CONNECTING SUSTAINABLE DEVELOPMENT FROM FINLAND TO COLOMBIA

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Master's thesis

Degree Programme in Business Management and Entrepreneurship

Visamäki 9.12.2019

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Degree programme in Business Management and Entrepreneurship
Visamäki campus

Author Arturo López **Year** 2019

Subject Connecting sustainable development – From Finland to Colombia

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ABSTRACT

This study is focused on evaluating how sustainable development and cooperation between countries and organizations can contribute to slowing down and helping us adapt to climate change. This can be illustrated by how Colombia and Finland could cooperate in sustainable development projects in a way that will be beneficial for the enterprises within the communities, as well as for the habitat, through the use of a Twinning project as a way to bridge the gap between EU and Colombia. Researching the Colombian market condition in order to understand the complexity of the country, market leads (insides) for internationalization of Finnish organizations or projects.

Accordingly, the first step will be analyzing Colombia´s market and its economy, understanding the developing model, and how biodiversity plays a role in sustainability. This thesis approaches neoliberalism as a factor of climate change and sustainable development as a solution to it. As mentioned, this research focuses on sustainable development as a solution for climate change, highlighting Finnish strengths regarding this topic. Consequently, it presents a project in which different NGOs have been working to connect these two countries, the twin lakes project or Lagos Hermanos. Organizations like Valajärven conservation association, Ciudad sostenible foundation, and gobernación del Valle del Cauca can engage in collaborative approaches to natural resource management with the benefit of leveraging resources between each other so that little time, staff, and funds available can be put to best use.

Research results showed that Colombia meets the conditions so that a Finnish organization may lead the twin lake project, helping the organizations to be more strategic in their initiatives and use of funds, as well as staff. The Colombia government is willing to sponsor the initiative.

Keywords sustainable development, entrepreneurship, water, twin lakes.

Pages 67 pages including appendices 8 pages

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"The measure of intelligence is the ability to change."
Albert Einstein.

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1 INTRODUCTION

1.1 Background and justification

We are in a race against our environmental mistakes. The sixth mass extinction is knocking on our door. Unfortunately, the way we have been living, mainly since the industrial revolution, has unbalanced the earth dynamics triggering an increase in the climate change rate. Nevertheless, we are on time to deal with it through multidisciplinary approaches favored by international cooperation projects.

A significant aspect of this study is focused on how sustainable development and cooperation between countries and organizations can contribute to slow down and help us adapt to climate change. This case shows how Colombia and Finland could cooperate with sustainable development projects in a way that will be beneficial for the communities' enterprises and environment, and consequently for the communities and businesses based around it. Besides, this research looks into neoliberalism as a cause of global warming and sustainable development as a solution to it.

Researching the Colombian market condition was necessary in order to understand the complexity of the Latin country as a potential partner. Furthermore, it shows market leads (insides) for the internationalization of Finnish organizations and its projects. Accordingly, the first step will be analyzing the Colombian market and economy, understanding the developing model, and the role that biodiversity plays in it.

This research focuses on sustainable development as the mitigation tool for climate change, highlighting the Finnish strengths regarding water management policy. Additionally, it presents a project in which NGOs and government have been working to connect these two countries through cooperation and entrepreneurship with twin lakes project, where Finnish NGOs and Colombian local governments share knowledge and practices related to clean solutions, circular bioeconomy, sustainable land use, social innovation, and strategical broadcasting.

The twin lake project would enable local communities of Valle del Cauca Colombia and Hämeenlinna Janakkala (Renko) to exchange experience and innovation in the field of inland water use also municipality management techniques that encourage people not to be biased due to political barriers but instead encourage cooperation.

The expected result from the project is to export Finnish working methodology, as well as flows of goods and services to water-related ecosystem services, placing the Lake as the focus point of the project, with the involvement of the community, academic institutions, environmental institutions, the Colombian government, private institutions, and other stakeholders in order to create sustainable conditions.

2 METHODOLOGY

Pragmatism would be the right word to describe the research approach and the data collection used in this Thesis. By mixing quantitative and qualitative methods, where the research focuses on framing and solving the problem (can we connect sustainable development between nations). The methodology is varied in its design, (analysis of the sectors/economy, feasibility study), method of data collection (interviews, research, meetings, other) and analysis (twinning project & conclusions) further, it is also driven by fitness for purpose and employs quantitative and qualitative data as relevant. Furthermore, we must be aware of the vital role of the topic study method employed in this research. The right approach will help to deal with the study more dispassionately and clearly (Cohen, Manion & Morrison 2018, 34).

The research was conducted using qualitative and quantitative data collection methods, for example, interviewing target groups such as experts and leaders of some private and governmental organizations. In this process, the interaction between the writer and the target groups resulted in a comprehensive report and the scope of the project design. Moreover, since the thesis work is about sustainability, marketing, economy, and social issues, it will be a beneficial tool for country analysis, economic analysis, global warming, and others.

In qualitative research and data collection, the interview is the tool to obtain strategic information, starting by dividing it into two sections — one with the experts, and another with the shareholders' organizations involved. For most social researchers, interviewing people is the 'natural,' way to collect data, and interviewees were treated as (potentially) able to provide certain items of information to which they are supposed to have privileged access (Paul, 2004,56-57).

For organizing and presenting qualitative research by using conceptual material as primary and even secondary resources, research about the market condition of Colombia is necessary in order to find business leads or opportunities for Finnish companies. Also, the research and description of different business sub-sectors and sustainable industries are needed as well as the Colombian government budget planning 2018-2019.

Additionally, the quantitative research was based on the research of literature, governmental and non-governmental sources, global institutions (IPCC, UN, ONU, DANE), Thesis, so on.

2.1 Research objectives

The short-term objective of the study is to:

• Assess the instrument of the twinning project

• Analise Colombian market and economic condition

• Present Sustainable water management segment of Finland

• Discuss neoliberalism as a possible cause of climate change furthermore the role of sustainable development as a solution to it

• Feasibility study for the twin lake/ Lagos Hermanos

• Testing the water for waterways to the Colombian sustainable development market niche

The long-term objective of the study is to provide valuable information to understand a mutual benefit relationship between Colombia and Finland based on sustainability, entrepreneurship, and water economy (nexus). This information will allow NGOs and companies to develop the project "Twin Lakes/ Lagos Hermanos" Finland Colombia.

Twinning helps organizations be more strategic in their initiatives and use of funds and staff(Krantzberg & UNU-INWEH, 2011). Organizations like Valajärven conservation association, Ciudad Sostenible foundation, and gobernación del Valle can engage in collaborative approaches so natural resource management can have the benefit of leveraging resources with each other so that limited time, staff, and funds can be put to their best use. Research agendas can be developed in ways that seek solutions to shared problems, focus on local immediate needs and entrepreneurship.

2.2 Research questions

- Does Colombia have the economic conditions for establishing cooperation (links) or exchange with Finnish organization and initiatives? How much potential does the Colombian market have?

- How can Finnish strength (Supply) and the Colombian needs (Demand) in a sustainable development framework be integrated?

- How could the Finnish NGO Valajärven enter the target market?

- Can this case study (twin lakes) contribute to adapt and mitigate climate change in Colombia?
- What is the potential of Finland's bioeconomic offer to Colombia?
- What kind of impact would the twinning lake project bring?

2.3 Data collection

Based on Holopainen & Pulkkinen (2002), a survey/interview as a research method is systematic empirical research via statistical techniques. “A survey can be a questionnaire or an interview, even if both data collection is performed by using structured questionnaire formats so that the collected data is easy to analyze even if there are enormous amounts of information. Survey as a research strategy is intended for finding answers to the following questions; who, what, where, when, how to also how much? Heikkilä (2004) claims that a survey (Interview) is a cost-effective and efficient way of gathering information when the sample population is large and an interview when the sample population is small.

Data collection in survey studies can be performed by telephone, mail, or by online questionnaire/interview, or as a personal at-home or on-the-street interview. Naturally, the study can be a mix of the previously mentioned as well. The decision regarding the data collection method is often influenced by cost structure, and target population’s size, location, and willingness to participate. (Heikkilä, 2004)

Regarding personal interviews, it is quite challenging to find the time to perform all interviews and to write down the respondents’ answers. Heikkilä (2004) mentions that there can be numerous mistakes in the interview process that ultimately influence the results. The validity and reliability of the interview study depend on various factors. Vehkalahti (2008) describes the most important ones in today’s research settings being the following ones; 1) respondents’ motivation and ability to respond (accurate answers to the topic), 2) question design (open question to allow interpretation), 3) choice of experts (inaccurate representation of the target population), and 4) choice of data collection method (selection of a method that does not reach all sampling unit respondents). Consequently, face to face interviews was one of the methods used for collecting all the data needed in the whole thesis process.

Below are the details of the whole process.

Summarizing, the data collection method to be used was questionnaires and interviews. Additionally, the questionnaires and expert selection were designed by the student, and Professor Annika Michelson from HAMK to investigate:

• Value offers of water management projects from a Finnish organization to Colombia.

• How to design the project

• How to get funding

• Market segment and possible partners.

On the other hand, to research the other aspect concerned with this study used relevant literature, article, books, research documents, and statistics:

• Governmental Institutions, for instance: Proexport (Office of export Colombia), DIAN (Tax office Colombia), DANE (National dependency of statistic Colombia) Colombian market report. GDV (Gobernación del Valle).

• Literature: Shaker, R.R. (2015). The spatial distribution of development in Europe and its underlying sustainability correlations. Applied Geography, 63, 304-314. doi.org/10.1016/j.apgeog.2015.07.009

• Lynn R. Kahle, Eda Gurel-Atay, Eds (2014). Communicating Sustainability for the Green Economy. New York: M.E. Sharpe. ISBN 978-0-7656-3680-5.

• Krantzberg, G., & UNU-INWEH. (2011). Transboundary Lake Basin Management: Laurentian and African Great Lakes.

• Salomon, Robert (2006), Learning from Exporting: New Insights, New Perspectives, Edward Elgar Publishing Limited

2.4 Interviews

The study used interviews as a way of finding out the experts' opinions regarding water management, project management development, entrepreneurship, and bioeconomy. Thus, the interview was done individually with members and leaders of the following organizations: Häme University of Applied Sciences (HAMK), Valajärven conservation association (VCA), Vanajavesikeskus, Gobernación del Valle and Ciudad Sostenible Foundation (CS). All the respondents were notified in advance

whiles dates were scheduled to plan effectively towards it. A qualitative method has been used for this research.

According to David Silverman (2000,1), if you are concerned with exploring people's life histories or everyday behavior, then the qualitative research method is the best to use. The author would like to remind readers of this study to be mindful of generalizing the outcome of this qualitative research owing to the fact that in qualitative research, generalization should be avoided. In this case, the study is not only to explain but to understand and interpret, which will help the reader to get close and into the role being played by the different shareholders and stakeholders in the process of building a scope for the twin lakes project, furthermore the way of giving meaning to things choosing the interview as primary source of data collection.

It is believed that more information can be gathered about the topic from other sources than just observation. It is imperative to note that the approach of interviewing allows the study to view the world of the informants from a different perspective.

"Interviewing allows the author to know more about the participants' views and ideas about the subject at hand. Patton says that qualitative interview gives the impression that the perspective of others is meaningful, knowable, and able to be made explicit" (Patton 2002, 341). A total of seven questions were prepared forehand and sent to six leaders of the organization, including the initial project scope proposal. A total of ten members from all organizations were contacted. The initial project scope was sent to them before the interview to get familiar with the theme and prepare for the interview.

2.5 Analysis of data and expected contribution

Qualitative data analysis is often hard to interpret, because there are frequently multiple interpretations to be made, based on a principle purpose, the researcher must be right on what the research wants the data analysis to do, as this will determine the kind of analysis that is undertaken. The researcher can choose the use of qualitative research; the narrative conducted will focus on the interpretation of the researched data, interviews, and other sources (Cohen, Manion, & Morrison, 2007).

According to the above, Qualitative data is the best approach and method to know about the information, thanks to moving back and forth between experts' contribution in order to add rich interpretive analysis, consequently to Qualitative data presents the scope for the Twin Lake project. The assessment reports are a vital input of the international Twin lake project to tackle climate change.

On the other hand, quantitative data analysis is a powerful research method, emanating in part from the positivist tradition. It is often associated with largescale research, but can also serve smaller-scale investigations, with case studies, action research, correlational research, and experiments. (Baran, 2016)

In the following study, we show how numerical data can be reported and introduce some of the most widely used statistics that can be employed for their analysis. Based on the information and statistic institutions, this will be the raw material for finding Finnish sustainable development projects that can be introduced into the Colombian market. For this specific case, it will be "Connecting sustainable development between the twin lakes." In the initial scope, the project combines data and information, which will be helpful for Finnish companies to study pre-feasibility within Colombian territory.

