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*Erasmus*

# **Impact of oil exploitation on happiness in Northern Amazon region in Ecuador**

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## List of Acronyms

ENEMDU	National Survey on Employment, Unemployment and Underemployment (Encuesta Nacional de Empleo, Desempleo y Subempleo)
GDP	Gross Domestic Product
INEC	National Institute of Statistics of Ecuador (Instituto Nacional de Estadísticas y Censos)
OLS	Ordinary Least Squares
OPEC	Organization of the Petroleum Exporting Countries
SWB	Subjective well-being

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## **Abstract**

Ecuadorian people through its constitution states the importance of happiness in harmony with nature. However, its main source of income has relied on oil exploitation, extracted mainly from the northern Amazon region, for around five decades. Oil has been and is still being promoted as the engine for bringing development both for the region as well as for the whole country. The relationship between oil and development have been widely studied, however its link with happiness have not largely been explored. Happiness research can be a valuable and more interesting tool to look at more appropriate measures of development than conventional economic measures. This paper investigates on the relationship between happiness and oil exploitation at local levels. To this end, two datasets and a logit model are used to determine the likelihood of people living in oil producing areas on being part of a happier group of households. It is found that households living in the two provinces where oil is extracted are less likely to be happy, and household residing in communities near oil producing areas that have been negatively affected by oil industry are also less likely to be happy.

## **Relevance to Development Studies**

Income, growth and other economic measures are usually associated to development in mainstream economics. But development goes beyond purely economic progress. The use of other ways to tackle development is then important. This is done in this research while looking at happiness instead of other economic variables.

Oil has been promoted as a mean to bring progress to Ecuador since the 1970's and it continues to be fostered as the mean to achieve development. However, this promise of progress has not been fulfilled. The country remains dependent on oil revenues and still with poverty, inequality and other social issues. Oil rents have not adequately been translated to well-being of people. While the negative impacts of oil industry in economic and other welfare indicators has been investigated, the impact of oil on happiness has not widely been considered. Happiness research emerges as an alternative way to look at more realistic indicators of well-being than economic measures. Thus, analyzing on the relationship between happiness and oil industry is relevant for development studies.

## **Keywords**

Happiness, Subjective well-being, Oil industry, Resource curse, Amazon



# Chapter 1

## Introduction

### 1.1 Nature of the problem

Happiness, or subjective well-being (SWB), and nature are important for human beings. Ecuador's constitution, issued on 2008, on the very first pages voices the following:

**WE, the sovereign people of Ecuador**

...CELEBRATING nature, the Pacha Mama (Mother Earth), of which we are part and which is vital for our existence...

**We decide to build**

A new form of citizen coexistence, in diversity and harmony with nature, to achieve the buen vivir (good living)...

What is aimed to be noted here is the importance of two concepts: good living and mother earth. Good living can be explained as the aim of the human being to be happy in harmony with nature. But usually, nature and the resources it provides are seen as means to achieve this goal, or at least economic development.

Ecuador has been dependent on natural resources as a main source of income since long ago. With agricultural production like cocoa beans and bananas and lastly with oil exploitation. The latter has constituted, since the 1970's an important source of income for the country. Oil has been extracted mainly from the Amazon region and has been promoted as a mean of bringing well-being for the country since the beginning. And in recent times the idea of an extractive imperative (Arsel et al. 2016) seems to be still present, not only in Ecuador but in the region.

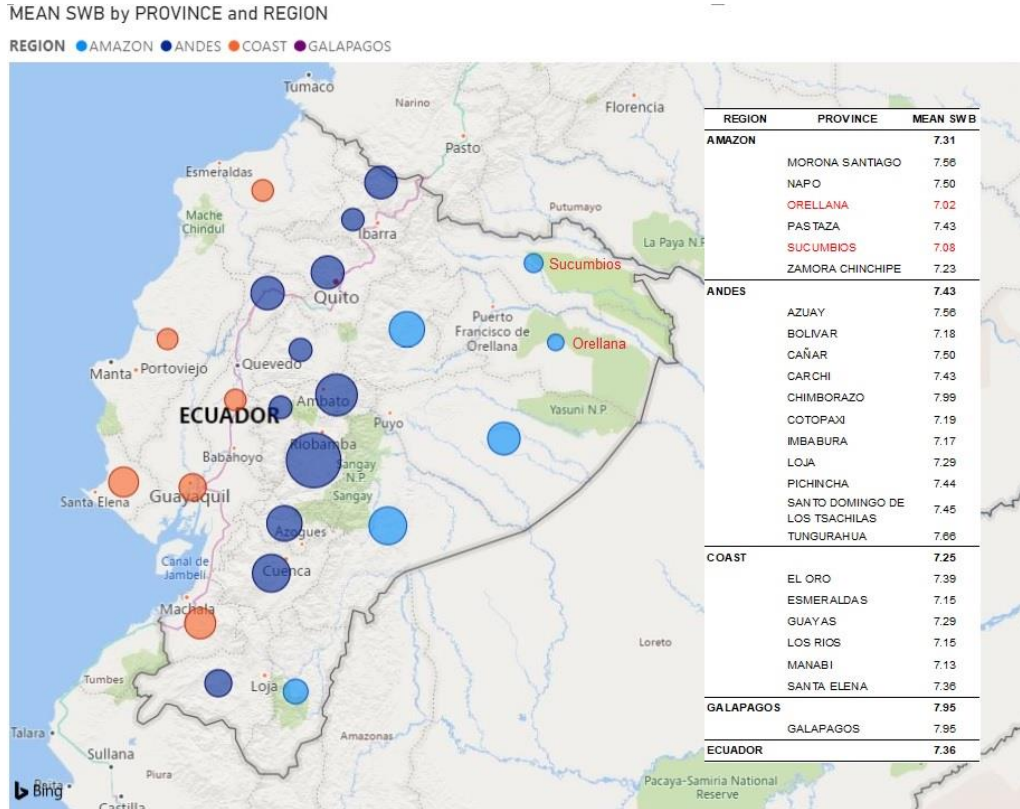
But, even though oil revenues from exploitation in the Amazon region represented an improvement on income and other benefits for the population, some concerns remain. Oil rents made possible an increase in income per person from USD 290 in 1972 to USD 1200 in 1980. (San Sebastian and Hurting 2004: 205). But on the one hand the country still remains with many economic and social issues, while on the other hand the impact the oil industry, which is highly pollutant, has also cause environmental problems with repercussions for nature and human life.

First, although the country has exploited oil for almost 50 years, there remain the difficulty to translate these resources to well-being, with problems such as poverty and inequality still present. And the region where oil is extracted seems not to be the most favored with these resources neither. For example, poverty rates in the Amazon region are between the highest compared to other provinces which are not oil producers. In 2014, 48% of the population was considered poor in terms of consumption while this rate is 14% for the province where the Capital is located and 54% for the poorest one (INEC 2014: 14), but even other indicators follow similar trends.

Further, other welfare indicators like subjective well-being are among the lowest in the region compared to the rest of the country. For instance, mean subjective well-being for the Orellana and Sucumbios provinces are in fact the lowest in data from 2017 (INEC 2017). This is shown in map 1.1.1 which presents on the left-hand side the map of Ecuador with the level of subjective well-being represented by a bubble for each of the 24 provinces, excluding Galapagos. Provinces in the Amazon region are represented in light blue

bubbles and the size of the bubble correspond to the size of mean SWB. On the right-hand side a table with the actual average levels is included.

**Map 1. 1.1**  
Mean subjective well-being by province and region in 2017



Source: Author.

Also, although income from exploitation can bring benefits for local communities in form of jobs and infrastructure it also brings environmental problems because of the nature of the industry. From the opening of roads and oil camps on the jungle to oil spills, all of these and more have been common in the history of the region. For example, the current development of the industry on the Yasuni national park requires the construction of infrastructure in the middle of one of the most bio-diverse areas in the world, following a similar path of development that had already happened before. And there has also been a clash between oil companies and local communities and activists due to the pollution on water, air and soil caused by the exploitation. Some studies have been made on the impact of oil activities in the Amazon. (San Sebastian 2004).

But even Arsel et al. argue that the impact of oil industry goes beyond the economic and environmental effects, indicating that the “immiserizing effects of oil extraction go beyond their environmental and economic impacts on well-being, but can also be found in the way they crowd out other ways of envisioning and enacting development.” (Arsel et al. 2019: 221). Thus, the negative impacts of oil industry may be even more difficult to understand.

So, while an increase in income can benefit individuals it remains the question whether this additional income is translated to gains in happiness. Specially whether the area where resources are extracted have been benefited or harmed by oil activities. A previous study at an aggregate level gives a rough approximation of what to expect. Thus, the aim of the paper is to investigate on the relationship between oil exploitation and happiness in the population living in the areas where oil is extracted in the Amazon region in Ecuador.

## 1.2 Justification and relevance

### 1.2.1 Justification

This study is relevant for a couple of reasons. There is a nascent literature on what Ali et al. call the happiness resource curse, that is, on the relationship between oil and happiness. Although there is an extensive literature on the effects of oil industry in the economy, most of it is made at a macro level. Finally, happiness is an important concept for Ecuador, but regarding the points raised before, any study has been made.

First, although there are studies on the resource curse on the one hand and on happiness on the other, the relationship between the two has been only recently analyzed. While there are studies on the impact of oil industry on other welfare indicators, its impact on happiness has not been considered. The paper aims to expand on the previous work by Ali et al. in which they try to bring together the relationship between oil rents and happiness and they find that “Consistent with prior empirical evidence of a resource curse in oil-rich nations, we find that oil rents are negatively linked to improvements in happiness over time.” (Ali et al. 2019: 20). A first point to be noted here is that oil dependent countries are expected have a negative effect on levels of happiness over time. It worth analyzing whether this argument holds at different levels than between countries. Thus, analyzing a more specific case can help to support this happiness resource curse hypothesis. For example, Ecuador which relies on oil rents would be expected to have a negative effect of oil operations on happiness.

Second, according to the resource curse literature analysis conducted by Gilberthorpe and Papyrakis (2015: 382) they state that the literature in this topic is fragmented. They explain that the literature at the macro and meso levels are mainly dominated by economists while, the micro level is dominated by anthropologists and other social scientists. They argue for a more coordinated research between different levels and approaches. Thus, research at more specific levels in an economic research may be valuable. For example, in the work by Ali et al. (2019) they use a panel dataset of a large number of oil dependent countries to see the changes in happiness over time. But they also warn on the usage of aggregated data which represents only mean values at the country level. This is one of the drawbacks of the use of aggregated data, that impede to observe the dynamics in more specific levels. They state that “Case studies and more disaggregated econometric models should complement the more aggregate country-specific analysis by examining the localized effects of oil presence” (Ali et al. 2019: 20).

Third, as explained earlier, happiness is an important concept for Ecuador but there is limited research in the area. Most of the happiness research has been made in analyzing the relationship between happiness and income. However, regarding the relationship raised above, there is no previous study on analyzing the impact of oil industry on happiness. Counting with this study is important as oil industry is being promoted as the mean to bring development, and oil activities continues to expand. But whether rents coming from the sector do benefit people residing in areas where it is extracted or even for the whole country is questionable.

Thus, because of the confirmation of the hypothesis of a happiness resource curse and the need for more studies at the micro level the study will contribute to current debates. Plus, it will also contribute to the limited literature on happiness on Ecuador in a sector which results after fifty years of operations may become to be questioned.

## **1.2.2 Relevance**

Understanding the relationship between oil exploitation and happiness in a more specific level, at subnational or at community level is relevant for the current academic discussions mentioned above, but also for national and local authorities as well as for local communities.

Having information on a different level, methodologies and data allow to support or oppose current findings on academic debates. As research in this area is relatively new, more research is needed to demonstrate such as the hypothesis of a happiness resource curse. Plus, considering the limitations and scope of previous studies, a new contribution would expand the knowledge and interest to further research and debates. Also, this would be a contribution to the analysis of such topics in the limited literature in Ecuador.

