecological and social dimensions on a local scale. Also it is important to underline that the Carbon Credits may be seen as an instrument of power that legitimates the territorialisation of lands for wind power exploitation despite local social and ecological damage. Thus it is an instrument that contributes to an imbalance in the dispute concerning the territories on the northeast coast of Ceará.

On the local scale, regulation lacks participation. In the state of Ceará, interested parties gathered together in 2009 for a Chamber for Wind Power ("Câmara Setorial de Energia Eólica"). It was implemented by the Development Agency of the Government of Ceará (Agência De Desenvolvimento Do Estado Do Ceará) with the goal of integrating public and private agents working for the consolidation of wind power in Ceará (Agência de Desenvolvimento do Estado do Ceará 2014).

No representatives of the affected communities were invited to take part. In this institutional space, created by a governmental agency, a number of government officials and industrial representatives consider the challenges and potentials for the sector without directly considering the challenges and potentials of the affected underprivileged groups. We may see that the economic dimension is focused by the Development Agency of Ceará, Agência de Desenvolvimento do Estado do Ceará (ADECE) without considering the social and political aspects of economic development, which in this case are the fair distribution of decision power and of benefits regarding the installation of wind farms among interest groups. This chamber may be seen as an instrument for investors to enhance the effectiveness of their occupation of territories for wind power exploitation according to their interests, relegating social and environmental issues to a secondary position.

Also it should be highlighted that the CONPAM, Ceará's Council for Environmental Policy and Management, which is responsible for "participatory, democratic, ethical and transparent management" of the environment, elaborating and coordinating the environmental policies of the states of Ceará, should include the participation of three members of civic society (defined by the executive power). Unfortunately, I was unable to find out who the current members are, as my emails to CONPAM were not answered, and during an interview, CONPAM's Coordinator of Environmental Education and Social Articulation (COEAS) refused to answer this question (Interview with the Representative of the Coordinating Body for Environmental Education and Social Articulation linked to the CONPAM, September 2013). We may see how political power to decide on environmental policies is relevant on the local scale, especially if we consider how it relates to the definition of limits for the territories of large investors such as wind energy firms (e.g. definition of areas of environmental protection).

Regarding the financing of wind farms, public auctions for wind power are regulated by the national agency for electric power ANEEL, and the chosen projects receive low-interest public loans from the federal bank BNDES. Both processes exclude the participation of small-scale wind power projects, since they are unable to compete at auctions and are not

targeted by the BNDES wind power program (Interview with BNDES representative, Luiz André Sa D´Oliveira, Rio de Janeiro, BNDES, 16 December 2011). This framework prioritises centralised production of wind power, which normally involves greater impacts and less participation in decision-making processes, as was discussed here in Chapter 4 (Weiss 2010; Agentur für Erneuerbare Energien 2011).

Two countries are internationally regarded as models in terms of renewable energy production: Germany and Denmark (International Energy Agency, 2011; International Energy Agency 2014). In both countries, two aspects are to be highlighted: 1) the role of public policies in regulating the energy sector and in supporting the renewable energy sector; and 2) the focus of these policies on decentralised energy production (Peter 2013; International Energy Agency 2014). Usually researchers point out that decentralisation of energy production is a key strategy for an energy system based on renewable energy (along with energy efficiency and the use of smart grids[1]). They highlight two arguments (Agentur für Erneuerbare Energien 2011; Bundesministerium Für Verkehr, Bau und Stadtentwiklung 2011; Bundesverband Wind Energie 2012; Starkenburg 2014; Blume 2010; Cumbers 2013).

Firstly, decentralised energy production represents some technical benefits such as: 1) smaller losses of energy in the transportation of the energy; 2) better coordination of the daily and seasonal variations between the energy supply and the patterns of customer demand; and 3) better exploitation of the country's climatic variations, which influence the availability of sunshine and wind, for example. Secondly, decentralised energy production increases social acceptance of energy projects due to a more democratic process of decision-making and a fairer distribution of the costs and gains of energy production across geographical areas and social groups, as discussed in Chapter 4. Here we may see that the BNDES and the ANEEL, based on the policy of the MME, focus on a centralised model of energy production that favours large investors and discourages the creation of wind energy projects led by cooperatives and NGOs. The contribution of

[1] According to the European Commission:

> *"Smart grids are energy networks that can automatically monitor energy flows and adjust to changes in energy supply and demand accordingly. (…) Smart grids can also help to better integrate renewable energy. While the sun doesn't shine all the time and the wind doesn't always blow, combining information on energy demand with weather forecasts can allow grid operators to better plan the integration of renewable energy into the grid and balance their networks. Smart grids also open up the possibility for consumers who produce their own energy to respond to prices and sell excess to the grid"* (European Commission 2014).

cooperatives to sustainable development and to poverty reduction was acknowledged by the UN Conference in Rio in 2012, and the United Nations General Assembly declared 2012 as the International Year of Cooperatives (United Nations 2012b). A cooperative is defined by the UN as:

> *"(…) an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise. (…) Co-operatives are based on the values of self-help, self-responsibility, democracy, equality, equity and solidarity. In the tradition of their founders, co-operative members believe in the ethical values of honesty, openness, social responsibility and caring for others"* (United Nations 2012b).

Also highlighted is the fact that *Co-operatives work for the sustainable development of their communities through policies approved by their members* (ibid.). Thus, we may see that the political choice to centre the Brazilian energy model on a centralised production favours big business and production patterns that do not favour a commitment to principles of environmental justice, as was analysed in Chapter 1. Here, on the national scale, we may see how the economic dimension of sustainable development is closely linked to ecological and social dimensions. Also we notice that national policies may privilege one model of territorialisation of wind energy based on large scale wind farms, which privileges some groups of interest. Now we will examine the licensing process.

Licensing process

The licensing process is also problematic. The investor presents the project to the environmental licensing agency (SEMACE for the state of Ceará) and the Enterprise of Energy Research (EPE subordinated to the MME). First of all, SEMACE issues a preliminary license. The EPE issues an authorisation based on the fulfilment of the demand and of technical requirements. After receiving both authorisations, the investor can take part in ANEEL auctions (Ricardo Marques Dutra, Researcher of the Brazilian Reference Center for Wind and Solar Energy, Rio de Janeiro, Brazil, 22 July 2011).

Next, winning investors submit environmental reports to SEMACE, which presents them to the affected populations during a public hearing in order to receive an installation licence. Having gained this licence, the investor can then apply for BNDES financing (Interview with Ivan Aquino, SEMACE, Fortaleza, 12 August 2013). SEMACE is the only government body that evaluates the social and environmental impacts of the project. Considering that environmental licensing is often ineffective, the BNDES, ANEEL and EPE may favour competitive projects that are socially and environmentally questionable. Here the economic dimension (targeting large-scale projects) seems to be privileged over the social and

ecological dimensions. This fact benefits the territorialisation of large investors. We will now see how power is exercised through the production of knowledge and discourses.

2. Knowledge and discourses

Planning

The regulation framework affecting the wind energy sector has to produce knowledge in order to be effective and to justify itself. The first aspect to be analysed here concerns the initial phase of wind farm planning. In order to define potential areas for the wind farm, and after receiving authorisation from the landowner concerned, investors can easily obtain a previous and simplified license for the installation of anemometric towers (Interview with a representative of SEMACE, Fortaleza 2013). Investors usually decide where to install them based on the National Wind Electricity Map that was shown here earlier (Centro de Referência para Energia Solar e Eólica Sérgio Brito 2001). This map represents the wind, relief and topographic variables of a space that seems to be socially empty. It does not include, for example, any research on land use or environmentally protected areas (Centro de Referência para Energia Solar e Eólica Sérgio Brito 2001).

This framework can be compared with its German counterpart, where in the state of Baden-Württemberg for example, local municipalities produce knowledge that will determine priority areas for wind farms but also restriction areas, considering a series of infrastructural, environmental, social and economic factors (Ministerium für Umwelt, Klima und Energiewirtschaft et al. 2012). Moreover, this procedure also stimulates a debate among local communities concerning environmental benefits and costs, increasing the likelihood of the produced knowledge including different local perspectives and interests (Agentur für Erneuerbare Energien 2011).

The previous classification of areas recommended and prohibited for wind farms also avoids the initial planning of projects that were not to be licensed, when considering their social and environmental effects (B. It may also be helpful for avoiding situations where wind firms try to pressurise local environmental agencies and judiciary powers, in the case of conflicts, into accepting projects that are not genuinely contributing to sustainable development. We may see that in Ceará, on the local scale, the environmental dimension is loosely regulated, thus favouring the occupation of territories that are ecologically fragile and socially disputed. The next procedure to be analysed is the licensing.

Licensing

Farms are licensed by the states, unless they are located in more than two states or in a federal territory (CONAMA 237/ 1997). The licensing of wind farms in Ceará is nowadays based on environmental impact reports called EIA/RIMA (Estudo de Impacto Ambiental/Relatório de Impacto Ambiental; Study of Environmental Impact/ Report of Environmental Impact). I could observe, while analysing the RAS of the wind farms affecting the Cumbe community and other EIA/RIMAS concerning wind farms elsewhere in Ceará, that these reports have an "economicist" and "technicist" approach, rather than an approach where the criteria of technical and economic efficiency would be guided by socio-cultural and socio-environmental criteria (RAS Central Eólica Bons Ventos 2008; RAS Central Eólica Canoa Quebrada, 2008; Rima Central Eólica Trairi 2011; RIMA Complexo Eólica Faisa 2011).

Among the criteria that should gain relevance in the reports are: the participation of affected groups, respect for traditional knowledge and territorial rights, and contribution to the reduction of social inequality. These aspects are ensured by the *Brazilian Constitution, Constituição da República Federativa do Brasil 1988, título X, art 68; Constituição da República Federativa do Brasil 1988, cap VIII, art. 231, parágrafo* 3, and by the Decree-law *Decreto 6040/2007*; and are defined as key aspects of sustainable development by the UN (United Nations 1992; United Nations 1997; United Nations 2012a).

The inhabitants' knowledge concerning the relationships between local ecosystems, livelihoods and socio-cultural practices is considered only very superficially. The social, cultural and economic values of the natural resources and the affected communities are not properly approached. Thus, the reports will not give accurate information about the impacts on inhabitants' daily lives. Here can be seen the links between the economic, environmental and social dimensions of sustainable development. Also it is quite clear that knowledge is a relevant power strategy with concrete effects on the territorial dispute on the coast of Ceara.

Besides this problem, we may observe a lack of access to information. The EIA/RIMA reports are officially presented to the community at a public hearing, where the population can ask questions and give their opinions (Interview with Maria Lucinaura Diógenes Olímpio, Director of the environmental consulting firm Geoconsult). This event includes SEMACE, the wind energy company, local residents, government representatives and all those who wish to participate (Interview with Ivan Botão de Aquino, Supervisor of the Environmental Impacts Sector of the Environmental Impact Services Department of Ceará). On this day the community votes for or against the project, although the vote is

only consultative and does not have to be obeyed by the authorities (Soares 2002). In order to access the reports before the public hearing, a person must either have ready access to the internet or make a trip to the capital of Ceará where SEMACE is located (Inteview with Ivan Botão de Aquino, Supervisor of the Environmental Impacts Sector of the Environmental Impact Services Department of Ceará). Neither option is easy to afford if you live in a poor community of Ceará state.

