

# Sustainable Development in the EU

Approach based on economic growth, sustainable consumption and resource productivity.



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## Abstract

**(English)** The research presented in this MSc thesis concerns the progress of sustainable development in the European Union (EU) during the period 2014-2019. By using data on the development of resource productivity, this thesis outlines the connection between sustainable development goal 8 (SDG8, Decent work and Economic Growth) and sustainable development goal 12 (SDG12, Responsible consumption and Production), at the EU level. The theory of ecological economics and green economy allows for the analysis to reveal the EU approach to sustainable development based on EU policies and reports. By using 'the ladder of sustainability', this thesis aims to distinguish between weak and strong sustainability to reveal which scale is applied at the EU level. I have carried out an in-dept qualitative analysis of official reports and communications from the European Commission, the European Parliament and Eurostat, with complementary descriptive statistics. The results of my analysis have shown that the EU is weighting economic growth over sustainable consumption and production. Although the data and results show progress regarding SDG8 and SDG12, the trends might not be entirely due to the success of environmental policies. It is very likely that economic or social factors have influenced this performance.

**(Español)** La investigación presentada en esta tesis de Maestría aborda el progreso del desarrollo sostenible en la Unión Europea (UE) durante el período 2014-2019. Mediante el monitoreo de la productividad de recursos, esta tesis describe la conexión entre el Objetivo de Desarrollo Sostenible 8 (ODS 8, Trabajo decente y crecimiento económico) y el Objetivo de Desarrollo Sostenible 12 (ODS 12, Consumo y producción responsables), a nivel de la UE. La teoría sobre economía ecológica y economía verde permite analizar el enfoque de la UE hacia el desarrollo sostenible basado en las políticas e informes emitidos por la UE. Mediante el uso de "la escalera de la sostenibilidad", esta tesis tiene como objetivo distinguir entre sostenibilidad débil y fuerte para revelar la escala que se aplica a nivel de la UE. He llevado a cabo un análisis cualitativo de informes oficiales y comunicaciones de la Comisión Europea, el Parlamento Europeo, así como de Eurostat, complementando la investigación con estadísticas descriptivas. Los resultados de este análisis han demostrado que la UE pondera el crecimiento económico sobre el consumo y la producción sostenibles. Si bien los datos y los resultados muestran avances con respecto al ODS 8 y ODS12, las tendencias podrían no deberse completamente al éxito de las políticas y estrategias ambientales. Es muy probable que factores económicos o sociales hayan influido este desempeño.

**Keywords:** Sustainable Development, SDGs, European Union, Economic growth, Sustainable consumption and production, Ecological economics, Green Economy, Ladder of sustainability, strong sustainability, weak sustainability, relative & absolute decoupling.

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## Introduction

Today humanity uses the equivalent of 1.7 Earths. With the global consumption of material resources increasing fourteen-fold between 1900 and 2015 and projected to more than double between 2015 and 2050, the world is quickly moving towards several tipping points (European Commission, 2019, p. 10). This is one of the reasons why sustainable development has become an important component of contemporary discussions at global level in both, public and private sectors. Environmental, economic and social issues need to be reshaped to solve the unsustainable global context that is threatening our planet and creating imbalances across the globe.

Sustainable development appears to be on the rise, notably in light of climate change, depletion of natural resources and public awareness around the world. Ensuring sustainability requires to integrate actions from citizens, businesses and governments to promote living standards under environmental limits. Indeed, the need to maintain human development while maximizing the use of renewable resources is encouraging the transition for sustainable changes.

In Europe, sustainable development has been outlined as part of the European policy due to the high demand of resources from developing countries and overconsumption patterns to maintain well-being and quality of life in the region. Moreover, the European Union (EU) as the world's largest single market has become over the past five years a leading force behind the sustainable development discourse. In 2015, the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs), were adopted by the United Nations (UN) General Assembly. The EU was one of the leading forces behind the UN 2030 Agenda for sustainable development onwards called 2030 Agenda (European Commission, 2019, p. 6).

Having this context in mind, I have the interest to research the connection of sustainable development with the 2030 Agenda at EU level, specifically to monitor SDGs 8 and 12 regarding economic growth and sustainable consumption and production. I also would like to understand if the allocation of resources and priorities for sustainable development in the EU reflects improvement on the selected SDGs. In order to investigate this, I will conduct qualitative analysis based on the EU approach to sustainable development, in addition of descriptive statistics collected from Eurostat database limited to the 2014-2019 period.