3 GLOBAL WARMING AND NEOLIBERALISM; A COMMON PROBLEM THREATENING LIFE

3.1 Justification

Earth has been writing its history for a long time; its perfect localization in the solar system has allowed life to be possible. From the beginning of this long journey, the planet´s atmospheric condition has changed consequently the species within it. Our planet, as we know it, would be inconceivable without the interaction and transformation of primeval elements, resulting in water; the perfect element that fertilizes Earth, birthing the evolution of all the species that have inhabited this planet. First, due to all the high surface temperatures, it turned liquid, which led to an accumulation of an unlikely extensive organic carbon reservoir. When the surface got colder, water and pure organic compounds, derived from a variety of sources, began to accumulate. This reaction set the stage for the process of chemical evolution, where a molecular game began making the process of multiplication, heredity, and variation possible, allowing the origin of life. (Bada, 2004; Maruyama et al., 2013)

Paleontology showed us the many different ways of existence across the geologic time scale of the blue planet, for instance, since the pre-Cambrian period until Holocene epoch evolution has played with shapes, textures, molecules and genetic structure that adapt to the variable environmental conditions. Life has always found a way to express it in multidimensional ways. Besides, life on earth has ended and restart many times, by consequence of natural influences from the earth, such as a volcanic activity not only but also the external one as meteorites. (Gradstein, Ogg, & Hilgen, 2012).

Life itself has proved that change is an unstoppable constant in the Universe. However, only one species has been able to disrupt the natural order threatening itself as well as other life expressions. Certainly, humans have only needed around 300 years to have a negative influence on the present and future life on Earth. As a result, the natural balance was affected by four specific subjects, such as air (Greenhouse gases), forest (Land use), water (Pollution), and fire (Energy management). Currently, the leading climate change cause is greenhouse gases (GHG) effect. Carbon dioxide is the single most important anthropogenic GHG in the atmosphere.

Since 1750 the emissions of CO2 from human activities were again at record levels from 2016 to 2019 emission are still growing. According to the most recent assessment of the Global Carbon Project, this problem continues increasing the global average temperatures in the world (Le Quéré et al., 2017; WMO, 2018).

Consequently, Human beings have engineered their destruction, global warming. Moreover, it seems that climate will keep changing as foretold by the rise in sea levels, extreme storms (hurricane and tornados) and extreme prolonged droughts making natural phenomena like “El Niño” even worse, those new conditions will affect the environment in a way we have never seen before.

Animal extinction is on the rise and society (population) as we know it will change. An example of these significant consequences is that we are seeing and will continue to see a rise in immigration, mostly from developing countries who would have to move out of the place where they live. (Nordhaus 2014).

Accordingly, to the researchers, the carbon footprint is in the middle of the discussion. In simple words, defined it as the mark that we leave upon the environment, in other words, "The carbon footprint is a measure of the exclusive total amount of carbon dioxide emissions that are directly and indirectly caused by an activity or is accumulated over the life stages of a product."(Wiedmann & Minx, 2008). This fact directly affects water ecosystems, human welfare, and socio-economic development.

Today humankind has the knowledge to do it, but paradoxically we have not communicated it well enough around the globe. Humanity has clean solutions, circular bioeconomic, and sustainable land use to overcome climate change. Unlike, the current fight against climate change claims more forceful actions that in practice have been insufficient. Still, the green demand is not a total market disruptor that can open doors for innovation with competitive business models and projects. The UN, governments, entrepreneurship, and local actions have willing to mitigate this problem, merging a new niche in the world market, which proliferated around the globe.

This document talks about climate change and CO_2 emissions as a global problem; therefore, sustainable development initiatives as a way to answer. Certainly, beginning by describing Colombian economy segments where Finnish companies could apply sustainable solutions (sustainable water management business and services from Finland). Second, by talking about, Twinning Lakes between Finland and Colombia for transboundary lake management cooperation.

The purpose of sister lakes is to share information practices and ideas that improve the living condition of the society and the water body, “encompassing watershed and socio-economic issues that impact lake water quality and quantity, highlining socio-economic as considerations that should be included full-cost accounting of shared costs and benefits of resource uses as part of better understanding of the ways and means of achieving sustainability.’’ (Krantzberg & UNU-INWEH, 2011).

Moreover, supporting action to reduce water pollution management by controlling, for example, agrochemical, atmospheric pollution, as well as physicochemical variables contributing to preventing the extinction of crucial local species.

3.2 The relationship between the Economy and CO2

Talking about global warming and leaving out the economy will be pointless and irresponsible, the current peril the survival of humanity is in is just an expression or outcome of economy, furthermore, neoliberalism has been the most used developing model used nations around the world; as the Chicago boys defined it in the late 80, the idea was that society should be shaped by free market, and the economy should be deregulated or privatized (Monbiot, 2016). For example, what works for the private sector should work for the public sector too; the conception of neoliberalism might be free trade under the same competition conditions for the countries, but in reality, it is way different. (Robledo 2004, 72).

Nevertheless, this practice brought on a different approach. Neoliberalism´s main problem is greed; if the world faces real free trade based only on competitiveness and the comparative advantage of each country, we could redistribute macro numbers and the productivity performance of world regions. For example, a country like Colombia with its geographical position has comparative advantages for agriculture instead of mining.

The new world order calls for a sustainable solution, and only the governments and society can change the way the world has been run. However, to put it in context, currently, most countries use the neoliberal model to develop their economy. A negativity trade balance is an example of how this model disintegrates national production through import from subsidiaries economies. An open economy is not the problem; the conception of neoliberalism might be fair trade focused on basic human needs, but its philosophical keystone is greed, making it ignore and contributes to the climate crisis with the CO_2 emissions.

3.3 Development model, Industrialization and CO_2 Emissions

First, economic growth is based on the country's development model / Industrialization. Before 1750 the planet had a balanced temperature that sustained life, but the industrial revolution disrupted that balance; the race to become economically more prosperous created misspre conceptions of how a developed economy should work. For example, high power has been given to the oil industry and its derivatives; burning fossil fuels for energy used in transport or economic growth brought out a new problematic, what nowadays we know as greenhouse gases.

The latest analysis of the observations from the WMO GAW program shows that globally averaged surface mole fractions(2) calculated from this in situ networks for CO2, methane (CH4) and nitrous oxide (N2O) reached new highs in 2016, with CO2 at 403.3 ± 0.1 ppm, CH4 at 1 853 ± 2 ppb(3) and N2O at 328.9 ± 0.1 ppb. These values constitute, respectively, 145%, 257%, and 122% of pre-industrial (before 1750) levels, in other words, the gathering of too much CO_2.

As illustrated by figure 1, we observe that carbon emissions have been continually rising even after the Paris agreement and the One Planet Summit, a situation that is increasing the problem.

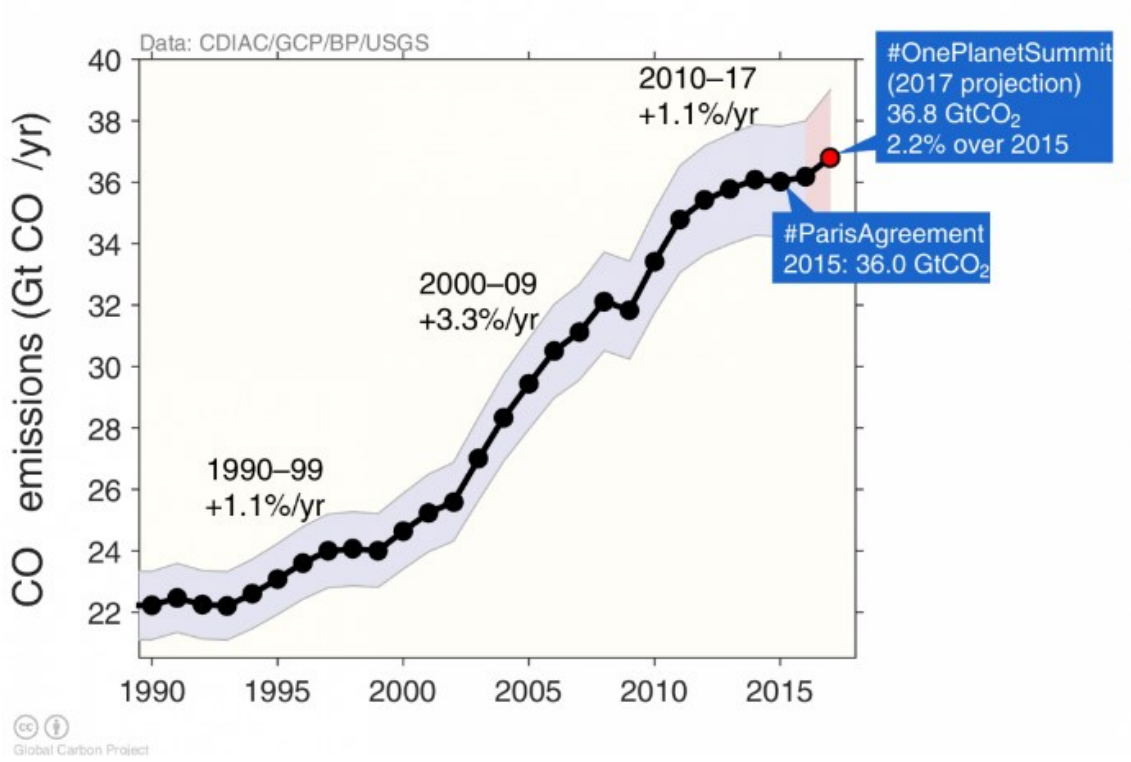

Figure 1. CO_2 emissions Vs Time (World Meteorological Organization 2017, 1).

Countries that signed the UN Framework Convention on Climate Change adopted a target to stop the average global temperature from rising before it reaches 2°C above pre-industrial levels. The Fifth Assessment Report of the International Panel on Climate Change (IPCC) quantifies the global maximum CO_2 the world can still emit and also have a likely chance of keeping global average temperature rise below 2°C above pre-industrial temperatures.

It reports that the goal is likely to be met if cumulative emissions (including the 535 GBTC emitted by the end of 2013) do not exceed 1 trillion tonnes of carbon (PgC). A gigatonne of carbon (1 GtC) is the same as a petagram of carbon (1 PgC). The world's effort to contrast CO_2 it is not enough. If the governments accept the 2°C target, the world needs to emit no more than 465 GtC by the time carbon emissions end. Many developing countries also support a reduction in the target to keep global average temperature increases below 1.5°C above pre-industrial levels. (Nordhaus 2014).

The level of heat-trapping greenhouse gases in the atmosphere reached another new record high in 2017. Carbon dioxide concentrations have increased to 405.5 parts per million, 146% of pre-industrial era levels. Methane and nitrous oxide concentrations have also risen. There has been a resurgence in CFC-11, potent greenhouse gas and ozone-depleting substance. Additionally, the latest report confirms that "This is the first time in human history, our planet's atmosphere has had more than 415 ppm CO_2," meteorologist Eric (Holthaus 2019).

The amount of carbon dioxide in the atmosphere just hit its highest level in 3 million years, the warming effect of long-lived greenhouse gases on our planet has increased by 41% since 1990. The impact will be more destructive if we do not rapidly cut greenhouse gases; cars play a leading role here since they are a symbol for development, but not the only cars themselves, urbanism has also been interconnected to the idea that cities and countries should be design for vehicular use and not real human needs.

3.4 Neoliberalism

Industrialization brought new levels of consumerism, preceded by neoliberalism and the whole macroeconomic theory, which focus development based on-sell or die, making an effect of increasing the demand for goods in a global market without measuring the consequences of natural resources offer and consumption. Another issue is the Food industry. The global diet has been based on cow meat and lacteous consumption, which releases a high amount of methane gases into the atmosphere, besides, it is one of the leading causes of deforestation.

Those are the central cause of global warming; agriculture is no longer the principal means for feeding humanity. Lastly, there are chlorofluorocarbons or CFCs which are widely used as coolants in refrigeration and air conditioners, aerosols, as solvents in cleaners, particularly for electronic circuit boards, as a blowing agent in the production of foam. CFC is the last major cause of stratospheric ozone depletion because it has a lifetime in the atmosphere of about 20 to 100

years. Those problems had a considerable impact on global warming; the temperature of the planet went above 0.74°C.

Consequently, governments and enterprises sounded the alarms regarding this issue and started to fight against it. For example, the United Nations arranged the climate change conference and the global goals for sustainable development to try to fix the problem. Also, the private sector is changing to provide a sustainable solution for the current markets. In the context of strengthening the global response to the threat of climate change, sustainable development show as the only solution to preserve equilibrium on the planet (UN 2015).

As it has been stated, the clean industries sector must play a vital role in changing weather conditions, the goal for the private sector should be to be a part of a Sustainable bio and circular economy. Currently, we understand the problem, we have the numbers facts to prove it, but we are very far from stopping it, not because of a technological gap to face it, but mainly because of the standard world views; humans must unite and learn how to bring countries closer and overcome the real barrier.

“The last frontier of climate change is to understand science, economics of abatement damages, but we do not understand how to bring countries together”, the real frontier work is going on according to William Nordhaus as the first humans set the goals to be achieved in the Paris climate change agreement and the Sustainable Development Goals SDG 2030.

In comparison, it is possible to see the relationship between the development and ecological footprint outputs of some countries, showing us that sustainability is not just about income or human development, each country could improve their indicator for the universal human welfare (Nordhaus, 2018), In figure 2 it is possible to see that most developed countries have higher performance in terms of ecological footprint.