Now, for national and local authorities counting with information of the impact of an important industry for the country on well-being is important for designing and/or changing the policies that aim to bring benefits to the population. The exploitation of oil has been promoted for a long period and has continued to expand with the idea of bringing prosperity for the country. This has also been the case for many other countries in the region with similar characteristics, but this policy may not necessarily be beneficial at all for some. Thus, counting with empirical evidence on the impact of oil will serve to implement better policies in the sector.

Finally, the study is relevant for local communities to have a better understanding of the relationship between oil activities and their well-being. Counting with such data is important for claiming for changes that go beyond receiving compensations in the form of additional income and infrastructure. It is important to them to have the basis to claim for alternatives that go beyond oil-led development.

## **1.3 Research objectives and questions**

### **1.3.1 Research objectives**

The objective of this paper is to investigate on the impact of oil industry in happiness in the Northern Amazon region in Ecuador. For this, the research aims:

- To determine the likelihood of households living in the oil producing provinces on being more or less happy.
- To determine the likelihood of households living in oil producing areas and who have been negatively affected by oil industry on being more or less happy.

### **1.3.2 Research questions**

What is the impact of oil exploitation on happiness on the Northern Amazon region in Ecuador?

- To what extent are households living in oil producing provinces more or less likely to be happier than those living in other provinces?
- To what extent are households that live in oil producing areas and who have been negatively affected by oil industry more or less likely to be happier than those that have not been negatively affected?

## **1.4 Structure of the paper**

With a clearer understanding of the problem and the objectives of this research to demonstrate the hypothesis described above the paper. The rest of the paper is structured as follows: Chapter 2 contains a review of the most relevant literature on happiness, on oil industry and on the relationship between the two concepts; Chapter 3 provides a description of the data and methodology used for the study; Chapter 4 presents the findings and discusses on them while Chapter 5 provides conclusions and recommendations.

## Chapter 2

### Literature review

This paper looks at the relationship between happiness and oil exploitation at regional levels. Although there exist a variety of studies in both fields, on happiness and on oil industry, little have been written on the relationship between the two. A review of the literature in both variables is necessary to explore the possible links between the two. It also worth looking at any possible link already made.

This section presents a review of the literature on the concepts that are relevant for the study. First, happiness literature is reviewed, mainly considering an economic approach; then, literature on oil exploitation, also centering the analysis on an economic perspective as well as at local levels, is presented; after, literature considering a direct relationship of both concepts is presented while at the end an analysis of the literature described these points is made.

#### 2.1 Happiness

Talking about happiness may become a controversial topic. That is what I have noticed in the process of this research when I talked to people about it. “How can you define happiness?” was one of the common questions I received. But not only people may have different views and thought about happiness, it has also been discussed by different scholars since long time ago. In this sense, Bok (2010) explores the idea of happiness from different perspectives across time. He presents an overview of happiness treated by different disciplines, going from philosophy in ancient Greece to modern sciences like economics and neuroscience in recent times. Thus, in this extensive happiness research world it worth first defining the scope and the idea used in the present study.

This study uses a subjective life satisfaction approach. This is the most common approach used in empirical research and measures happiness with a direct question to individuals. Frey (2018) explains better the idea behind, on indicating that there are mainly two extreme kinds of happiness: one related to momentary feelings and another related to the feeling one gets when analyzing the whole life before dying, called *eudaimonia* or eternal bliss. He indicates that “Empirical research in happiness focuses on an intermediate form of happiness, subjective life satisfaction. It reflects the answers given to the question: ‘Taken overall, how satisfied are you with the life you lead?’”, (Frey 2018: 6). And he expands that in the way it is measured, individuals avoid falling into one of the two extreme forms.

Once the general approach on happiness to be used is defined, the sections behind explore more on happiness literature in the field of economics. It starts with a brief revision of the first works in the field; it then discusses on the importance of happiness research; later, it centers on the determinants of happiness; and finalizes with a revision of the main publications in Ecuador.

##### 2.1.1 Happiness in economics

The great interest on happiness research in economics usually starts with the well-known Easterlin Paradox, however some had already been written before, and more importantly so much progress has been made up to now. Although happiness in economics had been studied on a theoretical perspective before, the work by Easterlin constitutes a turning point in the study of happiness in economics from an empirical approach. The role of in-

come plays a fundamental role, but it is also a starting point to think on the departure from current dominant ideas on development as well.

The idea of happiness had been related to economics since its beginning, at least that is what Crespo and Mesurado (2015) explain. They state that “Since its inception, economics has been meant to contribute to people’s happiness”, (Crespo and Mesurado 2015: 932). They explain about the idea that happiness has been one component of economic thought in different periods of the science. Nevertheless, most of these studies have been made in an theoretical perspective; and, on the contrary, the study of happiness from an empirical perspective in economics started in more recent times, first with few papers presenting correlates of happiness, and then analyzing its relationship with income, and other determinants.

One of these studies was the work by Wilson (1967) in which he summarized different findings on what he called “avowed happiness”. In this paper he presents what had been written on happiness, concluding that “The happy person emerges as a young, healthy, well-educated, well-paid, extroverted, optimistic, worry-free, religious, married person with high self-esteem, high job morale, modest aspirations, of either sex and of a wide range of intelligence”, (Wilson 1967: 294). This was a first approximation of the profile of the average happy person, which constituted a basis for further research on the determinants of happiness in subsequent studies.

But it was the work by Easterlin (1974) that called the attention of economists with what was later known as the Easterlin Paradox. This study looked into the relationship between income and happiness to investigate whether economic growth improves the human lot. The study found that in fact economic progress increased happiness but only on a limited proportion, and with a decreasing rate with greater income. The paradox contradicted the economic theory that usually made a direct link between positive improvements in welfare based on positive improvements in economic growth in a direct proportion. For instance, this implied that increases in growth were not necessarily being translated to happiness gains over time. Furthermore, he makes emphasis on the case of the USA when reflecting on whether this society has achieved the ultimate stage in growth, concluding that “If the view suggested here has merit, economic growth does not raise a society to some ultimate state of plenty. Rather, the growth process itself engenders ever-growing wants that lead it ever onward”, (Easterlin 1974: 121).

Oswald (1997) analyzed the relationship between happiness and economic performance. In his study he also confirms the idea that economic progress does lead to increases in happiness levels over time but only on a small proportion when looking at developed nations. But he noticed among other findings that happiness is U-shaped in age with minimum levels around 30s, and most importantly that unemployment has a negative impact on happiness. He concludes that “A consistent theme through the paper's different forms of evidence has been the vulnerability of human beings to joblessness. Unemployment appears to be the primary economic source of unhappiness. If so, economic growth should not be a government's primary concern”, (Oswald 1997: 1828).

And much more progress has been made. Going back to Wilson’s work, Diener et al. (1999) provide a new analysis of the research in the field. They delineate, as Wilson, an update of the profile of the happy person, saying that this character is

...blessed with a positive temperament, tends to look on the bright side of things, and does not ruminate excessively about bad events, and is living in an economically developed society, has social confidants, and possesses adequate resources for making progress toward valued goals. (Diener et al. 1999: 295).

This update includes other aspects that also influence happiness such as the importance of personality traits.

But on the other side, more recently other scholars have tried to reassess the argument made by Easterlin. In this sense Stevenson and Wolfers (2008) reassessed Easterlin findings, and with the use of more complete datasets they argue that economic growth has a clear positive effect on happiness increases over time, with no satiation point in which richer countries have less happiness gains.

Happiness research is still a burgeoning area of study in economics. And in the meantime, further research has made progress, in areas like the determinants of happiness, or research at national levels, or discussing on the way it is measured. But most importantly, this has emerged as an alternative way to represent progress in a more realistic way than current material measures like GDP. And, an important thing to be noted above is the role that happiness research may have in analyzing and challenging current economic theory. It worth keeping in mind that, as the doubt raised by Easterlin, whether the current economic system leads to a true state of progress and development as we expect.

### **2.1.2 The importance of happiness**

Happiness is important for people. It may sound so simple but somewhere in the beginning of this paper it was already mentioned the importance of this concept to people from Ecuador for example. Also, as Frey and Stutzer (2002: 402) declares “Happiness is generally considered an ultimate goal of life; virtually everybody wants to be happy”. This may not sound rare if we individually analyze the importance of happiness, and this is the main reason why it is so important.

Different authors have made the point that happiness research should play a more prominent role. Frey and Stutzer (2002, 2006) explain about the different things that economist can learn from happiness research. One of the things to be noted from these studies are the implications for economic policy. They explain that the happiness function has been considered as an approximation to the social welfare function and expand on indicating that “...the appropriate approach is not to maximize aggregate happiness directly in seeking to improve outcomes by direct interventions. Rather, we see the role of happiness research as seeking to improve the nature of the political processes”, (Frey and Stutzer 2006: 15). Finally, they build on the importance of disaggregating happiness indicators to regional, country and communal levels.

Also, Diener and Seligman (2004) claim for the importance of well-being. They state that “...well-being should become a primary focus of policymakers, and that its rigorous measurement is a primary policy imperative”, (Diener and Seligman 2004: 1). They explain that policy is currently dominated by economic outcomes and do not necessarily include all the things a society may value, they also show the failures of economic indicators. Further, they claim that measures on subjective well-being should be improved so they can constitute a more robust basis for policy.

On the contrary, more recently, Duncan (2010) questions whether happiness-maximization should be the goal of government. He explains on the limitations that utilitarian theory has and warns that using directly happiness to guide policy is not a better alternative. He asserts that “While happiness research does overcome some of the traditional objections to utilitarian political theory, the case for its direct application to public policy is challenged when closely examined on ethical and empirical grounds” (Duncan 2010: 177). He concludes that for now happiness-maximization is not an obligation of government.

Finally, Radcliff (2013) analyzes the political economy of human happiness. With the use of current data, methods and theories on happiness, he aims to objectively and em-



pirically examine how voters determine the quality of life based on their political choices. He builds on the idea that happiness can be determined by factors that can be entirely controlled, thus indicating that “Happiness, then, is a function of public policy – and thus a result of our collective choices as citizens in electing the governments that make policy”, (Radcliff 2013: 9). He concludes that policies usually implemented by Leftist governments tend to favor everyone.

In sum, happiness is important for people and happiness research can be an important instrument for improving the achievement of this desire for everyone. From an empirical perspective, happiness research is relatively new, and despite the methodological challenges it poses, it is a better estimator of well-being to be used instead of merely economic indicators.

### **2.1.3 Determinants of happiness**

Empirical research has made a lot of progress on understanding what makes people happy. Prior studies like Wilson (1967) and later Diener et al. (1999) summarized the main correlates of happiness and presented the profile of the happy person. Later, more has been investigated on the relationship between happiness and income, which seems to play an important role on the happiness discussion. But, throughout these decades and with the use of more sophisticated econometric models, other relationships beyond income have been analyzed. From unemployment to environmental degradation, this section presents some of the main determinants of happiness.

While looking at the determinants of well-being, Diener and Ryan (2009) present a general overview of the main correlates. They do not make a distinction between the different types of variables. They detail a set of demographic variables including gender, education, age, religion; social variables like marital status and social relationships; and economic variables like unemployment and income. They also mention culture as an emerging field of research in happiness determinants.

Also, Radcliff (2013: 96-109) presents happiness determinants but he makes the distinction between individual and national sets of variables. On the one hand, individual determinants refer to those characteristics that influence happiness on individuals. Among these they include sociodemographic factors like age, gender, race, and education; income; employment factors; marriage and other social connections; health; religion and cognitive and emotional disposition. On the other hand, national-level determinants refer to country characteristics that influence happiness. Among these the author mentions economic development, democracy, culture and national unemployment.

Meanwhile, Weimann (2015: 35-73) presents a deeper analysis on what makes people happy. He makes different categories between the determinants, first he considers the non-material determinants that contain factors that cannot be influenced, which includes heritable things, personality and values, health and disability, and age; and those that can be influenced like marriage, children, divorce, social contracts, the environment, and personal and political freedom; and second, they include those more material factors or economic determinants. These include unemployment, unemployment rate, inflation rate, income inequality, prosocial spending and education.