The ground of this research comes from a personal interest to understand the dynamics of sustainable development at EU level, a developed region where I consider, human well-being has led to exceed environmental limits. In this paper I also aim to unfold the role that European policies play to address the 2030 Agenda and to understand through descriptive statistics what is the stage of decoupling economic growth from natural resources in the Europe Union. Moreover, I have developed an interest towards environmental issues throughout the study of ecological economics, and especially due to the impact of human development in ecosystems around the globe. I agree with the ecological economist Tim Jackson (2016, p. 12) who states that “material growth cannot continue indefinitely because planet earth is physically limited.” The purpose of sustainable development is to create meaning in life, not only through material consumption, but also to flourish within the limits of our planet. I am therefore interested in the evolution of sustainable strategy in the EU towards this global commitment, because the development of policies at EU level could reflect some progress in comparison with other developing regions.

According to Næss (2006, p. 199) “a strategy for sustainable development must take the environmental problems seriously. These problems also represent real threats to the long-term resource base for capitalist production. A number of studies indicate that the present level of consumption of natural resources and environmental pollution is already higher than what can physically be sustained over the long term.



Growth in the consumption of raw materials, energy and land will lead to impoverishment of the natural base, loss of biodiversity and scarcity of a number of non-renewable natural resources within the foreseeable future. The extensive and increasing combustion of fossil fuels is contributing to dramatic climate change, unwholesome pollution in urban areas and damages to vegetation and wildlife. Growth in material resource consumption is not environmentally sustainable on a global scale, and in particular not in wealthy nations if the inequality between rich and poor countries is to be reduced”.

## Thesis structure

**Chapter 1** presents the problem formulation and the analytical questions I have stated to address the research. Furthermore, this chapter outlines a conceptual framework on economic growth, sustainable consumption and resource productivity.

**Chapter 2** describes the methodological considerations for this study, which include the single case study method, the reasons and practicalities to employ a descriptive typology of case, the application of a qualitative content analysis and descriptive statistics. Additionally, the chapter specifies the empirical data used for the development of this research, including the main SDGs, targets and indicators selected. Additional data regarding the EU approach towards the 2030 Agenda is briefly include.

**Chapter 3** introduces literature related with sustainable development. Firstly about how the approaches to sustainable development have evolved since the 1960s until the adoption of the 2030 Agenda for Sustainable Development; secondly the theoretical discussions on ecological economics against green economy; finally, the ladder of sustainable development and decoupling, which will be used in the development of the analysis.

**Chapter 4** presents the analysis in relation to the concepts, theories and empirical data. The main part of this section outlines the findings of the research.

**Chapter 5** further discusses the EU approach to sustainable development and presents the conclusion of the thesis.

## 1. Problem formulation

The purpose of this research is to contribute to a better understanding of the approach to sustainable development in the EU, and to investigate the progress of specific goals, analyzing policies and indicators at EU level. Understanding the connection between economic growth and sustainable consumption and production is at the core of sustainable development because it can show a panorama about the impact of human and economic activities considering planetary boundaries. In this sense, the main focus of this research seeks to explore and interpret the association of SDG 8 on economic growth and SDG 12 regarding sustainable consumption and production within delimited space (European Union) and time (2014-2019). Therefore, the implementation of the 2030 Agenda at EU level during the mandate of the Juncker Commission, will be the case study of this research. This considering that the region has been continually evolving policy strategies to integrate sustainable development in the Union.

As I will explore, the purpose of sustainable development is not only about decoupling economic growth from environmental impact, but also to create meaningful lifestyles for human beings. Accordingly, considering the importance of lasting awareness to preserve natural resources and ecosystems is a must. After all, social and economic structures are embedded in the ecological system. This research considers the theoretical approaches brought by ecological economics and green economics reflecting thoughts on the ladder of sustainable development and decoupling. In consequence, a qualitative theoretical analysis among this schools will bring insights into the discussion, which leads to the following research question:

How has the European Union approached the connection between economic growth and sustainable consumption-production towards sustainable development and to what extent the linkage enhances the capacity to accomplish strong sustainable development?

## 1.1 Analytical questions

¿Are economic growth and sustainable consumption sufficient indicators to assess sustainable development?

¿Does resource productivity reflect decoupling in the EU context?

Considering ecological economics and green economy theories ¿which approach reflects better the context of sustainable development in the EU?

¿How does European policies reflect action towards SDGs 8 & 12?