In Cumbe a public hearing occurred without the EIA/RIMA, based on the RAS, due to a requirement from the, Public Ministério Público Estadual do Ceará. Based on interviews with Cumbe's inhabitants and on media news and literature surveys, as well as on the analysis of the EIA/RIMAS and videos of public hearings applied to other communities accommodating wind farms in Ceará, I have observed the following problems:

1) Lack of transparency during the public hearing regarding future negative socio-environmental impacts and the restriction of access to natural resources and areas of common use that usually occurs.

2) The technical language used by the company representatives and by the scientists (representing the private company of environmental consulting hired for undertaking the EIA/RIMA) during the public hearing is of difficult comprehension for the community inhabitants, who mostly possess low levels of formal education.

3) False promises are made during the public hearings. In Cumbe, 1500 new jobs were promised, an argument that highly influenced the support given by the majority of the population to the project during the hearing. What was not pointed out during the hearing was the fact that most of these jobs required qualified and highly qualified labour not available in the community. The unqualified jobs offered were mainly very physically demanding, only temporary and low-paid (although with formal temporary contracts) (Interviews with Cumbe inhabitants; Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013; Interview with Jocélia Ribeiro, OPA Aracati/CE/Brazil, 08.11.2013).

We may see how the political, economic, socio-cultural and ecological dimensions of sustainability are interdependent on the local scale. The environmental licencing is thus an important instrument of power where legitimate knowledge favours the territorialisation of some groups to the detriment of others.

A further problem is the flexibilisation of environmental laws. In Cumbe, simplified reports (RAS) were adopted for the environmental licensing, as was mentioned earlier. This

attitude was based on the federal law, *Resolução CONAMA 279/* 2001, published after a hydropower supply crisis. It declared that wind farms are projects of "public utility" which produce "low impact" and released the environmental reports known as EIA/RIMA (Schiavon, 2009). The RAS did not consider a number of impacts or suggest alternative locations for the project (Meireles 2011). After much criticism, SEMACE banned this procedure for coastal wind farms, admitting they should be considered high-impact projects (Interview with Ivan Aquino, SEMACE, Fortaleza, 12.08.2013).

Nevertheless, since July 2013, SEMACE has authorised the use of RAS for the preliminary license so that projects can apply for the auctions on time. The EIA/RIMA will still be mandatory for installation and operating licenses. Nevertheless, this means that the winning bidders can offer a very competitive price based on a series of negative externalities caused to the environment and communities, and costs may be transferred to these communities or to the government. Here, on the local scale, loose economic and environmental regulation favours the territorialisation of large investors.

In 2014 the MMA began a process to implement a Legislative Resolution concerning the licensing of onshore wind farms in Brazil, establishing among other rules, that wind farms on fields of dunes should not be considered as low-impact projects, requiring therefore EIA/RIMAS instead of RAS (Ministério Público Estadual do Ceará 2009). Despite the fact that the MMA does not implement the participation of civic society in the creation and evaluation of its policies through conferences, as other ministries do, the CONAMA does include members of civic society and opened the possibility for these members to add their suggestions to the text of this Legislative Resolution.

I could not analyse the consequences of this process. I understand that the MMA's initiative to revise the Legislative Resolution, *Resolução CONAMA 279/ 2001*, to create a national Legislative Resolution specific for the licensing of wind farms and to include the consultation of the representatives of civic society by the CONAMA, may contribute to making the model of wind energy production in Brazil and especially on the northeast coast, fairer and more sustainable. Nevertheless, the content of the initial version of the text provided for consultancy retained similar characteristics to the one described above (regarding the EIA/RIMAS) and retained similar deficiencies regarding respect for traditional knowledge and for the territorial rights of traditional communities (Ministério do Meio Ambiente, 2014a). We will next analyse the role of the subjective evaluation of the wind farm in the conflict.

3. Environmental Subjectivities

Licensing

A public hearing in the community was required by the PUBLIC MINISTRY despite not being foreseen by the simplified environmental reports RAS, that were applied in the wind farms analysed here (public hearings are legally foreseen when an EIA/RIMA is required). Interviews have shown that the community's main desire regarding the wind farm was "employment". During the public hearing, the wind firms and the government used this desire to convince inhabitants of the benefits of the project, and made other promises: no significant impacts on livelihoods; "clean energy" for the country which is "good for the environment"; and "progress" for the community through infrastructural enhancement, besides "employment generation".

The fact that this community would be contributing to the sustainable development of the country's and the world's environment was highlighted by the institutions promoting the public hearing. On a national scale, discourses and rules seek to produce the same type of environmentally engaged subjects (Ministério do Meio Ambiente 2014b), produced by a global discourse (Rutherford 2007). Rutherford (2007) describes a "neoliberal subject" who is aware of the importance of the environment and actively contributes to its protection. It is about "taking part" in a global challenge, as if the challenge had been universally agreed upon. This discourse eliminates disputes regarding what are considered priority challenges and how to tackle them.

Additionally, this "taking part" is not about effectively participating in decisions on where to install projects and how to better invest the resulting profits, taxes and benefits. Neither is it about the possibility of defending one's own rights over resources when they are being disrespected.

This "taking part" is about giving support to projects which reduce global CO2 emissions, and would therefore benefit everybody equally. In this sense, all Brazilians are paying for the public investments made by the BNDES and should, according to this discourse, be proud that the country is investing in a clean source of energy. Nevertheless, some of those Brazilians are paying additionally for the negative externalities of the project despite being the ones less benefited by them, and this problem has still not been properly addressed by policy makers, investors or the mainstream media.

Nevertheless, as the regulation and planning of wind farms do not include the participation of affected communities during the planning and initial licensing phases, these

communities were not initially aware of the possible changes that would occur in their territories or of their available strategies to react against this process. Thus, encouraged by the discourse of the investors and of governmental agencies, there were initially positive expectations towards the implementation of the wind farm in the community, and a consensus that the community should accept the project (Interviews with inhabitants of the Cumbe community).

Here we see how on the global, national and local scales, there is a discourse that supports positive subjective values related to wind farms. It links mainly the economic, social and environmental dimensions of sustainability in order to gain acceptance for wind farms. Nevertheless, in this case, it is also clear that it is a biased discourse that favours some interest groups, aiming to reduce opposition to the occupation of traditional communities' territories by wind energy firms. Also, through its lack of or misleading information, it weakens the emergence of opposing discourses.

The negative results of this initial process of the wind farm's installation, as described above, started to appear during construction. The negative externalities of the project were transferred to the community, creating an unequal distribution of the project's costs and benefits. The main socio-cultural and economic impacts have been listed above.

We will now look at some positive impacts that were mentioned by Cumbe residents during the interviews. They occurred mainly during the construction of the wind farms and positively affected the subjective evaluation of the wind farms that some inhabitants currently have.

I believe here that the unequal distribution of the benefits of the projects, on a local scale, among the inhabitants of the community: 1) is one of the causes of the framework of environmental injustice observed in the case-study; 2) reflects unequal local power relations; 3) reinforces local economic inequalities; and 4) although not necessarily a power strategy intentionally adopted by the wind energy company at the time of its arrival in the community, results in internal conflicts (related to this unequal distribution of benefits) which may be used by the wind energy company as a power strategy for the adoption of good neighbourhood policies, as we will see later (in the third stage of the analysis of the governmentality framework of the Cumbe community). Still looking at the first stage of the governmentality framework of the Cumbe community, let us now examine those positive impacts and whom they have benefited the most.

Positive impacts, power realtions and contradictions on the local scale

For some groups, social and environmental losses have been somewhat offset by direct gains. However, I could observe that the benefits accrued largely for those who enjoyed a higher economic status. The main examples will be described.

Some inhabitants benefited from land leases for transmission lines. As the process was not mediated by public regulations, people with better economic and political status, aware of their bargaining power, were better compensated than poorer families who received unfair payment. Also those with larger pieces of land benefited more. Once again, the interviewed affirmed that some people were coerced into signing documents accepting the installation of the transmission lines. Also some residents had to struggle for the right of receiving land leasing even without possessing the land titles of their homes.

Here I would like to highlight three other factors which are inter-related, and which may be at the source of the environmental injustices observed in the Cumbe community. These three factors are: 1) a lack of implementation of an agrarian reform, so that most inhabitants do not own the titles of the lands they have been occupying; 2) the excessive power of politically and economically influential local families; and 3) a lack of political empowerment that would enable different interest groups to struggle for their rights.

We shall begin discussing the first and second factors, which are intimately related. The majority of the inhabitants of the Cumbe community do not hold the titles of their properties. Compensations for damaged houses during the construction works only reached those without land titles after protests whose demands included this issue. From this group of people living in houses without property titles, a great number affirmed that they or their parents received the land as a donation from one inhabitant, apparently the most economically and politically influential resident of the Cumbe community. I have interviewed this person, a businessman, who confirmed that he and his father owned the majority of the Cumbe community's lands and that together, they had donated most of the terrains where people today have houses. Due to lack of time, I could not investigate how the family had acquired this large area of land.

Within the community he owns shrimp farms and previously owned land that was recently sold to the wind energy company CPFL. He also owns a leisure facility with a restaurant that permanently receives visitors from various parts of Ceará and, according to him, even from other parts of the country. He receives tourist and school excursions. I have observed how school buses stop on his land and how lectures given by teachers and by representatives of the CPFL about wind energy and sustainability take place in his

restaurant, which is the largest restaurant in the community (where there are three). This businessman is therefore one of the community's main employers.

He has already been made a city councillor, and he is the cousin of the current mayor of Aracati. According to him, during his years as a politician, he has helped to bring water supply services, energy supplies, the first bridge and the first school rooms, among other benefits, to the community (Interview with the former city councillor in Aracati, largest landowner and largest merchant of the Cumbe community, Cumbe, 2013). He affirms that, even though most lands had been donated without contracts, if anyone needs his signature in order to sell the property or for other purposes, then he agrees to do so (Interview with the former city councillor in Aracati, largest landowner and largest merchant of the Cumbe community, Cumbe, 2013). For these reasons he is seen, by several inhabitants, as a "benefactor" in the community.

I cannot affirm the extent to which he economically and politically influences the community. Nevertheless, it is possible that a coercive power exists, since he is a landowner, the cousin of a local mayor, and the employer of many people, affecting thus the lives of many families, especially considering that in this small community, almost everybody is either related to, or has grown up since childhood with, each other. In this sense, some people may be discouraged to oppose the wind farms or shrimp farming (two activities that generate profits to this person) and suffer some kind of retaliation regarding their jobs or the acquisition of their land titles. The excessive influential power of some families in small communities in the countryside is definitely an obstacle to sustainable development and to environmental justice, as it may hinder truly democratic participation, free political expression and the reduction of social inequalities (Rauch 2009).