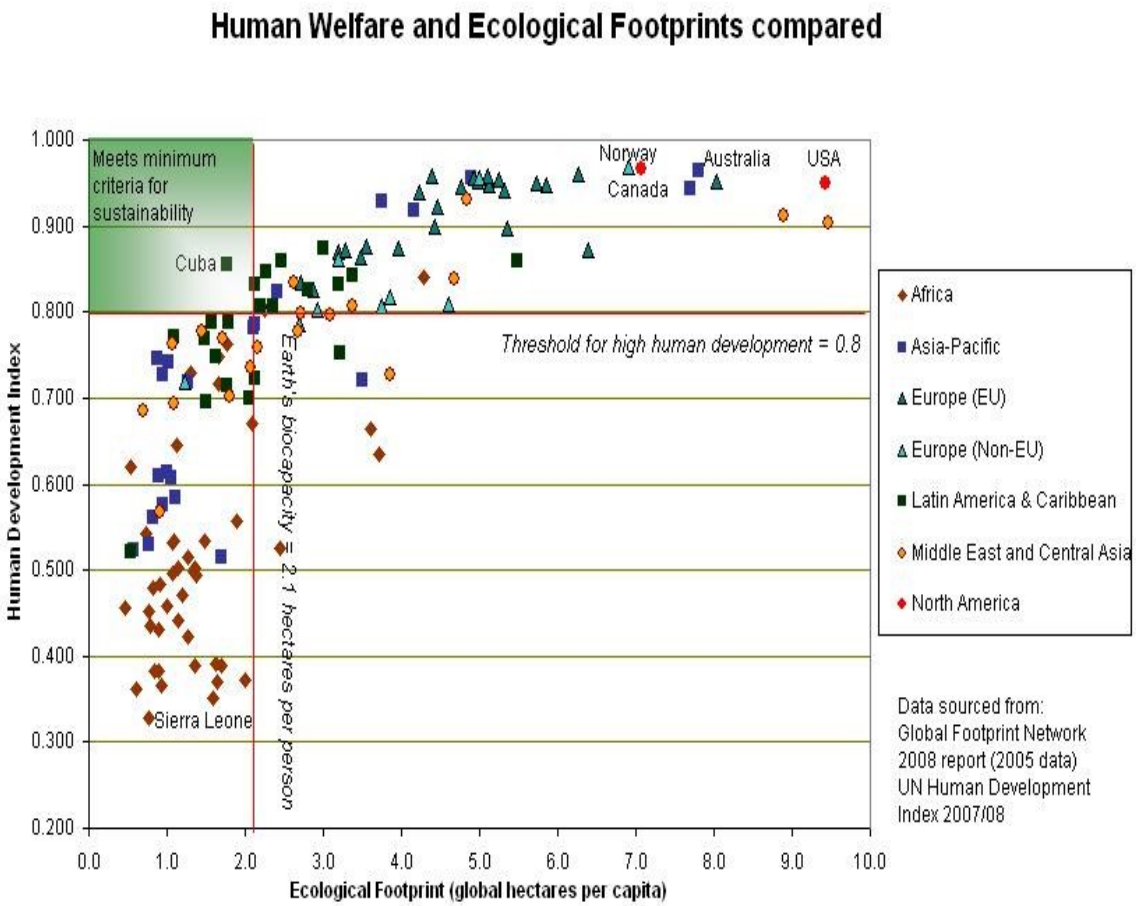

Figure 2. Global footprint Network (2008, 13).

Global warming is not an environmental problem; it is an economic output that has become a social issue proving that humans cannot agree on something as important as their survival. An example of the alarming situation where global leaders have been more focused on monetary loss is the critical fact that in just 40 years, 60% of species have been lost.

The extinction graphic shows the significant impact of climate change and the continuation of global extinction at an unprecedented speed, and we are at a point that the world will lose more than half of its biodiversity in less than a century (Nordhaus, 2018).

4 COLOMBIA A COUNTRY TO EXPLORE

4.1 Economy and market composition

During its history, Colombian economic yield has been weak. To contextualize, currently, the country uses the neoliberal model for development, having, as a result, a negative trade balance and alarming social indicators. One more example of how neoliberal globalization disintegrates national aggregate demand through imports from subsidized economies, having the foreseeable result such as terrible repercussions for its democracy, which is confronted with the fact that capital is worth more than society.

According to critics, neoliberal policies are aimed at creating a framework for the economy that makes it possible to raise profits by minimizing the costs of investment, reducing social security, and preaching individualism. Furthermore, Colombia is an excellent example of how this does happen. However, it is essential to recall that having an open economy is not the problem, the keystone is how to redistribute wealth in all societal states. The next chapter will be expanded the market and financial information of the country.

4.1.1 Development model

To understand the current state of the country, it is essential to have a broad view of what has happened throughout history. Furthermore, how the current macroeconomic conditions currently work. First of all, Colombia is on a deficit, and going back in time shows us the reasons why. For instance, the deficit on net export (NX) is related to the low-value offer as well as to the close relationship between a developing model and the negative indicator or KPI numbers in a social and environmental field. Secondly, we will try to present what was behind those decisions to change the developing model and, thus, the direct implication of economic growth.

1991 was the critical moment in modern Colombian economic history because Colombia changed from a protective development model such as the Keynesian to a neoliberal one. During this time and under the leadership of President Cesar Gaviria, Colombia embraced the opening of the economy to free trade. Some decisions are essential, and this one, in particular, would radically change industries and commerce forever. With it, the country lost the leadership of the Andes region (Ecuador, Perú, Venezuela, and Bolivia) to become a massive importer of products that

were and could be developed within the country. (Kalmanovitz, 1998; Useche Arévalo, 2002)

This transition was a significant change from a protective economy focused on domestic output with specific strength in manufactory and agriculture; additionally, to this, the conversion between changing the Keynesian to a neoliberal model was quickly and devastated for the industrial productive capacity and its maximum possible output economy. (Kalamnovitz, 1998).

4.1.2 Gross Domestic Product composition

The GDP is defined as the productive resources, entrepreneurial capabilities, and production linkages that together determine the capacity of a country to produce goods and services. The Colombia nominal GDP sector composition comes primarily from natural resources, followed by an industrial output, complemented by the participation of a third sector, financial services.

Colombia was unprepared to compete with scale economies in an international business environment, for example, an essential factor to take into account is the lack of technology and innovation added to low productivity standards, which were clear signs that things would not be suitable for the country, such as the following Table 1 illustrates the disruptive change in the economy composition.

Table 1. GDP Composition Colombia (DANE 2018)

COMPOSICIÓN PIB COLOMBIA		
	1991	**2017**
Agropecuario, silvicultura, pesca y caza	22,30%	6,30%
Explotación de minas y canteras	4,50%	6,10%
Industria manufacturera	21,10%	10,90%
Electricidad, gas y agua	1,10%	3,30%
Construcción	2,90%	7,20%
Comercio, restaurantes y hoteles	11,30%	12,20%
Transporte, almacenamiento y comunicaciones	8,80%	7%
Sector Financiero	15%	21,20%
Servicios comunales, sociales y personales	13,10%	15,60%

Fuente: elaboración propia con base en datos del DNP y DANE.

The government was aware of it, and instead of preparing for a transition to change the economic system, they had a system to reward the most adaptive companies until they went bankrupt. Instead of preparing and implementing mitigation policies, the government embraces the free market based on clientelism and corruption in favor of foreign and local companies that support the political ideology. Currently, national GDP has changed to concentrate the income distribution among specific conglomerates.

4.1.3 Trade Balance

Colombia is the 45th largest economy in the world. In 2016, Colombia exported $30.2B and imported $42.9B, resulting in a negative trade balance of $12.6B. In 2016 the GDP of Colombia was $282B, and its GDP per capita was $14.2k." MIT (2018, 45). Figure 4 presents the trade balance from 1980 until 2018.

Figure 4. Trade Balance Colombia (DANE 2018)

Colombia exchanges its potential industrial for foreign production (imports). Consequently, the more impoverished areas have faced even more underdevelopment descending into low competitive and informality. Afterward, and as a natural outcome, there was an increase in inequality, which was followed by higher unemployment. The strategy used by the government was insufficient to compete with more significant economies. The subdued loss of local productivity in exchange for and due to the constant increase in imports.

Currently, the main external selling outputs of Colombia are based on hydrocarbon, oil, and coal. As visualized in the last image, it shows how the GDP composition has favored foreign products over national production throughout the last 28 years.

4.1.4 Exports

Colombian top exports are related to the leading economic sector; in other words, raw material such as minerals. The strategy of the last five Governments has been keen on hydrocarbons and based on oil exploration as a primary source for export. Additionally, to this minerals group, it is possible to find Coal as a second mineral export (In decrease). Gold represents another important chapter for the multinationals which remove the country´s wealthy and leave the poison left behind by the extraction in the land and rivers.

As a current example, the country has signed a new agreement with Saudi Arabia to explore for gold at the paramo of Saturban (Santander) Colombia, which is the water resource of the whole region. On the other hand, mineral exploitation, such as emeralds, gold, and precious stones, also represents a big part of exports that do not contribute sustainable in the Boyacá region. Accordantly, figure 5 shows the relationship between oil and derivates in exports over the last 20 years.

Figure 5. Oil and gas, coil and ferroniquel export participation from 1995 to 2011. (DANE 2018)

The other main segment that worked for the GDP is agriculture, mainly due to coffee and flower exports. Paradoxically Colombia is a bio world power, but the economic development strategy is focused on mining exploration. Therefore, the GDP in numbers: crude Petroleum ($11.8B), coal Briquettes ($6.45B), coffee ($2.63B), gold ($2.46B) and refined petroleum ($2.1B) comparable 10 % that represent agriculture. With using the 1992 revision of the HS (Harmonized System) classification (MIT OEC 2017, 2). Figure 6 presents in detail the export composition of the country.

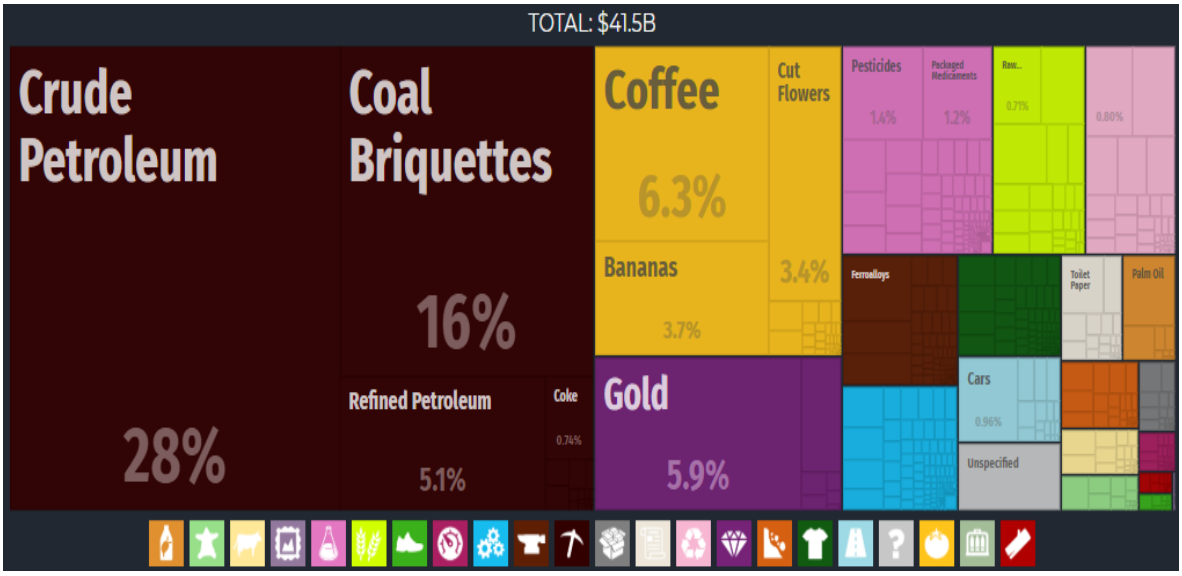

Figure 6. Colombian exports (MIT OEC 2017, 2)

4.1.5 Imports

The top imports are; Refined petroleum ($3.46B), cars ($1.9B), broadcasting equipment ($1.69B), unspecified ($1.65B) and packaged medicaments ($1.56B). Figure 7 presents in detail the import composition of Colombia.

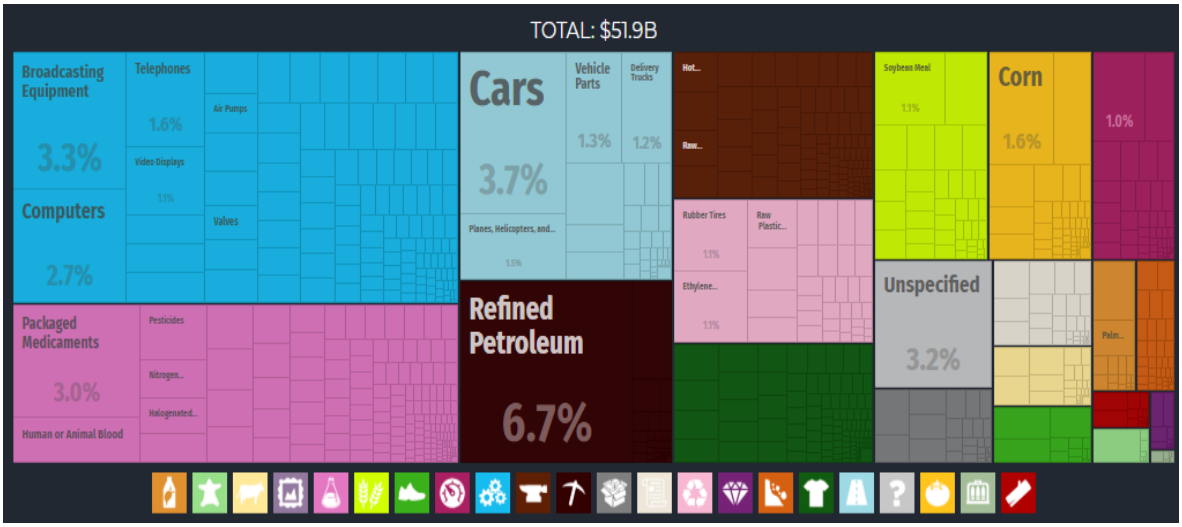

Figure 7. Colombian Imports (MIT OEC 2017, 2)

The top export destinations of Colombia are the United States ($10.2B), as a strategic partner, with a controversial free trade agreement between the countries which leaves Colombia in a negative position. Second place is for Panama ($1.91B), then Netherlands ($1.21B), Ecuador ($1.2B) and Spain ($1.16B).