¿Has the European Union achieved progress on SDGs 8 & 12 during the mandate of the Juncker Commission 2014-2019?

In order to respond these questions, I will start to illustrate a conceptual framework which will help the reader to understand fundamental terms that will be considered along the study.

## 1.2 Conceptual framework

### 1.2.1 What is economic growth?

“Economic growth is typically measured as the change in per capita gross domestic product (GDP)” (Howitt & Weil, 2010). “GDP is a measure of economic activity and is commonly used as a proxy for developments in a country’s material living standards. However, it is not a complete measure of economic welfare. For example, GDP does not include most unpaid household work. Neither does GDP take account of negative effects of economic activity, like environmental degradation. It refers to the value of total final output of goods and services produced by an economy within a certain period of time. Real GDP per capita is calculated as the ratio of real GDP (GDP adjusted for inflation) to the average population of a specific year and is based on rounded figures” (Eurostat, 2019).

### 1.2.2 What is sustainable consumption?

“Consumption, in its simplest sense, means using up resources in order to live our daily lives. We all need to consume in order to survive, there are still many people on the planet that consume too little. On the other hand, high consumption lifestyles have negative impacts on the environment and on other people. By ‘high consumption’, I mean lifestyles which use a lot of resources and create a lot of waste, the kinds of lifestyles that many people in the global North, and more affluent people in the global South tend to live. In its simplest sense, the term ‘sustainable consumption’ refers to efforts to understand how these impacts on environment or on other people might be avoided” (Middlemiss, 2018, p. 5).

### 1.2.3 What is resource productivity?

According to Eurostat (2019) “resource productivity is defined as gross domestic product (GDP) divided by domestic material consumption (DMC). DMC measures the total amount of materials directly used by an economy. It is calculated as the annual quantity of raw materials extracted from the domestic territory of the focal economy, plus all physical imports, minus all physical exports. It is important to note that the term 'consumption', as used in DMC, denotes apparent consumption and not final consumption. DMC does not include upstream flows related to imports and exports of raw materials and products originating outside of the focal economy”.

In the next chapter, I will present in detail the approach and method to conduct the thesis. I will first introduce the case study, typology and method of analysis. Finally, I will disclose the empirical data employed.

## 2. Methodology

This chapter will introduce the methodological considerations and choices that I have made in order to conduct the research and answer the problem formulation and analytical questions. First, I will present an overview of the case study considering a single case study approach for this analysis; second, the typology of case as a descriptive and typical case; third, the method of analysis as a qualitative approach, fourth the empirical data, presenting the targets and indicators I will employ in relation with SDGs 8 & 12; fifth, an approach of SDGs at EU level as part of the empirical data.

To answer the research question, I have decided to employ a descriptive case study to carry out in-depth analysis of Sustainable Development at EU level, meant that I will use a single-case design and triangulate the analysis addressing ecological economics and green economy as connecting theories.

### 2.1 Method: Case study

Concerning demarcation of this method, a case study is “an intensive study of a single case or a small number of cases which draws on observational data and promises to shed light on a larger population of cases. Moreover, a case study is highly focused, meaning that considerable time is spent by the researcher analyzing and subsequently presenting the chosen case, or cases, and the case is viewed as providing important evidence for the argument. For reasons of practice and practicality it makes sense for us to define case study research as an observational form of analysis” (Gerring, 2019, p. 27-28). I will use single-case study method because I seek to conduct in-depth analysis of sustainable development in the European Union during 2014-2019, collecting data on the performance of SDGs 8 & 12, analyzing EU reports to assess sustainable development and theoretical reflections related with the study case, this study aims to shed light on the current advancement of sustainable consumption and production in relation with economic

growth, because that connection could reflect evidence regarding decoupling, or at least improvement towards resource productivity.

## 2.2 Typology of case

Gerring, (2019, p. 55) states that “the range of strategies employed in the social sciences are categorized according to their primary goal- descriptive or causal”. Case studies “often use typologies to differentiate between cases and/or explain or describe change” (ibid, p. 57). In this study, I aim to describe changes concerning SDGs 8 & 12 during a five-year period, meaning that I will carry out a descriptive typology of case. In fact, the progress of sustainable development in the EU concerning policies and strategies are suitable to collect empirical data and investigate about the case. Hence, is feasible to center the research in the EU rather than other regions where data is lacking, also consecutive data during the chosen period is available at EU level.