This fact is not exclusive to the Cumbe community; instead it is a historical feature of the constitution of the Brazilian political regime. Defined by the notion of "paternalism" and the Portuguese term "coronelism", the excessive historical influence of private capital and private interests on politics, which was characteristic of the colonial period, has been perpetrated until today. Historical problems such as high land concentration, disseminated poverty and the omission of public power in the provision of basic services and in the guarantee of basic rights, have left the larger part of the rural population dependent on the "support" of large landowners, based for example on the exchange of "favours" and "loyalty" (Leal 1997). This complex issue cannot be properly examined here due to the limited extent and purposes of this work, but is nonetheless a relevant factor to the study of the unequal power relations affecting the conflicts analysed here.

Another factor may be considered as a possible cause for the occurrence of cases of environmental injustice regarding the installation of large-scale wind farms in the case-study community. This factor is the lack of political empowerment of most inhabitants living in the community. This issue requires further investigation but has to be mentioned. The social and cultural habits of those participating in civic social organizations and taking part in political activities are not familiar to a large number of those interviewed. The main arguments used to explain why they would not attend the Cumbe residents' association meetings were that they disliked them; that they wished to avoid the heated debates that occur between opposing groups; and the belief that the meetings would not have concrete beneficial effects on their lives.

Probably reflecting this lack of political empowerment, a large number of the interviewed gave discourses in which they were able to identify unequal power relations in the management of the environment on a national scale, or in general (when asked who possesses more power to determine the rules of environmental management and of the use of natural resources in Brazil, several of the interviewed answered "money", "corrupt people" or "politicians"); but not when they were asked to think about these relations within the local community (most of the interviewed said that there were no power relations). The exception to this tendency was the fishermen who, in general, concerning the local scale, would mention the shrimp farm businessmen and wind energy companies. Based on the perspective of Rauch (2009) I would say that the empowerment of all underprivileged interest groups in the community and dialogue between them would be essential in order to develop more participative policies on a local scale.

I cannot affirm but I suppose that maybe due to the exchange of experiences with the social movements the MST and OPA, fishermen seemed to be more aware of the power relations that are threatening their rights (with enterprises, the president of the cooperative of fishermen, the police, the judge of Aracati etc. on one side) and of the groups that are supporting them in this struggle (the Public Defence Service of Aracati, the MST, the OPA and academic researchers on the other side).

The words "territory" and "environmental protection" appear in their discourses to legitimize their struggle, maybe indicating a subjective appropriation of the current political struggle for territorial rights occurring since the 1980s in Brazil. As we have seen in Chapter 3, this struggle is supported by a national and global regulative framework but is also threatened by a global and national economic model that stimulates the overexploitation of nature, the enclosure of natural resources and land concentration. Those fishermen offer an

environmental discourse that criticizes the overexploitation of natural resources and the land expropriation promoted by big business.

The fishermen of the Cumbe community seem to struggle for their way of life, and instead of aiming for the safety of salaried jobs, aim for the freedom to preserve their livelihoods and the knowledge that was passed onto them from generation to generation; and aim also to preserve their relationship with the natural resources of their territories. They regard large investors as invaders. Some of them wish for their children to become fishermen as well, while others wish that their children had more opportunities to study than they did, and could follow other professional paths.

In opposition to this discourse, employees of the wind farm, the restaurants and the shrimp farms (and their close family members) currently usually support large investments in the community. Some of them are now politically organised through the new Cumbe residents' association, which opposes the previous one, which had supported the protests against the wind farms. Unlike the fishermen, they seem to struggle for their rights to employment that ensures the security of regular incomes and for investments that improve the infrastructural conditions of the community (without considering that the improvements occurring in the community after the arrival of the wind farm were the result of residents' protests).

Reflecting a different environmental discourse, this group reproduces the depoliticised environmental discourse produced by the wind farm company and by government, considering climate change a global challenge that affects everyone equally and focusing on strategies of so-called sustainable consumption practices and recycling. On one hand they mention that wind energy is a clean energy source that is good for the planet, and on the other hand they claim that some of the daily practices of fishermen are environmentally harmful, for example when fishermen sometimes leave plastic waste on mangroves or disrespect the designated periods for fishing (which are based for example on the mating seasons of crabs).

In order to deal with the conflicts currently occurring within the community (nowadays centred mainly on a territorial dispute between fishers and a large shrimp farm owner from Sao Paulo), the abovementioned businessman and large landowner from Cumbe affirmed that he has chosen the president of the recently-formed Cumbe residents' association (Interview with the former city councillor in Aracati, largest landowner and largest merchant of the Cumbe community, Cumbe, 2013). This association aims mainly to represent the interests of those who support large investments in the community and to oppose the previously existing association - whose most active members assume a position critical of

the discourse of progress brought by large-scale investments in the community. These people are in general those who initiated the protests and the road barricade against the wind power firm. We will return to this conflict later. Here we can see how this businessman is both economically and politically influential and may use the internal conflicts occurring in the community to his own favour, and may at any time choose to support the interests of the wind energy company, which is seen by him as very beneficial for the community.

Another directly affected group that benefits from the presence of the firm is restaurant and small market owners, who were normally contacted by the firm at the beginning of the project to provide meals to employees, and who until now have increased sales due to the movement of workers who are daily or temporarily at the wind farm conducting maintenance, checks and repairs. This has allowed them to expand their businesses and hire more people from their family or the community. Engineers and technicians employed at the wind farm have come from Fortaleza and other places outside Aracati, and live outside the community, in nearby towns. Nevertheless, they nowadays have lunch daily in the three restaurants inside the community and sometimes consume in the small markets of the community.

Besides that, today, only about ten people out of the roughly six hundred inhabitants of Cumbe work for the wind power company, primarily as security guards. They had to pay for qualification courses outside Cumbe, also paying for their own transportation, accommodation and registration fees. It is important to note that not all the people who attend these courses are necessarily hired by the wind firm. Also I was informed that most of these job offers were the result of community pressure on the company, during protests, to favour local residents if they were qualified.

Another group of people benefited when the wind energy company first entered the community. The arrival of the company was accompanied by a number of subcontracted firms, which required a host of temporary services. Many people stated in interviews that they had benefited from this extra income by being able to build or renovate their houses, for example. Nowadays these groups are more likely to engage in dialogue with the firm. Nevertheless during the critical phase of impacts due to construction works, most of them affirmed in interviews to have joined protests against the farm.

While looking at the positive impacts of the wind farms in the case study, we saw that during their installation, on a local sale, an important strategy may have been used by the interest groups in favour of the installation of the wind farm to facilitate its territorialisation: informal tacit rules based on paternalist relations among landowners and inhabitants,

based on high levels of poverty and unemployment; and based on the lack of public services observed in the Cumbe community. Here we see how the effects of a project that will supposedly contribute to sustainable development must be analysed from economic, socio-cultural, political and environmental perspectives, with an integrated and multi-scale vision. This framework will help us understand the current relationship between wind firm and community. But first let's look back to the protest stage.

7.3.2. Second Stage – Protests

Here we will consider this period of resistance as a different stage in the process of conflict, when a different set of power strategies are employed that interfere with the dynamics of the case-study area. New rules (albeit temporary), discourses and subjectivities appear, produced by the inhabitants in a process of resistance.

1. Temporary Rules

Environmental inspection

We will now look at problems that occurred mainly due to failures during the environmental licensing and environmental inspection processes, and the resulting power dispute in the community. Experiencing the previously mentioned negative social, ecological and economic impacts, and observing a lack of willingness on the part of the wind energy company to enter into dialogue with the community and the failure of the SEMACE to respond to the community's complaints, some inhabitants initiated a resistance movement against the way the project was being implemented. They had to appeal for support from other groups and institutions in order to increase their power of influence during the conflict. The Public Prosecution Service, the academic support of a researcher of the Federal University of Ceará Antonio Jeovah de Andrade Meireles (Meireles 2008, Meireles 2009a, Meireles 2009b, Meireles 2011) and representatives of the MST were key supporters in this process of resistance.

Based on the complaints of Cumbe's inhabitants and on studies undertaken by Meireles (2008), the Federal Public Prosecution Service and the Public Prosecution Service of the state of Ceará issued a public civic lawsuit against the wind energy firm Bons Ventos, against SEMACE and against IPHAN, forcing the interruption of the construction of the wind farms until proper reports on environmental impact, instead of the simplified ones in the form of the RAS, could be written (Ministério Público Estadual do Ceará 2009).

A further problem identified by the PUBLIC MINISTRY besides the RAS and reported impacts, was that the wind firm used a strategy (and that the SEMACE accepted it) to

avoid the EIA/RIMA (Ministério Público Estadual do Ceará 2009). Sixty-seven turbines installed on sand dunes in the same area were declared to the SEMACE as being three different small wind farms (instead of one large project), thus fitting into the category of low impact that could therefore be licensed with the RAS.

We see that the wind firm had a great power of influence to flexibilise rules according to its own interests. In response, an important power strategy used by the inhabitants of the Cumbe community was road closures. The road that passes through the community has been closed three times by the residents of Cumbe, who prevented the wind energy firm's vehicles from passing as a form of protest. One of these road barricades, in 2009, lasted nineteen days and gained the support of many residents, as well as of representatives of the MST, one of the key social movements in Brazil fighting for agrarian reform, as mentioned in Chapter 3. This protest incurred high costs for the firm and gained attention from the media (Diário do Nordeste 2010; Interview with participants of these protests, Cumbe, 2013).

On this occasion, after heavy rains, the poor quality road constructed through the community had accumulated so much mud that only the company trucks could use it. People could neither walk normally to work or school, nor use the road with normal cars. The initial promises made by the wind firm to improve the road still hadn't been realised. By contrast, the road used mostly by the wind power firm, which connects the community to their office, and this office to the wind farm, is made of high-quality material and was not affected by the rain.

The barricade lasted until an agreement was met. Among the main requests were: 1) the improvement of the road; 2) the free access of residents to the sand dune fields and to the beach; 3) the indemnification of damaged houses and houses affected by transmission lines (with or without a land title); 3) the employment of local people as permanent salaried staff (and not only for temporary jobs); and 4) an archaeological museum in the community (Interview with João Luís Joventino do Nascimento, researcher, activist and Cumbe´s resident). Fishermen's access to the road was only achieved in practice when it was legally guaranteed in 2013, thanks to the interference of the Public Defence Service of Aracati/CE (Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013)

In this sense, we may observe that during the construction of the wind farm, resistance provoked the establishment of some new, albeit temporary, rules. During these nineteen days the local inhabitants alone possessed power over the right to use the road leading to the wind farm. For five of those nineteen days, the community's opposition to the wind

farm project was legitimated by the Public Prosecution Service (Ministério Público Federal 2010b; Ministério Público Federal 2010a). As has been mentioned, the Prosecution Service placed an embargo on further construction due to the flexibilization of environmental laws and the use of simplified environmental reports in areas of environmental protection.

However, due to pressure from the wind firm Bons Ventos, five days later, a new order issued by a different representative of the judiciary power reversed the previous decision and favoured the wind firm. Eventually the wind farm was installed without EIA/RIMA, as I could verify by visiting the SEMACE and interviewing the Supervisor Ivan Aquino (Interview with Ivan Aquino, SEMACE´s Supervisor, Ceará, 2013). As we can see, the powers of the groups involved in the conflict to influence the rules that "govern" the territory, in a state of dispute, are massively unequal. Interest groups have used rules (both legitimated by public consent and otherwise) as strategies to impose their interest on the territory.