The top coming import are the United States ($13.1B), China ($6.75B), Mexico ($3.07B), Brazil ($2.23B) and Germany ($1.65B). Figure 8 presents imports composition by countries.

Figure 8. Top import origins (MIT OEC 2017, 3)

4.1.6 Bilateral trade between Finland and Colombia

The leading sector of Finnish exports was wood derivate products, health treatment, electrical devices. On the other hand, Colombia exports focus on agricultural products, natural raw materials, plants. Table 2 describes in detail the products and quantity imported from Colombia.

Table 2. Finland's imports from Colombian (Trade Map, 2018).

Product Label	Finland's imports from Colombia			
	Value in 2015, USD thousand	Annual growth in value between 2011-2015, %, p.a.	Share in Finland's imports, %	Equivalent ad valorem tariff applied by Finland
All products	89,815	-1	0	
Coffee, tea, maté and spices	65,393	3	20	0
Ores, slag and ash	15,208		1	0
Edible fruit and nuts; peel of citrus fruit or melons	5,745		1	1
Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	1,877	-11	1	12
Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral . . .	462	-61	0	0
Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	394		0	0
Other made-up textile articles; sets; worn clothing and worn textile articles; rags	326		0	0
Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; . . .	90		0	0
Miscellaneous edible preparations	67	68	0	0
Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical . . .	65	20	0	0
Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television . . .	37	10	0	0
Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	33	-10	0	0

4.1.7 Trade Finland to Colombia

Europe and Finland represent 1.9% of participation in Colombia. Its top imports are Refined Petroleum ($3.46B), Cars ($1.9B), Broadcasting Equipment ($1.69B), pharmaceutical products($1.56B) and others ($1.65B) (MIT OEC 2017, 3). Figure 11 describes in detail the products and quantity imported from Finland.

Table 3. Colombian's imports from Finland (Trade Map, 2018).

Product Label	Colombia's imports from Finlandia			
	Value in 2015, USD thousand	Annual growth in value between 2011-2015, %, p.a.	Share in Colombia's imports, %	Equivalent ad valorem tariff applied by Colombia
All products	107,420	-2	0	
Paper and paperboard; articles of paper pulp, of paper or of paperboard	38,208	4	6	7
Pharmaceutical products	15,770	1	1	5
Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	15,011	-3	0	1
Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television . . .	9,396	-13	0	3
Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical . . .	5,877	19	0	2
Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring . . .	4,971	11	1	5
Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad . . .	4,795		5	3
Albuminoidal substances; modified starches; glues; enzymes	3,699	14	3	8
Iron and steel	2,475	-34	0	3
Plastics and articles thereof	2,057	-12	0	6
Wood and articles of wood; wood charcoal	1,097		0	3
Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable	830	14	2	6

4.1.8 Colombian GDP

The current economic growth strategy has significant issues in terms of productivity and environment and is not free from consequences, mainly because it depends on hydrocarbon exports as well as on the international oil price, having a vast implication on macroeconomics terms. For example, when the exports mainly rely on a single product, in this case, oil, the price product fluctuation, which causes the rate to change continuously, has negative consequences for internal production, meaning agriculture.

Colombian economy could be comparable to the Dutch disease, which can be defined as… “the apparent causal relationship between the increase in the economic development of a specific sector (for example natural resources) and a decline in other sectors (like the manufacturing sector or agriculture). While it most often refers to natural resource discovery, it can also refer to "any development that results in a large inflow of foreign currency, including a sharp surge in natural resource prices, foreign assistance, and foreign direct investment." (Petro 2018.)

The dollars from this export weakens the national currency and generate little labor force or employment at all, which increases the supply making the price go down. So, the dollar becomes cheaper, and do the imports too. Some of the consequences of Dutch disease are the destruction of national productivity and its production.

When an extractive economy shifts to a productive economy, there is a disincentivizing of exchange rates; therefore, national agriculture production may grow. An example of this is when the oil prices fell worldwide, helping Colombia rise in the charts of coffee export. Oil production has a direct relationship with the currency devaluation, slowing down economic growth. (Petro 2018.) Figure 9 represents the GDP dynamic from 2000 to 2018.

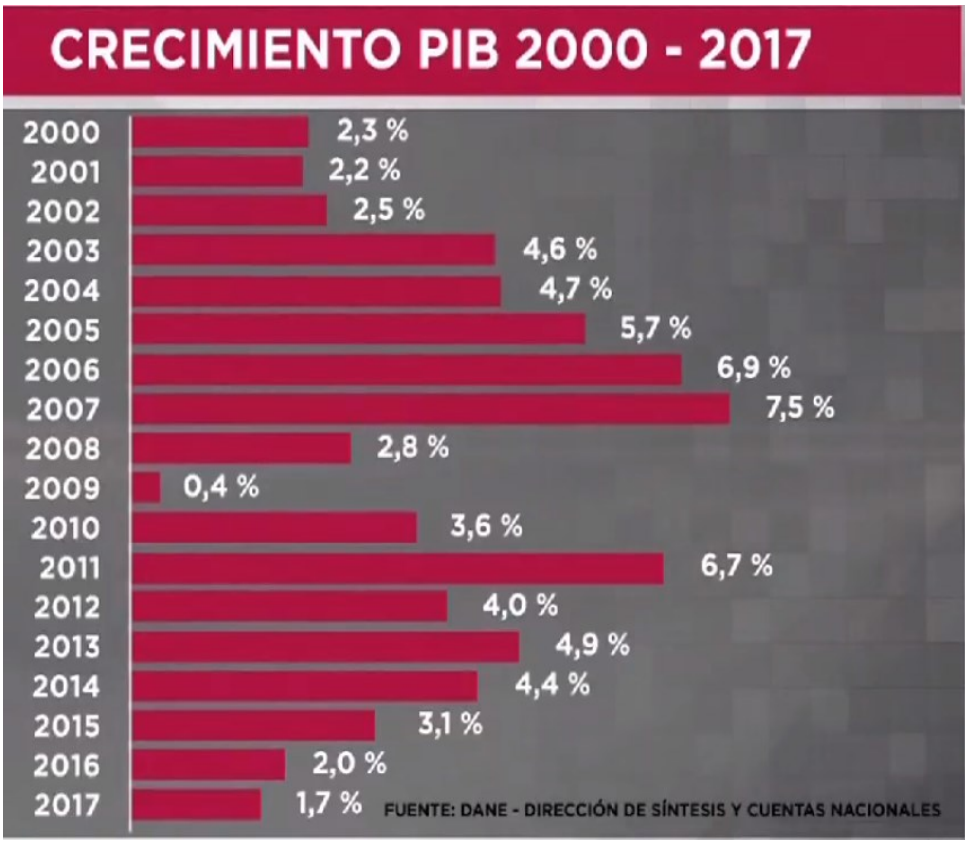

Figure 9. Colombian GDP growth 2000-2017 (DANE, 2018)

4.1.9 Free trade agreement between the USA/EU and Colombia

In Free trade agreements (FTA), “two conditions must be met for countries to participate in a free trade agreement. First, an incentive constraint must be satisfied; the agreement must make countries better off. Second, the agreement must be self-enforcing, long-run gains must make it worthwhile for countries to commit to the agreement, as opposed to maintaining tariffs” (Freund, 2004), having said this, Colombia is in a disadvantage to compete with the two economic powers.

4.1.10 Political

When talking about politics in Colombia, we have to go back in time and highlight its bloody history. The country has been ruled by right-wing parties since its independence, more than two hundred years ago; consequently, the nation has had a story full of violence, inequality, and war. The aforementioned factors play a central role in Colombia's culture and behavior. Colombia has recently ended the oldest internal war in America between the guerrilla group Fuerzas Armadas Revolucionarias de Colombia FARC and the national government by signing a peace agreement.

However, the murder of social leaders and ex-FARC fighters, the substantial economic profits of drug trafficking and illegal plantations, as well as noncompliance with some terms of the peace agreement has caused FARC dissident groups to not demobilize, as well as new threats to arise in the fight for the power vacuum left by the peace process. The state has also failed to be consequential to the agreement, leaving areas of the country without any real state control.

The current government’s national agenda for the next years is focused on the orange economy, which promotes entrepreneurship and the conditions needed for international investment in the national strategic sectors such as ICT, digital industries, entertainment, telecommunication, mining, tourism, agriculture, and biotechnology. Colombia is trailing behind regarding Sustainable Development Goals WSDG2030. The historical absence of the state in certain areas has helped illegal activity to grow, hurting the environment.

The country has many potentials, and it is waiting for an economic momentum full of interesting dynamics in bio-economic and land use for agriculture. Meanwhile, the national government is creating institutions and projects regarding environmental issues in the post-conflict. This strategy will bring new capital and international aid to the country.

For instance, the ministry of Environment and sustainable development will manage a USD 300 million fund from Norway for sustainable projects. The 'Sustainable Colombia' project will work on issues such as sustainable rural development, conservation of biodiversity and mitigation and adaptation to climate change, among others. (Ministerio de Ambiente, 2016).

Additionally, USD 160 million Fund from the USA is for the same cause.
Nowadays the political local election results have changed the traditional parties dramatically (Conservadores, Liberales, Cambio Radical, Centro Democratico), they have lost power all around the country, and in this case, the green party and more environmental friendly parties are leading the destiny of the regions in Colombia, bringing a new breath of hope.

4.2 Biodiversity

Colombia´s location is privileged, the territory is one of the most biodiverse places on Earth, the framework of the continental territory is 12°30'40" latitude north (Punta Gallina, Guajira) 4°13'30" and latitude south (San Antonio River with Amazonas river) and between east longitude east Greenwich in Rio Negro or Guainía (Cocuy rock) and 79°01'23" east from the meridian at Punta Manglares (Nariño department). Figure 3 represents the geographic location of Colombia in Latin America.
As a country, Colombia is classified as having high-level biodiversity at many levels, such as plant numbers, vertebrates, and ecosystems. With an extension of 1.141.748 Km2 only 86.888.9Km2 (7.6%) are protected from human activity. (Rangel-Ch, 2011, 54). Colombia is the country with the second biggest biodiversity in the world regarding species, communities, and ecosystems, only bested by Brazil.

Furthermore, it is one of the eleven countries that still keeps a significant area of the native forest without danger threat, and consequently, those ecosystems will keep creating and holding natural biological process which we depended on. There are records about the occurrence of 1.000 plant communities, most of which belong to the Andean region, followed by the Amazonian. The plant's richness always is higher in the Andean region; there are records of 840 species of 140 from the media and 38 families of Hepaticae; 1.500 species of 253 genera and 73 families of lichens and 927 species of 246 genera and 72 families of mosses. Ferns and allied represent 1.400 species of 115 genera and 32 families.

The registers about 26.500 species of angiosperms mean 12% of the global plant richness. The fauna richness concentrates in the Andean region too. Colombia holds the birds and amphibians' highest number of species in the

world. The number of mammal species is among the second or third position worldwide, and our reptilian species richness is in the third or fourth position.

Colombia holds the world's first position in these groups (Tetrapoda), with a total amount of species of 3.486. Despite these conditions, the conservation of our biodiversity has been affected by several factors, among which deforestation and plant cover loss are the main threats. All most 30% of the pristine plant cover has disappeared, the Andean and Choco regions show these plant cover loss very concerning estimates.

