UNIVERSITY OF AGDER

Indigenous Livelihood and Wellbeing

The Consequence of Ecosystem Degradation in Indigenous Territories

A case study of the Guaraní of the Tarija region, Bolivia

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***Abstract**: Economic development is prevailing over safeguarding environment and social capital in many developing countries today. Natural resource extraction and poor conservational measures are causing widespread ecosystem degradation. As a consequence indigenous groups are rapidly losing their basis for livelihood. Without mitigation measures or alternative ways of making a living these groups have the choice of withering away, migrate or join forces and mobilize. Conflict rates and mobilization rates are increasing in Bolivia, especially related to indigenous groups. The consequences are not likely profitable for Bolivia's future economy. This paper urges a reprioritization of indigenous rights and environmental conservation in order to safeguard national social and political stability and ultimately the Bolivian economy.*

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Abbreviations:

APG: Guaraní Peoples Assembly

CERDET: Center for Regional Studies in Tarija. Focus: the Weenhayek, Guaraní and Tapiete indigenous groups.

CIDOB: Center for Indigenous Peoples and Communities of the Bolivian East

MDG: the Millennium Development Goals

REPSOL: Refinería de Petróleos de Escombreras SOL (sun)

TCO: Original Community Territory.

UNPFII: United Nations Permanent Forum of Indigenous Peoples

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[The Rights of Indigenous People - Illustration Photo 1]

Chapter I: Introduction

1.1 The Rights of Indigenous People

Questions concerning indigenous rights are more prominent on the global agenda today than ever before. Acknowledged as a highly vulnerable group, their wellbeing is identified as one key step of reaching the Millennium Development Goals (UNPFII 2010). However the 2010 United Nations report on *the State of the World's Indigenous Peoples* paints a disturbing picture of social exclusion, social deprivation and major violations of human rights (UNPFII 2010). According to a UN press release "The world's 370 million indigenous peoples suffer from disproportionately, often exponentially, higher rates of poverty, health problems, crime and human rights abuses" (UN 2010:para1). Commitment to prioritize human and environmental capital over large scale industrial development is lacking in many developing countries today. As a result of environmental degradation, indigenous groups who before lived a self-sufficient life are in rapid speed losing their livelihoods and cultural identity. In return they have little left except a degraded territory and declined health due to industrial hazards. Until now this type of

practice has had few consequences except sporadic blockages and ethical pressure from the global society. This thesis suggests that if these trends continue the host nation will have to face consequences far more dramatic. The urgency of long term planning is pressing.

Latin America is estimated to inhabit more or less 400 indigenous groups, around 450 million people (Palacin 2009:para2). According to Michael Palacìn, director of the Andean Confederation of Indigenous Organizations, these "indigenous peoples almost invariably face exclusion and discrimination in their countries" (Palacin 2009:para2). Their quality of life and life expectancy are often highly reduced. Among the indigenous population in Peru for example about 80% is estimated to live in poverty or extreme poverty, and their life expectancy is estimated to be 20 years shorter compared to the urban population (Palacin 2009:para2). Although Latin America as a region is experiencing economic growth, the wealth is not equally distributed among the urban and rural population. Due to the biodiverse ecosystems and plentiful mineral resources one of the most pressing issues in rural South America today are natural resource extraction, especially related to oil and gas. These industries are widespread throughout the continent, covering more than 688,000 square kilometers of the Bolivian, Colombian, Peruvian and Brazilian Amazon forests (Palacin 2009:para5); affecting highly valuable ecosystems and local livelihoods. As a consequence the regions rural population still experience high rates of poverty. A lion's share of these concessions has been granted on protected areas or titled indigenous lands. In Peru for example, 1 of 5 hydrocarbon concessions are granted on protected areas and over half on indigenous lands (Orta-Martinez and Finer 2010). As a result, documentations of environmental degradation due to industrial hazards are widespread and growing. In 1996 Bolivia experienced what has been characterized as the most severe environmental disaster in Latin America, when a tailings dam broke at a mining site in Potosi and heavily contaminated the Pilcomayo River. The disaster forced people to move to escape polluted waters, deprived livelihoods and declining health (Farthing 2009). As mitigation measures are not adequately implemented and contamination from aggressive extraction continues, the trend of forced migration is likely to continue. Without alternative sources of food and other vital services, these communities have the option to migrate or to slowly wither away.

This thesis attempts through an in-debt presentation to give a face to the many stories of deprived indigenous people today. A qualitative study has been conducted to shed light on circumstances

of life among the Guaraní of the Bolivian Chaco, an indigenous group facing extensive ecosystem degradation over the last 20 years. A group which lives has been significantly altered especially after the region's largest natural gas field was discovered and opened in mid-90s. In Bolivia especially with such a large share of indigenous people it is interesting if not necessary to get a better understanding of how the indigenous are adapting and/or reacting to this situation, in order to properly understand the consequences of current development trends.

The Earth we live on and the environment that surrounds us is universal. Whether from Africa, Europe or Latin America - we all breathe the same air and see the same stars over our head on a clear night. Based on coincidence, the Western world has gained control of an unseemly large amount of power, thus also the right to distribute our common resources. Most of these resources are extracted to maintain Western consumption patterns. When I was a little girl I could not understand why grown-ups couldn't just resolve their indifferences, make peace and learn how to share as us kids did. I learned that things are complicated and that I would understand as I got older. All grown up I have learned that the leading fraction of the world's population are undermining the very basis of our existence, a consumption pattern lead by the biggest and supposedly brightest nations in the world. We are using more than we have, creating an environmental debt that is increasingly being paid by the most vulnerable. In the Latin language 'homo sapiens' is translated to 'wise man' or 'the man who knows' (Oxford Dictionary 2012b). I am not sure that name is entitled. Today, indigenous people are among the last people on earth living in a sustainable manner, conserving biodiversity and the basis of life on earth. Defending the rights of indigenous people is thus a way of protecting life.

Being born in a country as rich on resources and capacity as Norway means to me not only opportunities but also a great responsibility. Unlike me, there are billions of people in this world who do not have the opportunity to go to school, live in a safe environment or even eat every day. We live in a highly unbalanced reality; a null sum game where those in power require increasingly more, depriving humanity's most vulnerable. Darwin's concept of 'natural selection' has changed course from being a concept describing human ability to adapt to their surroundings, to being highly dependent on opportunities presented at birth, the cultural, political and economic context of a person's life. We see it in the media every day; people without food or shelter - people deprived of basic human rights. It is no coincidence that just these people have

been affected. They are the poorest and the most vulnerable of us all. Reasons for deprivation are many and diverse. Many reasons are easily understandable, such as lack of resources or capacity. It is simple math, if there aren't any resources there is nothing to distribute. Far too often however the real issue is how resources are managed and distributed.

This thesis is based on a realization that the foundation of development has economic underpinnings. The world's main driving power is based on a system of consumption were success is measured in income and economic growth. In order to increase environmental and social accountability, better knowledge is needed on the profitability of environmental and social capital. The main challenge towards addressing these factors equally are according to Rothman, to develop plans that make sense in "both the short and long-term" (Rothman et al. 2007:400). Sparked by increasing gaps in welfare between rich and poor parts of society, increasing rates of indigenous mobilization and migration has been documented. Indigenous rights, once near to ignored in national policymaking, has once again become an important issue on the global agenda.

1.1 Los Derechos de los Pueblos Indígenas (spanish translation)

Preguntas acerca de elos derechos indígenas son más prominentes en la agenda global hoy en día que antes. Reconocidos como un grupo altamente vulnerable, su bienestar es identificado como paso clave para alcanzar la "Millenium Development Goals" (UNPFII 2010). Sin embargo el reporte 2010 de Naciones Unidas sobre el Estado Mundial de las comunidades Indígenas pinta una imagen perturbante de exclusión social, privación social y altas violaciones de los derechos humanos (UNPFII 2010). Conforme a la declaración de prensa de Naciones Unidas, "Los 370 millones habitantes mundiales indígenas sufren desmedidamente, muchas veces exponentemente de altos índices de pobreza, problemas de salud, delincuencia y abusos de los derechos humanos" (UN 2010:para1). Hoy en día faltan compromisos para priorizar capital humano y recursos para el desarrollo industrial a escala grande, en países en desarrollo. Como resultado de degradación ambiental, grupos indígenas los cuales antes eran autosuficientes, están en camino de perder su sustento e identidad cultural. A cambio les queda poco, excepto de un territorio degradado y una salud en decadencia por intoxicación industrial. Hasta ahora este tipo de practica ha tenido muy pocas consecuencias excepto de unos paros, bloqueos esporádicos y presión ética de la sociedad global. Esta tesis sugiere que si esta tendencia continúa la nación

anfitriona va a tener que enfrentar consecuencias mucho más dramáticas. La urgencia de hacer planes sostenibles a largo plazo está presionando.

En Latinoamérica se estima que habitan alrededor de 400 grupos indígenas, más o menos 450 millones de personas (Palacin 2009:para2). Conforme a Michael Palacin, director de la Confederación de Organizaciones Indígenas, esta "gente indígena invariablemente la excluyen y discriminan en sus propios países" (Palacin 2009:para2). Su calidad de vida y expectativa de vida son altamente reducidos. Entre la población indígena peruana, se estima que alrededor del 80% viven en pobreza o extrema pobreza, y su expectativa de vida se estima de 20 años menos comparado con la población urbana (Palacin 2009:para2). Aunque Latinoamérica como región está viviendo un crecimiento económico, sus riquezas no son repartidas igualmente entre la población rural y urbana. Por sus ecosistemas biodiversos y vastos recursos minerales, uno de los temas más urgentes en Sud América rural, son la extracción de recursos naturales, especialmente relacionados al gas y petróleo. Estas industrias son repartidas ampliamente dentro del continente, cubriendo más que 688000 km2 en la amazonía Boliviana, peruana, colombiana y brasilera (Palacin 2009:para5); afectando valiosos ecosistemas y sustentos locales. Como consecuencia las regiones con población rural todavía viven altas tasas de pobreza. Una parte pequeña de estas concesiones se han dado en áreas protegidas o territorio indígena. En el Perú por ejemplo 1 de 5 concesiones de hidrocarburo son otorgadas en áreas protegidas y más que la mitad en territorio/tierra indígena (Orta-Martínez y Finer 2010). Como resultado, documentos sobre degradación ambiental por intoxicación industrial son amplios y están creciendo. En 1996 Bolivia vivió lo que fue caracterizado como el desastre ambiental más severo en Latina América cuando una represa en la mina de Potosí se rompió y contaminó seriamente el rio Pilcomayo. El desastre forzó a la gente a escapar del agua contaminada, privó el sustento y disminuyó la salud (Farthing 2009). Como las medidas no son adecuadamente implementadas y la contaminación de extracción agresiva continua, la tendencia de migración forzada probablemente va a continuar. Sin ninguna alternativa para fuentes de comida y otros servicios vitales, estas comunidades tienen la opción de migrar o lentamente marchitarse.

Esta tesis trata con una presentación profunda de dar a conocer las tantas historias de carencias de la gente indígena hoy en día. Un estudio cualitativo se ha hecho para dar luz a las circunstancias de la vida de los Guaranís del Gran Chaco de Bolivia, un grupo de indígena

enfrentando una extensa degradación del ecosistema sobre los últimos 20 años. Un grupo al cual su vida fue alterada significativamente después del descubrimiento y apertura del pozo de gas más grande de la región, a mediados de los años 90. Especialmente en Bolivia con su gran mayoría de gente indígena, es interesante sino necesariamente adquirir un mayor conocimiento en cuanto a como los indígenas se adaptan y/o responden a esta situación, para entender correctamente las consecuencias actuales de las tendencias en desarrollo.

La tierra la cual habitamos y el ambiente que nos rodea son universales. Sea de África, Europa o Latinoamérica – todos juntos respiramos el mismo aire y miramos las mismas estrellas sobre nuestras cabezas en una noche clara. Basado en coincidencias el mundo occidental se ha apoderado de una vasta cantidad de poder y así controlar la distribución de los recursos comunes. La mayoría de estos recursos son extraídos para mantener diseños de consumos occidentales. Cuando era niña chica no podía entender por qué los adultos no podían resolver sus diferencias, hacer paz y aprender a compartir como nosotros los niños lo hacíamos. Aprendí que las cosas son más complicadas y que iba entender cuando creciera. Ya adulta aprendí que una fracción que lidera la población mundial está enterrando las bases mismas de nuestra existencia, un diseño de consumo liderado por los más grandes y supuestamente naciones más inteligentes del mundo. Estamos usando más de lo que tenemos, creando una deuda ambiental la cual está creciendo a la cuenta de los más vulnerables. En el idioma Latín “homo sapiens” significa “hombre sabio” o “el hombre que sabe” (Diccionario Oxford 2012b). Yo no estoy segura si ese nombre corresponde. Hoy en día, la gente indígena son unos de los últimos humanos en el planeta que viven de manera sustentable, conservando la biodiversidad y la base de la vida en la tierra. Defender los derechos de los indígenas es de todas maneras una forma de proteger la vida misma.

Nacer en un país rico en recursos y capacidades como Noruega, no solamente significa oportunidad sino también gran responsabilidad para mí. A diferencia de mí, hay millones de personas en el mundo que no tienen la oportunidad de ir al colegio, vivir en un ambiente seguro, ni siquiera comer todos los días. Vivimos en una realidad muy desigual; un juego de suma cero, donde los que están en el poder exigen siempre más, privan a los más vulnerables de la humanidad. El concepto de Darwin “Selección Natural” ha cambiado ruta, de ser un concepto describiendo la habilidad humana de adaptarse a sus alrededores, hasta ser altamente dependiente de sus oportunidades al nacer, el aspecto cultural, político y contexto económico de la vida de

una persona. Lo vemos en los medios todos los días; gente sin comida o casa – gente privada de sus derechos básicos humanos. No es coincidencia que justamente esta gente sea la afectada. Ellos son los más pobres y los más vulnerables de nosotros. Las razones de privación son muchas y diversas. Muchas razones son fácilmente entendidas, así como falta de recursos o capacidad. Es matemática simple, si no hay recursos no hay nada que repartir. Pero demasiadas veces el problema es como los recursos se manejan y distribuyen.

Esta tesis está basada en una realización de que el fundamento de desarrollo tiene intereses económicos. El mayor poder mundial está basado en un sistema de consumo donde el éxito se mide en ingresos y crecimientos económicos. Para incrementar la responsabilidad ambiental y social, es necesario un mayor conocimiento de la rentabilidad ambiental y capital social. El gran desafío hacia dirigir estos factores igualmente son de acuerdo a Rothman, desarrollar planes que tengan sentido en "ambos a corto y largo plazo" (Rothman et al.2007:400). Iluminados por crecientes brechas en bienestar entre ricos y pobres de la sociedad, las tasas crecientes de movilizaciones indígenas y migraciones, han sido documentadas. Los derechos de los indígenas, antes cercano a ser ignorados en quehaceres políticos nacionales, una vez más están siendo un hecho importante en la agenda global.

1.2 Aims and Research Questions

We live in a world highly dependent on fossil resources and a system that generates more and more ecological debt (Lago et al 2010:46). In October 2011 the world population reached 7 billion people. As we are all living of the same ecosystem, the pollution we are posing on others will ultimately also be ours. Right now we do not face the most severe consequences. Our climate is changing and so is the environment. Temperatures are rising and extreme weather has become more frequent. As a result of degraded ecosystems basic natural resources fresh water is becoming a potent source of armed conflict.

The aim of this thesis is to shed light on one of the world's most vulnerable social group, the indigenous. To what extent is it possible for such groups to adapt or deal with the profound changes that have been initiated by industrialization and modernization? Degradation of ecosystems are threatening local livelihoods in high speed, and depriving indigenous communities of their basis for existence. Increased world demand for oil and gas energy and increased petroleum revenues implies that even more remote areas are likely to be under

exploration in the near future (Orta-Martinez and Finer 2010:208). The total effect of a new hydrocarbon peak is not mine to predict, though an escalation of current situation is likely. In general, today the roughly 400 different indigenous groups inhabiting the Amazon are in a highly vulnerable state, living "on the society's margins, [with] no role in decision making at the national level" (Barr and Mafuta 2007:245). Without a political voice, numerous indigenous groups are on their way to extinction, and many has already disappeared (Barr and Mafuta 2007:245). Consequently, if alterations are not made indigenous groups such as the Guaraní may either be forced to move or be on their way to extinction. An attempt will be made to shed light on how it is preferable safeguarding environmental and social capital in natural resource extraction in Bolivia; not simply for ethical reasons or for the sake of protecting the foundation of human life, but for safeguarding Bolivia's economy by calming social instability and reducing conflicts.

The overall objective of this research project has been to understand how ongoing processes of ecosystem degradation impact the Guaraní indigenous of the Bolivian Chaco, an area containing the second most biodiverse area in South America. The research will be done by conducting a field research, a series of qualitative household interviews in selected communities, to analyze current and changing indigenous livelihoods among three selected Guaraní communities along the Pilcomayo River in Grand Chaco and O'Connor department of Tarija region. A theoretical framework is presented as a foundation for this research, while the literature review presents a selection of earlier work done on this topic to give a basic understanding of current development. The theoretical framework, literature review along with the presentation of collected data will give a in debt presentation of indigenous groups vulnerability and adaption to changing ecosystems.

Research Questions:

1. To what extent are Guaraní's dependent on ecosystem services for their livelihood and wellbeing?
2. To what extent has ecosystem services been degraded during the last 20 years?
3. To what extent is ecosystem degradation changing Guaraní livelihood and wellbeing?
4. How do the Guaraní adapt or react to changes in the ecosystem?

1.4 Defining central terms and concepts

There are some terms and concepts which have been frequently used throughout the paper and require a definition. A concept which has been important for shaping Evo Morales political career is *Cultural politics*: which has been according to Wickstrom is "the promotion of indigenous values, beliefs, knowledge, ecological practices, and socioeconomic organization in development, the responses such promotion elicits from existing political systems and the conflict that then ensue" (Wickstrom 2001:16 in Lu 2009:10).

Ecosystem degradation: The process of undermining the ecosystem's natural balance and ability for self-sustainability. The degradation of ecosystems may be attributed to a variety of different natural and anthropogenic factors. There is focus on systems. When one ecosystem is degraded it is high difficult to calculate the ripple effects. When two or more ecosystems are being degraded the probabilities of destructiveness multiply.

Ecosystem services: Services or products used by man that is provided by the ecosystem. According to Boyd and Banzhaf the concept can be defined as "the benefits of nature to households, communities and economies" (2007:616). This is a definition with great economic underpinnings, and can be argued to be a result of the modern cosmology – looking at nature as something conquered and controlled by man. This conception is deceitful as it is human kind who is living on the terms of the ecosystem and not the other way around. A more holistic definition with focus on social and environmental values can be found in section 3.1.2 under "The value of Ecosystem Services".

Livelihood means the foundation for life which enables access to resources which is necessary for everyday life. Scoones defines livelihood as "the capabilities, assets (including both material and social resources) and activities required for a means of living" (1998:5). What is considered necessary is shaped by economic, social and cultural structures thus varies from context to context.

Sustainable livelihood: A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base " (Scoones 1998:5).

La Tierra Comunitaria de Origen (TCO): Titled land ownership for peasants and indigenous communities that enables the development of economic, social and cultural systems. "Those geographical spaces that constitute the habitat of indigenous and original (originarias) people and communities, and to which they have traditionally have had access and where they maintain and develop their own forms of economic, social and cultural organizations, the mode of which assures their survival and development" (Perreault 2008:10).

Wellbeing: is a highly subjective and vague concept. However, as Chambers (1997) argues; "a wellbeing approach to poverty and livelihood analysis may allow people themselves to define the criterias which as important" (Scoones 1998:6). In accordance to this statement, during fieldwork the respondents have themselves defined their own conception of wellbeing.

1.5 Organization of the Thesis

Chapter I: Gives an introduction to the overall thematic as well as an introduction of research conducted in this thesis. Chapter II: Describes a contextual overview, which is important to understand from where this development has grown, in addition to get a better understanding of current situation. Chapter III: presents the Literature Review; a review of previous relevant literature and The Theoretical Framework which presents the researchers theoretical point of view, and give the reader a more holistic understanding of the remaining research, such as the selection of literature review or the focus of the fieldwork and presentation of data. Chapter IV: The chapter on Methodology includes how in technical terms the research was conducted, as well as the ethics and limitations faced during before, during and after fieldwork. Chapter: V: Presents Findings and Analysis of data collected in field. Finally in Chapter VI we find a Personal statement from the Guaraní, before Chapter VII presents a Final Discussion and Conclusion.

Chapter II: Bolivian Contextual Overview

Bolivia is a land of contrasts and superlatives. A country with an estimated population of 10 million people (2010) spread over a land area of 1.28 million square km (FCO 2011). In the last half of the 20th century the Bolivian population grew more than 100% (Heins 2011:30). Combined with high rates of internal migration this has had extensive impacts on the country's demographics; "While in 1976 the majority of the population still lived in rural areas, 60 per cent of the total population lived in cities in 2001" (Heins 2011:30). Although the poorest country in South America, it is one of the richest in terms of natural resources. It is home to the world's largest salt lake, the highest navigable lake and the second-highest mountain plateau (Farthing 2009:25). The result is breathtaking and diverse. From steep chilly mountains to low humid jungles and arid savannas, Bolivia has everything except a coastline, which they lost to Chile after the War of the Pacific (1879-1883). Another one of the country's unique features is the high proportion of indigenous groups, which makes up 62% of the population (Hammond 2011:650). Wealthy urban elites have traditionally dominated political and economic life, creating a great divide between their own interest and the interest of the remainder rural farmers, miners and indigenous groups. An integration of the indigenous into the political and economic processes has not been a priority (Heins 2011:24). In the next section a brief historical political accounting will be made of important events from 1980 to 2009 that have shaped current Bolivian politics regarding natural resource extraction and indigenous politics.

2.1 Recent Political History (1980-2009)

1980-2000: The years between 1980 and 2000 in Bolivia were defined by economic decline and market restructuring. Due to a heavy drought in 1983-1985 the rural population was driven away from the valley and highlands and towards urban centers. (Heins 2011:28). As a response to these challenges and the deep economic crisis the country experienced in the 80's, the MNR government in 1985 implemented a series of economic reforms. Although the privatization controlled the country's hyper-inflation, it also left over 20.000 miners and 35.000 manufacture workers without a job (Perreault 2008:6, Hammond 2011:651). Naturally this caused high levels of dissatisfaction and increased levels of poverty among the general Bolivian population. Further, in the mid 90's President Gonzalo Sànches de Lozada presented and instituted the 'Plan de Todos' which promoted administrative decentralization and economic privatization. In order

to stop a great urbanization process 314 new municipalities were created under the Law of the Public Participation and given the authority to make decisions about development planning, infrastructure construction and budget decisions (Perreault 2008:6; Postero 2007:5/123). This decentralization process has been argued to be the start of the fragmented political environment seen today. On the other side this was also a time when indigenous and other rural people were presented with better options for socio-cultural organizing and political participation (Hammond 2011:651, Perreault 2008:6). In 1994 President Gonzalo Sànches recognized Bolivia for the first time as a multiethnic and pluricultural nation. Although these actions were part of an integrated neo-liberal development plan, the sum of these actions has improved indigenous opportunity for influencing national politics and increased indigenous political presence could be seen at the end of the decade. In the year 1990 there was a movement known as the 'March for Territory and Dignity', where around 800 lowland indigenous men, women and children from twelve ethnic groups marched from the Amazon lowlands to the Andean capital La Paz (Albó 2012:113; Perreault 2008:7) - much like the marches for TIPNIS in January and May 2012. As a result of the demonstration the ILO Convention 169 was ratified (Albó 2012:13) and seven indigenous territories were constituted in the Amazon region. Theorists including Perreault (2008) have argued however that this entitlement did not improve the situation for most of the poor indigenous and *campesino* groups. In 1996 Gonzalo Sànches presented his 'energy triangle' policy, which consisted of a new hydrocarbons law, capitalization of the state hydrocarbons firm Yacimientos Petrolìferos Fiscales Bolivianos (YPFB), and the construction of a natural gas pipeline to Brazil (Perreault 2008:8). The hydrocarbon law promoted a liberalization of the hydrocarbon sector by encouraging foreign investment, a process highly encouraged and supported by prominent international development agencies such as The World Bank. Before leaving office 'Goni' reduced from 50 to 18 the percentage the royalties' private firms were required to pay the government from newly established oil and gas reserves (Shultz 2008:29; Perreault 2008:8). This was done to create a favorable business climate for foreign firms. However, straight after came the announcement that Bolivia's oil and gas reserves were substantially greater than first anticipated. Proposed gas reserves increased from 1.5 trillion cubic feet (TCF) to 50.7 TCF with the discovery of the massive Margarita gas field in Tarija, while proposed oil reserves increased from 27.8 million barrels to 901.3 million barrels (Hindery in Perreault 2008:9). Consequently 97 % of Bolivia's oil and gas resources were labeled as "new"

reserves which were subject to merely 18 % tariff rate, a huge economic loss for the Bolivian economy.

Started by the "Water War" in Cochabamba (Shultz 2008), the year 2000 marked a turning point for Bolivia's indigenous struggles and the start of an organized and coordinated indigenous struggle against marked politics. From 2000-2005 a broad social movement grew in Bolivia using road blockages, strikes, demonstrations and marches. Especially the years between 2003 and 2005 was characterized by political instability, racial tension and violent protest concerning governmental plans to export natural gas to global markets (CIA 2011). In October 2003 protests over neo-liberal hydrocarbon reforms escalated in what is known as the "Gas War", encompassing most of the Andean highlands, citizens groups rejecting plans to export natural gas to the U.S. and Mexico via Chile (Postero 2007:2; Perreault 2008:14; Gordon and Luoma 2008). This was unthinkable to most Bolivians much due to the war of the Pacific in 1870's where Bolivia lost its coastline to Chile. A widespread protest was met with violent police and military response, which only served to strengthen the popular outrage (Perreault 2008:14). The death of 70 protestors transformed into a populist rejection of export plans all together. The gas war was mainly dominated by indigenous groups and social movements in La Paz, El Alto and Cochabamba – which serves as an attestation of how "struggles over natural gas were defined and enacted by people and places distant from the actual centers of production" (Perreault 2008:15, Bebbington and Bebbington 2010:271). The Guaraní people for example who were directly affected by gas extraction were excluded from the policymaking process. The capacity for the indigenous of the Amazon and Chaco to react was limited due to their small numbers, ethnic and linguistic diversity, economically and politically marginalized and spatially diverse (Perreault 2008:15). This has fuelled greater indigenous political mobilization and a fragmentation of the country's numerous indigenous groups. The inability of leaders to create a development plan which benefited more than just a fraction of the population threatened to undermine social order, risking even greater fragmentation of society by giving rise to resource regionalism (Bebbington and Bebbington 2010:271). The traditional political parties which had led the country for the last seven years were losing credibility. Empowered by a growing wave of mobilization, a common cause and weakening of current political leadership; the social movements in this period involved everything from indigenous organizations to indigenous political parties. Included in this wave was indigenous organizations such as The Oral Andean

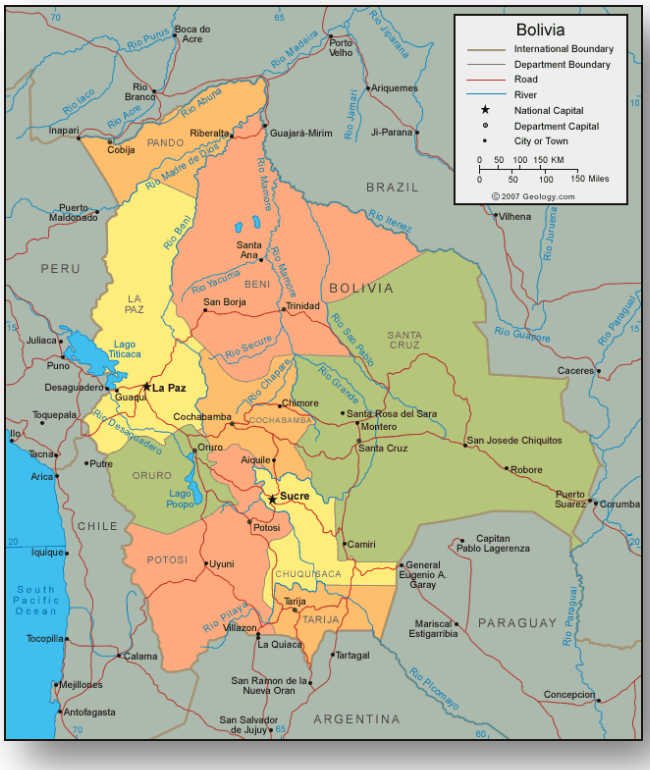
History Workshop (THOA), The National Council of Ayllus and Markas of Qullasuyu (CONAMAQ); indigenous political parties such as MAS and the Pachakuti Indigenous Movements (MIP), the radical Confederation of Peasant Labour Unions of Bolivia (CSUTCB), the Coca-Growers Union, the influential Cochabamba Irrigators' Federation (FEDECOR) and other, mestizo-led groups like the syndicalist Bolivian Workers Central (COB) and the Coordinator for the Defence of Water and Life (Coordinadora de Defensa del Agua y la Vida), which led the 2000 Cochabamba Water War (Schultz 2008; Perreault 2008:15). The most prominent political party of the social movement was the Movement Towards Socialism (MAS) led by Evo Morales, supported mainly by *campesino*, *cocaleros* and indigenous people, in particular "Quechua-speaking campesinos in Cochabamba, Chuquisaca, and Potosi and Oruoro" (Perreault 2008:16). Support grew tremendously among the lower social classes of the country, including the indigenous of the eastern lowlands, contributing directly to his victory in the 2005 election (Postero 2007; Gordon and Luoma 2008:100).