Here again we may observe how the political, social, ecological and economic dimensions of sustainable development are inter-dependant, and must be considered in an integrated form by public policies. The conflict is being analysed on a local scale, but as the protest has gained visibility, both local and national public institutions have become involved in the dispute. We will now analyse how, besides rules and institutions, knowledge and discourse have been used as strategies during the protest stage.

2. Critical knowledge and critical discourse

Environmental Inspection

During recent years researchers have produced and disseminated knowledge that gives visibility to the impacts of wind farms in coastal areas of northeast Brazil, contesting official knowledge and discourses, and contesting inadequate processes of environmental licencing and environmental inspection. Resistance has arisen in other places in this region, and affected communities gathered in 2012 with partners including national social movements such as the MST, the MAB, NGOs and academic research groups from the UFC (Federal University of Ceará) for a meeting entitled "Wind Farms, Conflicts and Environmental Injustices in the Coastal Zone" (Parques de Energia Eólica, Conflitos e Injustiças Ambientais na Zona Costeira) (Portal do Mar 2012).

Since 2009, knowledge concerning the impacts of the current model of wind energy production in the territories of traditional communities has been produced and shared

among social movements, researchers, environmental NGOs and other organizations including the National Network of Popular Lawyers (Rede Nacional de Advogados Populares) and the RBJA. This has been increasing awareness of the impacts on and resistance strategies used by various communities affected by wind farm projects, thus helping them to protect their territories. Also, sections of the media and NGO blogs have been publishing information based on these alternative sources of knowledge, questioning the discourses provided by the Abeeólica, the EPE, the BNDES and the MME, among others.

During the protest, reports of impacts, based on the scientific research of Meireles (2009), gave legitimacy to the initial decision made by the Public Prosecution Service of the state of Ceará, Ministério Público do Estado do Ceará, to stop the construction works. The production of these alternative sources of knowledge and discourses is thus a relevant power strategy used in the struggle for the territories on the northeast coast of Ceará. It is important to underline that it usually draws attention to the fact that the social, ecological and political dimensions of sustainable development are as important as the economic dimension. Also it highlights the fact that sustainable development must consider a fair distribution of the costs and benefits of economic development among socio-cultural groups and among places - including the global, national, regional and local scales.

Let us now examine how the resistance included a new subjective evaluation, made by residents, of the benefits of wind energy to the community, in comparison with the first stage as it was initially seen as a symbol of progress, of clean energy and of job opportunities. These changes are understood through interviews with roughly forty local residents.

3. New Subjectivities

Planning and licensing of the wind farm

The production of official knowledge (by govern-mental agencies and by wind power companies) has exerted huge influence over people's subjectivities on a local scale. Official discourses were widely accepted before the wind farm was constructed. Most inhabitants did not expect any significant negative impacts on their livelihoods, their traditional habits or their homes. As we have seen above, these negative impacts did occur, due among other factors to failures in the wind farms' planning and licensing processes. On the other hand, the inhabitants of Cumbe expected some kind of progress based on employment and infrastructural benefits, and an improved road running through their community. As has already been mentioned, this community has suffered, and is still

suffering, from a lack of jobs, healthcare, day-care for young children, sanitation, transport infrastructure, public transport and leisure activities for young people.

After experiencing the effects of construction work and gaining access to critical points of view provided by new sources of knowledge (as mentioned above), local inhabitants' subjective positions in relation to the project have started to change. This has been observed in people's discourses during interviews and also during registers of these discourses that built up during the days of protest. Posters which read, "The energy is clean, not its installation" and "Wind farms yes, on top of dunes no", show a new appropriation of the words used by official discourses.

This shift of position was perceived by the wind firm as a challenge and the result was a new phase of "good neighbourhood policies" implemented by the company Bons Ventos and continued by the new owner, CPFL. According to a representative of the CPFL, those policies show a will to compensate the community (Interview with the advisor for communication issues of the CPFL in the Cumbe community, Cumbe, 2013). Here we notice how the subjective values and images associated with the wind farms are instruments of power, as they motivate resistance to, or support of, the projects and the wind energy companies. Also, the need to analyse conflicts based on a multi-scale approach is evident here. Enterprises acting on a national scale must consider groups acting on a local scale, as well as their interests and territorial strategies.

From the perspective of policy makers and governmental agencies, the local impacts of projects that are assumed to be sustainable must be considered, not only aiming to promote sustainable development from an environmental perspective, but also from social, economic and political perspectives (regarding, for example, the acceptance of the wind farms and the participation of affected communities in the decision processes).

It is important to highlight that these so-called "good neighbourhood policies" adopted by the wind farm may have contributed to internal conflicts within the community among those who mainly view the wind farm and the wind power company positively and those who have a mostly critical view towards both. Some people have reconsidered their opinions about the wind farm based on what is seen as willingness on the part of the wind power firm to compensate for the damages caused. We will now analyse the current situation of the conflict and the power relations and strategies involved.

7.3.3. Third Stage – Good neighbourhood policies

In an attempt to appease opposition, the firm has implemented different strategies for securing their territory, or in other words to ensure that the Cumbe community remained a "governable space" (Agrawal 2006; Rutehrford 2007), where their economic activity could be developed without new hindrances. These strategies will also be analysed with regards to policies, discourses and subjectivities. Regarding the phases of the wind farm's development, the strategies of power analysed here - as we are focusing on the current configuration of local power relations - concern mainly the phase of environmental inspection or reflect failures that occurred during previous phases.

1. Corporative Policies

In order to establish good neighbourhood relations, one strategy has been the implementation of regular public meetings with residents in which the main demands are considered (Interview with the advisor for communication issues of the CPFL in the Cumbe community, Cumbe, 2013; Interview with João Luís Joventino do Nascimento, researcher, activist and Cumbe´s resident; Interview with Cumbe inhabitants). These are organized by a subcontracted firm, which select one person as a representative who attempts to establish friendly dialogue with inhabitants (Beth, the advisor for communication issues of the CPFL in the Cumbe community, which was interviewd). Social policies are also implemented, such as the offering of short-term vocational courses (e.g. cooking and sewing courses for women) or sport courses for residents, and the organisation of parties for children, offering food and beverages (Interview with the advisor for communication issues of the CPFL in the Cumbe community, Cumbe, 2013; Interview with João Luís Joventino do Nascimento, researcher, activist and Cumbe´s resident; Interview with Cumbe inhabitants).

Regarding archaeological sites in the community, the unearthed material (41,000 pieces) was taken to a museum in the state of Natal (Governo de Aracati 2014). After pressure from the community and the consequent interference of the PUBLIC MINISTRY a Conduct Adjustment Commitment (TAC, Termo de Ajustamento de Conduta) decided that, under the coordination of the IPHAN, the CPFL should finance an archaeological museum within the community (Governo de Aracati 2014). The land that will host the museum belongs to the abovementioned businessman (very influential in the community), who was reported to be satisfied with the price he received (Interview with the former city councillor in Aracati, largest landowner and largest merchant of the Cumbe community). Furthermore, after the protests and the claims made by the residents, the building of the school and the church

(both damaged by the construction of the wind farm) were reinstated by the company (Interview with Cumbe inhabitants).

These facts are underlined by those who nowadays see the wind farm mostly positively, and see the wind energy company as beneficial to the community. Many of the inhabitants, who are nowadays in favour of the wind farm, were actively supporting or at least agreed with the protests of 2009. Also some of them affirmed that they did not agree with the further development of the resistance against the wind farms, or against shrimp farmers, in particular because these investments brought employment to the community.

This group of interviewed persons usually describes salaried jobs as much more desirable than living from fishing. Some of them are former shellfish collectors or crab hunters, or fishers who prefer the stability and safer work conditions found in a salaried job. Most have never lived from fish and highlight the fact that the whole community could not live only from fishing and needs therefore to attract job opportunities. Nonetheless, respect for environmental laws, labour rights and fair salaries on the part of the investors seems to be left aside, while the risk of unemployment is regarded as more important. I could perceive within this group a feeling of fear that the current resistance of parts of the community (composed mostly of fishermen and women and other activists including lawyers, members of the local Catholic church including a priest, researchers and social movements) towards the large investors would aim at, and indeed succeed in, expelling them from the community.

Here we can see how the lack of job opportunities, professional qualifications, public services, and sometimes of awareness about constitutional rights in fact, as analysed by the approach of environmental justice, increases the acceptance by underprivileged communities of projects with serious negative socio-environmental impacts.

It should be pointed out that the representative of the CPFL who is responsible for implementing a good neighbourhood policy in Cumbe, traverses the community area daily, visiting inhabitants and inviting them to meetings promoted by the CPFL. I could also observe that many of those interviewed had a friendly relationship with this person, in particular the three restaurant owners and their employees.

Nevertheless, many other interviewed people, in particular the families of fishermen, rarely received visits from this CPFL representative, and a few could only vaguely identify who I was talking about when I mentioned this person. This means that the compensations provided nowadays by the wind firm may be unequally distributed (benefiting those who

are in favour of the project and who usually benefited more at the beginning), as compensations are neither proposed by law nor supervised by public power.

As we can see, informal and institutionalised policies and relationships are relevant instruments used in the community's territorial dispute. The local scale is here the most relevant, and the social and political dimension of the sustainability of wind farms is highlighted. Besides the abovementioned compensations, environmental education programs (which will be examined presently) were implemented at the local state school. We will now observe knowledge as "governmentality", that is, as a power strategy to ensure a "governable" territory, increasing the acceptance of the wind energy company in the community.

2. Knowledge and discourses

Environmental education programs offered by the wind energy company in the state schools disseminate information mainly regarding the advantages of renewable energy and of recycling in order to protect the environment (Interview with representatives of CPFL, Cumbe´s Inhabitants and Suzilon, Fortaleza, November 2013). I could identify these subjective values linking the environment primarily to the importance of individual practices of recycling, and regarding wind energy primarily as "clean" in the discourse of most inhabitants interviewed, except in the discourse of fishermen, who presented a critical discourse towards the wind farm.

This form of education, as implemented by the projects of Suzilon, Bons Ventos and CPFL, often in partnership with the governmental environmental agencies, does not aim at creating a citizen able to critically examine the reality or empowering them to search for individual and collective emancipation from exploitation and from all sorts of oppression (whether it be based on class, ethnic-cultural or gender distinctions) and to ensure the right of access to a sustainable environment for all (Loureiro 2012). If sustainable development has to include participation, the reduction of social inequalities and respect for the livelihoods, traditional knowledge and territories of traditional communities (United Nations 1992; United Nations 1997; United Nations 2012a), then environmental education that aims to educate citizens who will contribute to the promotion of sustainable development must include a critical, multi-scale and multi-dimensional approach to the environment. It must, for example, enable an individual to critically analyse the contradictory relationships between the green industry, environmental impacts and environmental regulations on different scales affecting their lives.

Nevertheless, biased knowledge regarding sustainable development and wind power is currently being diffused (with the support and legitimacy of public institutions) as a power strategy to increase wind farms' acceptance and to reduce critical views of the so-called green industry. In the present case study, the multinational enterprise Suzilon is applying and adapting global strategies of knowledge diffusion in order to achieve more local acceptance. This kind of knowledge focuses on the economic and environmental dimensions of sustainability on the global scale, not addressing political and social issues of inequalities and injustices regarding for example the distribution of losses and benefits of wind farms among different social and ethnic groups. Let us now look at the subjective values behind this mainstream approach of the environmental issue.

