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Declaration

I, Solveig Willgohs, declare that this thesis is a result of my research investigations and findings. Sources of information other than my own have been acknowledged and a reference list has been appended. This work has not been previously submitted to any other university for award of any type of academic degree.

Signature.....

Date.....

Abstract

Hydro power is a renewable source of energy which is largely appreciated for exploitation. However the exploitation of the water resource may give severe consequences to the environment and the population in the area where a hydro power project is located. This study investigates the regulations and procedures which control the establishment and management of the hydro electric power industry in Brazil and Norway, with the main focus on Brazil. The regulations and procedure in focus are those concerning social and environmental impacts and how these are implemented in the planning of projects, as well as how the ILO Convention No. 169 is included into the planning of hydro power projects, as both Norway and Brazil have signed and ratified the Convention. There are two main cases of attention in the study using a comparative approach: the proposed Belo Monte project in Brazil and the constructed Alta Dam in Norway. The study seeks to identify the agents involved in the regulation of the industry, how they interact and influence the regulations and the enforcement of them.

The research for this study was conducted in Brasilia, Brazil, from the beginning of October 2009 until the end of December 2009, as well as extensive literature study on both Brazil and Norway.

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Table of content:

Declaration.....	2
Abstract.....	3
Acknowledgements.....	4
Table of contents.....	5
List of abbreviations.....	8
CHAPTER 1: Introduction.....	11
1.1. Presentation.....	11
1.1.1. Problem statement.....	11
1.1.2. Objectives and research questions.....	11
1.2. Consequences by hydro power dams.....	13
1.2.1 Environmental consequences.....	13
1.2.2 Social consequences.....	15
1.2.3 Consequences for indigenous people.....	17
CHAPTER 2: Theoretical framework.....	19
2.1. Oakerson’s Framework as adapted by Vatn.....	19
Fig. 1.....	20
2.2. Using the Oakerson’s Framework as adapted by Vatn in the analysis of hydro power models and procedures.....	22
2.2.1. The resource and its attributes.....	22
2.2.2. The technology.....	23
2.2.3. The agents and agents’ choices.....	23
2.2.4. Institutions – regimes	23
2.2.5. Patterns of interaction.....	24
2.2.6. Outcomes.....	25
CHAPTER 3: Method of data collection.....	26
3.1. Data collection in Brazil.....	26
3.1.1. Location and time period.....	26
3.1.2. Pre- and post fieldwork preparations.....	26
3.2. Methods of data collection.....	26
3.2.1. Interviews.....	26
3.2.2. Purposive sampling.....	28
3.2.3. In dept interviews.....	28
3.2.4. Literature review and secondary sources.....	29
3.2.5. Public Hearings.....	30
3.3. Case study.....	30
3.4. Limitation of study.....	31
3.4.1. Time frame.....	31
3.4.2. Fieldwork challenges.....	31
3.4.3. Limitations of literature review.....	32
3.4.4. Ethical considerations.....	33
CHAPTER 4: Main agents and hydro power in Brazil.....	34
4.1. Political-historical background to current hydro power politics in Brazil today.....	34
4.1.1. Short historical-political review to the current political scene.....	34
4.1.2. Political situation today.....	35

4.1.3. PAC.....	35
4.1.4. Energy and hydro power in Brazil today.....	37
4.1.5. Future perspectives for hydro power in Brazil.....	38
Table 1.....	40
Fig. 2.....	41
4.2. Main agents and structure of the Brazilian hydro power sector.....	41
4.2.1. Ministry of Mines and Energy.....	41
4.2.2. Ministry of Environment.....	42
4.2.3. The National Council of Environment.....	43
4.2.4. Brazilian Institute of Environment and Renewable Natural Resources.....	43
4.2.5. National Agency of Electric Energy.....	44
4.2.6. The Energy Research Institute.....	45
4.2.7. National Foundation of Indian Affairs.....	46
4.2.8. Eletrobras and Eletronorte.....	46
4.3. Non-governmental organisations of relevance to the issue of hydro power.....	47
4.3.1. The Movement of Dam Affected People.....	47
4.3.2. The Socio-Environmental Institute.....	48
4.4. Presentation of the case of the Belo Monte Dam.....	48
CHAPTER 5: Main findings from Brazil and discussion.....	51
5.1. The perception of environmental and social consequences in Brazil.....	51
5.2. Institutional Framework in Brazil (hydro power regime).....	52
5.2.1. Environmental and social legal institutional framework.....	52
5.2.2. The legal institutions concerning indigenous peoples' rights in Brazil.....	55
5.2.2.1. National legal institutions.....	55
5.2.2.2. International legal institutions.....	56
5.2.3. Regulative governmental institutions.....	57
5.2.4. Institutional regulations within the hydro electric power sector.....	60
Table 2.....	62
5.3. Findings: Hydro power regulations and experiences in practice.....	65
5.3.1. Attributes of the resource.....	66
5.3.2. Outcomes.....	67
5.3.3. The experiences of representatives of social-environmental NGOs, people affected by dams and researchers critical to hydro power projects of outcomes and interaction.....	67
5.3.4. The experience of governmental institutions and the Eletronorte of outcomes and interaction.....	72
5.3.5. The case of Belo Monte, experiences up to spring 2010.....	76
Box 1.....	79
5.4. Analysis and discussion within the Oakerson framework as adapted by Vatn.....	79
5.4.1. The institutions.....	80
5.4.2. Technology and knowledge.....	81
5.4.3. Agents, agents' choices and motivation.....	83
5.4.4. Patterns of interaction.....	84
5.4.5. "The ghost from the dictatorship".....	88
CHAPTER 6: Main agent and hydro power in Norway.....	90
6.1. Political-historical background to current hydro power politics in Norway today.....	90
6.1.1. Historical review: political background and previous experience of hydro power projects.....	90

6.1.2. Political situation today.....	92
6.1.3. Hydro power in Norway today and future prospects for hydro power.....	92
6.2. Main agents and structure of Norwegian hydro power sector.....	93
6.2.1. Ministry of Petroleum and Energy.....	93
6.2.2. Norwegian Water Resources and Energy Directorate.....	93
6.2.3. The Ministry of Environment and the Directorate of Environmental Management	94
6.2.4. Statkraft.....	94
6.2.5. The Sámi government.....	95
6.3. Non-governmental organisation of relevance to the issue of hydro power.....	96
6.3.1. Norges Naturvernforbund.....	96
6.4. The case of the Alta Dam.....	96
6.4.1. The case of the Alta Dam and it's implications on Norwegian hydro power policies.....	98
6.4.2 The case of the Alta Dam and its consequences for the Sámi people.....	101
6.5. Analysis and discussion: in a historical perspective.....	102
 CHAPTER 7: Conclusion.....	 105
7.1. The perception of environmental and social consequences in Brazil and Norway.....	105
7.2. The experiences of Brazil and Norway.....	106
 References.....	 112
 LIST OF APPENDICES.....	 118
1.1. Interview guide for NGOs, researchers.....	118
1. 2. Interview guide for governmental organs.....	129
1. 3. Interview guide for energy companies.....	132

Abbreviations

- **AAI** Avaliação Ambiental Integrada (Integrated Environmental Evaluation)
- **ADA** Área Diretamente Afetada (Directly affected area)
- **AID** Área de Influência Direta (Area directly influenced)
- **AII** Área de Influência Indireta (Area indirectly influenced)
- **ANEEL** Agência Nacional de Energia Elétrica (the National Electric Energy Agency)
- **AP** Audiência Pública (Public Hearing)
- **APPs** Areas Protegidas Permanente (areas of permanent protection)
- **CONAMA** O Conselho Nacional do Meio Ambiente (the National Council of Environment)
- **C169** ILO Convention No. 169 Convention Concerning Indigenous and Tribal Peoples in Independent Countries.
- **DN** Direktorat for Naturforvaltning (Directorate of Environmental Management)
- **EIA** Estudo de Impacto Ambiental (Environmental Impact Assessment)
- **Eletrobras** Centrais Elétricas Brasileiras (the Brazilian Electric Power Company – the national electric energy company)
- **Eletronorte** Centrais Elétricas do Norte do Brasil S.A. (the North Brazilian Electric Power Company – subsidiary of the Eletrobras)
- **EPE** Empresa de Pesquisa Energética (the Energy Research Institute)
- **EU** European Union
- **FUNAI** Fundação Nacional do Índio (the National Indian Agency)
- **GDP** Gross Domestic Product
- **GHGs** Green house gases
- **GWh** Giga Watt hour
- **IBAMA** Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (National Institute of Environment and Renewable Natural Resources)
- **ILO** International Labour Organisation
- **IMF** the International Monetary Fund
- **ISA** Instituto Socioambiental (Social-environmental Institute)
- **IUCN** International Union for Conservation of Nature
- **KU** Konsekvensutredning (Environmental Impact Assessment Report)

- **KW** Kilo Watt
- **LP** Licença Previa (Prior License)
- **LI** Licença de Instalação (Installation License)
- **LO** Licença de Operação (Operationalisation License)
- **MAB** Movimento dos Atingidos por Barragens (the Movement of Dam Affected People)
- **MD** Miljødepartementet (Ministry of Environment)
- **MMA** Ministério de Meio Ambiente (the Ministry of Environment)
- **MME** Ministério de Minas e Energia (the Ministry of Mining and Energy)
- **MW** Mega Watt
- **NGO** Non-governmental Organisation
- **NVE** Norges Vassdrags- og Energidirektorat (Norwegian Water and Energy Directorate)
- **NVF** Norges Naturvernforbund (Friends of the Earth Norway)
- **OED** Olje- og Energidepartementet (Ministry of Petroleum and Energy)
- **OMBUDSMAN** Ministério Público (Ministry of the Ombudsman)
- **PAC** Programa de Aceleração do Crescimento (The Advancement/stimulation of Growth Program)
- **PCH** Pequena Central Hidrelétrica (Small hydro power plant)
- **PDE** Plano Nacional de Energia 2030 (National Energy Plan 2030)
- **PDMA** Plano Diretor de Meio Ambiente do Setor Elétrico (Environmental Guidelines for the Electric Sector)
- **PDS** Partido Democrático Social (Social Democratic Party)
- **PPP** Purchasing Power Parity
- **PSDB** Partido Social Democrático Brasileiro (Brazilian Social Democratic Party)
- **PT** Partido Trabalhadores (the Workers Party)
- **RIMA** Relatório de Impacto Ambiental (Environmental Impact Report)
- **SEE** Secretaria de Energia Elétrica (Secretariat for Electric Energy)
- **SIN** Sistema Interligado Nacional (National Interconnection System)
- **SISNAMA** Sistema Nacional do Meio Ambiente (the National System of the Environment)
- **The Master Plan** Samla Plan for Vassdrag (the Master Plan for Water Resources)

- **People's action group/the Action group** Folkeaksjonen mot utbyggin av
Alta/Kautokeinovassdraget (People's action group against the construction of
Alta/Kautokeinocourse)
- **The Protection Plan** Verneplan for Vassdrag (the Protection Plan for Watercourses)
- **TI** Terra Indígena (Indigenous Territory)
- **TWh** Terra Watt hour
- **UC** Unidade de Conservação (Conservation Unit (environmental))
- **UHE** Usina Hidrelétrica de Energia (Hydro electric plant)
- **UN** United Nations
- **WB** World Bank
- **WCD** World Commision on Dams
- **WWII** Second World War

Chapter 1: Introduction

1.1. Presentation

In this thesis I will investigate the regulations and procedures which control the establishment and management of the hydro electric industry in Norway and Brazil, with the main focus on Brazil. Within the procedures I will investigate the regulations and procedures which make the framework for giving concessions to build dams and regulate the industry. Focus will be on the environmental and social institutional framework. I will ask whether these policies and regulations take into consideration the ILO Convention 169 on Indigenous and Tribal People, which both Norway and Brazil have signed. I will further look at the different actors involved in the enforcement of the regulations and the policies, how they interact with each other, which interests they have and how they go about to pursue these interests. The comparison of the procedures in Norway and Brazil will be put in a historical context, as the two countries find themselves at different stages in economic and social development also with regard to development of hydropower. I will start with the presentation and analysis of the institutional framework and findings in Brazil then go on to present Norway and the case of the Alta Dam and continue with a comparative analysis.

1.1.1. Problem statement

How do governmental regulations and procedures control the establishment and management of hydro electric industry in Norway and Brazil? Which models and procedures are followed concerning social and environmental impacts, including the ILO Convention No. 169 in the planning of hydro power plants.

1.1.2. Objectives and research questions

Objective 1: Find out to what extent and how possible environmental consequences are considered in the process of giving concessions to build dams.

- What are the possible environmental impacts resulting from dams according to key agents and institutions?
- What are the requirements set by government regulations concerning environmental considerations in a dam building proposal?
- Which procedures do government agencies have to secure that environmental regulations are followed?

- What do hydro electric companies do to diminish possible environmental impacts by dams?

Objective 2: To get an overview of the possible social consequences to people affected by dam building, and to understand how the involved agents and institutions perceive social consequences by proposed dams, and how these are considered in the process of giving concession to build dams.

- What are the possible social consequences to people affected by dams?
- What are the involved agents and institutions understanding as social consequences?
- What are the requirements set by government regulations concerning accepted and unaccepted social impacts by dam building?
- Which procedures do government agencies have to secure that social requirements are followed?
- What obligations do hydro electric companies and the government have concerning people affected by dam building?
- If any obligations, how do they fulfil them?

Objective 3: To assess if and how the ILO Convention no. 169 and indigenous peoples' rights are considered in the regulations and procedures for dam construction concessions and management.

- What are the indigenous peoples' rights to land and natural resources in Norway and Brazil?
- How are the indigenous peoples' rights to land and natural resources incorporated into the regulatory framework and procedures of the concession giving process to hydro electric dams?
- How are the rights of indigenous people followed through by hydro electrical companies and government agencies in the building of hydro electric dams?

Objective 4: To find if there are lessons to be learnt between Norway and Brazil in the development of the hydro power industry, the regulations and procedures given to regulate it, with focus on environmental and social aspects.

- What are the similarities and differences between the developments of the hydro power industry in the two countries?

- How and why could it be possible or impossible for any of the policies and regulations made for the hydro power industry to serve as an input from one country to another?

1.2. Consequences by hydro power dams

The first big report on dams and their consequences to people, environment and development, was the “*Dams and Development*” published in year 2000 by the World Commission on Dams (WCD). The WCD participants consisted of a group representing different interests and scientific fields in regards to hydro power dams, as well as a Stakeholder Forum as advisory group for the Commission (World Commission on Dams 2000). The WCD concluded in their report that hydro power dams have both environmental and social consequences for the populations in areas where the dams are built. The WCD came with several conclusions and recommendations as to environmental and social issues related to dams, and contributed to acknowledging that there are several problems concerning dam building which governments, energy companies as well as constructors should consider when deciding on building dams and how. I will use the WCD’s report and the consequences listed as a point of departure to discuss what may be the consequences by dams, as not all consequences are necessarily negative. Even though the environmental and social consequences are presented separately, it is important to emphasise that there is a connection between social conditions and environmental degradation or improvements.

1.2.1. Environmental consequences

There are several environmental consequences and outcomes from hydro power dams which need to be taken into consideration when deciding on building a dam. The main potential consequences listed by the WCD in their report can be summarised in seven points (World Commission on Dams 2000: 73-95):

a. the impacts of reservoirs on terrestrial ecosystems and biodiversity

The inundation of reservoir area kills forests and plants and leads to displacement of animals. Flooding may result from clearing of upstream areas as these areas may serve as replacement for the land lost by inundation. Such a change in land use, may lead to land degradation, habitat loss for animals, reduction/loss of flora and fauna as well as feedback effects on the reservoir through alterations in hydrological functions.

b. the emission of greenhouse gases (GHGs) from large dams and reservoirs

According to the WCD report, 1 % to 28 % of the global warming potential of GHGs is accounted for by gross emissions from dams and reservoirs (World Commission on Dams 2000: 75). Large dams in both boreal and tropical regions emit GHGs, however shallow and warm dams in tropical regions are more likely to emit more GHGs than deeper and colder dams in boreal areas (World Commission on Dams 2000: 75).

c. the impacts of altered downstream flows on aquatic ecosystems and biodiversity

The ecosystems formed by natural rivers are a product of the flow, quantity and character of the sediments set in motion by the river as well as the materials that make up the riverbed. This flow is disturbed by controlled dam operations. Big and non-seasonal differences in the river flow may affect fish whose lifecycle is adjusted to seasonal differences in water flows, as well as plants and animals living downstream. Change in sedimentation flows downstream may lead to elimination of natural beaches and backwaters, which provides fish habitat as well as riparian vegetation¹ supplying nutrients and habitat for different aquatic and waterfowl species. A dam will also physically block the natural migration pattern of aquatic organisms which may lead to changed composition of species both upstream and downstream.

d. the impacts of altering the natural flood cycle on downstream floodplains

Reduction in downstream flooding may affect the productivity of riparian areas, floodplains and deltas. These areas are typically controlled by the dynamics of temporal flooding and sedimentation, water released from reservoirs at the wrong time may cause forest destruction which again will have a negative impact on fish diversity and production. Loss of silt and nutrients from flooding may contribute to reduced fertility of floodplain agriculture. Loss of bird species due to loss of wetlands is also a known problem as well as diminished recharging of groundwater in floodplains when floods are diminished.

e. the impacts by dams on fisheries in the upstream, reservoir and downstream areas

Dams as a physical barrier may alter the migration pattern of fish. The alteration of freshwater flows may also have effects on marine fisheries as many marine fishes spawn in estuaries and deltas. Decreased freshwater may reduce nutrients in the water, increase salinity which allows marine predatory fish to invade and reducing available food supply. However, dams can also

¹ Riparian vegetation: vegetation pertaining to riverbanks/streams and wetlands.

enhance some riverine fisheries benefiting from discharge of nutrients from the upstream reservoir. Lowered temperature from discharging the lower layer of the water in the reservoir may diminish or eliminate warm water river fisheries and lead to the introduction of coldwater species. Generally, changing composition of fish species as well as decline in species are consequences by dams. Though, local commercial fishing and sport-fishing is known to have emerged and increased in some cases.

f. the enhancement of ecosystems through reservoir creation and other means

It is possible to create productive wetlands by pumping water through previous dry areas, which creates wetland areas of wildlife and tourist value. Some reservoirs are known to support threatened reptiles and have importance to birds. However, productive and valuable wetlands are most likely to be created where reservoirs have shallow margins, limited drawdowns and where sediment inflows are heavy. Generally deeper reservoirs with steep sides or high seasonal water level fluctuations are not likely to support major wetland habitats.

g. the cumulative impacts by a series of dams on a river

A series of dam in a river means greater fragmentation of river ecosystems, this affects the flow regime and water quality of the river, as well as the productivity and specie composition of different rivers. The consequences by a series of dams for one river system generally results in an increased and cumulative loss of natural resources, habitat, environmental sustainability and ecosystems integrity.

1.2.2. Social consequences

The WCD report concluded with several important social consequences from dam building (World Commission on Dams 2000: 97-133):

a. socio-economic impacts through the planning and project cycle

In the planning and design phase of a dam, delays between planning and construction may signify lack of investments in the area in question from the part of the government, businesses, farmers and others because of fright of the area being inundated and that they will loose what they invested. Labour forces during construction are normally from the national labour market, whilst the contractors are international companies. This creates local and regional employment but also brings in investors which may have less social responsibility than a national investor would have – although this is not given, as well as taking economic

benefits out of the country. The construction of dams can contribute to employment from new enterprises established and investments as the provision of electricity and infrastructure increases. Construction may lead to increased infrastructure in the area in question as roads, power supplies, water and sanitation as well as social services. The new energy provided can benefit urban and local population in improved welfare.

b. physical displacement by dams

This does not only signify the physical displacement of people from the inundated areas of a reservoir, but also of people whose livelihoods are deprived as an effect of the construction of the dam. This can be brought on by loss of resource base as a consequence of changes in ecosystems downstream and upstream of a reservoir, like agricultural production, fisheries, livestock grazing, fuelwood and collection of forest products. A problem when estimating affected by dams in the planning of a project, is the under-estimation of affected people and a dissonance in the understanding of the nature and scale of impacts. Another problem has been affected groups which has not been counted or compensated, the definition of affected has been limited, and the main groups excluded have been particularly vulnerable like landless, indigenous people and downstream communities. There has also been a lack of assistance to resettle people who have actually been recognised as affected by the project.

c. indigenous peoples

Because of an often already marginal position for indigenous peoples when it comes to political, economic and social rights as well as discrimination, structural inequities and cultural differences in the societies in question, indigenous peoples often suffer consequences like displacement, negative impact on livelihood and cultural and spiritual existence. In addition they are often excluded from the benefits posed by the construction of dams. The free, prior and informed consent to development projects has emerged as an important tool to promote and protect indigenous peoples' rights in the process (World Commission on Dams 2000: 112). Indigenous peoples are often more vulnerable in regard to the construction of hydro power projects which affect them, because they historically have been marginalised regarding social, political and economic rights compared to the rest of the population. Policies concerning indigenous peoples have tended to consider them as subordinate to the rest of the population and often had a racist character. Additionally, indigenous communities in many countries tend to depend more on the environment and ecology surrounding them, which make them vulnerable to changes in the ecosystem.

d. downstream livelihood

Downstream communities in the tropics and subtropics suffer severe impacts by dams in cases where the hydrological regime is changed and affects the floodplains which support their livelihoods through flood-recession agriculture, herding, fishing and gathering forest products. These communities are often left out when recognising affected people by dam projects because they often live far away from the actual dam.

e. cultural heritage

The construction of dams may lead to loss of cultural heritage like religious and sacred places, and submerging and degradation of archaeological sites. These may be cultural, religious and historical values at a national level or community scale. Losing important, cultural, historical and religious values and symbols may contribute to further psychological stress to a population already under pressure.

f. human health

Water-borne diseases, toxics from excessive aquatic weed growth because of eutrophication, high levels of mercury in reservoir fish, socio-cultural disruption may be physiological traumatic for many communities and loss of food production through agriculture and fishing may lead to food shortage, hunger and malnutrition.

g. equity and the distribution of costs and benefits

Groups that bear the social and environmental costs of dams are generally not the one benefiting from the dams. Those suffering the costs are often poor, vulnerable and unrepresented like rural dwellers, subsistence farmers and fishers, indigenous peoples and ethnic minorities.

1.2.3. Consequences for indigenous peoples

As already mentioned there are several implications for indigenous peoples concerning dam building. The WCD concluded with indigenous peoples being some of the most vulnerable groups affected by dams. Because the rights of indigenous people and other ethnic minorities are often poorly defined and included in the national legal frameworks, they have traditionally had fewer opportunities defending their rights within legal frames than the majority of the population. Areas of cultural and religious importance have been neglected during planning and construction, as well as the dependence of many of the communities on the ecology that

surrounds them. The construction of dam has lead to displacement of indigenous communities, loss of livelihood support like hunting, fishing and collection of forest fruits and plants. In areas where there exists indigenous reserves these tend to be threatened by the construction of dams, not only by the water inundating the area, but also by large groups of immigrant workers coming into the region under the construction process and also by the resettlement process of other affected people. There is a discrepancy between what many modern societies consider to be natural resources with an obvious and easy potential for exploration and economic profits, and the dependency of many indigenous communities on the same resources in order to sustain their livelihood through fishing, hunting, extractivist activities and sites of religious importance. Where a modern society may see profit, indigenous communities may find their home and these two realities tend often to collide, also in the case of hydro power.

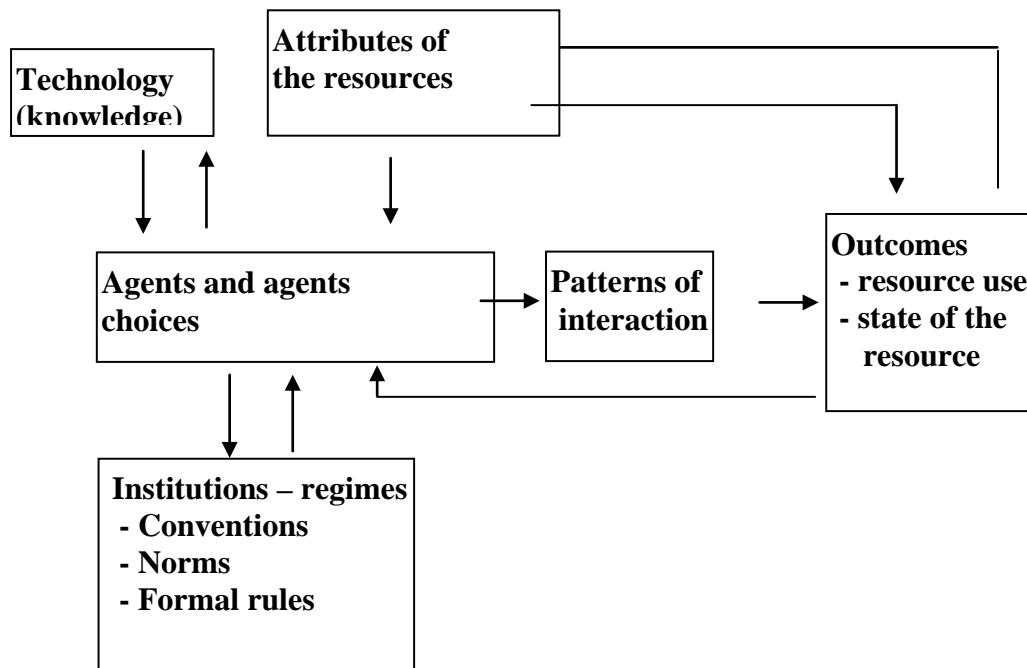
Chapter 2: Theoretical Framework

2.1. Oakerson's Framework as adapted by Vatn

As a theoretical tool for analysis I will use the framework originally developed by Oakerson as adapted by Vatn (2005). The framework is made as a tool to identify the rules/institutions established for resource management, the dynamics between the agents, as well as identifying how the agents behave in relation to the institutions. By identifying the dynamic between the agents and the institutions, one acknowledges that the success of a management system is not only related to the direct interaction between humans and nature, it also depends on the institutional structures which the agents operate within (institutional structures can in this context also be called resource regimes), and how they choose to behave according to the institutions. The idea of the framework is to identify the outcome of the resource regime as a result of processes and interactions between the agents involved and their choices, the institutions, the patterns of interaction and the attributes of the resource and the technology used. The institutional structures can include (a) property rights structures which governs the access to the resource, and (b) the set of rules regarding transactions over the result of the use of the resource (Vatn 2005: 252). In this thesis resource regime (or just regime), will refer to the latter, (b) the set of rules regarding transactions over the result of the use of the resource. I will also use the term institutional structures rather than resource regime, because I find the term resource regime to imply more focus on the property structures of the resource, private-, common-, state- or open access property, which will not be the main focus in this study.

By using the framework I will look at the different components as having influence on each other in a non-hierarchical way (Vatn 2005).

Figure 1: Oakerson's Framework for Analysis as adapted by Vatn.



(Source, lecture by Vatn, 15.10 2008)

The attributes of the resource and *the technology* available for its utilisation are defining whether a management problem exists or not, according to Vatn (2005). A management problem may be found when the attributes of the resource are perceived differently by the agents, this may give the agents different solutions on how to manage the resource. The attributes of the resource are the qualities of the resource which makes it valuable for the agents, what is it with the resource that makes the outcome of exploiting or not exploiting it valuable and beneficial. According to what the agents see as the main attribute of the resource, they will choose the technology and use institutions which will benefit them the most in order to obtain or maintain these attributes. However what the agents see as main attributes of the resource is a matter of perception. “Technology” is a part of the different tools the agents may use to manage a resource and achieve the outcomes they want, it can be science based knowledge and research, publicly acknowledge definitions and perceptions. The technology used will be influenced by how the agents perceive the attributes of the resource, as well as the technology available will influence the agents’ choices of modes of interaction with each other and through this interaction the outcome of the resource.

The institutions/regimes are as mentioned the set of rules regarding transactions over the outcome of the use of the resource, more specifically they are the conventions, norms and

formal rules which define the operational rules and management. According to Vatn, we may distinguish between operational rules – defining the everyday regulations of the regime/institution, rules concerning the defining of operational rules – constitutional rules of the regime and finally external arrangements – national and international laws and regulations (Vatn 2005: 284). According to Vatn, institutional issues can be divided in three:

- *Who gets access to which resources*
- *The costs of setting up and running institutions for the individual or common use of resource – transaction costs*
- *The effect a regime (institution) may have on how problems are perceived, which interests it defends and which values it fosters*

(Vatn 2005: 252)

Conventions in relation to the agents: “*have the function of coordinating behaviour through creating regularity – that is, supporting one type of behaviour as opposed to all other possible ways of handling an issue*” (Vatn, 2005: 6).