2005-2011: The years between 2005 and 2011 has been marked by contradictive politics, polarized by cultural politics and neo-liberal forces. In December 2005 Evo Morales was elected president representing the party the Movement Towards Socialism (MAS). With promises of social and political change from an elitist to a more people centered policymaking he won the election with the widest margin since the restoration of civilian rule in 1982 (CIA 2011). As the son of an Aymara *campesino*, growing up in the mining camps of Oruro, he became an important symbol of the poorest indigenous majority. After victory Morales started implementing the 'October Agenda', a plan set out to meet the demand of the social movement steaming from the Gas War in 2003. The first stage was to establish a Constitutional Assembly to rewrite the constitution to include indigenous interests, and the second to nationalize the country's hydrocarbon resources. The work constructing a new constitution from 2006 to 2009 developed into an inflamed source of conflict and can be described as a tortuous process (Hammond (2011:653). Main discord concerned distribution of oil and gas revenues and questions of autonomy. As the eastern lowland produced more hydrocarbons than the highlands, they demanded larger revenues. On May 1st 2006 Evo Morales announced 'the Heroes of the Chaco decree' which reclaimed property, possession and control of hydrocarbon resources at the wellhead; and with the national military seized control of 56 natural gas installations around the country (Perreault 2008:16, Lago et al 2010:45). This display was a strong symbol of

empowerment of MAS supporters and evidence of military support of Evo's plan of nationalization. The declaration obligated oil and gas firms to turn their production over to the national firm YPFB and operation in the largest fields will be subject to an 82% taxation rate. Indigenous protests and political clashes continued to flare in the following years; including the blockage of the Parapeti hydrocarbon control station in 2006, the violent clashes in Cochabamba in January 2007 and the violent uprising in Sucre surrounding the construction of the new Constitution the same year. Finally on the 25th of January 2009 the new constitution was passed with a 61% majority (Hammond 2011:649). This was a large victory for the country's various indigenous groups; whose language, culture and organization was acknowledged and to be respected.

2.2 The Study Area Profile: Tarija, Chaco and the Guaraní Traditional Territory

The area in which the Guaraní live is interesting as it consist of a patchwork of different titled areas. To get an understanding of the complexity of the situation, a brief description of the most important areas are provided below; the department of Tarija, the biodiverse Bolivian Chaco, the Aguaragüe National Park, the titled/untitled Indigenous Territories, and finally the extensive natural resource extraction in the area. An overview over conflicting titling of land in Bolivia (2008) is found in Appendix 3.



[Map 1: Bolivia Political Map: Overview over Bolivian Departments and Important Rivers]

Tarija; marked as orange south-east in map 1 is with its 37,623 square kilometers the smallest of Bolivia's nine departments, with a total population of 391,000 (Bebbington and Bebbington 2010:268). Despite its modest size, it contains over 70% of annual national production of natural gas, "with the bulk of that production

located in the two eastern provinces of O'Connor and Grand Chaco (INE in Bebbington and Bebbinton 2010:269).

The Pilcomayo River; (Map1) rises in the Andean mountains northwest in Bolivia and splits the country in half running southeast into the Bolivian Chaco and into Argentina and Paraguay. As an extension of Rio Grande north in Bolivia, it runs past Sucre and Potosi, passing the Bolivian Grand Chaco and flowing into Argentina and Paraguay in south-east. The Pilcomayo River, winding as a life-giving snake throughout the country is an important source of freshwater, food and life in the region and for the biodiverse Grand Chaco.

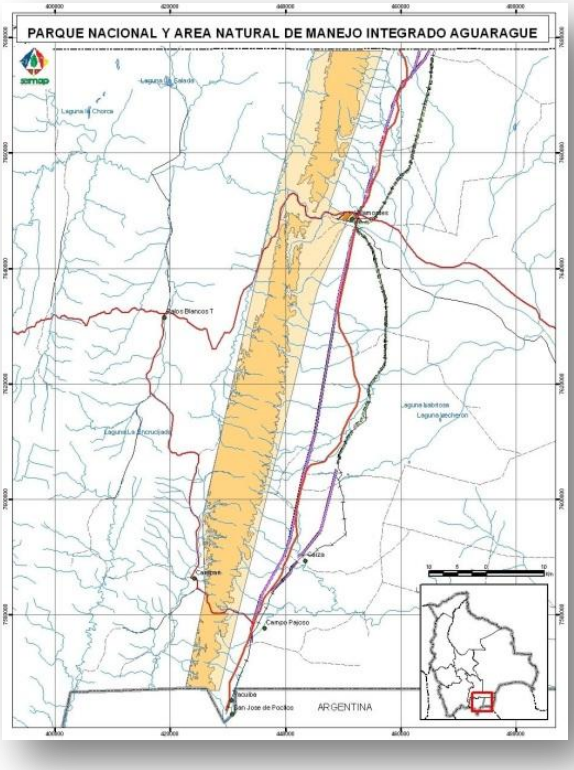
South America's Grand Chaco; (Map2) covers about 1 million km2 in Bolivia, Paraguay, Argentina and Brazil and is one of the continent's most extensive biographical regions after the Amazon forest (Painter 2009 :165). In addition to include the largest expanse of dry tropical forest in the Neo-tropics, the area is characterized by "diverse ecosystems that include palm savannas and marshes, semiarid thorn forests and open grasslands on sand dunes" (Painter 2009:165). Due to various factors the region has been subject to extensive ecosystem degradation. Bolivia is the only country where the Chacoan ecosystem and habitat more or less remain intact, through it is recognized as being under serious threat due to extensive land use and gas extraction (Painter 2009:165).

[Map 2: The Grand Chaco]

The Aguaragüe National Park (Map 3); In addition to the TCO and the hydrocarbon fields, there has also been established a national park in this area, The Aguaragüe National Park .The park comprise of a narrow strip reaching from the southern border of Bolivia – stretching 10 km in width and 110 km in length towards the north. According to the Servicio Nacional de Areas Protegidas – SERNAP (2001) – which is the Bolivian national service for protected areas. The

area was established in 2000 under Law 2083 to safeguard a representative selection of biodiversity and an important source of potable water for the areas various settlements. The area covers a total of 108307 hectares, a vegetation unique due to its location between the Chaco forest and the subtropical Yunga rainforest (SERNAP 2001). These forests extend from southern Santa Cruz del la Sierra in Bolivia to the eastern mountains in Argentina and include foothill areas of the sub-Andean mountains.

The Guaraní Indigenous Territory: The Guaraní are an indigenous group which is comprised of divisions in Bolivia, Argentina, Brazil and Paraguay. In Bolivia they are the third largest indigenous group after the Quechua and Aymara; divided into 'the Ava' situated in the foothills of Santa Cruz and Tarija, 'the Izoceño' in the Izozo regions of central Santa Cruz, and the Simba Guaraní of Tarilja and Chuquisaca departments (Perreault 2008:10). They are settled agriculturalists "who rely on smallholder subsistence or semi-subsistence-based farming (raising beans, squash, corn and a variety of other crops, as well as cattle, goats, pigs, chickens and sheep), hunting, fishing and the gathering of wild plants and fruits" (Perreault 2008:10). In terms of the focus of this research the Guaraní are particularly interesting as they according to Perreault (2008:11) have "borne the brunt of much of the oil and natural gas developed in Bolivia". Especially the Guaraní of the Margarita gas field are recognized as highly affected by nearby industrial production (Perreault 2008). The indigenous of the Grand Chaco, Tarija, are located far from APG headquarters and the Center for Indigenous Peoples and Communities of the Bolivian East - CIDOB in Santa Cruz, and they have few resources to draw on in "countering the impacts of the transnational hydrocarbons firms operating on their lands" (Perreault 2008:11).



[Map 3: Aguaragüe National Park]

Hydrocarbon Extraction. An astonishing 83% of Bolivian gas reserves are located under Guaraní territory in the Bolivian Chaco. The reserves are divided into four main fields; the largest one Margarita, San Alberto, Itaù - and the smallest San Antonio (Perreault 2008:9). Petrobras Bolivia was established in 1995, and began its operations in mid-1996. Petrobras is the main operator in the region and their activities include natural gas exploitation, production and transportation through networks of pipelines. On their webpage the company represent itself in the following words; "We hold stakes in six onshore blocks and are the operators of three. The highlights of our operations are the San Alberto, San Antonio and Itaú mega gas fields, which are located in the department of Tarija, home to the largest natural gas reserves in Bolivia" (Petrobras 2011:para4). Since operation start in 1996 their activities has taken its toll on the surrounding environment and indigenous communities. Today the environment is highly contaminated, especially so the water of the Pilcomayo River which runs through the whole region of Gran Chaco. The previously primary source of freshwater in the region no longer contains water suitable for human consumption. Also other freshwater sources in the area have degraded. This affects not only human settlements, but also livestock, wildlife and rich biodiversity.

2.3 Village Geographic's; Caigura, Tucainty and Cumandaroti

Indigenous groups have a tendency of being presented as a homogenous, despite the fact that there are clear individual differences between regions or even villages. Due to a great lack of documentation on the various individual Guaraní communities I have not been able to allocate reliable information on village characteristics, population size, etc. In lack of other information, an attempt has been made below to give the reader some idea of where we are geographically. *Caigura* is located about 20 minutes by personal car north of Villa Montes. The community lies within the Aguaragüe National Park. *Tucainty* village lies about 1 hour north-west with a personal car north-west of Villa Montes and are also located within the Aguaragüe National Park. Of the three villages included in this research, it is the most remote in terms of its distance from both the city and the main production fields. There are however a lot of gas extraction in the area, which can be spotted while driving past. The research team spotted a huge gas flare, along with villager's testimony of several other gas flares in the area. Finally the last village,

Cumandaroti is located 3 hours with a personal car northwest of Villa Montes. It is located within the Itika Guasu TCO, a recognized indigenous territory. It is also located in zone 3, the heart of gas extraction in Bolivia. Because of the high exposure to contamination, the living conditions among the indigenous communities living in this area are known to be severe and highly difficult.

[Indigenous from Isoboro Secure Territory protest march 11th of March 2012 – Illustration Photo 2]

Chapter III:
Literature Review & Theoretical Framework

3.1 Literature Review

3.1.1 Bolivia's path of Natural Resource Extraction and Contradictive Politics

Bolivia is the poorest country in South America, yet one of the richest in terms of natural resources. Consequently, the country's history and its environment have been dominated by extractive industries. It was once home to the Spanish colony's riches silver and gold mine - Potosi, and one of the world's richest tin mines - Siglo XX. Today Bolivia holds two of the world's largest silver mines - San Cristòbal and San Bartolomè, about half of the world's lithium reserves located in the Salahar de Uyuni, and the future largest iron ore mine in Mutùn. Last but not least South America's second largest gas reserve can be found in the region of the Bolivian Chaco (Farthing 2009:25). The extraction has taken its toll on the natural resource base. According to the Environmental Defense League (Lindema) "60 million acres of the country has been environmentally degraded and 17 million acres is under treat" (Farthing 2009:26).

After Evo Morales came to power in 2005, indigenous values have been promoted in national policymaking. He won the election with the widest margin of any leader since the restoration of

civilian rule in 1982, much due to his "promise to change the country's traditional political class and empower the nation's poor, indigenous majority" (CIA 2011:para1). The Bolivian people were ready for a change away from market liberal strategies towards a more people centered development. Despite high expectations as an indigenous representative, Morales political strategies have "exacerbated racial and economic tension between the Amerindian populations of the Andean west and the non-indigenous communities of the eastern lowlands" (CIA 2011:para1). Based on a review of recent political history it is clear that the role of indigenous people in Bolivian politics has remarkably improved. Some argue however that current political profile as a plurinational and inclusive is deceitful, especially questioning Morales image as an indigenous advocate. The Bolivian political system is complex and not understood easily. With a poor education system only the upper fraction of the population has the opportunity to understand what is going on. A contradictory politics that claim to support indigenous rights is dangerous as it may lead to a weakening indigenous political mobilization in a belief that indigenous interests are being safeguarded.

Management of the natural resources has become the largest source of conflict among the cultural diverse populations. The ambivalence in Bolivian development politics is contributing to increase the social tension between the nation's polarized populations. After the discovery of what is estimated to be the region's second largest natural gas reserve, natural gas has "emerged both as Bolivia's major source of export revenue and a source of political tensions involving regional governments, the central state, transnational hydrocarbon firms and indigenous peoples" (Perreault 2008:iii). Exploration, extraction and transportation have had profound negative social and environmental impacts for certain vulnerable parts of the population, "particularly for indigenous people of the eastern Chaco lowlands of Santa Cruz and Tarilja departments" (Perreault 2008:1). According to Sawyer (2004 in Postero 2008:17) the neoliberal reforms set out to create economic and political stability have 'backfired', jeopardizing the little credibility the state had established. People have started to doubt Morales credibility. Some say he is favoring the indigenous of the western highland, while forgetting about the south-eastern lowland (Perreault 2008). Others say he is in the pockets of multinational corporations. Recently the MAS government made new contracts with multinational corporations to extract the country's rich oil, gas, lithium and uranium reserves; the "very extractive industries that had gutted

Bolivia's subsoil at the expense of a population 69% of whom were living in poverty when Morales came to power"(Gonzalez 2011:para7).

3.1.2 Indigenous Vulnerability - Land Rights and Consultation

Risks and costs of industrial development are unevenly distributed across society. Although degradation of biodiversity and ecosystem services is indeed a global issue, it is "the poorest countries and the poorest people within them [that] are most vulnerable, being the most exposed and having the least means to adapt" (Douglas et al 2008:187). This means that not only are indigenous communities the most vulnerable to environmental change, they are also un-proportionally exposed to risks and costs of development initiatives. Environmental degradation, toxic wastes and destruction of self-sustaining ecosystems are only a few of the negative impacts related to major development projects, all in which have serious consequences for the health and well-being of indigenous peoples (Stavenhagen 2005:19).

Indigenous people's cultural security and existence are in many cases viewed as synonymous with the right to occupy and use ancestral territory. Their dependence on the environment are often extensive, varying from daily livelihood necessities as "water, food, medicines and wood [to being] the source for their existence, well-being and integral development as people" (Surrallès and Garcia-Hierro, in Orta-Martìnez and Finer 2010:213). For these reasons degradation of biodiversity in indigenous territories is equivalent with poor quality of life, as lack of economic capital among traditional indigenous communities prohibits them from finding alternative sources to ecosystem services. As the territory and environment for generation has been a source of security and identity; environmental degradation means losing a sense of belonging and affiliation. Often environmental degradation due to industrial production leaves the indigenous in a lose-lose situation, where resources they depend on are extracted and they are left with nothing more than the industrial hazards.

Deprived of their basis for livelihood, indigenous groups are re-categorized as 'poor' by the modern society, as they are becoming less self-reliant and thus more dependent on income to cover basic needs. Many are forced to participate as actors in a modern economy. With limited or no formal education they have to interact with regional or national authorities and multinational corporations about "concepts, terms, and matters with which they are unfamiliar" (Le 2009:23). The combination of limited resources and limited knowledge about how to be an actor in a

modern society makes them vulnerable, dependent on external assistance and thus easily exploited. Documentation that cultural diversity is rapidly disappearing alongside biodiversity degradation validates the vulnerable situation of indigenous peoples today (Ash and Fazel 2007).

The vulnerability of indigenous communities must according to Stavenhagen (2005) be seen in relation to lack of legal rights to ancestral land. This right is not given in developing countries economically dependent on natural resource extraction. In his opinion lack of indigenous legal provisions has contributed to "violations of the human rights of some 300 to 400 million IP's [indigenous peoples] throughout the world" (ibid 2005:18). Reviewing cases of indigenous groups in South America however one recognize land titling is not a panacea, as in many cases the laws are there - but not implemented. Focus should thus not only be on establishing adequate laws but on strengthening political structures for adequate policy implementation. For example, up until recently Peruvian legislation has granted extractive industries to establish production on indigenous lands, titled or untitled, without consultation or compensation for locals in the area (Sarkar and Montoya 2011:985). Thus in soon to be four decades the indigenous communities of the Corrientes River have been gravely impacted by petroleum activities, which has been filled with "environmentally unsound oil exploration and exploitation practices, outdated infrastructure and technology, and lack of adequate environmental regulation" (Sarkar and Montoya 2011:985). Even though the Peruvian government have adopted several indigenous friendly decrees, weak socio-political structures hinders adequate monitoring and implementation. A similar set of weak centralized structures and lack of adequate implementation of policies is seen in Bolivia. In general, large scale industries such as oil and gas exploration often fail to adhere to indigenous rights. Also global terms of agreement are not thoroughly implemented, such as the right to "free, prior and informed consent (the FPIC) established by Convention 169 of ILO and now required by the UN Indigenous People Declaration" (Orta-Martìnez and Finer 2010:209).

3.1.3 Legal Framework: Laws and Enforcement

Lack of human and economic resources in developing countries is causing governments to down-prioritize the protection the environment, as "basic survival needs frequently prevail over long-term considerations" (Farthing 2009:26). The issue is not only that the governments lack resources for implementing preventive measures, they also lack the ability to deal with potential violations. Even where there are individual initiatives, there's no backup system. Leonora Castro

from Sucre Association of Ecology (ASE) tells the story about when she urged to close Potosi's ore extraction plants in 2005 due to social and environmental concern; "Within days, cooperative miners kidnapped me and other authorities, forcing us to back down. So we had to change tactics" (Farthing 2009:27). The real threat that powerful private agents will take matters in their own hands complicate and hinders conservational measures.

As a result of Bolivia's inability to force polluters to pay for their mess, the country has developed 'environmental debts' (Farthing 2009:26). Previous generation's overuse of resources is gradually leading future generations into poverty. This trend will continue unless changes are implemented. However "the predominance of economic over environmental concerns make both healing Bolivia's environmental wounds and preventing future destruction an exceptionally difficult proposition" (Farthing 2009:29). Currently, due poor enforcement it is often more cost efficient for environmental violators to pay a penalty than to invest in preventive measures and expensive technical equipment. This is both because the fines are relatively low and not proportional to the cost of the damage, and also because the fine sometimes get caught up in the system. This type of practice has led to many disastrous events. For example, in January 2000 Bolivia experienced what has been called one of the country's worst environmental disasters; an oil pipeline broke spilling about 110.000 liters of oil into the country's most important highland river –the Desaguadero; "contaminating almost 2,400 square miles of crop and grazing land belonging to indigenous people" (Farthing 2009:26). Because of governmental inability to handle sanctioning, the responsible company Transredes was let off the hook with only a minimum of mitigation measures and compensation. For the company it was cheaper to pay the penalty than to prevent the disaster from happening. Due to high rates of rural poverty, local protests can be silenced with 'nickels and cents'.

3.1.4 The Pilcomayo River: A source of life and degradation

Where there is water there is life. The Pilcomayo River is an important source to life for plants, animals and people in urban and rural parts of Bolivia. The river and tributaries have however been subject to contamination for generations. The hazards are carried downstream. Mining has been an activity in Potosi since the 1545, continuously releasing large quantities of waste materials into headwaters, "causing severe contamination of the Pilcomayo's water and sediments for at least 200 km downstream from the mines" (Miller et al. 2004: 189). In addition

to the continuous flow of contamination from the mines, the Pilcomayo has in addition been subject to an increasing range of large scale environmental disasters. To grasp the severity of the situation, a few of them will be highlighted.

The Pilcomayo Disaster: In 1996 a tailing dam broke in Porco mine close to Potosi. 360,000 tons of zinc, lead and silver tailings was spilled, affecting fish reproduction and farming as far as 300 miles downriver (Church World Service 2006:para7). In Farthing's words the massive spill "destroyed the Pilcomayo"; however the government did not insist on remediation (Farthing 2009:27). The bill was left with the indigenous people living in villages downstream. With highly degraded soil fertility and destruction of crops, people were forced to migrate. One of the most affected communities – the Sotomayo "has seen its population drop from 1200-800 since 2006" (Farthing 2009:27). As a direct consequence of the disaster: in a little more than a decade, 33% of the population had migrated.

The Laguna Pampa leak: In October 2005 there was a major leak at the Laguna Pampa dyke, where 10.000 ton of sediments and liquid waste was released into a tributary of the Pilcomayo River. About a year later CERDET went to visit the area, and found another two dykes about to burst (Church World Service 2006:para7). No preventative measures had been installed. CERDET feared an environmental disaster on the same scale as the breaching of the Porco Dam in 1996 (Church World Service 2006:para7).

On April 12th in 2006 a flood provoked another massive oil spill near an oil field called 'The Monkey' in Park Aguaragüe, in a tributary of the Pilcomayo River. Intense amounts of rain sent a stream of water in high speed down the mountainside of Aguaragüe, digging up a gas and an oil pipeline that was buried 1,5 meters underground. The gas pipeline managed the stress, but this was not the case for the oil pipeline. According to the company one thousand barrels spilled into the 'Quebreada de los Monos', a tributary of the Pilcomayo River; but there was no way to verify this, since there was no access to the data (Lago et al 2010:44). As a result, the indigenous communities of the area suffered. The Guaraní community of Zapaterambia got their water sources contaminated by hydrocarbons "at a level several times higher than permitted in Bolivia and the European Union (EU)" (Lago et al 2010:44). After the disaster, a field visit was conducted by an environmental technician from the Villa Montes Mayor's office. Photos from the visit revealed how REPSOL-YPF had applied 'cutting edge technology' to prevent further

spilling; “a bucket tied to the pipeline with a rope” (Lago et al 2010:44). This is yet another example of how rhetoric and practice often differ within this field.

3.1.5 Hydrocarbon Extraction on Guaraní Indigenous Territories

According to Perreault (2008) about 55% of Bolivian territory has hydrocarbon potential, most of it is located in the Amazon and Chaco lowlands. As these areas are primarily inhabited by indigenous people, there are considerable overlap between the regions of hydrocarbon development and indigenous lands (Perreault 2008:9). A whole 83% of total Bolivian gas reserves are located in Guaraní territory in the Bolivian Chaco (Perreault 2008:9). The reserves are divided into four main fields; Margarita, San Alberto, Itaù - and San Antonio. As a result the Guaraní has been more affected by oil and gas extraction than any other group in Bolivia. Lack of resources, alternatives or external support; the impacts of hydrocarbon industries has transformed the Guaraní from self- sufficient to deprived and dependent on alms. The Guaraní are traditionally settled agriculturalists combined with husbandry of different sort. To a large extent they are dependent on natural resources to maintain all spheres of their everyday life; from access to food, health care, cultural identity and cosmology. As a consequence, when the resource base is contaminated, the ripple effects are immense. In 2005 samples was taken of water sources near the Alberto, San Antonio and Campo Margarita gas field. According to both Spanish and European legislation the water values were not fit for human consumption (Lago et al 2010:44). However some of the samples remained within the permitted contamination limits according to Bolivian legislation, yet another evidence of how Bolivian policymakers fail to prioritize environmental concerns over economical. The 2005 environmental study conducted by APG show how environmental degradation is changing the indigenous livelihood; “The effects of erosion and deforestation on forest animals and the pollution of surface water have modified how these people acquire their daily food” (Lago et al 2010:44). As water sources are contaminated and the forest is disappearing, the Guaraní’s are forced to change their conduct of life. Simultaneously, occupation and degradation of ancestral land are threatening the Guaraní cultural identity and affiliation; socio-cultural structures are weakening. An example is the increasing number of abandoned pregnant women among the Guaraní. According to the Guaraní Peoples Assembly (APG); “For a Guaraní man, responsible fatherhood is an important value, which today is put in doubt by the feckless attitude of REPSOL YPF’s workers” (Lago et al

2010:44). Influence from occupants and influx of modern values and norms are changing the traditional sociocultural structures.