According with Gerring (2004), “it is easier to conduct descriptive work than to investigate causal propositions while working in a case study mode”. Therefore, descriptive inference is a good way to gain a deep knowledge about the phenomena. “Some of the critics to case study have argued that the use of case study does not, or sparsely, contribute to scientific generalization. These critics appear to reflect the debate that revolves around the use of whether quantitative or qualitative methods, and more specifically on which is more suited to provide scientifically accurate findings” (Chapelain, 2018). Regarding this critique, I agree with Goertz & Mahoney, (2012, p.8), who argue that, “quantitative research is grounded in inferential statistics (i.e. probability and statistical theory), whereas qualitative research is (often implicitly) rooted in logic and set theory”, meaning that both approaches have relevant importance in the research field. However, “when case study research is conducted properly it can not only provide useful insights into the particular cases but also can be used for testing hypotheses if the research is well designed” (Peters, 2013, p. 168). In this regard, I position my case study as a qualitative approach, seeing that I will investigate on reports, EU policies and also academic books,

journals and articles to structure my analysis. However, I will also employ descriptive statistics referred to as descriptive methods to provide general information about the collected data (Shi & McLarty, 2009), specifically concerning the connection between economic growth and sustainable consumption and production.

### 2.3 Method of analysis

Case studies “may be contrasted between large and small cases. It also can be distinguished according to whether they exploit cross-case, longitudinal or within-case variation and generally case studies can be analyzed qualitatively (with causal-process observations) or quantitatively (with matrix observations)” (Gerring, 2019, p. 137). In general, “small-N qualitative inferences depend mainly on within-case analysis, whereas large-N quantitative inferences depend mainly on cross-case analysis” (Goertz & Mahoney, 2012, p. 73). Therefore, a small-N qualitative analysis is more suited to address my research. Also, within- case variation will be used for this purpose. Gerring (2019, p. 140) states that, “the most important element of any case study is the opportunity to exploit variation “inside” or “within” the case of theoretical interest. Any unit may be decomposed, and evidence drawn from each of these sub-units is likely to provide vital information for the main argument, pitched at the level of the primary case”. Applying this variation, I will address specific goals within the 2030 Agenda, meaning that from a broad case I will narrow the research down to explicit targets and indicators, which make the study suitable under the category of small and within case analysis.

According to Gerring (2019, p. 154), “case studies may contain both quantitative and qualitative evidence. He uses the term qualitative and quantitative to embrace two elements: the type of data (matrix/non matrix) and the type of analysis (formal/informal). In short, qualitative analysis refers to an informal analysis of non-comparable observations. Non comparable observations cannot be arrayed in a matrix format because they are examples of different things, drawn from different



populations. The analysis is informal insofar, as it is articulated with natural language and it is unconnected to an explicit and general framework of inference”.

The formulation of the Agenda 2030 serves as an illustration of formal and informal analysis. On one hand the Agenda explored informal analysis to interpret the needs of people, communities, and ecosystems, on the other hand, formal analysis was implemented to formulate objective measurements. However, the present investigation, will employ an informal type of analysis because non-comparable observations characterize the study. Additionally, the research is informal because it is not using any type of coding or matrix to quantify variables. Indeed, the analysis will describe the empirical data and interpret it according to theories that have been associated to sustainable development, which make the study more flexible and integrative.

The following section will present in detail the sources used to gather the empirical data.

## 2.4 Empirical data

My empirical data is based on data and reports collected mainly from Eurostat and the European Commission website. Furthermore, I also gathered data from academic articles, journals and e-books in order to conduct the theoretical analysis on ecological economics, green economy and sustainable development.

The main reports and initiatives considered to analyze the progress on sustainable development goals at EU level are:

- The communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the regions: Next steps for a Sustainable European future, European Action for sustainability, issued on November 2016.
- The staff working document “Key European action supporting the 2030 Agenda and the Sustainable Development” from 2016.

- The 2019 Eurostat’s report, “Monitoring report on progress towards the SDGs in an EU context”.
- The 2019 European Commission reflection paper “Towards a Sustainable Europe by 2030”.

I also carried out descriptive statistics analysis from figures, graphs and tables based on Eurostat database. Eurostat’s website contains a section dedicated to the EU SDG indicator set. Eurostat online data codes, such as `sdg_01_10`, allow for an easy access to the most recent data. The website also includes a section called ‘metadata’ with explanatory texts presenting full data description, including relevance, unit of measure and reference period, in order to simplify data regarding indicators. Furthermore, “Eurostat Statistics Explained is an official Eurostat website presenting statistical topics in an easily understandable way” (Eurostat, 2019).