Norms can be defined as: “*A norm is a response to questions concerning what is considered right and appropriate behaviour*” (Vatn, 2005: 7). Finally *formal rules* is defined by Vatn as: “*covering all levels from the constitution of a society, civil law, to the laws concerning business transactions, rights to resources - property rights*” (Vatn 2005: 7).

Agents and agents choices are influenced by the motivation of the agents, what they want to achieve and which role they play, they are also influenced by the institutional structures themselves as well as the technology and characteristics of the resource according to Vatn (Vatn 2005: 285). He claims that the institutions may fit the dynamics of a resource well, but may be undermined if the involved agents are motivated to break the rules (Vatn 2005: 285)

Patterns of interaction may create or solve problems according to the agents’ choices and motivations, usually there are several agents with different motivations involved in the management of resources, and this may create tension and problems as to whose interests should be the dominant if not an agreement or compromise is reached. The patterns of interaction are usually dominated by the interests of the agents: who it is beneficial to interact with and who one can afford to leave out of the interaction pattern, some may find the cost of

involving some agents to high and try to leave them out, while trying to include those that they see beneficial.

The *outcomes* are in which state the resource is left by the management of it, who benefits from the use and the management chosen, how is it managed and by whom. The outcome is closely linked to the attributes of the resource, but the outcome does not necessarily correspond with the attributes the resource was thought or able to give. This will depend on the agents involved and their choices on how to manage the resource, as well as the institutional framework they act within. If the outcomes are not in accordance with what is expected or wanted, Vatn states that agents can change the institutional structures, that being within conventions, norms or/and formal rules. However it is normally easier and less time consuming to change formal rules than conventions and norms (Vatn 2005: 285).

2.2. Using the Oakerson's Framework as adapted by Vatn in the analysis of hydro power models and procedures

In order to be able to analyse the hydro power sector and its models and procedures within the framework presented, it is necessary to present the relevant factors in this study within each box. I acknowledge that there are more factors of relevance to the issue of hydropower, but in this study I will focus on the following.

2.2.1. *The resource and its attributes*

The resource in question is the river and the ecological system it supports. The attributes of the resource is the electric energy the water has potential to produce if managed as a hydro power dam. The electricity could benefit industrial development as well as economic development for the region and the country as a whole, and also bring economic income to entrepreneurs. However, the river has other attributes depending on the agents involved: a unique aquatic river system valuable in an ecological sense and as a part of a bigger ecological system, as well as it contributes with food and fisheries for the communities living in the area. To the farmers it contributes to irrigation and nutrients to their soils which provides them with food and economic income, and it gives the population living in the areas a means of transport as a river way. An important aspect of the attributes of the resource is that it is largely based on the perceptions of the agents and what they perceive as attributes and how they perceive them.

2.2.2. The technology

Technology in this study is the governmental plans, science based knowledge and research, as well as power and arguments, which are tools the agents may use in the interaction between them in order to achieve the outcomes they want from the management of the resource. The different agents may use different tools of technology when pursuing their cause, depending on which outcome they want and on which position they have as agents. They may use different sets of technology: the government may use plans and arguments aiming at economical and social development for the country; the hydro power industry may use research justifying the exploiting of one specific source of energy; and the civil society may use social and environmental arguments in order to justify their cause. The choice of technology by the agents influences the patterns of interaction as they will use the technology to justify and argue for their causes.

2.2.3. The agents and agents' choices

The agents in this study is represented by the government, governmental agencies, energy companies, dam constructors, farmers, fishers, non-governmental organisations (NGOs) representing different interests like environmentalists and affected people, indigenous peoples and the public community. The main division between the agent's motivations is the social and ecological versus the economical and growth oriented motivations, though for some agents it will be an oversimplification to be put in either of these two groups. Because of the complexity of the issue, I acknowledge that there are agents I do not manage to consider in this study, and that some of the agents mentioned may have multiple motivations behind their choices and actions. A closer presentation of the agent will follow in Chapter 4 and 5, and their choices and motivations will be discussed in the analysis.

2.2.4. Institutions – regimes

I find it necessary to define what I mean by institutions in this study, and find the following two to complement each other as they include slightly different aspects of how we can identify institutions:

Institutions consist of cognitive, normative, and regulative structures and activities that provide stability and meaning to social behavior. Institutions are transported by various carriers – cultures, structures, and routines – and they operate at multiple levels of jurisdiction.

(Scott 1995, in Vatn 2005: 10)

[Institutions are the] rules and conventions of society that facilitate coordination among people regarding their behavior.

(Bromley 1989, in Vatn 2005:10)

The institutions (can also be called a regime) in this study are represented by formal laws and regulations given by the government and its' agencies, as well as conventions and regulations within the energy companies themselves, it also includes the international laws concerning indigenous people and their rights. The design and interpretation of the institutions may be influenced by the agents, through their choices and their use of technology in the form of research and scientific knowledge.

Institutions are also important in how agents interact and make choices, how they perceive problems and respond to them. According to Vatn:

...the social constructivist tradition (...) emphasises the effect of regimes on the perspectives and interests of the participating individuals, on their possibilities to communicate and willingness to cooperate. The position is taken that the regime not only influences the formal rights structure. It also influences the understanding of the problems involved, and the kind of norms and routines applied.

(Vatn 2005: 253-4)

This indicates that institutions not only regulate behaviour, but also contribute to how the agents perceive reality and that the institutions contribute in stating what is considered a problem or not.

2.2.5. Patterns of interaction

The patterns of interaction between the agents are largely based on their interests and motivation and what they want to achieve by the management of the resource. One aspect which is important is what the different actors can gain from interacting with each other, and which power each actor possesses. The patterns of interaction, the agents' motivation for interaction and which effect the institutions have on this, will be treated in the analysis.

Because the agents are intended to comply with different roles and tasks, they are also expected to operate within different sets of rules, regulations and norms in correspondence with their role.

2.2.6. Outcomes

An important aspect of this study to investigate is the outcomes of the resource, as it indicates whether the institutions work or not through the agents' choices and their patterns of interaction. The outcome is a result of the process of interaction between the agents, the institutions and how the agents behave related to the institutions. There are several perceived and feared outcomes and scenarios from the management of the resource: energy to both people and industries; industrial development of the country; employment from construction of dams and establishments of new industries due to access to energy; loss of fisheries; irrigation and source of soil nutrients to farmers; loss of aquatic and terrestrial ecosystem; threatened livelihoods for indigenous peoples; loss of water ways; pollution from GHGs and displacement of people. However, these outcomes are dependent on the institutions and which rules they set to manage the resource, the agents' choices and how they interact. If the outcome is perceived by one or more of the agents as not beneficial, it may lead to changes in the institutions and the patterns of interaction. Hence, the outcomes give an indicator to whether the interaction between agents and between agents and institutions works as intended and how it works.

Chapter 3: Research Method and Data Collection

3.1. Data collection in Brazil

3.1.1. Location and time period

I conducted my main data collection in Brasilia, Brazil, from the beginning of October until mid December 2009. Because of the institutional character of my study, most of my data collection was done in Brasilia due to its position as governmental and institutional centre, with the location of most of the representatives from the institutions I was going to interview. However, I also had to travel to Rio de Janeiro and São Paulo to conduct some interviews with central agents.

As I was conducting my fieldwork in cooperation with *Instituto Socioambiental*² (ISA) and their office in Brasilia, this also made Brasilia natural as a point of departure. ISA is a Brazilian NGO and research institution working with social and environmental issues all over Brazil, as well as with indigenous peoples' right. It was established in 1994 and is now a well acknowledged organisation within its field. ISA is amongst other things working with the social and environmental issues, as well as indigenous peoples' rights related to hydro power dams (ISA 2010a).

3.1.2. Pre- and post fieldwork preparations

The preparations for my fieldwork were done from March 2009 until the start of the fieldwork in the beginning of October 2009. It consisted of literature search and review, as well as a Portuguese language course in Brasilia from the beginning of August until the end of September 2009. This was necessary because nearly all of the written information is in Portuguese, as well as most of the interviews were to be conducted in Portuguese. I have also been trying to get the last interviews by email.

3.2. Methods of data collection

3.2.1. Interviews

My data collection is based on qualitative research methods, mainly literature reviews and interviews. My interviews were based on loosely structured interview guides and had a rather informal character, some of the interviews were more like conversations where I entangled

² Instituto Socioambiental: Socio- Environmental Institute

the questions and themes I wanted to discuss into the conversation. Because I was interviewing representatives from different organisations with different tasks and agendas, I needed to make three different sets of interview guides; one for governmental agencies working with issues related to hydro power and energy, hydro power companies and finally NGOs and academics working with social, environmental and indigenous issues related to hydro power dams. Although the interview guides were somewhat different, many of the main questions were the same in order to be able to see if there was correspondence between the different answers from the different agents, and also if there was correspondence with the written laws and regulations. The interview guides are included in the appendix.

I found qualitative method to be the most useful method in regard to my study as I have mainly been investigating policies, as well as the environmental and social consequences (outcomes) by dams. An important aspect of my study is the interaction between agents as their interaction will contribute in shaping the institutions in an attempt to achieve their wanted outcome. Social constructivism emphasises that social phenomena and their meanings are continually being negotiated by social actors and social processes (Bryman, 2008). Another reason for choosing a qualitative approach is the fact that I have been doing a case study and as Andersen (1997) states (my own translation from Norwegian):

...case studies are most viable to answer questions concerning how something happens and is experienced rather than why. This is put in connection with the perception of the information gathering as characterised by closeness to the actors and event, with emphasis on details and experience where data and analysis incorporates the actors own perspectives. Processes and changes over time are central. These are data that are not countable or measurable.

(Andersen 1997: 34)

To use qualitative method was also most suitable to get in depth information during the data collection. As Bryman (2008) states: “*Qualitative research ... usually emphasizes words rather than quantification in the collection and analysis of data*” (Bryman 2008: 22). It was important to me to be able to complete the whole picture within a political, historical and social context, with the possibility to ask question as to why people perceive things to happen and how, also personal opinions were of value to me, hence a strictly formulated quantitative

questionnaire to a large group of respondents would not give me this kind of valuable information.

3.2.2. Purposive sampling

I conducted in total twelve interviews and participated in two *Audiencias Publicas* (APs), which are Public Hearings on the licensing on the building of dams. Four of the interviews were with NGOs staff and academic persons, seven interviews were with representatives from governmental institutions and ministries and one was with the representatives from an energy company. The rather small number of interviews is due to several factors of which some will be explained in 3.4.2. I also had some informal conversations with NGO staff. When selecting my interviewees, I conducted purposive sampling, which Bryman explains as:

...essentially strategic and entails an attempt to establish a good correspondence between research questions and sampling. In other words, the researcher samples on the basis of wanting to interview people who are relevant to the research questions.

(Bryman 2008: 458)

As I had to interview specific groups, organisations and institutions in order to get the specific information I wanted, I found purposive sampling to be the most viable, it would not make sense to interview on a random basis. One of the reasons why I conducted not so many interviews is because of the relevance of the respondents, when doing purposive sampling in a study of this scale, there is limited number of actors relevant to the process under investigation. It also became quite clear just after a few interviews, that there was quickly an empirical saturation to the information I was obtaining.

3.2.3. In dept interviews

All my interviews were in depth interviews which lasted from minimum one hour to three hours. This gave me the opportunity to get in depth information on the relevant issues, to ask follow up questions and to get the confidence of the respondent more easily. I also taped most of the interviews after getting the approval of the interviewees, it did not seem like anyone was distracted by the fact of a tape recorder being placed in front of them. Just one respondent rejected being taped. In six of the interviews there was also between 2-3 persons present during the interviews, this was not intended from my part, but initiated by the part of the interviewees, as they felt they had different competencies within the field and that it would be

fruitful for both them as to give the most information as possible, as well as for me to obtain as much information as possible. This was very useful when conducting the interviews, as I also got a bit of discussion going on between the interviewees and because they had different experiences and different competencies to share. However, I also experienced in one of the interviews that there was a certain social control in having several participants present in the interview, as one of the interviewees commented to the other: “*We shouldn’t comment on this....*” These interviews were more similar to focus group interviews based on the definition of focus group interviews:

...there are several participants; there is an emphasis in questioning on a particular fairly tightly defined topic; and the accent is upon interaction within the group and the joint construction of meaning. As such, the focus group contains elements of two methods, the group interview, in which several people discuss a number of topics; and what has been called a focused interview, in which interviewees are selected because they are known to have been involved in a particular situation (Merton et al 1956:3) and are asked about that involvement.

(Bryman 2008: 474)

However, the interviews conducted do not fall fully under this definition, as the interaction within the group was not of main interests since the interviewees represented the same opinions on behalf of a company, Ministry or NGO. I did not expect them to have very diversified opinions about the theme since they as a group represented a specific interest, even though social control within the group became an apparent form of interaction.

3.2.4. Literature review and secondary sources

Literature review and examination of secondary sources have been a big part of my study. The sources have been governmental laws and regulations, reports and documents by different governmental institutions, agencies and energy companies, research papers and publications from NGOs and academics and scientists, as well as international institutions like the World Bank and the World Commission on Dams. This literature has been obtained by searching the internet on relevant actors’ homepages, literature search in libraries, by tips from respondents and supervisors, literature and documents given to me by respondents during interviews and through newspapers and academic publications.

3.2.5. Public Hearings³

The information obtained at the Public Hearings was obtained in a public space, where NGOs, government representatives from the *Ministério Público* (the Ministry of the Ombudsman – the Ombudsman), scientists as well as representatives for the affected people were present. My role as researcher can best be described as participant observation with the role as an complete observer as I was not able to participate actively and ask questions, but was rather an observer and listener to what the different parties had to say and how they responded to each other.

3.3. Case study

The main case under investigation is the Belo Monte Dam project in Brazil, and more specifically how the elaboration of the project is conducted with regards to existing hydro power policies on environmental and social issue, as well as in relation to the rights of indigenous peoples. This case will be compared to the case of the Alta Dam and its consequences for Norwegian hydro power policies in relation to environmental and social issues, and the Sámi rights in Norway. The historical time line is essential to be able to make a comparison between the two cases. The two cases appear at different historical times with 30 years of time difference under very distinct political, social and international conditions, as well as the current situation being quite different in the levels of development of the hydro power industry in the two countries. One of the important divergences regarding the two cases is that Norway has had a sequential development of hydro power from the beginning of the 19th century. This made the country dependent and focused on development of hydro power, then the development of the oil industry came during the 1970s until today, and more recently the development of gas and biofuels. Brazil on the other hand, has the possibility to develop all at the same time which makes the governmental focus being divided between the development of several energy source projects, as well as less dependent on one source of energy as there are different options as to sources. The socio political and the economic conditions in the two countries are also very distinct, as well as the international world politics and economics which takes on a different picture now than 30 years ago when the Alta case took place. Based on the fact that the two cases appear at such different times and settings, I am pursuing a case research design which Gerring (2004: 343) describes as “*across*

³ Audiencia Pública

and within units synchronically and diachronically". Gerring goes on to explain this research design as:

...case studies examine variation in one single unit over time, thus preserving the primary unit of analysis. Other case studies break down this primary unit into subunits, which are then subject to covariational analysis – either synchronically or synchronically and diachronically. These are the three logically conceivable approaches to the intensive study of a single unit where that unit is viewed as an instance of some broader phenomenon.

(Gerring 2004: 343)

I conduct the comparison of the two cases by breaking it down to subunits and conducting a synchronically and diachronically covariational analysis which can be described as comparative-historical (Gerring 2004). By subunits in this study, I refer to the components in the Oakerson's framework as adapted by Vatn. This enables me to make comparisons of current situations in the Belo Monte case and in Brazil, with previous experiences concerning the Alta Dam case and the development of Norwegian hydro policies.

3.4. Limitation of study

3.4.1. Time frame

I spent in total 20 weeks in Brazil, of which 9 weeks were spent doing language course as preparation for fieldwork, accordingly 11 weeks were set off to do data collection. Ideally I would have spent another month doing fieldwork to be able to obtain more interviews with social actors and affected groups by dam building. Because of the extensive amount of literature in Portuguese which was difficult to process before the Portuguese language course, a lot of this had to be read after the course was finished. It was necessary to read much of this material prior to conducting the interviews, as to be able to get an overview of the existing legal framework and some of its challenges, and to ask the relevant questions in the Brazilian case according to the legal framework and challenges.

3.4.2. Fieldwork challenges

I conducted my fieldwork in cooperation with ISA in Brazil. They assisted me in finding literature resources and information, as well as respondents. However, there were some challenges in this cooperation. The ISA staff is extremely competent, engaged, kind and

friendly, but this also contributes to them being very busy. It was therefore difficult for them to find time to assist me in finding the right respondents and getting in touch with them, in addition to their ordinary work. It was crucial for me to get some help and guidance in getting connected, because at the institutional level I aimed at interviewing, it seems to be essential to have contacts that connects you with the informants, or that you have a name to refer to when making contact.

Another challenge when conducting the fieldwork was to get contact with the informants. Most of the informants which I was connected to through ISA or by other informants answered me and gave interviews. However the ones that I contacted without any reference person did not even answer my requests for interviews or information. This was solved in some of the cases with my informants connecting me to the right person in the right institution because this person was a friend of his/hers or former colleague. It became quite clear that it was vital to be connected by someone to get in touch with the people I wanted to interview.

The difficulty of getting in touch with people and institutions is also one of the reasons for the rather small number of interviews, ideally I would have had more, and especially with the largest and most important hydro energy company in Brazil, Eletrobras, but it seems impossible to get in touch with the company. Also representatives from the Ibama, which is the environmental government agency supervising the planning of hydro power projects were impossible to get an interview with, because of their tight time schedule. These are two central agents within the Brazilian hydro power sector, which I ideally should have interviewed in order to get their opinions on claims against them and clarification, but it was not possible to get interviews

3.4.3. Limitations of literature review

There is always a challenge in reviewing and analysing literature and secondary sources, it will always require some precautions as to who are the sources and publishers. Statements, opinions and facts given may be coloured by authors and the publishing institutions and what they want to achieve, especially within such a debated issue as hydro electric power and its consequences. However, the colouring of information by the opinions of the author or publisher may also be information in understanding the position of the agents regarding the issue. A discursive approach involving critical reading is hence necessary when finding, reviewing and analysing literature. It is also important to be aware of that sometimes words

are just words, and does not necessarily transform into acts, especially with regard to laws and regulations. By discursive approach I mean an approach to the analysis of the written or spoken communication or formal discussion of a topic, which emphasises the way in which versions of the reality are accomplished through language (Bryman 2008; Oxford 2008). This means that the information communicated through the literature, may intend to communicate one particular view of reality which may be perceived as beneficial to those communicating it, or the cause they promote and non-beneficial to those opposing it, this also applies for oral information.

3.4.4. Ethical considerations

Research ethics are an important part of doing research, therefore it was of great importance to me to attend to all the ethical considerations of a research. All my interviews were pursued with informed consent of the respondents, also the use of tape recorder was always approved by all the respondents before recording started. All the respondents were explained the purpose and aim of the study, and asked for approval of using the information they gave in my thesis. No one refused this, however some were very clear on what was their personal opinion and experience and what was their agency's opinion of certain cases, and that I would have to distinguish between the two when interpreting data, something I of course have respected. This was also in concordance with my objective of this study which was to obtain the institutional views and policies when interviewing representatives from institutions, not individual and personal information. All respondents, whose names are used in the thesis, have given their consent to this.

Chapter 4: Main agents and hydro power in Brazil

4.1. Political-historical background to current hydro power politics in Brazil today

I will start with a brief historical-political background of Brazil. The political history of Brazil is relevant to understand some of the arguments presented by the agents interviewed, and because some of the projects carried out under previous governments, have implications on how some of the issues related to hydro power and the energy sector are perceived today.

4.1.1. *Short historical-political background to the current political scene*

Brazil became independent from Portugal in 1822 and since then the country has experienced going from a monarchy to republic in 1889, and then going back and forth between democracy and dictatorship between the years 1930-1964. A military coup in 1964 reintroduced dictatorship which would last until 1985, when democracy was restored and free elections were held. However the experiences from the time of the dictatorship set its imprints on the Brazilian society and development and still influence peoples' perception of politics and governance. The military dictatorship from 1964-1985 had as a goal to modernise Brazil, and pursued an agricultural expansion as well as mining, into previously unsettled areas in the Amazonian region and the north east of the country. Some of these areas were inhabited by indigenous groups, and this led to violent confrontations between the settlers and indigenous groups. The expansion put pressure on the land traditionally inhabited by indigenous groups as well as on the indigenous population itself. The military regime also built several infrastructure and energy projects like the Transamazon Highway, the Itaipú Dam (Itaipú Binacional) on the border with Paraguay and Argentina, the Tucuruí Dam in the Tocantins River, as well as proposed several prospected hydro energy projects, amongst them the Belo Monte project. However the regime did not manage to complete all of its projects, before the power was handed over to a democratically elected government in 1985 with President José Sarney and the Social Democratic Party (*Partido Democrático Social* – PDS). Sarney had two huge tasks when in presidency; to rebuild democracy and to solve the inflation crisis left by the military government. As a step towards renewing democracy, the 1988 Constitution was written. This was a Constitution where lobbying from different interest groups had been an important part of the development process, and the result was a Constitution with many citizen rights and reaffirmation of corporatists tenets (Skidmore 2010). The Constitution also stated the rights of indigenous peoples, as well as stating that the rights to the natural

resources belonged to the State and is under the management of the State. The environment was also included and it was stated that it is a public duty of the State and its citizens to preserve and take care of it in the interests of present and future generations (Brasil 1988).

During the 1990s the inflation and economic crisis which had riddled the country since the dictatorship, was addressed radically. In 1993, Fernando Henrique Cardoso was appointed finance minister, he introduced a shock treatment of the economy with wage and price freeze, a balanced budget for the coming year and a transition to a new currency, the *real*, consequently the inflation dropped and the economy stabilised. In the following elections Cardoso was elected president, and he continued his economic programs, amongst those privatising many of the state owned enterprises and corporations. By the end of 2000 most of the major state owned enterprises had been privatised except for Petrobás and the electrical power sector. Cardoso continued with the privatisation until Luiz Inácio “Lula” da Silva was elected president in 2002 representing the Workers Party, *Partido dos Trabalhadores* (PT). Lula was a previous worker union leader who had been working as a metal worker, born in poverty, without any formal education and with a more socialist political view than previous presidents. However Lula continued the IMF programs signed by Cardoso and his finance minister, but he halted the privatisation process. The result was that during Lula’s first term the minimum wages had increased, Brazil achieved a huge positive trade balance which made Brazil able to pay off much of its foreign debts, financial stability and almost no inflation. Lula had also introduced the *Bolsa Familia*, which is a social program aimed at the poorest. The program gives low-interest loans and direct subsidies to families that keep their children in school. This helps to alleviate some of the poverty crisis on local level, but has not been able to eradicate the big economic differences in the Brazilian society (Skidmore 2010).

4.1.2. Political situation today

Brazil is finishing the second term with Lula as president this year, and the coming presidential elections are in October this year. Lula cannot run for another term for PT and his follower as presidential candidate for PT, Dilma Rousseff, does not have the same popularity as Lula. The main opposing candidate is José Serra from Brazilian Social Democratic Party (*Partido Social Democrático Brasileiro* – PSDB), it is prospected that one of the two will win the presidential seat. The PSDB is a party consisting of a coalition of social democrats, democrats and liberals and is said to have a more centrist outlook in comparison with PT. However it is not expected to be many huge changes with either of them, although Serra will

be more prone to pursue more controlled privatisation than Rousseff is expected to (Reuters 2010). Both candidates will still have challenges in keeping the economic stability and avoid inflation. Brazil was not hit hard by the economic crisis that struck the world in 2008, but still there are huge economic and social differences in the Brazilian society, and it will take political measures to alleviate this. There is also pressure both from within the Brazilian society and from the international community on how Brazil manages its natural resources and forests, especially in the Amazon region, that being oil, hydro power, deforestation, agriculture or logging.

4.1.3. PAC

In 2007, the Growth Acceleration Program, *Programa de Aceleração do Crescimento* (PAC) was introduced by President Lula. The program is a new development model to promote social and economic growth and equality through public investment in national infrastructure such as transport, energy, sanitation, housing and water resources. Investing in these areas is seen by PT as essential in obtaining a sustainable development of the country, both industrial and productive, as well as social. The program aims at combining economic growth with income distribution in order to reduce poverty and to integrate workers into the formal labour market.

The PAC investments are organised in three main areas: logistic infrastructure, involving construction and enlargement of roads, railways, harbours, airports and waterways; energetic infrastructure, focusing on the generating and transmission of electric energy, production, exploration and transport of oil, natural gas and renewable combustibles; social and urban infrastructure, focusing on sanitation, housing, metros, urban trains, the implementation of the Light for Everyone program all over the country (*Programa Luz para Todos*), and the water resources. Between 2007 – 2010 the program is to spend 274,8 billion reais, equivalent to 156,3 billion US dollars, on the energy program alone, generate 12.386 MW of electric energy and construct 13.826 km of transmission lines (Brasil 2010a). In order to achieve this, it is necessary to construct several new hydro power dams, which is then seen as a way to develop the country and as a step to diminish the social and economic differences by bringing electricity to everyone, as well as stimulate industries and investments due to better and more stable access to energy.

In March 2010, the government released the plans for PAC 2, which is the continuation of the PAC program introduced in 2007 (PAC 1). The PAC 2 (usually referred to as just PAC) has more specific plans of how to carry out projects and achieve the goals set in PAC 1 (Brasil 2010b).

4.1.4. Energy and hydro power in Brazil today

Brazil today obtains most of its electric energy from hydro power, as much as 73,4% is generated by hydro power and an additional 15,4 % is generated by thermal sources⁴, accordingly almost 90% of the total energy production in Brazil is generated from water resources (EPE 2009a). The majority of the currently operating hydro power plants were developed during 1974-2005, increasing potential capacity from 13.724 MW to almost 70.961 MW (Brasil 2007). Most of the water resources in the south- and northeast are already explored, as much as 80% of the hydro power energy produced is generated in these areas and the remaining potential is mainly in the north and central west of the country that is, the Amazon (Brasil 2007). The biggest hydro power plants in Brazil today is the Itaipú dam located on the border with Paraguay and Argentina and is the second largest hydro power dam in the world. The construction of the project started in 1974 during the military dictatorship, and was inaugurated in 1982, the dam has 14.000 MW of installed capacity and generates approximately 18,9% of the total energy consumption in Brazil (Itaipú Binacional 2010). In total there are 527 hydro power plants in Brazil of which 361 are small hydro power plants (*pequenas centrais hidrelétricas* – PCH) with up to 30 MW installed capacity and 166 have more than 30 MW installed capacity (*usinas hidrelétricas* – UHE). There are currently, including both PCHs and UHEs, 86 projects under construction and 157 projects are granted concession with a total potential of 15.453.010 kW (ANEEL 2010a).

As the generation of hydro power energy in Brazil is uneven from region to region, Brazil has developed a system called the National Interconnection System (*Sistema Interligado Nacional* – SIN), to secure the provision of energy all over the country. It is also intended to secure a stable provision in all of the country as there are seasonal differences in water level and energy generation in some of the plants, and also in case there are blackouts in the generating from some hydro power plants. This means that energy generated in the south is transported to the north through transmission lines, and that the potential production of energy in the

⁴ Thermal sources: installation where energy is obtained through the chemical process of using combustible fossil fuels, liquids or gases and convert into energy by heating (Aneel 2002: 149).

Amazon can be transferred to the north east and south of the country, where both the population and industrial production is larger and the need for energy is more acute (Brasil 2007).

Brazil faced an acute energy shortage in 2001, with several blackouts hitting especially the southern parts of the country, amongst other the São Paulo City. The crisis led to energy rationing and an increased awareness of the vulnerability of the electric energy system and supply. The shortage was said to be due to draught and lack of water in the reservoirs, failure to implement planned projects due to lack of funds, bureaucratic procedures, environmental disputes and political manipulation (Gall 2002). The shortage made the politicians focused on improving and expanding the energy sector and to continue to push through several old hydro power plans introduced the last 20 years. This was seen as necessary in order to continue the social and economic development of the country, as well as getting political support during elections.