3. Environmental Subjectivities

This kind of knowledge, as reproduced by these courses and environmental education workshops offered by the CPFL (the owner of the wind farms in the case study) and by SUZILON (the turbine builders who carry out the technical maintenance of the wind farms in the case-study), as well as by the informative journals published by the Bons Ventos (Bons Ventos 2011), the CPFL (Cpfl 2013) and the CONPAM (Conselho de Políticas e Gestão do Meio Ambiente n.d.) fits in with a neoliberal attitude (Rutherford 2007) as described here earlier, which assumes a personal engagement with the environment as if the goals and strategies to be achieved could be unanimously defined. It stimulates individual daily attitudes, mainly regarding consumption habits (not questioning mass consumption but stimulating consumption of products with environmental labels) and recycling. These attitudes, though positive, do not question or tackle core problems such as: unequal access to resources; unequal distribution of environmental costs and risks; unequal contribution to climate change by countries and social groups in the past and today; the effects of massive consumption; and finally unequal participation in decision-making (Rutherford 2007, p. 299).

A report recently published by the NGO DARA (an independent non-profit organization that undertakes research and policy studies promoting humanitarian principles, learning and accountability), presents through concrete data the various dimensions of environmental injustice. The report "Climate Vulnerability Monitor" shows how different types of risks and social and economic damages caused by climate change disproportionately affect poorer countries and underprivileged groups (Dara 2015; Dara 2012).

Nevertheless, a critical perspective on the environmental issue did not appear to be enhanced by the environmental education programs, considering also the perspective of the Coordination of Environmental Education and Social Articulation of Ceará (COEAS,

subordinated to the CONPAM) (Interview with the Representative of the Coordinating Body for Environmental Education and Social Articulation linked to the CONPAM, September 2013).

It should also be pointed out that a critical position towards the mainstream discourse of sustainability and towards the so-called “green industry” was barely identified at all in the discourse of the governmental agency representatives interviewed on all levels. I would highlight the discourse of the main representatives of the Secretary for Social Assistance, Labour and Income, and of the Secretary of Finances, which referred to the wind energy company as a “partner”. In the first case, the social assistance programs are using the meetings promoted by the wind energy company to undertake surveys and to implement projects, claiming that these meetings are highly representative of the community.

Nevertheless, I have heard from many interviewed people (inhabitants of the case study community – comunidade do Cumbe, Aracati, Ceará, Brazil – that should be democratically enhanced by the public assistance programs) who do not attend these meetings (organised by the CPFL) due to a lack of interest or due to opposition to the corporative policies and behaviour of the wind energy company. Some inhabitants see the wind energy company as an “invader” (this word has been used in particular when describing the negative impacts of the wind farm) rather than a “partner” (the word used by two interviewed local governmental agency representatives). As for the secretary of finance, he affirmed that although the wind farm only has to pay the usual taxes paid by any other commercial activity (ICMS and ISS), part of these tributes are benefiting the economy of the municipality, and that the wind company is benefiting the whole community. He did not mention any conflicts or negative impacts on the communities except for the risk that the turbines represent to migratory birds.

We see that positive subjective values associated with the image of wind farms, of renewable energy and of sustainable development are reproduced by representatives of institutions and by official environmental education programmes (implemented by public institutions and by private firms), as the reduction of social resistance to wind energy projects and policies is a relevant and often used instrument of power. As discussed previously, these “subjectivities” (identified on the local scale through interviews and document analysis) are based on apolitical discourses legitimated by global multilateral institutions such as the UN and the World Bank. These apolitical discourses usually focus on the environmental and economic dimensions of sustainable development on a global scale, not considering for example local political issues of participation in decision-making processes.

As discussed in the first chapter, social structures (imposed by public institutions, laws and economic policies) limit the actions of some individuals and groups, while creating opportunities for others. On the other hand, the subjective positions of individuals and groups influence the social structures, preserving them or becoming aware of them and struggling (according to their different powers of influence) to transform them. Here we conclude our case study analysis and may pass to the partial conclusions of the chapter.

7.4. PARTIAL CONCLUSIONS

According to Mallon (2006), the distribution of costs and benefits of renewable energy projects is the responsibility of policy makers, since this does not necessarily occur naturally. This chapter has shown how the governmentality of wind power influencing the Cumbe community is produced on several scales, in a nonlinear and contested reproduction of power through rules/institutions/policies, knowledge/discourses and subjectivities. In this process some strategies are much more effective and durable than others, if they are attuned to the interests of groups with more power to influence the production and implementation of rules, the legitimation of knowledge and discourses and the diffusion of subjective values.

We also saw how the struggle for the recognition of values and identities is relevant for the struggle for territorial rights and the acquisition of property titles in areas of private and of collective use, which is relevant for access to citizenship through public policies and loans or through compensations in the case of damages occurred by the implementation investment projects. Here we conclude the analysis of the case-study and may move on to the final considerations of this research.

8. FINAL CONCLUSIONS

This work draws attention to a contradiction concerning the model under which wind power is being implemented in Brazil. On the one hand, investments are growing, costs of wind power production are decreasing, a chain of industries and services is emerging in Brazil to supply wind farms, the percentage of renewable energy sources in the country's energy mix is growing and, finally, national carbon dioxide (CO_2) emissions are being reduced. This depicts a positive framework considering the economic and ecological dimensions on a national scale.

On the other hand, this model has been criticised when it concerns the northeast coast of Brazil – the area where most of the investments are concentrated. In this area affected communities, academics, public prosecutors, public defenders, Non-Governmental Organisations (NGOs) and sections of the media have highlighted: 1) a disregard for environmental laws; 2) the transfer of negative impacts to inhabitants without appropriate compensations; 3) disrespect for social rights; and 4) disrespect for the territories of traditional populations (Alcântara 2009; Brown 2011; Comissão Pastoral da Terra 2014; Diario do Nordeste 2010; Francisco 2012; Lima 2009; Meireles 2011; Pachioni 2013; Portal do Mar 2012; Rede Brasileira de Justiça Ambiental 2014). This depicts a negative framework considering the socio-cultural, economic and environmental dimensions on local and regional scales.

Considering alternative definitions of the mainstream idea of "sustainable development" – which describe it as a process involving the reduction of socioeconomic inequalities, an effective participation of affected groups and respect for the reproduction of ecosystems (Rauch, 2009) – wind power policies affecting the case study community are not contributing to sustainable development.

The initial bibliographic survey and secondary data collection soon showed me that the reason for this contradiction was an unequal distribution of the wind farms' costs and benefits across space and among social groups. This preliminary research brought various perspectives to attention concerning the development of the wind energy sector in Brazil. Firstly, that the wind energy sector is seen as a strategic one for the Brazilian energy policy and for the national economic growth policy, and is therefore receiving large public loans with low interest rates.

Secondly, that there is a mainstream discourse linking wind energy to sustainable development in the media, some areas of academic research, national policies in Brazil and Germany, and on the global agendas of various multilateral organisations. Thirdly that

in Brazil, the wind energy sector is mostly developing on a centralised model of energy production, with large-scale wind farms concentrated on the northeast coast. Fourthly, that the development of wind energy in Brazil is seen by the government, the media, investors and researchers as relatively successful, due to increased economic competitiveness, technical efficiency and the promotion of the national supply industry (Dutra 2007; Alves, 2010).

And finally, as mentioned above, the preliminary research has showed me that the contribution of the wind energy sector to sustainable development is being questioned by academic researchers, NGOs and affected communities, who point to various socio-environmental impacts caused by wind farms. These impacts result in socio-cultural and economic losses to underprivileged groups directly affected by the projects. Therefore, I could observe an unbalanced distribution of the wind farms' costs and benefits among social groups and across geographical areas, as well as the resulting socio-environmental conflicts, and the need to question the contribution of such projects to sustainable development.

The definition of "sustainable development" is not consensual, but we understand here that a geographical approach of such a concept must be multi-scalar and multidimensional (Arnauld De Sartre & Berdoulay 2011; Rauch 2009). This means that the local scale and the socio-ecological dimension – which seemed to show the contradictions of the wind energy model in Brazil – must not be ignored by public polices aiming for sustainable development. The UN assumes that sustainable development has to include the reduction of economic inequality and the participation of affected groups, while promoting environmental preservation and economic development (United Nations 1992). Thus, if wind energy is to be considered sustainable, it must not cause environmental or social damage to directly affected ecosystems or threaten the livelihoods of poor communities.

It is based on these previous assumptions, that I have defined the key hypotheses, questions and goals of this research. My main hypothesis was that the public policy for promoting wind energy on the Northeast Coast of Brazil, and in the Cumbe community in particular, is failing to promote sustainable development and environmental justice, mainly due to unequal power relations. In other words, the observed negative socio-cultural, environmental and economic impacts of Brazilian wind farms, which lead to an unequal distribution of their costs and benefits, are mainly caused by unequal power relations among interest groups.

It is in this sense that, for my research, the concept of environmental justice seemed to better fit the Brazilian framework than the concept of sustainable development, as the first

concept politicises the environmental issue and highlights the fact that there is an unequal distribution of the costs and benefits of economic growth, including the so-called green economy. The main hypothesis has been confirmed, observing power relations on multiple scales. Based on the main hypothesis I have defined two further hypotheses.

The first one was that there is a territorial component that is central to the understanding of the conflicts concerning wind farms, as well as to the understanding of the reasons why wind power policies in Brazil are not succeeding in promoting sustainability and environmental justice. In other words, especially from the perspective of geography, the concept of territory is a useful research tool for answering my main research question.

I have thus decided to analyse the conflicts as territorial disputes. These are here understood as power relations through spatial relations and strategies (Gomes 2002; Souza 2000). These spatial relations of power are here seen as being: 1) formed over history; 2) multidimensional (economic, social, cultural, environmental); and 3) multi-scale (local, regional, national, global) (Rauch 2009; Souza 2000; Rutherford 2007). The first hypothesis has been confirmed.

The other hypothesis was that the concept of governmentality serves as a useful research tool for analysing power relations and territorial strategies regarding wind energy related conflicts on the northeast coast of Brazil. I assumed that the governmentality approach could contribute to the analysis of power relations among relevant groups of interest, on multiple scales; and to the analysis of the reasons why the model of wind energy production in Brazil has not been contributing to sustainable development or to environmental justice (Rutherford 2007). The second hypothesis has also been confirmed.

Based on the abovementioned assumptions and on the assumption that power relations are reproduced not only through formal institutions and laws, but also through informal practices and tacit rules, as well as through knowledge, discourses and subjective values (Agrawal 2006), I have defined my spatial frames and formulated my research questions and goals. I have selected the Cumbe community for undertaking my case-study, located in the municipality of Aracati, state of Ceará, NE region of Brazil. This choice was firstly based on the fact that the conflict regarding the installation of the wind farm in this community took place in the region (NE) and the state (Ceará) with the largest installed capacities in Brazil and with more expected growth as a result of future investments. Thus, I saw the relevance of analysing the problems occurring in this context in order to contribute to avoiding future conflicts.