More recently, Frey (2018) provides a general overview on the different determinants of happiness. These are grouped into those related economic factors that include income, work, distribution of income, economic development; socio-demographic influences like age, family status, children, social relationships, health, education, culture and religion; and political conditions containing democracy and federalism.

A deeper analysis looking into the determinants could be made with all the studies looking at different variables. However, for the scope of this research what is important to know in more detail is the most relevant ones. Thus, more detail of them are presented below. These are summarized between genetic endowments, socio-demographic characteristics, social relations and marriage, economic, and political variables. For further detail on each one a look into each author would give the reader a more complete understanding.

**Table 1. 2.1**  
Happiness and its determinants

<b>Determinant</b>	<b>Relationship with happiness</b>
<b>Socio-demographic characteristics</b>	
Age	U-shaped
Gender	Not representative
Health (Good health status)	Positive
Education	Variable
Culture	Variable
<b>Marital status and social relations</b>	
Marital status	Positive
Social relations	Positive
<b>Economic factors</b>	
Income	Positive
Unemployment	Negative
<b>Political factors</b>	
Democracy	Positive
Personal and political freedom	Positive
<b>Environmental factors</b>	
Environmental degradation	Negative

Source: Author.

To summarize, happiness determinants are an extensive branch in happiness research. Much progress has been made since the happiness income relationship was first analyzed. We can distinguish between those factors that we cannot influence and those that we can. In the first group there is mainly the personality traits that are transmitted in the genes with which the person is born. These are not the main concept of the study because of the limitations and the scope of the research with respect to this complex variable. In the second section there are mainly socio-demographic characteristics; marital status and social relations; economic, political and environmental factors affecting happiness. All from the second group are summarized in table 1.1.1 for an easier understanding of the impact of each variable on happiness according to the existing literature. More detail is presented below though.

### ***Genetic endowment***

“Therefore, while the environment plays a role in the expression of genetics, it is clear that heritable traits have a substantial effect on the well-being levels of individuals.” (Diener and Ryan 2009: 395).

“Psychological studies suggest that the differences in happiness between persons that are attributable to variations in genetic inheritance amount to forty–sixty per cent of the total differences. Happiness is substantially determined by genetic factors.” (Frey 2018: 14).

## ***Socio-demographic characteristics***

### **Age**

“...there is no consistent relationship between age and subjective well-being; however, there is a tendency for life satisfaction to decline much more rapidly with age in poorer countries than in rich ones (Deaton, 2008).” (Diener and Ryan 2009: 397).

“Age displays a U-shaped pattern with happiness, such that both the young and the old are happier than are those in the middle, with the nadir of happiness (controlling for other factors) appearing to be on one’s early forties” (Radcliff 2013: 99).

“Research has established a clear U-shaped relationship between age and life satisfaction, assuming health remains constant.” (Frey 2018: 17).

### **Gender**

“The relative well-being levels between the genders have frequently been examined, but the wellbeing data gathered thus far indicate that women and men do not substantially differ in terms of average subjective Well-being.” (Diener and Ryan 2009: 396).

“The effects of gender are less clear, though, on balance, the collective evidence seems to suggest that women are marginally happier than are men overall” (Radcliff 2013: 99).

### **Health**

“... self-reported health is another consistent and powerful predictor of happiness.” (Radcliff 2013: 103).

“Health is one of the most important contributors to well-being. This is true for both physical and psychological health.” (Frey 2018: 18).

### **Education**

“However, the “ignorance is bliss” aphorism is invalidated by a number of studies, which show a positive (albeit weak) correlation between one’s level of education and well-being, after controlling for other variables, explaining only 1-3% of the variance in wellbeing (Witter, Okun, Stock, & Haring, 1984).” (Diener and Ryan 2009: 397).

“Education shows inconsistent effects vis-à-vis happiness, varying across model specifications, in part because its effects are, again, channeled through other variables like income.” (Radcliff 2013: 100).

“A more advanced education opens more opportunities in life and is conducive to happiness.” (Frey 2018: 18).

### **Culture**

“A growing body of research has shown that while most people across nations report relatively high subjective well-being, there are distinct differences in the subjective well-being between nations that can be explained to some extent by the effects of culture.” (Diener and Ryan 2009: 399).

“Subjective well-being differs considerably between countries and cultures.” (Frey 2018: 18).

## ***Marital status and social relations***

“If unemployment has any competitor for being the leading determinant of subjective well-being, it is in having close interpersonal relationships.” (Radcliff 2012: 102).

### **Marital status**

“Subjective well-being increases through social bonding such as marriage, and other strong social relationships can also be very fulfilling (Helliwell, Barrington-Leigh, Harris, & Huang, 2009).” (Diener and Ryan 2009: 398).

“Marriage, or an equivalent form of life partnership, is in turn widely agreed to be the most important interpersonal relationship. We thus find that marriage raises happiness, everywhere and at all times.” (Radcliff 2013: 102).

“Married people are happier than those living alone and even than those living in unmarried partnerships.” (Frey 2018: 17).

### **Social relations**

“The number and quality of social relationships a person has are highly confirmed correlates and antecedents of high subjective well-being (see Diener & Biswas Diener, 2008 for review).” (Diener and Ryan 2009: 397).

“Close relationships with friends or other family members would come first after marriage, followed by more casual friends, neighbors, work colleagues, and so on. All kinds of positive personal connections appear to benefit the quality of one’s life” (Radcliff 2013: 103)

“People who live in a close network of family, friends, and neighbors, who get involved in their communities, or who are affiliated with religious groups are healthier and happier than others” (Weimann 2015).

“Intensive and regular social contacts within the family and among friends and acquaintances contribute strongly to happiness.” (Frey 2018: 18).

### ***Economic factors***

#### **Income**

“Overall, the research on the relation between income and well-being reveals that money has a positive, yet diminishing, effect as it grows in size.” (Diener and Ryan 2009: 398).

“The results are clear: People with higher income unambiguously consider themselves to be more satisfied with their lives than do persons with low income.” (Frey 2018: 15).

#### **Unemployment**

“Unemployment has been shown to have a consistent and unequivocally negative impact on subjective well-being (Clark, 2009).” (Diener and Ryan 2009: 398).

“Even more important than these multiple aspects of job satisfaction is the fact of having a job... being unemployed is one of the strongest correlates of unhappiness.” (Radcliff 2013: 102).

“The most important finding is valid worldwide: Unemployment reduces life satisfaction dramatically.” (Weimann 2015: 57).

“People who lose their jobs are much more dissatisfied with their lives than are those who hold jobs.” (Frey 2018: 15).

### ***Political factors***

#### **Democracy**

“Institutional conditions and political systems are a major determinant of human happiness. Research has established that economic activity fares better in democratic rather than authoritarian societies.” (Frey 2018: 19).

#### **Personal and political freedom**

“It seems obvious that achieving political and personal freedom contributes to high life satisfaction... life-satisfaction research provides us with findings that indicate strongly that freedom does in fact have the expected effects” (Weimann 2015: 54).

## ***Environmental factors***

### **Pollution**

“The effects of air pollution, water pollution, noise pollution and climate were investigated, and environmental conditions were found to have significant effects on life satisfaction in all cases.” (Weimann 2015: 53).

### **2.1.4 Happiness in Ecuador**

As mentioned in the introduction, happiness is of great concern for Ecuador. It has been an important component in the culture since ancient times and it has been included in the Constitution since 2008. Maybe, the term Good Living (Buen Vivir) is better known in the local context. Thus, the literature in happiness research in Ecuador starts with the work “Happiness as measure of Good Living in Ecuador”, then other studies expand on the relationship between happiness and Good Living as well as the determinants of happiness.

The first study found in the literature of happiness research in Ecuador is the one by Ramirez Gallegos (2007). This study takes advantage of the data obtained from an employment survey (ENEMDU) that includes the question of subjective life satisfaction. The aim of the paper to use the concept of life satisfaction as an approximation to the idea of Good Living and to determine the aggregate happiness function for the country. Meanwhile, Paladines Ramírez (2013) provides a brief analysis of subjective well-being for the period 2007-2009.

Also, Guardiola and Garcia Quero (2014) examines whether subjective well-being in Ecuador is dependent on measures as income or employment, or on other aspect of life related to the concept of Good Living. They conclude that:

...policy interventions focusing on raising income or Buen Vivir dimensions alone will be insufficient. Policies that foster Buen Vivir ethos while raising income and employment would succeed; aiming at improving economic potential while preserving people's ties to the community and the land. (Guardiola and Garcia Quero 2014: 182).

Also, Garcia Quero and Guardiola (2018) support this idea expanding on the analysis between subjective well-being and income poverty-based approaches. Both studies are made in rural areas of the country.

Other authors as Sarango Iturralde (2018) and Cornejo Vasconez (2018) have investigated on the determinants of subjective well-being in the country. The first study finds that “the increase in spending on food and non-alcoholic beverages; furniture and household items; and, recreation and culture positively and significantly affect happiness”, while the second study identifies the determinants to be considered in the planning process of the country. Also, Godoy Jaramillo (2019) expands on the determinants of happiness in Ecuador.

Finally, Moncayo (2019) analyses the relationship between happiness and public investment. He tries to test the hypothesis that the government plays a fundamental role in the pursue of happiness in the country. He concludes that “...when the State, through a strong public investment, encourages the economy and with this the population can improve the living standards and with this it can tend to the Good Living, or in other words, to the happiness”, (Moncayo 2019: 310).

Although the quantity is limited, there exist some basic research on happiness in Ecuador. Most of it look at the relationship between happiness and income or relates this concept to the idea of Good Living. Other authors look at the determinants, but any of

them have applied happiness research to analyze problems like the possible differences between regions or those related to environmental issues.

## **2.2 Oil industry and its negative effects**

Now a second branch of the literature to be considered in the paper is that related to the oil industry. At first sight, oil industry can trigger a negative view of the sector. It is usually associated to pollution and environmental degradation, but for countries like Ecuador, it may also be associated to the idea of being the source for development for the nation. Further, it may be associated to the idea of successful development as in the case of countries that have been successful cases.

This paper only considers the negative outcomes of oil industry, however it worth indicating the reason. As exemplified by Karl (2007):

A resource boom can be beneficial or detrimental: Norway, an oil exporter, has used the benefits of North Sea petroleum to earn the highest place on the United Nations Development Program's list of best development performance, whereas other exporters, such as Nigeria and Angola, are clustered near the bottom. (Karl 2007:662).

The presence of oil or mineral resources do not always translate into a curse but can be a blessing for the country. A variety of reasons may appear, among them the institutions already existing in the country when a resource discovery happens. As the nature of the problem analyzed in this research concerns the case of Ecuador, a country that have had problems in translating the benefits of oil to well-being, the analysis made in this section concerns mainly that related to the negative outcomes. Thus, the use of literature on oil-led development, resource curse, and other related theories are considered.

This section is organized as follows: first, it reviews some theories that relate oil industry and development; then, it explores on the negative impacts of the industry at local levels; and finally, it presents a review of the industry and its impact in Ecuador.

### **2.2.1 Oil and development**

It would be common to assume that if a county is blessed with a variety of natural resources, this bounty can be directly transferred to benefits to their population. And these blessings are usually promoted as the source of prosperity for the country. Oil is currently one of the most important commodities that, due to its nature, plays an important role not only for producer countries but for the functioning of modern society. Thus, it would be expected that if a country is blessed with oil reserves these would be translated into a blessing for its population as well. But this is not usually the case. This is what is explored below.

In accordance with the reasoning presented above some theories assumed the importance of natural resources as a catalyst for development. One of these is the big push theory that suggests that income obtained from resource exploitation can give the necessary push that less developed countries need to advance to further steps in the industrialization process. This theory is analyzed by Sachs and Warner (1999) who present evidence on some Latin America Countries concluding that "Empirically, resource booms seem to have done little to generate long-term growth, and may in fact have hindered growth on average", (Sachs and Warner 1999: 63).

Also, Ross (2001) analyzes the relationship between extractive industries and poverty. He finds that "oil and mineral dependence are strongly associated with unusually bad conditions for the poor" (Ross 2001: 4), providing a list of the negative effects for the poor.