Today the supply of hydro energy is more stable, but there is still a prospected energy shortage for the next decades and the expansion of the sector continues. The focus on the energy demand and supply once again came in focus with the 2009 November blackout in the south eastern and central regions of the country, amongst them the city of São Paulo, Rio de Janeiro and Distrito Federal (Brasilia). The blackout was said to be caused by heavy rains, thunderstorms and wind affecting three of five transmission lines transporting energy from the Itaipu dam to the south eastern and central parts of the country This again provoked a discussion whether the supply of electrical energy in the country is stable and secure enough, and that further expansion and development of the sector is necessary (Samek 2009), not only within hydropower energy but also within other sources of preferably renewable energy. As a curiosity, just before the blackout, Rio had been granted the Olympic Games in 2016, and the blackout which also affected Rio, caught the international media's attention as to whether or not Brazil is technologically prepared for such an event and expressed concerns about safety and the level of development of the country. This has been a blow to the pride of many Brazilians.

4.1.5. Future perspectives for hydro power in Brazil

According to the World Bank, Brazil has the world's ninth highest gross domestic product (GDP) measured by purchasing power parity (PPP, measured in 2008) and is expected to have

a growth rate of 5-6% in 2010-2011 (World Bank 2009). The continuation of developing the industry and the improved living standards of people will increase the public and private consumption of amongst other things energy consuming technology. This indicates that consumption of energy in the country will increase radically, and the demand of electrical energy from both industry and private consumption will augment in the coming years. Also considering the PAC initiative from the Lula government, with the investments in renewable energy and the Light for Everybody Programme signals a wish for further expansion in the hydro power sector. According to the National Energy Research Agency (EPE), the Brazilian energy consumption in 2008 was 428.250 GWh (EPE 2009a) and the demand is likely to increase to in between 950 and 1240 TWh in 2030 depending on economic development of the country (Brasil 2007).

Brazil is today exploring about 30% of its hydro power potential and the energy authorities are still planning to further develop the hydro power sector, according to EPE, there is a hydro power potential of 260 GW, of which 70% is located in the Amazon and the *cerrado*⁵ regions (Brasil 2007). This makes the exploration of water resources in these areas controversial and difficult due to environmental concerns. An example is in the Amazon biome where 16% of the territory is defined as Conservation Units, (*Unidades de Conservação – UC*), 25% is indigenous territories (*Terra Indígena – TI*) and 39% is classified as areas of priority for biodiversity conservation (*Área Prioritária para Conservação da Biodiversidade*), which will make the approval of hydro power projects in the future difficult as well as controversial from an environmental point of view (Brasil 2007). EPE acknowledges several socio-environmental consequences of exploring the hydro power resources in this area. The following table indicates the estimated amount of energy to be generated from areas with substantial environmental and social problems in relation to the generation.

⁵ *Cerrado*: Brazilian savannah/drylands with a vulnerable and unique ecosystem.

Table 1 – The Amazon Basin – Characteristics of hydro power potential according to environmental impacts (MW) as defined by EPE

Impact	Total potential (MW)	%
Without significant impact	29.196	37,9
Indigenous reserve	34.158	44,3
National park	9.330	12,1
Quilombo ⁶ population	2.883	3,7
Sustainable development reserve	968	1,3
National forest	420	0,5
Area under environmental protection	53	0,1
Biological reserve	50	0,1
Other impacts (*)	-	< 0,5
Total	77.058	100,0

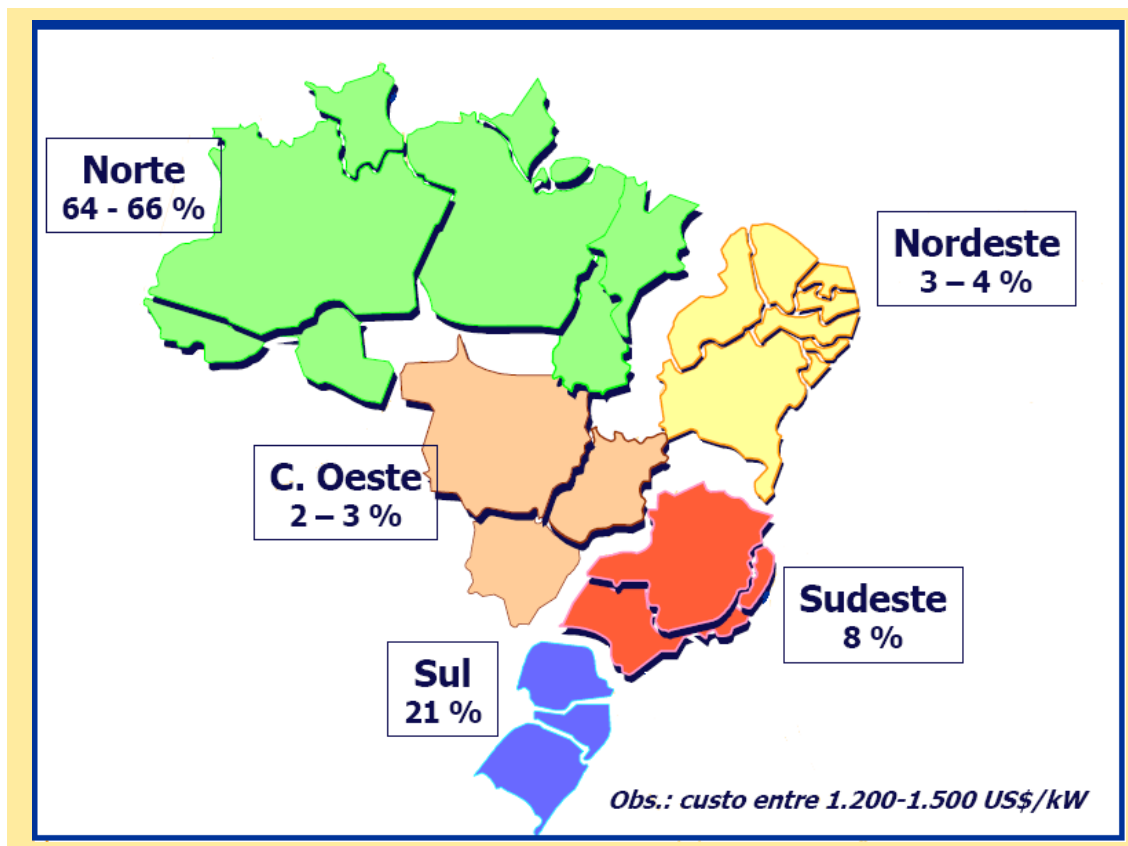
Note: (*) Cities, populated areas, virgin rivers, inundated areas, cost of land and infrastructure of significant importance.

Source: Brasil 2007

The situation of the *cerrado* region is similar with only 8% of the area with potential for hydro power projects being without environmental impacts, and 92% under some form of environmental restrictions (Brasil 2007). This indicates that the areas with the biggest hydro power potential are considered extremely vulnerable in socio-environmental terms. Figure 1 shows how the hydro power potential divided between the regions, including already exploited potential and estimated potential.

⁶ *Quilombo*: Communities originating from black runaway slaves, status as original/traditional communities according to Brazilian law.

Fig. 2: Geographical distribution of hydro power potential



Source: EPE 2009b

4.2. Main agents and structure of the Brazilian hydro power sector

In this study I will focus on the following agents, which I consider the most important in the process of regulating social and environmental consequences and executing indigenous peoples' rights with regards to hydro power projects.

4.2.1. Ministry of Mines and Energy

The Ministry of Mines and Energy (*Ministério de Minas e Energia* – MME) was created in 1960, later dissolved and its responsibilities given to the Ministry of Infrastructure in 1990, and then recreated in 1992. The responsibilities of the MME was explicitly defined in 2003 concerning the areas within geology, mineral and energy resources, the use of hydraulic energy, mining and metallurgy, oil, combustibles and electric energy, inclusive nuclear energy as its main responsibility (MME 2010a). The MME is divided into secretaries according to responsibilities, and the responsibility for hydro power sector falls under the Secretariat for Electric Energy (*Secretaria de Energia Elétrica* - SEE). The SEE is to establish and look after the compliance of the Policies and Directives of Electric Energy which secures the

universality of energy access, the modification of tariffs, the security and continuity, the reliability and quality of the energy supplied with the satisfaction of the consumers (MME 2010b).

The SEE (MME) is to monitor the expansion of the electric energy sector in accordance with supply and demand in concordance with the governmental politics. It is also to be part of the formulation of the policies and politics, securing the multiple use of water and the sustainable use of the environment, accompanying the implementation of the regulations and guarantying the expansion of the electric energy sector in a sustainable manner. The SEE is responsible for the management of institutional projects related to the electric energy sector; promoting the integration of the sector on a governmental level; articulate and the promote interaction between every agent of the sector, the environmental and hydro energy organs in order to make feasible the expansion and functionality of the hydro energy system; function as a centre for management of the projects and programs within its competencies (MME 2010b). MME has distributed responsibilities of the electric energy sector to other governmental agencies and partly governmental energy companies like the EPE, ANEEL and Eletrobras, which will all be described in the following sections.

4.2.2. Ministry of Environment,

The Ministry of Environment (*Ministério do Meio Ambiente – MMA*) was created in 1992 and its mission is to promote the adoption of strategies and principles of knowledge; protection and the recovery of the environment, the sustainable use of natural resources; the valorisation of environmental services and the introduction of sustainable development in the formulation and implementation of public policies, in a participating and democratic manner in all levels and instances of the government and society. According to law n° 10.683 from the 28th of May 2003 which clarifies the responsibilities of the organisation of the Presidency of the Republic and the Ministries, the following areas of responsibilities are attributed to the MMA:

- I. the national policies of the environment and the water resources;*
- II. the national policies of preservation, conservation and sustainable use of ecosystems and biodiversity and forests;*
- III. the responsibility of propose strategies, mechanisms and economic and social instruments to improving the quality of the environment and the sustainable use of natural resources;*

- IV. *the national politics on the integration of environment and production;*
- V. *the national politics and environmental programs of the Legal Amazon - Amazonia Legal*⁷;
- VI. *the responsibility for ecologic-economic mapping.*⁸

(MMA 2010a)

The MMA is divided into sub committees, secretaries and councils with different competencies and has various semi autonomous bodies like the CONAMA and IBAMA which will be further introduced in the following sections.

4.2.3. The National Council of Environment

The National Council of Environment (*O Conselho Nacional do Meio Ambiente – CONAMA*) is a council established in 1981 as the consultative and deliberative organ of the National System of the Environment (*Sistema Nacional do Meio Ambiente – SISNAMA*) which was established in 1981 by the law n° 6.938 of National Environment Policy. In addition to the CONAMA, the SISNAMA consists of the Minister of Environment, the governmental environmental organs, both federal and at state level as well as local municipal environmental organs. Together these are executing the National Environment Policy (Brasil 1981: Law 6.938/1981). The CONAMA consist of the Chamber, the Environmental Policy Integration Committee (*Comitê de Integração de Políticas Ambientais – CIPAM*), assesory groups, technical chamber and working groups. The Minister of Environment and its Executive Secretariat presides over the CONAMA, and the Council is exercised by the Executive Secretary of the MMA. The Council consists of representatives from five sectors: federal, state and municipal organs, business sectors and the civil society. The Council comes together every third month and has the responsibility of establish, supervise, assess, promote and recommend laws, resolutions, modifications and recommendations related to the environment. The resolutions of CONAMA are important tools in the regulation of environmental issues. (Brasil 2009; MMA 2010b)

⁷ Amazonia Legal refers to the nine states which pertain to the Amazon basin and the Amazon rainforest. The states are identified as having similar economic, social and political structural problems and are grouped together as Amazonia Legal to better address federal development programs in regards to these problems.

⁸ Author's own translation from Portuguese.

4.2.4. *Brazilian Institute of Environment and Renewable Natural Resources*

The Brazilian Institute of Environment and Renewable Natural Resources (*Instituto Brasileiro do Meio Ambiente e Recursos Naturais Renováveis* – IBAMA) is a federal semi autonomous organ, linked to the MMA but endowed with public juridical rights, administrative and financial autonomy. Its main attributes is to function as an environmental supervisor and to execute the national policies concerning environment and federal powers related to the environmental licensing; control of the environmental quality; the authorisation of the use of the natural resources and the inspection of this use, environmental monitoring and control, and execute the acts of competency of the Union in conformity with the environmental legislation in force (Ibama 2010a).

The tasks of IBAMA is to propose, edit and publish norms and standards concerning environmental quality; the mapping and evaluation of environmental impacts; environmental licensing; at federal level to implement the Federal Technical Register; the environmental supervision and application of administrative penalties; the generation and dissemination of information related to the environment; environmental monitoring, mainly concerning prevention and control of deforestation, forest fires and the purposive burning of forests; environmental emergency help; the execution of environmental education programs; the elaboration of information systems and the establishment of criterions for the management of the use of fauna, forests and fishing resources, among others. To fulfil its functions, Ibama can act in cooperation with the organs and entities of the federal public administration, directly or indirectly, with the states, the Federal District and the municipalities integrated into the SISNAMA and with the organised civil society to fulfil its objectives in concordance with the directories of the national environmental politics (Ibama 2010a).

In relation to hydro power, IBAMA has the important task to approve or disapprove the environmental licensing of hydro power projects after evaluating the environmental impact assessment report, as well as the two other licenses necessary to start the construction of the project and the operation.

4.2.5. *National Agency of Electric Energy*

The National Agency of Electric Energy (*Agência Nacional de Energia Elétrica* – Aneel) was created in 2006 and is as its name implies the national agency for electric energy. However it has extensive autonomy as a semi autonomous body linked to the MME. The

agency's task concerns the regulation and inspection of the generation, transmission, distribution and commercialisation of the electric energy, attend reclamations of agents of the electric energy sector and consumers as a neutral part and at the benefit of society; mediate in conflicts of interests between the agents within the electric sector and between agents and the consumers; grant, permit and authorise the installation and services of energy; guaranty just tariffs; to look after the quality of the services; to demand investments; stimulate the competition between the operators; and to secure the universality of the services. Aneel is also to provide favourable conditions to the electric energy market concerning the development of equilibrium between the agents and the benefits of the society (MME 2010c)

Aneel is also the agency which approves the inventory presented by the energy company for the dam in question, and Aneel releases the concession auctioning and decides who wins the bidding, as well as having the supervision of the construction.

4.2.6. *The Energy Research Institute*

The Energy Research Institute (*Empresa de Pesquisa Energética – EPE*) is a governmental energy research institute which falls under the responsibility of MME. EPE has as its responsibility to lend services and competency within studies and research aimed to support the planning of the energy sector, including electric energy, petroleum and gas, mineral coal, renewable energy resources and the energy efficiency (Brasil 2004).

According to law n° 10.847 15.of March 2004 Article 4, which authorises the establishment of EPE, some of the tasks attributed to EPE are to study and project the Brazilian energy matrix and the national energy balance; identify and quantify the potential of energy resources; to carry through studies to determine the optimum use of the hydro potential; elaborate the studies necessary for the development of the expansion plans of generation and transmission of electric energy in short, medium and long term; develop studies of the social impacts, technical-economic and social-environmental viability for the activities related to renewable resources and the generation of electric energy; to carry out and accompany the execution of projects and viability studies realized by the involved agents; develop studies to evaluate and increase the utilisation of energy originating from renewable resources; promote studies and give information to subsidies plans and programs concerning the development of environmentally sustainable energy, inclusive energy efficiency; promote plans and goals concerning the rational utilisation and conservation of energy (Brasil 2004).

EPE is primarily a research institution and is the institute which develops the National Energy Plan, the National Energy Balance Report, the Decennial Plan for Energy Expansion and other related reports, plans and prospects for the future, it is thus an important agent in estimating the future energy supply and demand of the country.

4.2.7. National Foundation of Indian Affairs

The National Foundation of Indian Affairs (*Fundação Nacional do Índio* – FUNAI) is the National Agency of Indian Affairs and is a governmental agency. It is important to make the point that the agency is not part of the Brazilian hydro power structure unless the project interferes with indigenous territories and communities.

The FUNAI was established in 1967 and has as its responsibilities to secure the rights of indigenous peoples in Brazil in compliance with Brazilian and international laws. This concerns amongst other things the right to traditional land and natural resources, food, education, cultural freedom, healthcare, protection against discrimination (Brasil 1967). FUNAI is the agency which conducts the consultation of indigenous groups in accordance with International Labour Organisation's Convention no.169 on Indigenous and Tribal Peoples (C169), in projects and plans that will affect their lives and livelihood. With regard to the Brazilian hydro power sector, Funai becomes relevant as it is the agency which conducts the consultation with the indigenous communities which may be affected by a hydro power project. Their conclusion after the consultation is integrated into the environmental assessment report of a project.

4.2.8. Eletrobras and Eletronorte

Eletrobras (*Centrais Elétricas Brasileiras* – Eletrobras) which is the main national electric energy company was founded in 1962 by the president at the time Jânio Quadros and is the main national electric energy company. The Brazilian state owns 53,9% of its shares and hence has the majority of the shares and main ownership in the company, the rest of the shares are owned by private investors. The company is controlled by the government, and operates within the areas of generation, transmission and distribution of electric energy. The company focuses on profitability, competitiveness, integration and sustainability and is the mother company in a system of twelve subsidiary companies, one shareholder enterprise (Eletropar), a research centre (Cepel) and is responsible for half of the investments in Itaipu

Binacional. Six of the subsidiary companies generate energy, as well as being responsible for transmission, these are: Chesf, Furnas, Eletrosul, Eletronorte, CGTEE and Eletronuclear, the other six are energy distribution companies: Eletroacre, Ceal, Cepisa, Ceron, Amazonas Energia and Boa Vista Energia. According to the company's statute, it is to create and offer solution which attend the national and international electric energy market with social and environmental profitability and responsibility, contributing to the development of Brazil. The Eletrobras system is responsible for 38% of the total electric energy generation in Brazil which is generated from 30 hydro power plants, 139 thermo electric plant and 2 thermo nuclear plants, and counts for 39.413 MW of installed capacity in the country (Eletrobras 2010).

Eletronorte (*Centrais Elétricas do Norte do Brasil S.A – Eletronorte*) is one of the subsidiaries of Eletrobras system and was created in 1973. Eletronorte operates and supplies energy mainly in the nine northern regions of the country known as Amazonia Legal: Acre, Amapá, Amazonas, Maranhão, Mato Grosso, Pará, Rondônia, Roraima e Tocantins, but provides also energy to other regions of the country through the SIN system. Eletronorte is responsible for the currently biggest and very much disputed hydro power dam in Brazil and the fourth largest in the world; the Tucuruí dam in Pará, and has currently plans of constructing similarly big projects in the state of Pará (Eletronorte 2010).

4.3. Non-governmental organisations of relevance to the issue of hydro power

There are several important non-governmental organisations in Brazil working with the issues of social and environmental consequences by hydro power projects, and indigenous peoples' rights. However I will focus on only two of these. Representatives from the two following were interviewed for this study:

4.3.1. The Movement of Dam Affected People

The MAB (*Movimento dos Atingidos por Barragens – MAB*) is a non-governmental organisation established as a national organisation in 1991, after being a regional organisation concentrated in the south of the country where the construction of the big dams like Itaipu, Machadinho and others had affected people since the 1970s and 1980s. Now the organisation is concentrating its attention on three regions the south, the north and the northeast. The MAB is working to improve the rights of people affected by hydro electric projects concerning resettlement, compensation, environmental and social responsibility of the energy companies

and the government, a lower price on the electricity, electricity for all citizens and what they consider a more fair and just energy model in Brazil.

The movement has managed to get international influence through the World Commission on Dams (WCD) which is linked to the World Bank. This was a result partly from a meeting in 1997 in Curitiba, Brazil, where participants from 20 countries, all affected by dam projects, came together and shared experiences and future demands and prospects. This was also the start to establish branches of the movement in other countries (MAB 2010).

4.3.2. *The Socio-environmental Institute*

The Socio-environmental Institute (*Instituto Socioambiental* – ISA) is a non-governmental organisation established in 1994 aiming at proposing sustainable and integrated solutions to social and environmental questions (ISA 2010a). The organisation has as its principal objective to defend the social, collective and diverse goods and rights related to the environment, cultural heritage, human rights and the indigenous communities, as well as contributing to the valorisation of the social environmental variety (ISA 2010b). ISA is working to influence the national policies concerning environmental issues as well as indigenous people's rights and other groups which are being marginalised when issues concerning their environment arise. ISA has programs and campaigns concerning environmental protection and social development, and contributes with research material and reports on social environmental issues, amongst those effects by dams in the Amazon. The organisation also has several national and international partners.

4.4. *Presentation of the case of the Belo Monte Dam*

The proposed Belo Monte Dam is located in the state of Pará in the Xingú River system. The project was first introduced in 1980 as a part of seven dams located in the Xingú River basin, after five years of mapping the hydro power potential in the Amazon initiated by Eletronorte. In 1986 the National Electric Energy Plan 1987/2010 concluded with the Belo Monte Dam, at that time called Kararaô, being the best option when initiating the construction and integration of the dams in the Xingú River in the SIN system. The plan was for the dam to be built within 2010 (Fearnside 2006). However, due to environmental and social controversies and resistance from local communities and environmental and social NGOs, the project has been postponed several times and subject to changes to better accommodate environmental and social preconditions. It is now the only larger dam prospected to be built in the Xingú River

complex. In the original plan the area to be inundated by the reservoir was 1.225 km², it is now reduced to 516 km² based on environmental and social concerns and the installed capacity is estimated to be 11.233 MW. In addition to the actual dam, it is planned to build two canals of about 12 km in length and 250 m in width to help the pression of water on the turbines. In order to build these canals 144 million m³ of soil and 51 million m³ of rocks have to be dug away (ISA 2010c).

In the Xingú Basin where the dam is to be constructed there are 28 indigenous ethnicities and 29 indigenous territories (TIs), of which 16 are in Pará and 13 in Mato Grosso, the total indigenous population in the area is approximately 20.000. There are also more than 300.000 inhabitants in 11 municipalities, amongst them the city of Altamira, riverine communities⁹ and *quilombos* (Eletrobras 2009). According to Eletrobras and Eletronorte there will be no inundation of indigenous land, but the indigenous groups as well as environmentalists and defenders of indigenous peoples' rights, claim that the dam will have consequences for the livelihoods of the indigenous communities, and that some of them will eventually have to be relocated because of alteration of their environment. Some of the issues of concern are the thousands of construction workers that will come to the region during the construction, people affected by the dam will have to move and find new land for agriculture, accordingly there will be increased pressure on the TIs. The water level in parts of the river will be altered and in the area known as Volta Grande do Xingú or just Volta Grande, the water level will be severely reduced, this will have consequences for the fish in the river which for many of the communities is the main source of nutrition.

The Belo Monte project is part of the PAC program initiated by President Lula in 2002, aiming to meet some of the future demands for energy in accordance with the focus on investing in renewable energy sources (Brasil 2010b). The energy generated for Belo Monte will be part of the SIN system and be transferred to the north, north-east, south-east and the central west of the country through the Tucuruí – Macapá – Manaus transmission line. Also the city of Altamira is to benefit from the project with more and stable energy. The project is aiming to give an overall more stable and secure supply of energy in the region, reducing the blackouts and breaks in the energy supply (Eletrobras et al. 2009). It is claimed from those defying the Belo Monte project that much of the energy will go to the energy intensive

⁹ Riverine communities in Portuguese are named *ribeirinhos*.

industry, like the aluminium and cement industry and not for consumption or electrification to the people, in particular considering those affected by the project.

Chapter 5: Main findings from Brazil and discussion

In this chapter I will summarise the main findings in the literature reviewed and information obtained through personal interviews. I will present the findings within the frames of the Oakerson framework as adapted by Vatn, in order to better be able to analyse the relationship between the agents and resources. However, as my discussion will show, some of the findings will fit into several categories.

5.1. The perception of social and environmental consequences in Brazil

When reviewing literature and conducting interviews, I realised that the perceptions in Brazil are different from those found in Norway concerning social and environmental consequences. The hydro power projects in Brazil are mostly constructed in rivers and lakes without any natural waterfall of significance, hence it is necessary to dam quite large areas with high barrier walls in order to get the necessary elevation differences in the waterfall. In some cases it has been necessary with additional reservoirs to save water from precipitation in the rainy season, in order to secure the water supply in the dry season. This has contributed to the inundation of large areas with settlements, pasture and forests. The social consequences have in many cases been resettlement of communities, loss of agricultural land and fisheries which has led to loss of income and changed livelihoods, change in social structures in communities and the inundation of large forest areas of which people depend of various reasons, that be collection of fruits and wood or hunting. The effects on human activity have been extensive and grave to the people depending on their environment to support their existence and livelihoods. Because this relationship between man and nature is so interdependent for people in many places in Brazil, you will seldom find anyone talking about only social or environmental consequences, it will almost always be social environmental consequences (*consequencia socioambiental*), which indicates the dependence of man on the natural environment surrounding him. The social consequences in communities affected by hydro power is almost always also put into a cause and effect relationship, which starts with environmental consequences, accordingly this is also referred to as social environmental consequences and explained as an effect of the deterioration of nature.

The environmental consequences are usually linked to the inundation of large areas and the drying up of downstream rivers. Some of the areas inundated has been rainforest, which

contains huge ecological diversity, both flora and fauna and which is difficult to map because of inaccessibility and extent of the area. There are also consequences for fish in the rivers and lakes both upstream and downstream of the reservoir and other animals and algae living in the water systems.

Based on this, the perceptions of social and environmental consequences in Brazil can be said not to be very strictly divided. In Brazil social consequences will be treated as social-environmental (socio-environmental) consequences where social consequences are perceived to almost always be triggered by the environmental consequences. On the other hand environmental consequences may be treated as an isolated issue and term without considering any social aspect, however, the two are often mentioned at the same time, and seems somehow inseparable in the Brazilian context, in both environmental and bureaucratic-administrative discourses.

5.2. Institutional Framework in Brazil

5.2.1. Environmental and social legal institutional framework

The existing legal institutional framework reflects the perception of socio-environmental consequences and do not really separate social consequences from environmental consequences. However, the institutions are presented as environmental institutions not social institutions, but by integrating the social consequences of environmental alteration, the legislation apparatus appears as socio-environmental institutions.

Brazil has an extensive legal framework when it comes to environmental issues, including hydro power. The framework for the current national environmental policies was first established in 1981 with Law 6.938/1981 on National Environmental Policy (Brasil 1981). Article 4 in this law states that the National Environmental Policy is to secure the compatibility between the social economic development and the preservation of the environmental quality and ecological equilibrium, as well as establish the criterias and standards concerning environmental quality and norms concerning the management and use of natural resources. The law also establishes the National System for the Environment (*Sistema Nacional do Meio Ambiente*) under which the governmental institutions Conama and Ibama works. The tasks attributed to Conama and Ibama are very important according to this legislation as the Conama is to assess, study and propose governmental decrees and resolutions concerning the environment and natural resources. The Ibama is the executive

organ in the system and has the responsibility of giving the approval to projects involving the exploitation of natural resources, which potentially may be polluting or have an environmentally deteriorating effect.

Further the Conama Resolution¹⁰ N° 01, from 23rd of January 1986, establishes basic criterias, definitions, responsibilities and general directives for the use and implementation of Environmental Impact Assessment (EIA) as an instrument for the National Environmental Policy. Article N° 01 states that environmental impacts are any alteration of the physical, chemical and biological part of the environment caused by whatever form of human activity, directly or indirectly, which affects health, security or wellbeing of the population, the social and economic activities, the biotic environment, aesthetic and sanitary conditions of the environment; and the quality of the natural resources (Conama 01/1986, Art. 1).

An EIA report is based on an environmental impact study (*Estudo de Impacto Ambiental* - EIA) which is to fulfil the objectives and principles of the National Environmental Policies as well as:

- I. *Contemplate all the technological alternatives in the location of the project as well as the hypothesis of no execution of the project;*
 - II. *Identify and evaluate environmental impacts generated in the implementation and operation of the project activities;*
 - III. *Define the geographic boundaries of the area which is to receive direct or indirect impacts, to recognise the area of influence by the project, in all cases, considering the hydrological basin in which the project is located;*
 - IV. *Consider the governmental plans and projects, proposals and the compatibility of the project in the area of project influence during implementation.*
- ... the responsible/appropriate governmental organ may give additional directives to each specific project when it finds it necessary due to the character of the project and/or the environmental conditions of the area, inclusive the deadline for the conclusion of the study.*¹¹

(Conama 1/1986, Art. 5)

¹⁰ Resolution: in Brazil official act establishing administrative norms or proposition which regulates issues under the competency of House of Legislation, of political, procedural, legislative or administrative character.

¹¹ Author's own translation from Portuguese.