My main question was: Why is the public policy for promoting wind energy on the northeast coast of Brazil, and in the Cumbe community in particular, failing to promote sustainable development and environmental justice? Confirming my hypothesis, I saw extremely unequal power relations, resulting in the unequal capacity of groups of interest to influence: 1) the productions of rules and policies that affect their interests; and 2) the knowledge and discourses that legitimate these rules and affect people's practices and subjective values.

I could also observe that several communities on the northeast coast of Brazil presented similar cases of environmental injustice concerning the installation of wind farms. I believe that there are some common features in this region, regarding the development of the wind power sector, which promote environmental injustice: 1) similar national rules concerning the financing and the environmental licensing of wind farms, which are not committed with principles of environmental justice; 2) the fact that investments call into question the access to resources and territories traditionally used and occupied by groups that still possess the titles of their lands; 3) the fact that, in the affected communities, a large number of people are living in poverty, do not have access to basic rights (e.g. a good quality health service) and struggle for the recognition of their ethnic-racial identities and territories; and 4) the fact that affected groups are initially attracted to various discourses which promise that the wind farms will bring sustainable development, but do not correspond to the real impacts of the projects.

Although my spatial research focus was on the northeast coast of Brazil, I could observe that in the South region, where a large number of projects are installed, social environmental impacts were less frequent or gained less public visibility. My hypothesis (although due to lack of time I could not investigate it further) is that there are two main reasons for this difference between the two regions: 1) In the South, the affected groups are the medium-sized and large landowners with land titles. Thus they possess more bargaining power and benefit from advantageous land leasing contracts; and 2) These areas are often used for cattle farming, an activity that can be combined with the functioning of wind farms (Tentardini 2011).

My main research goals were firstly to understand the main causes of the current framework of environmental injustice on the northeast coast of Brazil, based on the case-study. Secondly, my goal was to question a discourse legitimated by (international, national, regional and local) public agencies, sections of the media and multilateral organisations among others, which links wind energy to sustainable development based on an uncritical approach. Thirdly, my goal was to analyse power relations and to define

the main groups of interest and power strategies that influence the territorial dispute in the case-study. Finally, my goal was to propose necessary changes in public wind power policies to ensure sustainable development and environmental justice.

The main groups benefiting from the current wind energy model implemented in Brazil are: national and international investors who own the wind farms (including speculative capital that is often the shareholder); international and national agents who speculate in the market of carbon credits; skilled labour; businesspeople who control a wide chain of industries and services that is growing to supply the wind farms; and local large land owners who receive land leasing for the installation of turbines and transmission lines.

On the local scale other benefits, as we have seen, are mostly temporary jobs and small infra-structural works (occurring after protests) and mainly affecting those who had already enjoyed better economic positions before the arrival of the wind farm. Nevertheless, due to a lack of job opportunities, of access to public services and public infrastructure, these benefits are nowadays seen as extremely positive by several inhabitants. The group that currently claims to be more affected by the negative impacts of the wind farms and less benefited by the good neighbourhood policies implemented by the wind farms is the group of fishermen and fisherwomen. Their livelihoods were threatened by a territorial dispute with the wind energy company that lasted from 2008 to 2013 and was only solved with the support of the Public Defence Service (Defensoria Pública do Estado do Ceará 2013).

In order to study the power relations and territorial strategies causing environmental conflicts and environmental injustice concerning the installation of wind farms on the northeast coast of Brazil, based on a constructivist perspective, I conducted a literature survey, secondary data surveys on statistical reports and on the media, field research observation and semi-structured and narrative interviews. I have mainly used the following interdisciplinary theoretical approaches: political ecology, environmental justice and governmentality. In common they: 1) account for both larger structures of power and specific conjectures of social action and resistance; 2) acknowledge the role of institutions and rules as well as the role of discourses and knowledge in reproducing power relations; and 3) offer evidence of how policies are biased towards the interests of groups who use their economic power to conduct political lobbies.

Political ecology highlights the contradiction between the discourses and practices of the multilateral organisations that concentrate decision power. Environmental justice studies highlight the socio-spatial capital strategies for transferring the costs of economic growth to underprivileged social and ethnic-racial groups while (increasingly) concentrating benefits in the hands of the elite, in developed countries but also in the privileged rural areas, cities

and neighbourhoods of developing countries receiving more public investments and less environmentally polluting activities.

The approach of governmentality pays particular attention to the role played by subjective values in influencing people's relationships to institutions, rules, legitimate knowledge and official discourses: thus influencing people's interests and practices. These subjective values are therefore a point of dispute among groups who compete to ensure that the values that correspond to their interests are diffused and receive public visibility and acceptance, and that legitimacy is given to the legal protection of these interests through the law and through public policies. One example is the historically excessive value given by Brazilian legislation to private property in comparison to the right to common use of ancestrally occupied lands and the right of adverse possession (Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013).

For example, based on the Brazilian Civic Code of 1916, which was only substituted in 2002, one would have the right to kill a person who invaded his private property, alleging the legitimate defence of private property (Interview with Francisco Eliton Albuquerque Meneses, Public Defender of Aracati, 07.11.2013). Before the Brazilian Constitution of 1988, and the Civic Code of 2002, the property right was an absolute right, therefore not limited by the social function of the land or by respect for labour and environmental rules (Paschoal 2010). It is also important to highlight that the right to private property is still strongly protected by the Brazilian Constitution of 1988, *Constituição da República Federativa do Brasil 1988*.

Also relevant is the fact that the enforcement of the law is highly susceptible to the subjective values and ideological positions of judges and other representatives of the judiciary power, as various historians highlight. In Brazil, in order to be selected to assume a public office with significant decision power, people usually have to study at the best private schools and afterwards spend some years receiving financial support from their families, while paying for special courses that prepare for public exams for employment in a public institution. Both conditions are in general restricted to the elites, who will tend to have interests and ideological views closer to the interests of elite groups such as the agribusiness than to the peasants' movement or to the quilombolas when it comes to a territorial dispute (Interview with Rodrigo de Medeiros Silva, RENAP/Brazil/ CE, 12/09/2013). What also often happens is that important positions made by the judiciary powers are highly influenced by the interests of the executive powers, which in turn are highly influenced by the lobbies of the private capital that finances political campaigns (Interview with Rodrigo de Medeiros Silva, RENAP/Brazil/ CE, 12/09/2013).

This research observes that, on one hand, the corporative policies of wind energy firms and the discourse of representatives of the government diffuse an apolitical approach to a global environmental crisis, as a global challenge affecting everyone equally, to be tackled by the green economy based on an economicist vision of sustainable development and on so-called “ecological modernisation”. On the other hand, the discourse of critical social movements and academic researchers highlight a contradiction: the logic of economic growth is causing environmental damages and inequalities (among spaces, classes, ethnic-racial groups and genders), and proposes a model of compensation which, rather than promoting alternative modes of production and ways of living, aiming at greater respect for the principles of social justice and for the limits of nature, instead uses various similar strategies to ensure the concentration of capital.

These social movements have been resisting this model, pointing out its contradictions and limits, as well as struggling, for example, to win public support for agro-ecological systems of food production and models of decentralised renewable energy production and policies; or, for example, for the recognition by public institutions of the cultural identities of indigenous people and quilombolas, so that they can have access to social assistance programs or develop special educational programs for their children (e.g. Pronera, National Program of Education on the Agrarian Reform). Nowadays, despite advances made within Brazilian legislation, the power of underprivileged groups to achieve this support and recognition is still very limited – especially due to land and territorial issues, as we have seen.

This research highlights the fact that the struggle for the recognition of values and identities is relevant for the struggle for territorial rights, which is relevant for access to citizenship through public policies and loans. For example, without a land title a person or a community will face difficulties in receiving compensations for losses and damages to their houses caused by the installation of a wind farm. As discussed in the first chapter, there exists mutual influence between social structures and the actions of individuals and groups. Social structures (imposed by public institutions, laws, economic policies) limit the actions of individuals and interest groups, while creating opportunities for others. On the other hand, the subjective position of individuals and interest groups to a certain extent influences the structures. They become aware of these structures, and struggle (according to different and unequal powers of influence) to preserve or transform them.

The different theoretical approaches selected here show that there has been a very unequal struggle. The evolution of capitalism has shown that capital has the tendency to expand its frontiers in the search of new markets, bringing with it the dilapidation of nature

and the exploitation of Man's labour. This is a key strategy to ensure the concentration of added value extracted from capital, from labour and from land and its natural resources, thus producing socioeconomic and environmental inequalities locally, nationally, regionally and globally.

We saw that the capitalist system in its most recent phase, characterised by neoliberal regimes, shows an "evolved and more destructive form of capitalism" (HEYNEN & ROBBINS 2005). It has increased its capacity to explore nature and manpower, based on technical and technological advances, on further land expropriation and the enclosure of natural resources, ensured by the concentration of decision power among multilateral organisations that impose neoliberal agendas for the flexibilisation of the rules that regulate markets, natural resources, and labour relations. Since the acknowledgement of the dangerous and costly environmental effects of capitalism and the emergence of a so-called green economy, we have been able to clearly observe two different capitalist economic logics (Fairhead et al. 2012). One is based on an "economy of growth" which transfers the negative environmental externalities of economic activity to marginalised social and ethnic groups.

Looking at the Brazilian countryside we may identify this economic logic guiding the agribusiness sector. In the Brazilian countryside, multiple territories overlap, reflecting different interests, different production models and even the different projects of society, of groups with different kinds of economic and political power. The overlapping territories of the Brazilian countryside represent a very unequal struggle.

We have seen how historically in Brazil, an elite has been influencing the creation and application of laws and public policies which favour a certain model of territorial occupation of the Brazilian countryside, based on the non-implementation of agrarian reform and for the benefit of the large businesses that invest in monocultures for exportation and in land speculation, based on public credits and loose land regulation.

As we have discussed, for peasants and traditional communities, land means more than livelihood, it means territory: a space that ensures different ways of life, linked to cultural values and to ancestral knowledge, relevant for the preservation of biodiversity, for the preservation of ethnic cultural diversity, for ensuring food security and social justice, under alternative systems of land property, of labour relations and of agricultural production and distribution.

Territories are also spaces defined by power relations, if we recall the geographical definition of the concept. Thus, where power relations are extremely unequal, the land and

the territory are key elements for the analysis of policies of sustainable development and of space management, as this research tries to do by analysing the effects of the Brazilian wind energy policies from the perspective of “environmental justice”. For this reason, a brief analysis of land policies was made, showing that throughout the history of Brazil no government has ever implemented an agrarian reform, which is seen by critics as a means of maintaining the structures of economic and political power.

In opposition to this strategy, social movements and researchers have been drawing attention to the fact that the land is essential to human existence and its regulation should therefore differ from other resources available for private appropriation. Land speculation and land concentration are threats to food security, social justice and environmental preservation. Thus, the fulfilment of the social function of the land should be a condition for the use, possession and ownership of land.