Also, he indicates the importance of government actions to solve these problems, but he adds that the effects of extractive industries do also negatively affect the government, as for example with corruption, authoritarianism, civil war, etc. All of these show the complexity behind the structures, beyond the economics that oil development creates.

Furthermore, the resource curse hypothesis has also appeared to explain the idea that resource rich and/or dependent countries performs worse than non-dependent countries. In this regard, Barbier (2003) analyzes the role of natural resources in economic development. He provides a straightforward explanation to this paradox, indicating that “Simply because a developing economy is endowed with abundant natural resources, it does not necessarily follow that the country will exploit this natural wealth efficiently and reinvest resource rents in other productive investments” (Barbier 2003: 269). He concludes by indicating that the way a country manages its natural resources is fundamental for sustainable economic development.

Plus, Karl (2007) provides a more complete analysis on the social, political and economic consequences of oil-led development. He explains about the benefits that oil-led development is supposed to bring to a country, among them the creation of jobs, the increase of revenues for the government with subsequent poverty reduction, and the development of infrastructure and many more. But he contrasts this with what happens, indicating that:

...the experience of almost all oil-exporting countries to date illustrates few of these benefits. To the contrary, the consequences of oil-led development tend to be negative, including slower than expected growth, barriers to economic diversification, poor social welfare indicators, and high levels of poverty, inequality, and unemployment. Furthermore, countries dependent on oil as their major resource for development are characterized by corruption and exceptionally poor governance, a culture of rent seeking, often devastating economic, health, and environmental consequences at the local level, and high incidences of conflict and war. (Karl 2007: 661).

Thus, oil industry may not only be associated to negative outcomes related to environmental problems, but it may be related to negative consequences for the economic, political and social aspects of the country.

Now, while considering impacts at other than national levels, Gilberthorpe and Papyrakis (2015) made a point at analyzing the literature on extractive industries and resource curse at different levels. They explain about the fragmentation of this literature indicating that the macro and meso literature related to resource curse is mainly conducted by economist, while the literature at more local level is dominated by other branches of the social science like anthropology (Gilberthorpe and Papyrakis, 2015: 387). They argue for a more coordinated research between the different levels and functions. Thus, more research at the micro level from an economic perspective, and if possible, with the support of other sciences would be valuable for research in this field.

But the analysis of the effects of oil industry is so important as the idea of oil-led development may still be present. Going back to the idea of promoting development through natural resource exploitation, Arsel et al. (2016) explains on the existence of an extractive imperative, especially in the context of Latin America in recent years. They explain that:

An ‘extractive imperative’ was thus borne as natural resource extraction came to be seen simultaneously as sources of income and employment generation and financing for increased social policy expenditure. According to this imperative, extraction needs to continue and expand regardless of prevailing circumstances, with the state playing a leading role and capturing a large share of the ensuing revenues. (Arsel et al. 2016: 880).

And that is the case for many countries, without considering that the argument has been in place for decades with no successful result. This is also considered by Pellegrini (2018a) while analyzing two different expressions of oil-led development in different time periods but with the same idea and result behind.

To summarize, oil exploitation has been considered a source to achieve development, but it has proved the contrary. The economic, political and social conditions created by oil industry do in fact have negative effects for most of the countries that are dependent on it. Behind, complex mechanisms that still foster research exists. Also, the idea of promoting oil exploitation at any costs is still present. Governments promote oil exploitation as a necessity to achieve development, building on the idea of prosperity through infrastructure and future economic improvement. But this promise is never achieved.

### **2.2.2 Local impacts of oil industry**

The idea of the impact of extractive industries, specially of oil industry at national levels have widely been studied through the resource curse literature, however its impacts at localized levels requires another view. Along with the economic, social and political consequences raised by the resource curse literature presented above, while analyzing the impacts at local level it gains more attention the role of environmental degradation.

In regard to the impact of oil industry at more local levels Karl (2007) also provides an analysis which is a good starting point on the related literature. He states that:

The exploitation of oil has a profound regional and local impact, and from the standpoint of the majority of the local population, this impact is alarming. Rather than bring prosperity to a region, as is often the claim, the boom–bust cycle associated with petroleum dependence is magnified. Over time, localities where oil is actually located, compared to the rest of the country, tend to suffer from lower economic growth, lower per capita incomes, greater dislocations, higher environmental and health hazards, and higher levels of conflict. Economically, petroleum fails to offer long-term sustainable employment alternatives at the local level, but it can seriously disrupt preexisting patterns of production. (Karl 2007: 669).

Thus, negative impacts of oil are even worse for the population living in areas where this resource is extracted.

Analyzing in more detail most of the related literature on local impacts is linked to oil exploitation in Nigeria, an important oil producer. This literature mainly examines the socio-economic impact of oil industry in the region where oil is extracted. In accordance with the previous study it is expected that at regional levels the effects will be even worse for these areas.

For instance, Babatunde (2010) analyzed the socio-economic effects of oil exploitation on the Ondo state in the Niger Delta, a major oil producing area in Nigeria. He discusses issues concerning the economic, social and environmental aspects indicating that “Oil exploitation, through environmental degradation, depleted the fishing and farming output, resulting in the subsequent loss of income base, thereby accentuating poverty, which in turn created divisive tendencies leading to endemic social conflict.”, (Babatunde 2010: 61).

In the same line, Elum et al. (2016) analyze the negative effects of oil exploitation in the Niger Delta region. They center their analysis mainly in the environmental consequences, finding that:

...oil exploitation has increased the rate of environmental degradation and has perpetuated food insecurity as a result of death of fish and crops as well as loss of farm lands and viable rivers for fishing activities leading to loss of livelihood. (Elum et al. 2016: 12880).



This is in line with the previous finding, making emphasis on the environmental impacts and the subsequent effect on economic activities related to it.

Finally, Aristide and Moundigbaye (2017) analyze the impact of oil exploitation on poverty in the Host Region in Chad. They make use of a panel dataset with double difference and PSM approach to analyze the impact of oil in the region, considering a previous implementation of a compensation policy to mitigate the negative impacts. They find that:

...the incidence, gap and severity of the monetary poverty increased in the oil producing region compared with control regions. No evidence was found that non-monetary poverty decreased in the oil producing region, as the large investments in social infrastructure might have suggested. This result may reflect the lack of coherence between the social infrastructure financed by the oil royalties received and the communities' basic needs. It might also be related to a misuse of the individual compensations received and a poor supervision of microcredit programs. (Aristide and Moundigbaye 2017: 50).

As indicated by Karl, all the subsequent studies confirm the negative effects of oil industry at local levels. What most of these studies have in common is the role of environmental degradation, caused by oil activity. This negative impact can be translated to people living near oil fields through the direct impact due to water, soil and air pollution, with subsequent impact on loss of biodiversity, water and food sources, as well as direct impact on health. Also, the impact is channeled through the decrease in job opportunities due to damage on fishing and tourist activities, common in these areas.

### **2.2.3 Oil industry in Ecuador**

This section includes an overview of the oil industry in Ecuador to show, as indicated in the literature, the development of the industry, its negative effects and the possible existence of an extractive imperative. To this end it is first presented some of the history of the oil industry in the country and then a summary of the main articles from local newspapers related to the sector to a better understanding of the current situation.

Although oil was first exploited from the Coastal region in Ecuador, most of the reserves are found in the Amazon, which has been the center of the industry since the discovery of large deposits there. Muller (1988) provides interesting information on the first years of the development of the industry. She explains that early explorations in the region started around early 1920's, but it was not until the late 1960's that commercially exploitable wells were discovered. And exploitation and exports started in the early 1970's. In these years, the idea of prosperity through extractivism was already present. She includes the comments of a former minister of energy who indicated the importance of oil industry for the country, stating that "We highly encourage exploration and exploitation of the searching for a better life and free land", (Muller citing Santos-Alvite 1988: 42), while talking about the debt status of the country in those years and the need of resources to finance it.

The paper also raises some of the problems that the oil industry brought. Apart from the development of infrastructure like wells, roads, pipelines and towns in area were virgin jungle lied before, she includes an overview of the country at that time, indicating that Ecuador faced some boom and bust cycles "Since 1972, economy has revolved around petroleum exports. These have declined since 1982, causing severe economic distress." (Muller 1988: 43). Further details on the development of the industry can be also found in Pellegrini and Arsel (2018).

And the discovery of oil arguably became a blessing for the country, at least at the beginning, when revenues coming from the new sector made it possible an increase in the income of the country. For instance, a jump in income per person from USD 290 in 1972 to USD 1200 in 1980 was possible in a short period of time thanks to the oil revenues. (San

Sebastian and Hurting 2004: 205). Since then, the history of the country has been marked by the instability characteristic of oil-led development, as well as environmental and conflict issues in the area. Thus, the literature on oil is mainly divided in that related to conflict and that looking at the impacts on environment and health.

Hurting and San Sebastian (2002) and San Sebastian and Hurting (2004; 2005) analyze the impact of oil in the region, mainly the ones caused by oil pollution, on health-related issues. In a first approximation they find that “The results suggest a relationship between cancer incidence and living in proximity to oil fields, although this ecologic study cannot lead to causal inference.”, (Hurting and San Sebastian 2002: 1025). On a second study, they explore more on the environmental and health impacts stating that “We believe that oil exploitation in the Amazon basin of Ecuador has resulted in a public health emergency because of its adverse impact on the environment and health.” (San Sebastian and Hurting 2004: 209), adding that the government have not played an adequate role on preventing such negative effects.

More recently, and with the idea of an extractive imperative in Latin America, Arsel et al. (2019) presents the Maria’s Paradox. This paper analyzes the idea of immiserating poverty caused by the oil industry. It tells the history of Maria, who despite being negatively harmed by oil industry agrees with the increase of oil activities. They conclude that:

...when the rainforest is cut down, when wild animals are driven away, and when sources of water are contaminated, the only apparent path to the improvement of one’s well-being is seen through the construction of roads and bridges that go out of the area and the jobs in extractive industries that provide at least a modicum of stability through their modest wages. Therefore, we argue that the immiserating effects of oil extraction go beyond their environmental and economic impacts on well-being but can also be found in the way they crowd out other ways of envisioning and enacting development. (Arsel et al. 2019: 221).

This finding constitutes an interesting point of analysis that goes beyond the traditional social and economic impacts of the industry.

### ***The newspapers***

Now a more recent picture of oil industry is reflected through the media. To summarize, it seems that this ‘blessing’ instead of bringing prosperity to the country had brought a variety of problems, even more to the area where it is extracted. Table 2.1.1 presents a summary of articles related to oil industry in the country. Articles can be divided into three main topics that support the points raised by the literature reviewed above: most of them have to do with environmental degradation, the extractive imperative and with conflict. Other issues as corruption and the economic impact are also considered.

First, environmental impact of the industry is the most common type of news. Articles from different periods considered in the research are related to oil spills and its impact. On the one hand as oil has been extracted since the 1970’s, some of the articles refer to the pollution caused by oil companies in previous decades and the remaining effects of that pollution up to present time. On the other hand, oil spills have also been common in recent times. For instance, in El Universo (2013a) they present a report stating that there is one oil spill per week in Ecuador; while in another article El Universo (2013b) discusses on the effects of the remaining pollution caused in the past.

Second, many of the articles support the idea of an extractive imperative. Oil has been promoted as a mean to achieve development since the beginning of its exploitation, and it remains to be promoted with this message. The list begins with the best example, El Universo (2013c) presents an article in which they discuss on the four decades of oil dependence. Oil was presented as a mean to bring prosperity for the country, but reality have not

changed at all, and even the situation for communities in the producing areas have not improved. Then, many articles inform on the necessity of different governments to keep and even increase oil activities. For instance, in the very last articles some of them provides evidence on the bidding of new oil fields and the expectation of the current government to increase oil production. This desire responds on the necessity for more resources to finance the current fiscal deficit, the country even announced that it will quit the OPEC in order to increase its production in the coming years.