According to the Conama Resolution 01/1986, the EIA should at least include the following technical aspects;

I. Environmental diagnosis of the area of influence of the complete project with description and analysis of the natural resources and their interactions as they currently exists, in general characterise the environmental situation in the area before the implementation of the project, considering:

- a. The physical environment (...).*
- b. The biological environment and the natural ecosystems – flora and fauna, emphasising the species indicating environmental quality, of scientific and economic value, rare and endangered species and areas of permanent protection.*
- c. The socio-economic environment – the use and occupation of the soil, use of water and the socio-economy, emphasising the historic and cultural archaeological monuments of the communities, the relation of dependence within the local society, the natural resources and the potential use of these resources.*

II. Analyse the environmental impacts of the project and its' alternatives, through identification, prediction of the magnitude and interpretations of the importance of probable relevant impacts, distinguishing between: positive and negative impacts (benefits and its contrary), direct and indirect, immediate, medium and long term impacts; the degree of reversibility; its cumulative and synergetic attributes; the distribution of social burdens and benefits;.

III. Define the mitigation measures of negative impacts, amongst others the control equipment and the waste treatment systems, evaluating the efficiency of each.

IV. Elaborate the attendance and monitoring program of positive and negative impacts, indicating the factors and parameters which are to be considered.

... the responsible/appropriate governmental organ may supply additional instructions to each specific project when it finds it necessary due to the character of the project and/or the environment of the area, inclusive the deadline for the conclusion of the study.¹²

(Conama 1/1986, Art. 6)

¹² Author's own translation from Portuguese.

Article N° 2 in the same Resolution establishes the system of the Environmental Impact Report (*Relatório de Impacto Ambiental – RIMA*), which is a report based on the EIA of the project. The RIMA should reflect the conclusions of the EIA on environmental conditions of the area subject to exploitation; environmental and social consequences of the project; consideration of the alternatives to the project and the time horizon in the occurrence of the environmental impacts and indicating the methods; techniques and criteria adopted to identify; quantify and interpret these impacts. It should also contain the characterisation of the future quality of the environment, and a plan for the attendance and monitoring of the impacts and recommendations as to the most favourable alternative. It is stated that the RIMA should be presented in an objective and appropriate form which makes the content easy to comprehend. This is especially important because the RIMA is the report which is presented to the people who may be affected by the project, and all others interested who do not necessarily work within the energy business and is not confident with the scientific terminology of the sector (Conama 01/1986).

The obligation to conduct an environmental impact assessment study and produce an EIA report as well as a RIMA is attributed to hydrological projects of any kind which aim to exploit the hydro resources. This also includes hydro power dams over 10 MW and projects which rectifies the water course, electric energy transmission lines over 230 kW and electric power plants with whatever source of primary energy over 10 MW (Conama 01/1986).

Concerning the rights to water resources in Brazil, the 1988 Constitution as well as Law 9.433 of 1997 states that the water resources and rivers are a public good owned by the state and hence the state possesses the management rights to the water. It also states that the management of the hydro resources should be adapted to the multiple use of water. By this it is meant that all uses of the water resources should be taken into consideration when managing it, that be human consumption, irrigation, hydro power, transport etc (Brasil 1988; Brasil1997).

5.2.2. The legal institutions for indigenous peoples' rights in Brazil

5.2.2.1. National legal institutions

The legal rights of indigenous people in Brazil are bound by both national and international laws and conventions. The 1988 Brazilian Constitution Article 231 acknowledges: “*the exclusive rights of indigenous communities to their traditional land and resources, which is*

considered necessary for their productivity and existence” (Brasil 1988, Art. 231). However in the same article § 3 the utilisation of hydro resources, including those for potential energetic development, in indigenous territories may be exploited with the approval of the National Congress, but the indigenous communities affected has the right to be heard (Brasil 1988, Art. 231).

At same time, Article 20 in the Constitution states that the land traditionally occupied by indigenous peoples belongs to the State and so do the potential hydric energy resources (Brasil 1988, Art. 20).

5.2.2.2. International legal institutions

The International Labour Organization (ILO), which is a United Nations’ (UN) organisation, specified its definitions of indigenous people in 1989 when adopting Convention No. 169 Convention Concerning Indigenous and Tribal Peoples in Independent Countries (C169). The Brazilian government ratified the convention in 2002. I find it useful to look into the ILO definition of indigenous people in order to better understand the special position they hold in the countries of origin. The Convention No. 169, Article 1, defines indigenous peoples as:

(b) peoples of independent countries who are regarded as indigenous on account of their descent from the population which inhabited the country, or geographical region to which the country belongs, at the time of conquest or colonization or the establishment of present boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions.

(ILO 1989, Article 1:1b)

The ILO Convention 169 also states the Indigenous Peoples’ rights to their land and resources, both when it comes to the use and management of the land and resources and further they shall be consulted in decisions which may affect them in any way. These two aspects are stated in Article 6 and Article 14:

Consult the peoples concerned, through appropriate procedures and in particular through their representative institutions, whenever consideration is being given to legislative or administrative measures which may affect them directly.

(ILO 1989, Article 6:1a)

The right of ownership and possession of the peoples concerned over the lands which they traditionally occupy shall be recognized. In addition, measures shall be taken in appropriate cases to safeguard the right of the peoples concerned to use lands not exclusively occupied by them, but to which they have traditionally had access for their subsistence and traditional activities. Particular attention shall be paid to the situation of nomadic peoples and shifting cultivators in this respect.

(ILO 1989, Article 14:1)

The Convention states further that the consultation shall be undertaken in good faith and in a form appropriate to the circumstances in cases in which resources are pertaining to indigenous lands, and that there shall be undertaken consultation of the indigenous communities before permits to exploit these resources are given. The C169 also states that the government shall ensure that studies to assess impacts on the indigenous communities by planned development activities are carried out (ILO 1989, Article 7: 3).

As Brazil has signed and ratified the C169, this implies that the Brazilian government is bound by the Convention and that it applies as ordinary law.

5.2.3. *Regulative governmental institutions*

The Conama Resolution N° 06/1987, later revised in the Conama Resolution N° 237/1997, follows up the requirement given in the Conama 01/1986 on conducting an Environmental Impact Assessment (EIA) study followed by a concluding Environmental Impact Report (RIMA), by requiring the project to get environmental licensing at different stages of the project cycle, based on the approval of the EIA.¹³ The resolution gives a step by step directive on the environmental licensing process.

The EIA study has to be carried out by the responsible company in charge of the project, and has to be submitted to and approved by the appropriate state organ, in the case of hydro power this is the Ibama, which then give the environmental licenses for the project. According to the Conama 237/1997, the environmental licenses consist of three licenses which are given under the following conditions:

¹³ The EIA and RIMA are often referred to as EIA/RIMA because one cannot be presented or approved without the other.

- I. *Prior License - Licença Previa (LP); granted in the preliminary stage of the planning of the project or activity, approving the localisation and idea of the project, certifying the environmental feasibility and establishing the basic requirements and conditions which has to be met in the next stages of the project implementation;*
- II. *Installation License - Licença de Instalação (LI); authorises the installation of the project or activities as specified in approved plans, programs and projects, including establishing the environmental mitigation measures as well as control measures related to other restrictions;*
- III. *Operational License - Licença de Operação (LO); authorises the commercial operation of the project, after verifying the accomplishment and fulfilment of the agreements in the previous licenses and in accordance with the environmental control measures and conditions determined in order to obtain the operation licence.¹⁴*

(Conama 237/1997, Art. 8)

These licenses are all given at different stages during the planning and construction of a project and can be withdrawn or postponed if the project does not fulfil the environmental requirements established. The Prior License (LP) has to be obtained in the beginning of the planning phase of a project, before the viability study of the project is approved and before the final plans are settled. The LP is also known as the environmental license, because by the achievement of the LP, there is an implication that the two other licenses will also be given. To obtain the LP, the responsible enterprise first has to present the project and the terms of reference on how to carry out and which factors should be emphasised in the EIA/RIMA to Ibama, which then will discuss and agree upon them along with the conducting a technical inspection. Then the process of elaborating the EIA/RIMA starts. The process is subject to an inspection of Ibama and the carrying through of a Public Hearing (*Audiência Pública – AP*), in which communities which will be affected by the project, are going to be informed about the project, its purpose and consequences, what kind of measures the responsible company has established to diminish or ameliorate possible negative consequences. The affected communities will also give their doubts and opinions about the project (Ibama 065/2005). Ibama also defines the degree of expected impacts of the project, aiming at setting the environmental compensation.

¹⁴ Author's own translation from Portuguese.

If the EIA/RIMA is approved and the LP given, the licensing process continues to the next stage which is the Installation License (LI). The LI must be obtained after the final project plans are presented, and before the auctioning of who should be the constructor and responsible company for the plant, as well as before the construction of the project starts. To obtain this LI, the responsible company has to elaborate on the environmental compensations plan and the plans for diminishing and alleviate environmental impacts. During this stage, the Ibama should conduct technical inspections of the project as well as analyse and approve the environmental compensation plan and the plans to diminish impacts, called the Basic Environmental Plan (*Projeto Básico Ambiental*). With the approval of the LI the auctioning of which company will get the lucrative contract of the project starts, the construction begins and the process continues to the final Operational License (LO). The LO has to be obtained before the commercial operation of the project and in the case of hydro power dam, before closure of the dam barrier and the reservoir is filled. In order to get the LO, the implementation of environmental programs as well as evaluation of them must be fulfilled as well as supervision by Ibama must be carried out (Ibama 065/2005). The project evolves on the ground synchronically with the approval of the licenses, however, it is important to stress that without the LP and LI it is not possible to start the construction or put the contracts of the construction work on auction to possible bidders. The National Water Agency (*Agência Nacional de Águas*) additionally has to give their approval as to the project's sustainable use of the hydric resource in question after the LP is approved by Ibama.

If the project does not meet the necessary conditions in one of the stages, the project will according to the regulation, be stopped and postponed until the necessary improvements are made. Especially critical is the LP which in reality approves the project's existence. If the LP is not given the project cannot be carried through and the process is paralyzed. In such a case the EIA is sent back to the enterprise responsible with recommendations and the pointing out of flaws in the project which has to be improved in order to obtain the environmental license. Then the same process starts over again until the EIA meets the conditions and can be approved. In reality, this gives a decisive power to approve a hydro power project to Ibama, since a hydro power project cannot be carried through without the LP, and it makes the LP a key argument in the interaction between the agents.

With regards to the Oakerson's framework as adapted by Vatn, when the LP is approved on the basis of the EIA/RIMA, it can be moved from being a part of the institutions which *has to*

be accomplished and followed, to being a part of the technology and knowledge, the same goes for the EIA/RIMA. This can be justified by considering the elaborated EIA/RIMA as research and knowledge and as a base for arguments to be used by the agents in their interaction. The approved Prior License is a result of this knowledge and is a conclusion which indicates whether the project is environmentally viable or not, based on the knowledge of the research in the EIA/RIMA. The LP will be used as an argument for further development and construction of the project, however, the agents do not necessarily agree on the accuracy of the knowledge and research in the EIA/RIMA or that the LP is an accurate conclusive argument for further development, this will be reflected in the agents' choices and in the patterns of interaction.

When it comes to the approval of hydro power projects, the projects need to be labelled with the “optimum utilisation” (*proveitamento ótimo*) label, which is a prerequisite in order to get the inventory plan for the project approved. The “optimum utilisation” label means that the project comprises the best possible technical solutions, dam construction and water level, reservoir and energy potential which is possible to get in the chosen waterfall and hydrological basin (Brasil 1995, Art. 5 § 2; § 3).

5.2.4. Institutional regulations within the hydro electric power sector

The hydro power sector has to follow extensive regulations given by the agents within the hydro power sector themselves. The most important one is the Inventory Manual for Hydro Electric Watersheds (*Manual de Inventário Hidroelétrico de Bacias Hidrográficas*) published in 2007 by Eletrobras. The manual is developed by the Ministry of Mining and Energy (MME) in cooperation with Centre for Electric Energy Research and Eletrobras and is a revision of the Manual for Hydro Electric Watersheds from 1997 produced by Eletrobras. The manual is approved by the MME as the superior regulative organ of the sector and presents the criteria, procedures and instructions which are necessary to follow when elaborating the inventory plan of a hydro power project and which have to be followed during the complete project process. The manual includes technical requirements as to the equipment installed in a hydro power plant and to the construction of a dam and reservoir, the social-environmental measures and considerations which have to be incorporated, and what is called “the indigenous component” (*componente indígena*), which basically is the indigenous communities living in the area of exploitation. The manual does not really separate between social and

environmental consequences, but labels it as social-environmental consequences, with sub categories concerning social consequences (MME et al. 2007).

The manual gets an ambiguous role in the interface between institutions, agents and technology. The manual presents requirements and regulations (institutions) which has to be fulfilled by the agents in order to get a hydro power project approved, but it also represent knowledge and technology to be used by the agents in their argumentation and interaction. The fact that the manual is developed with the cooperation of the biggest hydro power agent in Brazil, Eletrobras, may contribute in making it a useful technology tool for the sector, by for example not separating the perception of socio-environmental consequences into social and environmental consequences. By doing so they avoid establishing a new category of social consequences to be more explicitly considered and elaborated on.

The social-environmental criterias mentioned in the manual are:

Table 2: Social environmental criterias in a hydro power inventory

Criterion	Purpose	Component included
Delimitation of area of study	To be able to analyse the socio-environmental processes in the watershed in its entirety and the consequences brought on by the hydro power development	Hydrological Basin/Watershed
Identify the environmental system	Identify the environmental qualities and interactions of the area	The individual qualities of as well as interactive relationship between physical-biotic, social, cultural, economic and political processes in the area
Elaborate a Component Synthesis	To understand the different elements in the socio-environmental system and emphasise those of major relevance in the project area, to be able to differentiate and investigate the alternative options on how to best exploit the watershed	Aquatic ecosystems (and the hydro resources) Terrestrial ecosystems Way of life Territorial organisation Economic base Indigenous populations/Traditional communities
Sub areas/subunits: Divide the watershed into subunits	To better understand the relationship between the components of the component synthesis in each subunit, and the interdependence between each subunit in the watershed	Subunits areas and the component synthesis
Assess vulnerability, fragility and potential of the area	To understand how and under what impacts the environment and the ecosystem will react when exposed to human activity. The potential of socio-economic development due to benefits from environmental changes	Ecosystems in the watershed Environmental vulnerability Environmental fragility (susceptibility) Socio-economic potential
Evaluation of socio-environmental impacts	To be able to compare the alternatives of how to best exploit the watershed	Negative social-environmental impacts Positive social-environmental impacts Processual impacts Impacts indicators/elements to be evaluated Evaluation criterions Social environmental index which expresses the intensity of environmental impacts Scale 0-10; 0 = no impact, 10 = maximum impact
Integrated Environmental Evaluation (<i>Avaliação Ambiental Integrada – AAI</i>)	To give a complete and integrated evaluation of the chosen solution on how to exploit the watershed and the impacts on the basin affected. To elaborate future scenarios of development of the basin, environmental and human development.	Technical solution to exploit the hydro power potential Impacts on basin Future human and environmental development for the region

Source: Manual de Inventário Hidroelétrica de Bacias Hidrográficas, MME et. al. 2007: 42- 46

What is new in respect of socio-environmental issues in this manual compared to that of 1997, is the integration of the AAI and the aim of an integrated evaluation of socio-environmental consequences and issues, with an analysis of future development prospect for the affected region. The aim of the AAI is to elaborate a complete analysis of current and future environmental, social and economical conditions of the basin in which the project is implemented.

In the terms of reference for the EIA/RIMA presented by Ibama there are introduced three terms to define and delimit what is considered geographical areas of most and least influence, and which then indicates the need for compensation to people and environmental programs in the areas, the terms are:

- *Directly affected area (área diretamente afetada – ADA) – means the area which is actually to be inundated by the reservoir, as well as the areas where the barracks of the workers is constructed and necessary infrastructure for the project is built. The areas which are physically and visible affected on the location of the project.*
- *Area of direct influence (área de influência direta – AID) – means the neighbouring areas to the construction site and reservoir, like cities and villages which will have more pressure on public services like health care, sanitation, and commercial activity as a consequence of the migration of construction workers.*
- *Area of indirect influence (área de influência indireta – AII) – means the more distant areas which may suffer from indirect impacts from the project and the construction.*
- *Areas of regional reach (área de abrangência regional) – means the areas affected which has regional importance – the hydrological basin.¹⁵*

(Ibama 2010b)

These terms are not an official definition on which areas should be considered affected directly or indirectly by the project and the work, neither do they define affected people and which losses they should be subject to in order to be entitled compensation. But they are still used to delimit the areas of influence and communities entitled to compensation.

The Eletrobras system established a set of socio-environmental guidelines in the beginning of the 1990s which is called Environmental Guidelines for the Electric Sector 1991/1993 Vol. I

¹⁵ Author's own translation from Portuguese.

and II (*Plano Diretor de Meio Ambiente do Setor Elétrico 1991/1993 Vol. I & II – PDMA I & II*). This is supposed to serve as guidelines to socio-environmental requirements and responsibilities within the hydro power sector. When it comes to the environmental responsibilities of the hydro power sector, the guide does not add any responsibilities developed from the hydro power sector itself. It is merely summarising the existing legal framework and directives like the resolutions of Conama 01/1986, 06/1987 and 237/2005, as well as the 1988 Constitution and the Law 6.938/1981 which establishes the national environmental policies.

Concerning the social aspects it is more innovative and recognises that the implementation of hydro power projects in a region is not only a matter of energy, but also a political decision. The plan also goes further than the Conama Resolutions in recognising the problem of displaced people and that the energy company responsible for the project has a responsibility to resettle, give compensation and help the establishment of new resettlement communities. The PDMA proposes instructions as to how resettlement and compensation should be carried through, one of them is that the energy companies responsible for the project has a responsibility to resettle people in similar conditions or better than those they are displaced from, as well as provide necessary infrastructure like healthcare and education. There is also an option of economic compensation. The way in which compensation is given is negotiable between the responsible company and the affected people, however there are no clear definition as to who has the right to compensation other than the complete or partial loss of property (Eletrobras et. al. 1990: Vol. II). Generally the questions of defining affected people, compensation and other social precautions and programs are largely left to each individual energy company to decide, as there are no formal institutions and definitions on this. The PDMA is just guidelines, and the instructions are not legally binding as such.

In the PDMA, in accordance with the Law 7.990 from 1989, Eletrobras emphasises the responsibility of the electrical company of paying up to 6% of the value of energy produced from the plant to the State and municipality which hosts the plant, or which has territories inundated by the reservoir belonging to the plant. This is a negotiable compensation and can be replaced by social programs, environmental mitigation programs or other programs which benefit the region or alleviate the negative impacts of the project (Eletrobras et. al. 1990: Vol. II).

The issue of indigenous people are also attended to in the PDMA, based on Article 231 in the 1988 Constitution, which states the rights of the indigenous people to the land they traditionally occupy. There are also guidelines as to how compensation should be distributed, whether it being resettlement or benefits from the project like electricity or community projects. It is explicitly stated in the PDMA Vol. II that the indigenous communities have the right to participate in all the decisions about the project which may affect them in short or long term perspectives (Eletrobras et. al 1990: Vol. II.). The PDMA does not give any guidelines besides what is already established in governmental laws and regulations concerning indigenous peoples.

5.3. Findings: Hydro power regulations and experiences in practice

In this section I will present the findings obtained in my interviews. When it comes to what is perceived as the attributes of the resource and expected outcomes of a hydro power project, I have chosen to put it into tables in bullet points and discuss them in the analysis and discussions part. I have not distinguished between environmental and social effects due how these two are perceived as strongly interlinked in Brazil as socio-environmental effects. On the other hand I have chosen to sum up the main findings more extensively on how the actual interaction between the agents is experienced, based on their choices, use of technology/knowledge, perceptions of attributes of the resource and institutions.

I will divide the informants into two groups: the socio-environmental NGOs (MAB and ISA), academic researchers and dam affected people in one group and the governmental agencies and the energy company in one group, based on regularities in their statements during interviews.

5.3.1. Attributes of the resource

The main attributes of the water resource for the two respondent groups, were considered as:

Perception of the resource	Social-environmental NGOs, dam affected people and researchers working within the field	Governmental agencies and energy companies
Similar across informant groups	<ul style="list-style-type: none"> • Means of transport • Supporting ecological biodiversity: forest, aquatic life, flora and fauna • Irrigation and supporting agricultural communities • Providing income and food by the exploitation of fish resources 	<ul style="list-style-type: none"> • Means of transport • Supporting ecological biodiversity: forest, aquatic life, flora and fauna • Irrigation and supporting agricultural communities • Providing income and food by the exploitation of fish resources
Different across informant groups	<ul style="list-style-type: none"> • Providing energy • Supporting riverine- and indigenous communities • Religious value to indigenous communities 	<ul style="list-style-type: none"> • Providing energy – “<i>Light for everyone</i>” campaign

Although the main attributes are largely the same within the two groups of agents, the perception of which is the most important is different. This will be discussed in section 5.4.4.

5.3.2. Outcomes

The main expected outcomes of the exploitation of the river into a hydro power project according to the respondents, are very different, and the socio-environmental NGOs, dam affected people and researchers tend to include more than the governmental agencies and energy companies:

Perception of the resource	Socio-environmental NGOs, dam affected people and researchers within the field	Governmental agencies and energy companies
Similar across informant groups	None	None
Different across the informant groups	<ul style="list-style-type: none"> • Energy – primarily to the industry • Inundation of communities, agricultural land • Environmental degradation and loss of ecological diversity • Loss of fisheries as source of income and as food • Loss of the river as means of transport • Relocation of people and communities • Breaking up of communities and social structures • Decreased income or lack of income • Social instability and psychological distress to population • Threat and insecurity to the livelihoods of <i>ribeirinho</i>¹⁶- and indigenous population • Loss of hunting grounds 	<ul style="list-style-type: none"> • Energy – “<i>light for everyone</i>” campaign • Employment • Economic income and new commercial and industrial incentives • Development for the region and the country

What they emphasise as the most important and of significance is different according to their interests and what they perceive as the attributes of the resource. This will be discussed in section 5.4.4.

5.3.3. The experiences of representatives of social-environmental NGOs, people affected by dams and researchers critical to hydro power projects of outcomes and interaction

The respondents in this group were representatives from ISA and MAB, people affected by dams and professor in energy planning, Célio Bermann, from the University of São Paulo and Flavia Vieira who has been working with professor in economic and social development,

¹⁶ *Ribeirinho*: rural communities living on the margins of a river/watershed.

Carlos Vainer, at the Federal University of Rio de Janeiro. Both Célio Bermann and Flavia Vieira, have been working within the field of hydro power and its social and environmental consequences for many years, and Mrs. Vieira has been working with MAB and on the elaboration of the concept of affected people.

There seem to be a general agreement on the perception of what socio-environmental impacts are between the agents in the two groups, and within the environmental institutions (laws and regulations) concerning the electrical sector seems to be in place. The electric energy sector even has its own guidelines as to how compensation and resettlement should take place. However, people who themselves has been affected or is expected to be affected by future hydro power projects appears to experience an incongruence between written laws and regulations and actual practice. In relation to local communities several main problems are mentioned:

- the procedures of giving compensation, that being resettlement or monetary compensation
- the definition of affected people and who is entitled to compensation, which losses one has to be subject to
- the lack of participation of the communities affected in the planning process of the project through APs
- the lack of communication, negotiation and dialogue between the involved agents (affected people, NGOs, governmental agencies and energy companies)
- the breaking up of communities and change in social structures because of the construction of a dam and relocation of people
- the environmental considerations in relation to pasture, forests and aquatic resources like fish
- the lack of governmental control with the energy companies and on the construction site, as well as lack of sufficiently skilled technicians in Ibama
- the replacement of hydro power as main energy source by developing new technology and the use of other forms of renewable energy, like wind and solar energy
- the current energy politics in Brazil as an overall problem of it all

These aspects were all mentioned by the informants but were especially emphasised by the representatives from MAB, with whom I met, who had personal experience from the planning

and implementation process of several projects, and were people who themselves and their families had been relocated. The first thing they pointed out and which all those opposing the current hydro power policies in the country who I talked to also pointed out, was the energy politics of the government the last decades. They claimed that most of the energy produced in the country during the last 20 years until today were consumed by and sold to energy consuming industries like the aluminium industry at a subsidised price¹⁷. They mentioned the big Brazilian aluminium company Alcoa as an example. In their point of view, this is subsidised by the Brazilian population who pays the fifth highest price in the world for the electrical energy they consume. It was also emphasised that people in the surrounding areas of a hydro power reservoir should be secured energy, and not as in the case of Tucuruí dam, where the transmission lines passes over thousands of families who do not have any electricity, but may be directly or indirectly affected by the construction of the dam. When I asked the MAB representatives if they could justify any negative social and environmental consequences related to hydro power, they responded a firm “no”, denying the acceptance of any negative consequences under the current energy regime.

Another issue in their experience has been the lack of environmental supervision on the part of Ibama during planning and construction phase of projects. According to the Conama 237/1997, Ibama shall conduct inspections of the environmental conditions in the area where the dam is to be constructed, this should be done in the planning phase, during the construction and before the filling of the reservoir and the operationalisation. In one of the MAB representative's (MAB 1) experience, representatives from Ibama had come to the construction site in Barra Grande and been taken around the site by the energy company's representatives, and not talked to the people at all, they did this first after the construction was finished. According to the second MAB representative (MAB 2) the Ibama comes and conduct the APs quickly just to get the signatures necessary to show that it has been done, and that the necessary procedures had been followed. In Barra Grande, the lodging and other expenses of the Ibama representatives had been paid by the energy company, so they were in “*in the hands of the company*” according to MAB 1, and in such a way not capable of doing an independent job in evaluating the work at the construction site. According to MAB 2, the companies are supposed to clean the bottom of the reservoir of vegetation before the filling of water. In the case of Itá dam this was not done, and as the water level rose, the biological

¹⁷ This is similar to the Norwegian policies providing the aluminium industry with energy at a subsidising price during the 1950s-1980s.

material started decomposing, deteriorating the water quality leading to fish dying and the release of gases making people sick and the air smell according to MAB 2.

The main issue brought up by the MAB representatives as well as the researchers and representatives from NGOs, was the issue of compensation, resettlement and the criterions to have the rights to compensation. According to the interviewees, the form of compensation was normally given in one of two ways: monetary compensation or resettlement. The people receiving compensation seemed to be selected on a rather random basis or limited to a few. It did not seem like the energy company responsible, nor the governmental agencies, had a clear definition as to who was going to be labelled “affected” and entitled to receive compensation. According to the respondents, the definitions of directly affected area (ADA), area directly influenced (AID) and area indirectly influenced (AII) are not sufficiently broad and can be interpreted in different ways in order to choose the least costly solutions for the energy companies. It was claimed that it is only the people living in directly affected areas who will receive any personal compensation or be resettled because they loose their land to the reservoir. However, people living in the areas defined as AID and AII areas will only get compensation based on their ability to negotiate, according to the respondents.

The representatives from MAB claimed that as many as seven out of ten living in areas affected by hydro power projects were expelled from their properties for one reason or the other, without any rights to compensation. The other three received in most cases monetary compensation, a decision made under pressure from the energy company according to the MAB representatives. MAB considered monetary compensation as an unsatisfying solution based on the fact that in most cases those receiving money moved to the cities, instead of being resettled in the surrounding areas or in re-established communities. According to MAB, this had consequences for the social structures in the surrounding communities and in the reestablishment of the already vulnerable community, as it led to decreased population, dissolution of social security networks and social interaction. In addition they emphasised that this also contributed to an increased poor and even criminal population in the cities, because the families moving into the cities usually had troubles getting employment, proper housing and problems establishing the social security network they needed and which they had in the previous community. The reason why people had to move were either that their houses and farmland were inundated by the reservoir or the experience of deterioration in the environmental and agricultural conditions surrounding the reservoir and to where their

property was located. All of the MAB representatives statements, were also confirmed by the other respondents in this group.

According to all the respondents in this group, of especial concern were the people living in the areas surrounding the dam, and not as such defined as directly affected by the construction or entitled compensation, but still affected by the consequences of the construction. In some cases these families moved because everybody else had to move, so there was no one left in the community and community structures like schools, healthcare and commercial activity simply disappeared. MAB 3 commented that farmers were losing income in some cases as they were not able to deliver their milk anymore, because of reduced population the production in some areas decreased to such a degree that the truck fetching milk did not see it as profitable to come to the area and fetch the milk. The dissolving of communities were of great concern to the respondents as this brought on consequences of psychological character when the social networks of people disappeared. Like MAB 2 who was affected by the Itá dam said: *“We used to have 14 football teams in our community, after the dam was built and people had to move, we only have 5 left, and suddenly my father didn’t have anyone to drink his beer with on Saturdays.”* Many people were getting depressed, problems with alcohol were getting more common, and families destructed. In the case of Itá, the community negotiated heavily with the responsible company and the city of Itá was rebuilt and the whole community was restructured with infrastructure like schools, healthcare, commercial activity, roads etc, however there were still changes in the social structures surrounding the city.