The other logic of the current capitalist system, complementary to the first logic, is based on an economy of repair, which restricts access to resources to privileged groups “for the sake” of nature preservation, producing further environmental injustices. Regarding the Brazilian countryside we may identify a number of projects that fit into this logic, such as wind farms, eucalyptus monocultures and sugar cane monocultures for biofuels for example. Both logics are causing environmental injustices in the Brazilian countryside and cities.

If we look at the contradictions of the current capitalist system considering more specifically the energy sector we see that multilateral organisations focus the debate on energy around three main issues: economic growth, human development and climate change. We can observe a mainstream discourse according to which the “inevitable” search for economic growth justifies the “inevitable” continued use of fossil resources (highly subsidised by governments and multilateral organisations) and the continued implementation of large-scale renewable energy projects (encouraged and rewarded by multilateral organisations through instruments that implement the financing of nature, such as carbon credits). These projects should offset the environmental damages caused by the use of fossil resources. Both energy sectors, attending to the increasing demand generated by economic growth, have been causing environmental injustices (e.g. land expropriation and the degradation of local ecosystems, affecting mainly underprivileged groups).

As mentioned, the current model of economic growth is based on massive production and massive consumption, ensured by neoliberal policies (globally diffused by multilateral organisations) that allow the overexploitation of nature and of manpower, especially in

developed countries, where international capital profits from the abundance of land and from the flexibilisation of agrarian, labour and environmental laws. Despite economic growth (particularly in developing countries) and technological advances that enhance energy efficiency (mainly in developed countries), access to energy services between developed and developing countries and between social classes within developing countries is still extremely unequal. On the other hand, developing countries and underprivileged groups are the most affected by the negative environmental consequences of current patterns of consumption and production.

The discourse affirming that an unregulated market and technological advancement are able to promote sustainable development reveals its contradiction. Economic growth has encouraged extreme inequality among regions, social classes, genders and ethnic-racial groups. As we have seen, alternative discourses and projects exist, are numerous and also vary in their political perspectives, goals and strategies. Some of them have shown that: 1) private property, massive consumption and profit generation are not the only possible values to guide the organisation of social life and of political economy; and 2) the concentration of capital and land based on centralised large-scale energy projects, monocultures and massive industrial production are not the only possible ways to organise economic production.

Social movements, critical NGOs and academics have been revealing how alternative ways of organising economic, political and socio-cultural life (e.g. decentralised energy production and small-scale farming based on collective properties) are possible, but that the main obstacle they face is the inequality (among social and ethnic-racial groups) of the political power needed to implement them.

On a global scale, as in Brazil, policies and rules are highly manipulated by lobby groups who use their economic power to ensure that policies and rules preserve their privileges. The wind sector is a lobby group struggling to increase its influence on global and national policies and official discourses, in order to win social acceptance and create a positive regulative environment for the geographical extension and economic growth of this market.

I agree here with academics, social movements and NGOs who affirm that the market should be shaped and ruled by public regulations and that these should be defined according to a democratic political debate based on equal rights and equal recognition among social groups, genders and ethnic-racial groups (Dubash 2006; Mallon 2006; Portal do Mar 2012; Rede Brasileira De Justiça Ambiental 2014; Cumbers 2013). Presenting a similar perspective, Mallon (2006) affirms that the distribution of costs and benefits of renewable energy projects is the responsibility of policy makers because, according

uniquely to the market's logic, this does not necessarily occur naturally. The case study presented here has shown an unequal distribution of the costs and benefits of wind farms, reflecting and reinforcing an unequal distribution of economic and political power among interest groups.

Based on the theoretical approach of "environmental governmentality" and on the multi-scale analysis of development policies of Rauch (2009), we saw that the governmentality of wind power influencing the Cumbe community is produced on several scales, in a nonlinear and contested reproduction of power, through rules, knowledge and subjectivities. During this process some strategies are much more effective and durable than others, if they are attuned to the interests of groups with more power to influence the production and implementation of rules, the legitimation of knowledge and discourses and the diffusion of subjective values.

Current technologies and techniques of wind power generation present two main principles that may be used for achieving environmental justice, when used in the context of policies and regulations created with the goal of environmental justice: 1) the possibility of producing energy without producing toxic waste or emitting polluting gases; and 2) the possibility of producing energy based on small-scale decentralised projects, promoting a more equitable distribution, both among regions and social groups, and of decision power and profits.

How these potentials are to be used in each national, regional and local context, depends on multi-scale power relations and on the regulative framework defined globally and in each context as well. In this sense, I present some key suggestions for achieving a more equitable distribution of costs and benefits of wind farms in Brazil, contributing to the promotion of environmental justice:

8.1. RECOMMENDATIONS ON THE GLOBAL SCALE

1) The promotion – through policies, loans, and scientific cooperation – of decentralised wind energy production, off-grid and on-grid, in developing countries.

2) The substitution of policies aiming towards the financing of nature with policies aiming to: (a) improve the global regulation of speculative capital, with a special focus on land speculation; (b) improve national systems of land regulation; and (c) protect the rights of traditional communities and peasants to preserve their lands, territories and knowledge,

while ensuring their access to natural resources that are essential for the reproduction of their livelihoods and cultural identities.

8.2. RECOMMENDATIONS ON THE NATIONAL SCALE

1) The promotion, through national policies, loans and scientific research, of decentralised wind energy production, on-grid and off-grid, in Brazil (with a key focus on the promotion of cooperatives of decentralised wind energy production).

2) Studies aiming at the classification of recommended and prohibited areas for wind farms considering, among others, the following socio-environmental factors: the territories of traditional communities, areas of land dispute, areas of socio-environmental conflict, areas of environmental protection, environmental laws and areas of cumulative impact.

3) The creation of a more transparent process of the planning of wind farms in Brazil, including effective mechanisms of participation of communities affected by the projects, active from the initial phases of the planning process.

4) A national model for the licensing of wind farms, that: (a) Considers the local knowledge of affected communities in regard to the affected ecosystems; (b) Investigates the economic and socio-cultural values of affected natural resources, areas of collective use and areas used for mobility; and (c) Ensures compensations, under close public supervision, based on the communities' demands.

5) A National Project of Environmental Education, especially in the regions that are most targeted by wind energy investments, based on a critical approach that politicises the environmental issue and empowers traditional communities to represent their interests in the process of wind farm planning.

6) Studies to analyse the perceptions held by affected communities of wind farms (especially in areas of conflict) and desired compensations, to be considered in the management of current wind farms and in the planning of future projects.

7) The consideration by all development policies of the diversity of the Brazilian territory and its composition of multiple territories, reflecting disputes among groups with very unequal levels of power to represent their interests.

8.3. RECOMMENDATIONS ON THE LOCAL SCALE

1) The enforcement of the abovementioned measures on a local scale.

2) The public regulation of compensation measures in order to ensure fair and equally distributed compensations.

3) The support of short and long term projects to train manpower in affected communities and targeted communities for future projects, and to ensure stable work on the wind farms.

4) Programs of income generation based on the potentials and desires of the inhabitants, instead of implementing top-down policies which are distant from the needs of the communities and have limited effect. This would reduce the bargaining power of investors to offer low-paid jobs while causing social and environmental costs in the community and would thus reduce current internal conflicts among those struggling for job opportunities and for their right to preserve their livelihoods.

5) Close supervision of the process of land concession for the construction of wind farms, in order to avoid land-grabbing.

Furthermore, based on literature and data survey and on the research field, I would like to point out that, in order to achieve more environmental justice (concerning any kind of activities) in Brazil, there are three main challenges:

1) The promotion of an agrarian reform including the demands of the peasant movements and of traditional communities.
2) A political reform that abolishes the private funding of political campaigns in order to reduce the excessive manipulation of public policies, infrastructure and funds by a minority elite.
3) The continued implementation of the PNPCT (National Policy for the Sustainable Development of Traditional Communities) and of the National Policy for Agro-ecology and Organic Production for ensuring alternative models of production and of land use to the agribusiness in the Brazilian countryside.

In the case of the Cumbe community, for those wishing to continue investing in their traditional livelihoods, policies must guarantee access to resources and the collective use of their territories. For those wishing to develop non-traditional activities, policies must invest in people's economic potential. Here it is important to highlight that considering the

conflict between these two groups, the fishermen are more vulnerable to the pressure of big business, because their livelihoods are not subordinated to the logic of capital and because they dispute with big business over access to natural resources. Thus, fishermen seek the support of academics, NGOs and social movements that contribute to their political empowerment and seek an increased awareness of the power relations that affect their lives, as I have seen in their discourses through interviews.

On the other hand, poor inhabitants of the community, who are calling for more job opportunities and better life conditions, considering the lack of job opportunities, the lack of assistance from the government (e.g. the community has no secondary school, no hospital, no public transport) and the lack of political empowerment, often see large investors as a source of hope for the community. Most of these inhabitants did not show an awareness of the local power relations that affect the community and their lives. Instead, they often see big business as a source of protection and the fishermen as a threat (the threat of expelling investors and destroying job opportunities).

Those seeking job opportunities often believe that their interests meet the interests of large investors, despite the low salaries offered and despite the environmental damages that are caused. In this way, based on the discourse of progress, the wind and shrimp farm businesspeople gain the support of numerous inhabitants in their territorial struggle with the fishermen. This internal conflict within the Cumbe community weakens the struggle for environmental justice, as it reduces the political pressure for equal opportunities, wealth distribution and social recognition among social classes and ethnic-racial groups. Instead of corresponding exactly to the theoretical debate as presented in Chapter 3, which opposes a struggle for social equality and a struggle for the recognition of identities, this framework presents a particular opposition, which includes a lack of political empowerment.

In this sense, policies in Cumbe must institutionalise channels for the effective participation of diversified groups during the formulation of all projects that affect them. Public support for environmental education and projects of political empowerment aimed at building critical environmental subjects and producing locally-based knowledge, are conditions for an effective system of participation. Arnauld De Sartre and Berdoulay (2011) remind us that even if participation policies are always imperfect, they provide more room for debate and political struggle, so that those who are made invisible by public policies and by the law may struggle for visibility and voice.

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10. ANNEX

INTERVIEW GROUPS

Due to a conflict occurring in the community at the time of the research, not all the names of inhabitants, or of some key interviewees, will be revealed.

Main Research Interviewed Groups (2011, 2012, 2013):

1) Cumbe inhabitants: fisherwomen and fishermen (inhabitants); restaurant employees (inhabitants); shrimp farming employees (inhabitants); shrimp farming owners (inhabitants); local business owners (inhabitants); artisans (inhabitants); pensioners (inhabitants); housewives (inhabitants); CPFL employees (living in and outside the community); suzilon employees (living outside the community); teachers (inhabitants); and self-employees (inhabitants).

2) Governmental Agency Representatives (Federal agencies, Ceará's state agencies, Aracati's municipality agencies);

3) Researchers and experts;

4) Wind energy firm representatives;

5) NGO representatives; and

6) Social movement representatives.

Interviewed groups within the Cumbe community (September, 2013)

1) Fisherwomen and fishermen (inhabitants)

2) Restaurant employees (inhabitants)

3) Shrimp farming employees (inhabitants)

4) Shrimp farming owners (inhabitants)

5) Local business owners (inhabitants)

6) Artisans (inhabitants)

7) Pensioners (inhabitants)

8) Housewives (inhabitants)

9) CPFL employees (living in and outside the community)

10) Suzilon employees (living outside the community)

11) Teachers (inhabitants)

12) Self-employees (inhabitants)

KEY INTERVIEWS

Cumbe community, Aracati, Ceará, Brazil (September 2013)

1) João Luís Joventino do Nascimento, researcher, activist and Cumbe´s resident.

