

**Czech University of Life Sciences Prague**

**Faculty of Economics and Management**

**Department of Economics**



**Bachelor Thesis**

**Sustainable Development in Bolivia:  
How the EIAs affect the achievement of sustainability**

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## BACHELOR THESIS ASSIGNMENT

Carlos Enrique Corminola Gutierrez

Economics Policy and Administration  
Business Administration

Thesis title

**Sustainable Development in Bolivia: How the EIAs affect the achievement of sustainability**

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### Objectives of thesis

The main aim of this thesis is to see and prove the absence of minimum criterions to guide the socioeconomic studies in the Environmental Impact Assessments "EIA" (second category – specific analytical) and that this absence generates differences in the evaluation and prediction of quantitative and qualitative environmental impacts, delaying the process of Sustainable Development in Bolivia.

Through this investigation work we will determine the minimum criteria that an "EAI" (specific analytical) contains and what it should contain at the time of conducting the socioeconomic study. In order to establish standardization parameters that are based on the preservation, conservation, improvement and restoration of the socioeconomic environment.

### Methodology

For the methodology of the research, it is necessary to accurately analyse the data given by the Government of the Plurinational State of Bolivia, displayed from each individual sector, region or state for the Ministry of Sustainable Development and Environment that later became the Ministry of Plan Development and more important for this work the Ministry of Environment and Water.

- During the investigation the types of exploratory research in a first instance and descriptive in a second instance were selected. These ones due to the object of the investigation; It is to examine a problem, such as identifying the socioeconomic measures used in the EIA's of Bolivia, in order to define standardized parameters. The descriptive type, because, this will allow describing the analysis variables, analyzing each of the specific parts of the problem and then explain their behavior and be able to reach concrete conclusions.

- This research will also use the non-experimental transectional method that is carried out without deliberately manipulating variables. Which is when no situation is constructed, but existing situations are observed, not intentionally provoked by the researcher.

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## Keywords

Sustainable development, Economy, Bolivia, Indicators, South America, Development, Environmental economics, Sustainability, Analysis

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## Recommended information sources

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## **Declaration**

I declare that I have worked on my bachelor thesis titled "*Sustainable Development in Bolivia: How the EIAs affect the achievement of sustainability*" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any other person.

In Prague on 22nd of March of 2020

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First and for most, I would like to thank God for his guidance not just through the process of this investigation, or my studies but his presence on my life in general specially on those dark moments in the last two years where my health and life were in danger. And the opportunity to develop this thesis and keep fighting.

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# **Sustainable Development in Bolivia: How EIAs affect the achievement of sustainability**

## **Abstract**

The aim of the bachelor thesis is to analyse what are the methodological criteria for the socioeconomic studies that are involved with the EIAs development process in Bolivia, for which, unfortunately, there are no standardized parameters generating differences in the assessment and prediction of qualitative and quantitative environmental and economic impacts for the populations where the projects, activities or public works are being done.

An analysis and study of the Regulations to the Environmental Law N°1333 “Environmental Prevention and Control” was done because the EIAs are framed by it and should meet the requirements of this legal norm to be approved.

After that, there is the analysis and exposition of a sample of the EIAs (second category – specific analytical), the results of which are detailed in the quantitative and qualitative study of the socioeconomic aspects, the identified socioeconomic structure, a socioeconomic diagnosis, and a prediction and evaluation of socioeconomic impacts that were identified.

One of the main conclusions reached is that when reviewing the EIAs, it is evident that there are no minimum parameters or criteria that a socioeconomic study should contain. In addition, some research recommendations and proposals regarding the basic guidelines are formulated.

**Keywords:** Sustainable development, economy, Bolivia, indicators, South America, development, environmental economics, sustainability, analysis.

# Udržitelný rozvoj v Bolívii: Jak EIA ovlivňují dosažení udržitelnosti

## Abstrakt

Cílem bakalářské práce je analýza metodologických kritérií pro socioekonomické studie v souvislosti s procesem EIA v Bolívii, pro něž bohužel neexistují standardizované parametry, které by generovaly rozdíly v hodnocení a predikci kvalitativních a kvantitativních environmentálních a ekonomických dopadů na obyvatelstvo v souvislosti s prováděnými projekty, činnostmi nebo veřejnými pracemi.

Součástí práce je analýza Opatření k Zákonu o životním prostředí č. 1333, Prevence a kontrola životního prostředí, protože posuzování vlivů na životní prostředí je koncipováno v téže směrnici a mělo by splňovat požadavky této právní normy, která má být schválena.

Další součástí práce je analýza příkladu části EIA (druhá kategorie - specifická analytika), jejíž výsledky jsou podrobně popsány v kvantitativní a kvalitativní studii, , socioekonomických aspektů, identifikované socioekonomické struktury, socioekonomická diagnóza a predikce a hodnocen identifikovaných socioekonomických dopadů.

Jedním z hlavních závěrů práce je konstatování, že z provedené analýzy EIA je zřejmé, že neexistují žádné minimální parametry nebo kritéria, která by měla socioekonomická studie obsahovat. Dále jsou definována některá doporučení a návrhy dalšího výzkumu.

**Klíčová slova:** Udržitelný rozvoj, ekonomika, Bolívie, ukazatelé, Jižní Amerika, rozvoj, enviromentální ekonomie, udržitelnost, analýza.



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## List of abbreviations

<b>EIA</b>	Environmental Impact Assessment
<b>GDP</b>	Gross Domestic Product
<b>Li</b>	Lithium
<b>Fe</b>	Iron
<b>USD</b>	United States Dollar
<b>OTB</b>	Base Organization
<b>DEI</b>	Declaration of Environmental Impact
<b>EAS</b>	Environmental Adequacy Statement
<b>EC</b>	Environmental Card
<b>EM</b>	Environmental Manifesto
<b>HDI</b>	Human Development Index
<b>TV</b>	Television
<b>RPCA</b>	Regulation of Environmental Prevention and Control
<b>INE</b>	Instituto Nacional de Estadística (Bolivian National Statistics Institute)
<b>UDAPE</b>	Unidad de análisis de Políticas Públicas y Económicas (Public and Economic Policy Analysis Unit)
<b>POA</b>	Plan Operativo Anual (Annual Operative Plan)
<b>PDM</b>	Product Data Management

## 1. Introduction

The following investigation analyses and determines which are the methodological criteria, orientation guide methods and its terms of reference for developing the environmental impact assessments in Bolivia (EIA), more specifically for the socioeconomic studies, for which ones actually there is not standardize parameters, which create differences on the evaluation and prediction of qualitative and quantitative environmental impacts of any activity, process or project.

Environmental Impacts are given within the Latin-American community where also can be found one of the biggest world problems, which is to cover the basic needs of society, and Bolivia is not the exception of these problems.

Despite the fact that there is a large number of Laws and Regulations in pro of a society where sustainable development goes on hand with the lifestyle of the population, Bolivia has yet to find it this way, moreover, even if there are all of these forms and government endorsing that the country is following the international standards, reality is quite different, and sustainability is not a main character on this game.

This research was developed to try to understand some of the sources of why even though the indicators and statements of the government say that Bolivia is a sustainable country, when clearly this is not the case and as an example, the population inside does not even comprehend what being sustainable means, which is a current problem in Bolivia.

A problem that for some aspects probably starts with the correct elaboration and evaluation of EIAs all around the country, which are a combined responsibility of the private sector and the government; however, the present investigation will lead us know if this responsibility is considered with the degree it should be taken, and if both parts if any, have their best interest on following what they preach in the needs of Bolivia.

## 2. General Approach of the Study

### 2.1. Background or Antecedents

It can be seen that in the world EIAs have been developed as a response to the concerns of all type of financial investors, international organizations and due to legal requirements, that have occurred in some countries.

The Environmental Impact Assessments plays a central role, since it allows documenting the entire analysis of the environmental impacts of a given action. This includes the description of the venture, the different alternatives for its implementation, the baseline, mitigation and, or compensation measures, and the monitoring and control programs.

Therefore, it is the primary source of information to pronounce about the expected environmental impacts of a proposed action.

It turns out to be important in our research work the EIAs because they are predictive and supported by scientific information; The selection of the most significant aspects to determine environmental impacts can be done considering the fragility (or resistance to impacts) and quality (or environmental assessment) of the affected territory. In such a way that the EIAs will be studied; since it is a unique and innovative process whose operability and validity as an instrument for the protection and defence of the environment is recommended by various international organizations. Moreover, it is also backed by the experience accumulated in developed countries, which have incorporated it into their legal systems for years.

It is necessary to carry out awareness regarding the need to incorporate preventive environmental analyses, because they allow to reduce environmental costs, externalities, time, money, human resources and thus reduce the scope of potential conflicts in situations that are not sustainable. Although in Bolivia there is an Environmental Law and its Regulations (Ley del Medio Ambiente N° 1333), we can see that there are no methodological criteria in the socioeconomic area so that we can “reduce financial and environmental costs”, in this sense it is intended to observe the content of the Environmental Impact Assessments due to the fact that reality shows us that there are still great challenges and spaces for improvement.

## **2.2. Justification**

One of the reasons why this investigation was created is because the EIAs are an instrument of preventive character that incorporate the environmental dimension into new human actions and modifications to the projects and existing activities, since it is an environmental requirement so that different types of human actions can affect nature or not. And should make sustainable development a closer reality.

The Environmental Impact Assessment process turns out to be a preventive management instrument, aimed at identifying, correcting and ensuring that the resources and environmental elements that are likely to be affected are described and evaluated considering all the measures aimed at their protection, in accordance with formal requirements and see in advance the negative environmental impacts derived from human actions, and optimize those of a positive nature not only for the environment but also in the socioeconomic sphere.

EIAs seek to help those responsible for the projects to define the fundamental aspects that must be incorporated in the respective environmental impact studies. The Project analyses the particularities of the action in all its phases (design, construction, operation and abandonment) and proposes corrective measures to eliminate, minimize or compensate for alterations, which involve damage to the environment, and are not sustainable.

The environmental dimension must be analysed, in a broad sense, both in its natural aspects (such as soil, flora, fauna) and pollution (air, water, soil, waste), landscape value, alteration of human customs and impacts about people's health. That is, all those alterations that affect the quality of life.

## **2.3. Investigation Area**

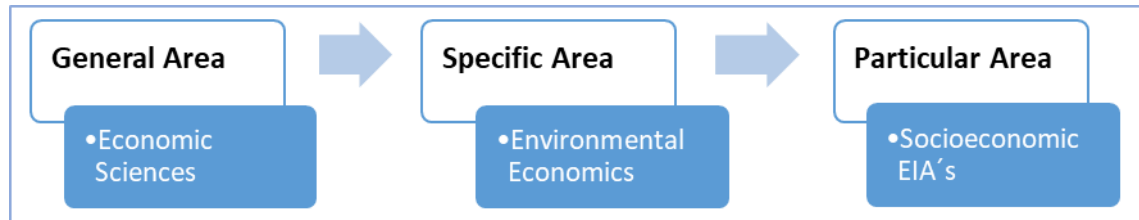
The research will consider Sustainable Development through the Environmental Economics as it covers the study of environmental problems using the vision and tools of economy, this being an important area to apply the criteria in EIAs.

### **2.3.1. Thematic Delimitation**

As a general delimitation, the Economic Science will be taken, from which the Environmental Economics is a branch, which will provide the necessary scientific and theoretical basis for: the study of the Environmental Impact

Assessments, specifically the socioeconomic component will be the particular area of the study, as expressed in the figure. N° 1

(1) Figure N° 1 "Thematic Delimitation"



*Personal elaboration*

### 2.3.2. Time Delimitation

For this research the time is delimited in the investigation, based on the milestone of the importance of Environment, which in the case of Bolivia is the approval of the Regulation of Environmental Prevention and Control approved in December 1995, in addition to considering that to date the Ministry of Environment and Water is the entity responsible for receiving the EIA entrusted by law.

## 2.4. Approach of the Problem

The deep economic and social changes of the two decades after the millennium have had important repercussions on the natural resources of Bolivia. The restructuring of the State in search of simpler and more agile forms of government, economic growth, liberalization and globalization of the economy, the privatization of state enterprises, and then the nationalization of the same state enterprises back, are currently the main political and economic issues. These reforms laid the groundwork for an index of progress that seemed impossible during the "lost decade" of the 1990s. However, the level of poverty is also having a huge repercussion on the health and environment of the country.

Currently, Bolivia's main problem is to reach a political consensus that maintains stability and economic growth, while addressing the growing social and environmental problems.

The Environment Law and its Regulations, in Bolivia are located within the State Policy, contemplating administrative infractions and their procedures. In addition, the civil action that is represented by any person, is legally qualified to defend the interests

of the community. Likewise, the figure of Environmental Crime is considered for actions that deteriorate, degrade or destroy the environment according to the seriousness of the event.

After the enactment of the Environmental Law (Law N° 1333), three years had to wait for its general regulation. This regulation consists of a legal body of six regulations: The General Regulation of Environmental Management, Regulation of Prevention and Environmental Control, Regulation on the Subject of Hydraulic Pollution, Regulation on Matter of Atmospheric Pollution, Regulation of Solid Waste and the Regulation for Activities with Dangerous Substances. Related regulations in force are: Forestry Law and its regulations, Law of the National Agrarian Reform Service, General Regulation of Protected Areas, Environmental Regulation for the Hydrocarbons Sector and Environmental Regulation for Mining Activities. This legal body is composed of rules that aim to attack pollution problems that have the biggest impact on environment.

The Regulation of Prevention and Environmental Control orders the Environmental Law, in relation to the Environmental Impact Assessments (EIAs) which aims to identify, predict, the impacts that a project or activity may cause on the environment and on the population, in order to establish the necessary measures to avoid or mitigate those that were negative and encourage those that are positive. There are four categories of these assessments according to the law, and two of them clearly state that the evaluation should be: integral analytical or specific analytical. The Law explains that all projects, public or private activities prior to their investment phase, must necessarily have the identification with the category of EIAs that must be carried out in accordance to the levels that are specified.

However, even if the problem is known, and the law establishes and explains what the procedures of each category are. We need to approach the following questions in order to allow us to identify the socioeconomic problems of the EIA:

What are the socioeconomic and environmental criteria to differentiate the need and the depth of the evaluation required to execute an EIA in Bolivia?

What are the minimum requirements in the socioeconomic factor that an EIA should have in Bolivia?



The current socioeconomic studies in each case have been developed under which type of guidelines, methodological procedures, indicative manuals or standardized reference terms?

## **2.5. Investigation of the Problem**

After investigating furthermore on the different EIA cases the following research problem is identified: Do current analytical EIA require minimum standards to guide the socioeconomic component, therefore, avoiding differences in the assessment and prediction of quantitative and qualitative environmental impacts?

## **2.6. Hypothesis**

The absence of minimum criterions to guide the socioeconomic studies in the Environmental Impact Assessments “EIA” (second category – specific analytical) generates differences in the evaluation and prediction of quantitative and qualitative environmental impacts. Delaying the process of Sustainable Development in Bolivia.

## **2.7. Objectives of the Investigation**

### **2.7.1. General Objective**

Determine the minimum criteria that an Environmental Impact Assessment “EAI” (specific analytical) must contain at the time of conducting the socioeconomic study. In order to establish standardization parameters that are based on the preservation, conservation, improvement and restoration of the socioeconomic environment.

### **2.7.2. Specific Objectives**

- Identify the EIAs that have been submitted to the competent authority (Ministry of Environment and Water) to study and analyse them.
- Analyse the evaluation and prediction of quantitative and qualitative socio-environmental impacts considering the aspects involved in a socioeconomic study:
  - a) The socioeconomic structure used in the diagnoses of EIAs.
  - b) Use of techniques in the evaluation of EIAs.
  - c) The prediction and evaluation of the socioeconomic impacts in the EIAs

- Suggest recommendations for the creation of a methodological working instrument for the quantitative and qualitative assessments of the impacts involved in a project or activity, on the socioeconomic and environmental aspects of EIAs to achieve a more real version of sustainable development.

## 2.8. Methodology

For the methodology of the investigation the types of exploratory research in a first instance and descriptive in a second instance were selected. These ones due to the object of the investigation; It is to examine a problem, such as identifying the socioeconomic criteria used in the EIAs of Bolivia, in order to define standardized parameters.

The descriptive type, because, this will allow describing the analysis variables, analysing each of the specific parts of the problem and then explain their behaviour and be able to reach concrete conclusions. (Hernández Sampieri, R.; Fernández Collado, C.; Baptista Lucio, P., 2004)

This research will also use the non-experimental transectional method that is carried out without deliberately manipulating variables. Which is when no situation is constructed, but existing situations are observed, not intentionally provoked by the researcher. In non-experimental research, independent variables have already occurred and cannot be manipulated, the researcher has no direct control over said variables, he cannot influence them because they have already happened, as well as their effects.

### 2.8.1. Description of the units of Study

The units of study for this research are EIAs that have been presented by different consulting companies or organizations to the competent authority.

- **Population:** For the present investigation the concept of Universe as of Population will be taken. Hence, we can indicate that it refers to a set of all cases that match a series of specifications. Under this concept we can define that the universe or population of this research is comprised of all those EIAs that have been submitted and approved by the Ministry of Environment and Water between the years 2007 to 2018. (Hlavsa, T., 2017)

- **Selection criteria:** To determine the sample, the Stratified Probabilistic Sampling method will be used where all the elements of the sample or universe have the same possibility of being selected, the sample error can be calculated under a normal curve.
- **Research sample:** The research sample will be determined by the same formula that is used for finite populations. which is:

( 2) Equation N° 1 “Formula for Sample Size”

$$n = \frac{Z^2 \times P \times \alpha \times N}{Z^2 \times P \times \alpha + (N - 1) \times E^2}$$

Where:

n = Sample size

Z = Standard normal value associated with the security level of the estimate.