The preferred solution by all the respondents with regard to resettlement, is that people is resettled in nearby areas, on lands and locations that are of the same quality or better than the previous, and that the communities are reconstructed with all necessary infrastructure like hospitals/health centres, sanitation, schools, commercial activities, churches, roads and basically everything that is needed for a well functioning community.

What MAB and the other respondents said is missing and which is the core of the problem of compensation scheme, is a clear definition of who is affected and not, which losses you have to be subject to and what further criterions have to be met in order to be entitled compensation. There is no clear definition today, and the right to compensation and how big it should be is largely based on the ability of the community to negotiate with the energy company, according to the respondent. The MAB representatives also claimed that the

companies were conducting a racist policy, because they tended to give better compensation in communities with a lot of European descendents than in communities with *quilombos* and *caboclos*¹⁸. This statement was however dismissed by Mrs. Vieira, who has been working within the field for many years, she stated that this was a result of educational and communicative level of the communities and consequently their ability to negotiate and know their rights. The respondents in this group was also making a point of lack of governmental control in the issue of compensation; that the governmental institutions needs to have more control over the energy companies in the issue of environmental and social compensation. They claimed that Ibama is not strong enough to exercise the environmental control because of lack of technical skill within the agency and because of pressure from different stakeholders.

5.3.4. The experience of governmental institutions and the Eletronorte of outcomes and interaction

The respondents in this group were representatives for the Energy Research Institute (EPE), the Ministry of Mines and Energy (MME), the Ministry of Environment (MMA), Aneel (the National Electric Energy Agency) and energy company Eletronorte.

The respondents in this group agreed with the representatives for social and environmental NGOs defying the construction of hydro power projects on many issues. However there were some aspects where differences came to the surface and where they considered the problems differently.

All the representatives considered the main weaknesses and problems in the processes related to hydro electric energy projects and environmental and social problems as:

- the definition of affected people and who is entitled compensation
- the lack of competence of the technicians of Ibama assessing the EIA/RIMA and conducting environmental inspections
- the responsibility of Ibama as an environmental institution to assess social impacts brought on by a project without having the competency in doing so
- the disagreement with local people on when Public Hearings should be carried through and how

¹⁸ Caboclo: person of mixed European and indian heritage.

- the responsibility for the social services of the State in the areas affected, cannot be the responsibility/be taken over by the hydro power companies
- the responsibility concerning the affected communities on the part of the State needs to be increased
- the paralyzation of the process of approving projects by the Ministry of the Ombudsman (*Ministério Público* – the Ombudsman) as a bottleneck
- the criticism by social and environmental NGOs and their lack of presenting alternative sources of energy
- the rhetoric and arguments of the social and environmental NGOs which is considered as outdated arguments based on experiences from the time of dictatorship
- the positive contribution of the environmental and social NGOs in improving the hydro power sector in Brazil and the continuous need for a active civil society

Many of the issues mentioned by this group of informants are the same as those of the previous group, although the approach to the issues and why they consider these a problem was sometimes different. All the governmental agencies as well as Eletronorte mentioned these aspects as challenges, and once again one of the main issues was that of defining affected people and who should be entitled compensation and what kind of compensation. The MME is currently working on a new definition of affected people, but this work is still not concluded.

The issue of who is entitled compensation was of especial concern to representatives from Eletronorte, which is responsible for giving compensation and for the resettlement of displaced people by the hydro power project the company is responsible for. However, in the view of Eletronorte, there is a problem that people who in the first place are not perceived as affected and entitled to compensation, claim they are affected and entitled to compensation. The representatives from Eletronorte emphasised that this was a very difficult issue for them and which needed to be solved in a better way than today, however how to solve it is not clarified. What they considered a problem was that in many cases people want individual compensation, which for Eletronorte is difficult to give. What Eletronorte currently considers the best way to give compensation to communities which has to be relocated, is through collective compensation negotiated through collective negotiations. According to the

representatives of Eletronorte, then the needs of the community can be mapped, restructured and rebuilt in the best possible way, which means rebuilding of health care, sanitation systems, schools and other social services and infrastructure. However, during the negotiation it is also a choice whether the community prefers monetary compensation or relocation, if the choice is monetary compensation, Eletronorte estimates the values of the land, the crops cultivated, whether it is perennial crops and how many more years it is prospected to yield and so on. But this is also decided on a collective basis which means that the solution is the same for everyone in the area, even though not all agree. The representatives from Eletronorte emphasised that the issue of compensation and rebuilding of communities is difficult because the enterprise cannot be considered a social service provider which takes upon the responsibilities of the State. As the representatives said:

...currently and in the future we will start projects in areas like the Amazon which is poorly developed in relation to social services and infrastructure, this will demand more from us when rebuilding communities because the local population will demand social services that may not have been there in the first place and which in reality is the responsibility of the State, not us as a corporation. We cannot take upon ourselves the responsibilities of the State in areas which the State has failed or alienated themselves from the responsibility to its citizens. But people see this as our task in the area where we enter, but we are a commercial enterprise not a social service institution.

(Interview with Eletronorte representatives, own fieldwork 2009)

The representatives also emphasise the need for more participation and involvement of the State in these issues, as the responsibility of restructuring the communities is not only a question of rebuilding the social services and the infrastructure because of a project, but in many cases the establishment of services and infrastructure which were not there in the first place and which is the responsibility of the State.

The lack of competency of the technicians of Ibama who assess and approve the EIA/RIMA and give the approval of the environmental licenses was stressed by all respondents in this group. This critique is based on lack of personnel in Ibama to evaluate the EIAs; the EIAs are normally quite extensive in quantity and contains profound technical and scientifically information about the hydrological basin, this requires highly competent personnel as well as

sufficient personnel to review it, this is not the case today according to the respondents. Additionally, they think it is a problem that there is no institution which considers the social consequences separately, so Ibama gets the task of assessing social consequences even though it is an environmental agency and do not have the competency of evaluating this.

Another issue is the role of the Ombudsman. The Ombudsman is a governmental agency where the citizens can make complaints on issues and on decisions made which they consider violating their rights as citizens. In the case of hydro power projects and the approval of the Prior License, this is often done based on claims that the procedures are not followed when conducting the EIA study or that impacts are not considered. The Ombudsman has then the possibility to paralyze the continuation of the process by demanding the annulations of the Prior License, or the postponing of the process until further studies are undertaken, based on the complaints and the laws and regulation applying to the complaint. According to the representatives from the governmental institutions interviewed, the Ministry of the Ombudsman has an important task in doing so, but that the Ministry also abuse their power in doing it almost as a routine. This increases the expenses of the project as it is postponed several times, as well as contributing to growing negative sentiments in the population towards hydro power projects. In stead of cooperating with the other governmental institutions working with the hydro power industry and try to bring solutions, they consequently counteract the industry, according to the industry respondents.

The Eletronorte as well as the governmental ministries and agencies, all commented on the claim from the social and environmental NGOs that the Public Hearing in the local communities to be affected should be held before the environmental impact studies were carried through. They all stated that this claim would not be very purposeful to carry through, because there would not be anything to present and discuss before the study is carried out, and the possible impacts are mapped. However the representative from Aneel, thought that more information earlier in the process, also before the actual studies of the area were conducted, would be purposive so that the population in the area would feel that they had a more participatory role, and not be intimidated about uncertainties and rumours about the project.

5.3.5. The case of Belo Monte, experiences up to spring 2010

The interviews conducted with regard to the case of Belo Monte, are with the representatives from the same agencies as in the previous sections, in addition to participant observation at the Public Hearings on Belo Monte in Brasilia.

The UHE¹⁹ Belo Monte was granted the Prior License 1st of February 2010. This was based on the EIA report which was released May 2009 by Eletrobras and which then was analysed by technicians from Ibama. The EIA report on Belo Monte is a report of about 15.000 pages on environmental and social effects, considerations and plans on how to carry out the project and how to diminish negative effects in the area where the project is located. This report received massive criticism by environmental and social NGOs as well as scientists working with questions related to hydro energy, not only social scientists but also engineers in the field, and finally from the communities which will be affected. Amongst the communities are also several indigenous groups living in the area. However, the MME, MMA, EPE, Aneel and Eletronorte all considered the EIA report for Belo Monte to be one of the best and most detailed ever produced.

Some of the strongest criticism has been concerning the four Public Hearings (APs) which were held in the area in September 2009 by representatives from Ibama and Eletronorte and what is claimed to be a lack of the prior consultation of the indigenous communities which are to be affected by the construction. The social and environmental NGOs claim that the APs were conducted in a hostile environment without any possibility for dialogue, in addition the complete EIA was made available to the public two days after the first AP was carried through, so that the participants did not really have a chance in making themselves familiar with the content. The same was said about the reunions carried out by Funai in the indigenous communities, which according to the C169 are going to be consultations. These were merely information meetings according to the indigenous peoples present and not consultations. The hostile environment which is referred to is the strong presence of police which was present at the APs arranged by both Ibama and Funai, especially in Altamira, there was a big force of police which was contributing to intimidating the participants from the communities. When confronting the representatives from Eletronorte, Aneel and the Ministry of Mining and Energy with this, they all explained the strong presence of police forces with the necessity of

¹⁹ UHE: Usina Hidrelétrica de Energia (Hydro electric plant)

having some security at hand. This was based on the fact that in 2008, one of the functionaries of Eletrobras was cut with a machete on the cheek by an indian woman and also in 1989 an indian woman put her machete on the cheek of the president of Eletronorte, José Antônio Muniz Lopes, as a gesture of indignation over the project. It was emphasised that the police presence was nothing special for these meetings, and that there would be no reunion held anywhere in the country, gathering several thousand of people without a strong presence of security, that would be irresponsible to do according to them.

The consultation with the indigenous groups has been undertaken by Funai and they concluded that there is no threat to indigenous populations or TIs (Indigenous Territories) because of the Belo Monte project. This conclusion has been negated by the indigenous communities in the area especially the communities of TI Arara da Volta Grande, TI Paquiçamba and TI Juruna do Km 17, living within the area defined as Directly Affected Area (ADA) in the stretch called Volta Grande and Vitoria de Xingú. The area of Arara da Volta Grande and Paquiçamba will experience that the river stretch called Volta Grande will get severely reduced water level and in periods may dry up. These communities use the river and only the river, as a means of transport to get to Altamira, the nearest city as well as to other places. The reduced water flow and occasionally drying up of the river will have severe consequences for transport as well as fishing for these groups. The reason for the dry up is the diversion of the river 40 km below the city of Altamira at the site called Sitio Pimental, into two 12 km long and 500 m wide canals, diverting the water away from its natural flow into the reservoirs and securing the constant flow of water to the main power house at the third barrier at the site called Sitio Belo Monte. These canals will be made of cement and constructed in an area where there currently is forest, according to critiques of the project, it will be necessary to dig away dirt and rocks equivalent to the amount dug away when building the Panama Channel. There will accordingly be a loss in forest and the ecological diversity in the area will be disturbed. This will also create effects on the hunting and extractivist activities for the indigenous communities, as well as other people in the area. Many of the indigenous communities do not have any confidence in Funai and feel betrayed based on the approval of the Belo Monte project by Funai, and they do not want the Funai to represent their interests anymore. However, there is a division within the indigenous communities as well with regard to the project, as some are positive to the construction, though they do not appear to be the majority.

In 2009, a group of specialists consisting of anthropologists, biologists, energy- and hydro engineers, sociologists, zoologists, political scientists, economists, specialists in public health care and others, were assigned to do an independent evaluation of the EIA/RIMA by a consortium of environmental and social NGOs. These specialists concluded that there are methodological problems as well as underestimates and faults in relations to impacts, they concluded with the following faults:

- underestimation of “directly affected area”
- underestimates of “affected population”
- underestimates of loss of biodiversity
- underestimates of forced relocation in rural and urban area
- denial of impacts downstream from principal dam and power house
- negligence in evaluation of health risks
- negligence in evaluation of risks to water security
- over-estimation of energy generation
- underestimates of social, environmental and economic costs of the project

(International Rivers 2009)

Especially the arguments that the project will not generate as much energy as estimated is much emphasised as well as the impacts on TIs and indigenous communities and the claimed underestimation of affected people. The installed capacity of the project is of a total of 11.233 MW, but the firm energy²⁰ is only estimated to be 4.000 MW, and during the dry season of 3-4 months the project will produce little energy (Santos et al. 2009). In regards to the number of affected people the EIA/RIMA estimates approximately 20.000 people will be directly affected by the project and will have to move permanently (Eletrobras et al 2009: 78).

However according to the specialists who conducted the analysis of the EIA/RIMA, this is an underestimation due to methodology flaws. The specialists base their argument on the median of 3.14 members of a household which the Eletrobras operates with is too small, and that the real median is 5.5.-7 persons per household (Santos et. al 2009).

The government representatives and Eletronorte however claim that Belo Monte is the cleanest and best energy alternative available at the moment, and that all interests are well attended to in the EIA/RIMA.

²⁰ Firm energy: energy available at any given time/guaranteed.

On April 20th the auctioning of who is going to have the operational and construction responsibility of Belo Monte was finalised. A consortium of nine companies won the auction under the name of Norte Energía, in addition Eletronorte, which originally was not a part of the Norte Energía, will enter into the consortium based on its historical experience in the elaboration of the plans of Belo Monte going back 20 years. This will make two of Eletrobras' holdings, Chesf and Eletronorte, part of the construction of the project. (ANEEL 2010b) The auctioning was held before the Installation License (LI) was given, something which is not in correspondence with the Conama 237/1997 and the Ibama 065/2005 which states that the auctioning can only be held after the LI is given.

Box 1

Norsk Hydro enter into the Brazilian aluminium stage

The 2nd of May 2010, the Norwegian company Norsk Hydro and the Brazilian Vale S.A, announced that Norsk Hydro had bought the aluminium industry of Vale. This includes the bauxite mine Paragominas, most of the shares in the refineries Alunorte and CAP and half of the smelting plant Albras. Vale justified the sale amongst other things in the high energy prices in Brazil which, according to the director of Vale Roger Agnelli, can make any new industry project in Brazil unviable. In exchange Vale get participation in 22,5% of the shares in Norsk Hydro. The advantage of Norsk Hydro according to Agnelli is the access to cheap energy in Norway. Vale also had interests in the construction and generation of energy from Belo Monte, but lost the auctioning together with its partners.

Sources: (Soares 2010; Dalen 2010; Valderhaug 2010)

5.4. Analysis and discussion within the Oakerson's framework as adapted by Vatn

The government of Brazil seem determined to continue the development of the hydro power sector in order to meet the future energy demands of the country, even though the opposition against the construction of hydro power plants is strong, with the main controversies being that of socio-environmental consequences. What appears to be the main arguments against the further expansion are to be found within the institutions, the agents' choices and their patterns of interaction: the lack of definition of affected people and thus who is entitled to compensation and resettlement programs; that the further expansion will be in ecological vulnerable areas as the Amazon region; the negative outcomes for indigenous peoples; the current energy policies of the government; the lack of control and supervision of the hydro power sector on the part of the governmental agencies; and the implementation of the existing

environmental institutions. There is also a discrepancy in what is considered outcomes and main attributes of the hydro resources and the discursive approach to the issue.

5.4.1. *The institutions*

There is a large institutional framework set up to attend socio-environmental concerns and considerations which the hydro power sector has to see to when planning, constructing and implement a hydro power project: the Conama Resolutions, the 1988 Brazilian Constitution, the regulations of Ibama and the guidelines established by the hydro power sector. The problem, however, is that this institutional framework is mainly directed towards environmental issues, and not social issues. Social issues becomes subsumed to environmental issues in the institutions and are indirectly but not explicitly incorporated into the framework, like the Conama 01/1986 Art. 6, Ic. This is a problem because it then leaves the social issues more or less left out of the institutional framework, and leaves it to the energy companies themselves to decide how to approach the social problems created in the area. Additionally, the Ibama which gives the Prior License, also called the environmental license, is a purely environmental agency, and do not have the competency nor as its' institutional responsibility to assess the social implications brought on by the construction of a hydro power project, although the EIA/RIMA which the Ibama approves also contain social components. The lack of a clear definition of affected people is a weakness in the institutions which creates a vacuum contributing to conflicting interaction between the agents because they have no institutional framework as guidance or as control mechanism. There are no regulations and guidelines to define what kind of compensation you are entitled to according to the loss you have suffered. The terms directly affected area (ADA), area directly influenced (AID) and area indirectly influenced (AII), refer to mainly the environmental affects and influences and are not definitions as such on social-environmental affects, yet these terms are used to define whether or not you are entitled compensation. If you are located in the directly affected area which means that your house and land is inundated, you are entitled compensation, however, if you are living in the areas labelled AID and AII which is not inundated, you are not necessarily entitled any form compensation. However in the AID area, the energy company usually have programs for the communities in order for them to be able to provide for the several thousands of construction workers who are expected to migrate to the area. That is health programs, sanitation and other infrastructure which is necessary in order to complete the work, but which also will be beneficial to the local population. But the terms of ADA, AID and AII, do not incorporate a more comprehensive analysis of the social structural

outcomes the construction of a hydro power project may bring to communities and individual families, as described by the representatives from MAB.

When it comes to the institutional framework on indigenous peoples' rights, there is a paradox within the general rules of the institutions. On the one hand, Article 231 of the 1988 Brazilian Constitution as well as the C169 which Brazil has ratified, states that the indigenous communities has the right to the land they traditionally occupy. The Constitution further states that the exploitation of resources, amongst them the hydro resources, can only be exploited by the approval of the National Congress after the indigenous communities have been heard. Additionally the C169 incorporates the right to previous consultation in projects which affects the indigenous communities. On the other hand, the 1988 Constitution, states that the land and resources traditionally occupied by the indigenous people, is "*bens do união*" which means that it is a national good and should be managed in the best interest of the country and all of its citizens. The interpretation of "national good" and "best interest of the country and the citizens" will be a matter of perceptions of the attributes of the resource and interests; for environmentalist and those defending indigenous peoples' right, it would be to preserve the resources; in the interest of energy companies it would be to develop the resources in order to supply energy to the citizens. This inherent contradiction in the institutions makes the interpretation of the institutional framework a matter of power of interests, where conflicting interests will interpret the institution differently and in the direction which will be beneficial to the wanted outcome. There is a tendency that the most powerful agents' interests win in the interpretation of the rules. The perception of the attributes of the resource is important as it will influence the construction and design of institutions, and tell us something about whose perception prevails and who has the power to influencing the institutional design.

5.4.2. *Technology and knowledge*

In this study I consider the technology and knowledge to be reports like the World Commission on Dam's "*Dams and Development*", the governmental PAC program and partly the PDMA, as well as research. The technology and knowledge will influences the patterns of interaction between the agents through their choices and how they choose to use the available technology. The technology will through the agents' choices influence the design of institutions, as well as how they choose to use the existing institutional framework. Technology and knowledge is also influenced by the perceptions of the attributes of the

resource by the agents. How the agents perceive the attributes of the resource is important, as it influences their use of technology and knowledge in their choices and patterns of interaction, and how they perceive this knowledge. Knowledge of the issue and of the technology available will also influence the institutions through the agents and their choices, because the new knowledge will make some institutions outdated, and contribute to the necessity of creating new ones.

There seem to be an overall agreement between the actors both in written documents and in interviews carried out for this study, as to what is perceived as socio-environmental consequences. These perceptions are in concordance with the consequences emphasised in the World Commission on Dam (WCD) report and which is part of the knowledge base the agents may use, and which all in fact did mention. However what appears as a difference in choice of perceptions between electro energy agencies and governmental institutions on the one hand, and the MAB and other NGOs and researchers claiming the rights of affected people on the other, is the psychological distress caused by resettlement, inundation of cultural and religious significant land and the breaking up of existing community networks. This was emphasised by the representatives from MAB, recognising that it had contributed to the breaking up of family structures, social security structures in the communities and in some cases led to suicide and alcoholism. Such dramatic consequences were not considered by the governmental representatives or the energy sector representatives, as they hardly talked about consequences on micro level. The energy sector representatives were more concerned about the losses measurable in monetary terms and losses which are easier to see and measure, and not so much the socio-cultural impacts and possible psychological effects this may bring. Another difference was that while the different NGO representatives did not recognise any positive environmental and social consequences, the governmental agencies as well as energy company recognise benefits from the projects in accordance with those recognised in the WCD report. This difference in perceptions and how the agents choose to use the knowledge and technology available like the WCD report, influence their patterns of interaction and the institutions through their choices.

A second issue which was emphasised was the current energy politics promoted by previous and the current government which include the PAC/PAC 2 program and to increase electric energy production according to the national demand, within which the “*luz para todos*” – “light for everyone” campaign. The “light for everyone” campaign is to bring electricity to all

households in Brazil and obliges the energy transmission companies to connect whoever requests it to their transmission lines (Brasil 2010b). The Belo Monte project is one of the main components in the PAC program to increase the electric energy production under the flag of what the government considers as renewable, clean energy with low CO₂ emissions. The PAC program contributes to set the development agenda for Brazil as well as influence the agents choices and their interaction, as the program emphasises the attributes of the hydro resources as a source of clean energy.

5.4.3. Agents, agents' choices and motivation

The agents and the agents' motivation behind their choices are essential for the patterns of interaction between them, the outcome, as well as for how well the existing institutions functions. As several of the respondents within both respondent groups commented: *"We have the institutional regulations with regard to environmental considerations, but the implementation is lacking."* This indicates that the institutions contribute to create a vacuum were the agents are able to decide how they want to interpret the institutions. This vacuum appears clearly in relation to the rights of indigenous peoples and in the lack of definition of affected people. One of the main influences of the agents' choices is the norms which motivate their actions and which outcome they want, and they will use the institutions, technology and knowledge at their hand to help them achieve this outcome.

The governmental agents are looking to develop the country industrially and economically, and as a means of achieving this is the creation of the PAC program and the use of hydro resources to produce energy. The governmental agencies are also motivated by the focus and discussion on renewable, environmental friendly energy which is currently going around the world, and which hydro power is considered to be an important part of. There are also economic motivations behind the choices of the governmental agencies, as the alternatives of environmental friendly energy to hydro power energy are considered to be solar energy and wind power. The technology of these alternative sources are still under development and the costs of investing in this would be approximately 860-1730 USD/MWh for solar energy, 115-140 USD/MWh for wind energy and 34-63 USD/MWh for hydro power energy (Aneel 2007) which indicates that there are also economic considerations to be taken.

The energy companies are motivated by economic profitability and to develop their industry to be nationally competitive. It seems like there is also a growing awareness of the

environmental responsibility due to the international focus on the environment and negative attention on energy companies. However, how much this motivates the choices and actions of the energy companies as agents may be disputable according to whom you ask.

The socio-environmental NGOs like MAB and ISA, the researchers within the field and the affected people are motivated by the fear of socio-environmental consequences brought on by hydro power projects. Their choices are based on the wish to protect the environment and secure the rights of the people in areas where hydro power projects are prospected to be built, or have been approved. Those claiming the rights of indigenous peoples, like ISA as well as the indigenous groups present at the Public Hearings on the Belo Monte project in the Ministry of the Ombudsman, are motivated by construction of the project, and to preserve the areas as indigenous territories in order for the indigenous communities to continue to develop their communities with their own wishes. With regard to the rights of the indigenous people and socio-environmental organisations, is it possible to question whether the socio-environmental organisations and environmental organisations are motivated by promoting the rights of indigenous peoples, in order to have a stronger argument in the quest for preserving ecological important areas.

5.4.4. Patterns of interaction

As the findings suggest, the agents above all view the outcomes of the exploitation of the resource differently, this influences their choices and interaction with each other. They have the same institutions, technology and knowledge to relate to, but how they choose to perceive them and act related to them are different based on their choices and wanted outcomes.

The different interests and motivations of the agents contribute to a polarisation between them and a lack of communication and cooperation. What was emphasised by ISA, MAB, Mrs. Vieira and the representatives for the communities that will be affected by the Belo Monte project, was exactly that of lack of participation, communication, negotiation and dialogue in the planning phase as well as in the implementation of projects. They want the affected people and the socio-environmental NGOs to have a more consultative role in the process. MAB is currently an active agent which mobilises people into demanding a broader definition of affected people, better compensation and more responsibility towards the communities on the part of the energy companies and government. The impression given by MAB and the other informants in this group on the current situation is that the negotiations always appear to start

from scratch from project to project and only if the communities fight for it. A change in the patterns of interaction through an improvement of the already existing Public Hearings, to more actively involve the communities from the start and throughout the process, may be a solution which would benefit all the agents by decreasing the conflict level and possibly give better and more individual tailored solutions to each community. However, this presupposes that information is given and available to all agents, as participating on equal terms is difficult if you do not have access to the same information and do not understand what you are participating in. As it is now it appear that the involvement of the communities is merely what Pretty et al. (1995) calls “*passive participation*” which is basically that people are informed of what is going to happen by an administration or a project manager, without being heard with their responses (Pretty et al. (1995) in Kambani 2005). What the representatives from MAB, ISA, Mrs. Vieira and the communities affected wish, is participation which can be said to be based on mix of what Pretty et al. (1995 in Kambani 2005) calls “*functional participation*” and “*interactive participation*”. Functional participation is when people participate in forming groups to meet determined objectives related to the project, however it does not take place at an early stage in the project cycle, but after major decisions have been taken. Interactive participation on the other hand, is when people participate in joint analysis which leads to action plans and formation of new local institutions involving the use of systematic and structured learning process, it involves dialogue and local decision-making and try to seek multiple perspectives (Pretty et al. 1995 in Kambani 2005). A combination of these two models of participation appear to be what MAB, ISA, Mrs. Vieira and the dam affected communities are seeking, however they want to participate from the very beginning of the planning of a project, not after the decision is taken as in the functional participation model.

With regards to this and when the consultation as well as the Public Hearings which are to be conducted by Ibama during the process of obtaining the Prior License of a project, there was a disagreement as to when these should be held. The MAB, ISA and the people representing those who will be affected by the Belo Monte project, wants this to be done even before the elaboration of the EIA/RIMA. The representatives from MME, MMA, Aneel and Eletronorte claimed that this would not have any purpose, because there would be no information on impacts to be given as no environmental studies would yet be conducted. Nevertheless, when there are projects which are very much disputed, it could be appropriate with the participation of the local population at an early stage, not only to inform them better about the project, but

also in order to be able to attend the socio-environmental needs of the area and the population better.

The gap in institutions regarding specific social regulations makes the will and procedures to compensate affected people and communities, to depend largely on the individual energy company. This lack of will of responsibility on the part of the energy company could be explained by the economic expenses this would mean for the energy company. The other informant group also agreed on the need of a definition on affected people and compensation, but the representatives from Eletronorte also emphasised the need of more responsibility on the part of the State in areas which in the future will be affected by hydro power projects because of the costs a compensation scheme would put on the company. Most of Brazil's remaining hydro power potential is located in the Amazon region which is also the least developed region in Brazil with regard to social welfare system and infrastructure, and one of the most vulnerable and important regions in the sense of ecological diversity. This is the area which the government and the governmental agencies see as one of the main providers of the planned energy supply in the PAC program. This means that if a energy company is going to invest in a project in the region, it will have to provide more or less all basic social and technical infrastructure in the region in order to provide for the migrate workers working on the project and to support the local population. This is an immense responsibility and as the representatives for Eletronorte pointed to, not the full responsibility of the energy companies. If the government wants an increased supply of energy in order to continue the economic and social development in concordance with the governmental PAC program, it must also take part in alleviating the socio-environmental consequences this will bring. This would mean on the one hand designing new regulative institutions to cover the existing gap in social institutions to secure the rights of affected communities, as well as the further elaboration of the environment institutions. And on the other hand for the State to be an active participant in providing social and technical infrastructure and in controlling the energy companies. There is no question of that Brazil will continue to exploit its' hydro power resources into energy, as this is part of a stated governmental program, but this also requires a stronger participation from the State and a better implementation of the already existing institutions.