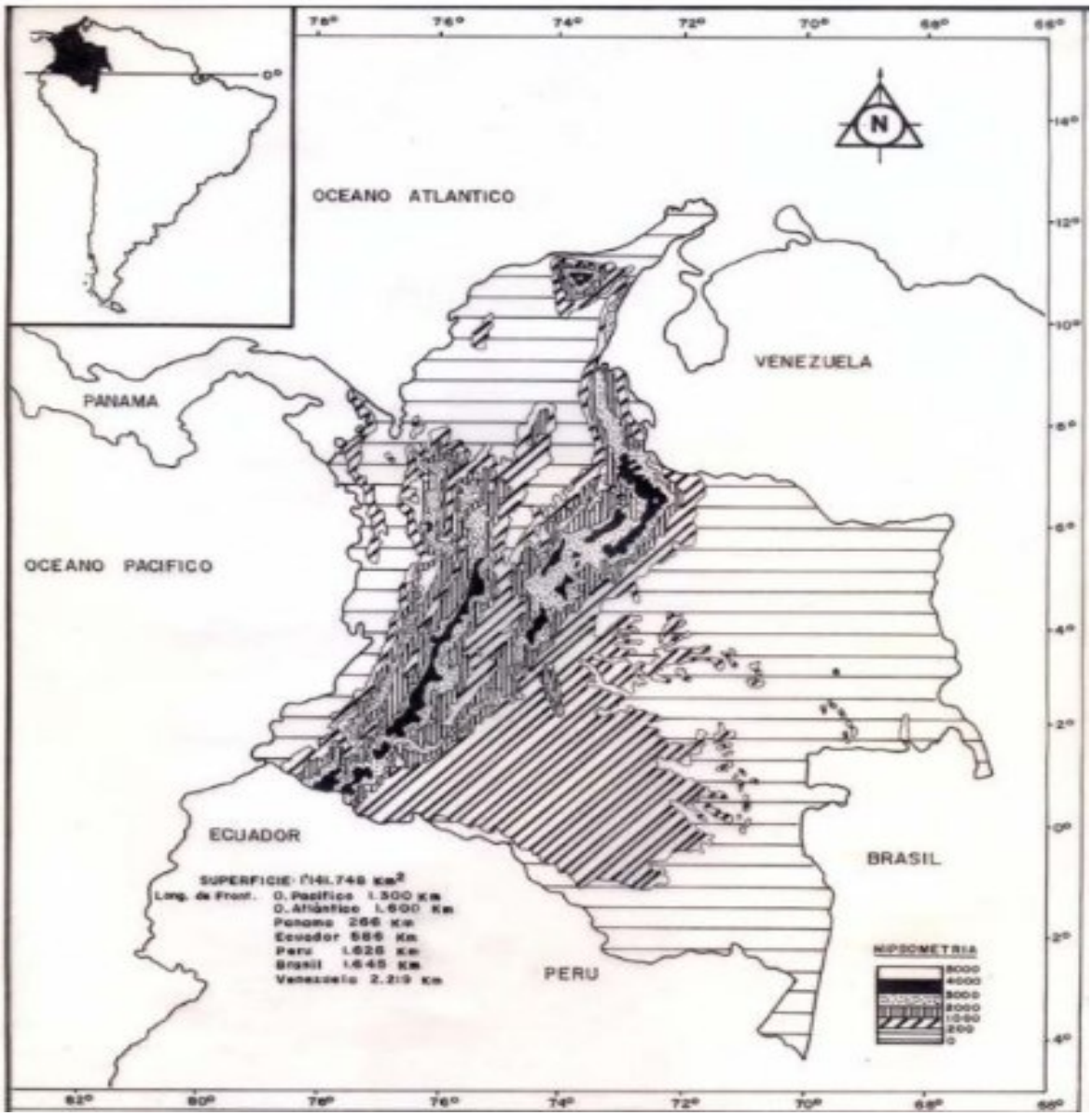

Figure 3. Geoastronomy location Colombia (Rangel-Ch, J.O., P. M. Aguilar-P 2011, 2).

4.2.1 Water

Colombia is one of the last environmental reserves with high levels of diversity and natural resources. Located in Latin American, the country is strategically located between the north of the south cone, sharing a jungle (Tapon Del Darien) and oceans with Panama and central America; Colombia's continental land and maritime extension are located at the intertropical fringe of the world.

The country is abundant in water and hydro sources, and it is composed in the next order, the central hydrographic watersheds are the Amazonas, Orinoco (which leads to the Atlantic), the Caribbean, and the Pacific. The Pacific one has a minor extension and is composed, among others, by the Mataje, Patía, Guasca, Sanguianga, Tapaje, Guapi, Anchicayá, Dagua, San Juan, Valle, and Jurado rivers. Among the principal rivers of the Caribbean region, there are the Magdalena, Cauca, Atrato, Mulatos, San Juan, Córdoba, Sinú, Fundación, Aracataca, Sevilla, Córdoba, Manzanares, Guachaca, Rancheria, Don Diego, Palomino, and Catatumbo rivers.

Among the Colombian geographical zones figure the paramo region, which flora represents 60% of the total biogeographical zone, 40% of this amount is endemic species to Colombia. Another geographical zone very important related to biodiversity is the biogeographical Choco region, one of the wettest zones of the globe, where there are register about 4.525 species of angiosperms. (Rangel Orlando, 2005)

5 SUSTAINABLE DEVELOPMENT

5.1 Sustainable development goals

SDGs came into being as a global deal, different countries from all the continents join forces to face a common goal; fighting climate change and adapting for it (the UN Framework Convention on Climate Change adopted a target to stop the average global temperature from rising before it reaches 2°C levels).
According to the UN initiative, officially, Humanity has set 17 goals in order to prevent extinction.

Goal 1: No Poverty.

Goal 2: Zero Hunger.

Goal 3: Good Health and Well-Being.

Goal 4: Quality Education.

Goal 5: Gender Equality.

Goal 6: Clean Water and Sanitation.

Goal 7: Affordable and Clean Energy.

Goal 8: Decent Work and Economic Growth.

Goal 9: Industry, Innovation, and Infrastructure.

Goal 10: Reducing inequalities.

Goal 11: Sustainable cities and communities.

Goal 12: Responsible consumption and production.

Goal 13: Climate action.

Goal 14: Life below water.

Goal 15: Life on land.

Goal 16: Peace, justice, and strong institutions.

Goal 17: Partnerships for the goals.

However, even though most nations have signed this global agreement, the local governments are not keen on respecting it; it can be seen by the USA withdrawing from the Paris Agreement and countries like Brazil and Colombia, which have increased deforestation of the Amazon. Also, mining and oil are still in control of many local legislations all around the world.

5.2 Water substance of life

First, we have to mention that freshwater is an essential substance for the survival of humanity and the maintaining of the exceptional diversity of habitats and species that strictly depend on it. It is widely used as a consumer product, the raw material for agriculture, the way of transport, source of energy production, among others. These ecosystem services constitute about 20% of the total value of services provided by the Earth's ecosystems (Costanza et al., 1997). However, global warming (Vörösmarty, Green, Salisbury, & Lammers, 2000), uncontrolled increase in its demand and its excessive capture have led to an unprecedented global crisis that is threatening the viability of many species including ours, due to the accumulation of negative impacts that have affected extensively and profoundly the freshwater ecosystems (Strayer & Dudgeon, 2010).

In these ecosystems, there are highly complex dynamics that involve from microorganisms and invertebrates to large mammals whose state of conservation deteriorates simultaneously with the loss of the integrity of the bodies of water that inhabit, Mainly due to their overexploitation, pollution, and destruction (Dudgeon et al., 2006). Thus, the way we approach business models and cooperation must adapt too.

5.3 Bioeconomy in Finland

Bioeconomy is a branch of the economy using biological natural resources to produce products, energy, food, and services. It is expected to drive the transition towards a more sustainable economy by addressing some of the significant global challenges, including food security, climate change, and resource scarcity. Clean, environment-saving technologies and efficient recycling are typical to it. By reducing dependence on fossil raw materials, combating degradation of ecosystems, promoting economic development, it is possible to create new jobs and an entire culture of sustainability around the whole world (Lewandowski, 2017).

Particularly, Finland has become one of the world’s most prosperous countries based on the ability to utilize renewable natural resources, well known as green gold. Forest and clean nature are- and have always been- the basis of their existence. Finns have top-notch expertise in sustainable

forest bioeconomy. Some 80 percent of the land area is covered with forest, which has been managed so well that more timber grows every year than are utilized.

Additionally, the country uses waste and side streams, plus water resources efficiently. Finland has strong known how in technology, constructions, energy, chemistry, food, and health sciences. Innovation, cooperation, and combined technologies in these fields make Finland a real pioneer in Bioeconomy (Pöykkö 2016). The Finnish bio-economy strategy explained by professor Tapani Pöykkö HAMK is focused on the production of biomass, the use of bio-based products and services looking for a replacement of fossils, and changing for the demand of renewables products and services. See appendix 1 Pöykkö T, interview….

The supply are characterized for sustainable production and use of biomass. Besides timber products and paper, it uses biomasses from forests to make things like fiber, pharmaceutical, chemicals, functional food, plastic materials, cosmetics, intelligent packaging, biofuels and more.

Here is the brochure presented by the ministry of employment and the economy of Finland:

• Bio-based consumer goods

• Using wood in the built environment

• Renewable energy in housing, transport, and industry

• Pure food for people and animals

• Biotechnology in the production of pharmaceuticals, functional foods, and industrial enzymes

• Biochemicals, e.g., for water purification

• Technology, equipment, and chemicals for biomass refining

• Nature ecosystem and wellbeing services (MOEATE 2018).

Consequently, national projection is keen on bioeconomic trends for the coming year as its expressed by the next figure 10.

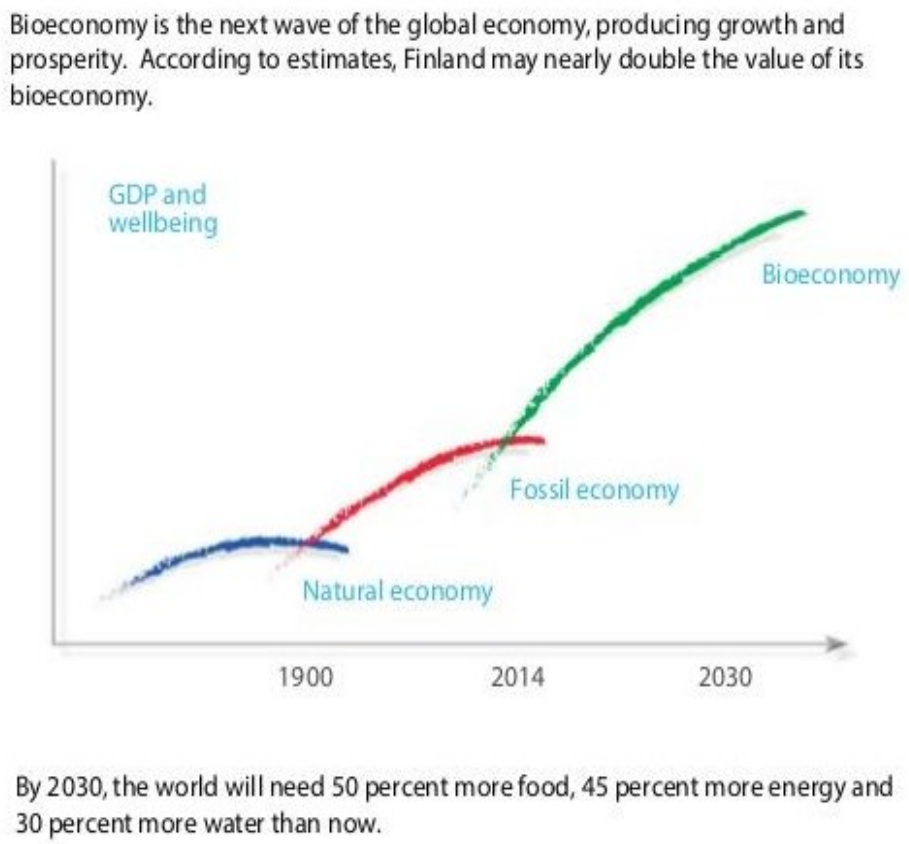

Figure 10. Bioeconomy as the next wave of the Finnish economy (MOEATE 2018).

5.4 Sustainable land uses and water management

Well known as the land of a thousand lakes, Finland's hydro structure is vast and abundant. The population of the country is generally speaking very well aware of the protection and the value of this central resource. Currently, global development challenges the country to examine water resources and their utilization in a new way. The need for water is increasing inevitably around the world. Population growth and lifestyle changes force us to seek new solutions for the use and exploitation of water and water systems.

The water resources of Finland, i.e., the opportunities of blue bioeconomy, are based on abundant water resources, high technical expertise, and the solution's ability to tackle multi-sectoral challenges. Besides, Finland has an excellent international reputation when it comes to water and environmental expertise. Bioeconomy solutions also have the potential to boost social welfare and employment if water resources and their use and production potential are examined more comprehensively. Versatile use of water resources is already the basis for many economic activities. The

main areas of the blue bioeconomy are water business, energy production, fisheries, nutrient recycling, and industrial symbiosis. (Bioenergy, 2018)

Based on the preliminary report, fisheries and tourism have been identified as potential growth opportunities in the short term. In addition to this, the potential growth of exports in the water business is very substantial. Long-term growth potential is associated with the recycling of nutrients and industrial symbiosis. (MOEATE, 2018)

5.5 Twinning projects

The European Union defines twinning as an instrument for institutional cooperation between public administrations of EU member states and beneficiary or partner countries. “Twinning projects bring together public sector expertise from EU member states and beneficiary countries with the aim of achieving concrete mandatory operational results through peer to peer activities.” (European Commission, 2019.)

Twinning works when bringing together public sector and academic expertise as an instrument that aims to achieve concrete, mandatory, operational results through peer-to-peer exchanges. For instance, it is possible to find different kind twinning of projects around the world, where the European expertise is helping to improve local conditions in partner countries. Then, we will highlight a few compelling examples related to our research goals:

In Macedonia (The Ministries of Agriculture, Forestry and Water Economy, and EU commission), performed a twinning project focused on assistance in order to increase the competitiveness of the country’s agricultural sector in the integrated EU and western Balkan markets. Accordingly, based on the expertise on geographical indication quality schemes, the partner institutions established a comprehensive system for developing and ensuring the quality of organic agricultural products and foodstuffs.

One of the leading fruit crops in the Ohrid region became the first product in the country to achieve Protected Geographical Indication status, followed by TAIEX expert missions which sought to identify ways of encouraging producers to register for geographical indications as well as how to develop quality and control standards for honey and bee products.

Additionally, in Malta, better water governance was the goal of a twinning project. An EU-funded research-capacity building project to optimize the use of water for agriculture. Experts from across Europe are sharing innovative approaches to water management with scientists and farmers to help conserve this scarce resource.