P = Proportion of Environmental Impact Assessment Studies that do not meet the minimum criteria

$\alpha$  = Probability of failure or rejection

E = Estimation error limit

N = Universe or Population

(Spiegel, M.; Stephens, L., 2004)

Data:

Instead of Z = 90% = 0.90, it is correctly expressed:

1 -  $\alpha$  = 0.9 Security level or confidence of the estimate

$\alpha$  = 0.10

So:

$$Z = 1 - \frac{\alpha}{2} = 1 - \frac{0.1}{2} = 0.95$$

Z = 0,95 = 1,645 (tables value)

P = 90% = 0.9 Assumption that means that 90% do not have minimum criteria

N = 270

E = 10% = 0.1 maximum margin of error allowed

Replacing the data in the formula you get:

$$n = \frac{(2.70) \times 0.9 \times 0.1 \times 270}{(2.7) \times (0.9) \times (0.1) + (269) \times (0.01)}$$

$$n = 22,37$$

The selection of the sample is given for 22 documents that will be randomly selected among those EIAs of second category, which have been approved during the years (2007-2018) (See Appendix 1)

## 2.8.2. Sources and Techniques for the data recollection

- **Primary sources.**

In order to ensure that the information collected is valid, there is going to be two techniques used for gathering information:

**a) Interviews:**

The interviews realized have a semi-structured format with open questions so that they enable dialogue with the interviewees. The interviews will be aimed at executives and official of the Ministry of Environment and Water and expert enterprises consultants responsible for the socioeconomic component of the EIAs at their companies. This technique is intended to obtain clear and valid information in order to achieve the objectives of the investigation, as well as obtaining information to be able to reach proper conclusions and have a broad basis for preparing a proposal, considering that in Bolivia it's been proven that not always what is stated in the documents is the reality. The interview consists of a conversation person to person, in which one is the interviewee and another (the author) is the interviewer, these people dialogue according to certain schemes or guidelines, accorded by their entities limits, about the issue determined, having a professional purpose.

**b) Structured observation:**

It consists of the systematic and valid record of the behaviour and or conduct that the respondents or interviewees express. It can be used as an instrument of measurement in very different circumstances. In the

case of this research will proceed to verify the data and answers given for a thorough review of the different EIAs that have been submitted and approved by the Ministry of Environment and Water of Bolivia.

- **Secondary Sources**

This technique refers to the bibliographic documentation that provide information to develop the investigation, as well as company reports, laws, books, projects, online resources, etc.

### 3. Theoretical Framework

#### 3.1. Conceptual Framework of Sustainable Development

The research will be developed under the approach of Sustainable Development since nowadays the concept of environment is linked to Sustainable Development; this relationship allows us to understand environmental problems and their link to development and how it becomes sustainable, which must guarantee an adequate quality of life for present and future generations. This conception was practically enshrined in the Conference of the United Nations on “*Environment and Development*” in Rio de Janeiro, Brazil on 1992, and became more structured base on previous definition like:

*“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”*. (World Commission on Environment and Development, 1987, p 43).

*“Sustainable development is often thought to have three components: environment, society, and economy. The well-being of these three areas is intertwined, not separate”*. (McKeown, 2002).

However, in the Rio declaration, measures and objectives were agreed to integrate the environmental and development activities included in the Program 21. This program has been conceived as a response to the main problems of the environment and development, including the economic and social aspects of sustainable development; such as poverty, consumption, population dynamics, human health, human settlements and in response to all concerns related to the environment and natural resources. Sustainable development involves the long-term viability of production and consumption in relation to all economic activities, including industry, energy, agriculture, transport, tourism and infrastructure, in order to use the resources in a more rational way from an ecological point of view and to minimize waste at all costs. (United Nations, Agenda 21, 1992).

As for the measures, almost all governments around the mention and created necessary internal institutional mechanisms for a favourable environment to all levels of society, so that in the administrative decision-making processes of all public government agencies ad offices in charge of economic, environmental and social policies and programs are held in accountable. The objective is to improve the quality

of life of the entire population through adequate population and development policies, and programs aimed at achieving poverty eradication, sustained economic development in the context of sustainable development and sustainable modes of consumption and production, use of human resources and guarantee of human rights. Also, there is a special attention to the socioeconomic improvement of women in developed and developing countries, the elimination of all types of discrimination is indispensable to eliminate poverty and to promote economic growth sustained in the context of sustainable development.

The last records of Governments all around the globe recognize that there has been significant progress, mainly in regard to awareness and entry into force of national and international legal norms, as is the case of the regulations of prevention and environmental control that regulates EIAs, Nevertheless, important challenges remain and are presented new imperatives to turn sustainable development into reality in countries like Bolivia, where the materialization of the necessary changes of the current development models is essential to reverse current environmental degradation trends. And in particular eliminate poverty at a vigorous pace.

Inequality along with its impacts afflict the countries of the same region and an old definition of sustainable development links it to the satisfaction of needs of the present, without compromising the ability of future generations to reach their own requirements. More recent visions link it with a process of sustained and equitable improvement of the quality of life of people, based on appropriate conservation and environmental protection measures. The basis is not to exceed the recovery or absorption capacity of waste.

### **3.2. Conceptual Framework of Environmental Economics**

Unlike previous periods, in the last decades, the environmental issue has occupied a central place both in the theoretical debate and in the process of making decisions in many parts of the planet. In our case study we will deal mainly with Environmental Economics.

The criterion of properly managing natural resources and economize the environment, according to which the environment is a fragile resource that must be managed sustainably, which corresponds to the economic principles for the allocation of scarce production factors.

The environmental economy emerged in the late 1960's, as a conceptual vision of the neoclassical school on the environment. It encompasses the study of environmental problems using the vision and tools of economy. Through environmental economics, solutions are sought through the problem of incompatibility between private and social uses of given natural resources.

It deals with how the depletion of natural resources is managed in relation to production processes and consumption activities, their distribution and the availability limits that we have to reach sustainable development. Environmental economics propose a set of economic instruments, called "Economic incentives", whose main objective is to modify real economic variables with the idea that the individual behaves in the best way possible, decreasing the levels of pollution produced and, consequently, reducing the problems of degradation of natural environments.

Another function of environmental economics is to propose a series of specific methodologies for estimating the economic value of environmental damage produced by pollution; in order to find the values of the necessary compensation to eliminate the effects of environmental externalities. (Field, B.; Olewiler, N., 2011)

In the original neoclassical model, the environment is a typical example of externality and is consequently considered. Within this school of Neoclassical thoughts are Arthur Pigou and Ronald Coase who deal with the theory of externalities. In the mid 1920's, the idea of collective consumption goods or goods was systematized with consequent externalities, which is a concept originally exposed by Alfred Marshall and Pigou. (Pigou, A., 2018)

Pigou is considered the founder of the Welfare Economy and principal forerunner of the environmental movement by establishing the distinction between private and social marginal costs and advocate for the state intervention through subsidies and taxes to correct market failures and internalize externalities. However, in the presence of externalities, there are divergences between the net and private social product. To improve those natural trends increasing the general welfare and national income public intervention is necessary. Externality is a case of government intervention, either with a tax in case of negative externality on its producer or subsidy in case of positive externality. (Pigou, A., 2013)

According to Coase's criteria, and the raise of the "Coase Theorem". Before the presence of external effects, it will always be possible to achieve optimal externality,



and a maximum level of wellness. A public good is one that produces effects on those that have not participated in the transaction. which is, those that produce effects for third parties or externalities that are not susceptible to internalization.

Coase establishes that the collection of the tax goes to the victims of the externality. That interventionist path would lead to an inefficient situation. It has transcended the idea of the tax but not of the subsidy. But it is not always desirable to eliminate all externality, because it is possible that what is earned with less is then what is lost with the elimination of the productive activity of externalities, because the reciprocal nature of the problem is not recognized. In an extremely twisted and perverse assumption in "The problem of social cost" of 1960, the Environmental and Natural Resources Economy assumes that all externality can receive a convincing monetary valuation, following a conventional monetary reasoning and, from such valuation propose various economic policy instruments to achieve the social optimum. (Posner, R.; Parisi, F., 2013)

### **3.3. Presentation of Bolivia**

The Plurinational State of Bolivia once known as “The Republic of Bolivia” before the “New Political Constitution” was implemented in 2009, is a South American country located in the central-western part of the continent. It is one of the only two landlocked nations of the area with Paraguay. Bolivia has a territorial expansion of 1.098.581 km<sup>2</sup>, that covers four types of biomes, making it one of the most biodiverse countries in the world, classifying it as a megadiverse country. (INE Bolivia, 2019)

The Andin country is conformed by 36 nations, it has a population of around 11 million people, and it’s one of the countries with the lowest demographic density of the world with almost 10 habitants per km<sup>2</sup>.

Bolivia has always been considered one of the richest countries of Latin America and sometimes even of the world, not only because of its history, but also because of its natural resources and incredibly high biodiversity. Due to the fact that the country is located on an strategic geographical position it can take advantages from 199 ecosystems which ones from an ecological way represent a huge amount of biodiversity in fauna, flora and climate, but also, countian some of the most important

and biggest reservoirs of some elements like lithium (Li), iron (Fe) among others and also natural gas deposits and oilfields, being these last ones really important for its present economy.

The Bolivian economy has recently being the leading economy of the Latin region, with over almost always a 4% increment per year. Which according to the government is because of the former president since, Juan Evo Morales Ayma, whose work is the reason why Bolivia has been leading in some important areas of the South American continent.

For the Bolivian economy we can observe that most of its GDP (Gross Domestic Product) Its properly balanced in many sectors of the economy and as in all countries most of it comes from the taxes and contributions from the public and private sector, being this one almost 18% of the country's GDP, and the other 82% is balanced in the next way; an almost 15.5% comes from the Services of the Public Administration, over 11.5% comes from the Agricultural sector other almost 11% comes from the natural gas deposits from the region of "The Chaco" located in the south part of the country in the central east part of the department of Tarija and the mineral production from the altiplanic departments of Potosi, Oruro and La Paz, and the manufacturing industries take up to almost 10.5%. The imports of the country \$9.4 billion USD are higher than its exports which ones are around \$8.08 billion USD. We should also mention that suspiciously the unemployment rate is 3.3% and the Inflation is of 2.3%, according to the data provided by the Statistics National Institute and the World Bank. Making of it one of the most stable and safest countries to live and to develop a business. Unfortunately, not being this one the case for a foreign investor due to the high taxes and extra special laws for them. (World Bank, 2018)

### **3.4. The Environmental Problematic in Bolivia**

The Plurinational State of Bolivia has an infinity of renewable and non-renewable natural resources, Nevertheless; these resources are threatened by permanent processes of degradation by demographic pressure, deforestation, fires, illegal hunting and productive activities that take place under specific pollution conditions that depend on productive inputs, the industrial processes used, the technological level and the environment are unwrap. In Bolivia there have been works on contamination of some

activities linked to the different sectors of the economy like the mining industry and some studies on the environmental issue where have included descriptions and sectoral analysis of mining and industrial pollution and more specific analyses of mining pollution. However, few works were done on environmental quality in the agricultural sector, poverty and the environment in everything that concerns the countryside.

Regarding environmental problems, these occur due to the generation of impacts which cause a divergence between private and social production costs. In this case, the production of goods is above the social optimum, while the goods prices below it. This indicates the presence of negative externalities, which in many cases have characteristics of public goods. From the economic point of view, it is first interesting to analyse the possible variables that affect or that could affect externalities, and if possible, determine an approximate magnitude of its effects. Then, analyse possible options of public policy guided by minimum health criteria, minimum conditions of safety, cost-effectiveness criteria or cost-benefit analysis. This country has no systematization of the information that allows the magnitude evaluation of environmental externalities. There are also no empirical studies about the effects of these pollutants on health, productivity and wellness. Although there is interest in participation in international forums for environmental problem.

### **3.5. Bolivia and the Environment**

In Bolivia, environmental problems and impacts are caused by activities where they use polluting products that affect environmental quality and natural resources. As are the mining, industrial, agricultural, forestry, metallurgical companies, manufacturing industries and energy sectors, which among them are oil refineries and oil and gas exploitation), among other urban activities that contribute to negative environmental impacts.

#### **3.5.1. Mining Sector**

Mining is one of the most important sectors due to the negative effects that are produced by the different direct and indirect impacts associated to this type of activities, like different pollutants are generated during the mineral extraction processes and concentration, acid drains whose leaks affect, allowing the generation of polluted waters damage the health of the inhabitants close to the

mining areas, but even more critical is the situation of the miners who work and what constitutes their sources of income under high risks. And they have their health and safety affected forever. Just because they were given in the tradition of mining.

### **3.5.2. Industrial Residues**

They are the cause of solid waste generation as are the sugar mills, breweries, distilleries, textile plants, petroleum refineries, chemical plants that produce soap and detergent, tanneries and dairy products. The most polluting activities of the energy industry are those linked to the exploitation, transportation and refining of oil and natural gas where they pollute waters and soils.

### **3.5.3. Oil Refining**

Being the industry that contributes the most to pollution they affect the environment not only when they dispose of their wastewater, since they are mixtures of waste, organic compounds and water generating atmospheric pollution, but also on the construction of pipelines in the same way generates only negative environmental impacts, when opening and levelling activities for the pipeline, causing damage to the earth, alterations in the landscape, biotics like flora, fauna and abiotic impacts like air, water and soil contamination. During the operation of the pipelines you have the fear of accidents occurring and the oil spill which would generate a very expensive negative externality, but it should be mentioned that this type of accidents already occurred in our country in couple occasions like in 2000, when 29 thousand barrels of oil were spilled on the “Desaguadero” river affecting the “Poopó” and “Uru Uru” lakes, in that particular case 80 thousand hectares of grassland were affected.

### **3.5.4. Manufacturing Activity**

There is no information on the likely negative environmental impact that this industry has because the Bolivian Government simply do not count them as the same level of medium and big industries because they use almost no technology and have limited access and low income levels, since most of them employ between 5 to 14 employees in very basic industries, such as: printers or product factories of

clay. But there are industries that cause impacts on the environment and health of the people such as tanneries, footwear, food, metallurgical and construction activities. Such as the concrete industry which is a subsector of industrial minerals that causes huge atmospheric pollution through the emission of large amounts of dust with silica, that cause harmful effects on the respiratory system in the population and animals, decreases agricultural productivity levels in the surrounding sectors. The tanneries also generate waste that includes liquid effluents like flows from the washing and soaking processes, acid effluent from chrome tanning, alkalis in rivers, solid waste, and emissions to the atmosphere.

### **3.5.5. Environmental Urban Problems**

You have domestic activities, industries, transportation, basic sanitation issues, solid waste, air and water pollution. Among the main environmental problems in urban centers are the housing differences of basic services and work environments, lack of security, industrial and domestic pollution.

The volume of solid waste generated by domestic activities in the urban centers is worrying since it can be observed in the streets, mainly in the downtown of the cities the large amount of household garbage that is generated every day. The problems of the garbage collection, transportation and location system in many areas of the cities of Bolivia. All this is happening as an effect of population growth with greater concentration in the main cities of the country causing more danger to public health and worst conditions for the percentage of people that live in poverty, the homelessness and waste of public health care expenses.

Another problem is sewage or wastewater caused by domestic waste, as in the cities of Potosí and Oruro where there are bigger impacts of mining activities on urban centers; in Oruro the emissions from the “Vinto” reach the city, imposing environmental risks and in Potosí the activities of the mining mills pollute the “La Ribera” river basin imposing serious environmental issues on the urban population of the city.

In Bolivia approximately 90% of urban housing has access to potable drinking water through connections inside and outside the home, however, even the Ministry of Health advices to never drink from the sink unless is necessary. In addition, this number falls dramatically at 35% in rural areas, taking into

consideration that these percentages vary according to which national or international institution you ask. Limited access is due to various causes such as the lack of physical infrastructure, for example, in El Alto, there are problems of water resource supply, in Cochabamba, unknown pollution of the rivers, while mining affects states like Oruro and Potosí, along with water from underground wells in parts of Santa Cruz, thereby affecting the improvement of the population.

86% of the Bolivian urban population and 33% of the rural population have access to sewer networks, wells or septic tanks. In Trinidad, Cobija and other smaller cities, there are almost no sewage disposal systems, while in La Paz, El Alto, Oruro and Potosí about a quarter of homes lack such infrastructure. Which causes greater contamination and outbreaks of infection towards children. There is partially sewage treatment in Santa Cruz, Cochabamba and Tarija where there are some units of liquid waste treatment, demonstrating a slow improvement.

### **3.6. Sustainable Development in Bolivia**

Together with the ecological crisis, the situation of widespread poverty is inevitable, which makes the current development model unsustainable, where hunger, ignorance, insalubrity and misery show the urgency of rethinking, not only, the simple fact of growing in the economic sphere counts; but also where, how and mainly for the benefit of who to grow, creating a model that allows to build a basic social ground. Together with the situation of ecological crisis and of widespread poverty as common features, globalization marked a course of analogous in development for all societies.

In Bolivia there has been an interest on being able to achieve a state that sustainable since the hyperinflation and the New Economic Policy of 1985, which later, generated that the State changed its objectives and focus on the possibility of sustainable development. Both the national legislation and the functional structure of the State where and still are in favour of the environmental protection and conservation of natural resources, unfortunately it was and still is dispersed, fractional and incomplete, because of what appears to be a problem of corruption, trying to hide reality not only for the international community, but also unfortunately for its own citizens.

Through time Bolivia has been trying to improve the structure of the system and even if ideally having created multiple laws, regulations, institutions, multiple

ministries and entities not only to enforce a real sustainable development, but for control and follow up of multiple projects, it just seems to be that the idea is there but is not executed properly.