With regards to the previous consultation in concordance with the C169 and the 1988 Constitution of indigenous communities which will be affected by the Belo Monte, the consultation was carried through, according the representatives from Funai who conducted the

consultation meetings as well as representatives from Eletronorte, Aneel, MME and MMA. But according to the indigenous communities themselves and ISA, this was merely information meetings not consultation. It is known that the indigenous communities themselves are split within the view of the construction of the Belo Monte hydro electric project, and the representatives from Eletronorte claimed that the indigenous groups opposing the project were taken advantage of by socio-environmental NGOs in order to use the Constitution and the C169 to paralyze the project. On the other hand the representatives from MAB claimed that the indigenous groups' positive to the construction had been paid off by the energy companies. Which is true is impossible to conclude with in this study, nonetheless what seems to be clear, is that the term "consultation" holds different meanings and explanations to interaction depending on the agent. For the indigenous communities and the NGOs working with them, consultation is the actual consultation on opinions, recommendations and participation in the planning process, the word "veto" did not appear at any stage in this study, but in the Public Hearings in the Ministry of the Ombudsman, this concept seemed to be an option by non-acceptance of the project. By saying no to a project when consulted, there seem to be an expectance that in order to be heard, this "no" response should signify the non-implementation of the project, if not the communities have not been heard. The governmental agencies and Eletronorte interprets the term "consultation" as information, clarifying doubts and concerns about the projects and give opinions which may or may not be considered, "veto" is by no means included in the interpretation of "consultation". This interpretations and practice of consultation by the governmental agencies and Eletronorte are in concordance with the description of consultation as a form of participation given by Pretty et al. (1995) in that *"People participate by being consulted and external agents listen to views. Agents define problems and solutions, and may modify these in light of people's responses. Such a consultative process does not concede any share in decision-making and professionals are under no obligation to take onboard people's views"* (Pretty et al (1995) in Kambani 2005). Consultation do not necessarily mean that your opinions will be heard.

However, in the process of the Belo Monte project, Aneel's recent finalisation of the auctioning of which companies are going to get the concession for the project, is not done in accordance with the Conama 237/1997 and the Ibama 065/2005, which states that the Installation License must be obtained before the auctioning of the concession can be carried out. When such omissions are taken by the governmental agents of already existing

institutions, it emphasises the statement by all the informants that the environmental institutions exists, but these institutions do not necessarily regulate the patterns of interaction.

5.4.5. “The ghost from the dictatorship”

One of the claims from the socio-environmental NGOs, Mr. Bermann, Mrs. Vieira and the representatives for affected people in the Public Hearings on Belo Monte in the Ministry of the Ombudsman, was that the energy generated is sold to the electro intensive industries and do not benefit the citizens of Brazil. Additionally they claimed that the energy companies do not have socio-environmental programs unless they are pressured to, and that this omission is based on economic motivation of profitability and lack of responsibility to the citizens of Brazil. The response to this from both governmental agencies as well as the representatives from Eletronorte, was to dismiss these accusations, claiming that these were arguments and a rhetoric based on experiences of “power decides” lived during the dictatorship before the current institutions were in place and as such were not applicable arguments anymore. Especially the representatives from Eletronorte, MME and Aneel, argued that these arguments were very much based on the experiences from the Tucuruí dam, which was inaugurated in 1984 and constructed during the dictatorship, and that Brazil has not experienced the construction of such a big hydro power project since then. Because the politics, policies and institutional settings have changed radically from the times of the dictatorship until democracy today, and the legislations and regulations have evolved based on the negative experiences from the Tucuruí project, the representatives from Eletronorte, MME and Aneel claimed that the same mistakes regarding socio-environmental impacts would not happen again. The Belo Monte project is in this regard a test to see if the institutions are good enough and if the agents choose to follow them. However, it may appear that it is already failing due to the accusations of lack of prior consultation of the indigenous communities, lack of involvement of the local population and the fact that the concession auction was held prior to granting of the Installation License. The dismissal of the representatives from Eletronorte and the governmental agencies, is also questionable when looking at the consequences of the Itá dam and Barra Grande from which two of the MAB representatives with whom I met had personal experience. Both projects were constructed and inaugurated during the end of the 1990s and the beginning of the 2000 when much of the current institutions were in place, nonetheless they had experiences of environmental and social neglect of the conditions in the areas. In the case of Itá, the population manage to negotiate deals with the energy company,

but this was through heavy negotiation and did not come as an initiative from energy company (Vieira, personal communication 2009).

Chapter 6: Presentation of Norway and main agents

6.1. Political-historical background to current hydro power policies in Norway today

In contrast to Brazil, Norway has developed the hydro power sector for more than 100 years. In this section I will give a brief historical review of this development.

6.1.1. *Historical review political background and previous experience by hydro power projects*

Norway has a long history in relation to hydro power, and the first official regulation appeared already in 1917 with the Act on acquisition of waterfalls, mines and other real property (OED 2006). Since then the energy generated from hydro power has been one of the most important factors for Norwegian industrial development, until large oil deposits were discovered and developed in the North Sea during the 1970s. The development of the hydro power sector in Norway allowed the energy intensive industry to develop, especially the aluminium industry which after the Second World War (WWII) was expanding radically. This industry was mostly expanding in areas where the access to waterfalls and the exploitation of these into hydro power was easy because of the natural waterfalls and the year-round rainfall. The government was also encouraging the development of the water resources into hydro power plants, in order to promote the establishment of industry in different parts of the country and promote economic development.

The State bought its' first waterfall in 1895 in order to electrify the Setesdalbanen railroad, and in 1907 the state bought what is called Norefallene after rumours of an English syndicate was going to acquire the waterfalls. This rumour made the government to pass the laws which stated that no waterfall can be bought or acquired by other than the state or municipality without the approval of the King (concession). Laws passed later secured that the power plants owned by others that the State will be reversed to the State when the license expires, this is known as the law of "right of reversion" (*hjemfallsretten*) (Statkraft 2010). Between 1907 – 1920 the Norwegian State bought several waterfalls without any consistent plan of the purchasing, other than the fright that the waterfalls would be bought by foreign companies and the monopolisation of the hydro power by industry which was mainly privately owned. Before WWII the State owned 10 % of the power supply in the country.

During the WWII, the Nazi regime was accelerating the development of the hydro power supply in order to be able to increase the production of aluminium amongst other things. After the WWII, Norway was entering into decades where the slogan “*building the country*” was essential and representative for the political decisions made, also with regards to hydro power. During the period 1945-1965, the Labour Party (*Arbeiderpartiet*), was in power and was an important actor in developing the current social democracy in place in Norway today. During this period the government made several bills which benefited the industry with substantial supply of energy at a cheap cost, amongst them the energy intensive industries like aluminium and electro chemical industry. This industry was especially benefited because it was considered to give employment and income from exports. In 1955, the government decided that the State should have monopoly on the import and export of electric energy, and in the coming decade the State constructed several big hydro power projects to supply the industry with energy. In 1956, the energy intensive industries were granted energy contracts of 50 years and only partly index regulation, additionally, the State was helping the municipalities which were not able to develop their own electrical energy supply through the support programs, construction of hydro power projects and transmission. However, the cheap energy to the industry was partly subsidised by the private consumers through either high electric energy prices or through taxes, on the other hand, the industry was very important in the development of the rural districts in Norway, contributing with employment and economic income.

In 1973, the first protection plan for watercourses was passed, and new definitions on environmental protection were introduced by giving the biological, ecological and aesthetical values a vector. Local interests was given an importance in decision making for hydro power projects, a new perception of environmental protection was emerging. Both environmentalists and others were starting to question the State’s plans and activities in relation to hydro power. In addition the oil crisis in 1973 made the society question the level of energy consumption. During the 1970s however, several big hydro power projects were passed based on the argument that further expansion would give employment and from 1970-1985 there was annual increase in installed capacity production of 10.730 MW or 4,1% (OED 2008). In 1978 the Alta Dam project was passed by the Parliament, and demonstrations and protests against the construction followed. This was the biggest protest against a hydro power project in Norway and was based on environmental considerations and the rights and interests of the *Sámi* people, Norway’s indigenous population. The case was brought to the Supreme Court

based on the lack of consultation of the Sámi reindeer herders but the Supreme Court declared the case legal. By the end of the 1980s however, the construction of hydro power projects was decreasing.

In 1991 a new Energy Act was passed This Act establishes the organisational framework for the current Norwegian power supply system. One of the main changes introduced with the Energy Act, was that the consumers could freely choose which energy supplier they would use – accordingly making the supplier side subject to competition, however, the transmission should still be subject to state monopoly (OED 2008).

In a Norwegian perspective, the years after the WWII were especially important in relation to the development of the hydro power sector. Norway was one of the poorest countries in Northern Europe after WWII, and the government made a massive effort in trying to develop and industrialise the country.

6.1.2. Political situation today

Today Norway has in 2010 a coalition government consisting of the Labour Party, Socialist Party (*Sosialistisk Venstreparti*) and the Centre Party (*Senterpartiet*), this coalition was re-elected in 2009 after being four years in government and will be in power until 2013. The current government agenda is focusing on environmental friendly and renewable energy, and to continue to use hydro power as the main source of electrical energy, but also on finding other alternative sources.

6.1.3. Hydro power in Norway today and future prospects for hydro power

Norway has the sixth largest hydro power production in the world today. 99% of the national energy production is generated from hydro power. This is equivalent to approximately 120 TWh in a normal year. However the last twenty years, there has been only a modest expansion of the sector and the increase in production capacity has largely been from improvement, expansion and rehabilitation of existing power plant.

Of the ten highest waterfalls in Norway, seven are exploited to generate power, and the other three are protected against hydro power development. As to January 1st 2008, there were 699 power plants over 1 MW with a total installed capacity of 29.030 MW. The hydro power potential is calculated to be 205 TWh per year as to 1st of January 2008, however

approximately 45,5 TWh/y of this is located in protected watercourses and cannot be exploited. The remaining potential which is possible to exploit is calculated to be 37,7 TWh/y (OED 2008).

There are currently no big hydro power projects planned in Norway, the focus is on restoring and improving those already in production, and focus is on smaller hydro power plant of installed capacity up to 10 MW.

6.2. Main agents and structure of Norwegian hydro power sector

In this study the following agents within the Norwegian hydro power sector will be in focus as they have had and still have a crucial role in the development of the hydro power sector and the current regulations. They were also main agents and active participants in the case of the Alta Dam:

6.2.1. Ministry of Petroleum and Energy

The Ministry of Petroleum and Energy (*Olje- og Energi Departementet* – OED) has the overall administrative responsibility of the energy sector in Norway, this implies that the OED has the responsibility to ensure that the management of the sector is in accordance with the guidelines of the parliament and to secure that there is an integrated energy policy based on the efficient use of resources. It is also to give concession to bigger and/or controversial hydro power projects in cooperation with the Norwegian Water Resource and Energy Directorate. The ministry is divided into four departments with the responsibility of different energy resources, amongst those are the Energy and Water Resource Department. The Department is responsible for the economic and environmental management of the hydro power resources. The Energy and Water Resource Department is divided into five sections: Water Resources and Area Planning, Section for Concessions, Hydro Power and Energy Law, Electricity Market, Energy Policy, Renewables and Energy Efficiency (OED 2008).

6.2.2. Norwegian Water Resources and Energy Directorate

The Norwegian Water Resource and Energy Directorate (*Norges Vassdrags- og Energidirektorat* – NVE) was founded in 1921 and is a subordinate agency to the Ministry of Petroleum and Energy. Its responsibilities are to administer the water and energy resources. The NVE is to “*ensure coherent and environmentally sound management of Norway’s watercourses and to promote efficient electricity trading, cost-effective energy systems and*

efficient energy use” (OED 2008). NVE is to ensure that the environmental regulations and other user interests are attended to when considering new plans for watercourses and when granting concessions to projects. It should also see to that environmental regulations and requirements are followed during construction and implementation. NVE is to have an overview over the demand and supply of the electric energy, as well as to give estimates on future potential and be able to foresee a possible energy shortage. The Directorate is also to give advice to county governments, municipalities and others concerning a comprehensive management of the water resources. Another of NVE’s tasks is to be the regulating authority in relation to the electric energy market, structural development in the energy business and ensure that all actors have access to the market, amongst those the power production and the transmission (NVE 2010a).

6.2.3. *The Ministry of Environment and the Directorate of Environmental Management*

The Ministry of Environment (*Miljøvern Departementet* – MD) is responsible for environmental issues, and responsible for the protection of watercourses, rivers of value for salmon and other vulnerable fish species and protection of vulnerable ecosystems and species. The execution of parts of the environmental politics of the Government and the Ministry is delegated to the Directorate of Environmental Management (*Direktorat for Naturforvaltning* – DN), which also has a counselling task. The DN is to identify, prevent and solve environmental issues, amongst them issues related to hydro power development and the environment. The DN has the responsibility to manage the Master Plan for Water resources and to accompany the environmental management conditions following hydro power concessions (DN 2010a).

6.2.4. *Statkraft*

Statkraft is the Norwegian state owned electrical energy company, which is the biggest energy company in Europe when it comes to renewable energy. The predecessor, the *Statkraftene Directorate*, was established already in 1960 as a part of NVE, and in 1986 the *Statkraftene* was separated from NVE and became Statkraft, based on the argument that it was necessary to obtain more independence from politics and Ministries, in order to run the business more efficiently. In 1992 the company was divided into two companies: Statkraft SF with the responsibilities of energy production and distribution; and Statnett SF which has the responsibility of the transmission. Statkraft was in 1994 turned into a limited stocks company owned by the Norwegian state. Statkraft has ten holdings: Trondheim Energi, Skagerak

Energi, Agder Energi, BKK, Fjordkraft, SAE Vind, SN Power, Småkraft, NaturKraft and Devoll Hydropower of which BKK and Agder Energi are some of the biggest companies when it comes to production, distribution and sale of electric energy in Norway. In total Statkraft has 149 hydro power plants in Norway, 58 in Sweden, 11 in Germany, 3 in Great Britain and 4 in Finland.

Today Statkraft produces 35% of all the energy production in Norway (included wind energy, natural gas, and district heating), 12% of the energy production in the Nordic countries and 1% of the energy production in Europe.

Statkraft has been the main constructor of hydro power projects in Norway since the 1960 through its predecessor *the Statkraftene* (renamed Statkraft from 1986), and was responsible for the big hydro power projects in Norway from the 1960s into the 1980s (Statkraft 2010).

6.2.5. *The Sámi government - Sámediggi*

The *Sámediggi* (*Sametinget*) was constituted in 1989 as a fulfilment of the Norwegian Constitution Section 110a which was adopted by the parliament (Storting) in 1988. This section states that the Norwegian Parliament should create the necessary conditions for the Sámi people to protect and develop their language, culture and society (Norge 1988). The legal basis for the *Sámediggi* is the Sámi Act Section 1-2, which states that the Sámi people shall have their own national Parliament elected by and amongst the Sámis. The political mandate of the *Sámediggi* is all cases and issues which the Parliament considers affecting the Sámi people and their interests (Norge 1987). The *Sámediggi* has 43 representatives from 13 constituencies elected by and amongst the Sámis, based on the census of the Sámi population. The elections are held every fourth year simultaneously with the election to the Parliament (Storting) (Galdu 2006).

The *Sámediggi* has two main tasks: to serve as the Sámis' elected political body to promote political initiatives; and to carry out the administrative tasks delegated from national authorities or by law to the Sámi Parliament. The state provides the funds necessary for the *Sámediggi* to fulfil its tasks.

6.3. Non-governmental organisations of relevance to the issue of hydro power

6.3.1. *Norges Naturvernforbund*

Norges Naturvernforbundet (*Friends of the Earth Norway* – NVF) was established in 1914. Until the late 1960, the environmental non-governmental movement in Norway was rather marginal, represented by *Norges Naturvernforbund* and consisted of professionals working with issues related to biology, flora and fauna. This changed during the 1960 after the Law of Environmental Protection had been passed in 1954, which made the establishment of national parks possible as well as the establishment of the Public Environmental Protection Council. These two events gave a boost to the public environmental consciousness. During the 1960s the NVF was restructured and started working a broader spectre of issues and more methodical towards the public. Today the organisation is a democratic run member organisation with 18.700 members all over the country. The NVF is working with issues concerning the protection of nature and environment with focus on the anthropogenic use and exploitation of these resources, and that this should not exceed the sustainability of the resources. The NVF especially focuses on protection of areas, climate, energy and infrastructure and possesses a strong voice concerning issues related to the environment and natural resources in Norway today. This voice emerged at the same time as the big hydro power projects was planned and granted concessions during the 1970s and in the beginning of the 1980s, and played a significant role in this polemic. NVF is still an important voice as environmental watchdog to the government, municipalities, public and private corporations, as well as within an emerging international cooperation (Naturvernforbundet 2009).

6.4. The case of the Alta Dam

The Alta hydro power dam is located in the county of Finnmark in the north of Norway in an area in part populated by Northern Norway's indigenous population, the Sámi people. The project was first presented as a hydro power project in 1968, with plans of inundating the Sámi village of Masi and the construction a 56 km long artificial lake between the cities Alta and Kautokeino. This was met by opposition by the people living in the area, and the villagers of Masi came together in 1970 and created the Action committee against inundation of Masi (*Aksjonskomiteen mot neddemming av Masi*). This was the first time since the 19th century that the Sámi people were making organised resistance against government authorities. The protests led to the abandonment of the plans of inundating Masi and the legal protection of the village, and the size of the planned dam was diminished. However the plans continued to build up protests and the People's action group against the construction of

Alta/Kautokeino course (*Folkeaksjonen mot utbygging av Alta/Kautokeinovassdraget* – People's action group/the Action group) was established in 1978. Still in 1978 the Parliament accepted the plans of building a plant of 150 MW and a dam with an altitude of 110 m at the Šávču canyon.

There were several reasons for the strong opposition to the project. In the beginning the inundation of Masi was a strong argument against the project, but when the project plans were changed to avoid the flooding of the village, other arguments became the focal issues. One was the environmental considerations of the flora and fauna in the region, as well as fear of losing the recreational value of the area and the wild salmon stock in the river, which is highly valued by the local population. Additionally the project would affect the traditional reindeer herding in the area, as well as other areas which traditionally belonged to the Sámi people and which had archaeological and cultural value to them. In the beginning the key arguments against the construction of the dam were mainly of environmental concern, also for the People's Action Group, the question of the rights of the Sámis were not considered as important enough. Additionally the Action Group as well as the Sámis, were afraid that bringing the question of Sámi rights into the debate would turn the non-Sámi community in Finnmark against their demands based on old prejudices and controversies against the Sámi population. However, this changed during late 1979 when the environmental arguments turned out not to be strong enough to stop the project plans, and it became clear that the project would interfere heavily with the pastures of the reindeers. With regard to this, the right of the Sámi reindeer herders to this land was violated as NVE had not asked for their approval to expropriate the area. This right had been manifested through several Supreme Court rulings during the 1960s-70s. During the autumn 1979 both the Sámis and the environmentalists realised that the argument of the rights of the Sámis to land and resources was their strongest and best argument. The argument appealed both to the legal rights system and to the responsibilities of the Norwegian people and government associated with the discriminating and at times racist treatment of the Sámis over centuries, institutionalised into the Norwegian society and policies.

At this point in the conflict, the engagement of the Sámi population and their claim of rights to land and resources which traditionally belonged to them, and the demand of consultation in plans which would interfere with land traditionally considered theirs, became the main argument against the construction plans, backed by environmental arguments.

In the summer of 1979, the People's Action group carried through several protests at the construction scene at Stilla and stopped the work for a shorter period. Later the same year a petition to stop the construction based on the lack of consultation and approval from the reindeer herders was sent to the NVE. A few weeks later a group of Sámis camped outside the Parliament in Oslo demanding the construction to be stopped also based on the neglect of the Sámi rights. This was not accepted by the government, and seven of the Sámi activist entered into a hunger strike. The Parliament stopped the construction for a shorter period of time, but concluded that the reindeer herders' demands had been met and that there were no arguments to be added. The construction was started again, and in January 1981, 600 policemen were put into action to remove 900 actionists at the construction site at Stilla, and once again a small group of Sámis entered into a hunger strike going on for a month. The case went to the Supreme Court in 1982, which stated that the project was legal in every sense and the People's action group was dissolved considered to have lost the battle. The construction was carried through, and the power plant was inaugurated in 1987. The fatal environmental consequences which was feared as to flora, fauna and the wild salmon stocks were not fulfilled, neither were the anticipated devastating consequences for the reindeer herders, however the case had important and extensive consequences for Norwegian policies regarding hydro power regulations and Sámi rights. It even had implications as to the rights of indigenous people internationally (Hjorthol 2006).

6.4.1. The case of the Alta Dam and it's implications on Norwegian hydro power policies

The case of the Alta Dam changed the policies of the government concerning hydro power industry and the further development and construction of new projects, especially in consideration to environmental and social requirements. The poor environmental studies carried out previous to the approval of the construction of the Alta Dam made the government improve the environmental requirements to projects. One important requirement is the Environmental Impact Assessment Report (*Konsekvensutredning – KU*) which was put in force in 1986 (revised in 2008 and the new law put into force in 2009), which aims to map and assess environmental and social consequences of hydro power projects of more than 40 GWh (NVE 2010b; Norge 1986; Norge 2009). The terms of reference of the KU report are set by the NVE and the responsible energy company has the responsibility to carry through the required technical and scientific assessments. The KU is then sent to the NVE for approval. In order to be approved, the KU has to be sent to relevant organs and agents who may have interests in, or will be affected by the project and who then have the possibility to make their

opinions being heard during a period of three months, during these three months NVE also conducts a public hearing. After the three months, the NVE conducts an inspection in the area where the project is located. If approved, the NVE sends all necessary information to the Ministry of Petroleum and Energy, which again sends the information to the relevant municipalities as well as other Ministries which are somehow involved in the project. The final stage is for the government and the King to approve or disapprove.²¹ In the further process the responsibility is with the NVE to conduct inspections and see to that environmental and social considerations are taken. (NVE 2010b)

Further consequence of the case of the Alta Dam was the elaboration of the Master Plan for Water Resources (*Samla plan for vassdrag* – the Master Plan) which was first launched in 1984, and since then revised by the Parliament in 1986 and in 1991. The purpose of the plan was to get a more integral management of the water resources where specific projects of more than 1 MW or more, were ranged according to economic profitability and conflict level into three categories:

- I. *Projects which could be given concessions consecutively in order to cover the need for energy.*
- II. *Projects which could be exploited into hydro power or other purposes, but could not apply for of be given concession at the current time.*
- III. *Projects which were not considered acceptable for exploitation due to very high levels of conflicts with other interests and/or high construction costs.*²²

(DN 2010b)

The categories are based on a report on the existing watercourses which evaluates the value of the watercourse in question, estimated construction costs and conflict level. In 1993 the two last categories II and III were combined and in 2005, the Parliament decided that projects with less than 10 MW in installed capacity would be exempted from the Master Plan. However new hydro power projects of more than 10 MW needs to be treated in concordance with the Master Plan and the report on watercourses.

Currently the management of the Master Plan is the responsibility of the Directorate of Environmental Management (DN), which makes decisions together with NVE in compliance

²¹ The King in Norway does not really have political power, this is a formality and it is the government which in reality decides. It has to be an extremely especial case for the King to go against the decision of the government.

²² Author's own translation from Norwegian.

with the Master Plan. If there are disagreements concerning decisions, the Ministry of Environment makes the decision in concordance with the Ministry of Petroleum and Energy. The Master Plan is today under revision and it is suggested to abandon the Plan in order to be able to implement the Water Framework Directive (*EUs vanndirektiv*) introduced by the EU, which aims to secure the water quality in all watersheds and watercourses through integral management of all water resources in the country. However this is yet to be fully elaborated and implemented. (DN 2010b; NVE 2009; St.meld.nr. 37 (2000-2001))

Another important consequence of the construction of the Alta Dam was the further elaboration and continuation of the Protection Plan for Watercourses (*Verneplan for vassdrag* – the Protection Plan). The Parliament has adopted four Protection Plans in the years 1973-1993. This plan is binding and is currently protecting 388 watercourses or parts of watercourses, the last ones added in 2009. The requirements for protecting a watercourse is that the watercourse represents a variety of protective interests and watercourses; some needs to be of significant size; should be dispersed all over the country, however with the priority of central watercourses with significant value to the population; that the energy need is covered without extensive economic sacrifices; avoid other interventions in the protected areas which may reduce their value of environmental protection and for recreational purposes (St.meld.nr. 37 (2000-2001):19-20; DN 2010c).

These plans are all important in the current regulation of the hydro power industry and were further elaborated on, or came as a result of the environmental controversies which came to the surface in the Alta Dam case.

The Alta Dam case did not have direct implications for policies regarding social consequences of hydro power projects, not considering the implications the case had to the Sámi people, which will be treated separately. The direct social consequences of hydro power in Norway are rather limited due to the location of the projects are usually in uninhabited mountainous areas. There has been no relocation of people, and the social consequences are considered to be that of loss of leisure activities like salmon fishing and hiking possibilities. Thus the social consequences are related to the environmental consequences, and are treated as such. There has not been the need of defining affected people and construct resettlement schemes, accordingly institutions related to this do not exist in Norway to my knowledge. However, the energy companies are obliged to pay compensation to the municipalities affected by the

project, as well as to provide the municipalities affected with up to 10% of the energy the municipality need the energy. (OED 2008:33)

6.4.2 *The case of the Alta Dam and its consequences for the Sámi people*

The implications of the Alta Dam case for Norwegian policies and politics concerning the Sámi people have been important. Historically the Sámis have been subdued to rather discriminating and racist policies, laws and perceptions carried out by the Norwegian state and society, considering the Sámis to be “subordinate” to the Norwegians. There have been laws that amongst other things demanded the Sámis to use only Norwegian as their official language, also within the educational system, preferably abandon traditional customs and become “good Norwegians” and demanding oral and written Norwegian language skills as a prerequisite for buying land (Hjorthol 2006). This started to change slowly after the WWII, because it was no longer possible to talk legitimately of superior races and people in neither Norway nor Europe. During the end of the 1960s education in Sámi language was implemented and the Sámis organised themselves in the Norwegian Samí League (Hjorthol 2006). In 1970 the organising against the inundation of the Masi village by the Alta Dam project began, and this was the start of a chain of events which would change the Sámi rights in Norway.

The case brought to the surface the question of the rights to land and resources which the Sámis had traditionally occupied and used, as well as the issue of consultation when plans which would affect the livelihoods of and use of resources by the Sámis were proposed. The rights of the Sámis were constitutionalised as a consequence of the focus the case brought on the rights or lack of rights of the Sámis at the time. The rights of the Sámis concerning their right to develop their language, culture and society was added to the Norwegian Constitution in 1988 (Norge 1988), and the Sámi Act was put in force in 1989 (Norge 1987) which also stated the establishment of the *Sámediggi* (Sámi Parliament).

In 2005 the Finnmark Act was passed which gives the management responsibility of the land and natural resources traditionally used by the Sámis to the Finnmark Estate (*Finnmarkseiendommen*), which is a legal subject located in county of Finnmark. The Finnmark Act is through the Finnmark Estate to secure that the county of Finnmark is managed in a balanced and ecological sustainable manner in the best interest of its inhabitants, and in particular with respect to the Sámi culture, reindeer herding, use of non-

agricultural land (*utmark*)²³, business and industry, and communities. It gives the citizens of Finnmark special rights to the natural resources through salmon fishing, cutting of firewood and extraction of peat to household use, collection of eggs and down etc in their respective municipality. However, the Act does not interfere with collective or individual rights achieved through the historical use or claims to the use of land and resources by the Sámis or others in the county. The Act is also subordinated to the C169. The Finnmark Estate is managed by a board of six persons who all have to be citizens of Finnmark county, elected by the Sámediggi and the Finnmark County government. The Sámediggi has an active part in the decision making by the Finnmark Estate, and is to be consulted and to approve cases which affect Sámi interests (Norge 2005).

The case of the Alta Dam also had implications internationally. The way the Sámis were treated in the case got international attention, especially since Norway had taken the initiative to promote the rights of indigenous peoples nationally and internationally in the UN in 1979. The way the Sámis rights were treated in the case of the Alta Dam did not correspond well with this, and in the wake of the conflict and the emerging recognition of Sámi rights, the Norwegian government was amongst those taking the initiative to reform the already existing ILO Convention 107 on the rights of indigenous people. Emerging from this work was the ILO C169 the Indigenous and Tribal Peoples Convention, which was adopted in 1989 and is currently signed by ratified by twenty countries (as of February 2009), amongst those Norway and Brazil (ILO 2009). The C169 states the rights of indigenous peoples to the land and resources which they traditionally occupy and also defines the term indigenous peoples.