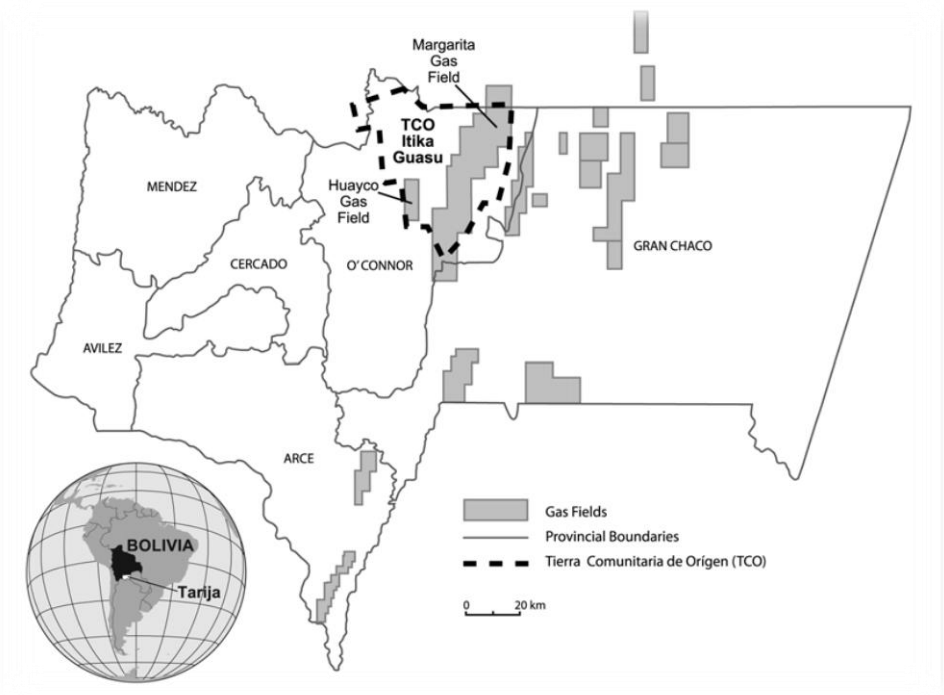
3.1.6 The Itika Guasu indigenous territory (TCO) and the Margarita gas field

The traditional territory of the Guaraní from Grand Chaco and O'Connor department are scattered over the area, but most are connected to the Pilcomayo River or tributaries. In an attempt to regain control and legal rights to their traditional territory, in 1994 the Guaraní submitted a land claim for 18 TCO's, covering 10.220.340 ha. Two years later, in 1996, the Margarita gas reserve was discovered which significantly altered and delayed the application process. Finally in 2004 "after eight years of consideration (and six years of gas production), the government awarded the Guaraní just 6.8 per cent of their request (697,957 ha)" (Perreault 2008:10). The remaining 93.4 per cent of the claim has been effectively opened up for oil and gas development (Orduna in Perreault 2008:10). Today the Margarita and TCO are located more or less on the same spot. The Margarita gas fields consist of four wells (X1-X4) operated by transnational firms, including REPSOL YPF (37.5% share), the BG Group (37.5% share) and Pan American Energy (25% share). The Itika Guasu TCO is home to seven Guaraní indigenous communities, including the Zapaterambia, Itaparara, Puerto Margarita, Yuati, Ivoca, Villa Mercedes and Cumandaroti (Perreault 2008:9). Inside the TCO the Guaraní are outnumbered two-to-one by the 1600 non-Guaraní workers employed in various phases in the gas production and have little control of what is going on in their territory (Orduna in Perreault 2008:9). This process is a testimony of how little consideration the government attributes the indigenous population. The firms operating within the TCO has committed to facilitate the Guaraní by providing basic services, "including the construction of health posts and adobe houses, and the provision of such items as fencing, blankets and construction materials" (Perreault 2008:11). Overall they are decreed to consult the indigenous about extractive activities happening on their area according to the ILO convention 169 (ratified by Bolivian law 1257 and passed in 1991). The Bolivian hydrocarbon's law requires firms to conform to the directives of Convention 169, but leaves the responsibility for monitoring and making sure these are followed to the firms themselves. This type of monitoring and enforcement is highly inadequate to ensure that indigenous are properly involved in the process (Perreault 2008:12). As a result it is easy for the companies to manipulate reports or work their way around costly and time consuming obstacles. As examples two operations of REPSOL-YPF will be highlighted; first from oil exploration in

Ecuadorian Yasuni National Park, and then from gas extraction in Margarita well X-3 – both areas are inhabited by indigenous peoples.

3.1.7 REPSOL-YPS Operations – experience from Bolivia and Ecuador

The Margarita well 'X-3' is operated by -YPF in collaboration with Maxus, and located in close distance to the Guaraní community of Cumandaroti. The village is located within 500 meters of well X-3, though regulations require a minimum 700 meters distance (Perreault 2008:12). Company failure to comply with regulations has also been registered by the department of National Resources and Environment, which report numerous incidents of legal noncompliance,



[Map 4: Margarita Gas Field and Itika Guasu TCO. Retrived from; Perreault (2008:11)]

mainly "failure to issue monitoring reports, presentation of expired environmental licenses, and even failure to present licenses for the company projects at all" (Lago et al 2010:43). Two incidents of defective reporting will be used to explain these statements. In both cases, according to Bolivian legislation, consultation processes should have been implemented.

The Bolivian department for Natural Resources and the Environment reports how REPSOL-YPF/Maxus has failed to consider socio-cultural and environmental impacts on the Guaraní (Lago et al 2010:43). Reviewing REPSOL's environmental impact assessment (EIA) for well X-3, the full report contains only ten lines about how the Guaraní and to what extent they would be

affected by the planned activities. According to APG it is evident when reading the report that public hearings were not held (Lago et al 2010:45). REPSOL's report claims further that the firms were exempted from local consultation because the area supposedly belonged to a third party (Perreault 2008:12) – when in fact well X-3 undoubtedly was located within the boundaries of Itika Guasu TCO; a nationally recognized indigenous territory.

On another occasion; when preparing a legal document delivered to the Vice Minister of the Natural Resources and the Environment about operations on X-3 and the Cumandaroti community, Maxus conveniently used a template from an old report from the company's earlier operations in the Tsiman community of San Borja. The Tsimans are located in the Amazon Basin hundreds of kilometers to the north of Itika Guasu and do not resemble much to the Guaraní (Orduna 2004 cited in Perreault 2008:12). By a mistake names were not changed, and so the Guaraní people were referred to as 'Tsiman' and the community of Cumandaroti as 'San Borja'. This is evidence that local opinions and participation is given no or little value. Unfortunately, these practices have led to no greater consequences for the company than oral reprimands.

It is not only in Bolivia the Spanish company REPSOL-YPF is known for poor extractive practices, which implies this practice is not an irregularity. Looking at their operations in Ecuador, one can find many similarities with the Bolivian context. In 1996 the Argentine company YPF bought out Maxus and got control of the Yasuni National Park. When in 2000 REPSOL absorbed YPF, REPSOL-YPF operated all oil fields in the park. The effect on the indigenous group has been invasive. After oil extraction started the indigenous Huaorari reported experiencing decreased fish and wildlife for hunting; skin rashes due to a contaminated Tiputini River; high increase of gastrointestinal and respiratory disorders, dermatitis and an increase of miscarriages among Huaorari women (Lago et al 2010). Over a short amount of time the sustainable way of life of the Huaorari indigenous group was threatened, a frightening development "for a hunter-gatherer society that lived in harmony with the forest until a few years ago" (Lago et al 2010:42). REPSOL-YPF's poor practice is reflected in the community-company agreement, which was only written in English. Most indigenous have problems expressing themselves in Spanish, yet alone understand English. According to Oilwatch "the decision-making process followed could not be characterized as transparent and participatory"(Lago et al 2010:43). The Huaorani was on paper consulted, but had in reality no chance of understanding

what was happening or promoting their interests. Such irregularities can perhaps in some cases be accepted when done by actors due to the complete lack of resources. However, companies like REPSOL YPF with millions of euros in profit are "more than capable of producing high-quality reports, taking ameliorative measures and using less damaging technologies" (Lago et al 2010:43). A report prepared by Orduna showed that REPSOL and Maxus have invested about $200 million in the Margarita gas field. Less than 0, 05% ($100,000) of the total investment has been spent strengthening social capital through goods and services among the Guaraní communities (Perreault 2008:12). On the other side of the budget $2.4 million was spent constructing a bridge over the Pilcomayo River. The saved expenses are exchanged in degraded livelihoods and declining health among the indigenous community;

- "Gas flares, heat and odour associated with drilling and extraction cause headaches and human illnesses, and adversely affects crops and animals. Waste drilling mud, chemicals and lubricants used during drilling have been dumped into a large open pit, along with chemicals and hydrocarbon-contaminated water" (Orduna in Perreault 2008:12

In conclusion the hydrocarbon companies have failed to consult affected indigenous communities, as in Bolivia are required by ILO Convention 169 and Bolivian Law 1257. The companies are however not the only scapegoats in this equation. Blame for this practice is shared with the government agencies for accepting insufficient reporting, a consequence of their inability to implement existing legislation. It is also shared with international lending institutions such as the World Bank for financing natural gas extraction and the construction of pipelines. Together they have "established a lax business climate in which private firms were largely responsible for policing themselves" (Perreault 2008:14). In addition monitoring agencies are too closely tied to private firms, in some cases even funded by hydrocarbon extraction activities (Perreault 2008:14). This creates an unhealthy balance of power among agencies that are to be objective and control each other. As a consequence poor practices are not adequately managed.

3.1.8 Indigenous Socio-Political organization and Political Activism

Traditionally, the Guaraní are socially and politically organized in the 'Capitàn system', a system comprised of a Capitàn from each community headed by a Grand Capitàn. The Grand Capitàn is however controlled by an assembly (*asamblea*). There are assemblies for each community, as well as a 'Grand Assembly' for the whole Capitàn system (Perreault 2008:10). In addition, since

the 1980's the indigenous group has been organized into modern indigenous organizations. The CIDOB was established in 1982, and function as an umbrella group for all the various indigenous groups in the Amazon and Chaco region. In 1987 the APG was founded with support from CIDOB. The APG has a unifying function, bringing together the different divisions of the Guaraní, with leadership composed of representatives from each of the three zones (Hirsch 1999 in Perreault 2008:10). Since the 1980s however, the Guaraní has been represented by modern indigenous organizations. In 1982 the Centre for Indigenous Peoples and Communities of the Bolivian East - CIDOB, was established in Santa Cruz. In 1987 the APG was founded with the support of CIDOB, the Catholic NGO and the Centre for the Investigation and Promotion of the Peasantry (CIPCA). It unites the different Guaraní group divisions by a leadership composed of representatives from each of the three zones (Hirsh 2003 in Perreault 2008:10).

Over the last decade, tension has been rising between the Guaraní's and the MAS government over the monitoring of natural gas operations. The tension is reflected in increasing rates of protests and political activism. An APG representative from Itika Guasu Teofilio Murillo states; "Over the last 10 years the hydrocarbon companies have come onto our land without respecting or consulting us" (Farthing 2009:28). Their complaints or initiatives for monitoring and reporting activities on indigenous territory have been ignored, now their patience is running out. The growing urgency of the indigenous conditions of life has motivated sporadic protests. In May 2004, dozens of Guaraní staged a peaceful protest against REPSOL YPF and Maxus operations in the Margarita Gas field by surrounding company installations at the Margarita, blocking transport of food supplies to company workers (Perreault 2008:12). After five days protesting, the government agreed to establish a fund by which two per cent of gas rents paid to the state would be used for development projects among the Guaraní. Two years later, in August 2006 the indigenous were not content with the way the agreements had developed. This time the protestors, 300 members from APG, concentrated on the Parapeti Control station in Santa Cruz; threatening to shut off the flow of gas to Brazil (Perreault 2008:12). The protest was provoked by dissatisfaction concerning an agreement with pipeline operator Transierra, which is a cooperative between Petrobras, REPSOL YPF and Total. A fund of $9million that was to be invested in the Guaraní communities over a period of 20 years as compensation for the pipeline crossing indigenous lands (Perreault 2008:13). At that time the companies operating Transierra had only spent $255,000, far from what had been promised and expected.

In November 2005, APG released a statement condemning REPSOL YPF's activities and impacts on Itika Guasu TCO, accusing them of "violating Bolivian law under Evo Morales' presidential decree of 1May 2005" (Perreault 2008:13). The position and power of influence of APG is not strong. However, strengthened by the national and international legal framework their case is getting stronger. As the 'eye of the world' increasingly is watching, pressure to execute sustainable and responsible development is increasing. For now however the firm keeps on extracting, and according to Perreault, "given the financial reliance of the Bolivian state on hydrocarbon rents, it is unlikely to cease operating any time soon" (Perreault 2008:13).

One of the most recent reactions to current political trends is the indigenous protest of governmental plans of constructing a 400 km highway through the Isiboro Sècure National Park in august 2011. Several thousands of men, women and children representing the 64 indigenous groups inhabiting the park started on a march of protest towards the city of La Paz. They claimed the construction would cause enormous environmental damage, disrupt and dissolve local indigenous livelihoods and that its "real purpose was to give easy access to multinational oil and gas companies" (Gonzalez 2011:para6). The situation for Bolivia's indigenous is far from unique, but rather a regional trend set out to open up the Amazon for trade and commercial production. Manifested among others through the Initiative for Integration of Regional Infrastructure of South America (IIRSA) a regional coordinating network of roads, ports, waterways, pipelines and other infrastructure to integrate the continent and open up the Amazon for commercialization (Bebbington 2009:13). As the current trend of progressive development in vast areas is regional, findings from my research may be helpful understanding similar situations regarding extractive industries, vulnerable groups and conflict throughout South America.

3.1.9 Indigenous Internal Migration

In addition to increasing political mobilization among the indigenous population, reactions has taken the form of internal migration. The problem of rural to urban internal migration is according to the Economic and Social Council (ECOSOC) one of the main factors causing increased poverty rates in Latin American cities today (Heins 2011:24). More than any other social group in Bolivia, "indigenous people are migrating within the country in search of work and social advancement" (Heins 2011:24). Settling in the suburbs of the biggest cities however, the road to poverty is short as access to basic needs is lacking, unemployment high and social

problems thriving. The main reasons for migration according to a MECOVI study from 1999, include search for employment, education, job transfers, health and civil safety (Heins 2011:29). More specifically access to land and livelihood safety are major issues. These issues are triggered by various reasons, such as industrial hazards and environmental problems such as frost, drought, hail or flooding; both affecting agriculture. In addition to incentives such as lack of livelihood, malnutrition and search for a 'western lifestyle, a major push factor include "the precarious health situation in some regions, the rustic living conditions in rural areas and the lack of basic services" (Heins 2011:30). Generally the living conditions are poor among the indigenous people in the region. According to Heins, the main reason for indigenous people to migrate is poverty; "almost 90% of indigenous people are poor" (Heins 2011:36). The statement is based on research saying that about 90% of the people living below poverty line are indigenous. This is not the same. In reality the main reason is deprivation of basis for livelihood. Poverty strikes when rural people enters urban areas or modernity reaches rural areas, as poverty in its modern form indicate not having enough money – which entails being incorporated into the modern world economy.

The internal migration has led to a range of consequences, including i) increasing crime in suburbs and cities; ii) environmental pollution and overburdening of transport and infrastructure; and iii) a rise in ethnic conflict, especially related to indigenous people. Through generations of oppression the indigenous people, gathering in urban communities "emphasize their ethnic identity in order to distinguish themselves from the white majority" (Heins 2011:35). Increasing rural to urban migration is causing increasing pressure on available resources and the social conflict rates arise. Politically it is a fight for attention, which is reflected in high rates of protests and marches in urban areas. Especially among the people at the bottom of the social pyramid, the search for social enhancement becomes a scramble for remainders.

3.2 Theoretical Framework: Political Ecology

Part I: Sustainable Development

3.2.1 Sustainable Development and Environmental Degradation

Achieving economic development without negative effects on people and the environment is the ultimate challenge for sustainable development. In the early post-war period development was solely based on economic terms. Economic aid introduced by the Marshall Plan to rebuild Europe in the wake of World War II (Bräutigam and Knack 2004:256) set the idea that development could be fuelled monetarily. But the relationship between economic growth and environmental conservation is highly controversial (Kristof 2000 in Moe 2007: 2). There are limits to the world's resource base, which means the world's resource base needs to be adequately managed and safeguarded in order to bring future prosperity. Natural resources can be harvested in a sustainable way as long as ecological thresholds are not exceeded. The most famous definition of sustainable development was expressed in the Brundtland Report of 1987 as the ability to "meet the needs of the present without compromising the ability to future generation to meet their needs" (Brundtland 1987:5). This definition is a recognition that investment in environmental and social resources has to be implemented in development policies in order to achieve sustainable, long term economic growth. Interlinkages are recognized, claiming we all have shared responsibility for 'our common future'. This anthropogenic concept implies current climatic changes are caused partly by human actions, and that we must take care not to exceed the world's environmental limits to growth. Based on this acknowledgement there exist a consensus that "development institutions, projects and aid givers should seek strategies in which both human well-being and a healthy environment jointly exist and are mutually reinforcing" (Crocker 2006:5). Consequently various business policies have been developed in order to address this challenge; concepts such as 'corporate social responsibility' and the 'triple bottom line' address social and biophysical considerations in economic development. Although based on economic underpinnings they have become a priority on the global development agenda. The main challenge towards addressing these factors equally are, according to Rothman, to develop plans that make sense in "both the short and long-term" (Rothman et al. 2007:400).

The pursuit of development and economic prosperity has lead man to use more of the Earth's natural resources than is sustainable. According to the Millennium Ecosystem Assessment from

2007, 60% of global ecosystem services are degraded or unsustainably used, compromising production of vital ecosystem services along with human health, security and well-being (Gitay et al. 2007:366). This is more visible today than ever before, as industrialization, globalization and global market forces are gaining foothold in even the most remote corners of the world. The result is an extensive pressure on the world's ecosystem. As specified in *Our common future*; inequality sharpen as a system approaches ecological limits (Brundtland 1987:17). As a valuable asset for many the unequal access and distribution of ecosystem services has led to increased poverty for particular vulnerable groups, land degradation and human induced climate change (Gitay et al. 2007). The cost are highest for the most vulnerable, those most dependent on natural resources and with least alternatives.

As a response to steadily increase in ecological distribution conflicts, Jason W. Moore (2000 cited in Orta-Martinez and Finer 2010) has introduced the term 'commodity frontiers'; referring to the "environmental transformation, degradation and relative exhaustion in one region after another due to natural resource production and extraction; environmental transformations that were conditions as well as consequences of an expansion of a world-economy predicated on the endless accumulation of capital" (Orta-Martinez and Finer 2010:216). Moore presents this development as highly contradictive, stating the unsustainable use of natural resources for capitalist values of the modern world not only undermines its own conditions of production, "but also the conditions of livelihood and existence of peripheral people, so that ecological distribution conflicts keep increasing across the world" (Moore 2000 cited inOrta-Martinez and Finer 2010:216).

3.2.2 The value of Ecosystem Services

The inter-linkage that exist between the world's atmosphere, land, water, biodiversity and human society are evident, and not constricted by national, regional or continental borders. Today the largest and most important reserves of biodiversity are located within the borders of developing countries. With limited social and economic resources, management of these complex systems of common resources is particularly challenging. Consequently, a broad set of multi-scaled governance tools may be required (Gitay et al. 2007).

The relationship between human well-being and the natural environment is connected through a range of services provided by the ecosystem. In order to live people need basic provisions of air,

water and foods; services produced by a balance in the world's ecosystem. Most people are however not aware to what large extent their existence are dependent the environment, or what grave consequences environmental degradation may have for human welfare. A thorough definition of ecosystem services include; *provisioning services*, such as food and water; *cultural services*, such as spiritual recreational and cultural benefits, *regulating services*, such as flood and disease control, and *supporting services*, such as nutrient cycling that maintain the conditions for life on Earth" (Millennium Ecosystem Assessment (MA) 2005 cited in Martino and Zommers 2007:15). These services are interdependent, and imbalance to this system will negatively affect human well-being with implications for "security, basic material for a good life, health, and social and cultural relations" (Millennium Ecosystem Assessment (MA) 2003 in Martino and Zommers 2007:15). Although this is a global phenomenon, some groups or regions are more easily affected than others. As the world's poor are particularly dependent on environmental goods and services to sustain livelihoods, it makes them "particularly sensitive and vulnerable to environmental change" (World Resource Institute (WRI) 2005 cited in Martino and Zommers 2007:15).

The term '*ecosystem service*' should however be discussed as it is in its current form a testimony of the modern concept of nature as something to be controlled and conquered by man. It implies these are services the environment is meant to provide humanity. Rather it is humanity's task to nurse the environment for it to provide the services we need. Up until now however this has not been done in a sustainable way, compromising not only the reproduction of vital ecosystems but also human health, security and well-being (Gitay et al. 2007:366). The increasing pressure on the worlds natural resources are causing distribution conflicts (Moore 2000 cited in Orta-Martinez and Finer 2010), which in turn provokes a sharpening of social inequality and poverty (Brundtland 1987:17). As the stock of resources keeps on decreasing those with political and/or monetary power will first and foremost safeguard their own interests, leaving the most vulnerable to fend for themselves.

3.2.3 Different Concepts of Nature

Throughout history man has sought to both understand and adapt the forces of nature. By developing tools man has increasingly been able to understand and manipulate the natural environment to their convenience, and so the modern concept of nature has evolved. But there

exist a variety of different ways of conceptualizing nature. The value people attribute nature is according to Escobar shaped by cultural, socioeconomic and political factors (Escobar 1999). This means we have different ways of relating to our natural environment based on the social, political and economic framework in which we live. As a result nature has different meaning for "indigenous people, environmentalists, states, corporations, development agencies, and non-indigenous urban or rural dwellers from different social classes" (Lu 2009:5). Along the era of industrialization came the notion of nature as a 'resource' for economic growth – "a resource that could be managed, directed and engineered" (Lu 2009:6). During these times the environment became a commodity, and the modern concept of nature went from being an integrated part of the human existence to something external and manageable. While a lion's share of the world's population has adopted a modern lifestyle based on a market economy and advanced division of labor, there are still many who live according to traditional principles of subsistence cultivation and with close relations to their natural environment. Because of the indigenous cosmologies and concepts of nature, they are particularly vulnerable as ecosystem degradation not only means degradation of livelihood - but will also disrupt their sense of belonging and idea of being in the world. When all the most fundamental aspects of their lives are changing rapidly, without enough time to adapt, this may cause a sense of social displacement.

3.2.4 DPSIR

In order to conceptualize the interaction between society and the environment in the Bolivian context, a part of the DIPSIR framework will be used to reveal the impacts on indigenous groups and their responses to ecosystem degradation. DPSIR is short for *drivers, pressures, state, impact* and *responses*; and attempts to reflect key components of "the complex and multidimensional, spatial and temporal chain of cause-and-effect that characterizes the interaction between society and the environment" (UNDP 2007:xxi). For the indigenous of the Bolivian Chaco, *drivers* such as changing demographics, consumption patterns and economic demands, distribution patterns, institutional and socio-political frameworks and local value systems all contribute to current situation. Also contributing are *pressures* such as hazardous waste, the use of chemicals, increased pressure on land and resource extraction. While the *drivers, pressures* and *state* may to some extent be identified through literature reviews, the *impact*s and *responses* of eco-service degradation will be the main focus of this thesis. The *state* of human induced environmental changes includes land degradation, biodiversity loss, air and

water pollution. The *impacts* may refer both to human well-being and the capacity/ability to cope with environmental change (UNEP 2007). Finally the *responses* address "issues of vulnerability of both people and the environment, and provide opportunities for reducing human vulnerability and enhance human well-being" (UNEP 2007:xxiii). The DPSIR framework has become a popular tool used by researchers and policymakers as a way of capturing the key relationships between factors in society and the environment. It is promoted as a simple way of improving communication between researchers on one side and stakeholders and policymakers on the other. According to Svarstad (et al. 2008) it is important to be aware that this is not a framework that generates neutral knowledge. Rather, it is a discourse-selective framework which tends to favor certain discourses (e.g.Preservationist and Win-win), and ignore others (e.g.Traditionalist and Promethean) (Svarstad et al. 2008). As an example it is argued to ignore key non-human drivers of environmental change such as increasing temperatures. Such limitations are important to be aware of in order to establish good communication in environmental research and thus successful participation in biodiversity management. Consequently, when using the DPSIR-framework in this thesis non-human drivers have been included.

3.2.10 World Economy dependence on Oil and Gas

Biodiversity provide the basis for ecosystem services and constitute the foundation for human survival on local, regional and global scale. Although the importance of biodiversity conservation is obvious, the rates of biodiversity degradation are increasing due to a whole range of *pressures*, such as changing land use, habitat degradation, overexploitation of resources and pollution (Ash and Fazel 2007:162). These pressures are driven by a whole range of human induced *drivers*, chiefly population growth and the associated increase in global consumption of resources and energy (Ash and Fazel 2007:162). The extensive pressure on human and environmental capital is therefore difficult to understand without taking into account the world economy dependence on oil and gas (Orta-Martinez and Finer 2010:216). Hydrocarbon has been the main source of energy used by man from the dawn of industrialization. Today it has become the precondition and an "essential input for exomatic energy metabolism of contemporary rich economies" (Orta-Martìnez and Finer 2010:208). However, as world demand and consumption of fossil fuels has increased throughout the 20th century, the discovery of new reservoirs started decreasing in the 1960's (Tsoskounoglou et al. 2008 cited in Orta-Martinez and Finer 2010:208). Data from a variety of sources suggest the world's production of conventional oil has reached a

plateau, but "the combined production of conventional, NGL's and non-conventional oil is still rising" (Hughes and Rudolph 2011:232). Greater demand and decreased resources are causing greater competition for the resources that are left. A future increased scramble for petroleum resources combined with decreasing 'energy return on energy investment' [EROI] (Orta-Martinez and Finer 2010:208) may lead to world supply shortage and increasing oil prices. Because much of the world's conventional oil has already been extracted; "new discoveries tend to be smaller than in the past, take more time and more expensive technology to develop, and they run dry faster" (Orta-Martinez and Finer 2010:208). A prospected oil peak may further increase the great divide between developed and developing countries. The need for energy in terms of oil is still growing in the vast emerging markets in the developing world such as China and India (Orta-Martinez and Finer 2010:208). In addition, due to a likely increase of revenues developing countries are likely to continue the path of oil frontiers despite heavy environmental and social costs. The global market and a united oil industry urges for major investment in exploration for new reserves and easier access to new and promising territories, arguing this is the solution to prevent record high oil prices (Orta-Martinez and Finer 2010:208). This is alarming news for the world's ecosystems, as oil exploration will be forced into increasing numbers of vast territories. With increased world prices on oil - despite lower quality of reserves, production may still be profitable.

Critics to the oil peak model has argued that the introduction of alternative energies, more advanced technologies, new oil discoveries and use of non-conventional oil sources has slowed down the pressure on oil resources and thus postponed an oil peak. According to Boyce the classic Hubbert-Deffeyes Peak Oil model (HDPO) attempt to force a linear relationship onto data which are inherently non-linear (Boyce 2012:1). However, Boyce does not deny that oil production may eventually peak, only that the HDPO model has limitations when it comes to timing and potential magnitude. Although new and better technologies are provided, these methods are expensive, energy intensive, potentially polluting, "expected to do little more than delay a plateau or peak by more than a few years" (Hughes and Rudolph 2011:232). Bottom line is that societies should prepare for a world with less oil. According to Alexander a downscaling from an energy-intensive consumer lifestyle is desirable for environmental and social justice reasons (Alexander 2012) leading to a more just and sustainable path of development).

Part II: Political Ecology

3.2.5 Political Ecology

Ecology is the study of relation between living organisms and their natural environment. As our biosphere is increasingly being dominated by human actions ecology must incorporate human behavior. Political ecology as such present a powerful tool for integrating natural and social dynamics, used in this thesis as a superior theoretical framework in which all the other themes are connected. This complex multidisciplinary discourse emerged in its modern form in the 1980's from the studies of anthropology, geography and environmental studies (Nightingale 2010:159). Critics has argued it is a 'field without an institutional home', a blurry discourse made out of a selective combination of different fields – with only the relationship between environment, politics and society as a common denominator (Wolford 2010). However, due to the variety of different approaches available, it is important for researchers to specify in which theoretical direction they are heading. It is indeed a complex body of knowledge that can be costumed into fitting specific situations, but that is also its biggest strength. In order to understand the complex dynamics of social behavior there is need for an equally complex and dynamic framework. The most famous work on sustainable development defines poverty alone as a trigger to environmental degradation (Brundtland 1987). This reflects an oversimplified picture of the driving forces of environmental degradation. Instead Duraiappah (1998) advocates the importance of seeking a more nuanced pattern of interconnected driving forces; stating in cases such as water pollution, commercial agents are driven primarily by profit motives while "low-income groups pollute because of a lack of provision of proper sanitation and drinking water facilities by governmental agencies" (Duraiappah 1998:2175). This example suggests a notion of approaching environmental degradation as a *circular* phenomenon, rather than a *linear* chain of cause and effects. Through a framework of political ecology one is able to identify and address all links simultaneously.

Following Bryant and Bailey (1997 in Robbins 2004:11) a common premise in political ecology is the recognition that environmental change and ecological conditions is the product of political processes. Behind this premise there are three fundamental linked assumptions; the acceptance of inequality, hierarchy and power (Wolford 2010:718). In accordance most political theorists are concerned with control, access and distribution of environmental resources. Understanding how

power and asymmetrical power relations may influence policymaking can be used as a tool to influence decision-making. In addition it provides a holistic approach for understanding social and environmental issues beyond local simplification such as the work of the Brundtland Commission (1987) mentioned above.