Considering the delicate political position of the country at almost all existing times, even though former and the actual government says that the country is improving. As a matter of fact, it is improving but at a much lower slope than what politicians show and report to the outside world and to their population as well. Having opened and closed multiple ministries for the control of Sustainable Development, having created multiple commissions to avoid centralization of the data and actually have a better spread of the control, having created multiple laws, regulations and decrees that are for the same purpose is just a way to show that everything is failing. And while the country is being praised for the creation of these laws and enforcements, no one is actually checking or controlling if they work or even if they are being implemented.

Sustainable Development in Bolivia is something that unfortunately is far from reality and having an economy focused on the exploitation of its hydrocarbon resources, and taking into consideration the multiple environmental issues like the melting of the now non existing glaciers in the altiplano, the uncontrollable droughts on the Chaco region, the burning and destruction of millions of hectares in the amazon and many others is just the proof of what the country is actually living.

## 4. Legal Framework

### 4.1. Chapter of level 2 Environmental Juridical Laws in Bolivia

The following Juridical Laws, Regulations and Decrees are the ones that control and enforce and regulate everything that has to deal with the environment

#### 4.1.1. “Ley del Medio Ambiente N° 1333” of 1992 (Law of the Environment N°1333)

The N° 1933 Law aims to protect and conserve the environment and natural resources regulating the actions of man in relation to nature and promoting sustainable development in order to improve the quality of life of population.

The Law of the Environment creates an institutional framework for environmental planning and management, recognizes rights and duties of society and the State for the conservation of environmental quality and establishes a basis for the rational use and optimality of natural resources. It also considers environmental education, health issues and, technology and science in environmental matters that are consistent with sustainable development. (BOLIVIA, Ley del Medio Ambiente N° 1333, 1992)

#### 4.1.2. “Ley de Participación Popular N°1551” of 1994 (Law of Popular Participation N°1551)

This Law initiated a process of perceptible change in the quality of life of millions of Bolivians, its concretion has allowed the transfer of political and economic power to neighbourhoods in cities and, especially to rural communities and Indigenous groups and communities in the provinces and autonomous regions.

With regard to environmental management, the Law of Popular Participation promotes the citizens participation in the preservation of natural resources and the conservation of the environment, through education campaigns and mainly with the participation of citizens through OTB's (Base Organizations) or other entities that are legally constituted, in the processes of decision and denunciations which are related to public works, projects and other activities, through efforts of management with the Environmental Authorities by the procedures established in



the Regulation of Environmental Prevention and Control. (BOLIVIA, Ley de Participación Popular N° 1551, 1994)

#### **4.1.3. Regulation to the Environmental Law, Decreto Supremo N° 24176 of 1995**

It is composed of six regulations:

- a) General Regulation of Environmental Management
- b) Regulation of Environmental Prevention and Control
- c) Regulation on Air Pollution
- d) Regulation on Water Pollution
- e) Regulations for Activities with Hazardous Substances
- f) Solid Waste Management Regulation

These Regulations are framed within a direct global common regulation trend that seeks to ensure the eradication and mitigation of pollution in the environment that is inhabited by the human being.

They deal with the processes of licensing or environmental permits and pollution control regulations for water and air quality, dangerous substances and solid waste, and establish rules of action for the population with respect to the ecosystem, for developing risk reduction and all of the activities that address the environment quality.

To obtain environmental licenses you must have the Declaration of Environmental Impact (DEI) and Environmental Adequacy Statement (EAS), where establish the specific conditions, actions and measures of environmental control. To obtain the EAS and the DEI, the Environmental Card (EC) must be submitted, which determines the category of Environmental Impact Assessment (EIA) to perform, whose purpose is to obtain information corresponding to the description and project activities, and the Environmental Manifesto (EM) that evaluates the produced impacts and proposes an environmental adaptation plan in case the activity, project or public work is not carrying one within the regulatory framework. (BOLIVIA, Decreto Supremo N° 24176 - Reglamentación de la Ley del Medio Ambiente. Reglamento de Prevención y Control Ambiental, 1995)

#### **4.1.4. “Ley de Municipalidades N°2028” of 1999 (Law of Municipalities N°2028)**

Within its general provisions its purpose is established to preserve and conserve, as what concerns the Municipality within the environment and ecosystems of the region. Contributing to the sustainable and adequate use of the territory and its natural resources.

In the “*Article 8, Chapter I, subsection 6)*” regarding sustainable human development, states: “preserve, conserve and contribute to the protection of the environment and natural resources, wildlife and domestic animals, exercise and maintain ecological balance and the control of pollution in accordance with the laws that govern the subject”.

This law also establishes sanctions for individuals and groups, public and private, within the framework of their powers, that cause damage to public health and the environment, which are or can be caused by the industrial, commercial or economic activities of any kind or nature. And the preservation of National Heritage, public domain and property of the state. (BOLIVIA, Ley de Municipalidades N° 2028, 1999)

#### **4.1.5. “Ley de los Derechos de la Madre Tierra N°071” of 2010 (Law of the Rights of Mother Earth)**

The Law No. 071 aims to recognize the rights of “Mother Earth”, conceiving that we are all part of it, as a community that cannot be separated and that we depend on each other to live. At the same time, it recognizes the obligations that the Plurinational State of Bolivia and its citizens have with the nature. In addition to add a set of new obligatory principles such as the guaranty of regeneration of Mother Earth and the no mercantilization of it among others, to the Bolivian society. (BOLIVIA, Ley de los Derechos de la Madre Tierra N° 071, 2010)

#### **4.1.6. “Ley Marco de la Madre Tierra y Desarrollo Integral para Vivir Bien N°300” of 2012 (Framework Law of Mother Earth and Integral Development for Living Well N°300)**

“Its purpose is to establish the vision and fundamentals of integral development in harmony and balance with Mother Earth to Live Well, guaranteeing the

continuity of the regeneration capacity of the components and life systems of Mother Earth, recovering and strengthening local knowledge and ancestral knowledge, within the framework of the complementarity of rights, obligations and duties; as well as the objectives of integral development as a means to achieve a good living status, the basis for planning, public management and investments and the strategic institutional framework for its implementation.

In particular, it defines living well as the civilizational and cultural horizon alternative to capitalism and modernity that is born in the worldviews of native indigenous people, and intercultural and Afro-Bolivian communities, and is conceived in the context of interculturality". (BOLIVIA, Ley Marco de la Madre Tierra y Desarrollo Integral para Vivir Bien N° 300, 2012)

## **4.2. Study and Evaluation of Environmental Impact**

### **4.2.1. Process of evaluation of the Environmental Control**

The Environmental Impact Assessment process emerges as an instrument for the protection and defence of the environment, is recommended by various international agencies. It is also endorsed by the experience accumulated in developed countries, which have incorporated it into their legal system for many years already.

The EIA is a warning early process to verify compliance with environmental policies. Prevents and evaluates the possible negative and positive impacts that public works, activities and projects generate on the environment, and measures are proposed to adjust them to acceptance levels.

The Environmental Impact Assessment is a systematic analysis, that is reproducible and interdisciplinary of the potential impacts, a proposed action as of its alternatives, in the physical, biological attributes, cultural and socioeconomic of a particular geographical area. The main goal of the EIA is to prevent environmental problems and deterioration of the quality of life of the population before the execution of the action of a project, public work or activity takes place and where appropriate measures must be applied so that the impacts derived from human actions are acceptable and correctable. It is a warning system where you

develop t a continuous analysis to protect the environment. It is considered as an instrument that is at the service of the informed and accurate decision-making process, it allows to reach a broad knowledge and integrated impacts derived from human actions and the quality in the environment.

In the EIA process it is important to define the scope of action, analyse the actions that have significant impacts on the environment. That way you can express itself effectively as an instrument of identification and mitigation of unwanted impacts, becoming an efficient planning tool to move towards sustainable development. An EIA process is a logic sequence of steps when it comes to apply in human actions for the fulfilment of environmental objectives. The elimination or poor consistency in some stages could become an incomplete analysis and with an inefficient operation

In Table N° 1 a theoretical scheme of an EIA process can be observed within the main stages for the prevention of significant environmental impacts:

(3 )Table N° 1 “Outline of EIAs Process”

<b>Outline of EIAs Process</b>			
<b>Stage 1</b>	<b>Stage 2</b>	<b>Stage 3</b>	<b>Stage 4</b>
<b>Environmental Identification and Classification</b>	<b>Preparation and Analysis</b>	<b>Rating and Decision</b>	<b>Monitoring and Control</b>
Description of the project	Description of the environment	Review by the Environmental Authority, the potential risks, damages and environmental benefits are verified. EIA approval, rejection or modifications are determined	The effectiveness of the environmental analysis is verified, if the environmental protection criteria are met and compliance with the commitments acquired by the person responsible for the action is regulated
Description of the influenced area	Forecast and analysis of environmental impact		
Mitigation measures that are possible to use for sustainability	Environmental management plan		

*Source: Regulation of Environmental Prevention and Control of Bolivia  
Personal elaboration*

The stages for impact prevention must be clearly identified, significant prove that are associated with human actions more specifically activities, public works and projects.

The EIA process must be studied from its design phase, from the moment that the construction stage begins operation until the abandonment stage of the draft. In addition, compliance with protection measures must be environmentally verified.

#### **4.2.2. Stages and Functions of a Socioeconomic system for the EIA**

An Environmental Impact Assessment evaluation must comply with various dimensions required by the Regulation of Environmental Prevention and Control, which says that the socioeconomic system is important, and you should consider how to be following elements, like the description, identification, prediction and evaluation of impacts.

**a) The socioeconomic environment:**

The factors that describe the socioeconomic environment represent a conglomeration of numerous aspects that may or may not be interrelated. It's like that may include factors not associated with the physical, biological or cultural elements, but describe interrelations and human relationships.

**b) Impact identification:**

The activities, public works or projects can cause socioeconomic alterations in the environment, consequently EIAs must systematically: identify and quantify, as much as possible, and interpret properly those alterations.

Possible socioeconomic impacts can be assessed using methods with matrixes, interaction networks, simple checklists and or descriptive checklists which are actually the most used methods. They can also be useful in study cases of similar projects.

When making a project the owner must know what are the conditions in which the place is located, have information, and if the information does not exist, it must be developed before beginning the building phase. The first thing to do is identify the possible impacts followed by the preparation of a description of the existing conditions for chosen factors. To properly evaluate the existing conditions, they must use the appropriate indexes, criteria or guidelines.

**c) Description of the existing socioeconomic conditions:**

To describe the existing conditions is essential to focus on the conditional socioeconomic factors that are susceptible to alterations as a result of the execution of the proposed project.

The sources of socioeconomic information can provide primary data on studies in specific fields or in selected factors, or secondary data that is published reports. EIAs must gather enough information to allow the forecasting and the evaluation of existing conditions that may cause significant impacts. There are many possible sources of information, the use of these will depend on the circumstances of each study.

Existing conditions should be studied not only based on current data, but also through historical series, there are indicators to describe the initial conditions and serve as a point of reference to outline the impacts of projects, such as for projects in developing countries, it is the indicator on human development (HDI) which can provide a relatively simple method of controlling any level of socioeconomic development (Prochazka, P., 2015)

**d) Socioeconomic-environmental indicators:**

It is important to mention the quality of life since it is a term that has been developed to indicate the characteristics of the socioeconomic environment. In many cases structured approaches have been developed, including indicators, that describe the quality of life since it is part of the evaluation process of the environmental impact.

There are nine methods that are grouped into three groups:

○ **Structured control lists:**

These are methods that consider quality of life or social welfare, and they are organized into categories each with an associated factor.

○ **Structured checklists with importance weighting:**

They are methods that assign the previous categories or factors some weights of relative importance, the purpose of this weighting is to allow the calculation of a numerical index of the quality of life.

- **Structured control lists with interpretation of the information:**

For these methods there are given indications for the interpretation of information about a certain factor, whether positive or negative, depending on whether it improves the quality of life or not.

An increase in data from some factors imply an improvement in the quality of life (+), while the increase in other factors may be negative (-) as they indicate a decreased in quality of life

**e) Forecast of socioeconomic impacts:**

The most important technical activity in the socioeconomic impact study is the forecast of impacts for each of the alternatives evaluated, including the one that will be chosen. This forecast can be made of four different forms, through: the qualitative description, the quantitative description, the use of specific forecasting techniques, and relative comparisons between effects of the alterations. The choice of one of these systems will depend on the magnitude of the socioeconomic study and of the factors that the impacts can suffer.

**f) Impact evaluation:**

A thorough technical examination is required; reasoning should be systematic and scientific uses. Based on the prediction of impacts to interpret and evaluate them. Information regarding technical standards, criteria and qualitative parameters regarding the socioeconomic factors.

**g) Necessary Information:**

A need for prior knowledge of the place of action, a description of the affected environment to know the significant impacts and changes that may cause human action is a must.

If knowledge is scarce, then it is a priority to make a quick description, giving an idea of its general characteristics and subsequently determine what is required more accurately. If there is adequate information, then only those necessary aspects should be included to deliver a finished

assessment of the possible environmental components that will be affected by the place of action.

Information systems should be used because they are instruments that support the correct EIA application. The purpose of any information system is to identify, measure and facilitate the overall assessment of the main problems and environmental issues, predicting the scientific data that is necessary for the proper management of natural resources and environmental quality.



## 5. Results and Discussion (Practical Framework)

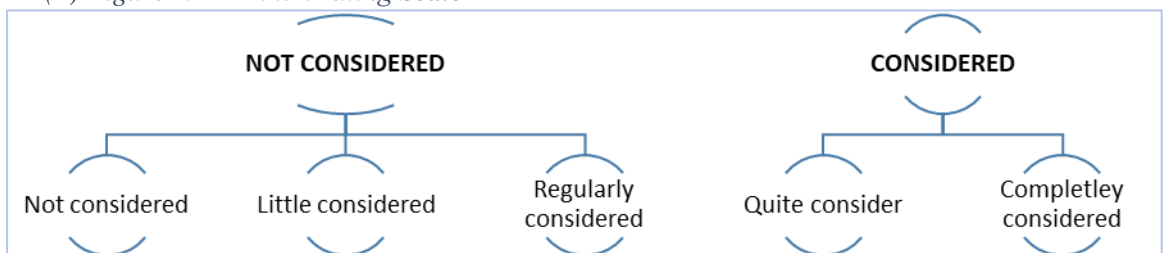
### 5.1. Quantitative and Qualitative Study and Evaluation of the Socioeconomic Component in EIAs of 2<sup>nd</sup> Category (Specific Analytical)

#### 5.1.1. Methodological Criteria

Before proceeding to develop the investigation realized, it is necessary to explain some methodological criteria that were defined during the process:

- Establishing a context that allows to know the socioeconomic criteria that are handled in the socioeconomic diagnosis of EIAs. An analysis to be obtained from results of the investigation carried out by the selected 22 EIAs, thus having elements that can support and sustain the results of our analysis.
- The “Likert rating scale” that was used to assign values to the review of the 22 EIA's, defines as fundamental aspect in the application of the technique; that the researcher preferably analyse trends resulting from the combination of 5 options defined as an instruments of analysis. That is when, two aspects have been grouped a) “*Not considered*” + “*Little considered*” + “*Regularly considered*” = *NOT CONSIDERED* and b) “*Quite considered*” + “*Completely considered*” = *CONSIDERED*.

(4) Figure N°2 “Likert rating Scale”



Source: Allen, Elaine; Seaman, Christopher (2007). "Likert Scales and Data Analyses"  
Personal elaboration

- On the other hand when the Research is about the minimum methodological criteria in the socioeconomic area to conduct an EIA, it considers that: the “no, little or regularly” considered are aspects that do not meet the minimum expectations it requires for standardization, and that the “quite

and completely” considered aspects meet the minimum expectations, so the interpretation of the results is based around this approach.

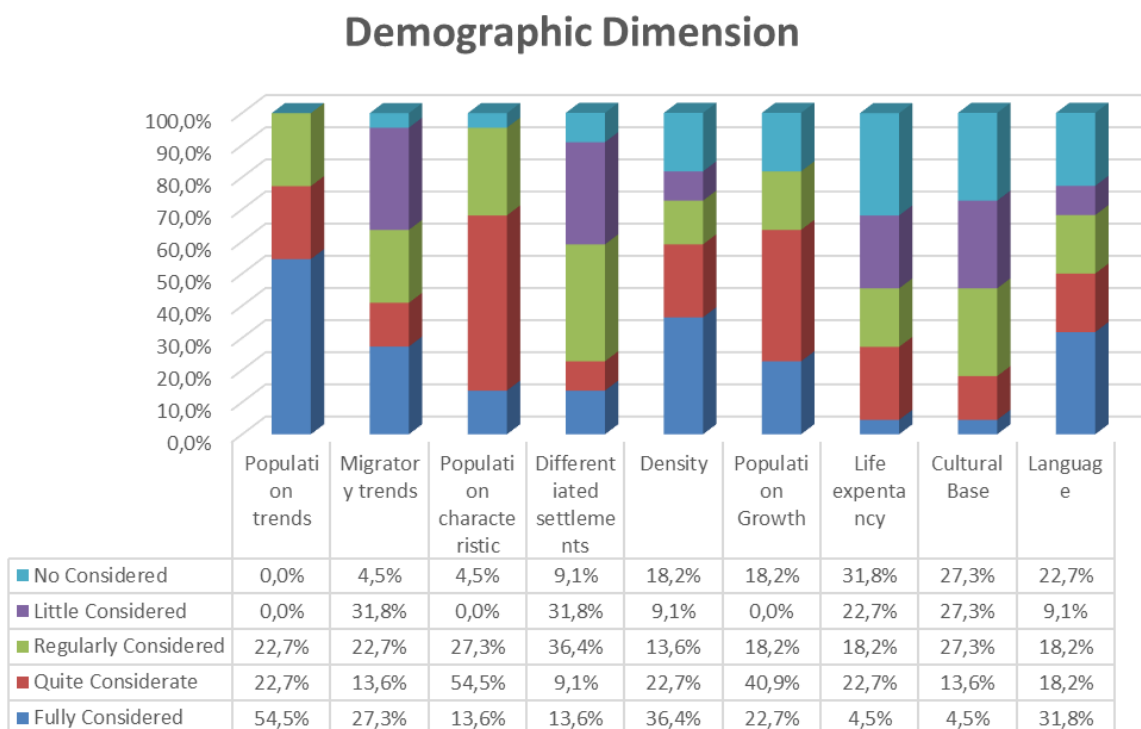
### 5.1.2. Sustainable Structure used in the Diagnosis of the EIAs

The following describes the aspects that were considered in the diagnosis of initial status (Baseline) of the EIAs, in which the recollection of information by selecting the sample about those aspects that companies and / or consultants consider in their analysis, where obtained the following results:

- **Economic and demographic:** Graphs N° 1, 2, 3 express the results of the subfactors analysis, that were considered on the EIAs.