"We are focusing on four areas of concern: reducing the demand for water, using alternative sources of water, desalinization and the use of saline water, and dealing with nutrient-rich groundwater resulting from fertilizers. These are all hot issues for Maltese farmers." says project coordinator Malcolm Borg of MCAST. (Horizon2020, 2018).

As a conclusion, twinning projects illustrate how employing twinning in any region allows the partner country to build on its achievements and ensure the sustainability of reforms. As a result of the combined use of the Institution Building tools, many more products may follow in the footsteps.

5.6 Transboundary lake basin management Laurentian and the African Great lakes

Next, we have the study case of the Transboundary Lake Basin Management Laurentian (North America) and the African Great Lakes, where African organizations benefited from studying and implementing the approach of integrated multi-sectoral management of lake resources, learning how to leverage the scare resources.

This project is an example of twin lake Colombia Finland because of the next outcome: "cooperation framework, the lake twinning dialogues provided the opportunity for continued comparative analysis of lake management between the North American and African systems. The following high-priority areas for joint research, studies, and investigations have been identified"(Krantzberg & UNU-INWEH, 2011):

First, "Climate change (adaptation/mitigation), with a focus on modeling change in lake ecosystems, undertaking vulnerability mapping, and developing management strategies for adaptation.

Second, governance structure, with a focus on Human wellbeing centered around educating communities on the relationship between their actions and the health of lakes, and the linkages between the status of lakes (water quality) and human wellbeing. It was also suggested that joint research should be undertaken for natural resources evaluation to determine the economic value of the environmental services provided by the Great Lakes. Third, Public-private partnerships, with a focus on a systematic analysis of partnerships, engagement of the private sector, fostering public-private partnerships, and sustainability of these partnerships.

Third, gender equity, with a focus on involving women when developing a new water management regime or water policies.

Finally, ecosystem approaches and management, with a focus on integrated management of land, water, and living resources to promote conservation and sustainable use of resources. Some topics that need detailed research are groundwater aquifer management, invasive species, pollution control, water quality standards, effective monitoring strategies for ecologically complex interactions, and narrative analysis of governance structures to facilitate policy, legal, also institutional reform for transboundary waters management".(Krantzberg & UNU-INWEH, 2011)

6 CASE STUDY TWIN LAKE/ LAGOS HERMANOS FINLAND COLOMBIA

Figure 11 presents the logo of TWIN LAKE FINLAND COLOMBIA created by one of the members.

Figure 11. Twin lake logo (López 2019, 1)

6.1 Summary

Twin Lake Finland/Colombia is a form of municipal international cooperation (mic) which enables local communities and organization to share experience about innovation and sustainable development to improve conditions around the lake, helping to develop bioeconomy, tourism, and sustainability around the water body.

Base on the water ecosystem as centrum of the project, lake twinning looks for dialogues on transboundary lake management between Society, NGOs, government, business, academic institutions, environment institutions, regional initiatives, besides private institutions such as stakeholders. Twin Lake Finland/Colombia would provide a frame to encourages people and institutions following the tendency to remove political barriers in cooperation to fight climate change through twinned organizations that learn from each other's experiences and use that information to explain to stakeholders which management practices should or should not be tried.

The notion of twinning fosters collaboration and information sharing among a wide range of professionals and stakeholders regarding science and management. Such cross-fertilization of ideas provides decision makers a stronger base for sound political decisions(Krantzberg & UNU-INWEH, 2011).

The twinning of lake-governance systems offers unique learning opportunities. Moreover, it will allow in the future flows of goods, services, and export Finnish expertise into this Latin market, as the first project of its kind between Finland and Colombia, initiated by the Finnish NGO Valajärven conservation association with the help of the Helsinki University to bring experiences to improve the water conditions. Furthermore, counting on the Gobernación del Valle as a crucial partner, as well as the Ciudad Sostenible foundation, to provide a community based social innovation workshop. See attachment 1 Koskinen P, interview……

The project has four components:

- Monitoring and research
- Social innovation workshop
- Ecotourism and business
- Twinning lakes

Therefore figure 12 presents the main activities and components by the organization.

Figure 12. Stakeholders & project scope (López 2019, 3)

The purpose of this project is to connect sustainable development based on new diplomatic and entrepreneurial way between the two countries, focusing on the advantage of Finnish technologies and the lack of projects regarding sustainable development (Water) in South America specifically in Colombia, accordingly creating a bridge between other foundations and different organization to explore the Latin market (Andes) in sectors like clean energy, mobility, urban planning, water management, commerce, tourism and entrepreneurship in general additionally designing a Remedial Action Plan (RAP) for the lakes.

6.2 An overview of project implementation

Before talking about twinning lakes, we have to focus on the lakes involved in this brotherhood, first of all, the Finnish example. Lake Valajärvi.

Valajärvi is located in the highlands of the municipality and the City of Hämeenlinna Janakkala (Renko) region (Latitude/Longitude: N 60° 48' 0.00" E 24° 28' 0.01" (60.80000, 24.46667). The lake has an average depth of only 4.2 m (deepest point measured is 13.4 m), covering an area of 3.5 square km. The lake is very delicate and vulnerable, for the water is scarce. Some research has found that in the depths, during late summer, there is a lack of oxygen, but during winter, the oxygen situation was right.

Another issue is that there are excess of nutrients in the bottom of the lake that causes eutrophication, so it is imperative to ensure that the nutrient load of the lake remains under control or even reduced. Figure 13 and 14 shows the landscape of the Finnish lake in the different seasons.

Figure 13. Valajärvi in wintertime (Koskinen 2017)

Figure 14. Valajärvi in summertime (Koskinen 2017)

The water quality has been studied since 1966, in the latest analysis, the amount of total phosphorus was 12 g/l, and nitrogen was about 355g/l. The Ph is slightly acidic (6.7), and the electrical conductivity is low. As a whole, the lake is a pretty typical Finnish medium-sized lake with its usual problems. People used to wash their clothes on the shore back until the '70s, besides the excess of fertilizers and nutrients as phosphate coming from agriculture was threatening water quality. Furthermore, forestry and

untreated wastewaters had contributed so that the water has more nutrients, having a negative effect on water quality.

However, nowadays, the water in Valajärvi is very clear, and the visibility is excellent due to the protection program. For example, gasoline-powered boat motors cannot be used in the lake.

The bottom investigation, Meritaito oy operated Valajärvi bottom investigation on 20-25.8.2015. The investigation was operated by a specially equipped motorboat, and the Valajärvi protection association got versatile data from this process. One of the most exciting finds was a shipwreck. The reason for the lake's water good quality is several springs located at the bottom. The lake has two deep pools where water has less oxygen, which is a big problem for fish and other living organisms. The near swamp allows much humus into the lake, and it is visible in the bottom map. See attachment 1 Koskinen P, interview……

The blue area in the map is hummus; the green area is fine sand, and the orange area is rough gravel. Figure 15 represents the described above.

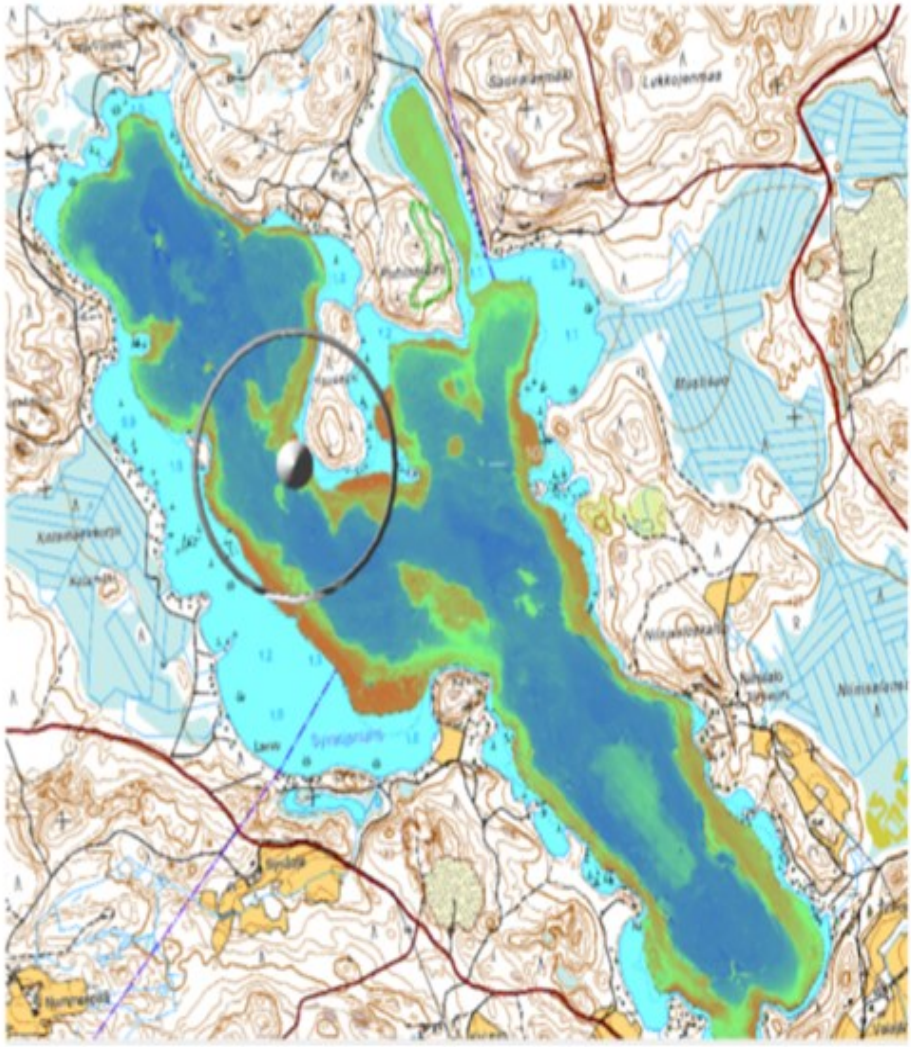

Figure 15. Topography Valajärvi (Koskinen 2017)

Looking for a successful partnership, the team will check the similarities and shared challenges of the water ecosystem. That why the gobernación del Valle has presented three options to be chosen; lake Calima, laguna el Sonso, and San Cipriano river. One of these water bodies might have some thriving conditions such as freshwater fisheries and resident populations dependent on sources for food, water, or tourism. Both lakes should be integrated into global economic markets.

Both regions face similar challenges, such as sustaining fish stocks, dealing with changing water levels, managing habitat loss, preventing and controlling invasive species, integrating land-use decisions into ecosystem management, additionally, addressing negative externalities of globalization. Sustainable management of the fisheries involves biological and political complexities.

Nevertheless, it essential to understand that each of the three water bodies is different, such as characteristics and bionetwork; all of them have potential areas or topics to be improved. Accordingly, it will describe three Colombian lakes:

First,Lago/Laguna EL Sonso is located in the municipality of Buga; the community practices fishing as an economic activity. The lagoon is not in optimal condition due to different reasons; for instance, the presence of foreign invasive species. Currently, they are 298 invasive species of fauna and flora in the country, but only information about 88 of them (Baptiste, M. et al 2010). The foreign invasive species are well known as the second cause of global loss of BD (MADS, 2011).

About SE, like the hydrological ones, there are several known cases (Laguna de Sonso) affecting the water storage and the displacement of boats. The lake has been designated as Ramsar place. Figure 16 shows the present condition of the lake. See the appendix 1 Hernández C, interview….

Figure 16. Laguna el Sonso

Second, River San Cipriano. It is proclaimed as a natural park, the river holds a community (Afro), which is proactively organized for ecotourism. The only way to go to this location is through an authentic railway in a device called “Brujitas.” Figure 17 presents the transport system used by locals and tourists to get there. See the appendix 1 Hernández C, interview….

Figure 17. San Cipriano “Brujitas”

Located near to the Pacific Ocean, the river is composed of natural deep pools and a waterfall that made it an attraction for Colombians and foreigners. The river has been threatened by illegal mining; today, authorities are still seeing how to control this situation. Nevertheless, it is still possible to fish for different species. In figures 18 and 19, it is possible to see the water quality of the San Cipriano river and the natural pools. See the appendix 1 Hernández C, interview….

Figure 18 San Cipriano natural pools.

Figure 19. San Cipriano river

Third, The Lago Calima is placed next to “el Darien” town, Calima lake is an artificial creation made by the Colombian government, designed initially as a hydroelectric source of energy which failed from the start. In 1980 Colombian authorities dammed the Darien river and some other small one and moved the town uphill and dragged the river in order to create the new reservoir. On the bottom of Lago Calima, there remained some fences from the old city.

Currently, this place is an attraction for tourism and water sports competition, as well as music festivals, and the surroundings are populated by summer cottages and recreational centers. In figure 20, it is noted the current condition of the artificial lake. See the appendix 1 Hernández C, interview….

Figure 20. Lago Calima

6.2.1 Project purpose

General goal.

The purpose of the twin lakes is to share information and ideas that improve the condition of life of the community and the environment surrounding the body of water, connecting with stakeholders that provide information to create subsequent solutions seeking to help the ecosystem and the relationship with the community. Transboundary lake management offers unique learning opportunities. Such cross-fertilization of ideas provides decision-makers a stronger base for sound political decisions.

In this lake twinning project, a visitation study to Colombia by the Finnish experts may provide opportunities both in theoretical and practical aspects throughout the project, since the work may be carried out in the development of the plans and the national guidelines in the project themes.