The recognition of the unique environmental value of forests has reached the global arena. Concerns based on the potential loss of species, its impacts on the rights and needs of forest people and its impact on sustainable development (Adams 2009:244) has made forests conservation a priority on international agendas. In 2010 Tanzania got the world's attention when releasing plans of building a highway through the national park Serengeti, possibly effecting the preservation of wildlife (Gettleman 2010). The debate has revealed polarized interests between Tanzanian politics and conservationists. While Western voices uphold the importance of ecological preservation, the Tanzanian government justifies the literal road ahead as an improvement of infrastructure that will join the country and promote human development. The spokesman of the Tanzanian President Salvator Rweyemamu, used these words in describing the conflicting argumentation:

> *"You guys [The West] always talk about animals, but we need to think about people" (Rweyemamu in Gettleman 2010: para 8).*

The challenges of embracing elements of political ecology in development practice relates to the dangers of expressing 'ecological imperialism' by upholding the asymmetrical power balance from the colonial era regarding resource management. Asymmetry of power is also evident in the costs and benefits related to forest management, as often "those who convert forest land take the benefit but do not have to pay the cost" (Adams 2009:246). Indigenous groups who depend on the forest for food, water and livelihood can therefore be deprived of forest access and their basis for survival. Most forests today are managed by governments and agencies which don't rely on or relate to the forests. According to Siry, 87 % of global forest stocks are now owned by states, which affects who's voices are heard in development policies (Siry et al in Adams 2009:246).

Adopting Robbins (2004) approach to political ecology this thesis seeks to "demonstrate the undesirable impacts of policies and market conditions, especially from the point of view of marginal groups and vulnerable populations (Robbins 2004:12). A paramount objective is

finding causes and solutions rather than symptoms of degradation of social and environmental capital. In order to reach conclusions about underlying causes and mapping the various factors involved however, it is essential with a thorough understanding of specific issue and the social, cultural, political and economic context. Using the words of Watts (2000 cited in Robbins 2004:6) this thesis also aim to understand "the complex relations between nature and society through a careful analysis of what one might call the forms of access and control over resources and their implication for environmental health and sustainable livelihoods". This will be done by identifying the 'material conditions and the imaginary status' (Robbins 2004) of the environment from the perspective of marginal groups.

Robbins has presented four big questions or themes what in his eyes unites the diverse work within the field (2004:14). These are the degradation and marginalization thesis, the environmental conflict thesis, the conservation and control thesis, and the environmental identity and social movement thesis. By merging Robbins' environmental conflict thesis and the environmental identity and social movement thesis we are approaching more specifically how the political ecology theory is applicable to the theme in this paper. Using these approaches means also adopting certain theoretical underpinnings which will be highlighted below.

- **The environmental conflict thesis;** "Increasing scarcities produced through resource enclosure or appropriation by state authorities, private firms, or social elites accelerate conflict between groups (gender, class or ethnicity). Similarly, environmental problems becomes "socialized" when local groups(gender, class or ethnicity) secure control of collective resources at the expense of others by leveraging management interventions by development authorities, state agents, or private firms. So too, existing and long-term conflicts within and between communities are "ecologized" by changes in conservation or resource development policy" (Robbins 2004:173). This thesis is rooted in three fundamental lessons within social ecology, the argument is based on an understanding; 1) that social systems are structured around divisions of labor and power that differentially distribute access and responsibility for natural goods and systems, 2) that property systems are complex bundles of rights that are politically partial and historically contingent, 3) that development or environmental management initiatives tend to be based on assumptions that are part of

larger gendered, classed, and race struggles; which often results in poor and uneven policymaking (Robbins 2004:173-176).

- **The environmental identity and social movement thesis**; "Changes in environmental management regimes and environmental conditions have created opportunities or imperatives for local groups to secure and represent themselves politically. Such movements often represent a new form of political action, since their ecological strands connect disparate groups, across class, ethnicity, and gender. In this way, local social/environmental conditions and interactions have delimited, modified, and blunted otherwise apparently powerful global political and economic forces" (Robbins 2004:188). This thesis is based upon three fundamental pillars within human ecology; 1) the issue of unequal distribution of risks and hazards within environmental justice, 2) theories of peasant action and social mobilization due to threatened livelihoods and deprivation, and 3) the issue of post-colonialism for marginal groups living on the margin: an effort to make space for the claims and actions of marginal communities in livelihood movements (Robbins 2004:189-191).Social and political struggles are shown to be linked to basic issues of livelihood and environmental protection.

3.2.6 Environmental Justice and Development Ethics

In parallel to increased pressure on environmental capital worldwide, since the early 1990s a steady increase of protests has evolved based on claims that vulnerable minorities and disadvantaged groups bear "disproportionate amount of negative health and environmental effects from pollution, often as a result of environmental racism"(Block and Whitehead 2009:7). It is recognized that goods and hazards are unequally distributed and that there are a few people, politicians and the most powerful social or economic forces in society, who decides who get what. The rural poor are often left at the bottom of the government's priority-list striving towards national economic development, and are in many cases left in a situation of loss, where their natural environment and livelihood are degraded in an industrialization process which does not benefit them. Local communities are left with the negative social and environmental cost, without receiving much of the benefits. In response to the needs of these deprived vulnerable groups an environmental justice framework has emerged, set out to examine the links between social injustices and environmental problems (Stephens et al in Martìnez et al 2007:2). This framework has roots in human rights and social justice, emphasizing how different social groups are unequally exposed to "environmental costs, risks, and benefits" (Bebbington 2009:19).

Securing human rights is within this discourse an essential prior to any natural resource extraction projects. If these measures are not in place, development efforts will be counterproductive and undermine its own condition for existence.

Environmental justice is in its legal form highly interlinked with the discourse of Development Ethics; which reconnects *humanity* to the *ecosystems*, as well as advocating the importance of human freedom. It has sprung from the idea of 'good' development, in line with the words of Goulet: "Development is an ambiguous adventure born of tensions between what goods are sought and how these are obtained" (Goulet 1997: 1161). The Mérida Declaration, from the Second International Conference on Ethics and Development held in Mexico in 1989, states the importance of addressing the relation between human and nature in international development ethics: "The recognition of a new relation of human beings with nature, facilitating responsible use, respectful of biological cycles and the equilibrium of ecosystems - especially those of tropical forests - and in solidarity with future generations" (IDEA 1989: para6). The concept of freedom is related to the ability to choose, which is in compliance with the Free Prior and Informed Consent (FPIC) of the ILO Convention 169.

3.2.7 Indigenous Rights and Indigenous Politics

Indigenous groups' interest in natural preservation is profound and embedded in their cultural identity. In these traditional societies "nature is viewed as part of human society and proper relations with nature are necessary in order to have proper relations between people, including past and present generations" (Alcorn 1993:425). It is paradoxical that the most important natural resources on earth are inhabited by the world's most vulnerable; the rural poor. Due to their weak political position, indigenous preservation organizations worldwide are trying to safeguard "indigenous peoples' rights to conserve their forests and to regulate development activities currently imposed upon them without their consent" (Alcorn 1993:424). Not surprisingly, degradation of forests and livelihoods for industrial purposes has fuelled demonstrations. While some groups seek external assistance in order to preserve biodiversity, others take matters in their own hands. Today we see a great many cases where deprived groups seek global attention in order to regain land or health rights. In 1988 the Peruvian COICA – an umbrella organization for the indigenous people of the Amazon Basin, held a meeting in Iquitos Peru to shed light on the relationship between indigenous people, the environment and the implications of foreign

intervention. The COICA declaration was launched, directed towards the global environmental community;

"*We are concerned about the 'Debt for Nature Swaps' which put your organizations in a position of negotiation with our governments for the future of our homelands. […] We are concerned that you have left us Indigenous Peoples and our Organizations out of the political process which is determining the future of our homelands" (Robert and Stearman 1993:429).*

It was highlighted in the declaration that no power was ever delegated to the global environmentalist community to speak on their behalf, questioning the motives and foreign interference in these matters.

3.2.8 Environmental degradation and Conflict Theory

There are clear links between environmental degradation and increasing social instability and conflicts. According to the work of Homer-Dixon such changes in the environment will gradually deprive societies, causing social divides based on class and ethnicity. He meant this situation could "undermine liberal regimes and spaun insurgeries" (1991:78). In addition, he claimed "environmental degradation will increase the level of stress within national and international security, thus increasing the likelihood of many different kinds of conflict and impeding the development of cooperative solutions" (1991:78).

His theory show how environmental effects may cause social effects that in turn may lead to conflicts. In order to understand this chain of cause and effect, holistic understanding of the cultural context is a precondition, as it determines the vulnerability and adaptability of a society when faced with environmental stress. Rural poor or indigenous groups are fundamentally dependent on the natural resource base for survival. Because the developing world is host to some of the most vulnerable groups on earth, environmentally induced conflicts are likely to arise here first**.** Faced with degradation of agricultural land may produce large-scale migration in search of livelihood security, and in turn "create ethnic conflicts as migratory groups clash with indigenous populations" (Homer-Dixon 1991:86). In addition, as social and political institutions tend to be fragile in developing countries, they are less capable of dealing with the consequences of environmental change and social conflicts. They do not have the "the financial, material, or

intellectual resources of the developed world" (1991:88). Further, ethnic clashes may alter the operation of a society's markets and thereby its economic activities (Homer-Dixon 1991:86).

According to the theories of Homer-Dixon (1991) there are seven human induced *environmental problems* which may to large extent lead to conflict; especially within and among developing countries. These are; *Greenhouse warming; Stratospheric ozone depletion; Acid deposition; Deforestation; Degradation of agricultural land; Overuse and pollution of water supplies; and Depletion of fish stocks*. The greatest threats of these are deforestation and degradation of water supplies, as these provide ecosystem services fundamental for human survival. Many of these problems are causally interrelated, and thus the range of effects on a specific location may vary greatly. Environmental degradation as such may lead in principal to four *social effects* which, either singly or in combination - may cause social conflict (Homer Dixon 1991:91);

1. Decreased agricultural production
2. Economic decline
3. Population Displacement
4. Disruption of legitimized and authoritative institutions and social relations

These social problems are often found to be causally interlinked. Decreased agricultural production is often is mentioned as the most worrisome consequence of environmental change because it chiefly affects the most vulnerable, and because it has the potential to cause powerful ripple effects. According to Homer-Dixon, "a drop in agricultural output may weaken rural communities by causing malnutrition and disease, and by encouraging people to leave; economic decline may corrode confidence in the national purpose, weaken the tax base, and undermine financial, legal, and political institutions" (1991:98). Further, mass migration of people caused by malnutrition and disease; "may disrupt labor markets, shift class relations, and upset the traditional balance of economic and political authority between ethnic groups" (Homer-Dixon 1991:98). Homer-Dixon's theory is supported by Blakie's 'chain of explanation of land degradation' (Adams 2009:207). His theory show how physical changes in soil and vegetation may have an effect on the local economy; land-use practices; effect on who uses the land, their resources, skills and assets; time horizon and technology; the nature of the agrarian society, and finally - the nature of the state will influence the international society. Where Homer-Dixon has a distinct conflict theory, Blakie is more focused on change rather than conflict. Although

environmental problems in general may not generate conflict, in the specific case of the indigenous of the Bolivian lowlands however Homer-Dixon's conflict approach is more suitable.

3.2.11 Degradation of Water Supplies

Degradation of water supplies is according to Homer-Dixon's theory (1991) one of the most pressing factors leading to conflict. Right now global access to safe potable water is decreasing. In October 2011 we reached 7 billion people on earth, and the world population keeps on expanding. Today 70 to 90 % of available fresh water is spent on agriculture, producing wastewaters with additional nutrients and contamination into rivers and streams (Corcoran et al. 2010). Combined with increasing human and industrial wastes, polluted waters may be the biggest development challenge of our time. Worldwide, almost 900 million people still do not have access to safe water (Corcoran et al. 2010:9). These numbers are far from equally distributed throughout the world but correlate with available resources, thus water shortage is mainly prevalent among the poorest regions and the poorest among them. Poor infrastructure such as insufficient wastewater management is one of the most important contributors to polluted waters. The World Development Report states that a changing climate will impact developing countries the most, as they are "particularly reliant on ecosystem services and natural capital for production in climate-sensitive sectors" (WB 2010:5). The vulnerability is caused by the inability to deal with sudden changes such as the effects of natural disasters, or lack of alternatives to degraded natural resources. Today polluted or 'sick waters' cause more annual human deaths "than the amount killed by acts of violence, was included" (Randsborg 2010:para5). Most of these victims are those dependent on the natural environment for their livelihoods. As a response to increasing tensions caused by water shortages, water has been called 'the new oil', implying water scarcity will fuel political tensions which could escalate as far as armed conflicts (Clarke and King 2006:78). Combined with current population growth the need for water is expected to increase, possibly escalating into a competition for survival both within and between countries. The latter theory has however been contested by Theisen (et al. 2012) which based on an empirical evaluation of postcolonial Africa concludes there is little evidence of a drought-conflict connection. Rather increased risk of national or border conflicts over natural resource scarcity can be explained by sociopolitical *drivers* (UNEP 2007) such as poverty and dysfunctional social and political institutions. *State's* such as politically marginalized populations, high infant mortality, proximity to international borders, and high

local population density (Theisen 2008:801, Theisen et al. 2012) are rather symptoms and contributing factors rather than the real cause of problems. Future studies should focus more on the role of state actors in this process and the management and distribution of resources. Theisen and his peers are supported by Tertrais (2011) who emphasize that climate is only a 'threat multiplier', "one of myriad factors in a complex causal web underlying conflict" (Tertrais 2011:25). In this lies that conflict is not natural, but a social construction and a consequence of human choices.

As an alternative approach to the water scarcity issue the UNEP has developed the Green Economy Initiative (GEI) – a project by set out to assist governments 'greening' their economies by reshaping and refocusing policies, investments and spending in a range of industrial sectors (UNEP 2012). According to the GEI wastewater management may be a profitable alternative, as "every dollar invested in safe water and sanitation has a pay back of US$3 toUS$34" (Corcoran et al. 2010:5). According to studies safeguarding the environment will lead to improved food security, health and therefore the economy (Corcoran et al. 2010:10). In order to achieve such paybacks however priorities have to change. It will require comprehensive investments in water and wastewater planning and management. These are economic investments that developing countries such as Bolivia may not have at their disposal, and their need for short-term profit may overshadow long-term priorities. As many countries of the developed world depend on goods and services produced by ecosystems in the developing world, a good investment would be to safeguard the flows of goods and the social capital which maintain them; a win-win situation which makes sense both in the short and long-term. The study by GEI serves as evidence how safeguarding natural resources can indeed profitable, but it require a significant economic investment

3.2.9 Environmental Resources in a Balance Sheet

The value of environmental capital has long been promoted in current development discourse. Still national accounts do not incorporate or adequately recognize the "contribution that natural resources make to production and economic welfare (Repetto 1992:14). It is argued that until these forms of value are integrated in national accountings, they will not be adequately prioritized. As a consequence of current models of accounting; "a nation could exhaust its mineral reserves, cut down its forest, erode its soil, pollute its aquifers and hunt its wildlife to

extinction – all without affecting measured income" (Repetto1992:14). The consequences might be severe, first and foremost for poor developing countries. According to Repetto it is ironic that low income countries dependent on natural resources for "employment, revenues and foreign exchange are in an unsustainable way using (wasting) their principle asset (Repetto 1992:14). It should however be emphasized the difficult situation many developing countries are facing; including limited competence and resources, unstable social and political structures and powerful internal and external political pressures. Based on this it is argued that sustainable development is undermined by current national accounting (Repetto 1992). As pioneers on the field, functioning as examples of this type of natural resource evaluation, Norway and France have established extensive resource-accounting systems to supplement their national income accounts. "The Norwegian system includes accounts for such material resources as fossil fuels and other minerals, such biotic resources as forests, fisheries, and such environmental resources as land, water and air" (Repetto 1992:15). Although such accounts puts focus on the value of natural resources, research on the effects of natural resource accounting (NRA) also shows how various systems developed for natural resource accounting fail to capture the actual value of the resources. According to a case study from India for example, the conventional system of Forest Resource Accounting (FRA) fail to capture the tangible value, benefits and costs of forest resources; leading to a gross underestimation of the real contribution of the forest sector to GSDP and GDP of India (Mali et al. 2011). This is supported by Leefers and Castillo (1998) who claim current System of National Accounts (SNA) does not adequately reflect the depletion and degradation of natural resources. Also it only includes resources which are tradable; some natural resources are not traded in markets and therefore not reflected in the SNA (Leefers and Castillo 1998). Critics claim that especially among developing countries with weak economic and/or political structures; natural resource accounting may require expenditures, knowledge or other resources that is not available, thus rather than helping it may obscure decision-making on environmental issues (Rydin 2002, Turnhout 2009 cited in Åkerman and Peltula 2011:68).

[Example of Interview Setting – Illustration Photo 3]

Chapter IV: Methodology

4.1 Qualitative Research Approach

The research design is built on a literature review, a study of former empirical and some theoretical work on the relevant field. However, "the social world must be interpreted from the perspective of the people being studied, rather than as though those subjects were incapable of their own reflections" (Bryman 2008:385). In line with Bryman a field study has been conducted using chiefly a qualitative research approach. The qualitative over quantitative approach is chosen based on an interpretivistic epistemology, an understanding that the study of the social world must reflect the distinctiveness of humans (Bryman 2008:15). This involves not only an *interpretation* of human action but an *understanding* of human action which also means a thorough understanding of the specific socio-economic and cultural context. Weber in 1947 described sociology as "science which attempts the interpretive understanding of social action in order to arrive at a causal explanation of its course and effects" (Weber 1947 cited in Bryman 2008:15). In order to understand why people act as they do we need to understand what they have experienced, learned and how they interpret and make sense of reality. The qualitative

approach emphasizes details and the uniqueness of respondents, putting little constraints on their answers and has the potential for in-debt understandings of a situation. Also because focus can change as the researcher learns more, qualitative research is an interactive process of investigation which hinders reproduction of pre-set perceptions.

When doing qualitative research thorough consideration must be given the vulnerable stage of interpreting and transforming of social behavior from its original unbound form to a written state. Turning an ongoing interactive process into a static state is a process which has been criticized because the researcher always presents a specific version of social reality rather than the one that can be regarded as definitive (Bryman 2008:19). Especially when transforming cultural values into a different language, one should be aware of the assignation of concepts and values that may not exist in the epistemology of the research objects. In order to evaluate a researcher's interpretation it is therefore important to get an overview of his or her theoretical position and background. One should also be aware that a qualitative interpretation is a still frame, picked out of an ongoing series of interaction. A presentation of a situation is a product of particular people interacting at a particular time within a particular setting. The results from a study can be used in comparison to other studies in order to make assumptions of general trends.

4.2 Data Collection: Semi-structures Interview and Participant Observation

The fieldwork for this thesis was conducted between January and April 2012. 10 semi-structured interviews (Bryman 2008:193/196) was conducted with household representatives, in a selection of 3 Guaraní communities. The villages was chosen in collaboration with a coordinator from APG, based on; i) their location between the Margarita Gas field and the city of Villa Montes, ii) their location near to and dependency on the Pilcomayo River and surrounding environment and iii) their exposure to hydrocarbon extraction and other contaminants. The amount of interviews was adjusted based on data saturation. The plan was to conduct 10 interviews in each village, but in each village we reached a saturation point after 7 or 8 interviews. Because of the time pressure, high amount of collected data collected and similar answers collected from the respondents; we decided it was not necessary to conduct the last interviews only for the intention of completing 10 interviews per village.

Choosing a semi-structured interview model means the questions are "somewhat more general in their frame of reference" (Bryman 2008:196). This enables participants to choose their own

words, and the interviewer has the ability to ask follow up questions "in response to what are seen as significant replies" (Bryman 2008:196). The participants for the household semi-structured interviews were selected through purposive snowball sampling (Bryman 2008:184) in accordance with socio-cultural structures. As Armstrong Taylor (1993) stated; "in order to understand social actions we must grasp the meaning that actors attach to their actions" (Bryman 2008:385). In accordance to the Guaraní cultural structures of elders as the leader of the household, we asked to speak to the 'leader of the household' or 'the eldest member of the household available'. Expect from this we did not give any further instructions such as gender preferences, etc., so that the informant would set the rest of the terms for the interviews. This may have created a misalignment in material collected as some social categories may have been more represented than others. We did emphasize that it was good if the respondent remembered how life was like 20 or more years ago. It was interesting to see who was presented to us, the range of representatives differed between the three villages.

In addition to semi-structured interviews with household representatives, semi-structured interview was also conducted with each village Capitàn, the community indigenous leader. As these are the primary and closest representatives promoting the needs and interests of the indigenous, their input will be helpful painting a holistic picture of their situation. One should however be aware that there may be unequal power relations within the community which may influence the answers of the Capitàn. It may however function as a validity check when comparing these answers to the answers of the general community.

Face to face communication enables context interpretations and participants may ask questions and eliminate uncertainties that might affect their response. The interview will thus be an opportunity for *participants observation* followed by *thick descriptions* (Bryman 2008:378). Thick description means detailed accounts of social settings, events or individuals; which might help to paint a holistic understanding of the situation, explain irregularities, or just describe cultural characteristics. Therefore a notebook and photo camera was used during interviews to capture the setting. Participant observation allows the researcher to study the interaction between several participants simultaneously, and more precisely also allow the researcher to interact with her informants in daily activities in the area where she conducts research, and thus develop a better understanding of the social and cultural context. During fieldwork opportunities presented

itself to conduct semi-structured interviews with representatives from CERDET and the local Governmental Environmental Unit. Although data from these interviews are not in full presented in the presentation of data, they contributed to build a holistic understanding of the overall situation among the Guaraní.

Primary data was obtained through semi-structured interviews and participant's observation: gathered through field notes, interviews and digital voice recording. The data analysis was conducted within the *grounded theory* framework, which means data are being "systematically gathered and analyzed through the research process" (Bryman 2008:541). One of the greatest challenges in data analysis is to transfer information from the field onto paper without missing relevant information (Brymans 2008:455). This may entail coding and interpreting of information, which will be particularly challenging dealing with an interpreter. It is also important to be aware that subjective decisions may influence the data analysis, that one as a researcher is a co-constructer of knowledge through interpretation (Bryman 2008:19).

Impairment of data collection aims at transforming verbal responses into comparable *indicators* (Bryman 2008:542). In this process the primary data and participant observation will be compared to secondary data in the literature review. As this research collects information on how ecosystem degradation impact a specific indigenous group, the findings might not be directly generalizable to other indigenous groups. However as Williams (2000) proposes there are clear moderatum generalizations – where "aspects of the focus of enquiry […] can be seen to be instances of a broader set of recognizable features" (Bryman 2008:392). The general trends are relevant throughout the region.

4.3 Organizational Collaboration and Interview Settings

The agent or organization which presents the researcher to a particular culture sets the tone for conduct between the researcher and the respondents, quite like the role of the interpreter. The fieldwork was conducted in near collaboration with APG and the Villa Montes Office for Environment and Natural Resources, both highly necessary to carry out the fieldwork. While the Office for Environment and Natural Resources contributed with transportation and access to the area, APG functioned as a gatekeeper and a key to trust among the respondents. The two agencies are accustomed collaborating, and the collaboration with the local government was a natural extension of the collaboration with APG. From the Office of Environment and Natural

Resources were assigned two non-indigenous representatives, a male forester and a female environmental engineer.

The setting during an interview is important for the outcome. Interviews are most fruitful when conducted in a place the respondent feel comfortable, usually in their own homes or in a familiar setting relevant to the topic of the interview (Grenier 1998). As a formality, a letter of introduction from the researcher written in Spanish was presented along with a confirmation letter from the University. To avoid the respondent to feel pressured or intimidated the first approach was done by the APG coordinator and then after agreeing the rest of the team stepped forward. The actual interview was done inside or outside respondent's house, chairs arranged in a circle for an open face to face communication. All of the interviews were recorded continuously, which has enabled the use of direct quotes. Because of this the indigenous own voice permeate this study, increasing the data trustworthiness. Present was researcher, translator, APG coordinator and representatives from the Environment and Natural Resource Office. The tone was easy, encouraging small talk by all to ease any tension and present to encourage openness and sincerity. However, the presence of the research team consisting of people with different roles and titles may have affected the collection of data. For example the APG coordinator was at times eager to help the respondent along if answers didn't come fast enough or the respondent didn't know what to answer. Some also turned to him to 'help' them if they did not understand the question or if they did not know the answer. This clearly had an effect on answers and on the material this thesis is built. If this APG coordinator hadn't been present informants might have searched a little longer within themselves for answers. Even through the rest of the research team remained as objective as possible, their mere presence as individuals or governmental representatives, etc. might also have provoked feelings, attitudes and influenced answers among the respondents. Although explanation was gives as to how the data would be used, respondents may also have doubted the intention of research due to the different agencies involved. From experience they have learned that promises from external agencies not always are fulfilled. Despite difficult circumstances of life I experienced openness among respondents to answer questions, share thoughts and experiences. However, as we were not able to reach a point of total confidence in the short time we had available with the respondents; it is highly likely that sensitive information was not shared with us. A couple of respondents mentioned that there had been 'people there before asking questions' but that they had not heard anything afterwards.

Some of the respondent answers may have been restricted if they were unsure if it was worth it to share their time and information or if the data would be used for other purposes than proclaimed.

4.4 The respondents

All of the respondents were asked if they wanted to be anonymous, however without exception all said no and spelled their full given and family name. However, because of the unequal balance of power between the local community and other agencies there can be unseen consequences of publishing individual full names. As a researcher I have a responsibility not to intensify current situation. Thus, in order to safeguard the safety and anonymity of the informants an encryption has been conducted to maintain their anonymity. Below is an overview of all informants and basic household information.

Village 1: Caigura

Nr.	Sex	Age	Household members	Occupation/ Livelihood	Code
1	Male	63	9	Agriculture and Husbandry	R1-V1 M63
2	Male	68	4	Agriculture and Husbandry	R2-V1 M68
3	Male	62	8	Agriculture and Husbandry	R3-V1 M62
4	Female	70	4	Agriculture and Husbandry	R4-V1 F70
5	Male	45	5	Agriculture and Husbandry	R5-V1 M45
6	Female	30	3	Agriculture and Husbandry	R6-V1 F30
7	Female	50	5	Agriculture and Husbandry	R7-V1 F50
8	Male	40	1	Agriculture and Husbandry	R8-V1 M40

In Caigura 8 household interviews were conducted in addition to the indigenous leader. The 8 households were represented by the head of the family or the eldest member of the family that was available. In total this directly represented 39 people. We asked to speak to the head of the family, which resulted in 3 female and 5 male respondents, the average age of the respondents were 53 years. 4 out of the 8 respondents had moved into the village in their 40's. The village was in addition represented by "Capitán Caigura" (52).

Village 2: Tucainty

Nr.	Sex	Age	Household members	Occupation/ Livelihood	Code
1	Female	50	5	Agriculture and Husbandry	R1-V2 F50
2	Female	65	7	Agriculture and Husbandry	R2-V2 F65
3	Male	25	6	Construction worker	R3-V2 M25
4	Male	46	3	Welder	R4-V2 M46
5	Female	37	7	Agriculture and Husbandry	R5-V2 F37
6	Male	29	6	Agriculture and Husbandry	R6-V2 M29
7	Female	48	6	Agriculture and Husbandry	R7-V2 F48

In Tucainty 7 household interviews were conducted, representing 40 household members. The respondents in this village were represented by 4 women and 3 men, with an average age of 42. All but one was born and raised in the village. The first respondent in Tucainty was a woman who needed a ride from the entrance of the park Aguaragüe into the village, which turned out to be a representative picture of one of the biggest challenges the villagers are facing today; mobilization and access to transportation. Tucainty was in addition represented by "Capitàn Tucainty" (44).