Graph N° 1 expresses the results of the particular analysis factor of the “demographic” dimension, of which the following observations are denoted:

(5) Graph N°1 “Demographic Dimension”



Source: Results of the Investigation (Self resources – structured observation)  
Personal elaboration

“Migration trends” in the project area, are not included in 59.1% of the studies, this being an important factor since migration occurs mainly for

employment reasons, that is to say to get a work and to be able to survive since it is a primary source of income in the place where the activity is developed, leaving aside other tasks or activities that have, such as agriculture, livestock, manufacturing, etc. This indicator should be highly considered since the inhabitants of the towns go to other places or return to their hometowns, because they went to live somewhere else between one and two years approximately and return when there are new jobs available.

As for “differentiated settlements in economically weak groups”, 77.3% of EIAs do not consider it. This is an indicator that should not be set aside, hence, mostly the locals notice a fault of employment or means of work then their production and commercialization levels are low. And for the projects that take place in remote areas local inhabitants do not have enough economic income, not even above of the national minimum, in addition to the fact that their only means of livelihood is the production that they perform in their localities, which is more for surviving than for living.

The “life expectancy” indicator is only considered in 18.2% of the cases, it should be noted that this is an important indicator that gives us information about how many years of life have people, after being born because generally they have not improved their economic level, nor their quality of life.

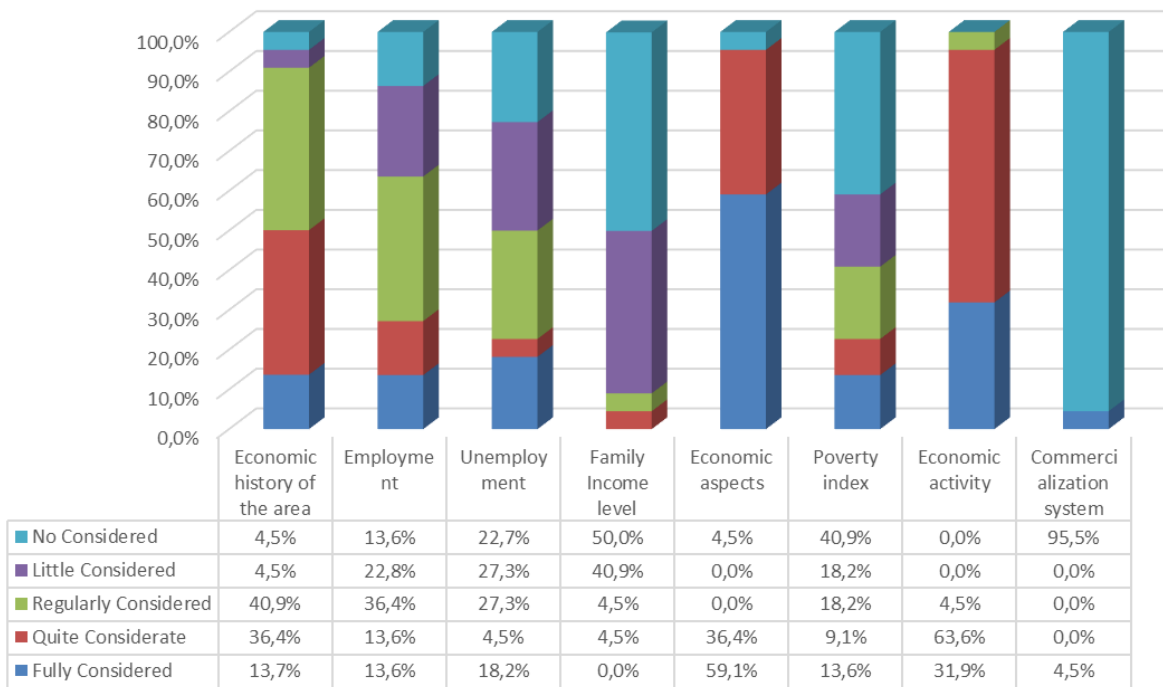
And for the “cultural base of the population” they do not consider it in 72.7% of evaluations, forgetting that this indicator shows us which is the cultural context of the area, as well as how the inhabitants established the first in the regions where the public works or projects are done, what is the level education in the population, in addition to knowing how they are organized and or if they live in a very dispersed way from each other.

Graph N° 2 shows the dimension on “economic aspects and” where the results of interest of the investigation ended in the analysis that concludes that the two least considered indicators are the “level of family income”, and the “commercialization systems” being these two very important factors within the economic sphere; which is to say that of the 22 EIA's, only one considers them. Regarding the “level of family income”, it is not considered

in 95.5%, being an indicator that plays a role in the employment and income situation of the region, know who contributes to the household income, how many are employed and how many are not, how many have fixed incomes and many other details that must not be set aside. Similarly, it happens with the “commercialization system” indicator where only 1 evaluation considers it, knowing that trade leads to expand products both for supply as for exchange, where basically (in rural areas) they are more dedicated to self-consumption.

(6) Graph N°2 “Economic Aspects and Employment Dimension”

### Economic Aspects and Employment Dimension



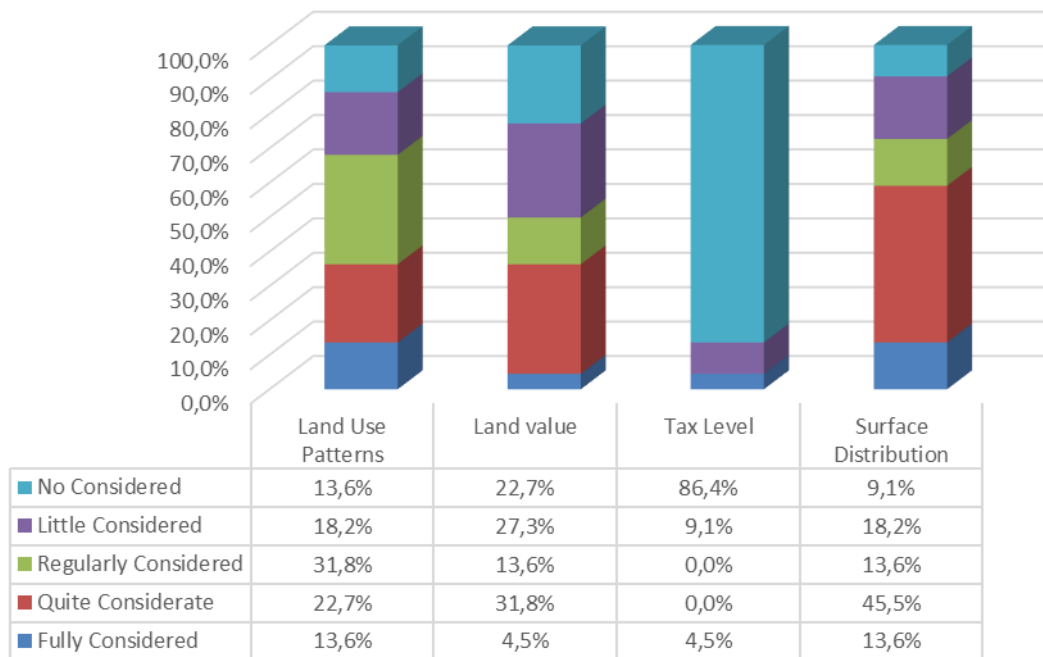
Source: Results of the Investigation (Self resources – structured observation)  
Personal elaboration

Then, graph N° 3 shows the results of the dimension of “Soils, prices and taxes” of which it can then be deduced that the less considered indicator is the “tax level”, and we can say this statement because it is observed that only one EIA includes it in its evaluation and the remaining 21 do not even mention it. Due to the fact that the people who live in places very far from the main areas they do not pay taxes, but it is still an indicator that should be considered, because it also means that most probable they also do not have access to the basic services. And any public work, project or activity

that is approved should generate benefits and income for the population of the region, therefore, generates income for the municipality for the payment of taxes and royalties which leads to improve the community situation.

(7) Graph N°3 “Soils, Taxes and Prices Dimension”

### Soils, Taxes and Prices Dimension



Source: Results of the Investigation (Self resources – structured observation)  
Personal elaboration

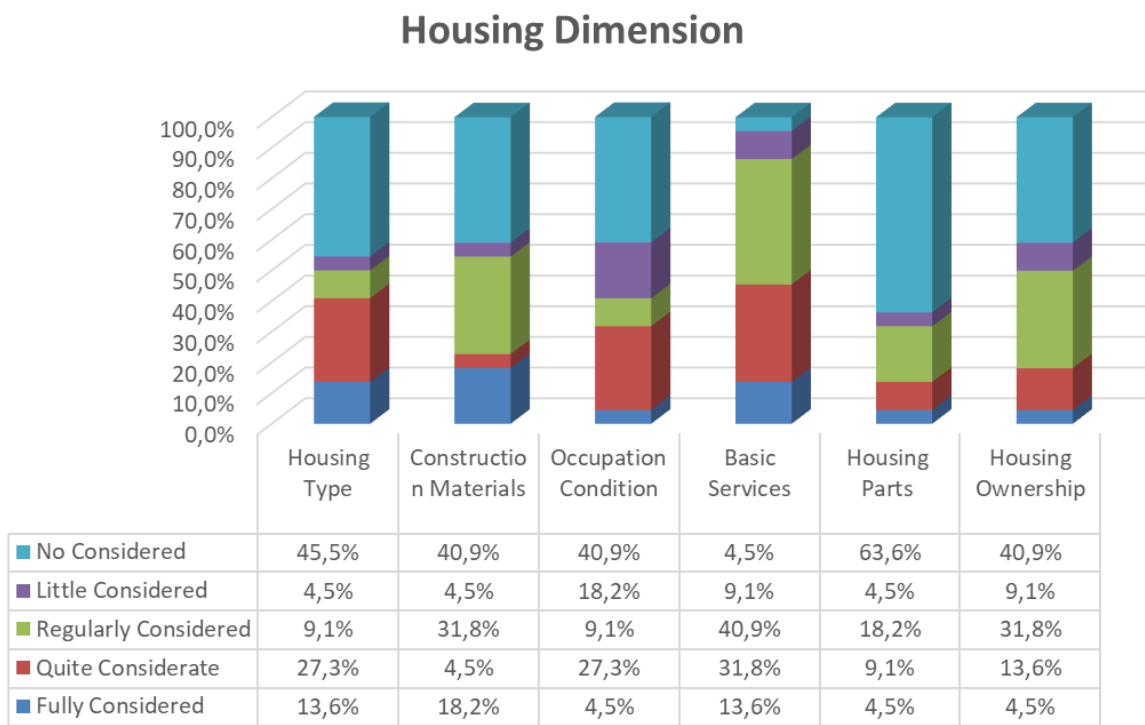
- **Social and public service:** The following graphs will show the results obtained from the subfactor of Social analysis and Public Services that were considered in the Studies of EIAs.

Graph N ° 4 expresses the results in particular of the “Housing” dimension where observing this behaviour it can be concluded that regarding the “house parts” indicator is not considered in 86.4% of the cases because the government does not have accurate data, since in many cases it is not possible to carry out surveys in remote places and generally these families are made up of 4 to 6 people living in extremely small and precarious conditions, basically in rural areas where they do not have equipment and comfort is not a priority.

Regarding the “housing ownership” and “construction material”, it is observed that the 81.8% and 77.3% of EIAs, respectively do not include it in their socioeconomic analysis.

This resulting into a problem because they are important indicators that let us know under what conditions the people acquire their houses, if it is own property or rented. As for the indicator of “construction material”, in rural communities mainly in the altiplano are characterized for having precarious building materials: adobe (handmade mud bricks) exterior walls, reed roofs, etc. and in other places the use of regular bricks, concrete, stucco walls.

(8) Graph N°4 “Housing Dimension”



Source: Results of the Investigation (Self resources – structured observation)  
Personal elaboration

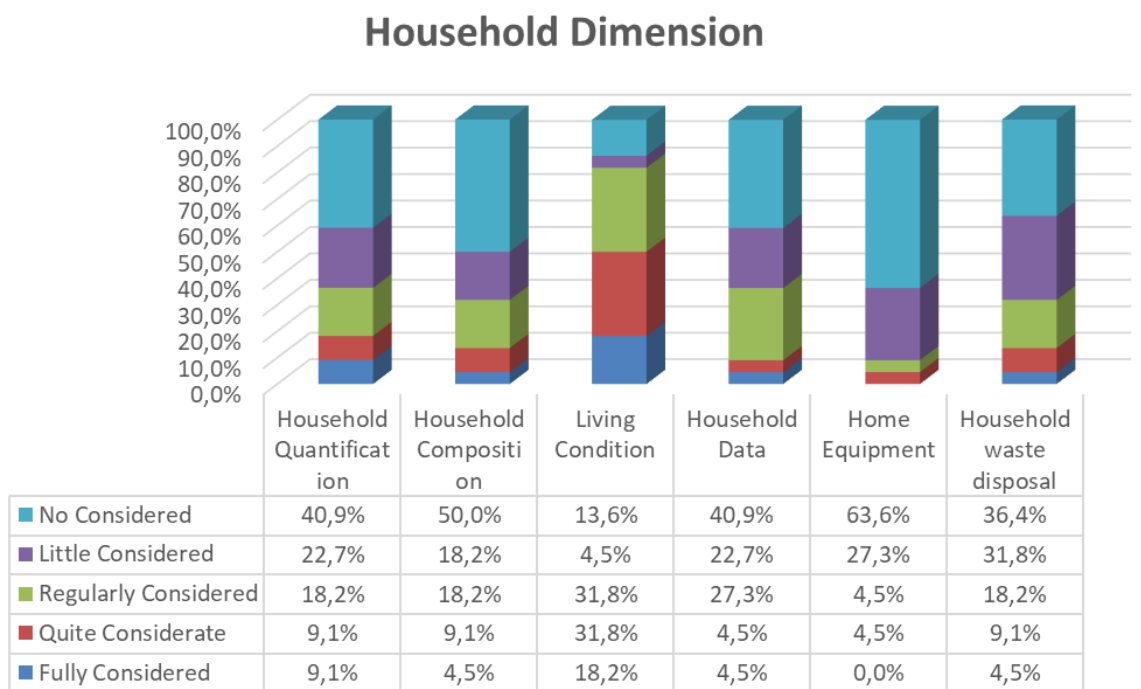
In the chart N° 5 shows an analysis of the “household” dimension it can be concluded that the indicator less considered is the “home equipment”, hence, from 22 EIAs only 1 considers it.

In a much smaller order of importance are the indicators of “quantification”, “composition” and “household data” even though these indicators are significant within the socioeconomic study because the inhabitants of the communities are the main actors in the production process, and the

distribution according to the number of dependencies per family, they are considered as non-important for most of evaluations.

As for the indicator of “household waste disposal”, it is not considered in 86.4% of studies, denoting that the non-elimination of waste causes effects and damages in the health of the human beings and in the contamination of the ecosystem for exposure and non-collection of it.

(9) Graph N°5 “Household Dimension”

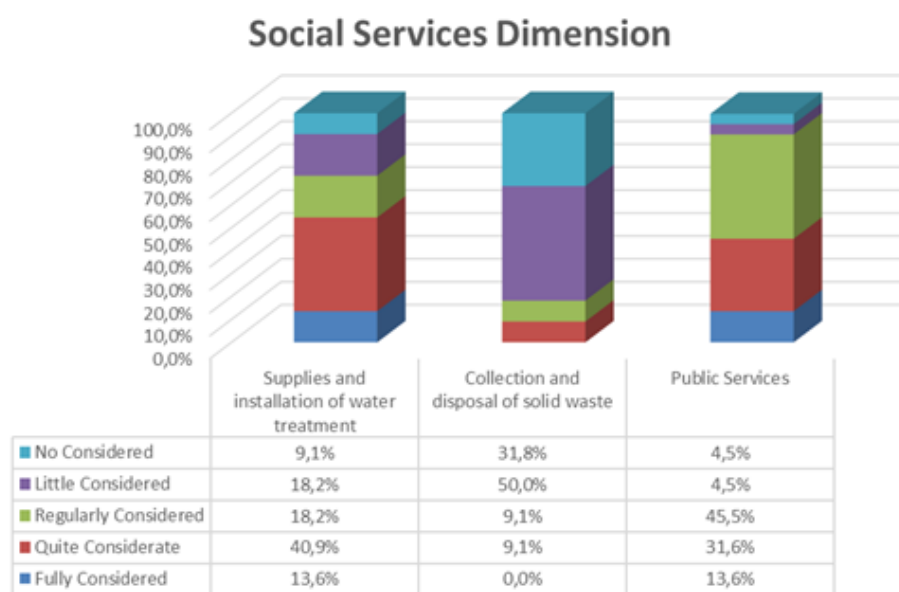


Source: Results of the Investigation (Self resources – structured observation)  
Personal elaboration

The following graph N° 6, express the results of the “Social Services” dimension.

In conclusion it can be shown that the least considered indicator is the one of “collection and disposal of solid waste” which represents 9.1% of the studies that consider it, meaning only 3 EIAs mention it. If this indicator is not included in the analysis it generates negative impacts like damage to the environment and life expectancy of the people.