**Table 2.1.2**  
News related to oil industry in Ecuador

<b>Year</b>	<b>Newspaper</b>	<b>Headlines (English)</b>	<b>Classification</b>
2013	El Universo	In Ecuador there is one oil spill per week	Environmental degradation
2013	El Universo	Oil traces remain in the Amazon	Environmental degradation
2013	El Universo	Four decades living on oil	Extractive imperative
2014	El Universo	Oil spill caused by pipe breakage	Environmental degradation
2014	El Universo	Oil traces remain in many areas of Ecuador	Environmental degradation
2015	El Universo	Sucumbios, worried by oil and commerce	Economic impacts
2016	El Universo	Declined sectors in Orellana province, area that made a living on oil	Economic impacts
2017	El Universo	Ecuador "needs resources from oil", said minister Carlos Perez	Extractive imperative
2017	El Universo	Oil polluted a lagoon in Lago Agrio	Environmental degradation
2017	El Universo	Oil spill affects farm in Sucumbios	Environmental degradation
2018	El Universo	Ecuador will increase the quantity of oil and gas areas to be auctioned, minister announced	Extractive imperative
2018	El Universo	Four communities in Orellana affected by oil spill	Environmental degradation
2018	El Universo	Ecuador launches oil bidding to search for investments in more than one billion dollars	Extractive imperative
2018	El Comercio	Ecuador expects to increase oil production to 700 000 barrels in 2021	Extractive imperative
2018	El Comercio	More revenues from crude oil in 2019 will boost growth	Extractive imperative
2018	El Comercio	Amazon Law will contribute 394.8 millions to the region	Development
2019	Expreso	The struggle of waorani warriors against oil companies in the Amazon	Conflict
2019	El Universo	Oil is not the only thing that pollutes on the Ecuadorian Amazon	Environmental degradation
2019	Expreso	Minister Perez announces private investment for more than 2 000 millions in oil biddings	Extractive imperative
2019	Expreso	Waorani community protested in Quito against oil exploitation	Conflict
2019	El Universo	Oil spill affects community in Lago Agrio	Environmental degradation
2019	Expreso	Government expects investment in 1170 millions in seven oil fields	Extractive imperative
2019	Expreso	Sevel oil fields were tendered for 24 years	Extractive imperative
2019	El Comercio	Infraestructure and production, priorities of the Amazon	Development
2019	Expreso	Corruption traces increase in hydrocarbons	Corruption
2019	El Universo	Waoranis celebrate verdict that prevents oil extraction	Conflict
2019	Expreso	Oil companies cut off 1000 jobs	Economic impacts
2019	El Comercio	Struggle for culture and land in the Oriente	Conflict
2019	El Universo	Oil and minning threaten more to Ecuadorian Amazon than fires	Environmental degradation
2019	El Universo	Ecuador will increase crude oil production in 2020 after leaving the OPEC, minister announces	Extractive imperative

Source: Author.

Third, an important group of articles are related to conflict in the area. This conflict is mainly the struggle between indigenous groups and oil companies. These groups as well as other isolated groups were inhabitants of the Amazon before the arrival of the industry and with it, western modernity. The origin of the conflict is based on the negative impact of oil exploitation in form of deforestation, environmental pollution, aggravated by the constant expansion of the industry in the jungle. It seems that despite economic compensations, in the form of extra budget allocation for regional governments and jobs provided by the industry, the negative effects of the industry are greater than the compensation measures.

Fourth, the impacts of oil industry presented in the media reach the economic impacts. These refer to both the positive and negative ones. It can be seen that the boom and bust nature of the industry do not only directly influence the economy of the country but the local economies. The articles related to this topic report on the difficulties of the towns in areas that depend on oil. For instance, during 2015 where oil prices declined, towns in the region face difficult situations. People depending on oil industry could no longer sustain their businesses, many more lost their jobs directly linked to oil companies.

But also, other few articles are related to the arguably positive benefits of the industry. These refer mainly to the extra rent allocated to the provinces of the Amazon region. What is interesting is that this extra monetary remediation is mainly used to boost development in the form of infrastructure and productivity. Finally, other problems like corruption in the sector are also exposed.

## 2.3 Happiness and oil exploitation

The literature that relates happiness and oil exploitation is quite limited. From happiness research side the nearest relationship is with the one that analyzes the relationship with environmental degradation. While from the research in oil industries the nearest relationship is the one that analyzes the impact on welfare indicators. However, none of these branches makes a direct link between the two but a single study.

Ali et al (2019) analyze the relationship between happiness and the resource curse. They claim to be the first authors to explore this relationship making use of a large panel dataset to analyze the impact of resource revenues to happiness between countries. They find that "...oil rents are negatively linked to improvements in happiness over time. This happiness 'resource curse' appears to be oil-specific and holds both for the levels as well as changes in happiness" (Ali et al. 2019: 20).

They also call for further research on this field, given that this is a first approximation using country data. This, also in accordance with the argument presented in other section that indicates that resource curse research is fragmented, it would be useful to investigate whether this resource curse hypothesis holds when analyzing data at different levels.

Finally, when considering the literature for Ecuador there does not exist neither. Any study looks into the relationship between happiness and oil. Thus, conducting this study will be a valuable piece of work.

## 2.4 Analysis

Considering both branches of the literature, on happiness and on extractive industries research, give us an idea of what are the possible links between them. The study by Ali et al. is also a good starting point to establish the relationship, but it does not show a more specific indication of the means through which oil exploitation hampers happiness levels. From the literature review it may be expected that oil industry has a negative impact on happiness

levels of people living in areas where oil is extracted. There may be some mechanisms through which the negative impact of oil exploitation is translated to happiness. Some of the possibilities are analyzed in this section.

First, economic factors may negatively influence happiness in this region. Given the economic structures dependent on oil sector, the instability of it may cause negative impacts on well-being. Also, employment related issues may affect areas where oil is exploited. As an important factor influencing happiness is unemployment; and, considering the economic structures that oil-led development creates in these regions, employment opportunities may be limited. The few positions created by the industry may not suffice for the demand of jobs for local population. Further, other activities such as fishing and hunting may severely be affected by the activity, reducing even more the opportunities for local communities to be part of the economic life.

Second, community relations seem to be quite an important factor affecting happiness. This factor may, in less proportion, be affected by the oil industry. But, in the case of the socio-demographic structures that are shaped by the oil industry create conflicts in the social composition of traditional community structures, happiness levels of these communities may be negatively affected as well.

Third, political participation may be a way in which happiness of people from this region is decreased. Political participation and personal freedom have been seen as contributing to increasing happiness. On the other hand, if people are impeded to exercise their rights and freedom, happiness levels may be expected to decrease. This may be the case of inhabitants residing in oil extractive regions. As oil becomes a strategic resource for the country, decisions on the region are taken from the central government in favor of the whole country, affecting the self-determination of people in these regions in many cases. Even external powers, like oil companies, may become dominant in power relations. All of these affect the decisions of local communities to decide on what is better for them. Even worse, no sufficient compensations are implemented, and the resource revenues usually favor other areas of the country.

Finally, and most importantly, environmental issues may be seen as the most prominent negative factor affecting happiness. Oil industry is known for the negative effects on the environment, and even though technology has helped to reduce possible environmental impacts, these are still high. On the one side, the development of the industry supposes the construction of infrastructure in remote areas like in the jungle, this negatively affects biodiversity. But on the other side, while in operation, oil spills are quite common. Oil has a devastating negative impact on living species, including humans, contaminating soil, air and water sources. Thus, the environmental impact is usually seen as the main effect of oil industry, this may be translated to negative effects on well-being as well.

## Chapter 3

### Methodology

This study investigates on the relationship between happiness and oil exploitation at local levels. Most of the economic research on these topics are made at macro levels, or on the other hand, at micro levels but with a more ethnographic or anthropological approach. This study attempts to provide empirical quantitative evidence at a micro level. To this end, and taking advantage of a two data source, a quantitative methodology is applied.

The study uses two different datasets to draw some conclusions on the impact of oil industry on happiness in the Northern Amazon region in Ecuador. In line with previous empirical happiness research a logit model specification is used to determine likelihood of being more or less happy given certain conditions, among them being exposed to negative effects of oil. This section presents the empirical approach used in the research as well as the limitations of the same. It starts by presenting the data including its sources, variables of interest and descriptive statistics; then, the model specification is explained; finally, the limitations of the strategy are also stated.

### 3.1 The data

There exist a variety of sources of data on happiness, most of them are collected by different institutions at national levels. However, finding such data for more local levels is quite difficult. As the purpose of this study is to investigate on happiness on areas where oil is exploited, usually a remote one, data at this local level in this area is needed.

This study takes advantage of two sources of data that have been identified. It uses a dataset that contains information for households at a national level, while also a dataset that includes information for households at a more local level. The two sources of data have been collected through household surveys and are explained in more detail in table 3.1.1 and below.

**Table 3.3.1**  
Sources of data

Institution	Survey	Year	Scope	Sample size	Unit	Section
INEC	ENEMDU	2017	National level	30023	Household	Section 13: Personal harmony and with the community
Lorenzo Pellegrini	Household Survey	2017	Northern Amazon	1135	Household	Wellbeing: Self-perception of households

*Source:* Author.

The first dataset comes from the National Survey on Employment, Unemployment and Underemployment (ENEMDU), carried out by the National Institute of Statistics of Ecuador (INEC). The ENEMDU is a quarterly survey conducted to monitor employment indicators in the country. It has been conducted in a regular basis since 2007 and apart from the labor market statistics it contains other modules that collect data on a great variety of topics.

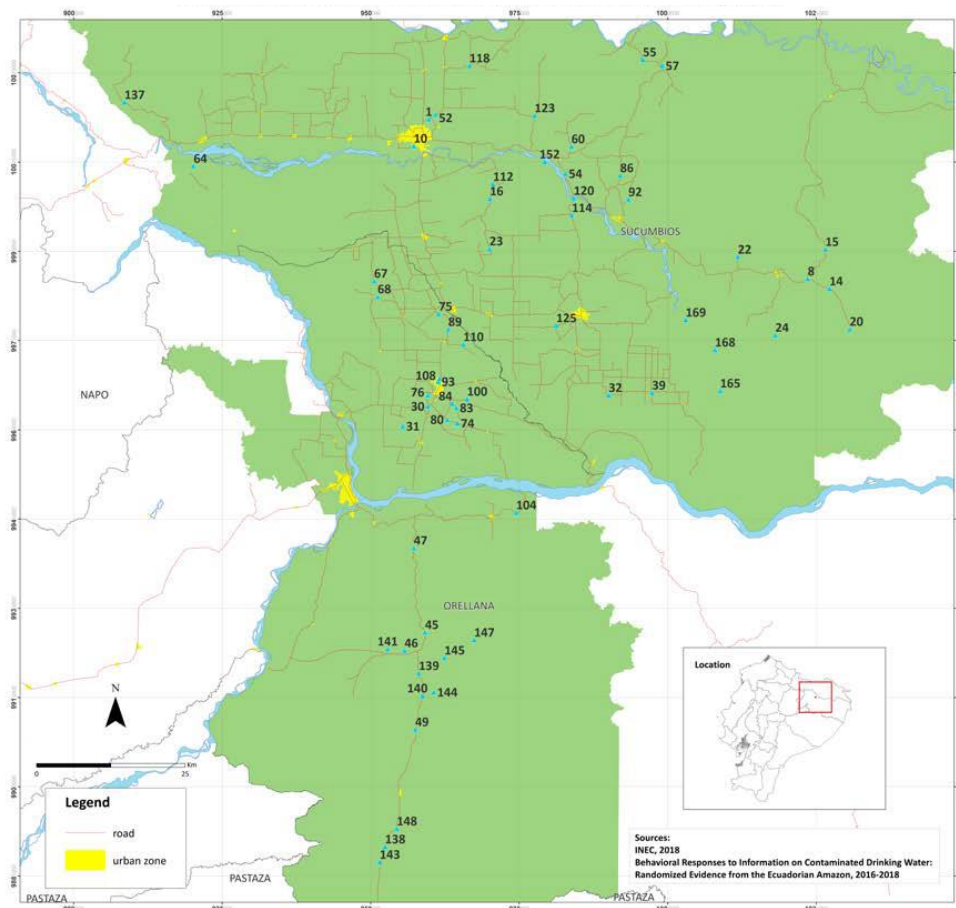
The dataset includes information from households for a national level that can be disaggregated up to the Province level. The survey includes data on life satisfaction as well as a set of socio-demographic variables. The question regarding life satisfaction is one commonly used in happiness research.