6.5. Analysis and discussion: how changes was possible in a historical perspective

The hydro power sector in Norway has been developed over 100 years under democratic governments (except for five years during the WWII when the country was in a state of war). The sector has been under a protectionist policy agenda in which the control and ownership of the State has been important, privatisation and outsourcing of resources has been viewed as a threat to the social democratic public welfare system which has been developed in Norway during the second part of the 20th century. This period is seen as the industrial development era of Norway and hydro power is considered one of the components which made this

²³ *Utmark*: land which is managed and may be harvested in one way or the other, but which do not need year round attendance and which largely maintains itself, example a forest where you may extract timber or use as pasture in the summer, but do not need to fertilize or cut the grass in order to maintain it.

industrial development as well as the development of the welfare state possible. The Norwegian social democratic system is based on the high public spending on public services like health care, social security systems, education, infrastructure and subsidies to particular industries, as well as high taxes.

Until the late 1960, the development of the sector was rather uncritical regarding the social and environmental impacts which were brought on by the exploitation of waterfalls and rivers. Social consequences were considered positive as the increased supply of energy contributed to employment in the industry, industrial export and increased national budgets. Rivers in water pipes leading into power plants were perceived as a sign of development and modernity. However this changed during the 1960s, with the increased focus on environmental protection as a consequence of the establishment of the Law of Environmental Protection and the restructuring of the *Naturvernforbundet* which made the organisation more visible to the public. The visual aesthetic effects of the expansion of the hydro power sector were also starting to appear, as more and more waterfalls disappeared and were replaced by pipelines. The environmental effects of the industrial development was also starting appear both in Norway and in Europe with regard to polluted air and water. This contributed to an increased awareness of environmental protection and that the industrial expansion had its costs.

At the same time as the first protest against construction of large hydro power projects appeared in the beginning of the late 1960s and the beginning of the 1970s, Norway discovered large oil deposits to be explored in the North Sea which were further explored and exploited during the 1970s. After the Alta Dam case in the end of the 1970s and the beginning of the 1980s, the era of great hydro power projects in Norway were over and the environmental institutions were improved. However by the time of this improvement, Norway had exploited most of its hydro resources and the main energy demand was saturated and the need for new large projects was not pressing. Thus the institutions regarding environmental consequences were developed after the great hydro power expansion in Norway. It is possible to question if this would have been possible to the same extent without the discovering of the oil deposits and the shifting focus from hydro power to oil as energy source, export commodity and income generator to support public spending. The need for a further expansion of the hydro power sector in Norway was not as pressing in the name of industrial

development and as income generator as oil was more profitable than hydro power and new technology was making the exploration and extraction of oil from sea deposits possible.

The significance of the Alta Dam case for the Sámi people and the emergence of institutions securing the rights of the Sámis cannot, however be underestimated. Though after the WWII the politics towards the Sámis had changed as it was not legitimate to talk publicly of superior races and cultures, at least not within Europe. Hence the rights of the Sámis were starting to be addressed in the legal system, and the appearance of the case of Alta Dam addressed the situation of the Sámis to the public. Most Norwegians were naïvely unaware of the degree of racist and discriminating treatment of the Sámis the Norwegian State had conducted and promoted during centuries. The attention the Sámis attracted regarding their lack of rights and as subjects to discriminating behaviour stirred the consciousness of the politicians and the public, it also attracted international attention which was embarrassing to the Norwegian government which recently had been promoting the rights of the indigenous people in the UN system. Additionally the emerging awareness of environmental concerns and environmental activists, started to look upon the Sámis as allied in the fight to protect and preserve the environment, as they were perceived to live in and of the nature as reindeer herders, to a greater extent than the industrialised society. This gave both the Sámis and other indigenous groups around the world living under similar conditions, an emerging legitimacy in the environmental organisations nationally and internationally, which in turn gave an increased focus to the conditions indigenous people were living under and the historical discriminating treatment they had been given over centuries.

Chapter 7: Conclusion

In this chapter I will conclude by draw on the main findings of similarities and differences within the hydro power systems in Norway and Brazil, and use the Belo Monte project and the case of the Alta Dam project as exemplifying those.

7.1. The perception of environmental and social consequences in Brazil and Norway

It is necessary to clarify the general perception of environmental and social consequences in relation to hydro power in Brazil and Norway. Today these perceptions have different meanings in the two countries, related to historical, demographical and topographical differences. The perception can be viewed as attributes of the resource within the framework, as it will be reflected in how the agents perceive the attributes of the resource and accordingly the agents' choices of technology and interaction and in the institutions. This is important to be aware of when discussing the policies and regulations which exist in order to understand the evolution of policies, as well as the controversies related to the issue of hydro power in each country.

Norway has largely constructed its hydro power projects in mountainous areas with natural lakes and waterfalls with high falls and little or no permanent settlement. The effects on human activity in these areas have mostly been restricted to leisure activities like fishing, especially salmon fishing, picking of berries and hiking. In some areas loss of parts of the pasture for reindeer and summer pasture for sheep and cattle has been a problem, and in relation to this activity the old mountain cottages used by people herding the stocks have been lost, although except for the reindeer farmers, this has not had much significance as to the farmers' income or livelihoods. There has been no need for resettlement of people during the development of the Norwegian hydro power sector, and few directly and perceivable negative impacts on peoples' livelihoods.

Also in relation to environmental effects, the consequences have been different from these in Brazil. There have been effects to the fish stocks in rivers, especially to the salmon, and there has been inundation and loss of valuable ecological habitats, but because of the differences in climatic and ecological conditions between Norway and Brazil, there has not been the diversity of flora and fauna affected that you will find in Brazil. This is a consequence of the

different types of ecosystems in the two countries, tropical ecosystems are more diverse in species than the arctic ecosystems you find in Norway, though they are both vulnerable and unique. Despite of the fact that areas affected in Norway may be of high ecological importance, the forest areas and the ecosystems are easier to map because of the limited number of species, and it is accordingly easier to assess effects and establish preventive measures. What is more emphasised in Norway is the loss of aesthetical and recreational landscapes like waterfalls, rivers and hiking areas and the value of nature itself as “cultural landscapes” which implies the historical, recreational and aesthetic value of the nature for people. Because of this experience with hydro power projects in Norway, we distinguish rather strictly between social and environmental consequences in relation to hydro power: social consequences are loss of recreational and leisure activities; and environmental consequences are loss of aesthetical landscapes, but also consequences for flora and fauna and especially wild salmon stocks have been assessed as important. The salmon has been considered important based on the fact the Atlantic salmon has become extinct in several countries where it originally was found, and Norway is one of four countries which is considered to still have a viable stock of Atlantic salmon which should be protected (WWF 2010). Additionally salmon fishing as recreational activity in Norway and as an indicator on the quality of water and river systems are emphasised as important.

As explained in section 5.1.1., when reviewing literature and conducting interviews, I realised that the perceptions in Brazil and in Norway are different concerning social and environmental consequences. There will not be strictly divided into two categories as in Norway, but rather referred to as socio-environmental consequences in Brazil.

7.2. The experiences of Brazil and Norway

Although the two cases appear at different times and in countries with very different political and cultural history there are some similarities:

- the concern of negative social and environmental outcomes
- the locations in environmental vulnerable areas
- the concern of negative outcomes to indigenous peoples
- the uniting of the social and environmentalist movements with the indigenous communities

- the projects as part of the governmental development plans to meet prospected future energy demand

There are also some distinctions however:

- the current knowledge of socio-environmental impacts of hydro power projects
- the extensive environmental institutions already developed in Brazil which Norway developed as partly a *consequence* of the case of the Alta Dam
- the current existence of international and national institutions with regards to indigenous peoples' rights, especially C169
- the possibility for Brazil to take advantage of existing technology of renewable energy like solar- and wind energy as an alternative energy source to hydro power

Furthermore, differences in political history as well as level of social and economical development are important when comparing the two cases and the two countries. When the case of the Alta Dam appeared in Norway, the country had experience a big leap in industrial, social and economical development since the WWII, to a great extent due to the development of the hydro power resources and under democratic governments. Norway was no longer considered as a poor country by European standards, and the immediate energy need was met. The discovering of oil also shifted the focus from hydro power energy as main source of income to the State, to that of developing and exploiting the oil resources which became more prevalent than that of hydro power. When the Alta Dam project lead to such big controversies related to environment, social consequences and Sámi rights, the government could afford to improve the regulation on hydro power, establish the Master Plan for Water resources and elaborate the Protection Plan for Watercourses, without risking the further industrial and economical development of the country. This situation has continued until today with the main focus on developing the oil sector, because of the economical situation of Norway today, the country can today also afford to develop other sources of renewable energy, such as wind energy, solar energy (though not very much suitable for the Norwegian climate as main energy source), and wave energy. However this technology is still under development, expensive and introduces other environmental and social concern than hydro power. Brazil is following a different trajectory, involving a different pattern of interaction between key agents. Brazil is currently still developing the hydro power industry with a large remaining potential to be exploited, and with much of the institutions in place with regards to regulating the hydro power industry in relation to socio-environmental consequences. These were partly

passed as a consequence of the negative socio-environmental outcomes the hydro power projects conducted during the dictatorship in the 1970 and beginning of the 1980s, like the Tucuruí dam. However, Brazil is currently not even close in an equal economic and material distribution between the citizens of the country, and the government has presented the PAC program as a component in reducing this gap. In the PAC program, energy is an important contributor to this reduction, and hydro power in particular as it is renewable energy considered to be environmentally friendly, the Belo Monte project is presented as one of the main energy supplier planned in the PAC program. The program also considers alternative energy sources like biomass and wind energy, but this is considered to be very expensive. Solar energy is also an alternative which could be explored today, but according to Aneel this is estimated to be 20 times more expensive and cover an area of 200 km² (Aneel 2007). However, today the Brazilian government has the possibility of exploring new energy technology aiming to replace the current dependence on hydro power, which was not a possibility when the Alta Dam project was planned and constructed. But as the Belo Monte project is presented in the PAC as one of the main suppliers of energy in the coming years, it may seem like the government already has decided to carry out the project, no matter the socio-environmental outcomes.

The concern with negative social and environmental outcomes is present in both cases, and is what creates and created the great opposition against the projects. However, when the Alta Dam was constructed, the knowledge of negative environmental outcomes were still not universally accepted, and the environmentalist movement were still emerging, claiming the negative outcomes of inundating large areas, and decreasing water levels of the river in others. This knowledge is widely known today and universally accepted through for example the World Commission on Dam's report on social and environmental consequences. The Brazilian agents involved in hydro power projects in the country including the Belo Monte, are fully aware of this, but are still neglecting to take the full responsibility of the outcomes for affected people and the environment. The environmental movements in Brazil are, as in the case of the Alta Dam in Norway, trying to bring the socio-environmental outcomes as the vector which paralyzes the project. This did not work in the case of the Alta Dam and it does not seem to work in the case of Belo Monte. In the case of the Alta Dam, the environmental movements allied with the Sámi community in order to bring new and weighty arguments to stop the project into the discourse. Bringing the indigenous communities and the outcomes a dam would have on their livelihood into the debate, changed the discourse from a pure

environmental discourse, into a polemic also involving human rights, discrimination and racism. This did not manage to stop the construction of the Alta Dam, but it contributed in the change and improvement of the rights of the Sámis in Norway. The same methods are pursued in the case of Belo Monte where environmentalist movements ally with the indigenous communities in bringing together social and environmental arguments. However, if this will succeed in Brazil seems disputable when looking at how the process is evolving. One of the reasons may be that the indigenous people in Brazil tends to be perceived as a component of the environment, rather than communities living with and of the environment. Accordingly where the argument of discrimination against the Sámi community as a indigenous group subject to centuries of discrimination appealed to the Norwegian government as well as people, the argument of negative outcomes of indigenous peoples in Brazil tend to be perceived as another environmental argument.

The institutions in regards to the rights of the indigenous peoples were not in place in Norway during planning and construction of the Alta Dam, but came as a consequence of the project and are currently implemented in the institutional framework under which the hydro power sector operates. The C169 were also evolving partly as a consequence of the Alta case with the Norwegian government and Sámi as active participants in the formulation, but the government were not bound by such institutions at the time of the construction of the dam. Brazil on the other hand, has also ratified the C169 and is currently bound by the Convention, and has additionally incorporated the there are rights of the indigenous people to their land they traditionally occupy into the 1988 Constitution, Article. 231, however, the article also states that the hydro resources found on indigenous territories are State property. Because of the paradoxical relationship within the Article 231 and between Article 20 which states that the indigenous territories are State property, the actual rights to the land may be interpreted in different ways depending on the agent and the agents' motivation.

With regards to the institutions concerning indigenous peoples' rights, both countries have ratified the C169 and have to implement the Convention also when indigenous interests come in conflict with larger-scale national development. The rights of the Sámis and the indigenous peoples in Brazil are also constituted into the constitutions of the respective countries. But the implementation is different, the Norwegian Sámis have an advantage in having the *Sámediggi* representing them officially as a part as a part of the institutionalised representative democracy, whilst the indigenous communities in Brazil do not have such a unified

representative body. The indigenous communities in Brazil are dependent on making themselves heard in Public Hearings or consultations held by governmental agencies or hydro power companies. This can be considered as being in line with the participatory democracy which Brazil is pursuing, and in which the citizens are encouraged to participate in the decision making, by giving their opinions and suggestions when decisions are being made. However this does not seem to be functioning as opted for. One of the reasons may be that the indigenous communities in Brazil are considered to be represented by Funai, which is a governmental agency which by no means is elected by the indigenous communities. Funai is conducting the consultation which is institutionalised through the C169 and the 1988 Brazilian Constitution. However, a consultation does not necessarily mean that you are heard, as Pretty et al. (1995 in Kambani 2005) stated that a consultative process does not grant any share in decision-making and the professionals are under no obligation to take on board people's opinions and suggestions. However, by being consulted by Funai, the communities are considered to be heard and being part of participatory process, the way the consultation is structured today, may also be seen as an advantage by some agents. As Pretty (in Cornwall and Pratt 2003: 171) point to: *"Most professional agencies would probably like to keep things towards the consultative end of the spectrum, as it means controlling power."* Giving up this power to a representative organ like the Sámi Parliament, which will be much more professionalized and changing the patterns of interaction radically, may seem intimidating to many in Brazil.

Another aspect which influences the optimal participation is information. Optimal participation requires to be well informed through information and knowledge (technology) which can be hard and costly to obtain. In relation to hydro power, this would be amongst other things through the EIA/RIMA and Public Hearings, where representatives from the government and hydro power companies come to inform as well as to hear the communities out. As the information in the EIA/RIMA is extensive and technically difficult to understand, it may be difficult to obtain this information, additionally, the information is in written Portuguese – not everyone in the indigenous communities in Brazil are literate or speak Portuguese. Hence to obtain the information is difficult, and the oral information given in the Public Hearings, may be selective and limited depending on the presenting agents choices and interests. When identifying this problem of participation in the Public Hearings, an institutionalised representative organ like the Sámi Parliament (*Samediggi*) may be more functional and democratic. Such an organ requires less cost in gathering information and

would be more unifying and give a stronger voice to the claims and suggestions of the communities.

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Appendices

1.1. Interview guide for NGOs and researchers

Interview no: _____ Date: _____
Recording no: _____ Location: _____
Organisation: _____
Organisation's field of interest: _____
Name of respondent (voluntary): _____
Respondents position in organisation: _____

Environmental issues:

1. What do you/your agency consider possible environmental impacts resulting from dams?
- O que considera a agencia/instituição como possíveis impactos ambientais de barragens? Por que?
2. Do you know what hydro electric companies do to diminish environmental impacts?
- Você sabe que os empresas de hidroeletricas fazem para diminuir os impactos ambientais?
 - a) Do you think hydro electrical companies take sufficiently environmental considerations when planning dam constructions and during construction of dams?
Why/why not?
- Você acha que os empreendedores/empresas de hidroeletricas estão fazendo suficiente considerações ambientais no planejamento de inventarios e durante a construção de aproveitamentos/barragens?
3. Do you know if local people in areas affected by dams are consulted during planning and construction phase?
- Você sabe se as moradores nas comunidades/povos afetadas de construção do barragens estão consultadas sobre os assuntos/impactos ambientais no fase de planejamento e construção?
 - a) If yes, do you know who in the community is consulted, how, when and by whom?
- Se sim, quien na comunidade esta consultadas, como, quando no proceso e de quien?
 - b) If no, why do you think they are not consulted?
- Se não, por que não você acha?
 - c) If no, do you think they should be consulted?

- Se não, você acha que deveriam ser consultadas no fase de planeamento e construção? Por que/por que não?
4. Do you know how the responsible government agency secure that the hydro electrical companies abide the environmental requirements, both in the dam proposals and during dam construction? Explain.
 - Você sabe o que procedimentos as agencia governmentais tem para controlar/segurar que a industria hidroeletrica esta suportando os requisitos ambientais no inventarios, no EIAs e durante a construção? Explicar.
 5. Do you know if there are any sanctioning procedures from the governmental agencies if the energy company do not follow the environmental regulations?
 - Você sabe quais são os medidas para corrigir ou que tipo de sanções as agencias governmentais tem se o empreendedor não seguiria os requisitos ambientais no inventario do aproveitamento, no EIA e na construção do barragens?
 - a) If yes, do you know how they are implemented?
 - Se sim, você sabe como estão implementados aos empreendedores? Explicar.
 - b) If yes, do you know how the hydro electrical companies respond to these sanctions and how they correct their mistakes? Explain.
 - Você sabe como respondem os empreendedores á sanções e como estão corretando faltas ambientais no inventario, EIA e no contrução do barragen? Explicar.
 - c) If no, why do you think there are no sanctioning procedures?
 - Se não, por que você acha que não existe sanções?
 - d) If no, do you think there should be any sanctions? Why and what kind?
 - Se não, você acha que deveria existir sanções? Por que e que tipo?
 6. Which stakeholders do you considered exercising influence over the governmental agencies in power to supervise the hydro power industry, and over the hydro power industry itself?
 - Existem grupos com intereses no desenvolvimento da hidroenergia que tem influencia sobre os agencies governmentais que estão regulando os diretrizes e requisitos ambientais e sobre a industria de hidroenergia?
 - a) Why do you think these stakeholders have influence?
 - Por que você acha que estos grupos tem influencia?
 - b) How do they interact with each other and what kind of influence do they exercise?
 - Como interagem um com o outro e que tipo de influencia tem?

Social impacts:

7. What do you consider social consequences by dam building? Why?
 - O que esta considerado pelo agencia como consequencias sociais no construção do barragens? Por que?
8. What do you consider acceptable social consequences by dam construction? Why?
 - Quais consequencias sociais estão considerando como aceitavel no construção do barragens? Por que?
9. What do you consider unacceptable social impacts by dam construction? Why?
 - Quais consequencias sociais estão considerando como inaceitavel no construção do barragens? Por que?
10. Do you know which governmental requirements exist to diminish social impacts by dam construction?
 - Você sabe quais são os requisistos e diretrizes governamentais que os empreendedores precisa seguir para regular e diminuir impactos sociais no construção da barragens?
 - a) Do you think these requirements are sufficient? Why/why not?
 - Você acha que estos requisitos e diretrizes são suficientes? Por que/por que não?
 - b) What requirements/considerations do you think should be added?
 - Quais requisitos/consederações deveria ser suplementados? Ou que você acha deveria ser modificado?
11. Do you know which tools the energy companies and the government use to measure social impacts by dam construction? What are they?
 - Você sabe quais são os procedimentos governamentais e de as empresas hidroeletricas para medir quais impactos sociais estão acontecendo nas areas afeitados do aproveitamento? Quais são?
 - a) Do you think these measurements are good enough? Why/why not?
 - você acha que estos procedimentos são suficientes? Por que/por que não? O que você acha deveria ser modificado?
12. Which tools do your agency have to measure what social impacts is occurring in areas affected by dam construction?
 - Quais são os procedimentos que sua agencia tem para medir quais impactos sociais estão acontecendo nas areas afeitados do aproveitamento? Quais são?
13. Do you know how the governmental agencies control that hydro electrical companies abide by the social requirements by dam construction?

- Você sabe como as agencias governamentais estão controlando se os empreendedores estão acatando os requisitos para diminuir impactos sociais na construção de o aproveitamento/a barragem?

14. Do you know if there are any sanctioning procedures if the hydro electrical company do not abide the regulations?

- Você sabe se existem procedimentos de sanções que as agencias governamentais podem impor aos empreendedores que não estão seguindo/acatando os requisitos para diminuir os impactos sociais?

a) If yes, what are they?

- Se sim, quais são?

b) If no, why do you think there are no sanctions?

- Se não, por que acha você que não existe sanções?

c) If no, do you think there should be any sanctions?

- Se não, você acha que deveria existir sanções? Por que?

15. Do you know if local people in areas affected by dam construction are consulted and asked for opinions and experiences concerning possible social consequences during the planning and construction phase of dams?

- Você sabe se as comunidades/povos afetadas pela construção do aproveitamento, estão consultadas no proceso de planejamento e construção de barragem sobre as efeitos sociais que poderiam acontecer e também suas experiências durante o planejamento e construção?

a) If yes, who are consulted, when, how and by whom?

- Se sim, quem na comunidade/povo esta consultada, como, e quando no proceso e de quem?

b) If no, why do you think not?

- Se não, por que não você acha?

c) If no, do you think they should be consulted? Why/why not?

- Se não, voce acha que deveria ser consultadas? Por que/ por que não?

16. Do you think the identification process of who is affected by the dam are sufficient? The way the government define the three categories of areas affected by directly affected, indirectly and directly influenced?

- Voce acha que o proceso de identificar as pessoas atingidos são suficiente? Por que/por que não?

- Você acha que o jeito que o governo e os empreendedores definam as áreas atingidas como AII – Área de Influência Indireta, AID – Área de Influência Direta e ADA – Área Diretamente Afetada são suficientes? Por que/por que não?

17. Do you think the government and the hydro electrical companies have any responsibility and obligations concerning people affected by dams?

- As agências governamentais e as empreendedores/empresas hidroelétricas, têm algum tipo de responsabilidade ou obrigação para as pessoas afetadas pelos barragens construídos pela empresas?

a) If yes, why?

- Se sim, quais são?

b) If no, why not?

- Se não, por que não você acha?

18. Do you know if there exist any governmental policies as well as policies by the hydro electrical companies concerning resettlement of people displaced by dams?

- Você sabe se existe políticas governamentais e de as empresas hidroelétricas no respeito de pessoas deslocadas e reassentamento por aproveitamentos?

a) If yes, what are they?

- Se sim, quais são?

b) How does resettlement take place?

- Como faz o reassentamento?

c) What are the criteria for resettlement camps?

- Quais são os critérios para a terra selecionada para reassentamento? Fertilidade do solo, abastecimento/acesso da água para consumo e irrigação, acesso a escolas e hospitais no comparação com a locais anteriores etc...

d) Do the government or hydro electrical company contribute with infrastructure, water, schools, hospitals and other public services in the new settlements?

- Contribuem o governo e/ou as empreendedores/empresas de hidroelétricas com infraestrutura, abastecimento da água, escolas, hospitais ou outros serviços sociais no lugares de reassentamento?

e) Do you think the government and the hydro electric companies do enough to help resettling people? What do you think are missing or should be added?

- Você acha que o governo e as empresas hidroelétricas fazem suficiente para ajudar as pessoas deslocadas e com o reassentamento de as pessoas? O que você acha está faltando e precisa modificar/adicionar?

f) If no policy on resettlement, why do you think not?

- Se não, por que você acha que não existe política de reassentamento?

g) Do you think there should be a policy on resettlement of displaced people?

- Se não política de reassentamento, voce acha que deveria ter uma política de reassentamento de as pessoas deslocadas pelo aproveitamento? De governo ou empreendedor?

19. Do you know what policies exist within governmental agencies and hydro electrical companies concerning paying compensation for loss of agricultural land, fisheries, income, cultural/religious sites and deteriorate of local environment due to pollution on dam construction site?

- Qual é a política de as empreendedores a respeito de pagar indenização por perda de terra agrícola, peixarias, renda, danos a lugares importantes culturais e religiosos e em general a deterioração e poluição no area da construção da aproveitamento?

a) If yes, what are they?

- Se sim, quais são?

b) Which criterions have to be fulfilled to be entitled compensation? Which affects and losses must one be subject to?

- Quais são os requisitos para ter direito a indenização? Quais são os afeitos e perdas para ter direito de indenização?

c) How is it paid and when?

- Como se paga a indenização e quando?

d) Do you think the government and the hydro electric companies do enough to pay compensation to people affected by dams? Do you think something should be changed or added?

- Você acha que o governo e as empresas hidroeletricas fazem suficiente para pagar indenização as pessoas afeitadas de as barragens? Você acha que deveria modificar/adicionar algo?

e) If no policy on paying compensation, why do you think not?

- Se não há uma política de pagar indenização, por que não?

f) Do you think there should be a policy on paying compensation to people affected by dam construction? Why/why not?

- Se não existe uma política de pagar indenização, voce acha que deveria ter uma política sobre isso? Por que/por que não?

20. Which stakeholders do you think may influence the governmental agencies and the hydro electrical companies and their regulations and procedures on social consequences?

- Quais são os grupos com interesses no desenvolvimento da hidroenergia que tem influencia sobre os agencies governamentais que estão regulando os diretrizes e requisitos sobre consequencias sociais e as empresas de hidro energia?

a) Why do you think these stakeholders have influence?

- Por que acha que estos grupos tem influencia?

b) How do they interact with each other and what kind of influence do they exercise?

- Como interagem um com o outro e que tipo de influencia tem?

c) How can your agency influence the governmental agencies and the hydro electrical companies and the regulations concerning social impacts?

- Como pode sua agencia influir as agencies governamentais e as empresas hydro eletricas e as regulações no respeito de impactos sociais?

Indigenous Rights issues

21. Do you know if the indigenous peoples' rights according to ILO 169 and the 1988 Brazilian Constitution Art. 231 are incorporated into the regulatory framework and procedures of the concession giving process to hydro electric dams?

- Você sabe como incorporam as agencies govenmentais os direitos de os povos indigenas ao terra e recursos naturais no conformidade do Convenção 169 de OIT e a Constituição Brasileiro da 1988, Art. 231, no diretrizes a procedimentos no planeamento e construção de aproveitamentos/barragens?

a) If yes, how?

- Se sim, como?

b) If it is not incorporated, why do you think so?

- Se não, por que não você acha?

c) If not incorporated, do you think indigenous rights should be incorporated in the regulatory framework?

- Se não incorporados, você acha que os direitos de os povos indigenas deveria ser incorporados no diretrizes e os quadro/esquema de regulação?

22. Do you know if there are any criterions to especial considerations for indigenous peoples' rights in the concession giving process?

- Existe alguns criterios do parte de governo para considerações especiais a respeito de direitos a terra e recursos naturais de os povos indigenas, quais o empreendedor precisa seguir/considerar no planejamento de inventario e construção de o aproveitamento?

a) If especial criterions, what are they and how are they implemented in the concession giving regulations and procedures?

- Se sim, quais são e como deveria executar/implementar – lhes no projeto de aproveitamento?

b) If no criterions, why do you think so?

- Se não, por que acha que não existe?

c) If no criterions, do you think there should be some?

- Se não, você acha que deveria existir considerações especiais a respeito de direitos de os povos indigenas? Por que/por que não?

23. Which control mechanism do you have to control that indigenous peoples' rights are abided by during the planning and construction of dams?

- Quais medidas existe para assegurar que os direitos dos povos indigenas ao terra e os recursos naturais estão acatados no planejamento do inventarios e a construção de os aproveitamentos?

24. Which control mechanism do the government and the hydro electrical companies have to control that indigenous peoples rights' are abided by during the planning and construction of dams?

- Você sabe se existe mecanismos de contol do parte do governo e das empresas hidroelétricas para supervisionar/fiscalizar que os direitos de os povos indigenas são acatados no planejamento e construção de os aproveitamentos?

a) Do you think this control is sufficient? Why/why not?

- Você acha que este superisão está sufieciente? Por que/por que não?

b) If not, how do you think it can be improved?

- Se não, como você acha que deveria ser aperfeiçoado?

25. Do you know if there are any sanctions applied if the energy company do not abide by indigenous peoples' rights in the planning and construction of dams?

- Existe sanções governmentais se o empreendedor não suporta/acata os direitos de os povos indigenas no planejamento de inventario e a construção do aproveitamento/barragen?

a) If sanctions, which and how they implemented?