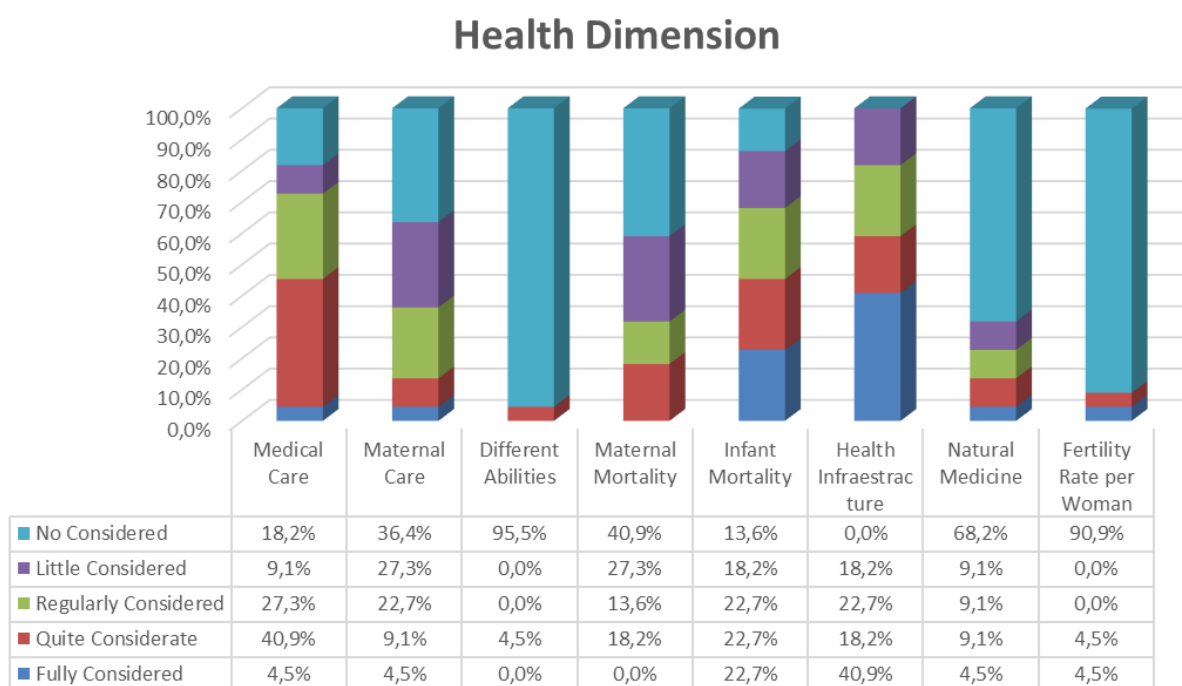
(10) Graph N°6 “Social Services Dimension”



Source: Results of the Investigation (Self resources – structured observation)  
Personal elaboration

Graph N° 7 shows the results of the particular analysis of the "Health" dimension.

(11) Graph N°7 “Health Dimension”



Source: Results of the Investigation (Self resources – structured observation)  
Personal elaboration

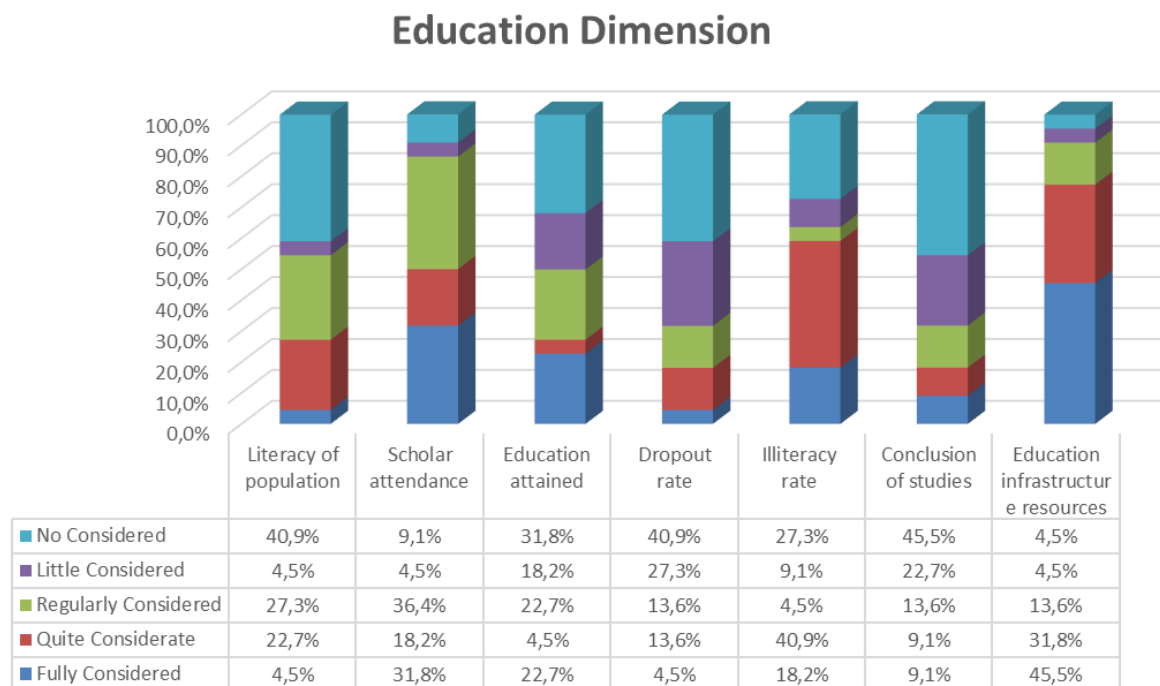


Of which it can be observed that the “medical care” indicator, is considered in 45.5% of the sample, also 45.5% of cases considered "infant mortality". Regarding the “health infrastructure (health centers, health posts, etc.)” 59.1% of it is counted. Nevertheless, only 13.6% of studies consider "maternal care."

And 18.2% “maternal mortality” and the indicator of "fertility rate per woman" is considered only in 9.1% of the sample. Unfortunately showing that the female population is not a priority for the Governments plan. In addition, sadly only 4.5% of studies take into consideration the indicator for “Different abilities” which is just another name for people with disabilities.

Next, we have graph N° 8 which shows the results of the analysis in particular for the dimension of “Education” and according to the analysis of this graph, it is concluded that first none of the 22 EIAs contemplate all the mentioned indicators.

(12) Graph N°8 “Education Dimension”



Source: Results of the Investigation (Self resources – structured observation)  
 Personal elaboration

The indicator for “literacy of population”, “level of education attained”, “dropout rate” and “conclusion of studies”, are the least considered compared to the other factors. Where it can be pointed out that they are

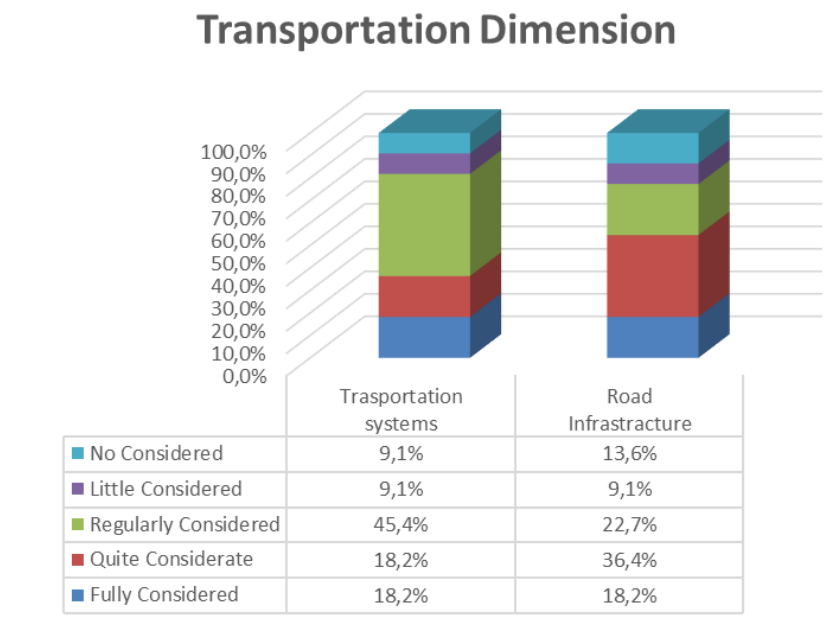
indicators that should be included in the socioeconomic analysis of the EIA, not only for urban areas but also specially for the ones developed on rural regions, due to the fact that it shows us the degree of study in which settlers have reached in the populations of rural areas.

We could also observe that their level of education is very low and that the future development should focus on it, in addition to the fact that the majority of people in the rural areas only reaches to study the primary or elementary level of school and only get to speak one language usually Aymara, Quechua or Spanish.

They cannot conclude their studies because they are forced to work on agriculture or emigrate outside their place of origin to be able to survive at the margin of society.

Graph N° 9 shows the results in particular of the “Transportation” dimension where only two factors apparently should be considered in each EIA.

(13) Graph N°9 “Transportation Dimension”



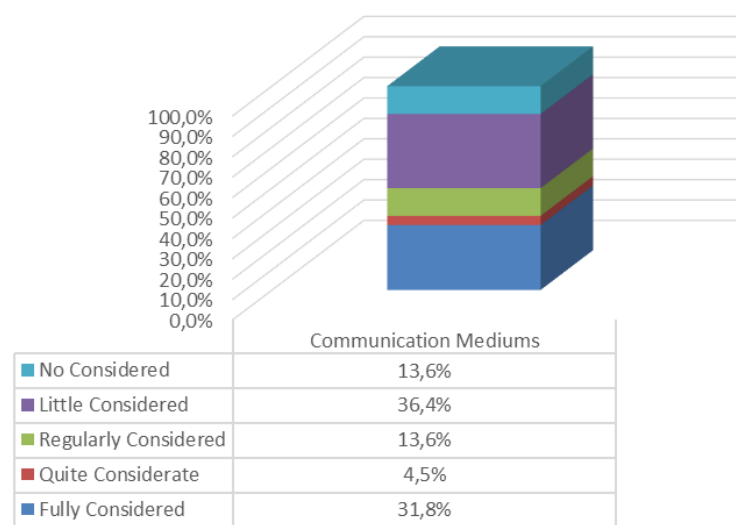
Source: Results of the Investigation (Self resources – structured observation)  
 Personal elaboration

The first indicator is “transportation systems” like highways, railways, fluvial systems, etc. this one is considered in 36.4% of the total sample. And for the indicator of “Road infrastructure”, 54.5% EIA covers it. Unfortunately both indicators are considered relatively in the baseline

diagnosis, Like for instance the indicator of “transportation systems” is not covered properly in 14 EIAs of the sample, because for the consultants this should be a minimum indicator for any EIA, but in reality that statement is not logical, hence it is through the transport routes that towns, regions and cities get connected and that is inside the “transportation systems”, moreover for the socioeconomic character of the evaluation the products and goods also go through this indicator and in the case if the project, public work or activities for which the EIAs is being done are realized, the commercialization of goods and services, entry of machinery, building equipment and so many other factors are influenced by these indicators.

(14) Graph N°10 “Communication Dimension”

### Communication Dimension



Source: Results of the Investigation (Self resources – structured observation)  
 Personal elaboration

Graph N° 10 let us know the results of the dimension of "Communication" in which it is clearly observed that the only indicator of this dimension is very little if considered for the socioeconomic diagnosis of the EIAs. Because 50% of the studies in the sample take it into consideration and the other half does not consider it. This indicator called “communication mediums” includes a variety of ones, that should be analysed separately, such as press, telephones, mobile phones, TV, radio, etc. basically it shows the big difference between the rural and urban area in the consultants

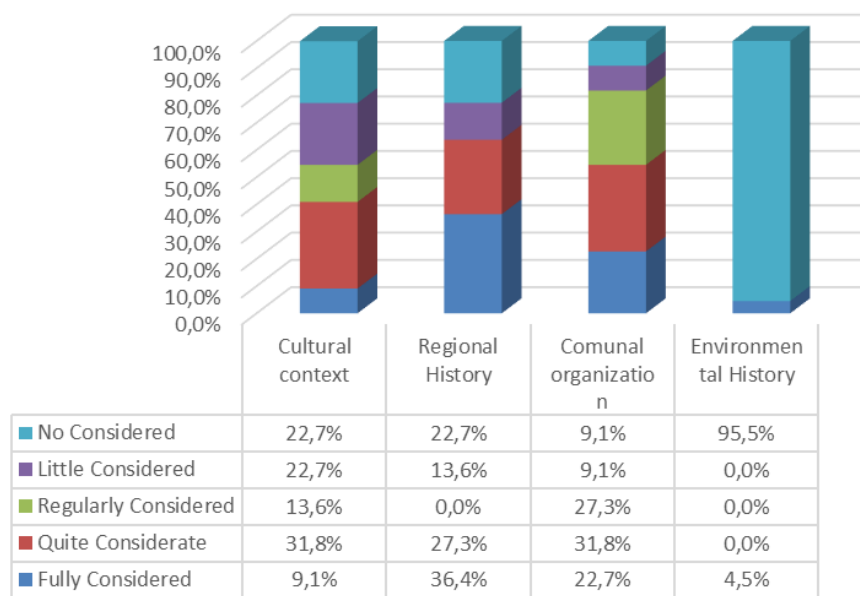
perspective, forgetting that rural areas nowadays have increased their means of communication compared to previous decades where they only had a radio or radio recorder.

Currently telecommunications give more coverage, and it should be considered more important for the EIAs if we want to be sustainable.

- **Other aspects:** For the subfactor of “Other Aspects” graphs N° 11, 12 and 13 express the results obtained in the analysis of the sample.

(15) Graph N°11 “Attitudes and Lifestyle Dimension”

### Attitudes and Lifestyle Dimension



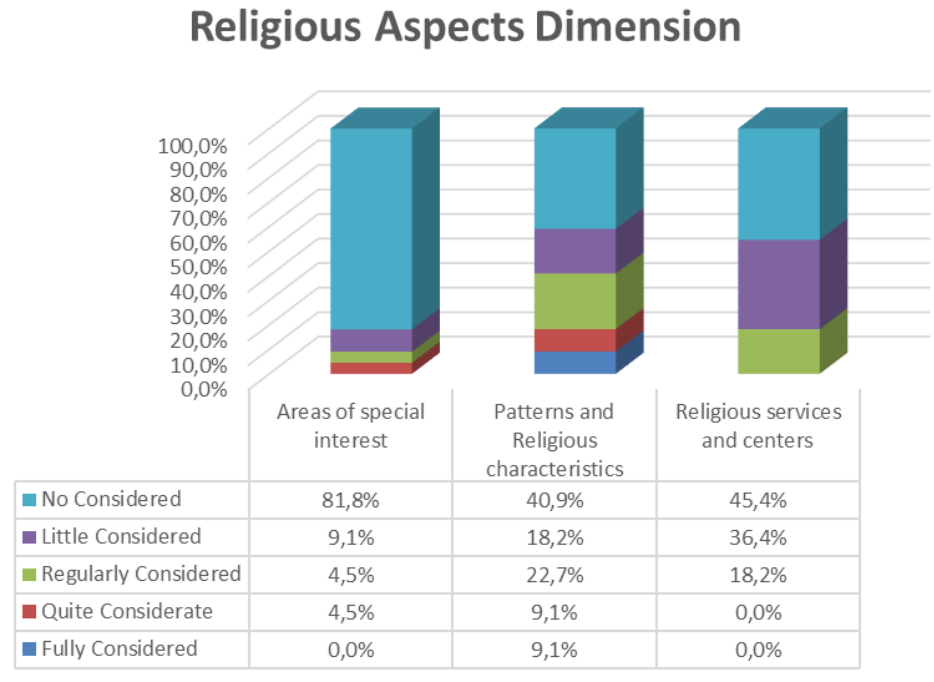
Source: Results of the Investigation (Self resources – structured observation)  
 Personal elaboration

Graph N° 11 expresses the results of the particular dimension “Attitudes and Lifestyle” where you can see that the least considered indicator is the “environmental history” where 95.5% of studies do not even mention it when they make the diagnosis of the place. And it is important to know the place where the activity or project is being developed not only to know the geographical situation in which it is located but also to know the places that would be affected with the completion of the project, and the environmental problems that would entail, in order to minimize and prevent negative

impacts that would result in its realization; not considering them would generate environmental and economic impacts in the area of influence.

Graph N° 12 shows the results of the “Religious Aspects” dimension.