2) Xavier Silvério, Former city councillor in Aracati, largest landowner and largest merchant of the Cumbe community.

3) President of the new Cumbe inhabitants' association.

4) Salete, Public Health Officer in the Cumbe community.

5) Beth, representative of the Firm Via de Comunicação, Advisor for communication issues of the CPFL in the Cumbe community.

Aracati, Ceará, Brazil (September 2013)

1) President of the fisher colony of Aracati

2) João Falcão, President of the City Chamber and City Councillor of the municipality of Aracati, Brazilian Green Party, elected in 2012 through the PV, the Brazilian Green Party.

3) Jocélia Ribeiro, Representative of the social movement "Popular Organisation of Aracati", OPA, Organização Popular de Aracati.

4) Representative of the Social Assistance, Labour and Income Services Department of Ceará (Representante da Secretaria de Assistência Social, Trabalho e Renda, SEMAST)

5) Luciene Feitosa, Coordinator of the Social Assistance Reference Centre Nossa Senhora de Fátima, responsible for the Cumbe Community; subordinated to the SEMAST (Coordenadora do Centro de Referência de Assistência Social Nossa senhora de Fátima responsável pela comunidade do Cumbe, vinculada à SEMAST)

6) Francisco Raphael dos Santos Pinheiro, Secretary of Finances of Aracati (Secretário de Finanças de Aracati)

7) Fábio Luiz Rocha, Manager of Environmental Protection Areas of Canoa Quebrada, linked to the Tourism, Culture and Environmental Services Department of Aracati (Gestor de APA de de Canoa Quebrada, vinculado à Secretaria de Turismo, Cultura e Meio Ambiente de Aracati)

8) Francisco Eliton Albuquerque Meneses, Public Defender of Aracati/CE, Defensor Público de Aracati/CE

9) Tamaris, Fishing Engineer, Representative of the Department of Fishing and Aquiculture of the Economic Development, Agriculture and Fishing Services Department of Aracati (Representante da Secretaria de Desenvolvimento econômico, Agricultura e Pesca)

10) Representative of the electricity company of Ceará, Coelce, Aracati.

Fortaleza, Ceará, Brazil (September, 2013)

1) Fernando Ximenes, Secretary of the Chamber for Wind Power of Ceará linked to the Development Agency of Ceará (Secretário da Câmara Setorial de Energia Eólica vinculada à Agência de Desenvolvimento do Ceará)

2) Ivan Botão de Aquino, Supervisor of the Environmental Impacts Sector of the Environmental Impact Services Department of Ceará (Supervisor do Núcleo de Impacto Ambiental – NUIAM - da Superintendência Estadual do Meio Ambiente – SEMACE)

3) Sônia, Administrative Director of the Oversight Sector of the Chamber for Environmental Compensation of the SEMACE (Diretora Administrativa da Superintendência da Câmara de Compensação Ambiental da SEMACE)

4) Nancy Mireya Sierra, Representative of Coordinating Body for Environmental Education and Social Articulation linked to the Council for Environmental Management and Policies of Ceará (Representante da Coordenadoria de Educação Ambiental e Articulação Social – CONPAM)

5) Lawyer, Rodrigo de Medeiros Silva, RENAP/Brazil/ CE (Advogado membro da Rede Nacional de Advogados Populares)

6) Ricardo Durval Eduardo de Lima, Director of the Institute for Agrarian Development of Ceará (Instituto de Desenvolvimento Agrário do Ceará, IDACE)

7) Diego Alencar, Suzlon Quality, Environmental and Community Manager (Gerente de Qualidade, Meio Ambiente e Comunidade da Suzlon Energia Eólica do Brasil)

8) Maria Lucinaura Diógenes Olímpio, Director of the environmental consulting firm GEOCONSULT, responsible for the environmental reports, RAS, presented by the wind energy firm Bons Ventos for the implementation of the wind farms affecting the Cumbe community (Diretora da empresa de consultoria ambiental GEOCONSULT - responsável pelos relatórios ambientais, RAS, que licenciou os parques do estudo de caso- Ceará, Fortaleza).

Rio de Janeiro, Brazil (November, 2013)

1) Julianna Malerba, Representative of the Brazilian NGO FASE - Coordinator of the Center for Environmental Justice and Rights (Coordenadora do Núcleo de Justiça Ambiental e Direitos da FASE);

2) Dawid Bartelet, Director of the NGO Heinrich Böll Stiftung Brazil (Diretor da Heinrich Böll Stiftung Brasil);

3) Luís André d'Oliveira, Manager of the Alternative Energy Department of the Brazilian National Development Bank BNDES (Gerente do Departamento de Energia Alternativa do BNDES), December 2011;

4) Ricardo Marques Dutra, Researcher of the Brazilian Reference Center for Wind and Solar Energy (Centro de Referência para Energia Solar e Eólica Sérgio Brito / Centro de Pesquisas de Energia Elétrica - CRESEB, CEPEL), July 2011;

5) Prof. Geraldo Martins Tavares, Researcher of the Laboratory of Wind Energy of the Federal University of Niterói, UFF (Professor Pesquisador do Laboratório de Energia dos Ventos da Universidade Federal Fluminense) January, 2013;

6) Clarice Campelo Ferraz, Researcher of the Group Energy Economics of the Economics Institute of the Federal University of Rio de Janeiro (Pesquisadora do Grupo de Economia da Energia, GEE, IE, UFRJ) September, 2012.

Germany (2012, 2013)

1) Hanno Brühl, Manager of the Department for Renewable Energy and Energy Efficiency of the Public Energy Enterprise of Tübingen, Germany. Erneuerbare Energien und Energieeffizienz, Stadtwerke Tübingen GmbH, August, 2012;

2) Jürgen Simon, Wind energy planner of the Energy Cooperative Starkenburg, Germany (Windenergieplaner, Energiegenossenschaft Starkenburg) May, 2012;

3) Xavier Arnauld de Sartre, Researcher of the National Centre of Scientific Research from the Ministry of National Education and Research of France - Interview by Skype on the subjects of “narrative interviews” and “research methodology” (Centre national de la recherche scientifique, Ministère de l'Éducation nationale, de l'Enseignement supérieur et de la Recherche de France) April, 2013.

QUESTIONNAIRES

Questionnaire 1 - Cumbe Inhabitants (10 preliminary interviews + 40 interviews)

Introductory questions

1) I would firstly like to know your name and your age, please.

2) Were you born here in the Cumbe community? If not, where? When did you arrive? What brought you here (if you wish to share it)?

Narrative Interview

1) How did you experience the arrival of the wind energy farm? Did you feel that anything had changed in your life, or in the life of the community?” (key question of the narrative part of the interview)

Semi-structured Questionnaire

1) Could you mention positive changes brought by the wind farm? And negative changes?

2) Are you aware of any groups or people who suffered any kind of loss as a result of the installation of the wind farm?

3) Before the installation of the wind farm, would you usually go to the dunes and lakes?

4) By foot, by car or by bike?

5) Do you still do this? How? Do you have a car? Have you ever been restricted access by the wind energy company to the dunes or the beach? Why?

6) At the time of the protests against the wind energy company Bons Ventos, did you take part in or support the protests in any way? Why? How?

7) Did you stop supporting the protests? When and why?

8) Do you own the title of the land where you are living? If not, did you try to request the land title? Did you find any difficulties? Did you know the former owner? How did you obtain the land?

9) Have you ever heard the term “sustainable development”? What does it mean to you?

10) Do you believe that the wind farm is contributing to “sustainable development”?

11) Did you take part in the public hearing promoted by the wind energy firm Bons Ventos at the time of the announcement of the wind farm? Why? Did you become aware of it? How? Were you in favour of it or against it? What were your expectations at the time?

12) Do you currently attend the meetings promoted by the wind energy company CPFL?

13) Do you know Beth, the CPFL representative in the community?

14) Does she come to visit you or invite you personally to the meetings? How often?

15) Did you attend any of the courses offered as compensations to the community by the CPFL? Were they useful to you?

16) Do you attend the meetings of the Cumbe Inhabitants Association Meetings? Why?

17) What did your parents do for a living?

18) What is your main occupation? Do you receive “Bosa Família”? Do you have any other income sources such as agricultural farming for example?

19) Since when have you been employed in your main occupation? Are you a formal employee?

20) Do you have children?

21) What are your hopes for their future?

22) Would you prefer it if they followed in your professional footsteps, studied outside the community, or followed a specific career?

23) What is for you your territory? How would you define it?

24) Could you please describe it or draw it for me, including the elements in it that are important to you?

25) Do you sometimes feel that your territory is being threatened by anything or anyone?

26) Who should set the rules in your territory? And who actually does it?

27) What does “quality of life” mean to you?

28) Do you feel that you have a good quality of life? How would you describe it?

29) What could currently be done to enhance the quality of life in the Cumbe community?

30) Do you believe that you could personally contribute, directly or indirectly, to enhance Cumbe’s quality of life?

31) Do you think that the environment is important?

32) Why? For whom? Who has the right to set rules for the environment or who has power over the environment? Who should define its rules? Who actually defines its rules?

33) Who actually defines the rules in the Cumbe community or who has more power in the community, more voice, to define rules, to make their interests prevail…? And who should actually have more power?

34) Who defines the rules in Brazil? And who should do?

Questionnaire 2 - Interview with governmental agency representatives, researchers, experts, wind energy firm representatives, NGO representatives and social movement representatives.

Questions asked to every interviewee from the abovementioned groups

A) Narrative Interview

1) To begin I would like you to say, please, how long you have worked at your current post and briefly tell me about what brought you here, your career trajectory. (Opening question of the narrative interview)

B) Semi-structured Interview

1) What are the main goals of your institution and the work at your post?

2) What is the spatial scale of your activities (local, regional, national, international)?

3) What are the main strategies and partners adopted to achieve these goals?

4) What are the main challenges that you face?

5) In your opinion, what should and could be done to tackle these challenges?

6) What does the term “sustainable development” mean to you?

7) How relevant is the “territory” to the work that you do?

Specific questions, added according to the work post, experience and knowledge of the interviewed:

1) What currently are the formal and legal procedures regarding land conflicts and the agrarian reform?

2) What are the formal and legal procedures regarding the wind farms in terms of planning, regulation, financing, licensing and inspection?

3) What are the formal and legal procedures regarding the environmental compensation for wind farm projects?

4) What are the formal and legal procedures regarding the participation of affected communities in the planning of wind farms?

5) What are the goals of the environmental education projects implemented by your institution?

6) What kind of support does your public department give to wind energy production and what kind of return does it receive (e.g. taxes)?

7) Why is the German government investing in a decentralised energy production?

8) Could you compare the benefits of a centralised energy production to those of a decentralised energy production?

9) Why is the Brazilian government privileging the support of a centralised wind energy production?

10) Why is it that the decentralised projects of isolated micro wind energy systems were not successful in isolated places not reached by the centralised energy network?