Village 3: Cumandaroti

Nr.	Sex	Age	Household members	Occupation/ Livelihood	Code
1	Male	46	11	Husbandry and Apiculture	R1-V2 F50
2	Female	31	4	Agriculture and Husbandry	R2-V2 F65
3	Male	52	9	Agriculture and Husbandry	R3-V2 M25
4	Female	19	4	Agriculture and Husbandry	R4-V2 M46
5	Female	24	4	Agriculture and Husbandry	R5-V2 F37
6	Female	54	3	Agriculture and Husbandry	R6-V2 M29
7	Female	46	6	Husbandry and Apiculture	R7-V2 F48

In Cumandaroti 7 household interviews were conducted, representing 49 household members. The community was represented by 5 female and 2 male respondents, with an average age of 38 years. Two of the respondents plus the community Capitan was not born in the community, but moved here 4 to 8 years ago. This reflects the high flow of people in and out of the community. Cumandaroti was represented by "Capitàn Cumandaroti" (48).

4.5 Limitations and Ethics

In an interview setting, as with all human interaction, there are various limitations to the communication between two people. It can be cultural differences, dialectic differences or just experiences in the past that connects meaning to certain words, phrases or body langue. As a consequence it is highly important to be aware and eliminate possible interference for good communication. A good start is on forehand to have a good understanding of the culture you are entering, which is done best by interacting and accustom oneself with cultural norms and rules.

4.5.1 Literature Review

When reviewing previous literature on the relevant topic, one gets an impression of the situation on the location of the fieldwork. It is important to be aware that each paper only highlight a certain focus range, and cannot be used as a complete presentation of the truth. In Bolivia, as in many developing countries, documentation and storing of literature is inadequate. In many cases there are materials, but they not digitalized, systematized and are therefore hard to access. For the literature review material in English has mainly been used, with may limit the presentation to European or North American perspectives. On the other side this is the system the writer is accustomed with and is therefore able in a better way to validate the quality of the work presented. It is however recognized that a review of Spanish texts could have given a more holistic presentation of current situation.

4.5.2 Cultural Differences and Linguistic Constraints

Practical limitations when out in the field include culture and language barriers. Being a female researcher there might be complications relating to gender structures, as Bolivian and Guaraní indigenous culture might have more restricted gender roles than the researcher is accustomed. In addition there is the challenge of good communication. When doing face to face interviews there is the challenge of continuous translating from oral to written form, and also in this case to translate from Spanish to English without losing the respondents significant meaning. Due to lack of ability to obtain a recorder, a challenge was to keep the respondents interest and concentration throughout the interview. This was done by taking turns asking questions and writing down answers and at the end of the day along with go through the notes in case we should have missed anything. In addition we paid attention to topics what the respondents was interested in, and if interest slacked off we ask questions that we knew would catch interest. As

such, the interview guide used for the interviews also changed and developed during the course of interviews.

The Guaraní traditionally speak Guaraní indigenous language, which is part of the Jivaro linguistic family (Le 2009:4); however today almost all speak Spanish. The researcher's limited knowledge of Spanish and thus restricted ability to communicate with informants presents one of the biggest challenges for this research. Consequently, special care must be taken choosing a translator - as he or she may highly affect the quality of the research. This is especially important to consider in the context of the Bolivian indigenous communities as they have been subject to ethic racism and social exclusion through generations. Poor communication can happen unknowingly through unintentional misinterpretations, or for example the social role of the translator may cause reluctance in participants to speak truthfully and in confidence. The objective role of the translator is determined and unquestioned, as his or her own opinions may shine though and affect the interviewees. Using a translator may constrain the bond of trust between researcher and the respondents, creating a distance which may limit confidentiality and limit the researcher's ability to develop a holistic understanding of the respondents. In order to limit the distance to a minimum, time must be prioritized creating bonds with respondents.

The time of the actual fieldwork was my second visit among the Guaraní. A couple of weeks before the interviews were conducted I did a research trip to the area get familiar with the environment, get to know my coworkers and most importantly attend the Guaraní Carnival in Yacuìba. This carnival is an annual event where in addition to most of the Guaraní communities of south-eastern Bolivia attend, but also participants from Brazil, Argentina and Paraguay. I was introduced to many of the Capitàns and governmental officials in charge of the arrangement, a networking which was very useful during my second visit. In addition I was presented as a researcher for all of the Guaraní present, so my later visit to the communities would come as no surprise. I was warmly welcomed and included in the activities as a guest of honor. As a 'real' Guaraní woman I was dressed up with traditional clothing, necklaces and headband and danced along with the hundreds of Guaraní and the mayor or Villa Montes.

Originally a Bolivian was engaged as a translator in order to meet both cultural and linguistic challenges. Due to personal reasons however this person withdrew from the project on short notice. With a great deal of luck I was able to replace him with an old acquaintance of mine

living in Chile. With his half-Norwegian, half-Chilean background he functioned as a good intermediary between myself and the informants as he possessed at least a general understanding of both cultures, in addition to his fluent Spanish skills. During the conduction of interviews my Spanish knowledge improved which made me able to understand and ask follow-up questions if the translator was not able to obtain valid or reliable information. I found it a challenge in the beginning to make sure questions were asked in the right manner. In order to avoid misunderstandings in the first interviews, time was invested explaining to the translator not only the questions, but also the reason behind asking particular questions. This was done so that also the translator could secure that collected data was valid.

That both I and the translator were outsiders naturally created challenges in relation to knowing how it was appropriate to act in this particular cultural environment. We entered a new territory and were getting to know a new culture. Building a basis for good communication is a process which takes time, patience and humility. There were times where we didn't understand the locals and the other way around. As a visitor one should have utter respect for the local socio-cultural norms, which may at times be tiresome if these differ from your normal cultural context. For the indigenous we were foreigners entering their land. Due to their historical experience with occupants, our need to step carefully and be honest about our intention was of utter importance.

4.5.3 Respondent selection and Gatekeeper

This fieldwork is based on a restricted selection of respondents, which meant that if other respondents were chosen the data might look slightly different. Also it should be noted that doing research on several geographical locations may allocate slightly variation in types of answers from each location. For example, when considering the presentation of data in thesis one should know that information collected from Cumandaroti to some extent was limited. Compared to the other two villages, the respondent's openness was somewhat restricted. They seemed more skeptic of our presence, less willing to be interviewed and generally gave less information. If this comes from unwillingness, lack of interest or from not being able to answer is difficult to say. From our perspective there are three possible explanations for this. Firstly, our Guaraní coordinator 'juristic' did only apply to the first two villages. This means that the villagers of Cumandaroti would to a lesser degree be familiar with his name and thus his credibility was smaller. Second, the presence and to some extent the control of the private companies were

stronger in this village. The first day in the village we attended a honey festival which was arranged by the companies. This might explain why questions regarding contamination or the presence of the hydrocarbon companies were sensitive. They could have been afraid to talk, or they might not be reflected on the matter. A third explanation can be that to a larger extent than the other villages, during household interviews there were mostly women present. Their gender role may have restricted their ability to answer. Although the women talked little about where the men were located, some said they were out working in the field. During Based on data from the fieldwork Cumandaroti was one of the most conservative in relation to gender structures, thus this can explain the constrained amount of gathered information. The particular cultural values and ethics might be an explanation for the reluctance to speak, as women may be more reluctant to speak to a foreign man than they would have been speaking to a foreign woman - or they could have been more open speaking to a Bolivian man instead of a foreign man. At the same time the male informants might have been more open if they were interviewed by solely Bolivians, and they might have been more reluctant to speak if my male translator was not there and they had to only deal with a foreign woman.

A limitation may also be found in details of collected data. This can be explained by different factors. One and perhaps the most prevailing is the unequal division of power. The local community has no real power in relation to the private companies operating on their land or even the local government. They are subordinate to the agencies which to some extent are responsible for their difficult livelihood situation at the same time as they are dependent on them to access necessaries of life. Because of the highly unequal balance of power the local communities may be reluctant to speak openly about this to two foreigners, perhaps intensified by the presence of the local government. Also, the indigenous access to education has proven to be inadequate; therefore the accuracy when it comes to names of diseases, perhaps also official names on plants and animals might be incorrect. Also, because of poor state, private, local synergy and communication, distributing guilt – knowing who is to blame for what; may be difficult. For example there are only a few companies mentioned by the indigenous, although there are a variety of companies present in the area.

4.5.4 Time and Resources

Being a master student conducting a field work, research must be adjusted to the time and resources available. This may very well affect the outcome of the study, as with greater time and resources the researcher would be able to conduct a broader study and perhaps collect more thorough data. As the quality of qualitative research often is dependent on creating a basis of confidentiality and trust towards and among interviewees, time and research limitation may present a challenge in this regard. For the main research one month was spent in Villa Montes, which served as ground zero from which all field visits was initiated. The area in which most Guaraní communities live is a restricted area. First one has to have permission to enter the Aguaragüe National Park. Second one has to be allowed to enter the gate leading into the San Antonio Petroleum Block which is guarded by Petrobras (Appendix 5). Thirdly it is necessary to have a pick up car which can drive in rough terrain, and more importantly an experienced driver that knows the rules of conduct on these narrow dirt roads in steep hillsides. There is a relatively high amount of traffic on this road, to a large extent traffic related to industrial production which includes mostly large trucks filled with construction materials, chemicals, waste, etc. These trucks are often too big to pass each other; therefore they have developed a system with guards along the roads, which also function as a way of controlling who is in the area. Due to all of these factors we were only allowed a limited amount of time within the Guaraní villages, which required us to be highly efficient. Over three weeks we were allowed three days visit to Caigura, two days in Tucainty and two days in Cumandaroti. With such limited time range we were not allowed to build any deep relations of trust except from the trust given us as coadjutants with APG and the local government. Consequently the range of information presented to us was most likely restricted. This could possibly been avoided if using a local interpreter; however this was not accessible at the time of research. When collaborating with established organizations care must be taken as their presence or association might influence answers. Consideration should also be taken that lack of consistency in Bolivian political processes may lead to difficulties in accessing relevant data and interviewees. The oil industry contains large amounts of money, thus much is at stake for many involved actors. This may be wise to consider both for own safety and for securing the informants.

4.5.5 Ethical Considerations

In order to protect the security and interest of respondents, ethical considerations are necessary. Based on the British Sociological Association researchers have a responsibility to "ensure that the physical, social and physiological wellbeing of research participants is not adversely affected by the research" (BSA 2002:2). An ethical challenge related to this study is the amount of sensitive information the researcher should reveal. As the main goal is to protect the livelihoods and quality of life in Guaraní Indigenous territory, securing their anonymity will be top priority. However, as the study will focus on such defined geographical space, it may not be difficult to locate the interviewees. Therefore, data processing of interviews and notes should be done in close collaboration with the translator, and secure that data is not used for other purposes. It is important to be aware that corruption may be encountered during research, and that researchers might find bribing necessary in order to access key informants, services, etc. In general terms, it is necessary that researchers remain a neutral part, and not allow their subjective opinion on social, political or similar matters color the participants or study as a whole. When having a pre-set opinion as to what will come out of a research, this may very well lead to a paper of self-fulfilling prophecies, and must be avoided. Finally, considerations should also be made whether the study may implicate Guaraní relationship with external governmental or private agencies, as it may influence accessibility of vital services.

[Guaraní Adaption to Change - Illustration Photo 4]

Chapter V: Findings and Analysis

Research Question 1:

5.1 To what extent are Guaraní dependent on ecosystem services for livelihood and wellbeing?

In order to answer the question; 'to what extent are the Guaraní dependent on ecosystem services for their livelihood and wellbeing', a better understanding of the Guaraní conduct of life is essential. In this section therefore an account of the Guaraní livelihood is presented; a presentation of access to basic needs such as food and water. Because the concept of 'wellbeing' is a subjective and highly dependent on cultural preferences, the Guaraní informants themselves were asked how they define 'A good life'.

5.1.1 Livelihood

'*Livelihood*' and '*wellbeing*' are two blurry and highly contextually dependent concepts. 'Livelihood' means the foundation for life which enables access to resources which is necessary for everyday life. Scoones defines livelihood as "the capabilities, assets (including both material and social resources) and activities required for a means of living" (1998:5). What is considered necessary is shaped by economic, social and cultural structures thus varies from context to context. 'Wellbeing' is likewise a highly subjective and vague concept. A basic definition of 'wellbeing' is "the state of being comfortable, healthy or happy" (Oxford Dictionaries 2012a). What is takes to be comfortable, healthy or happy however is situational. Despite conceptual vagueness, the selection of concepts is intentional. Chambers (1997) argue that "a wellbeing approach to poverty and livelihood analysis may allow people themselves to define the criterias which as important" (Scoones 1998:6). Wellbeing is a good or satisfactory condition of existence depending on what is preferable for a specific culture. It gives good indications of both social and cultural contexts. In accordance with this statement, during fieldwork the respondents have themselves defined their conception of 'wellbeing'.

Agriculture and Animal Husbandry

According to the literature review the Guaraní are settled agriculturalists "*who rely on smallholder subsistence or semi-subsistence-based farming (raising beans, squash, corn and a variety of other crops, as well as cattle, goats, pigs, chickens and sheep), hunting, fishing and the gathering of wild plants and fruits*" (Perreault 2008:10). This was confirmed by respondents in all three indigenous communities. However, the extent to which the indigenous rely on agriculture, husbandry or other forms of work depends on the conditions of livelihood, which vary from village to village.

A pattern found was that in villages such as Caigura, far away from the biggest extraction sites; conditions for livelihood are more stable and all the respondents (8/8) were pure farmers, a term I have created to include those who only are occupied with agriculture and animal husbandry. In Tucainty only 57% was pure farmers and in Caigura 71% were pure farmers. Within Caigura, the inhabitants are mainly agriculturalists and do not keep that many animals compared to the other communities. Husbandry in Caigura is limited to chickens (5/8), pigs (3/8) and cows (2/8), meaning they will have to buy meat products at the market. This was confirmed by a respondent,

saying "*The little income we get goes to buy food in Villa Montes*" (R4-V1 F70). However, as the village is located so close to the Villa Montes marked it is at least accessible. Tucainty held mostly pigs (5/7), chicken (3/7) cattle (2/7) and ducks (1/7); while Cumandaroti had the widest range of husbandry, including chickens (7/7), pigs (5/7), goats (5/7), cattle (2/7), ducks (2/7), sheep (2/7), horses (2/7), donkeys (2/7) and turkeys (1/7).

Regarding **agriculture**; Caigura cultivates a good variety of fruits and vegetables, 21 different types in all; mainly maize (5/8), yucca (4/8), citrus fruit (4/8), watermelon (3/8), potatoes (3/8) and beans (3/8). Tucainty had the least variety 9 in all; mainly beans (6/7), pumpkin (5/7), maize (5/7) and anko (4/7). Cumandaroti cultivates least of all in all 10 plants, mainly maize (3/7), beans (3/7), sweet beans (3/7), pumpkin (3/7), tomatoes (2/7) and onions (2/7).

A more detailed account for all villages combined is found in appendix 4. These numbers are based on a selection of the community inhabitants, thus if other respondents was included in the research the result might look different. There is however no account for how large each production was. However, from this it is possible to say that agricultural production varies widely, but a lion share cultivate maize and beans, and keep chickens and pigs. In the villages located furthest away from the main production sites there is more agricultural production, while in the villages closer to the fields there are more husbandry.

Other types of livelihood

In Caigura all respondents were pure farmers. The rest of the respondents from Tucainty were employed in various occupations. One respondent was working for the oil companies Petrobras and Seperbol; one was a welder, and one combined farming with fishing and being a construction worker for Seperbol (R6-V2 M29). Both of the men employed in the company were young. This might be an indication that the younger generation to a larger extent is looking for alternative ways to make a living besides agriculture and are thus becoming less directly dependent on ecosystem services for their livelihood. Data collected from this study confirms this statement. In Cumandaroti the remaining respondents (2/7) were dependent on apiculture in addition to keeping animals, making Cumandaroti the largest case of apiculture among the communities. According to respondents this is an alternative livelihood project which started in 2009 (R1-V3 M46). Cumandaroti increased dependency on honey was reflected in a honey

festival that was arranged by Petrobras that we attended during fieldwork. Here locals could sell principally honey but also various kinds of handicrafts. This is an attempt by the company to facilitate an opportunity for an alternative livelihood, however it is a testimony that their focus is not on restoring degraded resources or improving practice of waste management but rather to find new options.

5.1.2 Access to Water

Water is life, and one of the most basic human needs provided by the ecosystem. Mapping access to water is therefore a good indication of the circumstances of life among a group of people. The indigenous need water for human consumption and agriculture and livestock.

Water for Human Consumption

Regarding access to potable water, In Caigura (6/8) of villagers receive potable water from SISTERNA; a governmental service set up to provide potable water to all Bolivian citizens. In Tucainty (5/7) receive water from SISTERNA, while in Caigura only (1/7). The service is a water truck sent from Villa Montes, which fills water containers in the village. In the two villages greatly dependent on SISTERNA to access potable water, the frequency and reliability of the service vary greatly. While some respondents said the SISTERNA tanker comes every week, other said every other week, and others again every 15 to 20th day. One respondent said with concern; "*The SISTERNA governmental service is supposed to deliver water every two weeks, but it may take up to a month for every time they show up*" (R1-V1 M63). One of the two respondents that did not access potable water from SISTERNA said they accessed drinking water from a well. According to R1-V1 M63 however, the ground water, and thus the water in the well is contaminated by natural gas, sulfur or chemicals used to extract the gas. A man of 45 said he didn't have any clean water to drink, and had to drink water collected from the Pilcomayo River. He claimed he hadn't yet been sick (R5-V1 M45). However, whether respondents say they receive water once a week or twice a week, they all agree it is still not sufficient. "*SISTERNA provides 1000 liter water at a time, it is not enough*" (R7-V2 F48). When the potable water runs out many are therefore forced to use alternatives water sources, for example drinking water from the river. One of the respondents in Tucainty that worked as a construction worker for Seperbol said he received potable water from the company. It is likely this is the case for the other respondent who worked for the company. Cumandaroti compared to the other villages, access to

potable water is highly unstable and unsystematic. Besides one respondent that received water from SISTERNA, two said they receive potable water from REPSOL (2/7), another two respondents said they receive potable water from a tap coming from a reservoir (2/7), one collected water in a stream coming from the mountain (1/7) and yet another from a well (1/7) which was located 5 kilometers away (R3-V3 M52). Not surprisingly, access to potable water is not sufficient to cover the needs of the village, which was reflected by all respondents.

Water for Agriculture and Husbandry

Caigura is unique in this study regarding access to water for irrigation. The Caigura Dam is a highly valuable good that is only accessible for this community. Nearly all respondents from Caigura receive water from the Caigura Dam which they use for agriculture and livestock (7/8). The water is distributed throughout the area through pipelines. However, the distribution is poor and unequal and there have been some issues with inadequate filtration systems, leaving the water in the dam in poor quality. According to my informants from the Office of Environment and Natural Resources of Villa Montes, the dam is subject to 70-80% of contamination. Test to assess water quality has been conducted by Petrobras three times, however test results has not been made public. This implies poor policies of transparency within the company. With or without the pending publication, the poor quality of the water from the dam is confirmed by several respondents. In both Tucainty and Cumandaroti, the villages are 100% dependent on rain to access water for agriculture and husbandry. The phrase "*No rain, no crop*" was repeated by more or less all respondents with agricultural production. As a last resort some farmers said they used water from the Pilcomayo River.

From this we can read that access to water for both human consumption and for agriculture/husbandry, is highly unstable and insufficient in all three villages. For Caigura and Tucainty, access to potable water is some extent covered as over 11 respondents receive potable water from the governmental service SISTERNA. However, the service frequency and quantity is not satisfactory. In Cumandaroti access to potable water was unsystematic and fractioned. In comparison Caigura is in a favorable situation, both because of the Caigura Dam but also because of its location near to Villa Montes. Although contaminated, the Caigura dam secure a certain degree of food production, and the close distance to Villa Montes market enables sales and access to foods. Tucainty and Cumandaroti remote locations hinder the same possibilities to

access markets. In all, Cumandaroti and Tucainty are in a more vulnerable situation than Caigura concerning access to water. This might explain why Caigura has more agricultural production while Cumandaroti has most husbandries. In the next section dealing with contaminated resources and water we see how informants relate the deterioration of water quality to the establishment of hydrocarbon companies.

5.1.3 Wellbeing

In Caigura, when being asked what they considered "*una buena vida*" (a good life)', most answered *"seguridad de sufficiente trabajo"* (security from sufficient access to work) (6/8), implying their sense of wellbeing is highly connected to a secure livelihood. According to answers a secure livelihood included; cultivable and fertile soils, access to land, sufficient amounts of rain, and sufficient and uncontaminated water for animals, irrigation, human consumption and everyday needs. These are all problems the indigenous are struggling with at the moment. After a secure livelihood people valued; 'Good health and Medical Service' (4/8) and 'A good social life with friends and family' (4/8) as important for living a good life. Also mentioned was 'Easy access to market' (1/8), 'Car for transportation' (1/8), 'Governmental financial assistance' (1/8), 'Guaraní culture' (1/8), 'Education' (1/8) and 'Clean air' (1/8).

In Tucainty and Cumandaroti the respondents' perception of 'wellbeing' was more concerned with basic everyday human needs, but also safeguarding livelihood by improving transportation and access water for irrigation. In Tucainty most (5/7) respondents answered 'sufficient potable water', 'gas for cooking', 'electricity and lighting' and 'access to means of transport' which also includes a good and/or improved road. Two respondents also answered 'A secure livelihood' (2/7). One of the respondents was working for the companies Petrobras and Seperbol. In his opinion one of the preconditions for living a good life was maintaining a good relationship with the hydrocarbon companies. Only this way, he said, is it possible to preserve the environment and keep a balanced relationship between the environment and the industrial production (R3-V2 M25). In Cumandaroti five out of seven respondents answered 'Electricity and Lightning' (5/7), 'Brick house' instead of adobe (5/7) and 'Good/Improved road' (5/7). Four out of seven answered that 'Sufficient potable water and water for irrigation' (4/7) would give them a good life. Three out of seven mentioned 'Good health and Medical Service' (3/7), 'Good and better

accessible schools' (3/7) and 'Governmental financial assistance' (3/7) principally to maintain agricultural production. Need for machines for agricultural efficiency and better health of cattle was mentioned. Concern was expressed about decreasing financial support; "Before we received more support than today. If this trend continues the consequences will be fatal for us" (R3-V3 M52). One out of seven also mentioned 'A secure livelihood' (1/7), 'Equality' (1/7), 'Good relations between the companies and the people' (1/7), 'A mobile network' (1/7) and 'Less traffic'(1/7).

Dependency on Ecosystem Services for Livelihood and Wellbeing

All Guaraní communities are highly dependent on ecosystem services for livelihood and wellbeing, although some more than others. They are agriculturalists which in addition keep animals such as cattle, goats, pigs and chickens which means the conditions of their plants and animals determines their annual harvest, and thus their livelihood security. From the answers we see that the villages present different conceptions of 'a good life', dependent on the different circumstances in which they live. While Caigura connect wellbeing to a secure livelihood, good health and a social life, the other two villages value more basic needs first; such as water, gas, lighting and a good house. From this we can read that the living situation is better in Caigura, both because their access to resources is better and they are located furthest away from the source of contamination. It should be mentioned that the concept 'a good life' can be a bit complicated as it is often easy for respondents to focus on aspects that are *missing* in order to live a good life, and perhaps take for granted aspects that are already there. Although almost all respondent said they were dependent on the environment for livelihood and welfare, contamination was an underlying subject. Because of contamination and ecosystem degradation, many respondents said although they were dependent they had a poor relationship to the environment.

[Gas flare in Tucainty village – Illustration Photo 5]

Research Question 2:

5.2 To what extent has the ecosystem changed over the last 20 years?

In order to present a broader understanding of how much the ecosystem has changed over the last 20 years, we asked to what extent the ecosystem and thus access to ecosystem services have changed over the last 20 years. The changes were possible to categorize in two main boxes; Contaminated Resources, and Decreased and Disappeared Resources.

5.2.1 Contaminated Resources

"*Waste water with chemicals is thrown in the water. It kills the fish, our cattle and crops become sick and the wildlife and biodiversity are affected. A lot of people have become poor; the company has left us in misery. In addition the companies are emptying the wells and contaminate our drinking water" (Cumandaroti Capitàn - 48)*

[See also: Appendix 2]

Water

In all communities the main contaminated resource are water, especially from the Pilcomayo River. Contamination of water was reflected by all respondents from Caigura (8/8), all respondents from Tucainty (7/7) and all respondents from Cumandaroti (7/7). 17/22 especially mentioned the Pilcomayo River, but also other water sources was mentioned such as tributaries, ground water, wells and streams coming from the mountain. The contamination of water is believed to be connected to the arrival of the hydrocarbon industry; leading to diseases on animals, crops and human health. In Caigura this was uttered by all respondents. Because the river is used for multiple purposes, contamination of water has complex ripple effects. Some of them include increased disease on plants and crops, decreased fertility and efficiency of agricultural production, and decreased health and life expectancy of animals and people.

There is a chain reaction; "*The gas industry pollutes with caustic soda and sodium bentonite for hydrocarbon exploration and extraction – which pollutes the ground water, soil and ultimately the rivers*" (R1-V1 M63). A woman in Caigura stated; "*Seismic drilling started in the 70-80's and from then plants and animals started to die. When we watered our crops with water from the river they all died*" (R4-V1 F70). Poor communication and inclusion in policymaking is implied; "*When the company first arrived their proposal sounded good, but it has developed into a tragedy. We find dead plants and animals all the time*" (R4-V1 F70). According to respondents crops experience plagues and fungus that comes from the water. It infects the roots of the crops so that it will not grow unless one uses pesticides. For example citrus trees die because of plagues. The diseases go into the leaves and into the roots of the tree. Consequently "*citrus trees now live for 3-5 years, before they could live for 15 years*" (R7-V1 M50).

Animals

Another effect has been detected in the health and life expectancy of animals. According to one respondent, the chickens are subject to more chemicals and thus needs more vaccination and hormones to keep healthy (R2-V1 M68). Several respondents talked about diseases and miscarriages on cattle. "*Especially in the 80's the cattle rangers experienced a massive wave of miscarriages*" (R1-V1 M63). This might correspond with the seismic drilling that started in the 70-80's. "*The water in the area has been polluted. The cattle drink the water with contamination*

and gets warts and experience miscarriages" (R5-V2 F37). She was far from the only one who had experienced similar reactions on animals. People talked about pigs and cows getting warts, scabies and large inflamed blisters from drinking the contaminated water. "*The animals drink water from there [the river] and gets diseases and warts*" (R6-V2 M29). The life expectancy of the animals is also decreasing. One respondent said his cows were dying because they drink water from the well. Others said their pigs life expectancy is decreasing; "*The pigs do not grow old, because they drink contaminated water. Before I had 100 pigs, now only 50*" (R1-V2 F50). Also crops have bad quality and fertility. One woman said her pumpkins were rotting (R2-V2 F65). Generally the biodiversity is declining, especially around the production sites; "*Where there is drilling there are no more grass – no more food for the cows and animals*" (R3-V2 M25).

There have been attempts to rinse the water for contamination, although inconsistent and inefficient. It proves that this is a problem recognized by more than just the indigenous themselves. One respondent told about a filtration system that had been initiated to avoid contamination of the river: - "*There was a filtration system for the water, but the waste was not properly maintained. When it rained the contaminated water ran into the Pilcomayo again*" (R3-V2 M25). Similar arrangement was observed during a fieldtrip outside of Caigura. We were shown "filtration systems" that was simply a dug hole with contaminated wastewater and an open fence around – there was no hindrance for the water to run into the streams again, for example during rain [see appendix 1]. Complaints and urge to clean up has not been received well by the companies; "*The Company says the river is not contaminated, but we can see the oil spills and the high gas flares at night. When we drink the water we all vomit and get diarrhea*" (R2-V2 F65).