Furthermore, we have to identify the environmental problems through the work of and the VCA to coordinate with the CSF and GV with the community. It plans to improve the management practices around the lake while also preserving it and giving value to the scientific advice and keeping in mind the ecosystem services as well as a wealth relationship for the community. See appendix 1 Koskinen P, interview….

6.2.2 Specific goals

• Climate change (adaptation/mitigation), with a focus on modeling change in lake ecosystems, undertaking vulnerability mapping and developing management strategies for adaptation.

• Governance structure, with a focus on comparative analysis of governance structures to facilitate policy, legal and institutional reform for transboundary waters management.

• Public-private partnerships, with a focus on a systematic analysis of partnerships, engagement of the private sector, fostering public-private partnerships, and sustainability of these partnerships.

• Ecotourism, with a focus on involving community when developing a new water management regime or water policies to strength the eco-tourism cluster.

• Ecosystem approaches and management, with a focus on integrated management of land, waterland protection for living resources to promote conservation and sustainable use of resources. Some topics that need detailed research are groundwater aquifer management, invasive species, pollution control, water quality standards, and active monitoring strategies for ecologically complex interactions.
* (UNIU-INWEH. 2008.)

6.2.3 Objective by project component and its corresponding entities

The project is comprised of four components; twinning lake, environmental research and monitoring, Social innovation workshop and project boards from all organizations.

6.2.4 Component 1. Twining lake

The main goal of the project is to reach twin lakes or sister lakes agreement as a form of legal or social agreement between villages, cities, counties, or enterprises, to promote cultural and commercial ties. We are looking and intend to foster friendship and understanding between these different cultures as an act of environmental preservation, encouraging trade and tourism. This project will be used as a form of strategic international cooperation between member cities and lakes. Accordingly, both Colombia and Finnish organization and town mayor office will provide the needed documents helping to create a twinning agreement. See appendix 1, Pulliainen T, interview….
In Finland, the institution responsible for national twinning coordination is the Foreign Ministry.

6.2.5 Component 2. Social innovation workshop

Based on strategic planning methodologies, the community proposes solutions that must be assessed by an interdisciplinary board to include it in the action plan and local municipal legislation**.** Communication is a vital factor for success in project development. That is why the workshop starts gathering all opinions and hearing different points of view about problems related to the project scope by focusing on social, urbanism, cultural, environmental, internal, and external aspects.

That is why Ciudad sostenible will be responsible for offering services for the logistics operation and execution of the first congress of lagos hermanos & shared value with the gobernación del Valle and the academic

network. Based on the outcomes, the next step will focus on how to deal with the problem. See the appendix 2….

A closing event could be the best way to present these outcomes to the community and officialize the agreement between lakes:

- Social innovation workshop
- First congress twin lakes Fin-Col

6.2.6 Component 3. Environmental research, monitoring, and ecosystem services

Peter Drucker stated: “If you cannot measure it, you cannot improve.” Furthermore, water bodies are not the exception to it. Measure water level regulation and control always have an impact on lake conditions, variables, and inhabitants. The extent of the impact depends on both the intensity and timing of regulation, as well as the characteristics of the water body. Crucial factors include the shape and characteristics of the species assemblages of the water body.

On gentle slope shores even, small changes may have large-scale effects. The inland waters is an indicator to control, protect, and think on how to improve the lakes' water and ecosystem, to carry out measurements of sediments. One of the components to evaluate is Human pressure, which is exerted by the surrounding inhabitants, due to the urban modeling of the areas that border.

Downloads of organic material to the lake, this is a limiting factor for life generation and generation of organisms as algae in the ecosystem, the residual organic discharge collided. Another reason that generates problems is the runoff of nutrients, and the crops release nutrients that end up being harmful to the lake. (Michelson 2017). As a result, it is necessary to take into account the vital role of the ecosystem services of this tropical lakes and relevance of project KPI to monitor the present and to improve future, for instance, measuring:

- Ecosystem services (Provisioning, Regulating, Supporting and Cultural services)
- Human pressure
- Runoff of nutrients
- Carrying capacity
- Inland waters

- Water composition analysis
- Sediment analysis
- Reintroduction of native species
- New business development (Internationalization and local)

6.2.7 Component 4. Project board meeting

The advisers group composed by the Mayor´s Office of the Colombian municipality of Darien, Buenaventura or Buga, furthermore, the Gobernación del Valle with the followed departments, Secretarías de Agricultura, Medio Ambiente, Turismo GDV, UES, Corporación Autonoma regional Valle del Cauca/CVC, also Ciudad Sostenible Foundation (supported by la Ciudad Verde foundation), further Valajärven conservation association (supported by Helsinki University) which will agree on the final scope and time table for the project implementation, leading to design specific responsibilities and schedule for the activities to follow up. Table 4 explains the project coordination plan for the twin lakes. See appendix 1, Martinez A, interview…

Table 4 – Project coordination plan

Project summary	Measurable indicators	Means of verification	Important assumptions
GOAL: Get a partnership between Finnish and Colombian lakes and make posible international cooperation.	• Communities have increased access to sustainable basic water services	• Programme evaluation • Observation analysis • Comparisons against against national country plans	• Social and economic stability • Community residents see value in the project • Central government is receptive to the project goals
PURPOSE: **• Develope the project of internationalization of Finnish services or technical cooperation in the field of sustainable water use** **• Work with economical resources from the European Union.**	Improvement in the quantity and quality of basic services, falling under the responsibility of local government including: primary education, social welfare, public health, broader environmental health and housing compared to preprogramme levels	• Programme evaluation • Meeting minutes and reports • Local level assessment reports • Visit reports	• Stability of staffing in the council
OUTPUTS: **• Lake twining between Latin Amercia and Europe.**	• Established plans in place • The Project is working towards the delivery of strategic plans and is able to monitor performance against these plans	• Written action plans • Records of progress against plans with improving trends • Interviews with community groups. - Minutes of meeting	

6.2.8 Possible funding to apply

Finally, it is suggested the next list of the different grants that may apply regarding twinning projects and entrepreneurship compiled and suggest within this timeframe for this topic. See the appendix 1. Pulliainen T, Eija Laitinen E, interviews…..

Furthermore, here is a list of possible sponsoring institutions:

Business Finland: Financial support for the planning, development, besides training phases of projects aiming at establishing long term commercial activity in or started importing from developing countries, such as business partnership support - supportable project types A grant type of seed capital for projects aiming at long-term business partnerships in developing countries, e.g., joint venture, subsidiary company other long-term partnerships (long-term subcontracting, maintenance, franchise or licensing contract) importing from developing countries vocational education and training (Finn partnership 2018).

ELAN Programme: (European and Latin American Business Services and Innovation) is a European Union (EU) initiative that seeks to increase and diversify the EU economic presence in Latin America, by meeting the Latin American demand for knowledge and innovative technology. ELAN also aims to boost the opportunities that both markets offer for European and Latin American SMEs, through two interdependent strategies:

European and Latin American Business Services (ELAN Biz): Whose main objective is to provide current and comprehensive information services to European SMEs interested in doing business in strategic Latin American countries. Furthermore, to generate technology-based business opportunities between European and Latin American SMEs.

Leader groups, Linnanseutury- Support for local initiatives – “The castle is one of the Regional Associations of Finland 54 to the Leader group. The association finances its domain Hattula and Janakkala municipalities and the city of Hämeenlinna (except the downtown areas), the rural associations, and business activities of venture funds. The financing consists of EU, state, and local government funding (European Agricultural Fund for Rural Development).”

IAF, The Inter-American Foundation, an independent U.S. government agency, was created by Congress in 1969 to channel development assistance directly to the organized poor in Latin America and the Caribbean. The IAF has carried out its mandate by responding with excellent support for the most creative ideas for self-help received from grassroots groups and nongovernmental organizations.

It also encourages partnerships among community organizations, businesses also local government directed at improving the quality of life for poor people and strengthening democratic practices. The IAF is governed by a board of directors appointed by the president of the United States and confirmed by the U.S. Senate. A president, appointed by the board, serves as the Inter-American Foundation's chief executive officer, managing a group of employees based in Washington D.C.

Satoyama, IPSI, the International Partnership for the Satoyama Initiative, promotes collaboration in the conservation and restoration of sustainable human-influenced natural environments (Socio-Ecological Production Landscapes and Seascapes: SEPLS) through broader global recognition of their value.

Ministry Agriculture and Forestry have experience with Twinning projects with Pyhäjärvi in a water cooperation project with China.

European Commission: indicative multiannual programs where participant portal where citizens can look for open or forthcoming calls in different programs - Horizon2020.

MAA Ja vesitkaniikan tuki organization which finances research, traveling for research by awarding grants. MMA public and private companies' association focused on foreign trade; it is an excellent possibility to incorporate into the project regarding internationalization.

Entrepreneur association in Hämme region.

Yrittajat the federation of Finish enterprises.

The SYKE (Finnish Environment Institute).

Business Finland.

7 CONCLUSIONS

7.1 Own reflection of the research and its results

There are many popular myths concerning neoliberalism and free trade agreements, among which there are some like that it is passively bringing prosperity for everyone involved and that the flow of cheap products will save consumers money, therefore increasing living standards. Furthermore, it is believed that the flow of capital will create jobs that benefit the people and environment involved in said agreements.

However, by now, it is clear that the opposite is happening; the economic system in the hand of world leaders seems more focused on monetary profits than human welfare or the environment. For example, we have seen that in just 40 years we have lost 60% of all the animal species on the planet. This has led us to the point of starting a new human-influenced geological epoch on earth called the Anthropocene, which seems to be the unprecedented continuation of global extinction.

When searching for solutions for climate change, it is crucial to understand that the climate crisis is not exclusively an environmental problem but also an economic outcome. Consequently, national economies need to see Climate Change as the real enemy of the human race and start fighting against it.

Accordingly, finding the solutions requires radical macro-economical actions, for instance, adopting the military Keynesianism into the national strategy of public spending; by applying this strategy, the government should raise spendings on climate change-related projects, and businesses focused on sustainability, sustainable food systems, bio-clean technology, renewable energy, sustainable land use, and recycling to boost the country economically, along with a comprehensive carbon tax policy reform. These actions would allow a shift into a bio and circular economy, hence achieving the SDG.

However, this fight cannot be fought only by individual governments. It is mandatory for all world stakeholders to be involved in it and cooperate as well as speed up projects or initiatives that contribute to fighting mass extinction, including national and local governments, communities, businesses, and nonprofit organizations. As an example of this kind of project and as a research result, I present the twinning lakes project as a small-scale binational contribution, which can bring innovation between the involved parties that can contribute to change the consciousness of the communities, protect the ecosystem services of the lakes and pursue a more sustainable world.

7.2 Answers to research questions

- Does Colombia have the economic conditions for establishing cooperation (links) or exchange with Finnish organization and initiatives? How much potential does the Colombian market have?

The country analysis concludes that it is a good time to enter into the Colombian market, even if the economy dynamic performance is low compared to developed countries. Currently, the nation is living an increase in domestic consumption & production in terms of sustainable development solutions and products, encouraged by the rise of awareness of the consumers and authorities.

The country is experiencing a slow transition where sustainable projects are more welcome than ever. Moreover, in 2020, Colombia will start a period where local and regional government resources will be available to invest in a green agenda, opening an opportunity for organizations that want to take advantage of this.

- How can Finnish strength (Supply) and the Colombian needs (Demand) in a sustainable development framework be integrated?

Cooperation is the key to opening the door for the case study because bilateral trade history between the countries is especially essential. Finland has small participation in the Colombian market; furthermore, the Colombian society and market are evolving and demanding an innovative solution from problems that have already been solved in Finland.

That is why we consider that Finnish organizations can be pioneers, bridging the gap between two countries through the preservation of water bodies, while creating economic dynamics around it; this will be a new framework to better handle resources for sustainable solutions in water management. Finnish technology and experience would contribute to setting up a future bridge for universal agreements between towns, cities, and organizations.

- How could the Finnish NGO Valajärven enter the target market?

First of all, governments need to hire companies to deal with the aforementioned problem, mitigation, and adaptation to Climate change. Additionally, twinning projects and international investment are welcomed by the Colombian institutions, as well as any internationalization exercise from Scandinavia, which is seen as a desirable work option for Latin America.

VCA has a significant chance to export the methodology of water management, know-how, and to continue to work in the Colombian field. For instance, through outsourcing with Colombian partners in order to replicate these projects in other parts of the country and even in other countries of the Andean community of nations (CAN).

- Can this case study (twin lakes) contribute to adapt and mitigate climate change in Colombia?

Twin lakes could contribute to mitigating climate change, mainly due to its input to the water-related ecosystem services. First of all, taking care of the water body represents an invaluable benefit for society and the economy of the region that relies on this ecosystem, which translates to the provisioning of services like food, fiber, and locally sourced medicines. Furthermore, it regulates services such as air purification, water purification, water regulation temperature, and CO_2 absorption provided by wetlands. Also, the pollination of crops is an essential part of this framework.

Moreover, supporting services like nutrient cycling, photosynthesis, soil formation also have the same purpose. Finally, cultural benefits such as introspection, health, cultural heritage, recreation, and spending time in nature are also an added value. Flood prevention and tackling climate change are inherent to the ideas previously offered.

Finally, installing the need for taking care of H_2O as an ecosystem and creating biodiversity reservoirs.

- What is the potential of Finland's bioeconomic offer to Colombia?