The second and main dataset to be used in the study comes from a household survey from an impact evaluation conducted by Lorenzo Pellegrini (2018b). This survey was made to collect data for the study “Behavioral response to information on contaminated drinking water: randomized evidence from the Ecuadorian Amazon” and contains mainly information on water usage but also on other variables.

The survey was conducted in 2017 in the Northern part of the Amazon region in Ecuador. The area considered for the collection of data included parts of the Provinces of Sucumbios and Orellana as the purpose of the intervention was related to oil related contamination. These Provinces are deeply linked to oil industry since oil exploration and exploitation in the Ecuadorian Amazon region started in this area. Further, most of the current oil infrastructure and production takes place in this zone.

The survey was conducted to households in 60 selected communities with the following conditions: “they have at least 20 households, the distance with the border with Colombia is larger than 5km, and no information on water quality is available to the local population.” (Pellegrini 2018b: 5). Map 2.1.1 shows the region of study. For further details on the survey refer to the cited study.

**Map 2.3.1**  
Map areas included in the household survey in Northern Amazon



Source: Pellegrini 2018b.

The dataset includes variables related to life satisfaction as well as other variables that are useful for the present study. For life satisfaction it includes a question that is widely used in happiness research.

### 3.1.1 Variables

The variables used in the present study have been selected depending on a theoretical basis, but also considering the limitations of the data. Happiness research have made progress in identifying the determinants of happiness in different studies, these have been discussed in the literature review and some are considered for the model. Also, on the oil exploitation related literature there exist other variables to be considered. The list of variables of each dataset used in this research are listed in table 3.2 and 3.3 corresponding to the first and second datasets explained above.

The main variable for the study is happiness level, captured in this model through the subjective well-being variable in the dataset. There exist discussions on what is the best way to measure happiness, however in this paper a general life satisfaction approach is used. That is happiness is measured with a question asking on general satisfaction considering all aspects of life. The way in which this question is formulated overcome some drawbacks usually present on measuring happiness.

This question asks respondents to self-rate their life on a 0-10 scale basis, being 0 completely unhappy and 10 completely happy. However, a rescale procedure was made in order to simplify the process and to make it easier to understand the results. So, Subjective well-being variable was converted to a binary one in which 0 correspond to happiness levels below the mean happiness level in the dataset and 1 to scores greater or equal than the mean happiness values. For example, a household with a score of 7 in the original scale, which is lower than the mean value of 7.79 is rescaled to 0; while a household with a score of 8, which is higher than the mean value of 7.79 is rescaled to 1.

**Table 4.3.2**  
Variables in dataset 1

Variable	Code	Values	Description	Question	Expected impact
<b>Dependent variable</b>					
Subjective well-being	swb2	0-1	0 less happy, 1 more happy	How do you feel about the general satisfaction with your life, that is, taking into account all aspects of your life?	
<b>Oil impact</b>					
Oil province	oilp	0-1	0 not oil province, 1 oil province	Province	Negative
<b>Socio-demographic characteristics</b>					
Age	age	cont	Age	How old are you?	U-shaped
Gender	sex	0-1	0 female, 1 male	Sex	Not representative
Education level	edu	0-2	0 no education, 1 school/high school, 2 university	Which is the highest education level and year that you achieved?	Variable
Identity origin	ide	0-2	0 indigenous, 1 mixed, 2 other	How do you identify yourself according to your culture and customs?	Variable
<b>Social relationships</b>					
Civil status	civsta	0-1	0 other, 1 married	What is your current civil status?	Positive
<b>Economic factors</b>					
Income	incpc	cont	Household income per capita in USD	Household per capita income	Positive
Unemployment	unem	0-1	0 other, 1 unemployed	Employment status	Negative
House ownership	hown	0-1	0 not own, 1 own	The house in which this household resides is?	Positive
<b>Environment</b>					
Water pollution	wpoll	0-1	0 not affected, 1 affected	In the following environmental problems, which ones do affect your neighborhood? - water pollution	Negative

Source: INEC 2017.



**Table 5. 3.3**  
Variables in dataset 2

Variable	Code	Values	Description	Question	Expected impact
<b>Dependent variable</b>					
Subjective well-being	swb2	0-1	0 less happy, 1 more happy	How do you feel about the general satisfaction with your life, that is, taking into account all aspects of	
<b>Oil impact</b>					
Negative impact on family	imfam	0-1	0 no, 1 yes	Has your family benefited or been harmed by the impact of the oil industry?	Negative
Negative impact on community	imcom	0-1	0 no, 1 yes	Has your community benefited or been harmed by the impact of the oil industry?	Negative
Negative impact in Ecuador	imecu	0-1	0 no, 1 yes	Has Ecuador benefited or been harmed by the impact of the oil industry?	Negative
Oil spills	spill	0-1	0 no, 1 yes	Have there been spills in your community in the last year?	Negative
Oil job current	oiljob	0-1	0 no, 1 yes	Does anyone in your home currently work for any oil company?	Negative
Oil job 5 years	oiljob5	0-1	0 no, 1 yes	Has anyone in your household worked for any oil company in the last 5 years?	Negative
<b>Socio-demographic characteristics</b>					
New household	nhh	0-1	0 no, 1 yes	Is this a new household?	
Indigenous household	ihh	0-1	0 no, 1 yes	Is this household indigenous?	
Households size	hhsiz	cont	Number of persons	Number of persons within the household	Variable
Sex	sex	0-1	0 female, 1 male	What is the sex?	Not representative
Age	age	cont	Age in years	How old is the person?	U-shaped
<b>Social relations</b>					
Community participation	com	0-1	0 no, 1 yes	Do you regularly participate in community meetings?	positive
<b>Economic factors</b>					
House ownership	hown	0-1	0 not own house, 1 own house	What is the ownership of this dwelling?	positive
Income scale	inc	0-1	0 bad, 1 good	According to the circumstances of your home, how do you consider your monthly income level available?	positive

Source: Pellegrini 2018b.

Variables that capture the impact of oil are a key component in the study. Meanwhile for the first dataset this data is not included for the second dataset specific information exists. The advantage of this dataset is that it provides this data by asking about the impact of the oil industry at different levels. For example, it contains variables indicating if the impact of oil exploitation has benefited or harmed the family, the community or the country. So, the variable negative impact is included, assuming a value of 0 if the household do not consider being negatively affected by oil industry and 1 if the household consider being negatively affected by oil industry. The same holds for the different variables indicating the perceived impact at a family, community and at a national level. Similar rescale procedures were also applied to some of these variables for simplification.

The datasets also include other relevant variable identified in the literature. These include other oil related, socio-demographic characteristics, social relationships, economic and environmental factors which are described in more detail in tables 4.1.1 and 5.1.1. The tables also include the expected impact that each variable may have on happiness according to the literature.

### 3.1.2 Descriptive statistics

Basic descriptive statistics on the variables introduced above are presented here. Tables 6.1.1 and 7.1.1 present these statistics for each dataset respectively. As most of the variables have been converted to binary ones, interpreting them is quite easy. Thus, the mean value of most of them represents the percentage of households that holds the characteristic of each variable, compared to the reference group. Missing data have been dropped in these statistics as they are not relevant for the model introduced later.

**Table 6. 3.4**  
Descriptive statistics dataset 1

Variable	Observation	Mean	SD	Min	Max
<b>Dependent variable</b>					
Subjective well-being	29898	0.5183	0.4997	0	1
<b>Oil impact</b>					
Oil province	29898	0.0607	0.2387	0	1
<b>Socio-demographic characteristics</b>					
Age	29898	50	16	12	99
Gender	29898	0.7261	0.4459	0	1
Education level 0	29898	0.0580	0.2337	0	1
Education level 1	29898	0.7646	0.4243	0	1
Education level 2	29898	0.1774	0.3820	0	1
Identity origin 0	29898	0.1169	0.3213	0	1
Identity origin 1	29898	0.7822	0.4128	0	1
Identity origin 2	29898	0.1009	0.3012	0	1
<b>Social relationships</b>					
Marital status	29898	0.4466	0.4971	0	1
<b>Economic factors</b>					
Income	29898	286.98	533.86	0.43	50260.00
Unemployment	29898	0.0144	0.1191	0	1
House ownership	29898	0.6086	0.4881	0	1
<b>Environment</b>					
Water pollution	29898	0.1550	0.3619	0	1

Source: INEC 2017.

**Table 7. 3.5**  
Descriptive statistics dataset 2

Variable	Observations	Mean	SD	Min	Max
<b>Dependent variable</b>					
Subjective well-being	1116	0.6263	0.4840	0	1
<b>Oil impact</b>					
Negative impact on family	1116	0.4668	0.4991	0	1
Negative impact on community	1116	0.3987	0.4899	0	1
Negative impact in Ecuador	1116	0.2939	0.4558	0	1
Oil spills	1116	0.1075	0.3099	0	1
Oil job current	1116	0.2222	0.4159	0	1
Oil job 5 years	1116	0.3737	0.4840	0	1
<b>Socio-demographic characteristics</b>					
Age	1116	45.9346	15.0493	18	93
Gender	1116	0.8441	0.3629	0	1
New household	1116	0.1900	0.3924	0	1
Indigenous household	1116	0.1505	0.3578	0	1
Househols size	1116	5.2545	2.6601	1	18
<b>Social relations</b>					
Community participation	1116	0.5833	0.4932	0	1
<b>Economic factors</b>					
House ownership	1116	0.8495	0.3578	0	1
Income scale	1116	0.2903	0.4541	0	1

Source: Pellegrini 2018b.

## 3.2 Model specification

The idea of the paper is to investigate on the impact of oil industry in happiness in the Northern Amazon region in Ecuador. To this end, based on previous studies and on the data source available, the empirical approach considered in this study is explained below.

Most of the empirical studies on happiness research makes use of logit or probit models. Analysis of happiness usually includes the use of multi-response variables so, ordered logit regression is used. However, Ferrer-i-Carbonell and Frijters (2004) have shown that using both a Logit or a OLS yield similar results. As this study uses a binary variable on subjective well-being, instead of using an ordered logit, a simple logit regression technique is implemented. This strategy makes the results easier to be interpreted compared to other methods. In addition, OLS is also used to show the coherence of the results.

A logit is a type of qualitative response regression model (see Gujarati and Porter 2009). It is specifically a binary response model in which the interest relies on the response probability, which makes use of the logistic distribution function. As explained by Wooldridge (2016) the response probability can be modelled as in Equation 1:

**Equation 1:**

$$P(Y = 1 / X) = G(b_0 + bX)$$

where the probability P of Y being 1, given each of the X explanatory variables is a function G of the explanatory variables. Where Y is a dichotomous variable taking values of 0 and 1, G is the logistic cumulative distribution function and B are the coefficients of each regressor. The model is then computed using maximum likelihood estimation.

In simple words, the model estimates the likelihood of being part of a determined subgroup conditioned on a set of explanatory variables, and the coefficients gives the partial effect of each of the regressors. For example, if  $Y = 1$  stands for a household who is part of a happier set of households or 0 otherwise, the model computes the probability of being part of this happier group conditioned on the explanatory variables. The coefficients of the explanatory variables show the partial effect of each variable on the likelihood of being part of the happier group keeping all other variables constant.

With this in mind, the strategy of the paper is as follows. First, using the ENEMDU dataset a model will be used to determine if households living in the provinces of study, this Orellana and Sucumbios, are on average more or less likely to be happy than those living in other provinces. With this strategy it is not pretended to demonstrate the direct impact of oil exploitation on happiness, as there exist limitations on the data to draw these conclusions. However, what is intended is to demonstrate the existence of a relationship between living in this oil producing area and being more or less happy controlling for other factors. The first specification can be modelled as in Equation 2:

**Equation 2:**

$$SWB = a + b1 OILP + b2 SDC + b3 SOC + b4 EC + b5 ENV + e$$

where SWB is happiness level, OILP is a set of variables related to oil producing provinces, SDC a set of socio-demographic variables, SOC a set of variables related to social relations, EC a set of economic variables, ENV environmental factors, and e the error term.