Air

After 'water', the respondents of both Tucainty and Cumandaroti named 'air' as the second most important resource that has been contaminated. Especially among the respondents from Tucainty this appeared to be a big challenge. The petroleum industry pollutes not only the water and soil, but also air. One of the biggest problems is gas flares.

"*Around here there are 9 flares that pollute the air*" (R7-V2 F48).

One respondent working as a construction worker for Petrobras and Seperbol, talked much about gas flares. According to him the companies highly increased the flames during the night so that people would not notice; "*From 09:00 to 17:00 the flare is 2 meters high, but from 17:00 to about 04:00 in the morning the flare is about 10 meters high*" (R3-V2 M25). The fertility around the flares is decreased to the point of extinction. One man said; "*Everything within 300 meters of the flare is dead soil*" (R3-V2 M25). In addition, there are times a year where the flares are especially fierce, affecting animals and wildlife nearby. "*The cows get sick especially from August to November, because during that time the gas flares increases and they breathe in the gas*" (R3-V2 M25). The presence of large flares was also confirmed by respondents in Cumandaroti, one of them said; "*The gas drilling contaminates the air. Around here there are 5 flares that burns all hours of the day, but during the night they make the flame bigger*" (R2-V3 F31). The statements about air contamination are further strengthened by testimonies about new the range of diseases under research question 3.2.

5.2.2 Decreased and Disappeared Resources

Whether a natural resource is decreasing as a result of contamination or other explanation is not always clear. During fieldwork it became evident that contamination is not the only reason for decreased access to freshwater or other natural resources in the region. A high increase of temperatures in combination with high decrease in amounts of rain are creating droughts that are drying out the Pilcomayo river, its tributaries and other water sources in the area. The increasing temperatures are also drying up the soil, plants and trees, and are destroying crops. In combination with industrial pollution, the effect is devastating for all life in the area; indigenous communities, plants and animals. Some places the soil has totally lost its fertility; "*20 years ago the earth was fertile and good for agriculture. Now there are large areas here in Caigura where the soil has lost its quality and we cannot grow anything anymore*" (R2-V1 M68).

Water

A concern which is reflected in the interviews made with the indigenous was the decrease of water sources. In Caigura, 2/8 mentioned 'water sources' and 'water levels' as a resource they had noticed was decreasing (2/8). This might correlate with the village access to water from

Caigura dam, thus the need to gather water elsewhere is not as precarious. In the community of Tucainty the indigenous did not have a lot of answers. Only 1 of 7 mentioned decreased water levels and that the river is drying up. They have however experienced extensive crop loss due to drought – such as maize (2/7), beans (2/7) and anko (1/7).

- "*There is less and contaminated water in the river, less waterfalls, and generally smaller water sources*" (R5-V1 M45).
- "*Up in the mountain there was crystal clear water, now there are no water at all*" (R4-V1 F70).

Forest

In Caigura 5 of 8 said vegetation is decreasing, such as trees and plants. In Tucainty it was reflected by all respondents (7/7), while in Cumandaroti by 4 out of 7. Trees mentioned especially were: Colorado, Oak, Palo Santo, Cedrela, Quebranco, Algorobo, Mistol, Quina, Oak, Orundel, Tacillo, Taquillo, Tala, Bocochi and Chaña – a fruit tree which has food for pigs. All the trees have different functions. Some trees have fruits for animals and works as a construction material. "*The Tacillo is a tree used for construction, but it is nearly extinct*." (R3-V2 M25). Because of illegal felling of trees, different species of plants are disappearing. This trend is partly related to industrial production; "*Many companies just cut down plants and herbs*" (R4-V3 F19). Because this is an ecosystem; *Some plants only grow around certain trees. As a consequence, when the tree decreases and disappears, so do the plants*" (R1-V1 M63). Deforestation is also causing other unforeseen reactions; "*As a consequence of degraded forest, there are more forest fires and more dead trees*" (R5-V1 M45). Drought and fires are chasing animals out of the area because of lack of food and water, contamination and noise due to traffic and machines.

Some trees have disappeared altogether. Respondents from Caigura mentioned, Oak, Cedrela Odarata, Cedar, Palo Blanco, Quina and Fiebra Atzo. In Tucainty the tree Algarrobo has disappeared; a fruit tree where fruit is food for pigs and the wood is suitable for construction. In Cumandaroti named Mistol – a tree with fruit, Algarrobo, Challan, Oak and Tusca as trees that has disappeared. This decrease or disappearance of various trees and plants are according to respondents leading to decreased access to material for construction and less food for animal

husbandry, wildlife and human consumption. It is also leading to a decrease of herbs and other smaller vegetation growing near to these trees and plants.

Wildlife and animal husbandry

Due to conditions of the area, stocks of animals are decreasing. All respondents in Caigura mentioned a decrease in wildlife (8/8), in Tucainty it was mentioned by six (6/7) and in Cumandaroti also six respondents (6/7). Especially mentioned were Tapir, Wild Boar, Guanaco, Charta, Leon, Corsuela, Mountain goats, Turkey, Leon, Pawa, Leopards, Lowland Paca and Fish in the river, for example Sardine. Except from contamination and increasing temperatures, respondents mentioned over-hunting and illegal hunting as possible reasons for this decrease in animals. Also fish stocks have been degraded. According to a respondent from Tucainty, today "there is less and thinner fish. 15 years ago there was plenty" (R3-V2 M25). Respondents documented that also farm animals are becoming fewer. In Tucainty especially, farmers experience decreased health and life expectancy of their animals. Two respondents mentioned decreased health of cows and another two mentioned decreased health of pigs. The decrease in wildlife and livestock was linked to an increase of industrial activities such as traffic, noise and contamination.

In spite of focus and initiatives to recuperate the effects of over-hunting, it has taken its toll on the stock of animals. In Caigura, some animals have disappeared completely. According to respondents, these are Tapir, Acusti, Wild Boar, Charate, Quirquincho, Ñandel (Rhea – little ostrich). Respondents from Tucainty named Grey Brocket, Wild Boar, Tapir, Chaco Chachalaca (bird), Pawa, Quirquincho (animal with shell), Cuchimonte, Paiko, Toronjilo and Iguana. Finally, respondents from Cumandaroti named Tapir, Grey Brocket, Wild Boar and Tiger.

Nearly all respondents said they have observed a decrease in the stocks of animals. A few respondents also mentioned they had over time experienced a decreased ability to go hunting due to decreased stocks of wildlife and restricted freedom of movement. One respondent said that before there were a lot of animals to hunt, but now they have disappeared.

- -"*Before there was a lot of animals in the forest, such as leopards, but the animals are scared off by the noise and activities of the companies. In the river there is almost no fish anymore*" (R6-V3 F54)

- "*Animals disappear because of noise, contamination, etc. A lot of them are also hit by trucks and die*" (R7-V3 F46)

5.2.3 Causes, Consequences and Alternatives

In Caigura, when asked about what is causing these changes in the ecosystem, all mentioned increasing temperatures (8/8), little rain (8/8) and drought (8/8). One also mentioned the increasing frequency of forest fires. After 'increasing temperatures' and 'less rain', seven out of the eight respondents answered 'contamination as a result of hydrocarbon production' (7/8) – which includes seismic drilling, exploration and extraction. Two of eight (2/8) mentioned that high increase in traffic, together with noise and dust from the highway. Along with ecosystem degradation and contamination these factors scares off animals and contaminates the air (2/8). In addition the dumping of wastewater from the mines of Potosi and Oruro was recognized (1/8), along with illegal deforestation and 'Project Pantalon [NOTE] (1/8). "*Project Pantalon splits the river in two in Argentina – the fish can no longer migrate upstream to spawn*" (R7-V2 F48).

In Tucainty and Cumandaroti, changes in the ecosystem were related to contamination and activities linked to the hydrocarbon industry. This was reflected by all respondents from both villages (14/14). This includes exploration, extraction and related activities; including increased traffic, noise and dust. Blame is laid on practices of the companies and subcontractors - led by Petrobras, but also the companies Seperbol, Bolinter and Petrosur / Andina was mentioned. In Cumandaroti contamination of water and soil around gas field was mentioned twice (2/7). When talking about "the company" most meant REPSOL, however due to lack of communication it might be hard for the villagers to distinguish between the operators. After contamination and hydrocarbon industries, in Tucainty one person mentioned the increase of temperatures (1/7), and yet another deforestation (1/7). In Cumandaroti deforestation was mentioned by tree of seven respondents (3/7), while two mentioned increasing temperatures and forest fires (2/7).

El Proyecto Pantalon

After hearing about 'El Proyecto Pantalon' (The Pants Project) from several respondents as a reason for decreasing fish stocks, we decided to do some more interviews with government officials to see if there was any hold to the statements. At the border between Bolivia, Argentina and Paraguay a project involving a split in the Pilcomayo River was initiated in 2010; one part

would go into Argentina and one part would run into Paraguay. However, a problem when interfering with the natural ecosystem is that it is difficult to predict how the system will react. When splitting the Pilcomayo in two, more water than expected started running in the direction of Paraguay, leaving maximum 10% of the water for Argentina. This has been devastating for the inhabitants in Argentina who depend on this river a source of fresh water, as well as for some areas in Paraguay which has been flooded. Because of the low water levels, fish no longer has enough water to migrate upstream to spawn. Consequently a high decrease in fish stocks north of the border has been documented, and millions of fish and animals south of the border are dying. (See pictures appendix 2). This situation is devastating for the people living upstream depending on fish as a source of food. One of the area's most vulnerable groups is the Weenhayek indigenous group, which traditionally is dependent on fishing as primary basis for livelihood. The combination of Proyecto Pantalon, drought and contamination has forced them to look for alternative livelihoods. Some are entering agriculture which has started many conflicts with mestizos and other farmers in the area. Groups of people that before lived together in peace are now increasingly in quarrels and disputes with each other for resources; evident among others through the San Antonio protest (see section 7.4 "Increased conflict over land").

Alternatives

As a follow-up question respondents were asked if they could in any ways access alternative resources or deprived resources elsewhere. The answers were almost identical from all tree villagers; Yes, if they travelled a long distance (20-30 kilometers) preferably where there are no people or no industry. However, they have no or little means of transportation and most of the land has become private property of either rich private owners or extractive companies, hence they have no access even if they could get there. Their alternative is to buy at the market, but this requires transportation and money. This means that the resources are there, but out of reach because of the Guaraní little access to resources such as money, means of transportation or land rights.

Research Question 3:

5.3 To what extent are Changes in the Ecosystem affecting Guaraní Livelihood and Wellbeing?

This chapter attempts to shed light on how the changes in the environment are affecting Guaraní livelihood and wellbeing. The effects can be categorized into three boxes;

3.1) Livelihood and Wellbeing, 3.2) Health, and 3.3) Socio-Cultural Structures

5.3.1 Livelihood and Wellbeing

Livelihood

Today the conditions for Guaraní livelihood - agriculture and husbandry are declining. Because of drought and contamination the soil is no longer as fertile. This affects agriculture, but also wildlife and husbandry that graze surrounding vegetation. If vegetation is contaminated and/or experience drought, wildlife will most likely migrate, but livestock will not have enough food or water and their health will decrease. Decreased livelihood security is reflected with deep concern by respondents from all three communities.

Increasing temperatures and decreasing rain has devastating effect on crops: "*This year there has been little rain, so our crops are destroyed*" (R5-V3 F24). This was reflected especially by respondents from Tucainty and Cumandaroti. In addition to rising temperatures, the climate is generally unstable; "*The climate has been very unstable. For example in 2010 there was a lot of hail, which destroyed much of the crops*" (R6-V1 F30). The instability in climate is causing livelihood insecurity and social unrest. "*Often there is a drought, it is not possible to cultivate and the fish disappear*" (R1-V2 F50). The same woman continued; "*Because there is a drought it is not possible to cultivate maize and I need to sell my pigs*" (R1-V2 F50).

Contamination related to extraction of gas is causing livelihood insecurity through decreasing biodiversity and declined soil fertility. As biodiversity is degrading access to ecosystem services decline – including crops and livestock. Contamination is tied to chemical waste from hydrocarbon industry, including contamination of water and spills of chemicals on soil. Clean up procedures are insufficient; "*Sometimes trucks are colliding on the narrow roads, tip over and*

spill toxic chemicals. Nobody takes responsibility for cleaning it up, it is just left there" (R1-V3 M46).

The decreasing soil fertility due to contamination and drought is leading to decreased livelihood security, partly because: "*There is less work. Before I worked 80 % in the field, now only 35 to 40 %. The land is no longer as fertile*" (R2-V1 M68). Another man summed up; "*My livelihood is totally dependent on my cows and my crops. They are both at danger*" (R5-V1 M45). In addition, increasing disease and poor health on farm animals are contributing to livelihood insecurity, as the animals are fewer and expectancy of life lower. Diseases are linked to contamination principally, but also drought as the animals can get deficiency diseases; "*Animals get rabies and malnourishment because of the drought*" (R1-V3 M46). In addition many animals are killed by the traffic; "*A lot of animals are hit by passing trucks, but again nobody takes responsibility and there is no compensation*" (R1-V3 M46)

Wellbeing

The Guaraní relationship to the environment has during the last 15- 20 years been put to the test. As Guaraní wellbeing is closely connected to the conditions of their livelihood, we already have a good impression of the conditions of their wellbeing. Decreasing wellbeing is reflected in people's relationship to the environment. With the changing ecosystem and the indigenous' high dependency on the natural environment, all respondents expressed strong ambivalence when talking about their relationship to the environment. For most it has become a constant source of concern and insecurity. Few describe their relationship as 'good' – mostly only as 'dependent'. Most attribute their poor relationship with the environment to the establishment of the hydrocarbon industry; contamination, heavy traffic and an increased pressure to generate money. In addition a decrease/degradation of natural resources were mentioned and generally the disturbance of a peaceful life in harmony with nature.

- "*I am dependent, but have a bad relationship to the environment*": (R7-V1 F50)
- "*The environment is everything. We need it to survive*" (R6-V1 F30)

At the same time people have become more environmental conscious, aware of the importance of environmental preservation and generally more concerned about what is going on around them. In the three villages (5/22) said that villagers have become more environmental conscious;

"*People are more conscious and are preserving the environment to a larger extent*" (R1-V3 M46). A highly engaged man from Caigura said; "*The environment is very important to me. I want to preserve and practice environmental consciousness. We need to work together to prevent erosion and prevent forest fires. Attitudes are slowly changing, but people do not have the skills to deal with the situation*" (R1-V1 M63).

A few (3/22) meant that the Guaraní had always cared and protected the environment and that their relationship to the environment had not changed. One respondent in Cumandaroti said one change is that there today is less hunting, implying that the Guaraní used to be more dependent on the forest wildlife for livelihood. One of them stated;

"*The relationship to the environment has not changed*" (R4-V3 F19)

5.3.2 Health; Conditions, New Diseases and Access to Health Care

Health Conditions

People's presentation of current health conditions varied greatly. While some described health conditions as 'good' or 'normal', others described it as 'terrible', which implies that health conditions vary greatly from household to household. As the Guaraní villages and villagers are scarcely scattered the health conditions for one household can be totally different from another, depending on household access to resources and subjection to contamination; "*The health conditions vary. Some are more affected by the activities of the company than others*" (R4-V2 M46). Respondent answers also differed according to their point of comparison. In Cumandaroti 6/7 of respondents answered that the health conditions are 'good' or 'normal'. However, many said health conditions had improved because they had seen minor improvements the last week or two. Other claimed that health conditions had improved as health services before was not available. It isn't unlikely therefore that in some ways health conditions has improved. However, the quality and availability of the service is poor and inadequate. Once again Caigura is in a favorable situation as they have access to water from Caigura dam. Despite that the water is subject to contamination, at least their food security is better. "*The health conditions today are improved because of the dam construction. Because of the dam people have better accesses to*

water for crops and thus more food" (R3-V1 Male 62). However, a lion's share of respondents from all villages claimed health conditions have changed for the worse over the last 20 years, and that it started when hydrocarbon companies arrived in the area. "*The health conditions changed when the company arrived in 1996*" (R3-V3 M52).

In Caigura most (6/8) said there had been an increase in diseases the last 20 years. This was reflected by the majority in both Tucainty (4/7), and in Cumandaroti (5/7). Further, life expectancy today in Caigura varied from 70 to 90, with a mean of 80. However, all respondents agreed it has highly decreased with an average of 15 years lower than 20 years ago. In Tucainty life expectancy was estimated to be in average 80 years, decreased with 15 over 20 years. In Cumandaroti, life expectancy were set to 68 years; a decrease with 30 over a 20 year timeline. For all three villages the mean average life expectancy is 76 years, an expectancy that has declined 20 years over a 20 year timeline. Current access to health service is not sufficient to match the growing need for medical treatment. "*The health conditions has changed - there are more diseases but there is no health service or treatment*" (R7-V3 F46)

- "*Life expectancy has decreased a lot. Today average life expectancy is 70. My grandfather became 120 years*" (R3-V1 M62).
- "*The health conditions are terrible; it has declined since the 1920's*" (R2-V2 F65)
- *"One can smell the gas and chemicals miles away*" (R1-V2 F50)

New Diseases

Contributing to decreasing health conditions and life expectancy among the indigenous, a lot of new diseases has arrived over the last 20 years. According to Johnny Robles from the Villa Montes Environmental Unit there are no studies over new diseases in the area. An overview for the three villages will be presented;

'Stomach illnesses' such as diarrhea, etc (13/22), 'Skin diseases, rashes and irritations' such as white spots on skin (12/22); Dengue (9/22), Respiratory difficulties and diseases (7/22), Headaches (7/22), Eye disease, irritation and pain (5/22), Malaria (3/22), Yellow Fever (2/22), Swine flu (2/22), Cholera (2/22), Cancer (1/22), Typhoid fever (1/22), Fever (1/22), Osteoporosis (1/22), Pneumonia (1/22), Influenza (1/22), Chaga disease (1/22), Kidney infection

(1/22), Allergies (1/22), Sunstrokes and fatigue –such as breathing difficulties and weariness (1/22), Pain in joints and bones (1/22).

Caigura presented a list of 10 new diseases. Most respondents named 'Dengue' (4/8) which according to respondents was not present before; 'Stomach Illnesses' such as diarrhea, etc. (4/8) connected to dirty waters and contamination - especially mentioned was white spots appearing on people's skin: "*My 12 year old child has these white spots, and has to take medicine*" (R7-V1 F50). In addition 25% mentioned the appearance of 'Cholera' (2/8), which many people presumably have died of - and the appearance of Malaria (2/8). According to respondents there are more mosquitos because there is more garbage and waste pits, which spreads more malaria and dengue.

Tucainty had the widest list of new diseases, in total 15 were named. All respondents (100%) mentioned 'Skin diseases, rashes and irritations' – from water contaminated with chemicals (7/7). As in Caigura the white spots on skin were specifically brought up by four respondents. Those who live close to production sites are more affected than others; "*People who lives close to the gas fields experience skin problems*" (R3-V2 M25). After skin problems, 'Respiratory difficulties and diseases' such as astma - because of contaminated air were brought up by six respondents (6/7), 'Dengue' (5/7), 'Stomach problems and illnesses' (diarrhea, etc.) (4/7), 'Headaches' (3/7), 'Eye disease, irritation and pain' (3/7).

The respondents of Cumandaroti presented the shortest list of new diseases, 5 in total. These are Stomach problems and illnesses (diarrhea, besicula, etc.) (3/7), headache (3/7), Skin diseases, rashes and irritations (from dirty contaminated water) (2/7), Eye irritation and pain (2/7) and fever (1/7). There is a good chance they lack knowledge about the diseases, as was mentioned in both of the other communities. The introduction of new diseases was by respondents tied up with the immigration of occupants into the area; "*There are new diseases because it arrives more people*" (R7-V3 F46). Especially eye disease was connected by 86% to gas flares and air contamination; *"'Mal de chaga' eye disease increase in August, September, October and November because of extra high flares and contamination of air*" (R3-V2 M25). Air contamination was a concern in all communities. Increased traffic is causing more noise, dust and air contamination. Respondents from all villages said the air is always dusty, their skin and eyes are irritated and expressed concerned about the conditions of their lungs. A representative

comment is from a woman in Cumandaroti; "*It affects my family and my community by adding more stress, more dust and contamination in the air we breathe. We are worried, cannot relax properly*" (R2-V3 F31).

- "*The air makes the eyes burn*" (R5-V2 F37)
- After the company arrived in 2001, the industrial pollution has given people bacterial stomach problems, such as 'besicula'.
- "*We have a lot of headaches*" (R6-V3 F54)

Based on the respondents top-five lists of new diseases it is possible to say something about the health conditions of the different villages. In Caigura the diseases are more related to water, such as stomach illnesses, cholera, skin diseases, malaria and dengue. Although there are small production sites around Caigura, air contamination is relatively small compared to the other villages. Tucainty on the other hand is subject to high rates of both air and water contamination, leading to skin diseases, respiratory diseases, dengue, stomach problems, headaches and eye irritations. In Tucainty the production sites were many and the flares highly visible. Cumandaroti is also subject to water and air contamination, reflected in villager's stomach problems, headaches, skin diseases, eye diseases and fever.

The introduction of a range of new diseases is causing a situation where herbal medicine no longer is enough. Before, the indigenous were more dependent on herbal medicine. A man from Tucainty when asked if there had arrived new diseases said: "*Yes, the diseases has changed so much that herbal medicine is no longer sufficient. I don't know the names of all the diseases"* (R4-V2 M46). Many of the indigenous are illiterate, have little access to education and do not have knowledge about the different diseases or what is causing them. As a result, they may not know that pain they are experiencing is possible to treat. Water sources such as the wells and rivers, and crops such as watermelon and tomatoes are subject to a lot of pesticides and contamination – many people are not aware of the dangers of consuming these things, or they may just not have other options. For example a man from Caigura said he has been drinking highly contaminated water, but he hasn't been sick yet so everything is okay (R5-V1 M45).

Access to Health Care

In each community there is a Mini Hospital, often referred to as the 'Posta' by the villagers. However the access, quality and reliability of the health service are highly inadequate in all three villages. In Caigura all respondents answered 'Caigura Mini Hospital' or 'Posta' when asked where they go if they get sick (8/8). However the conditions and quality of the facility is poor and the services are not always available. One respondent said the hospital is closed somewhere after 16:00-18:00. If someone gets ill during the night or the conditions are serious they have to go to Villa Montes Hospital. This was confirmed by another woman who said; "*The doctor in the Mini hospital is there only from 07:00-15:00, and some days he is not there at all*" (R4-V1 F70). Even when the facility is open, due to poor quality, all respondents said if their condition was serious they had to go to Villa Montes Hospital (8/8). Two respondents also mentioned Tarija Hospital and Santa Cruz Hospital as second best alternatives (2/8). In order to get to a hospital they need to arrange and pay for transportation themselves and pay in full for the service. One man said;

"*If I get sick I need to go to the Hospital in Villa Montes. The installation of the Mini Hospital in Caigura is there, but it does not function. No permanent doctor is employed and the doctor comes and goes as he please in opening hours from 08:00 to 17:00. After 17:00 the post is closed. We cannot rely on it*" (R8-V1 M40).

In **Tucainty**, despite high range of new diseases access to health service is poor to the extent of no access. The Posta is equipped with nurses, but they are not always there; "*The mini hospital is abandoned and located 15 km away*" (R5-V2 F37). Due to the remoteness of the village and lack of means reaching a hospital is highly difficult. Consequently All but one respondent said they use herbal medicine when they get sick (6/7). With the introduction of new diseases however, herbal medicine is no longer sufficient. One of the biggest challenges in Tucainty towards improving health conditions is the lack of transportation. Only one respondent mentioned the Tucainty mini hospital, but expressed difficulties reaching the facility; she said "*The Mini Hospital is 13 km away, without transportation it would take me about 2 hours to get there*" (R2-V2 F65). As a consequence, five respondents said they needed to go to Villa Montes if the herbal medicine didn't do the trick (5/7). The remaining two respondents were employed with Petrobras and Seperbol, and had the opportunity to call them in severe cases to send an ambulance or

doctor (2/7). This arrangement was however not reliable. In general it is difficult for the villagers of Tucainty to get help when they are sick. Some just have to do with traditional medicine, much because they don't have transportation or money to pay for the service (2/7). A young man said; "*We are usually not able to access help [health service] from outside the community. We use our shaman and herbal medicine. If someone gets seriously ill everyone in the community must ask Petrobras to call for an ambulance*" (R3-V2 M25). As it takes about 40 minutes with a personal car from Villa Montes to Tucainty in daylight, it would take a good while to get an ambulance from Villa Montes to Tucainty and back again in order to send a critical case to the hospital. As a last resort 71% in Tucainty said they would call Petrobras or Seperbol if they got sick (5/7). One of these worked for the company and therefore had an health insurance though them (R3-V2 M25). For most however the option is highly inconsistent and only for emergencies. Some respondents mentioned that Petrobras once in a while sends a doctor to check the general health conditions. However, the frequency of the visits vary in different parts of the village; while some said a doctor comes every three months, others replied once a year.

In Cumandaroti, 6/7 of the respondents answered 'Cumandaroti Mini Hospital' when asked where they go if they get sick (6/7). But here too the quality of the mini hospital is disturbing; according to respondents the facility is open inconsistently "*once in a while*" (R3-V3 M46), they don't have toilettes or kitchen (R5-V3 M52), and even the service is poor; "*I go to the Mini Hospital, but the quality of the service there is terrible, they don't have medicine*" (R7-V3 F46). For emergencies and severe cases of illness, 3/7 said they would go to Palo Blanco Hospital which is the nearest densely populated area, 3/7 would go to the city of Tarija and 2/7 to the city of Villa Montes.

There exists a health service called Seguro SUSAT (Seguro Unico de Salud Autonomo de Tarija), a project initiated by the hydrocarbon companies and provided by the mayor's office. The health insurance covers 15% of the health treatment cost. In Caigura a majority (5/8) said they were insured, in Tucainty less than half (3/7) and in Cumandaroti 5 out of 7. However, based on the indigenous access and quality of health care, it does not seem like this arrangement is functioning as the safety net it is supposed to be.

5.3.3 Socio-Cultural Structures

Cultural Traditions and Celebrations

During the last 20 years the Guaraní cultural traditions and celebrations has gone through many changes. Although culture as a social phenomenon is an interactive process and can be said always to be changing; if fundamental changes happen too fast it may cause detachment and a feeling of cultural displacement as people don't have time to adapt and create a new sets of making sense in the world. Many respondents expressed melancholia about how things used to be and claimed old traditions are being lost with the elder generation. Current religious practices are the result of a process of syncretism, and are now a mixture of Guaraní traditional culture combined with Christianity. Looking at the top-four list of celebrations important to the three communities, one can see they are very similar, with a combination of 25% Guaraní traditional culture and 75% Christianity. When asked which traditions or celebrations were important to their household, the indigenous of Caigura answered; Guaraní Carnival (3/8), Christmas (3/8), Marriage (3/8), Santo Santiago (2/8). Also mentioned was Babtism, Mass, Qaniceñera[1], Horse race, Cock fights, Fiesta Santiago Patronal[2] and Semana Santa (Easter) which all was mentioned by 1 of 8 respondents. In comparison the Tucainty villagers are more unified in their traditions. 100% of respondents attended the 'Guaraní Carnival'(7/7), in addition The 'Santo Santiago' (6/7), Christmas (5/7), New Year's Eve (4/7), Markada (2/7), 'La Minga'[3] (1/7), 'Dia del Cruz[4]' (1/7), Fiesta familiar (1/7), Weddings (1/7), Birthdays (1/7) and Reunions at Tucainty (1/7). In Cumandaroti the variation of traditions and celebrations was little compared to the other villages. The most important traditions was 'the Guaraní Carnival' (6/7), New Year's Eve (5/7), Christmas (3/7), Dia del Cruz (3/7), Birthdays (1/7) and Marking of Cattle (R3-V3 M52). The youngest respondent from Cumandaroti said her household does not attend any celebrations (R4-V3 F19). In line with the rest of this interview, this household was more concerned with making ends meet, living more or less hand to mouth.