- Se sim, quais são e como se implementam?
 - b) If sanctions, how do hydro electric companies respond to such sanctions?
 - Como respondem os empreendedores/empresas hidroeletricas a estas sanções no seu projetos?
 - c) If no sanctions, why do you think so?
 - Se não, por que não voce acha?
 - d) If no sanctions, do you think there should be sanctions? Why and what should they be?
 - Se não, voce acha que deveria ter sanções? Por que/ por que não? e quais?
26. Are indigenous peoples consulted in accordance with the ILO 169, Art 6 in the concession giving process, and in the development of construction and implementation plans for dams?
- São os povos indigenas consultados no conformidade com a Convenção 169 de OIT, Art. 6 no no estudos de inventario e no proceso de licenciamento?
 - a) If no, why do you think not?
 - Se não, por que você acha?
 - b) If no, do you think they should be consulted? Why do you think so?
 - Se não, você acha que deveria ser consultadas? Por que acha asi?
 - c) If yes, how and when in the process are they consulted? By whom?
 - Se sim, como e quando eles são consultados? De quien?
 - d) Are their opinions taken into account in the concession giving process?
 - If yes, how?
 - If no, why?
 - Seus opiniões são consideradas na aprovação de a EIA/RIMA e ao licenciamento previa?
 - Se sim, como?
 - Se sim, por que?
 - e) Do you think they are sufficiently consulted? Why/why not?
 - Você acha que eles são suficiente consultadas? Por que/ por que não?
 - f) How can the consulting procedures be improved?
 - Como você acha o proceso de consultação deveria ser aperfeiçoado?
27. Which stakeholders do you think may influence the governmental agencies and their regulations and procedures for the hydro power industry concerning indigenous peoples' rights, as well as over the hydro power industry?

- Quais são os grupos com interesses no desenvolvimento da hidroenergia que tem influencia sobre os agencies governmentais que estão regulando os diretrizes e requisitos sobre consequencias sociais e as empresas de hidro energia?

a) Why do you think these stakeholders have influence?

- Por que acha que estos grupos tem influencia?

b) How do they interact with each other and what kind of influence do they exercise?

- Como interagem um com o outro e que tipo de influencia tem?

c) How can your organisations influence the governmental agency and their regulations and procedures for the hydro power industry concerning indigenous peoples' rights?

- Como pode sua agencia influir as agencies governmentais e as empresas hidroelectricas e as regulações no respeito dos direitos de os povos indigenas?

1.2. Interview guide for governmental organs:

Interview no:

Date:

Recording no:

Location

Agency:

Name of respondent (voluntary):

Respondents position within agency:

Environmental issues:

1. What is the position/task of your agency within the issue of hydro power and environment regulations of the industry?
 - Qual é a posição/trabalho de sua agencia em relação ao assunto de hidropower e regulação no respeito do meio ambiente?
2. What do you/your agency consider possible environmental impacts resulting from dams? Why?
 - O que considera a agencia como possiveis impactos ambientais de barragens? Por que?
3. What kind of governmental requirements and regulations to diminish environmental impacts by dams exists within the concession process in respect to dam building proposal?
 - Quais diretrizes e requisitos governamentais existem na relação aos impactos ambientais causadas por aproveitamentos/barragens que os empreendedores precisa incluir/considerar no inventario e durante construção do aproveitamentos/barragens?
 - a) What are the environmental impacts included in these requirements?
 - Quais são os impactor ambientais incluidos neste diretrizes e requisistos?
 - b) How are the energy companies supposed to implement them in their dam proposals?
 - Como implementa os empreendedores os requisito ambientais no propositos/inventarios de contrução do barragens?
4. Which procedures do you have to follow up/secure that the industry abide by the environmental requirements both in the proposals and during construction?
 - O que procedimentos tem seu agencia para controlar/segurar que a industria hidroeletrica esta suportando os requisitos ambientais no inventarios, no EIAs e durante a construção?
5. What kind of correction measures/sanctions do you have if energy companies do not follow environmental regulations and how are these sanctions implemented?

- Quais são as medidas para corrigir ou que tipo de sanções tem suas agências se o empreendedor não seguiria os requisitos ambientais no inventário do aproveitamento, no EIA e na construção das barragens?
 - a) How do the hydro electrical companies implement/respond to the corrections?
 - Como respondem os empreendedores a sanções e como estão corrigindo faltas ambientais no inventário, EIA e na construção das barragens?
- 6. Are local people in areas affected by dam construction consulted on environmental issues during the planning and construction phase of dams?
 - Estão consultando os moradores nas comunidades/povos afetadas de construção das barragens sobre os assuntos/impactos ambientais na fase de planejamento e construção?
 - a) If yes, who within the community is consulted, when in the process, how and by whom?
 - Se sim, quem na comunidade está consultado, como, quando no processo e de quem?
 - a) If no, why not?
 - Se não, por que não?
 - b) If no, do you think they should be consulted during planning and construction phase? Why/why not?
 - Se não, você acha que deveriam ser consultados na fase de planejamento e construção? Por que/por que não?
- 7. Which stakeholders do you consider exercising influence over the governmental agencies in power to supervise the hydro power industry and over the hydro power industry itself concerning environmental issues?
 - Existem grupos com interesses no desenvolvimento da hidroenergia que tem influência sobre as agências governamentais que estão regulando os diretrizes e requisitos ambientais e sobre a indústria de hidroenergia?
 - c) Why do you think so?
 - Por que você acha que estes grupos tem influência?
 - d) How do they interact with each other and what kind of influence do they exercise?
 - Como interagem um com o outro e que tipo de influência tem?

Social issues:

- 8. What do you consider/define social consequences by dam building? Why?
 - O que está considerado/define pela agência como consequências sociais na construção das barragens? Por que?

9. What do you consider/define acceptable social consequences by dam construction? Why?
 - Quais consequencias sociais estão considerando/definido como aceitavel no construção do barragens? Por que?
10. What do you consider/define unacceptable social impacts by dam construction? Why?
 - Quais consequencias sociais estão considerando/definido como inaceitavel no construção do barragens? Por que?
11. Which requirements exist to approve or discharge a proposed dam construction projects based on social impacts?
 - Quais são os requisistos/criterios socioambientais no inventario e EIA para aprovar ou negar um aproveitamento?
 - a) Which procedures do you have to secure that the requirements of diminishing social impacts are implemented in dam building proposals as well as during construction?
 - Quais procedimentos tem para assegurar que os requisitos para diminuir impactos sociais são implementadas no inventarios e durante o construção?
12. Which tools do you have to measure/evaluate which social impacts are occurring in areas affected by dam construction? When are these impacts measured?
 - Quais são os procedimentos para medir/avaliar quais impactos sociais estão acontecendo nas areas afeitados do aproveitamento?
 - Cuando estão avaliadas?
13. Which tools do you have to control if the hydro electrical companies abide the requirements of diminishing social consequences during dam construction?
 - Como pode controlar se a companhia esta acatando os requimentos para diminuir impactos sociais na construção de o aproveitamento/a barragem?
14. What sanctioning procedures do you apply if the relevant energy company do not fulfil social impacts requirements?
 - Tem procedimentos de sanções que podem impor aos empreendedores que não esta seguindo/acatando os requisistos para diminuir os impactos sociais?
 - a) If yes, what are they and how are these sanctions applied to the relevant parties?
 - Se sim, quais são e como se aplicam aos empreendedores?
 - b) If yes, how do the relevant parties respond to such sanctions?
 - Se sim, como respondem os empreendedores aos sanções?
 - c) If no, why not? Do you think there should be any sanctions?

- Se não, por que não? Voce acha que deveria ter sanções?

15. Quais são os criterios para ser diretamente atingidos/afetadoa? Por que?

Como se define areas afetadas como AII – Area de Impacto Indireta, AID – Area de Impacto Direto e ADA – Area Diretamente Afetada? Qual é a diferencia entre as duas ultimas categories? Por que este diferencia não são os mesmos?

16. Are local people in the areas affected by dam construction consulted and asked for opinions concerning possible social consequences during the planning and construction phase of dams?

- As comunidades/povos afetadas pela construção do aproveitamento, estão consultadas no proceso de planeamento e construção de barragem sobre as efeitos sociais que poderiam acontecer?

a) If yes, who are consulted, when, how and by whom?

- Se sim, quien na comunidade/povo esta consultada, como, e quando no proceso e de quien?

b) If no, why not?

- Se não, por que não?

c) If no, do you think they should be consulted? Why/why not?

- Se não, voce acha que deveria ser consultadas? Por que/ por que não?

17. How do you define people affected by dams?

Do the government and the hydro electrical companies have any responsibility and obligations concerning people affected by dams?

- Como se define pessoas atingidas? Quais são os criterios para ser atingida? Tem diferentes categorias?

- As agencias governmentais e as empreendedores/empresas hidroelectricas, tem algum tipo de responsabilidade ou obrigação para as pessoas afetadas pelos barragens construidos pela companhia?

a) If yes, what are they?

- Se sim, por que e como?

b) If no, why not?

- Se não, por que não?

c) If no, do you think the government as well as the hydro electrical companies should have any responsibility and obligations towards affected people? Why/why not?

- Se não, voce acha que o governo e as empresas de hidroeletricas deveria ter responsabilidade e obrigação para as pessoas? Por que/por que não?

18. How do you define when people need to be resettled? What policies exist concerning resettlement of people displaced by dams?

- Como se define as pessoas que precisa reassentamento? Quais são os perdas, que sua terra seria alagado ou tambem outras causas?

Quais politicas existe no respeito de pessoas deslocados por aproveitamentos?

a) How does resettlement take place?

- Como faz o reassentamento?

b) What are the criterions for resettlement camps?

- Quais são os criterios para a terra selecionada para reassentamento? Fertilidade do solo, abastecimento/acceso da agua para consumo e irrigação, acesso a escolas e hospitais no comparação com a locais anteriores etc...

d) Do the government or hydro electrical company contribute with infrastructure, water, schools, hospitals and other public services in the new settlements?

- Contribuem o governo e/ou as empreendedores/empresas de hidroeletricas com infraestructura, abastecimento da agua, escolas, hospitais ou outros serviços sociais no lugares de reassentamento?

e) If no policy on resettlement, why not?

- Se não, por que não?

f) If no, do you think there should be a policy on resettlement of displaced people?

- Se não politica de reassentamento, voce acha que deveria ter uma politica de reassentamento de as pessoas deslocadas pelo aproveitamento? De governo ou empreendedor?

19. What policies exist concerning paying compensation for loss of agricultural land, fisheries, income, cultural/religious sites and deteriorate of local environment due to pollution on dam construction site?

- Qual é a politica de o governo no respeito de pagar indenização por perda de terra agricola, peixerias, renda, danos a lugares importantes culturais e religiosos e em general a deterioração e poluição no area da construção da aproveitamento?

a) Which criterions have to be fulfilled to be entitled compensation? Which affects and losses must one be subject to?

- Quais são os requisitos para ter direito a indenização? Quais são os afeitos e perdas para ter direito de indenização?

- b) How is it paid and when?
 - Como se paga a indenização e quando?
- c) If no policy on paying compensation, why not?
 - Se não há uma política de pagar indenização, por que não?
- d) If no, do you think there should be a policy on paying compensation to people affected by dam construction? Why/why not?
 - Se não há uma política de pagar indenização, voce acha que deveria ter uma política sobre isso? Por que/por que não?

20. Which stakeholders do you think may influence the governmental agencies and their regulations and procedures on social consequences?

- Quais são os grupos com interesses no desenvolvimento da hidroenergia que tem influencia sobre os agencies governamentais que estão regulando os diretrizes e requisitos sobre consequencias sociais?

- d) Why do you think these stakeholders have influence?
 - Por que acha que estos grupos tem influencia?
- e) How do they interact with each other and what kind of influence do they exercise?
 - Como interagem um com o outro e que tipo de influencia tem?

21. Which stakeholders do you think may influence the energy company and their internal regulations and procedures on social consequences?

- Quais são os grupos com interesses no desenvolvimento da hidroenergia que tem influencia sobre industria de hidroenergia e seus os diretrizes e requisitos sobre consequencias sociais?

- a) Why do you think these stakeholders have influence?
 - Por que acha que estos grupos tem influencia?
- b) How do they interact with each other and what kind of influence do they exercise?
 - Como interagem um com o outro e que tipo de influencia tem?

Indigenous issues:

22. How do you incorporate the indigenous peoples' rights to land and resources according to the 1988 Brazilian Constitution Art. 231 and the ILO 169 into the regulatory framework and procedures of the concession giving process to hydro electric dams?

- Como está incorporando os direitos de os povos indigenas ao terra e recursos naturais no conformidade do Convenção 169 de OIT e a Constituição Brasileiro da 1988, Art. 231, no diretrizes a procedimentos no planejamento e construção de aproveitamentos/barragens?

23. Are there any special considerations for indigenous peoples' rights to land and resources in the concession giving process?
- Existe alguns criterios do parte de governo para considerações especiais a respeito de direitos a terra e recursos naturais de os povos indigenas, quais a companhia tem que seguir/considerar no planejamento de inventario e construção de o aproveitamento?
 - a) If yes, what are they and how are/should they be implemented?
 - Se sim, quais são e como deveria executar/implementar – lhes no projeto de aproveitamento?
 - b) If no, why not?
 - Se não, por que acha que não existe?
 - c) If no, do you think there should be any special considerations?
 - Se não, você acha que deveria existir considerações especiais a respeito de direitos de os povos indigenas? Por que/por que não?
24. Which control measures do you have to secure that the indigenous peoples' rights to land and resources are abided by during the planning and construction of dams?
- Quais medidas existe para assegurar que os direitos dos povos indigenas ao terra e os recursos naturais estão acatados no planejamento do inventarios e a construção de os aproveitamentos?
25. What sanctions do you apply if the energy company do not abide by indigenous peoples' rights in the planning and construction of dams?
- Existe sanções governmentais se o empreendedor não suportar os direitos de os povos indigenas no planejamento de inventario e a construção do aproveitamento/barragen?
 - a) If yes, what are they?
 - Se sim, quais são?
 - b) How do hydro electrical companies respond to such sanctions?
 - Como respondem os empreendedores/empresas hidroelectricas a estos sanções no seu projetos?
 - b) If no, why do you think not?
 - Se não, por que não voce acha?
 - Se não, voce acha que deveria ter sanções?

26. Are indigenous peoples consulted in accordance with the ILO 169, Art 6 in the concession giving process, and in the development of construction and implementation plans for dams?

- São os povos indigenas consultados no conformidade com a Convenção 169 de OIT, Art. 6 no no estudos de inventario e no proceso de licenciamento?

e) If no, why not?

- Se não, por que não?

f) If no, do you think they should be consulted? Why do you think so?

- Se não, voce acha que deveria ser consultados? Por que/por que não?

g) If yes, how and when in the process are they consulted? By whom?

- Se sim, como e quando eles são consultados? E de quien?

h) Are their opinions taken into account in the concession giving process?

- If yes, how?

- If no, why?

- Seus opiniões são consideradas na aprovação de a EIA/RIMA e ao licenciamento previa?

- Se sim, como?

- Se sim, por que?

27. Which stakeholders do you think may influence the governmental agencies and their regulations and procedures for the hydro power regulations concerning indigenous peoples' rights as well as the hydro power industry itself?

- Quais são os grupos com intereseres no desenvolvimento da hidroenergia que tem influencia sobre os agencies governmentais que estão regulando os diretrizes e requisitos sobre os direitos de os povos indigenas e sobre as empresas de hidro energia?

d) Why do you think these stakeholders have influence?

- Por que acha que estos grupos tem influencia?

e) How do they interact with each other and what kind of influence do they exercise?

- Como interagem um com o outro e que tipo de influencia tem?

1.3. Interview guide for energy companies/agencies:

Interview no:

Date:

Recording no:

Location:

Agency/company:

Name of respondent (voluntary):

Respondents position within agency:

Environmental impacts:

28. What position do your company have within the hydro power sector?

- Qual é a posição de sua companhia em relação de a setor de energia elétrica?

29. What does your agency consider possible environmental impacts resulting from dams?

Why?

- O que considera a companhia como possíveis impactos ambientais de barragens? Por que?

30. What kind of governmental regulations do you have to follow concerning environmental impacts by dams in the dam proposals you present and during construction?

- Quais são os diretrizes e requisitos governamentais a companhia precisa seguir em relação aos impactos ambientais causadas por barragens no inventário e durante construção?

a) What are the environmental impacts included in these requirements?

- Quais são os impactor ambientais incluídos neste diretrizes e requisitos?

b) How do you implement these requirements in your dam proposals?

- Como implementa os requisito ambientais no propositos/inventários de construção do barragens?

31. How do governmental agencies control that you follow the environmental regulations in your proposals for dam construction and during construction?

- Como fazem as agencies governamentais como Aneel e Ibama para controlar que a companhia esta seguindo os diretrizes e requisitos ambientais no inventário, no EIA e durante a construção de barragem?

32. How do governmental agencies respond if you do not follow environmental regulations in your proposal and construction of dams?

- Como respondem as agencies governamentais se a companhia não seguiria os requisitos ambientais no inventário e na construção do barragens?

a) Are you subjects to any sanctions?

- Esta sujeito a sanções?

- If yes, how and which?
 - Se sim, quais e como?
- b) How to do you respond to sanctions and how do you correct failing environmental requirements in your plans and during construction of dams?
- Como responde a companhia a sanções e como esta corretando faltas ambientais no inventario e no contrução do barragen?
- c) If no, why do you think you are not subject to sanctions?
- Se não, por que acha que não esta sujeito a sanções?
33. What kind of environmental policies do your company have to diminish environmental impacts of dams?
- O que a companhia tem como politica para diminuir impactor ambientais de barragens?
- a) If no environmental policy, why do you not have this?
- Se não tem politica ambiental, por que não?
- b) If yes, how do you implement these policies in practice during planning, construction and maintenance of dams?
- Se sim, como esta implementando este politica na pratica de planeamento, construção e manutenção dos barragens?
34. Do you consult local people in the communities affected by dam construction on environmental issues during the planning and construction phase?
- Esta consultando as moradores nas comunidades/povos affetadas de construção do barragens sobre os assuntos/impactos ambientais no fase de planeamento e construção?
- a) If yes, who in the local community is consulted, how, when in process and by whom?
- Se sim, quien na comunidade esta consultadas, como, quando no proceso e de quien?
- b) If no, why not?
- Se não, por que não?
- c) If no, do you think they should be consulted during planning and construction phase? Why/why not?
- Se não, você acha que deveriam ser consultadas no fase de planeamento e construção? Por que/por que não?
35. Which stakeholders do you considered exercising influence over the governmental agencies in power to regulate environmental issues within the hydro power industry, and over the environmental policies of the hydro power industry itself?

- Existem grupos com interesses no desenvolvimento da hidroenergia que tem influencia sobre os agencies governamentais que estão regulando os diretrizes e requisitos ambientais e sobre a industria de hidroenergia?

a) Why do you think these stakeholders have influence?

- Por que você acha que estos grupos tem influencia?

b) How do they interact with each other and what kind of influence do they exercise?

- Como interagem um com o outro e que tipo de influencia tem?

Social impacts:

36. What do you/your company consider as social consequences by dam building? Why?

- O que esta a companhia considerando como consequencias sociais no construção do barragens? Por que?

37. What do you consider acceptable social consequences by dam construction? Why?

- Quais consequencias sociais estão considerando como aceitavel no construção do barragens? Por que?

38. What do you consider unacceptable social impacts by dam construction? Why?

- Quais consequencias sociais estão considerando como inaceitavel no construção do barragens? Por que?

39. Which governmental requirements do you have to follow to regulate social impacts in proposed dam construction projects?

- Quais são os requisistos e diretrizes governamentais que precisa seguir para regular e diminuir impactos sociais no construção da barragens?

a) How do you implement them in dam building proposals and during construction?

- Como esta implementando estos no inventario e durante a construção?

40. Which tools do you have to measure what social impacts may occur in areas affected by dam construction?

- Quais são os procedimentos para medir quais impactos sociais pode acontecer nas areas afeitados do aproveitamento?

41. How do governmental agencies control that you abide by the requirements of diminishing social impacts?

- Como controlam os agencies governamentais que a companhia esta acatando os requimentos para diminuir impactos sociais?

a) What tools do governmental agencies have to measure social impacts occurring in areas affected by dam construction?

- Quais são os procedimentos de os agencias governmentais para medir quais impactos sociais estão acontecendo nas areas afeitados do aproveitamento?
42. Do the governmental agencies impose sanctions if you do not follow the requirements for diminishing social impacts?
- Os agencias governmentais estão impoendo sanções se a companhia não esta seguindo os requisistos para diminuir os impactos sociais?
 - b) If yes, what are they and how are they applied?
 - Se sim, quais são e como se aplicam?
 - c) How do you correct failing social requirements in your dam building proposals and during construction?
 - Como esta corrigindo faltas no requisistos sociais no inventario e durante a construção?
 - d) If no sanctions, why do you think not?
 - Se não sanções, por que não?
43. Are local people in the areas affected by dam construction consulted in the process of planning and construction of dams concerning which social effects may take place?
- As comunidades/povos afeitadas pela construção do aproveitamento, estão consultadas no proceso de planeamento e construção de barragem sobre as efeitos sociais que poderiam acontecer?
 - a) If yes, who in the local community are consulted, how, when in the process and by whom?
 - Se sim, quien na comunidade/povo esta consultada, como, e quando no proceso e de quien?
 - b) If no, why not?
 - Se não, por que não?
 - c) If no, do you think they should be consulted? Why/why not?
 - Se não, voce acha que deveria ser consultadas? Por que/ por que não?
44. Do you as a hydro electrical company have any responsibility and obligations towards people affected by dams built by your company?
- Como uma companhia hidroeletrica, tem algum tipo de responsabilidade ou obrigação para as pessoas afeitadas pelos barragens construidos pela companhia?
 - a) If yes, why and how?
 - Se sim, por que e como?
 - b) If no, why not?

- Se não, por que não?
 - c) If no, do you think you should have any responsibilities and obligations? Why/why not?
 - Se não, voce acha que deveria ter responsabilidade e obrigação para as pessoas? Por que/por que não?
 - d) If no, who do you think should have the responsibility for people affected by dam building?
 - Se não, quien deveria ter a responsabilidade pelas pessoas afetadas de aproveitamentos construidos?
45. What policies do your company have concerning resettlement of people displaced by dams?
- quais são as politicas de a companhia no respeito de pessoas deslocados por aproveitamentos?
- a) How does resettlement take place?
 - Como faz o reassentamento?
 - b) What are the criterions for land used for resettlement? Fertility of land, accessibility of water, infrastructure to transport goods to market, availability of schools and hospitals compared to previous settlements etc...
 - Quais são os criterios para a terra selecionada para reassentamento? Fertilidade do solo, abastecimento/acceso da agua para consumo e irrigação, acesso a escolas e hospitais no comparação com a locais anteriores etc...
 - c) Do your company contribute with infrastructure, water, schools, hospitals or other social services in the new settlements?
 - A companhia contribuiu com infraestructura, abastecimento da agua, escolas, hospitais ou outros serviços sociais no lugares de reassentamento?
 - d) If no resettlement policy, why not?
 - Se não, por que não?
 - e) If no resettlement policy, do you think your company should have a policy concerning resettlement of displaced people?
 - Se não politica de reassentamento, voce acha que a companhia deveria ter uma politica de reassentamento de as pessoas deslocadas pelo aproveitamento?

46. What policies do your company have concerning paying compensation for loss of agricultural land, fisheries, income, cultural/religious sites and deterioration of local environment due to pollution on dam construction site?
- Qual é a política de a companhia a respeito de pagar indenização por perda de terra agrícola, peixarias, renda, danos a lugares importantes culturais e religiosos e em general a deterioração e poluição no area da construção da aproveitamento?
- a) Which criterions have to be fulfilled to be entitled compensation? Which affects and losses must one be subject to?

- Quais são os requisitos para ter direito a indenização? Quais são os afeitos e perdas para ter direito de indenização?
 - b) How is it paid and when?

- Como se paga a indenização e quando?
 - c) If no policy on compensation, why not?

- Se não há uma política de pagar indenização, por que não?
 - d) If no policy on compensation, do you think the company should have a policy concerning compensation?

- Se não há uma política de pagar indenização, voce acha que deveria ter uma política sobre isso?
47. Which stakeholders do you think may influence the governmental agencies and their regulations and procedures on social consequences?
- Quais são os grupos com intereses no desenvolvimento da hidroenergia que tem influencia sobre os agencies governamentais que estão regulando os diretrizes e requisitos sobre consequencias sociais?
- f) Why do you think these stakeholders have influence?

- Por que acha que estos grupos tem influencia?
 - g) How do they interact with each other and what kind of influence do they exercise?

- Como interagem um com o outro e que tipo de influencia tem?
48. Which stakeholders do you think may influence the hydro electric company and the regulations and procedures on social consequences?
- Quais são os grupos com intereses no desenvolvimento da hidroenergia que tem influencia sobre industria de hidroenergia e seus os diretrizes e requisitos sobre consequencias sociais?
- a) Why do you think these stakeholders have influence?

- Por que acha que estos grupos tem influencia?

- b) How do they interact with each other and what kind of influence do they exercise?
- Como interagem um com o outro e que tipo de influencia tem?

Indigenous Rights Issues:

49. How do your company incorporate the indigenous peoples' rights to land and resources according to the ILO 169 and the 1988 Brazilian Constitution Art. 231, into the regulatory framework and procedures in the planning and construction of dams?

- Como está incorporando os direitos de os povos indigenas de terra e recursos naturais no conformidade do Convenção 169 de OIT e a Constituição Brasileiro da 1988, Art. 231, no diretrizes a procedimentos no planeamento e construção de aproveitamentos/barragens?

- a) How do you implement them in practice in dam construction?

- Como faz para implementar os direitos de os povos indigenas na practica no construção de barragens?

50. Are there any criterions imposed by governmental agencies to especial considerations your company have to take as to indigenous peoples' rights concerning land and resources, in the concession giving process and during planning of dams?

- As agencies governmentais impõe alguns criterios para considerações especiais a respeito de direitos a terra e recursos naturais de os povos indigenas, quais a companhia tem que seguir/considerar no planejamento de inventario e construção de o aproveitamento?

- a) If yes, what are they?

- Se sim, quais são?

- b) How do you implement them in your dam projects?

- Como se executar/implementar – lhes no projeto de aproveitamento?

- c) If no, why do you think there are not?

- Se não, por que acha que não existe?

- d) If no, do you think there should be any special considerations?

- Se não, você acha que deveria existir considerações especiais a respeito de direitos de os povos indigenas? Por que/por que não?

51. Are you subject to governmental sanctions if your company do not abide to indigenous peoples' rights to land and resources in the planning and construction of dams?

- Existe sanções governmentais se a companhia não suportar os direitos de os povos indigenas no planejamento de inventario e a construção do aproveitamento/barragen?

- c) If yes, what are they?

- Se sim, quais são?
- d) How do you respond to them in your dam project?
 - Como responde a estas sanções no seu projeto?
- e) If no, why do you think not?
 - Se não, por que não voce acha?
 - Se não, voce acha que deveria ter sanções?

52. Are indigenous peoples consulted in accordance with the ILO 169, Art. 6 in the concession giving process, and in the development of construction and implementation plans for dams?

- São os povos indigenas consultados no conformidade com a Convenção 169 de OIT, Art. 6 no no estudos de inventario e no proceso de licenciamento?

- a) If no, why not?
 - Se não, por que não?
- b) If no, do you think they should be consulted? Why/why not?
 - Se não, voce acha que deveria ser consultados? Por que/por que não?
- c) If yes, how and when in the process are they consulted? By who are they consulted?
 - Se sim, como e quando eles são consultados?
- d) If yes, are their opinions taken into account in the concession giving process?
 - If yes, how?
 - If no, why?
 - Se sim, seus opinião tem peso no decisão sobre a aprovação do projeto e a licenciamento?
 - Se sim, por que?
 - Se não, por que?

53. Which stakeholders do you think may influence the governmental agencies and their regulations and procedures for the hydro power regulations concerning indigenous peoples' rights?

- Quais são os grupos com intereses no desenvolvimento da hidroenergia que tem influencia sobre os agencies governamentais que estão regulando os diretrizes e requisitos a respeito de os direitos de os povos indigenas?

- a) Why do you think these stakeholders have influence?
 - Por que voce acha que eles tem influencia?
- b) How do they interact with each other and what kind of influence do they exercise?

- Como interagem um com o outro e que tipo de influencia tem?

54. Which stakeholders do you think may influence the hydro energy companies and their procedures in their dam proposals and in the construction of dams, concerning indigenous peoples' rights?

- Quais são os grupos com interesses no desenvolvimento da hidroenergia que tem influencia sobre industria de hidroenergia e seus os diretrizes e requisitos no respeito de os direitos de os povos indigenas?

a) Why do you think these stakeholders have influence?

- Por que voce acha que eles tem influencia?

b) How do they interact with each other and what kind of influence do they exercise?

- Como interagem um com o outro e que tipo de influencia tem?