Second, using the household survey dataset by Lorenzo Pellegrini a similar specification will be used to determine if households that consider that have been negatively affected by oil industry are on average more or less likely to be happy than those that have not faced a negative impact. To this end, a logit model is also used to capture the probability of being more, or less happy conditioning on have been negatively affected by the oil industry. This is modelled as in equation 3:

**Equation 3:**

$$SWB = a + b1 OIL + b2 SDC + b3 SOC + b4 EC + e$$

where SWB is happiness level, OIL is a set of variables related to oil impact, SDC a set of socio-demographic variables, SOC a set of variables related to social relations, EC a set of economic variables and e the error term.

### 3.3 Limitations

This paper constitutes a first attempt to analyze the impact of oil industry on happiness at a local level. However, some limitations arise when conducting the study, the main one is related to data limitations.

The first idea while designing the research was to make use of the two datasets to combine them and be used as a single dataset. Although some variables may coincide, most differ. While the first dataset includes a huge amount of data and variables, it does not contain specific data on oil impact; while the second dataset includes specific data on oil impact, but the quantity of variables is more limited.

Also, even though the main variable, subjective well-being, is the same and is measured with the similar scale and question in both surveys, levels seem not to coincide. First, the variable of interest seems not to coincide in mean values where compared in similar regions. For example, for the first dataset the mean SWB values tends to decrease if looked at a more local level starting from the country level, following the regional and finally with the oil productive provinces level, which yields the lowest level (7.05). However, for the

second dataset, the mean SWB for the area of study, which is contained within the last region of the first dataset, is substantially higher (7.79). Even if compared to country mean values, the value for this region is higher, only comparable to provinces like Galapagos and Chimborazo, but still do not coincide with its province level (7.95 and 7.99 respectively).

Second, the comparability of the two datasets is difficult in terms of localities included, however there exist a region that can be compared. Almost none of the localities included in each dataset coincide but one. For instance, the locality of Rumipamba in the Orellana Province can be found in both datasets. This allows us to compare the mean SWB for this locality in both sources. And again, the values between the two sources in the same locality do not coincide. With a substantial difference between the two.

This difference may arise for different factors. Responses may be influenced by the way in which the question is asked, however, as here both sources include the main question this is possibly not the case. Also, responses are influenced by the order of the questions in the questionnaire or by different influences of the interviewer. This may be more consistent as both surveys are made with different purposes in different questionnaires and different conditions. Investigating these differences is beyond the extent of this paper, but the two datasets may be used and interpreted separately.

Considering all of this, the strategy of using both dataset in a different way is implemented. The first dataset would only be used to give support to the main point to be made using the second dataset.

## Chapter 4

### Results and findings

The model presented in the previous section was computed using different specifications. Coefficients were calculated using a statistical software. In this section the results of these econometric model are presented.

The first section contains a brief description and analysis of the main findings of the first model; the second section contains the description and analysis on the results of the second model on the impact on the communities where oil is exploited; finally.

#### 4.1 Impact in oil producer provinces

##### 4.1.1 Results

As a starting point it is clear that two of the provinces where oil has been exploited are the least happy according to the first dataset. Descriptive statistics using the full scale on happiness variable shows that Orellana and Sucumbios have the lowest mean happiness level in Ecuador as presented in table 8.1.1. The next step is to see the impact of living in this area on happiness. The results of this model are presented here. It worth clarifying that this model constitutes a basic set up that would provide some support to the findings of our main model in the next section.

**Table 8. 4.1**  
Mean subjective well-being in Ecuador

Region	Subjective well-being			
	Mean	SD	Min	Max
Ecuador	7.36	1.85	0	10
Amazon	7.31	1.91	0	10
Oil Provinces	7.05	1.83	0	10

Source: INEC 2017.

Four different specifications of the model were computed using a statistical software. The first three correspond to the logit model while the third corresponds to an OLS. For an easier understanding of the results marginal effects are shown in the table 9.1.1. The idea of these estimates is to show the probability of being part of a happier set of households, conditioning on the different regressors.

The first specification is a basic one, considering only the variable showing if a household resides in one of these provinces. The second specification expands on including a set of control variables that also affect happiness. Results show that households residing in these provinces are on average 4.2 percentage points less likely to be part of the happier group of households keeping all else constant. The fourth specification includes a variable showing if a household have faced water pollution, this also affects happiness and it seems that it takes part of the impact shown before in the variable of oil province. Now living in these provinces negatively affects happiness on a 3 percentage points on average. Thus, living in the provinces where oil is exploited do negatively affect happiness.

**Table 9. 4.2**  
Logit model 1 – marginal effects

Variables	Logit			OLS
	1	2	3	4
<b>Oil impact</b>				
Oil province	-0.0617*** (0.0121)	-0.0421*** (0.0128)	-0.0353*** (0.0129)	-0.0334*** (0.0120)
<b>Socio-demographic characteristics</b>				
Age2		-3.06e-05*** (1.94e-06)	-3.09e-05*** (1.95e-06)	-2.89e-05*** (1.77e-06)
Gender		0.0166** (0.00764)	0.0169** (0.00764)	0.0154** (0.00709)
Education level 1 (Education level 0 excluded)		0.124*** (0.0145)	0.125*** (0.0146)	0.111*** (0.0123)
Education level 2		0.271*** (0.0139)	0.272*** (0.0139)	0.261*** (0.0144)
Identity origin 0 (Identity origin 2 excluded)		0.0109 (0.0133)	0.00947 (0.0133)	0.00883 (0.0124)
Identity origin 1		0.0199** (0.0101)	0.0184* (0.0101)	0.0178* (0.00941)
<b>Social relationships</b>				
Civil status		0.0624*** (0.00690)	0.0616*** (0.00691)	0.0576*** (0.00644)
<b>Economic factors</b>				
Log income per capita		0.0828*** (0.00372)	0.0826*** (0.00372)	0.0763*** (0.00327)
Unemployment		-0.0172 (0.0259)	-0.0161 (0.0259)	-0.0147 (0.0241)
House ownership		0.0110* (0.00656)	0.0118* (0.00656)	0.0107* (0.00607)
<b>Environment</b>				
Water pollution			-0.0423*** (0.00836)	-0.0393*** (0.00780)
Observations	29,898	29,898	29,898	29,898
R-squared				0.076

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Author.

The results presented above do not provide direct evidence that oil activity is the driver behind reduced happiness in this region. However, it provides valuable support to explore more into the impact of oil industry in a more specific region within this zone. This is presented in the next section.

#### 4.1.2 Findings

It was shown in table 9.1.1 that average happiness levels in the oil producing provinces were among the lowest compared to the regional and country average. Furthermore, while

looking at the results from the first model in table 4.2, there exists a negative relationship between living in these provinces and happiness. As explained earlier, this is a rough approximation which do not directly indicate a link to oil exploitation given data limitations. However, these results provide important insights.

First, households residing in this area are on average less likely to be part of the happiest set of households, even after controlling for other variables that also affect happiness. It is found that household living in these provinces are on average 3.5 percentage points less likely to be happier keeping all else constant as shown in specifications 3 and 4. Even though the literature analyzing this relationship is limited, results are in accordance with previous findings. On the one hand, it is in line with the findings by Ali et al. (2019) which found a negative link between oil revenues and happiness at country levels over time. While on the other hand, it is in accordance with a set of less related studies which indicate a negative effect of oil industry in different welfare indicators in areas where oil is exploited. Thus, it was expected that oil producing regions were in fact less likely to be happy.

Second, while it is difficult to establish a direct relationship with oil industry in this first approximation due to data constraints, part of this negative effect may in fact be caused by oil activities. And given that one of the main negative impacts of oil is through environmental degradation, a regressor on water pollution is included in specification 3. So, when controlling for water pollution, this variable takes part of the effect of the regressor on oil provinces obtained before, as shown in specifications 2 and 3. Prior the inclusion of water pollution, a household living in oil provinces was on average 4.2 percentage points less likely to be happier, but while including this additional control, it drops to a 3.5 indicated before. Now, water pollution is also related to a 4.2 percentage points decrease in the likelihood of a household of being happier, keeping all else constant. This finding is in line with previous research analyzing the relationship between environmental degradation and happiness as indicated by Ferrer-i-Carbonell and Gowdy (2007).

Although water contamination measured in the survey may be caused by other factors, households in these provinces are more likely to have faced this problem. While for the country level around 16 percent of households face water contamination, for the oil provinces level rises to about 32 percent, indicating that they are more exposed to this type of issue. As oil spills are common in the region, air, soil and more importantly water contamination is more likely.

The negative impact of contaminated water is then twofold: on the one hand it directly affects water sources, while on the other hand it affects biodiversity. Given the characteristics of the Amazon region which is one of the least advanced regions, infrastructure and basic services are not common as in bigger cities in other regions. Thus, water supply from public sources are usually limited. For instance, meanwhile for the country average, access to water supply through pipelines is of about 90 percent, for these two provinces it drops to a 74 percent while the remaining 26 percent of households have access through other means which include direct collection of water from rivers, wells and other sources. Contaminated water may have a direct link to well-being through health issues associated with it.

Other factors that do also affect happiness, among the more relevant found in this model are education, civil status and income. First, it is shown that the higher the education level, the higher the possibility of being happier. For instance, a household with a university or superior level of education is on average 27.2 percentage point more likely to be happier compared to a counterpart with no education keeping all else constant. Second, social relations, as expected, have a positive impact on happiness level, making a household 6 percentage points on average more likely to be part of the happier group. Finally, a one percent increase in income is associated with 8.3 percentage point increase in the probability



of being happier which is as expected, however not representative negative impact of unemployment is found.

In short, what can be said is that these provinces are on average less happy, even after controlling for other variables. But the negative effect even holds after taking away the partial effect of water contamination. Thus, it is possible that the lower levels of happiness in these regions is due to oil activities, and if that is the case, the explanation behind this impact may be found beyond the environmental impact, or at least beyond water pollution. This is explored below.

## 4.2 Impact in oil producer areas in Northern Amazon

### 4.2.1 Results

The results of the regressions of the second model are presented below. In order to make it easier to interpret, marginal effects of the model are presented in table 10.1.1. Seven different specification were estimated.

From the seven different specifications the first 6 correspond to a logit model, while the last one is an OLS. The first specification is a simple model considering only the impact of oil exploitation to the family; second specification includes controls on socio-demographic characteristics, social relationships and economic factors; specification 3 and 4 include other controls related to oil industry; while specification 5 and 6 are the same as 4 but considering the impact to community and to country level respectively instead of to family level.

Marginal effects for each regressor in the logit model represent the probability of being part of the happier set of households conditioned on each explanatory variable. For instance, households that have been negatively affected by oil industry to their families in model specification 1, are on average 9 percentage points less likely to be part of the happier group. Thus, considering this simple specification, households that perceive a negative impact of oil industry to their families are on average less likely to be happy.

But, there are also other variables influencing happiness. Model specification 2 include other variables found in the literature that are expected to determine happiness on individuals. With these additional controls, a more realistic effect on the impact of oil industry is computed. Some of these new variables included have a statistically significant effect on happiness; so, taking out this partial effect, households facing a negative impact of oil industry are now on average 5 percentage points less likely to be in the happier group. Although the coefficient of oil impact decreases, its statistical significance still holds at a ten percent level.

Models 3 to 4 add other variables related to oil impact, similar results on the coefficient of oil impact holds even with the new variables included. Model 3 includes a variable showing if a household have faced oil spills, which seems not to have a significant effect. Models 4 include a variable showing whether a household member is currently working in the oil industry. Although any of these two variables included have a significant effect, it seems that currently working in the oil industry have a greater effect than working in the last 5 years (not included), thus our final specification is model 4.