(16) Graph N°12 “Religious Aspects Dimension”

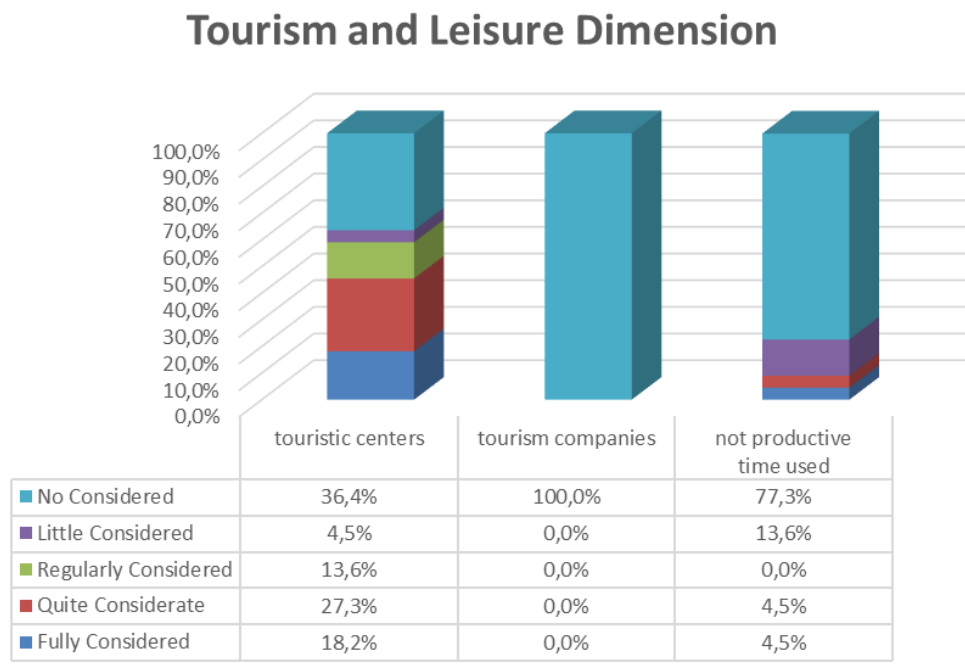


Source: Results of the Investigation (Self resources – structured observation)  
 Personal elaboration

According to the analysis done the indicator of “areas of special interest” like cemeteries and religious facilities in considered in 4.5% of the total sample, also 18.2% of the evaluations reviewed take into consideration the indicator “patterns and religious characteristics”, and unfortunately the “religious services and centers” indicator is ignored or omitted in the diagnosis of all the 22 EIAs that were randomly selected for the sample. Even if these indicators are catalogued as others, knowing that Bolivia is a highly religious country some aspects and factors should be taken into consideration in a more serious way, because people will bases their lives around their believes, and moreover, there is a reason that they are included in the regulations of the country so ignoring them is not a feasible solution.

Finally, graph N° 13 shows the results of the “Tourism and Leisure” dimension and only three indicators are mentioned and those are; “touristic centers”, “tourism companies” and “not productive time used”, which are considered 45.5%, 0% and 9.1% respectively from the EIA's of the sample. This is a dimension that should be taken with more credit, especially if we talk about the economy how none of the evaluations mention in their socioeconomic diagnosis any information regarding tourism businesses is definitely a step in the wrong direction for sustainability, hence, tourism is a important part of economy that Bolivia is not promoting as how it should and we can see the governments reflection and ideology on the approved evaluations by the Ministry.

(17)Graph N°13 “Tourism and Leisure Dimension”



Source: Results of the Investigation (Self resources – structured observation)  
Personal elaboration

### 5.1.3. Techniques used in the evaluation of EIAs

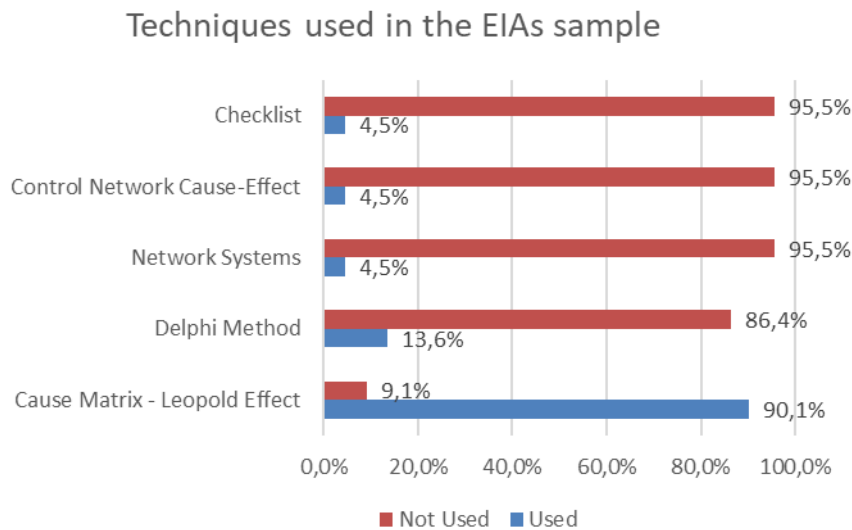
Once the diagnosis of the initial socioeconomic status has been made as a main part of the EIA's, the evaluation techniques are described, they usually employ consulting companies and or consulting professionals for the characterization and qualification of impacts in the socioeconomic and

environmental impact assessment phase. Addressing that at this point the techniques taken continue being the ones of the sample for the investigation.

There are different techniques that are applied to the EIAs which are conformed by identification, prediction and evaluations, where identification refers to the identification of the effects that the activities of each of the phases of the projects will cause on the environment. Prediction refers to the prognosis of the behaviour of the impacts previously identified over time, taking as reference the lifetime of the project for example. And evaluation refers to the development of a judgment value about the impacts identified, in order to establish a prioritization of these and that at the same time allows to identify and define the mitigation measures that are achieved, in the most appropriate possible way.

The results of the analysis of the use of techniques show the following aspects. It should be denoted that each EIA can use not only one but multiple techniques according to what the consultants believe will be better for the indicators evaluated and the project in general:

(18) Graph N°14 “Techniques used in the EIAs sample”



Source: Results of the Investigation (Self resources – structured observation)  
 Personal elaboration

It can be seen that the most used is the “cause matrix - Leopold effect” in 90.9% of the total of the sample, what basically means that 20 EIA's use it, being recommended by the Regulation of Environmental Prevention and Control, consists of a series of columns and rows, which contain the weighting of positive and

negative impacts to the different environmental attributes such as; air, noise, socioeconomic and soil, and activities for each of the stages of the project.

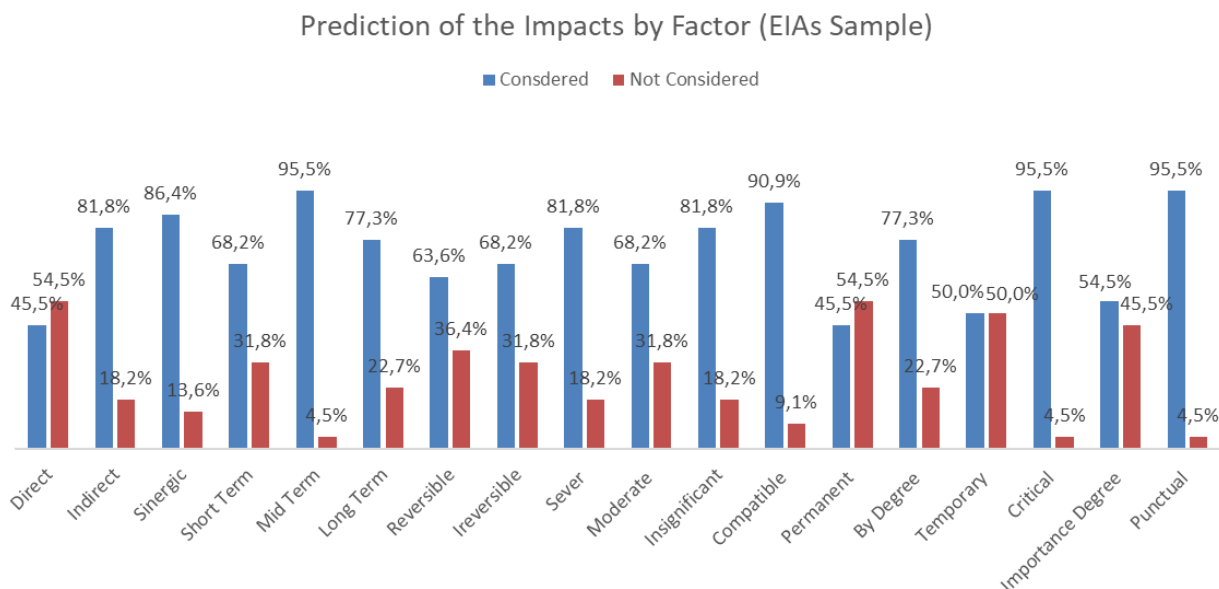
The “Delphi method” is considered in 13.6% of evaluations, which means that 3 studies apply it.

With equal percentages are “network systems”, “control network cause-effect” and “the checklist” where it is observed that only 1 EIA considers it in the identification of impacts of socioeconomic factors and actions of the project in the different stages or phases that are contemplated.

#### 5.1.4. Evaluation and Prediction of the EIAs Impact

In this section we proceed to predict and evaluate the associated environmental impacts to each factor considered in the EIAs, determine what will be the magnitude of the identified impacts. Through the criteria of evaluation, which allows to know the type of impact, its magnitude, importance and prioritization of the most affected factors.

(19) Graph N°15 “Prediction of the Impacts by Factor (EIAs Sample)



Source: Results of the Investigation (Self resources – structured observation)  
Personal elaboration

Graph N° 16 shows us the degree of evaluation considered at the moment to make the impacts prediction. From which the following results are obtained:



In the EIAs an impact analysis is done under the criteria assessment of socioeconomic components, like: direct, moderate, severe, and others, where they perform a weighting and characterization of the impacts according to the degree of importance that could be extreme, high, medium or low. According to the analysis carried out on the 22 randomly selected EIA's, the research sample reaches the following conclusions.

1) At the time of making the Baseline or diagnosis of the initial state of the existing environment, it was first observed that the same socioeconomic variables are not used nor all the indicators mentioned here, each consultancy company or consultant includes the components that they think fits better; nevertheless, even if they considered them less or not important at all they should be minimally included in their socioeconomic analysis, or explain why they are not being accountable.

2) Indicators that were not considered within the socioeconomic structure used for socioeconomic studies warn us that not using them can and will lead to problems and negative impacts in economic, social and cultural levels, making a non-sustainable society.

3) The main variables and indicators that are not considered are: employment, unemployment rates, GDP, GDP per capita, migration, commercialization systems, tax levels, household equipment, maternal mortality, competition of studies, environmental history, and tourism companies among others, being these ones extremely important within the economic and social context. It is more than essential to know the economic situation of the region and the country, the levels and economic activities of production and marketing of its products; together with the level of employment and poverty in the area where the activity or project is being developed. These ones are investment generators, of aggregated value and economic movements in communities. (Maitah, M., 2017)

The application of the mentioned indicators must be considered in order to avoid and mitigate negative impacts generated by the activities, public works or projects that the EIAs evaluate.

4) Regarding the use of environmental impact assessment techniques, it was possible to note that the most used is the “cause-effect matrix”, in which only 2

EIA did not use it, which is very important since they use the evaluation matrix established by the Regulation of Environmental Prevention and Control.

5) On the other hand, regarding the typology and classification of impacts, it was possible to observe that not all typologies are considered in equal magnitude. When reviewing them, we could observe that the types of impacts such as; direct, indirect, reversible, irreversible, etc., are incorporated in their analysis mainly if the results are positive and they apply them with a literal description of their behaviour for the conclusions, instead of having a proper analysis.

6) At the time of the socioeconomic impact assessment, it was observed that its objective is to determine the degree of ranking and priority of impacts evaluated. In addition, that each consulting company incorporates the variables and indicators that they want to consider, which shows that there is an absence of minimum criteria which generates differences in the identification, prediction and evaluation of socioeconomic impacts and makes harder a correct assessment of the impacts.

7) Some consultants develop an environmental assessment index or rating of the impacts, this according to the stages of the project and the magnitude of the expected change, that way they no longer perform an analysis of each of the socioeconomic components and is more to professional judgment.

8) After having done the research by means of the analysis previously developed, the conclusion is that there are no standard socioeconomic criteria; in none of the indicators analysed independently. Therefore, the research hypothesis is proved (confirmed) *“The absence of minimum criterions to guide the socioeconomic studies in the Environmental Impact Assessments “EIA” (second category – specific analytical) generates differences in the evaluation and prediction of quantitative and qualitative environmental impacts. Delaying the process of Sustainable Development in Bolivia”*.

## **5.2. Developed Interviews to Experts**

### **5.2.1. Presentation**

In the present investigation, the semi-structured interview was used, this one being defined in the Approach to the Study. A recollection of information was

made from the personal interviews with a dialogue between the interviewer and the interviewee with non-limiting open questions in order to obtain more data and information. Being the one that best fits the characteristics of the study. The interviews were aimed at companies and consultants dedicated to prepare EIAs, which are registered in the National Business Directory of Environmental Consultants and Consultancies, whose data was obtained from the Ministry of Environment and Water. In addition, also interviews with Environmental Authorities of the Vice Ministry of Sustainable Development. The main objective of the interviews is to know under what criteria and methodological basis are elaborated the socioeconomic studies of EIAs. Both interviews correspond to a line of qualitative and both types of interviews were conducted unoriented towards the same particular topics with the same focus of questions.

### **5.2.2. Interviews to Companies**

The results of the investigation are presented below, considering the approaches to the judgments of professionals who have knowledge in relation to their area of specialization and mainly knowledge of the socioeconomic aspect. Where 8 questions were asked to 10 Consultants and their opinions and highlights will be synthesized in order to systematize the information.

#### **1) How many EIAs of second category have you or your company produced?**

According to the results, the following information was obtained; some consultants carry out many EIAs of second category, but others only a few, and many of them perform EIAs of first category as a preference. among the total EIAs done by the 10 interviewed consultants, it was averaged that each of them does 12 EIA second category, but not all of them ended up approved.

#### **2) From your point of view. What importance do socioeconomic studies have in relation to other studies such as vegetation or geology that you perform?**

The common denominator judgment value revolves around the point of view that socioeconomic studies in an EIAs are a very important aspect that

depends on the type of project, in addition of being required by law, these studies are necessary but do not distinguish some degree of hierarchy with other components such as physical studies. Over time they have become more important to the other evaluations, because of the regulations.

**3) From your perspective. When you are in the process of making socioeconomic studies, do you consider that obtaining information is easy or seems complex?**

The answers move around the insights that it is a bit complex to obtain information, in some cases data from statistic institutions such as “INE”, “UDAPE”, and some municipalities that have the “POA” or the “PDM”, is used in many of them, but it depends on the scope that is given to the socioeconomic study of the project and the sector, because in some places there is no information at all and in others there is.

**4) When do you do the diagnosis of the initial state (Baseline) of the socioeconomic factor and which variables are considered for social, economic and cultural values?**

The interviewees indicated that they are based on the Law, but it is based on a type of draft. As there are no requirements, the most relevant variables must be considered because the time of elaboration is minimal. Of course, all should be included in possible factors and should also be prioritized. And for the variables, they are entered through tables that were pre-made or predetermined matrices from previous works. On the other hand, some of them mentioned that information is collected from some projects that were already elaborated.

**5) What are the methodological criteria used in the preparation of an EIA specifically for a socioeconomic study?**

The interviewees indicate that they have their own company methodology which is a working tool, depending on the type of project and the area where impacts are evaluated. It is analysed if the project is socially, economically and technically viable.

Above all, what is established is strictly considered with the Law, in the “RPCA”, which give guidelines and administrative techniques for the preparation of EIAs documents. Similarly, bibliography, primary and secondary information, surveys, total or partial censuses are useful; also, direct and indirect variables, interviews with ex executives based on what you want to identify.

**6) From your point of view. What are the minimum contents that manifest the EIAs that you elaborated, in relation to the socioeconomic factor?**

The interviewees consider that Law N° 1333 and its regulations include a basic format with three components: social, economic and cultural. Also, public consultation is in important.

Based on this, some topics depend on the type of project, sector and other factors. Since there are no guidelines or anything standardized, everyone does as they see fits better. The works that are elaborated have different contents, some studies require deeper analysis, which depend on the economic factor, but for them time is more important.

**7) When you perform an EIA, in the socioeconomic study do you use methodological guides and indicative manuals?**

The interviewees point out that: firstly, there are the legal regulations that is Law No. 1333 and its regulations, then Bolivian norms, corresponding to each area. There are methodological guides, bibliography, own experience and other guides or indicative manuals from other countries and are adapted to the reality of Bolivia. They have a database and it is filled in a form already outlined in function to the evaluation for each type of project. However, the format provided by the “RPCA” is only indicative and not precise.

**8) Do you consider that it would be pertinent to design a methodology that is a working instrument for the quantitative and qualitative EIAs aspects of a Project, Public work or Activity?**

The answers revolve around the following considerations: When making an Environmental evaluation is highly subjective and not as technical.

### **5.2.3. Interview to Advisors of the Ministry of Sustainable Development**

A total of 5 interviews were conducted with technician, advisors and officers representing the Ministry of Environment and Water, whose function is to review the EIAs as a competent environmental authority. 7 questions were asked which will be described compendium of the most important points of view for the present investigation.

**1) How many EIAs second category have been reviewed and approved by the public institution where you work?**

All the informants point out that the number of EIAs can only be determined in their private database, and they do not know the numbers by memory.

**2) From your point of view. When you prepare the technical report of an EIA, what is the importance of the socioeconomic factor in comparison with other factors?**

The interviewees denote that within an EIA there are six factors indicated by the Law, and its importance lies even more when the activity, public work or project are focused on a protected area. It is relative but it has its importance just like the other factors, all are relevant, none is less important, all are environmental matters.

**3) What are the methodological criteria used at the time of evaluating an EIA specifically for the socioeconomic study?**

The interviewees mention that the evaluation of the environmental study depends on the sector, for example hydrocarbons the legal representative presents to the Ministry of Hydrocarbons through its environmental unit, where they do a technical review in detail, once they consider that the study is correct they make a report recommending viability. By Law it is reviewed again in a pre-established period, based on the “*Law N° 1333 Art. 23 to Art. 35*”. Then the document of disclosure where the company makes a project presentation so that the form of the area of influence know that the project will bring positive and negative outcomes.

The community members of the place present their observations, suggestions in such a way that the company incorporate them into an EIA.

**4) From your perspective, what are the minimum contents that have the EIAs reviewed and approved by your institution, in relation to the socioeconomic factor?**

The interviewees declare that the minimum content has already been worked out, this in the regulations for public consultation and its framed a lot in the Law N° 1333. The relation is about regulating and setting rules on how to fill out the legal forms.