The following section will explain the goals, targets and indicators that I will employ throughout the research, displaying arguments and reasons to support that choice.

#### 2.4.1 Goals and indicators: connecting SDGs 8 & 12

“At the core of the 2030 Agenda is a list of 17 SDGs and 169 related targets to end poverty, protect the planet, and ensure prosperity and peace” (Eurostat, 2019, p. 20). However, the complexity of the agenda appears challenging to analyze it as a whole. Hence, I have decided to focus on SDG 8 and SDG 12, explicitly on the side dedicated to economic growth and responsible consumption and production. I consider that the relationship between them is key to analyze the potential of the sustainable development in the EU. For instance, if achieving economic growth requires higher resource and energy consumption, it can create a trade-off between SDG 8 and SDGs 12 and 7 (ibid, p. 29). On the other hand, it is relevant to remember that the interlinked nature of the SDGs is at the core of the agenda, which means that at some point trade-offs, synergies and unintended consequences will emerge.

SDG 8 specifically calls to 'promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all'. Goal 8 on one hand, "recognizes the importance of sustained economic growth and high levels of economic productivity for the creation of well-paid quality jobs, as well as resource efficiency in consumption and production" (UN SDGs Knowledge Platform, 2019). On the other hand, SDG 12 calls to 'ensure sustainable consumption and production patterns'. Goal 12 calls for a comprehensive set of actions from businesses, policymakers, researchers and consumers to adapt to sustainable practices. It envisions sustainable production and consumption based on advanced technological capacity, resource efficiency and reduced global waste" (UN SDGs Knowledge Platform, 2019).

The goals have been selected considering three main linkages among them.

- First, SDGs 8 & 12 are associated with two specific terms that define today's capitalist economic system, which are; economic growth and consumption-production patterns.
- Second, the conceptual approach of these goals shed light into the unsolved discussion of decoupling economic growth and resource consumption from environmental impact, which is the main interest area of this research.
- Third, when looking at targets and indicators, I found out that resource productivity and domestic material consumption are used to monitor indicator 8.4.2 and 12.2.2.

Following, I will display the selected targets and indicators to address the research.

| GOAL   | TARGET  | INDICATOR   |
|--------|---|---|
| SDG 8  | TARGET 8.1 Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries.   | INDICATOR 8.1.1 Annual growth rate of real GDP per capita   |
| SDG 8  | TARGET 8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead | INDICATOR 8.4.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP  |
| SDG 12 | TARGET 12.2 By 2030, achieve the sustainable management and efficient use of natural resources  | INDICATOR 12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP |

Source: UN SDGs Knowledge Platform, 2020

A second part of the empirical data section will present the SDGs at EU level, in order to discuss about establishment and contribution of European strategies.

#### 2.4.2 Implementation framework

The EU has committed to implement the Sustainable Development Goals in both, its internal and external policies. “In response to the 2030 Agenda, on November 2016, the European Commission adopted its Communication ‘Next steps for a sustainable European future: European action for sustainability’, announcing a two-step approach towards the implementation of the SDGs. The first work stream is to fully integrate the SDGs into the European policy framework and Commission priorities. The second work stream is a reflection on further developing the EU’s longer-term vision after 2020. In this respect, on 30 January 2019 the Commission presented a reflection paper ‘Towards a Sustainable Europe by 2030’. The Communication from 2016 also announced a detailed regular monitoring of the SDGs in the EU from 2017 onwards, which led to the establishment of the EU SDG indicator set and the launch of annual EU SDG monitoring reports in November 2017” (Eurostat, 2019, p. 23).

During the 2014- 2019 mandate of the Juncker Commission, “the SDGs feature in all of the European Commission’s 10 priorities. Therefore, the reflection paper includes three annexes: the Juncker Commission’s contribution to the SDGs, the EU’s

performance on the SDGs (among others based on the Eurostat SDG monitoring report from 2018), and a summary of the contribution of the SDG Multi-Stakeholder Platform to the reflection paper” (Eurostat, 2019, p. 24).