With the final specification, it is found that a household facing negative impacts of oil industry is expected to be less happy. Results demonstrate that a household that consider been negatively affected by the oil industry is on average 5 percentage points less likely to be part of the happier group of households. These results are confirmed by an OLS model

presented in specification 8, which coincides with the 5-percentage points coefficient as using the logit.

**Table 10. 4.3**  
Logit model 2 – marginal effects

Variables	Logit					OLS	
	1	2	3	4	5	6	7
<b>Oil impact</b>							
Negative impact on family	-0.0912*** (0.0290)	-0.0572* (0.0300)	-0.0573* (0.0300)	-0.0519* (0.0309)			-0.0508* (0.0302)
Negative impact on community					-0.00459 (0.0302)		
Negative impact on Ecuador						0.0169 (0.0320)	
Oil spills			-0.0479 (0.0485)	-0.0497 (0.0486)	-0.0506 (0.0486)	-0.0498 (0.0486)	-0.0458 (0.0464)
Oil job current				0.0270 (0.0381)	0.0423 (0.0366)	0.0438 (0.0364)	0.0235 (0.0353)
<b>Socio-demographic characteristics</b>							
New household		-0.0592 (0.0440)	-0.0605 (0.0440)	-0.0577 (0.0440)	-0.0568 (0.0440)	-0.0555 (0.0440)	-0.0560 (0.0430)
Indigenous household		-0.0217 (0.0434)	-0.0188 (0.0435)	-0.0148 (0.0438)	-0.0142 (0.0438)	-0.0132 (0.0437)	-0.0143 (0.0423)
Households size		0.0131* (0.00699)	0.0129* (0.00700)	0.0125* (0.00701)	0.0123* (0.00701)	0.0123* (0.00701)	0.0121* (0.00672)
Gender		0.00708 (0.0409)	0.00745 (0.0408)	0.00602 (0.0408)	0.00761 (0.0409)	0.00730 (0.0410)	0.00609 (0.0404)
Age2		-1.42e-05 (9.87e-06)	-1.46e-05 (9.89e-06)	-1.40e-05 (9.95e-06)	-1.47e-05 (9.91e-06)	-1.48e-05 (9.92e-06)	-1.41e-05 (9.92e-06)
<b>Social relationships</b>							
Community participation		0.0559* (0.0309)	0.0561* (0.0309)	0.0551* (0.0309)	0.0540* (0.0308)	0.0535* (0.0308)	0.0519* (0.0298)
<b>Economic factors</b>							
House ownership		0.0121 (0.0430)	0.0110 (0.0431)	0.00972 (0.0430)	0.0122 (0.0432)	0.0122 (0.0432)	0.00963 (0.0419)
Income scale		0.199*** (0.0302)	0.200*** (0.0302)	0.197*** (0.0304)	0.203*** (0.0300)	0.204*** (0.0300)	0.193*** (0.0303)

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Author.

Now, if the variable measuring oil impact at the family level is changed for the one measuring impact at a community or at a national level, results do not hold. This is shown in models 5 and 6. For instance, a household that considers that oil industry has negatively affected their community is less likely to be happier, but the coefficient is small and not statistically significant. In contrary, a household that consider that oil industry has negatively affected Ecuador, is more likely to be happier, but same as before, the coefficient is small and statistically insignificant. What is interesting to analyze if why do this change happen, this is analyzed in the next section.

Finally, results also show that other factors do influence happiness in this region. In specifications 4 to 7, other 3 determinants of happiness, in addition to the already explained, are found. In a small proportion household size do positively affect happiness. But more importantly, social relations and income in a greater extend, play a more prominent role in happiness. community participation increases the chances of being happier on a 5 percentage points on average. While having a greater income is a big determinant, increasing the chances of being happier on a 19.7 percentage points. All of this are as expected by the literature.

## 4.2.2 Findings

Given the insights from previous section, the analysis of the results on the impact of oil in local communities is made here. The dataset used in this section contains more specific data on oil impact in areas where oil is exploited, so in contrast with results presented earlier, more concrete impact of oil activity in happiness can be analyzed. As expected, oil is found to have a negative impact on happiness in household in the area of study. It is found that household living in this area are on average 5.2 percentage points less likely to be part of the happier set of households, even after controlling for other factors, as shown in table 10.1.1. This is again in line with the findings by Ali et al. (2019) in a negative relationship between oil and happiness, and other authors that indicated the negative effects of oil industry at local levels. Some important points need to be analyzed.

First, as one mechanism through which oil industry may affect well-being is the environmental degradation, a regressor on oil spills is added in specification 3. As indicated earlier, oil spills are common in this region, as reported by some newspapers. Spills pollutes air, soil and water sources and as also explained above, households in these provinces are more vulnerable to water pollution. For instance, around 51 percent of households in this region use water from sources as rivers, streams, rain, wells and other as the main source for drinking water. However, not statically significant effect is found for the impact of oil spills in happiness. But it worth clarifying that this variable measures the direct response of a household indicating whether there have been oil spills in their communities, thus if no effects were perceived by the household even though a real spill happened this is not considered. It would be preferable to look at more objective measures of oil pollution than the one available for this study.

Second, as another mechanism that may affect happiness, in a positive way, is the provision of employment opportunities in the industry, a regressor on jobs in the oil industry is included. It would be expected that someone working in the oil industry will be happier. The negative effects of unemployment on happiness have been discussed in the literature review, and as income provided by this industry is usually higher someone with a job position in the oil industry would be expected to be happier. However, not statistically significant effect is found whether including a variable measuring if a household have worked for the last 5 years in the sector or is currently working in the sector.

Third, other factors that seems to drive happiness in the region include social and economic factors. On the social side, community participation is positively associated with happiness, household participating in community activities are 5.5 percentage points on average more likely to be happier. This finding is in line with previous research that indicates the importance of social relations. For instance, Radcliff (2012: 102) indicated that after unemployment social factors were among the most important determinants of happiness. On the economic side, income is also positively related to happiness as expected. A household that consider being part of a good income scale is on average 19.7 points more likely to be happy. Although it is in accordance to what literature explains, here results need

to be treated with caution, given that the income scale is measure in a subjective manner, better approximations of income would have been preferred.

So, even after controlling for these variables a negative relationship between oil industry and happiness holds. Households whose families have been negatively affected by oil industry are on average 5.2 percentage points less likely to be part of the happier set of households keeping all else constant. This is shown in specification 4. This finding is in line with the findings by Ali et al. (2019) and with less related literature that finds negative impacts of oil industry at local levels. But there may be other mechanisms through which negative impact of oil industry is translated to well-being that were not considered in the empirical specification due to data constraints. Among the ones considered in the literature are other economic, social, environment and political consequences.

So, by looking at other economic aspects beyond income like unemployment the structures created by the oil industry may explain some of the negative effect. The oil sector is related to boom and bust cycles which creates vulnerable structures for households in the region. For instance, in 2015 when oil prices declined, newspapers reported the negative conditions of business and towns which dynamics depended on oil activity. This irregular situation may impact the economic conditions of households, plus the changing conditions may cause distress in households affecting their well-being.

On the social perspective, social issues caused by the industry may also contribute to negative outcomes in happiness. For instance, Murat et al. (2019: 217) discuss about some of the social issues raised by the oil industry naming prostitution, teenage pregnancy and alcoholism among the issues that oil industry may engender.

From the environmental perspective the effect of oil spills was analyzed but other more tangible measure may be analyzed. Previous finding showed that water pollution does negatively affect happiness. But also, loss of biodiversity and changes in the environment may cause health issues like solastalgia.

Furthermore, political factors would be also relevant to be included. Political participation and individual freedom have been found to positively affect happiness, thus if any of these are affected in the region, happiness would be negatively influenced. This would be an important factor to analyze, given that collective decisions are usually taken in the region in favor of the whole country, and usually local actors are not considered, or not effective compensations are implemented. This seems also to be partially the case, as some newspapers report on the demonstration and struggles of groups against the activities and expansion of the oil industry in the region.

Finally, while findings in specification 4 concerns the perceived negative impact of oil industry at the family level, when considering a negative impact for the community or for the country level, the negative impact on happiness do not hold anymore. This is presented in specifications 5 and 6 respectively. This constitutes an interesting finding as it would have been expected that if a household believes that its community or its country have been negatively affected by oil industry the happiness of these household would have been negatively affected as well. But it seems that well-being of households is only touched if negative effects of oil industry directly affect their families.

Going back to the ideas of oil-led development and the extractive imperative, it would be the case that oil has been heavily promoted as the engine for development. Thus, if people is not directly affected by oil effects, but indirectly, the idea that this is a price they have to pay for a better future may be so rooted in the their imaginaries that this negative effect is not translated into negative impacts on well-being, even though in the long run the goals of development would not be achieved as has been the case for the long decades of oil exploitation in the Amazon.

## Chapter 5

### Conclusion and recommendations

Happiness is an important concept for many cultures. In Ecuador this is expressed in the idea of Good Living (*buen vivir*) included in the constitution since 2008. But the harmony with nature that it implies is difficult to be achieved when natural resources have been used and promoted as a mean to achieve development. Since the 1970's oil, mainly extracted from northern Amazon region, became the main source of income for the country. It has been promoted since then as the strategic source for development. However, the country remains dependent to oil revenues and still faces many issues like poverty, inequality, fiscal instability, and seems not to have found the route to development. Even worse, Amazon region where oil is extracted is among the poorest region in the country and well-being indicators are among the worse also. Thus, the country has not found the way to translate the resources from this 'blessing' in benefit to the people.

The effects of oil industry on economic measures have been widely studied. The resource curse literature gives some insight on the negative impact of oil industry in economic development of most of the oil dependent countries. However, this research looks at traditional economic indicators like growth, GDP, income and others. On the other hand, happiness research has emerged as an alternative way to analyze in a more appropriate way the well-fare of people. Although the literature on oil indicates the negative effect of it for a country, and even more negative impacts for the region where it is obtained, research on the impacts of oil industry in happiness is limited. Ali et al (2019) provides an important finding indicating the existence of a happiness resource curse, that is happiness is negatively related to oil revenues over time. But this study is a cross country analysis at a macro level, thus a research looking at this relationship in more disaggregated level is needed to provide more support to this hypothesis. The present work aimed to do so.

With the use of two datasets and a logit model the impact of oil industry on happiness in the oil producing region was analyzed. It was found that households living in Orellana and Sucumbios, the two provinces where most of the oil is extracted, are on average 3.5 percentage points less likely to be part of a happier set of households. Also, households living in areas where oil is extracted and that have been negatively affected by oil industry are on average 5.2 percentage points less likely to be part of the happier set of households. What is interesting to mention is that this negative effect is only found if households family have been directly affected. On the contrary, the effect does not hold if the negative impact happens at community or at country levels. This may support the idea that oil-led development and the extractive imperative have been heavily promoted in the area.

Although these constitutes interesting findings which complement the previous results by Ali et al., a deeper understanding on the mechanism through which oil activities affect happiness levels is needed. Plus, as data limitations were faced in this research, other interesting variables to be analyzed may be included in future works, among them other economic, social and political factors may be incorporated in the model. As decision on exploiting oil on the Amazon region are taken for benefit of the whole country, without considering the necessities of local population, struggles against the industry have occurred. Thus, it would be fundamental to analyze the political variables influencing happiness in the region. Also using data from more than one single year would provide better estimations on the finding found in this study.

This paper has argued that oil exploitation has negative effects on wellbeing of the people living in the areas where it is extracted. With the presence of an extractive impera-

tive with oil still being promoted as the engine for bringing prosperity by expanding the industry, and with the expansion of activities in other extractive industries like mining, it is highly important for the pertinent institutions from different sectors to take into account the result found in this paper to reconsider the idea of extracting as much oil as possible to finance well-being for the country. This has proven not to be the solution after five decades of exploiting oil with the promise of a better future. And it has definitely not been a blessing for the Amazon region, which has seen the green jungle bleed out with black gold running through its rivers, the construction of roads and infrastructure on the bringing of 'development' with no harmony with the nature.

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# Notes