[1] Rite of passage when a girl reaches 15 years of age.
[2] Christian celebration 17th - 25th of July.
[3] Latin American arts festival
[4] 3rd of May

When asked if these traditions have changed over the last 20 years; Half of respondents from Caigura said yes (4/8), (3/8) meant they had not changed. In Tucainty all but one meant these rituals have changed over the last 20 years (6/7), against one who meant it had not changed (1/7). Last, in Cumandaroti four respondents said there has been a change in cultural celebrations and rituals (4/7), against three who said it had not changed. In sum a majority of all respondents say traditions has changed. The diverse specter of traditions and lack of unanimity in the community strengthens the theory of weakening cultural structures. One respondent explained changes in the celebration of Semana Santa; "*Before everybody ate fish during Semana Santa but now everybody eats meat*" (R5-V1 F30). From these data one can read that the lack of fish in the rivers and the changes in the ecosystem services are changing the Guaraní culture. Respondents did express some melancholia when talking about these changes. It seems they have been more or less accepted, and compared to other subjects they did not provoke very much engagement or sharing of opinions. Another young man said; "*When we were children we were preparing for Christmas 40 days in advanced, now this is not common. I am devoted to Jesus*" (R3-V2 M25). However, although traditions are changing the sense of belonging is not; "*Before there were more social gatherings, but our culture is still kept alive*" (R1-V2 F50). A common response when asking about change in celebrations can be summed up into the statement of one man (63) who said; "*Now the social and cultural gatherings are more about money. Today people apply for state subsidy in order to arrange. Before there was more singing, dancing and local musicians; today they just put on a CD or a cassette, most often because people drink too much to perform*" (R1-V1 M63). This statement was supported by nine out of the total 22 respondents from all three communities (9/22). In addition to increasing importance of money in celebrations, these statements also indicate an increasing presence and importance of alcohol. Most of these statements were directed towards the Guaraní Carnival.

The changing traditions are according to respondents linked up with invasion and activities of occupants on indigenous territory which are weakening social ties within communities. There is less unity than before and thus people are less bound to social norms and traditions. Two respondents in Caigura said traditions are changing due to influx of Christianity (2/8). Greater flow of people, goods and ideas into the community are changing the socio-cultural structures. For the Tucainty villagers this include immigration into the community (1/7); technology, media and education (1/7); human development' (1/7), and in addition the new constitution of 2009

which due to new laws protect women's rights and are changing the roles of women (1/7). The weakened social unity is also closely connected to the changes in the ecosystem. According to a Caigura man: "*The shifting ecosystem changes the sense of unity in the community*" (R1-V1 M63). It seems Guaraní culture and social unity is disappearing alongside ecosystem degradation and the lack of livelihood security they are experiencing. Also, especially in Cumandaroti four respondents meant changing socio-cultural structures were related to generational change (4/7); "*The new generation does not preserve the traditions, they follow what is in fashion*" (R5-V3 F24). Two respondents meant changes are related to increased rates of occupants in the area (2/7) - including increased influence from more urban areas. In addition in the village of Cumandaroti the company Petrobras is involved in arranging a range of social gatherings, traditions earlier arranged by the indigenous. "*Petrobras organizes gatherings now*" (R2-V3 F31). This can be positive in the sense that Petrobras has resources available to arrange social gatherings, now more than ever as there is more focus large gatherings that costs money. It might also be that this arrangement has contributed to that trend. On the other side it might be negative as lack of control and influence might lead to decreased sense of ownership to the celebration and ultimately loss of cultural significance.

- "*We are influenced by people from town, the company, television, music, etc"* (R5-V3 F24)
- "*People get hired by companies and do not want to move back again*" (R2-V3 F31)

Perhaps the most visible change among all Guaraní communities is that the amount of people who speak the indigenous language is decreasing. This was mentioned by one respondent in Cumandaroti (R2-V3 F31) and also key informants from the local government's office. During fieldwork we met only two elderly women who only spoke Guaraní. Most spoke Spanish with only a hint of Guaraní words, often related to names of trees or animals. In order to reverse this trend the local government in collaboration with APG has initiated a contest during Guaraní Carnival which is meant to inspire the young generation of Guaraní to learn and practice the traditional language. As an example; in order to win the title as the "Princess Guaraní" or "Queen Guaraní" you must be a good representative of the Guaraní, be a positive force within the community, act according to cultural norms and speak the indigenous language fluently.

According to some respondents in Cumandaroti the community has become more organized than before (2/7); "*The Capitan has a meeting once a month with the whole community to talk about*

and discuss problems" (R4-V3 F19). According to respondents however the general the social structures are weakened and life is experienced as more stressful and complicated; there is weaker solidarity among people. "*People care less*" (R6-V3 F54). Based on the statements of informants this seems to have created a feeling of displacement and frustration;

- "*Bigger roads, bigger problems. Today there is more people with bad habits such as narcotics, alcohol, theft, etc*." (R3-V3 M52)
- "*Before it was more relaxed working in the forest and with fishing, now everybody want to work in the company*" (R7-V3 F46)

Gender Roles and Power Structures

A common feature among cultures with changing socioeconomic and socio-cultural structures is change in gender and power structures. This is also the case for the Guaraní, where gender roles have changed tremendously the last 20 years, especially the role of women. Part of this change has to do with the Constitution of 2009 which strengthened the role of women. In Caigura more than half of the respondents (5/8) means the role of women had strengthened, against 1/8 who meant women stay housewives (R7-V1 M50). Also in Tucainty the gender structures are changing towards greater equality. Except from one person, all respondents meant the position of women is changing in the sense that they enjoy more respect, freedom and importance outside of the household (6/7). As a contrast, in Cumandaroti the opinion was more divided; Four claimed that gender structures has not changed (4/7), while three said there has been a change related to greater respect for women and how women get more jobs outside the household (3/7). This indicates that attitudes towards gender are more traditional in Cumandaroti compared to the other two villages. That the trend is not accepted by all indicates it is under transformation. However, a lion share of respondent meant compared to before women now have a stronger position in the community, they receive more respect and they are more included in activities outside the household such as agricultural production, education and politics; "*The women's role is changing. They now participate more in agricultural production, come work in the fields. Before this was not so*" (R5-V1 M45). They are more involved in working at the fields, which before was a task reserved for men. In addition they get jobs outside the community, are more involved in politics and have become more politically active creating and organizing creating assemblies.

Other changes observed are related to changing socio-cultural structures, related to marriage, abortion, social gatherings and money. For example more women get abortions and more married couples get divorced: "*Before people who married stayed together*" (R3-V2 M25). One respondent even said that today women are sent in front during demonstrations, as it is less likely they will get treated with violence or get arrested.

To explore changes in power structures among indigenous groups an approach is to look into the role of elders. In all three communities a large majority (16/22) said the elders still have an important role in the community as advisors and testimonies of the past. It seems the importance of their role has not changed a great deal, functioning as advisors and collective glue. "*They function as community advisors, and spreads knowledge about the past*" (R4-V3 F19)". Although they still have an important function however, today they are forced to work through old age because there are not enough resources within the community to take care of them, as was the practice before. In addition their credibility as advisors is being challenged because of modern influence and new technology; "*The elders has experience, but in time the younger generation takes over*" (R3-V2 M25). A man from Caigura said "*before the elders knew when it would rain – today they don't*" (R3-V1 M62).

This implies that the rapid change in the ecosystem has an impact on the power structures. As the ecosystem is changing in unforeseen ways, the indigenous knowledge cannot 'keep up' so to speak. It seems that even though elders receive a lot of respect from their community, their role is also changing with greater flow of people, goods and ideas in and out of the community. The new generation has new technology to feed them knowledge. Also, the younger generation does not have the same collective responsibility to their families as children had before. Greater individualism and better opportunities for education leads young people to go away to study and afterwards they do not want to move back into the village. They find new jobs in the city and lose respect for the country life; "*The younger generation does not have the same obligations to help out their family anymore, they do what they want*" (R3-V1 M62).

Research Question 4

5.4 How do the Indigenous Adapt or Respond to the Changes in the Ecosystem?

Based on the theoretical framework and literature review, to include indigenous people in policymaking that affects their area is key in order to safeguard indigenous rights and change the trend of deprivation and social displacement. This section will attempt to reveal to what extent the indigenous are involved in policymaking affecting their area, to what extent they are able to safeguard their own interest. There is evidence of increasing rates of political activism among the indigenous, including protests, blockages and assemblies, and generally a will to fight. This trend has increased as women are included in both public space and politics. When asked "how do you deal with the changes in your livelihood and wellbeing?" most of the respondents said they are not much involved in politics, stating "*There are not much alternatives. We just have to deal with it", or "There is no support, the community help each other out*" (R4-V2 M46). Some however, such as one woman from Cumandaroti answered: "*We organize more*" (R7-V3 F46). This was evident also in the section about changing gender structures, where many stated that women to a larger extent are politically involved.

5.4.1 Political involvement & Guaraní Peoples Assembly (APG)

Political involvement among the Guaraní happens principally through being represented by APG. The organization is built on the cultural Capitàn system, compounding of the community Capitan's from all villages and lead by the Grand Capitan called Jorge Mendoza. APG works to safeguard the needs and interests of the indigenous group, and their representatives distributes seeds and some places rents out tractors for more efficient agricultural production. In Caigura, main involvement in political activities it is restricted to forming community committees and dialogs with APG (8/8). This is also reflected by all respondents in Tucainty (7/7), and nearly all respondents from Cumandaroti (6/7). In all communities there is a meeting between APG and the community assembly at the end of every month to discuss the current situation. "*The Capitàn has a meeting once a month with the whole community to talk about and discuss problems*" (R4-V3 F19). There are however split opinions about whether people feel sufficiently included in APG's

policymaking. In Caigura half of my respondents says they feel sufficiently included (4/8), against three respondents which do not feel sufficiently included (3/8). In Tucainty (3/7) feels sufficiently included, while another (3/7) do not feel sufficiently included. Finally, in Cumandaroti only one respondent said he felt sufficiently included in the APG's policymaking (1/7), while the majority said they did not feel sufficiently included (6/7). Based on the informants answers a conclusion can be reached that the level of political inclusion in Cumandaroti is kept to a minimum, and that most often it is the Capitàn who speaks on behalf of the community rather than being a representative for the community. "*We have a Capitan that speaks for us*" (R5-V3 F24). Whether sufficiently involved in APG or not; all respondents from all communities expressed lack of inclusion or influence in policymaking affecting their area. This implies that APG do not have sufficient amount of influence on policymaking on higher levels. According to the Capitàn of Cumandaroti "*APG tries as much as they can with the little resources they have available*" (Cumandaroti Capitan - 48). As a consequence, for many of the locals politics represent talk without action and a process in which they have no chance to participate.

- "*I do not feel included in policymaking affecting my area. There is a lot of talking and discussions, but they are not efficient and don't lead anywhere*" (R4-V1 F70).
- "*I feel included in APG, but not in other types of policymaking*" (R4-V2 M46)
- "*There are committees. They talk but nothing happens*" (R6-V1 F30).

5.4.2 Indigenous Political Mobilization

In all three villages pilot projects has been initiated by the government in cooperation with operating hydrocarbon companies in the area with the purpose of presenting alternative ways of make a living. An example is the Honey festival in Cumandaroti which was arranged by Petrobras. However, these are all projects which are pilot tested at the moment. In Caigura there has been initiated project by the Mayor's office to cultivate sugar cane. In both Tucainty and Cumandaroti there have been initiated projects to start apiculture. In addition, there is the Guaraní Development Plan (Plan Desarollo Guaraní) and the temporarily halted Pro Habitat Villa Montes housing project. Besides these initiative however, it seems the Guaraní are living on alms from various agencies that appear on a more or less irregular basis. One person from Tucainty said that every two years the cattle are vaccinated with support from the government

(R7-V2 F48). However, she was the only one who mentioned this. Others said consistently; "*we get no help from the government or the hydrocarbon companies*" (R1-V2 F50). Most often support comes as a result of sporadic political pressure; through protests, strikes and blockages. One respondent from Caigura said that the mayor's office sometimes gives financial support if they are pressured enough. This was confirmed by another man from the same village, saying;

- "*Sometimes the government are distributing seeds, but we need to fight for it*" (R8-V1 M40)

The local expectation towards the central government is basically to receive what they have been promised. The national and local government has made promises of improvements, but they have failed to follow through. As natural resources has been taken away from the indigenous community - in terms of restricted land rights, contaminated waters and degraded plants and animals life; mitigation measures has been promised to make up for lost resources. The mitigation measures has however not been sufficiently implemented. Based on their concept of a good life the Guaraní want nothing more than to be able to work to have an income, be healthy and have the basics necessary to live a simple life in the countryside. Examples of broken promises is the abandoned housing project Pro Habitat Villa Montes, a project initiated to ensure that locals would live in hazard free areas in safe distance to the gas extraction. Other are insufficient potable water service and health service. In addition the local communities see all the riches that is extracted from their land but from which they are not able to benefit. This leads to expectation s of for example gas and electricity.

From this it is possible to read that in order to be heard, making complaints are not enough. The more loud and powerful measures they initiate, the better are their chances to be heard. As a result, over the last 20 years there has been an increase in political activism among the indigenous population, through protests and blockages, etc. In Caigura most political activism happens through the organization of APG, which may coincide with the fact that a lion share felt included in APG policymaking. In Tucainty however, there is a different story: Here three respondents said they was or had been involved in 'assembly's' (3/7), three in 'blockages' (3/7), and one respondent said 'protests and strikes' (1/7). Also company employees are protesting; "*We protest when the company [Seperbol] does not pay salary or other things. I earn 2300 bolivianos a month*" (R6-V2 M29). Lastly, in Cumandaroti, a few respondents were or had been involved in assembly's (1/7), protests (1/7) and blockages (1/7).

- "*We arrange blockages against Petrobras to increase salaries. We are forced to strike or nobody will listen*" (R3-V2 M25)
- "*The committee in collaboration with APG is pressuring the authorities for larger protected areas and access to water. There have been arranged blockades to make them listen. We need to catch their attention or else we are not heard*" (R5-V1 M45).
- "*For 18 years we have arranged committees, delegations and assembly's to fight for improvement. We have arranged blockages to be heard, to realize our projects*" (R1-V2 F50)

Poor inclusion in decision-making is causing increasing frustration among the indigenous. A common complaint was lack of dialogue between the community on one side and the hydrocarbon companies and the government's office on the other. A clear lack of trust was detected towards both agencies. Much distrust is connected to the governments lacking ability to plan or fully carry out projects. An example that was highlighted was a governmental housing project a couple of years ago, called Pro Habitat Villa Montes. It was meant to provide indigenous that lived in hazardous surroundings an option to move and to improve their standard of living. The project was welcomed by the locals, but came to a halt after just a few months because money had run out or flow of money from central government had stopped. A lot of people do not trust what is promised to them, as they have been disappointed time and time again. The government starts projects but they don't follow through. Another example is a company's attempt to reforest an area: "*The Company brings seeds and plants here, but they are not suitable for this area. Examples are Lechero and Qhurqui seeds*" (R1-V2 F50).

However, despite increased rates of political engagement and activism, it seems the real influence on local and national policymaking is more or less restricted to them being represented by APG. "*We have done blockages, but we do not get a new road*" (R7-V3 F46). Although the Guaraní People's Assembly does a good job with limited resources and limited power, they do not have enough authority to influence a centralized government. The important decisions are made in the power 'capitals' La Paz, Santa Cruz or Sucre far from where decisions are executed. With no local political involvement and practically no real options for promoting their interest, the feeling of powerlessness leaves great space for frustration. Despite the difficult situation and slim options for inclusion in policymaking; there is a will in people to fight for their rights; "*We are always fighting against contamination, for the protection of our nature. We are fighting for*

the government to initiate projects" (R8-V1 M40). One respondent from Cumandaroti said that norms are changing and forcing both politicians and companies to be more considerate of locals and the local environment; "*They steal our resources. But now politicians and the companies are forced to take into consideration the locals living here. There is more attention around these subjects*" (R1-V3 M46).

- "*The community is not informed about Petrobras' activities*" (R4-V2 M46).
- "*During campaigns they promises everything, but they do nothing but lie*" (R7-V2 F48)
- Nothing happens, only empty words (R7-V2 F48)
- "*The politics is driven from La Paz, we know nothing*" (R4-V3 F19)
- "*There is a distance between the company that operates on our land and our own government*" (R2-V1 M68).

The presences of hydrocarbon companies are current, so is villagers' limited influence in development on their traditional territory, though it has improved slightly. When entering the area, Petrobras set up gates with guards one has to pass in order to enter or leave areas that belong to them. This included also the indigenous groups living in the area. Before the villagers of Tucainty needed an ID card to enter the port leading into the village, otherwise they could not go out or in. Also before the gate was only open 12 hours a day, from 06:00 to 18:00 (R2-V2 F65). However, "*this all changed about six month ago, now we have access 24/7*" (R2-V2 F65).

5.4.3 Indigenous Migration

According to the indigenous leaders from Caigura, Tucainty and Cumandaroti, as a consequence of unsecure livelihoods the indigenous have started migrating to secure income. According to the Caigura Capitàn (52), the migration started in the 1990's as a direct consequence of occupant influx in the community. During this period people from outside started to settle in Caigura, buy land and cultivate. According to the Tucainty Capitàn (44), the main incentive is to access labor and income. "*Every year about 10% migrate and about 5% move into the village, thus the population decreases slowly. The migrants usually go to the nearest biggest cities in search for work, such as Santa Cruz, Yacuiba, Tarija or they cross the border to Argentina*" (Tucainty Capitan - 44). According to Cumandaroti Capitàn (48) "*As a consequence of pollution, people find it necessary to change their livelihood or migrate. Many of the people who before was dependent on fishing has now become either farmers or construction workers*" (Cumandaroti

Capitàn- 48). Consequently according to the Capitàn, the village has experiences a massive wave of migration out of the village since 1996, the same year as the company started drilling. The migrants are moving to the bigger cities and over the border to Argentina. "*Migrants send remittances to support their family financially, about 10% of their salary*" (Cumandaroti Capitàn- 48)

There was somewhat unanimity regarding whether migration is temporary or permanent. All respondents claim there is a lot of migration, though some say it's only temporarily. Both Milton Borda from CERDET and Johnny Robles from the Villa Montes Environmental Unit claim the Guaraní are not nomads and thus are only migrating temporarily; "*They do not move permanently to the cities. Some has families in Argentina and are travelling back and forth. It is not the indigenous who change their lifestyle. The city is moving to the indigenous groups, and not the other way around*" (Milton Borda - CERDET). However, as the indigenous leaders and this fieldwork reveal, few of the people that has got a taste of the modern society want to move back into the village. This is especially so for the young students going to the more urban areas to study, such as Villa Montes, Santa Cruz or Tarija. "*To a large extent the migrants lose their identity and the unity of the community*" (Tucainty Capitàn - 44). Along with the discussion about indigenous migration it is important to highlight that rural to urban migration is a common and growing trend in and between developing countries today. Thus it cannot be attributed to 'indigeneity' alone, but does also apply other vulnerable groups from rural areas.

Often the people who migrate do so in search for a better future. However, the situation for those who migrate is often not the best. Moving to more urban areas, they often starts working in low status occupations such as construction, mechanics, chefs, waiters, and some get by dealing narcotics, prostitution, etc. "*Even though they have university education they are not employed, and end up with the worst kind of jobs*" (Caigura Capitàn - 52). This is confirmed by Tucainty Capitàn; "*Most become construction workers, road maintenance workers and so on; jobs that doesn't need an education and that pays little*" (Tucainty Capitàn - 44).

5.4.4 Increasing Conflict over Land

According to Milton Borda in CERDET, as a consequence of occupant influx into the indigenous territory and extensive environmental degradation, "*farmers and agriculturalists are already in conflict with indigenous farmers over land – claiming it is their area because of number of cows, etc."* Already 12 families have been forced to move because they could not justify their area; "*The mestizos are stealing territory from the Guaraní in Yacuiba with violence"* (Milton Borda). The increasing conflict was confirmed by a protest witnessed during fieldwork. The San Antonio protest 15th of March 2012 in Villa Montes was a testimony of the increasing tension between indigenous and mestizos in the area [Appendix 6]. Outside a local governments building, mestizos were protesting what they presented as an invasion of Weekhayek indigenous on their land. The protestors were demanding compensation for lost property and urging the centralized government to come and see what is going on instead of making decisions from a distance. They were promised governmental representatives would come and participate in the discussions. However, these never showed which aggravated the frustration of the protestors. On the other side of this conflict is the Weenhayek. According to Milton Borda in CERDET this group are far more vulnerable and affected by decreasing environmental resources than the Guaraní as they are fishermen – and 100% dependent on fishing for their livelihood. The combination of industrial contamination, project Pantalon and drought, their livelihood are more or less already lost. As a consequence they are seeking away from the river in search for an alternative livelihood, and this is where conflicts arise with established mestizos or other settled indigenous as the Guaraní. No representatives from the Weenhayek were present during the protest, implying their interests are not presented in this debate. Based on Appendix 3 which presents an overview over land conflicts in Bolivia in 2008 the situation in the Bolivian Chaco with overlapping land rights is far from unique.

[Guaraní Marking of cattle, Carnival 2012, Illustration Photo 6]

Chapter VI: A personal Statement from the Guaraní

The Guaraní are highly engaged in issues regarding their own situation and have a lot of suggestions for improvement, from big structural to small scale changes. Taking into consideration that the Guaraní opportunity for stating their case is poor and near to non-existent, I have included to include some of the most concrete suggestion and statements in this chapter of my thesis. The statements are quoted in the way they were given in interview situations.

Improved synergy between government, company and local community: The indigenous are fighting to get their basic needs taken care of, but they are not heard;

- ✓ "*The company says the river is not contaminated, but we see the oil spills and the gas flares at night. When we drink the water we all vomit and get diarrhea*" (R2-V2 F65)
- ✓ "*We have asked for a well, but do not get it. They lie claiming we have light, water and everything we need*" (R5-V2 F37)

- ✓ "*We need to receive more support! The companies are stealing everything we depend upon*" (F4-V2 M46)
- ✓ "*The companies claim people are fine, and that our roads are good enough. The government does nothing to help. We live next to a gas field, but does not have access to gas*" (R5-V2 F37).
- ✓ "*There needs to be a proper cooperation between the community and Petrobras. If a company starts drilling the community is the last to know about it*" (R3-V2 M25). The locals need to be informed and the companies need to start fulfilling the norms of conduct, keeping their end of agreements.
- ✓ "*Authorities are more concerned about money, they are forgetting about us*" (R5-V2 F37)
- ✓ We need more respect from the companies
- ✓ "*The occupants show neither respect from the nature or the people living here*" (R3-V3 M52).

Fair distribution of resources; A widespread source of frustration in all three communities are all the resources that are extracted, that literary runs past their house, but they cannot access;

- ✓ "*The pipeline goes right outside our house. We need gas, it is right there but out of reach*" (R6-V3 F54)
- ✓ "*The government and Petrobras must stop stealing and help us regular people*" (R7-V2 F48)
- ✓ "*Petrobras extract all the resources from our land while we are living in poverty*" (R7-V2 F48)
- ✓ "*We have to beg for gas even though the pipeline runs 500 meters from our house*" (R2-V2 F65)
- ✓ "*Petrobras is 'stealing' our livelihood. We are entitled to more than this*" (R4-V2 M46)
- ✓ "*Before we were happy, but now everything has changed. All the resources that surrounds us do not benefit us at all*" (R1-V2 F50).

Better mobilization:

- ✓ "*I hope for a better road. It is not possible to drive on the dirt road with a normal car, one needs a range rover*" (R2-V2 F65)

- ✓ "*We hope the government will follow up. We need a better road and a bus to improve community mobility*" (Capitàn Tucainty - 44)

Attention about their situation and external assistance:

- ✓ "*We need people that care, like you*" (R4-V2 M46)
- ✓ "*This year there has been little rain, thus our crops are destroyed*" (R5-V3 F24)
- ✓ "*I wish our lives could go back to how it was before, living a quiet and healthy life, and stop fighting like this*" (R3-V3 M52)
- ✓ *"Hopefully our dreams can come true; that we receive sufficient water to drink and for irrigation so that our health can improve*" (R8-V1 M40)
- ✓ One respondent said SISTERNA provides 1000 liter water a time, this is not enough.
- ✓ "*I would like a better house, lighting, education and more political and economic support from the government*" (R2-V3 F31)
- ✓ "*Some households have electricity, but only enough for three light bulbs. It does not work for a refrigerator or even a radio*" (Capitàn Tucainty - 44).

Continuation of projects, such as 'Pro Habitat Villa Montes' - a housing project started to offer pollution affected families a house in a safe environment. Respondents hope that the government will continue with the project building houses for the affected community – so that they could move away from the highly contaminated area. "Pro Habitat Villa Montes" started but halfway the project was abandoned. Left are unfinished houses and broken promises.

Subcontractors: According to many respondents, much spilling and contamination are done by sub-contractors. "*The subcontractors contaminate most"* (R4-V2 M46). It might seem like Petrobras give out 'dirty' jobs to sub-contractors, so that their own hands will remain clean. When accidents happen the two actors are blaming each other and it is difficult to apportion blame. It is necessary - in front – to define who is to blame in such cases; otherwise no one will take responsibility for preventive measures.

Hire locals: In addition these sub-contractors are hired in other cities and not from the local communities nearby, this was mentioned by 4 of 7 respondents in Tucainty (4/7) and indication this is causing frustration as the basis of their own livelihood are degraded; "*Local people don't get jobs, they hire people from Santa Cruz, La Paz and Cochabamba"* (R2-V2 F65).

Cumandaroti: Because of decreasing dependency on natural resources, people are looking for work outside the safe structures of the community. But the need for employees is unstable; "*I find odd jobs now and then as a working woman (obrera). The companies sometimes give people jobs, but they need to have all their documents in order*" (R4-V3 F19).

Microfinance / Financial support: Many are looking for other ways to make a living. Some want to start up restaurants to meet the market demand of the many workers in the area, but they don't have resources or opportunities for loans. "*We want to start a store/ restaurant to maintain a living, because there are a lot of companies that pass through here*" (R4-V3 F19). This can be done with support from the government, gas companies, NGO's or international organizations.

Dam construction and Fish cultivation: One respondent from Tucainty expressed desire to construct a dam to cultivate fish, which once again show how the degradation and changes in the ecosystem are affecting Guaraní livelihood and needs.

Environmental consciousness and preservation has become more important, however there is still a long way to go. For example one respondent from Caigura mentioned a highly inefficient practice within the community; "*People burn maize instead of giving it to the animals – this should change*" he says (R1-V1 M63). The practice is both bad for the environment and a waste of perfectly good fodder. Some think in order to stop the process of degradation, there is need to designate the area as a park; "*We need to construct a park for conservation and reforest*" (R5-V1 M45).