**5) When you review and approve an EIA for socioeconomic studies what methodological guides and indicative manuals, are used as official assessment instruments.**

The interviewees indicate that first the Law, second the regulations, third the specific regulations, according to the “RPCA” according to the category. Also, you have to do a physical examination, and minimally enforce general technical standards with all the points, plus the specific chapter of the “RPCA” where it indicates everything a project should contain and then the assessment is done. Nonetheless, it must be stated that for the hydrocarbon and mining sector there are two environmental regulations, the other sectors do not have any regulations.

**6) What opinion deserve the work of consulting companies or consultants that elaborate EIA, regarding the socioeconomic study?**

The interviewees answer that since the promulgation of the Law N° 1333 in 1992 and its regulations in 1995, it has been 28 years of application of the Law, and you can see that they have improved a lot. The oil sector is the one that has advanced the most since it is the sector that has the most economic resources. Where the environmental control along with social participation is better in relation to other sectors in the country.

**7) Do you consider that it would be pertinent to design a methodology that is a working instrument for the quantitative and qualitative EIA aspects of a Project, Public work or Activity?**

All the interviewees consider that it would be good, of course with minimum parameters which would contribute to the improvement in the elaboration of EIA.

#### **5.2.4. Analysis and Discussion of the semi-structured interviews**

From the responses obtained by the representatives of the consulting companies and by the environmental authority the following conclusions of this chapter are reached:

1) The interviewees point out that the fundamental basis for the preparation and review of an EIA is the Law and the Regulation of Environmental Prevention and Control.

2) Socioeconomic studies have the same degree of importance as the other environmental factors established by the law, therefore there is no hierarchy and none of them is more important than the others.

3) They declare and accept that although the norm establishes the criteria considered in the “socioeconomic” aspect these ones do not have standardized guidelines and are very general. Therefore, they apply the experience that the consultants, and also that each one does according to their personal criteria and professional judgment.

4) When the consultants carry out the Baseline of the socioeconomic factor, it does not exist clearly in the Law what variables or indicators to consider; neither includes all possible factors, nor prioritizing the most important ones. They are done through information from some similar projects or surveys.

5) Despite having the Law and its regulations, these do not clearly indicate how to elaborate the socioeconomic part of the EIA, for this reason since there is no clear guidelines, nor standardized parameters then the socioeconomic studies are at their own discretion and depending on the type of activity or project to be produced. And it's based on a non-updated system.



6) There is still no guide as a basis and complement on the elaboration of the socioeconomic studies, in many cases they are forced to search the bibliography of other countries, which is not according to the reality of the country. For this reason, the interviewees consider the design of a pre-established methodology, with main guidelines, and with a quantitative and qualitative database. That serves for the quantitative and qualitative assessment of EIAs. It would be useful to prepare one, which would facilitate environmental management and would be sustainable.

7) Having a pre-established methodology would be useful, with main guidelines of a socioeconomic analysis and framed within the terms of the Law, and an updated version of this one, which would facilitate environmental management evaluation. Since there are no standardized criteria that benefit the environmental sector and, in many cases, there is only a bibliography of projects already prepared. There are many factors that should be identified and considered due to the variability of Projects. Then elaborating an assessment by constructing indicators and a quantitative database as a checklist. The manual of the Ministry of Environment and Water is very general and not complete; therefore, based on this document, another manual should be considered and studied in depth and propose to the instances to maximize its applicability.

## 6. Suggested Solution and Recommendations

The research was mainly framed in the socioeconomic aspects at the time of conducting an EIA, without considering the other environmental factors, which are air, water, soil, ecology, noise, in addition to being a very determining part in the evaluation of the impacts, it turns out to be indispensable for its incorporation to avoid alterations in the socioeconomic factors, which minimizes the time, costs and human resources in the programs of mitigation of the impacts.

The Regulation of Environmental Prevention and Control arises as a response to the protection and defence of the environment under the verification of compliance with policies, in order to prevent early environmental problems and the deterioration of the population's quality of life that are generated at the time of performing some public work, activity or project.

The norms and regulations of environmental management do not facilitate the way in which a socioeconomic studies should be prepared, nor do they provide the criteria of revision of the EIA, which are presented to the environmental authority in many cases being these ones incomplete and without considering all the minimum necessary aspects.

Both in the identification, prediction and evaluation of positive and negative impacts, use different methodologies, different ways of evaluating and the impacts classifications are very varied, in addition, to handling different criteria of quantitative and qualitative evaluation: therefore, there is no standardization of variables.

It would be very important to consider the indicators analysed in the research minimally and to consider them in different stages of the EIA, particularly when fulfilling the socioeconomic study.

Remark the importance of considering the minimum methodological criteria to establish standardization parameters in the EIA of second category, whose purpose is to be the basis for the preservation, conservation, improvement and restoration of the socioeconomic environment, in addition of being important to define an analysis of socioeconomic impacts, they should realize public consultations with a greater citizen

participation, a mitigation of negative externalities and then perform a cost benefit analysis to see if it is feasible or not to develop a project.

The consultant that develops the project in different sectors must perform a good set of criteria managements, professional judgment, consistency in the way in which the Environmental Impact Assessments are detailed and a prioritization of those factors that may cause unfavourable or negative effects to society.

At the time of performing the identification, prediction and evaluation of impacts, the evaluation methods vary, so the recommendations of the RPCA must be used, which is the matrix of the “Cause - Effect” of impact evaluation.

The proposal suggested of the present research work is a complement to the already created process of realization of socioeconomic studies in the specific analytical EIAs, it is a working instrument for the analytical performance of the assessment and prediction of quantitative and qualitative socioenvironmental impacts, taking into account the aspects involved in a socioeconomic study, which are the identification of positive impacts, identification of negative externalities and a determination of weighted criteria that should be standardized for the correct decision-making of environmental impacts in a project, public work or activity

To avoid differences in the assessment and prediction of quantitative and qualitative impacts, the quantifiable effects of the negative impacts on the main macroeconomic variables and aggregates such as national income, inflationary processes and others, must be estimated and the indicators of migration rates, infrastructure changes, health, archaeological remains or alters the cultures of the inhabitants of the region should be checked.

## 7. Conclusion

As suspected prior to the beginning of the investigation the Hypothesis presented in the research: *“The absence of minimum criteria to guide the socioeconomic studies in the Environmental Impact Assessments “EIA” (second category – specific analytical) generates differences in the evaluation and prediction of quantitative and qualitative environmental impacts. Delaying the process of Sustainable Development in Bolivia”* was confirmed and proven to be one of the causes that the country is far from what its politicians affirm. Unfortunately, Sustainability is not a reality that the citizens of the country experience and this research proves that assessment and control of the law enforcement is missing.

When the review of the EIA obtained from the sample was accomplished, it was evident that the suspicion at the beginning of the investigation was right and that there are no minimum parameters or criterion that a socioeconomic study should contain within a specific analytical EIA, each consultant considers the socioeconomic indicators that it considers best.

When setting the "baseline" that is, the situation before the project is prepared, this being the first step in the development of an EIA, socioeconomic indicators that are necessary and precise should be considered in order to avoid effects on the economic, social and environmental factors. Knowing the pre-existing situation implies establishing basic guidelines so that in the socioeconomic factor an appreciation of the economic performance and behaviour of the main economic aggregates is required.

Establishing a correct evaluation of the possible impacts together with methodologies that facilitate the management of socioeconomic indicators, which will lead to a better implementation of the project, a correct identification and prediction of socioeconomic impacts avoids the cause of negative externalities, it should be the basis for the definition and adoption of the decisions to be taken in the impact mitigation measures. So that when the completion of the project is completed, it will be raised on the basis of essential factors and indicators that should be considered in the EIA of second category.

In the identification of the socioeconomic variables to be affected, it was observed that relatively the impacts will be positive, because in many cases it will be temporary.

When making a macroeconomic evaluation, a recollection and identification of the central socioeconomic impacts, of the most important characteristics of the situation which are the contribution to the region's economy, the impact on the pace of economic growth , the dynamism in the economy, benefits in direct investment in economically depressed areas and without work alternatives, increase commercial activities such as demand for services, improvement in lifestyle, would allow the reinvestment of capital for the expansion of the project and its set for the development of the region and the country

The environmental authorities often do not fulfil their functions well, there is no good control and monitoring of environmental management, since there is no standardization with minimum necessary parameters in the EIA either, which leads them to consider what they think is most essential and depending on the type of project, they use the Environmental Law and the Regulation of Environmental Prevention and Control very vague; On the other hand, other consultants are based on methodologies from other countries or, failing that, they observe similar projects in the area that they are realizing them, and that has already been done, which generates differences in the assessments of environmental impacts.

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## 9. Appendix

*Appendix N° 1 “List of EIAs approved by the Ministry of Environment and Water between 2007 – 2018 period”*

<b>EIA Code</b>	<b>Name of the Project</b>	<b>Place</b>
<b>EIA – 24/07</b>	Perforación Pozo Sararenda X-1 (Sararenda X-1 Well Drilling)	Santa Cruz
<b>EIA – 63/44</b>	Línea de Transmisión Kamutu (Kamutu Transmission line)	Potosí
<b>EIA – 23/09</b>	Carretera Ambano (Ambano Highway)	La Paz
<b>EIA – 22/94</b>	Construcción del Puente Alfonso Reyes (Alfonso Reyes Bridge construction)	Cochabamba
<b>EIA – 43/95</b>	Línea de Transmisión Carrasco (Carrasco Transmission line)	Cochabamba
<b>EIA – 23/00</b>	Perforación Pozos Exploratorios Surubi N-X1, X2 y X3 (Surubi N-X1, X2 and X3 Exploration Well Drilling)	Cochabamba
<b>EIA – 33/99</b>	Camino Curqui – Verdiguera (Curqui – Verdiguera Road)	Tarija
<b>EIA – 10/81</b>	Perforación del Pozo La Vertiente -11 (La Vertiente - 11 Well Drilling)	Tarija
<b>EIA – 13/49</b>	Perforación Exploratoria de Pozos SBL-X2, y SBL-X-3 (SBL-X2, and SBL-X-3 Exploratory Well Drilling)	Tarija
<b>EIA – 23/62</b>	Construcción Centro Yapacani (Yapacani Center Construction)	Santa Cruz
<b>EIA – 03/39</b>	Ferrocarril Puerto Suárez (Puerto Suárez railway)	Santa Cruz
<b>EIA – 73/74</b>	Línea de Transmisión Punutum (Punutum Transmission line)	Potosí
<b>EIA – 89/06</b>	Explotación de la Mina Chororna (Exploitation of the Chororna Mine)	Potosí
<b>EIA – 93/41</b>	Terminal Portuaria en el Rio Paraguay (Port Terminal on the Paraguay River)	Santa Cruz
<b>EIA – 10/96</b>	Circunvalación de Villania (Villania Main Avenue)	La Paz
<b>EIA – 41/16</b>	Fundición de Estaño (Tin Foundry)	Oruro
<b>EIA – 22/72</b>	Prospección sísmica 2D (2D seismic prospecting)	Santa Cruz
<b>EIA –</b>	Asociación de Mantenimiento Vial	Cochabamba



<b>30/25</b>	(Road Maintenance Association)	
<b>EIA – 24/72</b>	Ampliado y Remodelación Planta Generadora Camiri (Camiri Generating Plant Expansion and Remodeling)	Santa Cruz
<b>EIA – 71/16</b>	Fundición de Estaño (Tin Foundry)	Oruro
<b>EIA – 24/14</b>	Mejoramiento del Tramo Irupana - La Plazuela (Improvement of the Irupana - La Plazuela Section)	La Paz
<b>EIA – 24/15</b>	Mejoramiento del Camino Caranavi - Guanay (Caranavi - Guanay Road Improvement)	La Paz
<b>EIA – 24/16</b>	Mejoramiento del Camino Lámbate - La Plazuela (Improvement of the Road Lámbate - La Plazuela)	La Paz
<b>EIA – 24/17</b>	Mejoramiento del Camino Caxata – Lloja (Improvement of the Road Caxata – Lloja)	La Paz
<b>EIA – 80/81</b>	Perforación del Pozo La Vertiente -18 (Well Drilling La Vertiente -18)	Tarija
<b>EIA – 15/19</b>	Repavimentación, Mantenimiento y Administración de la Carretera Beni (Repaving, Maintenance and Administration of the Beni Highway)	Beni
<b>EIA – 90/26</b>	Transversal Juana Azurduy de Padilla (Transversal Road Juana Azurduy de Padilla)	Chuquisaca
<b>EIA – 18/31</b>	Proyecto La Mamora - Emborozú (La Mamora - Emborozu Project)	Tarija
<b>EIA – 23/42</b>	Construcción Planta Criogénica Campo Carrasco (Construction of the Carrasco Field Cryogenic Plant)	Cochabamba
<b>EIA – 24/92</b>	Planta de Refinación de Hidrocarburos (Hydrocarbon Refining Plant)	Santa Cruz
<b>EIA – 40/27</b>	Puente Vial sobre el Río Pilcomayo (Road Bridge for the Pilcomayo River)	Tarija
<b>EIA – 40/28</b>	Puente Bóra (Bora Bridge)	Oruro
<b>EIA – 53/39</b>	Ferrocarril Puerto Busch (Puerto Busch railway)	Santa Cruz
<b>EIA – 99/09</b>	Carretera Humacha – Ambanó (Humacha - Ambanó Highway)	La Paz
<b>EIA – 15/77</b>	Interconexión Eléctrica de Monteagudo (Monteagudo Electrical Interconnection)	Chuquisaca
<b>EIA – 12/29</b>	Perforación Exploratoria y Explotación del Pozos N J I- X - 1 10 (Exploratory Drilling and Well Exploitation N J I- X - 1 10)	Santa Cruz
<b>EIA – 23/52</b>	Pozo Exploratorio Rosario del Ingre X-1 (Rosario del Ingre X-1 Exploratory Well)	Chuquisaca
<b>EIA – 20/34</b>	Desarrollo del Campo Llnoa (Development of the Llnoa Field)	Cochabamba
<b>EIA – 23/08</b>	Construcción de Avenida Obrajes (Obrajes Avenue construction)	Oruro

EIA – 24/09	Expansión del Gasoducto al Altiplano (Expansion of the Gas Pipeline to the Altiplano)	La Paz
EIA – 83/39	Ferrocarril Puerto Bahía (Puerto Bahía railway)	Santo Cruz
EIA – 73/41	Terminal Portuaria en el Río Mamore (Port Terminal on the Mamore River)	Santa Cruz
EIA – 15/39	Perforación Pozo de Carambo (Carambo Well Drilling)	Santa Cruz
EIA – 64/72	Ampliación y Remodelación Planta Generadora CRE – Camiri (Cre – Camiri Generating Plant Expansion and Remodeling)	Santa Cruz
EIA – 20/34	Desarrollo del Campo Anata (Development of the Anata Field)	Cochabamba
EIA – 24/71	Perforación Pozo Caranda – 1008 (Caranda - 1008 Well Drilling)	Santa Cruz
EIA – 65/39	Perforación Pozo Urubo (Urubo Well Drilling)	Santa Cruz
EIA – 35/55	Planta de Bórax (Borax plant)	Oruro
EIA – 20/34	Desarrollo Campo Kanatu (Campo Kanatu Development)	Beni
EIA – 24/70	Proyecto Minero Poopó (Poopó Mining Project)	Oruro
EIA – 95/68	Construcción de Centro Piñata (Construction of the Piñata Center)	Pando
EIA – 25/01	Perforación Pozo Suruhi N° 4 y 5 (Suruhi N° 4 and 5 Well Drilling)	Cochabamba
EIA – 55/21	Concesión Minera Motosolo (Motosolo Mining Concession)	La Paz
EIA – 14/78	Mejoramiento carretera Viacha - Thola Kollo (Viacha - Thola Kollo road improvement)	La Paz
EIA – 90/29	Mejoramiento de Caminos Vecinales – Sucre (Neighborhood Roads Improvement – Sucre)	Chuquisaca
EIA – 11/68	Perforación de Pozos RG D -78 D, RGD 81 D y RG D -82 D, Bloque Grigotá (Well Drilling RG D -78 D, RGD 81 D and RG D -82 D, Grigota Block)	Santa Cruz
EIA – 37/71	Perforación Pozo de Desarrollo Caranda – 1093 (Caranda Development Well Drilling – 1093)	Santa Cruz
EIA – 60/82	Perforación del Pozo La Vertiente -19 (La Vertiente - 19 Well Drilling)	Tarija
EIA – 84/72	Ampliación y Remodelación Planta Generadora CRE – Salvador (Expansion and Remodeling of the CRE – Salvador Generating Plant)	Santa Cruz
EIA – 14/32	Desarrollo y Explotación del Campo Margarita (Development and Exploitation of the Margarita Field)	Tarija
EIA –	Perforación Exploratoria Pozo Huacaya	Chuquisaca