Bioeconomy in Finland is producing bio-based consumer goods products that can replace plastic and engage in a sustainable cycle. The use of low carbon technologies as renewable energy in housing, transport, and industry are also present, along with a biotechnology production of pharmaceuticals, functional foods, and industrial enzymes.

This wide range of products may have a chance in the Colombian market, nonetheless, for this research, water management has been a segment that has to be connected, where Finland has developed a strong expertise, technologies, and smart solutions in biochemicals, e.g., for water purification, as well as, technology, equipment, and chemicals for biomass refining and more importantly, nature ecosystem and wellbeing services that can be shared with Colombia.

There is a clear option to increase the commerce between the two nations; bioproducts and cleantech are unexplored and could be an export to Colombia.

- What kind of impact would the twinning lake project bring?

The twinning of lake-governance systems offeres unique learning opportunities. It allowes twinned organizations and societies to learn from each other's mistakes and use that information to explain to stakeholders why a management practice should or should not be tried. For instance, linking science to policies is a way to transcend within a multiple jurisdictional boundary regarding lake management. This also encompasses watershed and socio-economic issues that impact lake water quality and quantity; it is the real impact of this project.

Furthermore, the fact of the internationalization of Finnish NGO services opens the door as a global actor by helping to export its management and innovation standards; furthermore, that same project could be replicated in other Colombian regions as well as in different places of South America.

Summarizing, if the initial project will be correctly executed, this project will have the chance to qualify for more resources such as local and international grants as a twinning project under the Horizons2020 framework.

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Appendix 1

9 APPENDIX HEADING

Interviews

Experts interviews topics and questions:

Eija Laitinen:

- Forest skill
- What kind or finances the projects that she has participated in have had – please name some of the programs?
- How many participant countries are usually in the projects?
- Have the projects been bi-lateral or multi-lateral?
- What kind of organizations have been participating?
- Project homepages

Answers and recommendation

We talk about African projects and the number of stakeholders for EU funding. She believes that because of the project nature, we need more organization for financing it. Her recommendation was to Focus in the Leader groups, Linnanseutu ry- found local initiatives – http://www.linnaseutu.fi/ “The castle is one of the regional associations of Finland 54 to the Leader group.
The association finances its domain Hattula and Janakkala municipalities and the City of Hämeenlinna (except for the downtown areas), the rural associations, and business activities of venture funds. The financing consists of EU, state, and local government funding (European Agricultural Fund for Rural Development (EAFRD)).”

Then contact In the Ministry of Environment (YMPARISTO), Councilor Pekka Harju-Autti might be the right person to give guidance if there would be possibilities in their ministry. http://www.ymparisto.fi/en-US.
Also, If the companies are willing to involved in the cooperation, the Finnish Technology Fund TEKES https://www.tekes.fi/en/ could be an option, but this would require a business approach.

Also, give us the contact of the environment minister of Finland.

Tapani Pöykkö:

- Forest skill
- Forerunner - a person who often might be before his time
- Tapani was one of the persons in Finland who was the first time he said that we should focus on **bioeconomy**. He was in the group of persons in Finland that first started to use this word.
- He has excellent skills in structural innovations, and he has good forest network in Finland
- He is an expert about lakes in forests - lakes used in recreation, the forest used in recreation, ask if he knows people that could be interested in cooperating with Colombian lakes.
- What kind of project is HAMK developing?

Answers and recommendation

Talk about some HAMK projects and his recommendation. Tell us that they already have one project for water issues. Now they will have another goal to protect all lakes in the region. Mikka's teacher from Forsa who has more information about the project for development funding for rural areas-EU money.
Send examples of the project.
We talk about the example of big projects like the plan Baltic sea- EU program support the sea. It depends on the funding system if it helps cooperation. EU check HAMK

HAMK: Harry Lakela expert H2O Forsa who has a connection to SYKE SANY
There is a project between HAMK and Valajärven conservation association working in Janakkala area for water protection.

Funding:

http://ec.europa.eu/europeaid/regions/latin-america/latin-america-regional-programmes-eu-funding_en

Toni Pulliainen

- He is an accountant, bookkeeper.
- Can you share some standard project layout excel that I could start using in building up the project budget?
- Can you give us useful advice about budget project planning? Especially for large budget planning

Answers and recommendation

Here is the link to the contact details of the national twinning coordinator in Foreign Ministry: http://formin.finland.fi/public/default.aspx?contentId=289626&nodeId=49663&contentlan=2&culture=en-US.

This is the link to the European Commission participant portal where you can look for open or forthcoming calls in different programs (Horizon2020 for example): http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/search/search_topics.html#c,topics=callStatus/t/Forthcoming/1/1/0/default-group&callStatus/t/Open/1/1/0/default-group&callStatus/t/Closed/0/1/0/default-group&+identifier/desc
From the Commission pages, you can also find more information about the programs.

You can find an example of a Horizon2020 application HAMK did a while ago. There is the main application document and then Part B with additional information. I know there may be a bit too much info, and these may seem very confusing to you, but you may get some idea of what different things are usually required in these applications. This was a big (and painful) project preparation and included partners also from South America. Unfortunately, I do not have a detailed budget in excel from this, but the budget overview is in the main document.

Mona-Anitta Riihimäki is the head of the Research Unit of Bioeconomy, so if bioeconomy is going to be part of this, then you should talk with her. She may also have some ideas and contacts you could use.

I will keep on doing research and try to find you maybe some more examples, people, and funding opportunities. It would be a good idea to look for smaller national funding sources also because these EU programs can be tough to apply for and many times require large projects and partnerships.

Alberto Martinez

- He is a Colombian Project manager professional with experiences in international business around the world.
- Can you give as useful advice about project management? Especially for internationalization.

Answers and recommendation

He made some recommendations in the project implementation for both countries. With an emphasis on the areas where Finnish companies might be interested in to go to Colombia, additional about twin lake, he insists that the project must bring the Finnish experts to Colombia for some time to work in the lake so it can have a real impact in the Colombian society. Furthermore, about the project development, he considers that the plan needs to extend for a partnership like; **http://www.sister-cities.org/what-sister-city**
And get funding by local resources like **http://enrd.ec.europa.eu/enrd-static/leader/en/leader_en.html**

Pekka Koskinen

- What does VCA need to develop the project in Colombia
- What would be the VCA contribution to the project?

Answers and recommendation

Pekka is the leader of VCA who provides the idea and motivation to build the twinning project, and we have been sharing information in different meetings around the last three years. One of the first meetings was in December 2016 in Helsinki, where Pekka will talk EU parliament Sirva; also, because he has a connection with the foreign minister. He agreed with applying for Local funding (Leader groups) as the finish contribution for the project.
Pekka will make a list about flora and fauna also measurement species control: Pekka has done the homework of the macro picture of the ecological approach for a lake is now ready in Finish. Additionally, he showed me how to control water issues by fishing species that produce phosphor, it requires still some more details, but the basic idea is there.
He is interested in adding the Tampere lab testing service to the Project.

Pekka talks about seed funding and the possibilities of having funding manage for a big organization as Vanajavesikeskus. The recommendation is to talk to Mikka Soramaki to have an interview about funding local regional.

Local as the finish contribution for the project.

It is also recommended to watch the Story of the lake, Finnish movie Jarven Tarina. Moreover, invited to join the VCA on Facebook. https://www.facebook.com/groups/www.valajarvi.fi/photos/

Meeting with Vanajavesikeskus and Hamk.

From HAMK:
Harri Mattila (linkedin.com/in/harri-mattila-9985a512)
Arturo Lopez
From Vanajavesikeskus:
Two members

Answers and recommendation

The meeting starts with a brief about the Twin lakes project scope by Arturo.
The adviser group composes by, HAMK and Vanajavesikeskus make the follow feedback. First, public funding. Ministry of Agriculture and Forestry is the way. However, they talked about the experience happening of Pyhäjärvi and water cooperation project with China. Also, they mentioned the embassy and some past experiences for practical measures project.

mmm.fi
MAA- JA METSÄTALOUSMINISTERIÖ

Possible new Stake holder

Second, Trade side**.** They suggest to research about public and privet companies' association, as the example: MMA (mma.fi) focus on foreign trade, the excellent possibility to incorporate to the project. Furthermore, contact the entrepreneur association in Hämme region (hameenliitto.fi) and the federation of Finish enterprises (Yrittajat.fi).

Yrittäjät

M M A Myynnin & Markkinoinnin Ammattilaiset

You are mapping up existing twin cities, Tampere, as an example.

Third, funding opportunities, Starting with MAA Ja vesitkaniikan tuki (mvtt.fi) organization, which finances research, traveling for research by awarding grants, apurahat (skr.fi).
Regarding the technical process for other stakeholders, Janakaala municipality will be faster to cooperate for the project. Environmental administrator (Ymparisto.fi)

Another resource: Shallow lakes 2017 network. Reference for Thesis, Book of abstracts find names and topics discussed in conferences Center for wetland ecology in the Netherlands.
(Tampere.fi) Information about water treatment where Heidi Rauhamaki was responsible. About the thesis model valid, twin city's strengths and weaknesses related to trade.

Meeting with Colombian government-Gobernación del Valle.

Answers and recommendation

Entrevista a Clara Hernández abogada de la Subsecretaría de Internacionalización de la Gobernación del Valle del Cauca.

Por instrucción de mi jefe, la Subsecretaria - Dra. Ana Maria Sterling y según lo planteado de su parte al sr. Jukka, le comparto que soy la persona encargada de adelantar las gestiones pertinentes para el hermanamiento de un Lago en el Valle del Cauca.

En ese sentido, manifestarle que es muy interesante para nuestro departamento la propuesta planteada, por lo que es importante conocer cuáles son las condiciones que se requieren del lago para adelantar el hermanamiento.

La Dra Ana Maria ha pensado inicialmente en San Cipriano o Sabaletas en Buenaventura, sin embargo me gustaria que pudieramos tener una conversación para ampliar el tema y tener más claros los parámetros requeridos o una ficha técnica, al igual que recomendaciones que considere usted pertinentes.

Tan pronto contemos con esta información, procederemos a agendar una siguiente reunión con las Secretarías de Agricultura y Medio Ambiente, Turismo, UES y CVC, con el fin de decidir con estas instancias cual seria el lago y así continuar con los pasos necesarios para el hermanamiento.

Appendix 2

Social innovation workshop Agenda.

Before the congress

- Graphic, audio-visual.
- Registration forms.
- Digital and media strategy, as well as dissemination to all the stakeholders.
- Decoration.
- Streaming devices.
- Build the content agenda based on the innovation workshop tools in conjunction with the shared value academic network.

During the congress

- Registration point
- Usability interactive platform (the digital platform that allows access to the agenda of the event, make contact between the participants, access the memories of the event)
- Presentation of the event - (Master of Ceremonies)
- Award ceremony.
- Event photography and dissemination in social networks.

After the congress

- Digital certificate of participation of the attendees
- Workshop Memories and statistics
- Workshop Photographic and audio-visual results pieces
- Report of results and report of the event
- Media strategy for disseminating results with stakeholders.
- Consolidation of databases of the assistants

Agenda and methodology description

Central Theme of the Congress
"Connecting sustainable development- Twin Lakes Finland Colombia + objectives of sustainable development, an opportunity for the generation of business models of shared value."

Place: El Darien/ Buga/ Buenaventura
Day and Time: Date to be specified with the Gobernación del Valle (GVDC), Time: 8 am - 5 pm
The 1st Shared Value Congress will have 3 Components and alternative transverse space.

- Component I. Academic Conference. 7:30 a.m. - 10:15 a.m.
- Component II. Presentation of ventures Academic network of shared value
- Component III. SDG- LABS. (Shared value labs focused on the challenges of the lake) 1:30 pm - 4:00 pm
- Alternative space (Networking - Research posters and projects)

Component for the academic day

Schedule

8 a.m. - 12 a.m.

7:30 a.m. to 8:00 a.m. Registry

8:00 a.m. to 8:15 a.m. Installation Gobernación del Valle Words

8:15 a.m. to 8:45 a.m. Intervention Valajärven conservation association - Pekka Koskinen

8:45 to 9:30 a.m. Shared value an opportunity to develop more and better businesses, ecosystems, territory. (Problematization: environmental impacts, environmental degradation, opportunity from social problems and entrepreneurship).

9:30 a.m. to 10:15 a.m. Sustainable Development Goals -

10:15 a.m. to 11:00 a.m. Presentation of research results in the lake, also entrepreneurship projects which could be incorporated at the shared Value academic network.

11:00 am. at 1:00 p.m. SDG - LABS.

Shared value via Bio and Circular Economy (Ciudad Sostenible,)
Shared Value for service companies

1:00 pm. at 2:00 p.m. Awards and Twin lake ceremony

7. Deliverables

Deliverable 1. (40%) Deliverable it is composed of the following event planning items:
Plan with dates of activities for the development of the contract, Document with the structure proposed for the preparation of the congress, Press releases announcing the congress, Design of graphic pieces before the event, dissemination strategy in universities, render of the assembly of the space.
Deliverable 2. (30%) Deliverable B is composed of the following items once the event has taken place:
Digital platform for interaction with attendees during the event. Registration databases for attendees, assembly of the physical space, design of graphics pieces used during the event, attendance certificate for online download,
Deliverable 3. (30%) Deliverable C consists of the following items against final reports:
Press releases announcing the results of the workshop, report of statistics of interactions before and after the event, report and report of the event, photographic and audio-visual coverage.