[Indigenous girl standing in front of armed forces in Bolivia, Illustration Photo 7]

Chapter VII: Discussion and Final Conclusion

Current conflicts involving management and distribution of natural resources are often rooted in a fundamental unequal distribution of power (Robbins 2004). On a global scale, in an attempt to reach or maintain a modern way of living important resources such as water, food and energy are being degraded – resources important for human existence. An inequality in power on global, regional and national stage is causing not only unequal distribution of the goods and services that are available, but also an unequal distribution of the risks and hazards related industrial production. Vulnerable minorities and disadvantaged groups bear "disproportionate amount of negative health and environmental effects from pollution, often as a result of environmental racism" (Block and Whitehead 2009:7). Weakest in this struggle for resources we find the least formally educated, the least "modern" in terms of a western lifestyle, and the most dependent on the environment for a living. As a consequence of impoverishment and livelihood insecurity the world population is increasing especially among the poorest groups, basically increasing poverty. In a battle for survival and search for alternative ways to make a living an increase in migration

and conflicts has been documented. Ecological distribution conflicts keep increasing across the world (Brundtland 1987:17; Homer-Dixon 1991; Moore 2000 cited in Orta-Martinez and Finer 2010:216). This path of unsustainable development has clear unfavorable consequences; not only for ethnic reasons, but also for social stability, national security and ultimately; economic growth. This trend of unsustainable development and social instability has been documented throughout Latin America - a continent packed with ecological and cultural capital. Cross regional projects such as IIRSA have been initiated to extract the resource rich areas and lead the continent into a more prosperous future. Sawyer has argued the state's neoliberal reforms have 'backfired'; instead of creating economic and political stability they have merely compromised the state's credibility (2004 in Postero 2008:17). Economic development without safeguarding social or environmental capacity has caused large scale ecological and social debt (Lago et al 2010) leaving the most vulnerable groups in society deprived of human rights and a decent standard of living. The consequence is documented through increased social instability and conflict, partly triggered by increased social movements and forced migration (Heins 2011, Homer-Dixon 1991, Perreault 2008).

7.1 Undesirable Consequences

This thesis has sought out to demonstrate the undesirable impacts of policies and market conditions, especially from the point of view of marginal groups and vulnerable populations (Robins 2004:12). By a thorough understanding of a specific issue and it's social, cultural, political and economic context it is possible to reach conclusions about underlying causes and map the various factors involved. By using the DPSIR framework the most important *Drivers*, *Pressures*, *State*, *Impact* and *Responses* of the situation for Guaraní indigenous group have been identified, with main emphasis on *Impacts* and *Responses*. The Guaraní indigenous group has been chosen for this research because an astonishing 83% of total Bolivian gas reserves are located within Guaraní territory in the Bolivian Chaco (Perreault 2008:9). In addition gas extraction in this area has been ongoing for over a decade and it is therefore possible to identify changes over time. The Guaraní therefore serves as a good example of the undesirable consequences of unsustainable development in indigenous territories.

The Guaraní indigenous group has over the last 20 years been subject to high scale ecosystem degradation which are depriving the indigenous of essential ecosystem services (MA 2003 in

Martino and Zommers 2007:15). Identified as the *Impacts* (UNEP 2007:xxii) this is to a large degree affecting their livelihood, health, socio-cultural identity and wellbeing in negative ways. Their ability to make their case heard is minimal, often limited to the representation of the APG - an agent with little real political power. In *Response* (UNEP 2007:xxii) the local communities are to a larger degree than before initiating protests and blockages. A tendency of increased political organization and mobilization has been identified. This trend might correspond with a national empowerment of grassroot movements, which also led to the marches for TIPNIS in January and May this year. Increased inter-ethical quarrels and conflicts are arising such as the San Antonio protest between the Weenhayek indigenous group and the mestizos. According to Homer-Dixon, ecosystem degradation on agricultural land may cause large-scale migration and in turn "create ethnic conflicts as migratory groups clash with indigenous populations" (Homer Dixon 1991:86). In this case however indigenous groups are entering the habitat of mestizos due to forced migration. The Weenhayeks have been deprived of their basis for livelihood. Due to ecosystem degradation of the water and fish stock of the Pilcomayo River they need to search elsewhere for alternative ways to make a living –thus the indigenous group is forced into the mestizo territory looking for land to cultivate. The mestizos are on their side complaining as 'settlers' are coming trying to occupy land, threatening their livelihood. This confirms Homer-Dixons theory that ethnic clashes may alter the operation of a society's markets and thereby its economic activities (Homer Dixon 1991:86). Besides increasing conflict rates and demonstrations another *Response* (ibid.) to this situation is rural to urban - temporary and permanent; migration. Although consequences of migration was not the focus of this study, researchers such as Heins (2011:35) claims these trends may have further negative effects on the county's poverty rates, national security and thus also for the national economy. In the urban metropoles, without education or a social network their chances of prosperity are few, often ending up in suburban slums with minimum access daily necessities (Heins 2011). With little alternatives the road to extreme poverty is short and criminal activities are sometimes the only way to survive.

7.2 The three most pressing issues for the Guaraní today

The three most pressing issues for the Guaraní today are: i) *Contamination of biodiversity*: air, water and soil - as a result of industrial pollution from hydrocarbon production and related activities such as increased traffic, plus wastewater contamination from the mines upstream such as Potosi; ii) *Increasing temperatures*; less rain, decreased water sources and more frequent droughts, and finally iii) *Disappearing fish stock* in the Pilcomayo River due to contamination, drought and Project 'Pantalon'. The local communities are losing a foundation for livelihood at the same time as their health is rapidly decreasing. In addition, the Guaraní culture and sense of collectivism are suffering as their communities have been invaded by settlers and their need to interact with outsiders is increasing as their livelihood is being degraded. Despite a few exemptions of elders all respondent spoke Spanish, with only a hint of Guaraní 'dialect' when describing the natural environment or old traditions.

Because of declined fertility in soil and increased plagues and diseases on crops and animals, in order to safeguard their livelihood the indigenous need to use more pesticides, medicine, vaccinations, etc. In addition, the increasing rates of new diseases and poor access and quality to health care forces people to travel to the bigger cities in order to receive health care. This presupposes two things; i) access to transportation and ii) access to money. A woman from Caigura said; "*We have to buy medicines to cope with the plagues and diseases on the plants and animals ourselves. Then we have to go into the market in Villa Montes*" (R6-V1 F30). In Tucainty especially, the remoteness of the village makes mobility one of their greatest challenge to safeguard their livelihood. For various reasons, such as decreased harvest and decreasing stocks of animals, the indigenous of Tucainty have to go more often to Villa Montes to buy products at the market. This is difficult when access for transportation is non-existent or marginal at best. One woman who lived relatively close to the main road said: "*We hitchhike to town because we don't have vehicle for transportation. We walk down to the road and hope that somebody will drive past and give us a lift. The waiting hours can vary from 2 to 12 hours*" (R2-V2 F65). With increasing rates of diseases, the indigenous are experiencing decreased ability to work in a situation where they to a larger extent need to secure income. This is causing concern and high rates of insecurity. High livelihood insecurity and declined health may explain increased pressure on governmental financial support. As their alternatives grow smaller, they become less self-dependent and more reliable on external help and services. Ecosystem

degradation is causing high rates of livelihood instability, declining health and socio-cultural structures among the Guaraní settlements. Due to lack of local inclusion into policymaking they are close to unable to participate in politics concerning their area as mandatory by the ILO convention 169 and the Bolivian Law 1257.

Going through literature previous written on this topic, poor management of natural resource extraction is given a lion share of the blame for the difficult livelihood situation of the indigenous groups in the area. This is not incorrect, however during the course of fieldwork other important factors were detected that also to a large degree affect the situation for the indigenous - contributing to current increasing conflict rates and migration. While former research on the subject reveals a clear emphasis on human induced climate changes – mainly poor management of natural resources extraction – it tends to ignore natural changes in the biosphere such as increasing temperatures Also ignored are important political decisions such as the Pants Projects which has had a tremendous impact on essential natural resources in the area - contributing to the current situation for the Guaraní. In general there is scarcity of public accessible documentation of the rural areas, rural livelihoods, and the rural communities of Bolivia. The problem is not that there is no information on the subject, rather there is a problem of dissemination of knowledge. During fieldwork I was told there existed a lot of literature on the subject of my study in paper form in various NGO or municipal offices in Villa Montes. The problem however was that the storing system and categorization of literature was so poor that no one was able locates the documents. The problem of *grey*, unpublished literature is widespread, causing a dissemination problem and a scarcity of a research results.

Much of the English literature found was based on second hand sources. This is problematic as it may create a false impression of the trends in the area. As political decisions often are taken from distant urban metropoles (Perreault 2008; Bebbington and Bebbington 2010) this may contribute to poor decision-making. On-ground, in-debt research on rural issues is needed and highly recommended. This is not only an efficient way of letting vulnerable voices of society be heard; it will also educate people, authorities and the global community on local issues- which may in turn contribute to increased local inclusion in decision-making.

7.3 The DPSIR framework in the context of the Guaraní

In order to simplify this complex chain of cause and effects influencing the Guaraní, one can use the DPSIR framework (UNDP 2007:xxi). Although main focus is concentrated around 'State', 'Impacts' and 'Responses', here also central elements of the drivers and pressures has been included.

DPSIR	The DPSIR Framework (UNEP 2007:xxii)	The case of the Guaraní Of the Bolivian Chaco
Drivers; Material, Human and Social Capital	**Human development:** • Demographics • Economic processes (consumption, production, markets and trade) • Scientific and technological innovation • Distribution pattern processes (inter- and intragenerational) • Cultural, social, political and institutional (including production and service sectors) processes	**Human Development:** • Poverty - lack of resources • **Weak socio-political institutional structures** • Unequal distribution of power, resources and risks • Inadequate local participation in policymaking. • **Lack of implementation of legal framework** • Historical trends of ethnical racism • **Market pressure:** National and international demand for energy • **Political pressure** on industrialization from national, regional and international stakeholders • Ethnic conflicts (UNEP 2007- *with own modifications)* • Urban to rural migration (UNEP 2007-*with own modifications)*
Pressures; Human interventions and Natural Processes	**Human interventions in the environment:** • Land use • Resource extraction • External inputs (fertilizers, chemicals, irrigation) • Emissions (pollutants and waste) • Modification and movement of organisms **Natural processes:** • Solar radiation • Volcanoes • Earthquakes	**Human interventions in the environment:** • **Gas extraction:** Transformation of agricultural land to industrial production**.** • Use of chemicals, fertilizers, persticides • **Inadequate investment in technology and measures to prevent pollution** • Inadequate waste management system • Emissions of gas and chemicals • **Proyecto "Pantalon"** **Natural processes:** • **Increasing temperatures** • Droughts
State; Natural Capital: Atmosphere, Land, Water and Biodiversity	**Environmental impacts and change:** • Climate change and depletion of the stratospheric ozone layer • Biodiversity change • Pollution, degradation and/or depletion of air, water, minerals and land	**Environmental impacts and change:** • Ecosystem degradation • Pollution of air, water and soil • Increasing temperatures and dryer climate and environment

Impacts	**Environmental factors determining human well-being** • Ecological services such as provisioning services (consumptive use), cultural services (nonconsumptive use), regulating services and supporting services (indirect use) • Non-ecosystem natural resources ie hydrocarbons, minerals and renewable energy • Stress, inter alia diseases, pests, radiation and hazards **Change in human well-being** broadly defined as human freedoms of choice and actions, to achieve, inter alia: • Security • Basic material needs • Good health • Good social relations (which may result in human development or poverty, inequity and human vulnerability)	**Environmental factor determining human well-being** • Degradation of the ecosystem and the ecosystem services; including provisioning services (air, water, forest, wildlife, fishstock), cultural services (identity and connection to the environment), regulating services (natural protection of drought, storms, etc.) and supporting services (balancing the ecosystem). • Diseases and plagues on animals, plants and agriculture • Less animals due to higher degree of stress, pollution and noise • Drying up of water sources and biodiversity **Change in Human Well-Being** • Deprivation of basis for livelihood • Decreased health, more diseases • Decreased security • Increased stress • Weaker socio-cultural structures and social relations • Deprivation of identity and sense of belonging • Decreased well-being
Responses; to environmental challenges	**Responses** The formal and informal adaptation to, and mitigation of, environmental change (including restoration) by altering human activity and development patterns within and between the D, P and I boxes through inter alia: science and technology, policy, law and institutions.	**Responses** • Higher socio-political organization and mobilization • Indigenous searching for alternative livelihoods • Rural to urban migration / Seasonal migration • Higher rates of conflicts related to social movements, migration and urbanization

7.4 Drivers and Pressures

The most pressing issues for the Guaraní are ecosystem degradation and contamination of their traditional territory. In order to change this trend there is need to look at what are the main factors leading to this situation, hence one again has to look at the 'Drivers' and 'Pressures'. This is approaching environmental degradation as a circular phenomenon. Looking at the central elements that are leading to this situation one realizes that these are interlinked and mutually reinforcing elements. The combination of unequal access to power and conflicting interests are in addition to weak socio-political structures causing inadequate implementation of the legal framework and inadequate local participation in decision-making processes. The lack of local participation in policymaking is leading to ecosystem degradation of indigenous territories as

"struggles over national gas was defined and enacted by people and places distant from the actual centers of production" (Perreault 2008:15; Bebbington and Bebbington 2010:271). The inability of including local stakeholders in policymaking is evidence of inadequate implementation of legal frameworks as are mandatory by the national legal framework and international agreements. It also reflects unequal power structures in a political context where rhetoric's on indigenous rights are strongly present, but where the gap between discourse and action remains large and a challenge in the long run when it comes to continued political stability.

The degradation of water sources was identified as one of the biggest problems for the Guaraní, causing complex ripple-effects. Water is the second most important ecosystem service besides air that is essential for human existence. Today 900 million people today are lacking potable water (Corcoran et al. 2010:9), and the issue keeps on increasing. Some say it is water shortage in itself that leads to conflict (Clarke and King 2006). Others such as Theisen (2008) emphasize the importance of looking at underlying drivers such as dysfunctional institutions, keeping focus on state actors in the process of management and distribution of resources. In other words, when searching for a solution to environmental problems one needs to look at the *Drivers* and not only the *Pressures* (UNEP 2007:xxi). This is also the case for the Guaraní, where the degradation of the Pilcomayo River must not only be seen in connection to poor management of natural resource extraction, but also the underlying socio-political structures that allows this kind of behavior. Goni's political decentralization in the mid 90's must take some of the blame for the fragmented political environment we see today. The combination of a centralized political and monetary power in addition to lack of communication and resources to the municipalities hinders adequate implementation of the Law of the Public Participation, set out to distribute power over development planning, infrastructure and budget decisions(Perreault 2008:6; Postero 2007:5/123). Today there are not enough resources or real power in the municipalities for this to function.

In order to fully understanding these structures there is also need to not only look at the internal national processes, but also include external factors such as regional/global politics and market pressures. Today for example Bolivia is experiencing political pressure from Brazil, which was the biggest advocate for promoting the construction of a highway through TIPNIS national

reserve earlier this year. The incentive was Brazils own plans to transport oil through Bolivia and Chile to the west-coast for export. It should be recognized Bolivia's limited resources and therefore modest influence and power over regional political agreements. It is also evident through literature review that Bolivia through history has experienced significant political pressure from the global market, especially the World Bank (Perreault 2008). Blame for current practices should be shared between a weak Bolivian political institution, poor CSR practice among hydrocarbon companies and finally international lending institutions such as the World Bank for financing such projects without taking responsibility for the consequences.

As a result of weak political structures it is possible for the powerful political elite to manipulate decision-making. The Bolivian government is headlined as indigenous friendly. It is asserted however that they are merely paying lip service to the interest of indigenous people (Almaraz et al. 2012), and that "*current political practice shows that democracy, as currently implemented, has in no way achieved the indigenous desire for actual inclusion*" (Heins 2011:22). Social exclusion, combined with livelihood insecurity and increasing rates of frustration are following Homer-Dixon (1991 and 1994) and Heins (2011) causing increasing conflict and inland rural to urban migration – especially among the indigenous groups. Because these trends have existed for generations (Perreault 2008) they have been absorbed as an actuality by all layers of society, and are therefore hard to alter. The most efficient way of change is through a top-down approach, started by the elite and then pervading the rest of the society through a trickle-down effect. According to Giovani Altuzarra from the Bolivian ministry of the Environment and Water; "*For too long the wealthy just used laws to their own advantage; so as far as poor is concerned, why should they obey them? As well, we just have never had real enforcement capacity, so impunity for crimes large and small is widespread*" (Farthing 2009:27).

My observation through fieldwork is that few of my respondents – whether it was indigenous inhabitants, NGO officials or even government officials - could present a complete overview of the laws or regulations regarding natural resource preservation or indigenous rights. This may by an indication that the legislative framework is currently subordinate to other informal rules and regulations, controlled by the interest of powerful agents. Consequently in practice it has little value knowing the jurisdiction by heart as it often does not apply. The gap between rules and practice is evident in policymaking, where important stakeholders are ignored in matters that

concern them. Due to the unequal balance of power and synergy between state, private company and local community the Guaraní has no real say or influence when it comes to political decisions. If their interests are being overridden there is little they can do about it without external representation. There are many organizations which claim to represent the indigenous groups in the Grand Chaco, for example the Confederation of Indigenous Peoples of Bolivia (CIDOB) or the Center for Regional Studies in Tarija (CERDET). During my fieldwork however I only heard the indigenous mentioning APG as their representative. Not once was any of the other organizations mentioned, which again may indicate that these development organizations lack contact with the rural basis, being organized in the same centralized way as the national political structure. Such urban structures leave little room for the Guaraní to negotiate or influence policymaking. Among the few options that remain are to protest in order to be heard or to migrate, both actions create increasing rates of social instability and conflict.

7.3 Final remarks

The case study of the Guaraní is a good example demonstrating the undesirable impacts of "policies and market conditions, especially from the point of view of marginal groups and vulnerable populations" (Robbins 2004:12). This has been done by identifying the material conditions and the imaginary status of the environment from the perspectives of the Guaraní. Based on a literature review, by thoroughly mapping the 'State' and 'Impacts' on the Guaraní indigenous group, one gets a more holistic picture of the 'Drivers' and 'Pressures' leading to the specific situation. Also one can in a better way understand the reasons behind 'Responses' and most importantly - identifying solutions (UNEP 2007). Understanding how power and asymmetrical power relations may influence policymaking provides opportunities for addressing issues of vulnerability of both people and the environment, and in addition "reducing human vulnerability and enhance human well-being (UNEP 2007:xxi).

The political and economic effects of increasing political mobilization and migration among indigenous groups in Bolivia should be taken seriously. Due to unique high proportions of indigenous people within the population, the effects could ultimately be devastating for national security. Being a country highly dependent on foreign investment and with an increasing tourism industry, ecosystem degradation and national instability is not a favorable course. According to Homer-Dixon environmental degradation will increase the level of stress within national and

international security, creating the likelihood of many different kinds of conflicts and impede the development if cooperative solutions are not found (Homer-Dixon 1991:78). If current socio-political trends in Bolivia do not change, ethnic clashes may negatively change the national market base and also negatively change the national economy. There is urgent need to make plans that make sense not only in short terms but also in the long term.

Appendix 1: Pictures from fieldwork excursion near Caigura village showing contamination of air, soil and water.

1) 

2) 

3) 

4) 

5) 

6) 

7) 

8) 

9) 

10) 

Description:

1) Gas field with continuous gas leak.

2) Contamination of soil.

3, 4 & 5) Station for containing contamination from water, lacking proper fencing and conservation of pollution

6) Gas field in production, without adequate wastewater conservation.

7) Gas leaking up through soil, visible in a small stream.

8) Abandoned gas field still leaking gas

9) Natural bubble bath; gas leaking up in surrounding waters.

10) Caigura Dam, supposedly 70-80% contaminated

Appendix 2: The consequences of 'Proyecto Pantalon'.

1) 

2) 

3) 

4) 

Description:

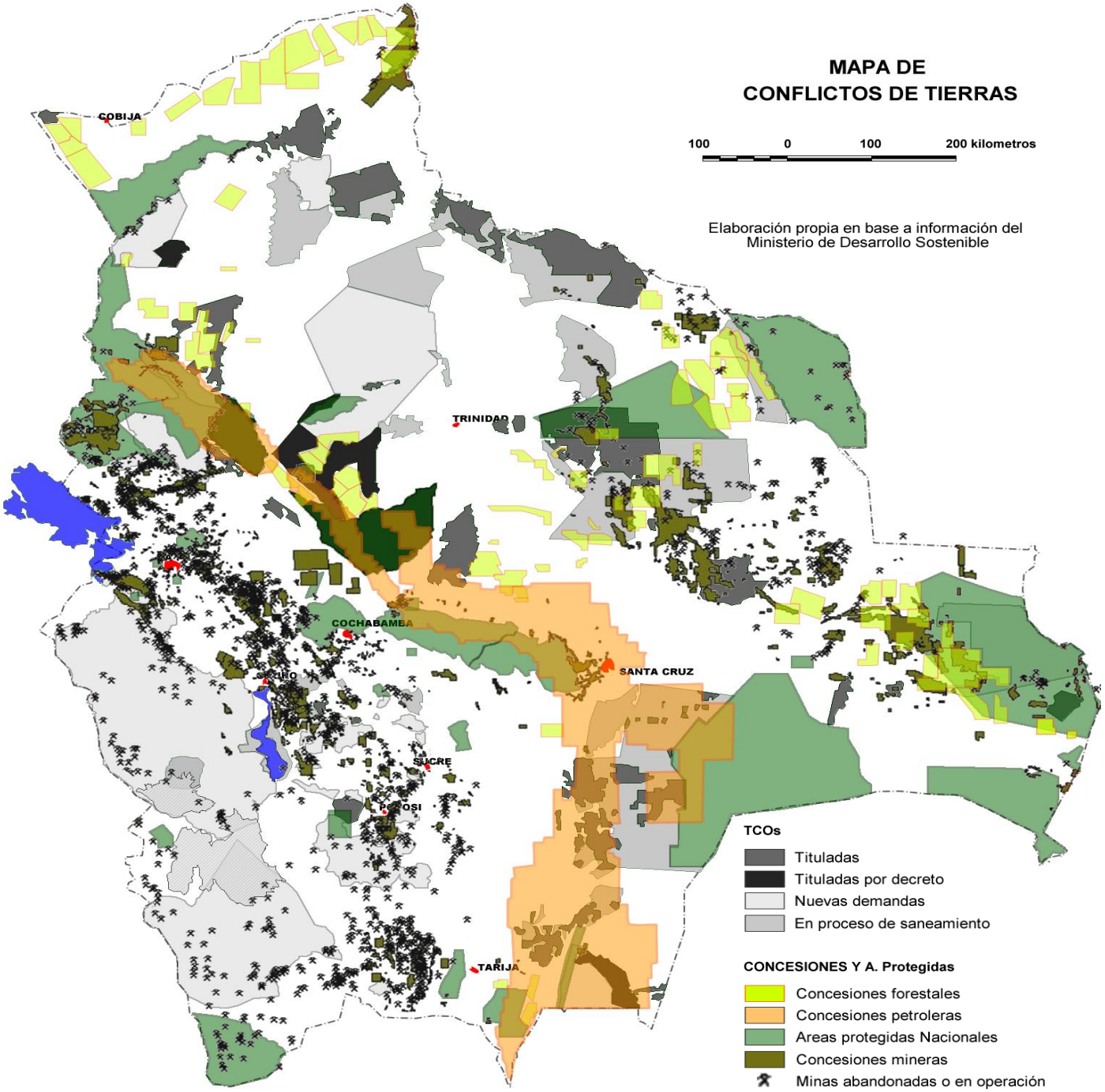
1) The partition of the Pilcomayo River did not turn out as planned. Here is a picture showing how almost all of the water now are running into Paraguay, while less than a percentage runs into Argentina. On the left it is possible to spot the dried out river bed where the Pilcomayo river used to flow. Source: http://www.ultimahora.com/notas/360969-Pilcomayo--Argentina-abre-canal-sin-avisar-y-perjudicar-a-al-Chaco

2) Today almost no water runs into Argentina. Source: http://www.lidema.org.bo/portal/index.php?option=com_content&view=article&id=321:informe-recorrido-por-el-pilcomayo-en-formosa-org-por-la-organizacion-de-las-capitanias-weenhayek&catid=48:noticias

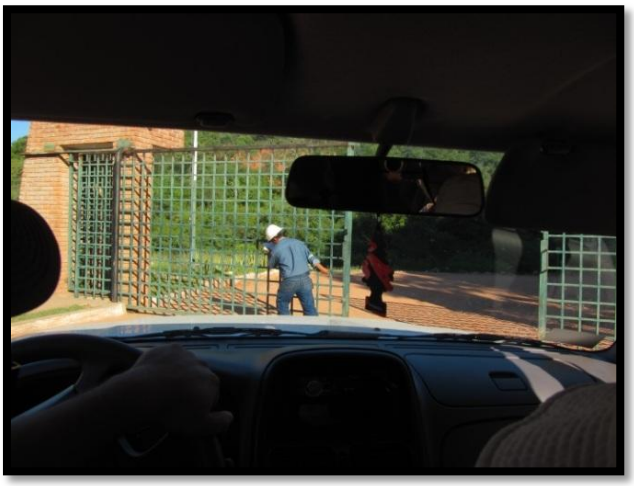
3) Fish that has been stranded and died due to lacking water levels. Source: http://rome.wordpress.com/2010/11/23/situacion-del-rio-pilcomayo-urgente/

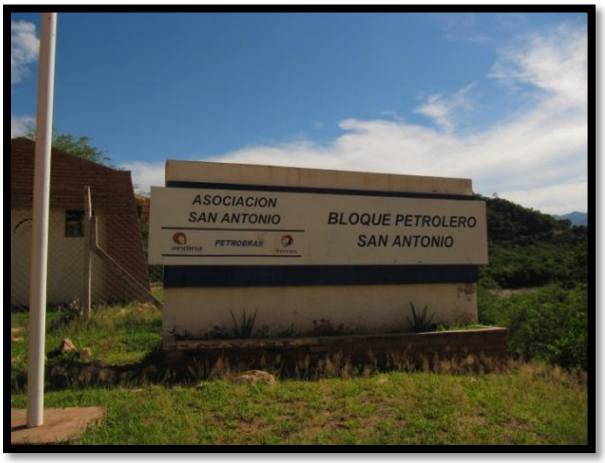
4) Fish that has been stranded and died due to lacking water levels. Source: http://rome.wordpress.com/2010/11/23/situacion-del-rio-pilcomayo-urgente/

Appendix 3: Map over land conflicts 2008. Retrieved from; Pablo Regalsky, CENDA.



Appendix 5: Restricted access into the Guaraní communities: The San Antonio Gate and Narrow dirt roads.





Appendix 6: The San Antonio Protest, a conflict between indigenous Weenhayek and mestizos.

Dictionary:

Indìgena: A term used to refer to Amerindian groups in the Amazonian and Chaco regions of the eastern lowlands, and not to Quechua or Aymara populations in the western Andean highlands. Often associated with ethnic cohesion and territorial claims (Perreault 2008:3)

Capitàn: Guaraní indigenous leader. For more thorough explanation, see page

Campesino: A peasant farmer (Oxford Dictionary 2012c), a person that works on the land. Primarily non-indigenous, though the lines between indigenous farmers and campesinos have become blurry.

Cocaleros: Cocoa growers (Spanish Dictionary 2012) A term which has become connected to cocoa leaf growers in Peru and Bolivia. Growing cocoa has for over 800 years been a highly important part of the indigenous culture and identity in the region. In recent years however there has been a clash between the *cocaleros* and the U.S. "war on drugs", to some extent criminalizing the practice and the social group.

Mestizo: A person of mixed race, particularly of Indian and 'white' parentage. The translation of "de sangre mestizo" means "of mixed blood" (Oxford Dictionary 2012d).

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