<b>25/33</b>	(Huacaya Well Exploratory Drilling)	
<b>EIA – 15/52</b>	Actualización de Línea Base Porapoli (Porapoli Base Line Update)	Santa Cruz
<b>EIA – 25/04</b>	Perforación Pozo Exploratorio Cuevo (Cave Exploration Well Drilling)	Santa Cruz
<b>EIA – 25/51</b>	Ampliación de la Estación Cochabamba (Cochabamba Station Expansion)	Cochabamba
<b>EIA – 11/68</b>	Intervención Pozo Rio Grande - 50, Bloque Grigotá (Intervention Pozo Rio Grande - 50, Grigota Block)	Santa Cruz
<b>EIA – 34/30</b>	Sistema de alcantarillado Sanitario y Lagunas de Estabilización de Buena Vista (Buena Vista Sanitary Sewer System and Stabilization Lagoons)	Santa Cruz
<b>EIA – 24/82</b>	Sísmica 3D Huacaya, Útoquo Caipipondi (3D Seismic Huacaya, Útoquo Caipipondi)	Chuquisaca
<b>EIA – 25/26</b>	Construcción Pista de Aterrizaje Izog (Izog Landing Strip Construction)	Santa Cruz
<b>EIA – 25/45</b>	Interconexión Eléctrica Punutuma (Punutuma Electrical Interconnection)	Potosí
<b>EIA – 30/26</b>	Interconexión Eléctrica La Deseada (La Deseada Electrical Interconnection)	Chuquisaca
<b>EIA – 52/93</b>	Mejoramiento de Caminos Vecinales (Punutuma Electrical Interconnection)	Chuquisaca
<b>EIA – 52/79</b>	Electrificación Rural Fase III (Rural Electrification Phase III)	Cochabamba
<b>EIA – 11/68</b>	Programa Estratégico de Perforación - Campo Rio Grande (Strategic Drilling Program - Campo Rio Grande)	Santa Cruz
<b>EIA – 14/13</b>	Programa Estratégico de Desarrollo Campo Víbora (Campo Víbora Strategic Development Program)	Santa Cruz
<b>EIA – 17/26</b>	Proyecto Minero Piloto San Vicente (Pilot Mining Project San Vicente)	Potosí
<b>EIA – 24/32</b>	Proyecto Piloto San Simón (Pilot Mining Project San Simon)	Beni
<b>EIA – 14/17</b>	Programa Estratégico de Desarrollo del Campo Sirari (Sirari Field Strategic Development Program)	Santa Cruz
<b>EIA – 43/60</b>	Proyecto de Electrificación Rural Arom (Rural Electrification Project Arom)	La Paz
<b>EIA – 23/35</b>	Circunvalación La Laguna (La Laguna Main Avenue)	La Paz
<b>EIA – 31/55</b>	Planta de Tratamiento de Aguas Servidas Para la Población de Ascensión de Guarayos (Sewage Treatment Plant for the Population of Ascensión de Guarayos)	Santa Cruz
<b>EIA – 21/39</b>	Manejo y Tratamiento de Residuos Sólidos en la Reserva de Fauna Andina Eduardo Avaroa	Potosí

	(Management and Treatment of Solid Waste in the Eduardo Avaroa Andean Fauna Reserve)	
<b>EIA – 23/18</b>	Manejo y Tratamiento de Residuos Sólidos en el Área Protegida en el Parque Nacional de Toro Toro (Management and Treatment of Solid Waste in the Protected Area in the Toro Toro National Park)	Potosí
<b>EIA – 39/16</b>	Proyecto Minero Urus (Urus Mining Project)	Oruro
<b>EIA – 38/32</b>	Urbanización Gran Paititi (Gran Paititi Urbanization)	Santa Cruz
<b>EIA – 40/33</b>	Urbanización Pontaguazú (Pontaguazú urbanization)	Santa Cruz
<b>EIA – 25/44</b>	Instalación de una Turbina a Gas Natural (Installation of a Natural Gas Turbine)	Chuquisaca
<b>EIA – 25/53</b>	Programa Sísmico 2D Cuevo (2D Cave Seismic Program)	Santa Cruz
<b>EIA – 53/35</b>	Proyecto de Electrificación Rural Arauca (Arauca Rural Electrification Project)	La Paz
<b>EIA – 24/34</b>	Tecnologías Metalúrgicas TECMET S.R.L. (Tecnología Metalúrgicas TECMET S.R.L.)	Oruro
<b>EIA – 14/17</b>	Programa Estratégico de Desarrollo del Campo Sirari (Sirari Field Strategic Development Program)	Santa Cruz
<b>EIA – 36/28</b>	Planta de Bórax (Borax plant)	Oruro
<b>EIA – 25/15</b>	Cenital Hidroeléctrica de Quehala (Quehala Hydroelectric zenith)	La Paz
<b>EIA – 25/43</b>	Instalación de una Turbina a Gas Natural en la Planta Aranjuez (Installation of a Natural Gas Turbine at the Aranjuez Plant)	Chuquisaca
<b>EIA – 19/74</b>	Construcción Múltiple (Multiple Construction)	Beni
<b>EIA – 25/62</b>	Pozo Exploratorio BO A - X 1 (BO A - X 1 Exploratory Well)	Santa Cruz
<b>EIA – 30/70</b>	Carretera Salamanca – Uyuni (Salamanca - Uyuni highway)	Potosí
<b>EIA – 72/07</b>	Electrificación Rural Fase III (Rural Electrification Phase III)	Cochabamba
<b>EIA – 73/00</b>	Perforación Pozos Suntbi (Wells Drilling Suntbi)	Cochabamba
<b>EIA – 20/53</b>	Presa Colas (Dam Colas)	Santa Cruz
<b>EIA – 15/07</b>	Ampliación del Área de Almacenamiento de la Refinería Oro Negro (Expansion of the Storage Area of the Oro Negro Refinery)	Santa Cruz
<b>EIA – 17/67</b>	Explotación Minera Kori Chaca (Kori Chaca Mining)	Oruro

EIA – 21/45	Nueva Presa de Cuotas Chillmoco (New Chillmoco Quota Dam)	Potosí
EIA – 31/21	Obra de Bifurcación del Rio Desaguadero (Bifurcation of the Desaguadero River)	Oruro
EIA – 20/24	Asfaltado de la Carretera Vincha – Charaña (Asphalting of the Vincha - Charaña Highway)	La Paz
EIA – 18/31	Tramo Üesem boquo (Üesem boquo section)	Tarija
EIA – 14/32	Desarrollo y explotación del Campo Margarita (Development and exploitation of Campo Margarita)	Tarija
EIA – 35/22	Programa de Revitalización y Desarrollo Urbano de La Paz (Revitalization and Urban Development Program of La Paz)	La Paz
EIA – 21/16	Fundición de Estaño (Tin Foundry)	Oruro
EIA – 20/34	Instalación de una Línea de Prueba de G (Installation of a G Test Line)	Cochabamba
EIA – 21/86	Desarrollo Campo Tacobo (Campo Tacobo Development)	Santa Cruz
EIA – 20/16	Construcción del Parque de Ingenios San Antonio (Construction of the Ingenios Park San Antonio)	Potosí
EIA – 21/57	Perforación Exploratoria de los Pozos P T JE -X 1 y YPC -E -X1 (Exploratory Drilling of Wells P T JE -X 1 and YPC -E -X1)	Santa Cruz
EIA – 21/90	Sísmica 3D Sara Bo (3D Seismic Sara Bo)	Santa Cruz
EIA – 21/99	Sísmica 3D Camiri (3D Seismic Camiri)	Santa Cruz
EIA – 19/06	Explotación de Desmontes y de la Mina Chorom (Mining and Mine Exploitation of Chorom)	Potosí
EIA – 19/C0	Carretera Kuchu - Santa Bárbara (Kuchu - Santa Barbara Highway)	Potosí
EIA – 21/13	Sistema de Alcantarillado Sanitario Para la Ciudad de Cobija (Sanitary Sewer System for the City of Cobija)	Pando
EIA – 20/21	Concesión Minera Motosolo II (Motosolo II Mining Concession)	La Paz
EIA - 3M/23	Aeródromo Carrasco (Carrasco Aerodrome)	Cochabamba
EIA – 41/24	Instalación de una Plata de Fundición de Metales No Ferrosos (Installation of a Non-Ferrous Metal Foundry Silver)	Santa Cruz
EIA – 61/32	Construcción Multiple (Multiple Construction)	Cochabamba
EIA – 16/75	San Bartolomeo (San Bartolomeo)	Potosí
EIA –	Línea de Transmisión San José	Cochabamba

<b>22/06</b>	(San José Transmission Line)	
<b>EIA – 21/15</b>	Perforación Exploratoria Pozo Chasqui (Chasqui Well Exploration Drilling)	Cochabamba
<b>EIA – 20/G3</b>	Asfaltado Chañe - San Pedro - Colonia Pirai (Asphalting Chañe - San Pedro - Colonia Pirai)	Santa Cruz
<b>EIA – 79/60</b>	Carretera Kuchu (Kuchu Highway)	Potosí
<b>EIA – HM/24</b>	Instalación de una Planta de Fabricación de Placas Para Batería (Installation of a Battery Plate Manufacturing Plant)	Santa Cruz
<b>EIA – 23/04</b>	Pozo Exploratorio El Llorade (El Llorade Exploratory Well)	Santa Cruz
<b>EIA – 21/43</b>	Estudio sobre el Chaco Seco (Dry Chaco Study)	Tarija
<b>EIA – 98/49</b>	Perforación Pozo Palo Marcado (Drilling Well Marked Stick)	Tarija
<b>EIA – 50/80</b>	Carretera La Mamora-Desemboque (La Mamora-Desemboque Highway)	Tarija
<b>EIA - 98/05</b>	Construcción Múltiple (Multiple ontruction)	Chuquisaca
<b>EIA - 43/44</b>	Explotación de Desmontes y de la Mina Concenl (Mining and Mine Exploitation of oncel)	Potosí
<b>EIA - 31/01</b>	Obras de Bifurcación del Rio Desaguadero (Bifurcation Works of the Desaguadero River)	Oruro
<b>EIA – 23/02</b>	Electrificación Rural Taso (Taso Rural Electrification)	Cochabamba
<b>EIA – 22/07</b>	Perforación Pozo de Desarrollo Colpa (Colpa Development Well Drilling)	Santa Cruz
<b>EIA – 23/24</b>	Carretera Inca Sonkata - Ovojuyo - La Cumbre (Inca Sonkata - Ovojuyo - La Cumbre Highway)	La Paz
<b>EIA – 21/19</b>	Explotación Minera Rosario de Araca (Rosario de Araca Mining)	La Paz
<b>EIA – 21/46</b>	Gasoducto Colpa (Colpa gas pipeline)	Santa Cruz
<b>EIA – HO/20</b>	Rehabilitación de Redes de Agua Potable y Saneamiento de la Ciudad de Santa Cruz (Rehabilitation of Drinking Water and Sanitation Networks in the City of Santa Cruz)	Santa Cruz
<b>EIA – 20/75</b>	Asfaltado Tramo Vial Puerta del Chacos (Asphalted Road Section Puerta del Chacos)	Tarija
<b>EIA – 16/64</b>	Actualización de Línea de Base Pozos (Baseline Update Wells)	Santa Cruz
<b>EIA – 20/53</b>	Presa de Colas Don Mario (Tailing Dam Don Mario)	Santa Cruz

EIA – 23/66	Planta Lixiviación Clorurante de Plata (Silver Chlorinating Leaching Plant)	Oruro
EIA – 20/40	Circunvalacion La Cumbre (La Cumbre Main Avenue)	La Paz
EIA – 19/05	Construcción de la Carretera Nareuda – Extrema (Construction of the Nareuda - Extrema Highway)	Pando
EIA – 21/41	Programa Sísmico 2D y 3D en el Bloque Caipipendi (2D and 3D Seismic Program in the Caipipendi Block)	Chuquisaca
EIA – 93/94	Actualización de Línea de Base de Pinchada (Pinchada Base Line Update)	Santa Cruz
EIA - 1C/38	Proyecto de Pozos Exploratorios Santa Clara X1 y X2 (Santa Clara X1 and X2 Exploration Well Project)	Tarija
EIA – 18/31	Carretera Chaguaya (Chaguaya Road)	Tarija
EIA – 21/76	Gasoducto Madre Jones (Madre Jones gas pipeline)	Tarija
EIA – 19/55	Línea de Transmisión Sucre (Sucre Transmission Line)	Chuquisaca
EIA – 19/56	Línea de Transmisión Carrasco (Carrasco Transmission Line)	Cochabamba
EIA – 19/57	Línea de Transmisión Santiva (Santiva Transmission Line)	Cochabamba
EIA – 17/08	Perforación Exploratoria Pozo Tomboy X-1 (Tomboy X-1 Well Exploratory Drilling)	Tarija
EIA – 32/B7	Carratera Vincha – Charan (Vincha - Charan Highway)	La Paz
EIA – 20/24	Reconstrucción Central Hidroeléctrica Santa Rosa (Reconstruction of the Santa Rosa Hydroelectric Power Plant)	La Paz
EIA – 22/97	Camino Iscayachi - Curqui – Verdiguora (Iscayachi - Curqui – Verdiguora Road)	Tarija
EIA – 23/20	Línea de Transmisión Aranjuez (Aranjuez Transmission Line)	Chuquisaca
EIA – 23/16	Carretera Santa Bárbara (Santa Barbara Highway)	Potosí
EIA – 19/60	Pozo Exploratorio Rosario Entre Ríos (Rosario Entre Ríos Exploratory Well)	Chuquisaca
EIA – 23/39	Ferrocarril Puerto San José (Puerto San José Railway)	Santa Cruz
EIA – 10/47	Proyecto Minero San Cristóbal S.A. (San Cristóbal S.A. mining project)	Potosí
EIA – 23/30	Construcción de Planta de Separación de Hidrocarburos (Construction of a Hydrocarbon Separation Plant)	Chuquisaca
EIA –	Construcción de Línea en Campo Kanata	Cochabamba

<b>23/19</b>	(Line Construction in Campo Kanata)	
<b>EIA – 23/41</b>	Terminal Portuaria del Rio Foianini (Rio Foianini Port Terminal)	Santa Cruz
<b>EIA – 20/34</b>	Desarrollo Campo Chunorúl (Campo Chunorúl Development)	Cochabamba
<b>EIA – 30/00</b>	Planta de Fabricación de Cementos Asfálticos, Emulsiones Asfálticos, Asfaltados Cortados (Asphalt Cement Manufacturing Plant, Asphalt Emulsions, Cut Asphalt)	Cochabamba
<b>EIA – 17/63</b>	Construcción de Obras de Remediación de Fuentes de Contaminación Originadas en Operaciones Mineras (Construction of Remediation Works for Pollution Sources Originated in Mining Operations)	Oruro
<b>EIA – 17/58</b>	Asfaltado Bermejo (Bermejo asphalt)	Tarija
<b>EIA – 14/32</b>	Desarrollo y Explotación del Campo Carolina (Development and Exploitation of the Carolina Field)	Tarija
<b>EIA – 15/67</b>	Actualización Carretera Pailón - San José - Puerro Juárez (Pailón - San José - Puerro Juárez Highway Update)	Santa Cruz
<b>EIA – 18/53</b>	Perforación Pozo Exploratorio Mamoró (Mamoró Exploratory Well Drilling)	Beni
<b>EIA – 20/36</b>	Pruebas de Producción en Campo Petrolero Camatindi (Production Tests in the Camatindi Oil Field)	Chuquisaca
<b>EIA – HM/19</b>	Proyecto de Riego INCAHUASI (INCAHUASI Irrigation Project)	Chuquisaca
<b>EIA – 30/90</b>	Planta de Fabricación de Cementos Asfálticos (Asphalt Cement Manufacturing Plant)	Cochabamba
<b>EIA – 16/64</b>	Perforación y Explotación Pozo Losqu (Drilling and Exploitation Well Losqu )	Santa Cruz
<b>EIA – 20/75</b>	Asfaltado Vial Puerta del Chaco - Villa Montes (Asphalting of the Puerta del Chaco Road - Villa Montes)	Tarija
<b>EIA – 20/17</b>	Explotación Minera Cangallí (Cangallí Mining)	La Paz
<b>EIA – 20/40</b>	Circunvalación Alto Lima (Alto Lima Main Avenue)	La Paz
<b>EIA – 17/59</b>	Ingenio Metalúrgico ANIMAS (ANIMAS Metallurgical Mill)	Potosí
<b>EIA – 18/53</b>	Perforación pozo Exploratorio Sinahota X-1 (Sinahota X-1 Exploratory Well Drilling)	Cochabamba
<b>EIA – 20/3G</b>	Pruebas de Producción en Campo Petrolero Luis Calvo (Production Tests in the Luis Calvo Oil Field)	Chuquisaca
<b>EIA – 15/27</b>	Actualización del Estudio de Factibilidad Carreteras (Road Feasibility Study Update)	Chuquisaca
<b>EIA – 20/49</b>	Planta de Tratamiento Metalúrgico y Comercialización de Wólfran Santa Rita	La Paz



	(Wólfran Santa Rita Metallurgical Treatment and Marketing Plant)	
<b>EIA – 20/07</b>	Explotación Minero Acurífero Cueva Monte (Monte Cave Acuriferous Mining Exploitation)	La Paz
<b>EIA – 17/1G</b>	Perforación de Pozos LT B X-1, LTB X-2 y LYB X-3 (Well Drilling LT B X-1, LTB X-2 and LYB X-3)	Santa Cruz
<b>EIA – 17/08</b>	Perforación Exploratoria Pozo Aguarague (Exploration Drilling Aguarague Well)	Tarija
<b>EIA – 19/C0</b>	Carretera Ingenio Potosí (Ingenio Potosí Highway)	Potosí
<b>EIA – 20/85</b>	Sísmica Complementaria 3D Yapacani (Yapacani 3D Complementary Seismic)	Santa Cruz
<b>EIA – 18/91</b>	Línea de Transmisión Ventilla (Ventilla Transmission Line)	La Paz
<b>EIA – 19/28</b>	Planta de Tratamiento de Residuos empresariales (Business Waste Treatment Plant)	Santa Cruz
<b>EIA – 14/32</b>	Desarrollo y Explotación del Campo Tarija (Development and Exploitation of the Tarija Field)	Tarija
<b>EIA – 19/42</b>	Yacimiento de Arcilla Concesión Marioly (Marioly Concession Clay Deposit)	Santa Cruz
<b>EIA – 19/36</b>	Proyecto Aurífero Guapurutu (Guapurutu Gold Project)	Santa Cruz
<b>EIA – 18/24</b>	Exploración Sísmica 2D Rio Ilonde Sur (2D Seismic Exploration Rio Ilonde Sur)	Beni
<b>EIA – 21/44</b>	Proyecto de Riego Presa Caigua (Caigua Dam Irrigation Project)	Tarija

*Source: Physical EIAs documents given by the Ministry of Environment and Water  
Personal elaboration,*