#### 2.4.3 EU progress towards SDGs

Over the most recent five-year period, “The EU progress in some goals has been faster than in others, and movement away from the sustainable development objectives occurred in specific areas of a number of goals. The EU has made good progress in improving the living conditions of its citizens, these favorable trends can be seen against the background of an improving economic situation in the EU over the past five years (mainly monitored by the indicators of SDG 8). The growing economic activity in the EU, however, has not always been accompanied by favorable developments in the use of natural resources and its negative environmental impacts, as exemplified by the positions of SDG 7, SDG 12, SDG 13 and SDG 15 in the overview figure of EU-28 progress towards the SDGs” (Eurostat, 2019, p.10) (See Appendix 1).

Moreover, “monitoring SDG 8 within the EU context, the goal is characterized by steady improvements in the EU’s economic and labour market situation over the past few years. Steady growth in real GDP per capita since 2013 has been accompanied by continued increases in employment and corresponding declines in long-term unemployment and in the number of young people not in education, employment or training. The EU is well on track towards meeting its 2020 target of raising the employment rate to 75%. In addition, resource productivity and the EU’s investment share of GDP have increased as well” (Eurostat, 2019, p. 12).

On the other side, “monitoring SDG 12 in an EU context focuses on developments in the areas of decoupling environmental impacts from economic growth, energy consumption, and waste generation and management” (Eurostat, 2019, p. 235). However, at EU Level “the unfavorable developments in energy consumption

reported for SDG 7, have also resulted in a deterioration of the overall assessment of SDG 12 'Responsible consumption and production' in 2019 compared with the previous year. For both energy and material use, only relative decoupling from economic growth is visible. This means that the recent increases in the EU's resource and energy productivity are mainly a result of strong GDP growth and do not reflect more sustainable consumption patterns of natural resources. Despite the increases in circular material use and recycling, total waste generation (excluding mineral wastes) continued to grow in the EU" (Eurostat, 2019, p. 14).

Certainly, promoting the 2030 Agenda could enhance balance among human needs while the environment is protected. Nevertheless, the current economic system and human behavior surpass ecological systems' capacity to regenerate natural resources. Therefore, in the literature review I will introduce the different approaches and theories that address the dilemma.

## 3.1 Literature review

### 3.1. 1 Environmental revolution - 1960s

Neo-classical economics has been the dominant paradigm in the economics profession since the late 19th century. This model sees the economy solely in terms of a circular flow of goods and services between producers and consumers in a closed loop. No reference is made to resource depletion or waste as the earth is assumed to have an unlimited capacity to support its population. Kenneth Boulding (1966) famously referred to this as the 'cowboy economy', so called "because the cowboys of the North American plains lived on a linear flow of inputs to outputs, from sources to sinks, taking what they wanted from the earth and throwing away the rest. In the cowboy economy, there was no need to recycle anything because resources were assumed to be so abundant" (Buckingham & Turner, 2008, p. 2).

These assumptions "were seriously challenged in the 1960s and 1970s with the advent of the environmental revolution. Seminal books such as Rachel Carson's *Silent Spring* (1962), Paul Ehrlich's *The Population Bomb* (1968) and the Club of Rome's *The Limits to Growth* (1972) foresaw gloomy prospects for the world, due to massive population growth, resource depletion and pollution. The Club of Rome painted a particularly apocalyptic future for the earth if the environmental impacts of the economy were not addressed" (ibid, p. 3). The Club of Rome "was made up of an informal, international group of scientists, humanists, economists and industrialists who shared a deep concern for the rapid rise in global population, global consumption and industrial output. The stage was being reached, they argued, when this explosion of economic and population growth would exceed the carrying capacity of the earth" (Revell, 2008 p. 2). Progressively, the evolution of ideas to reduce environmental impacts gained support from ecological economics.

### 3.1. 2 Foundation of ecological economics- 1970s

Ecological economics “was founded upon the importance of placing the economy within its biophysical limits, while recognizing the need for the conduct of human society to respect others both present and future, human and non-human” (Spash, 2017, p. 3). Herman Daly, the founding father of ecological economics, argued that ecological economics provides “a bridge to unite economics and ecology in the furtherance of sustainable development” (Jakobsen, 2019 p. 125).

### 3.1.3 Growth and Development

“As ecological economists have long argued, growth is quantitative physical increase in the matter-energy throughput, the metabolic maintenance flow of the economy beginning with depletion and ending with pollution. Development is qualitative improvement in the capacity of a given throughput to provide for the maintenance and enjoyment of life in community. Growth means larger jaws and a bigger digestive tract for more rapidly converting more resources into more waste, in the service of frequently destructive individual wants. Development means better digestion of a non-growing throughput, and more worthy and satisfying goals to which our life energies could be devoted. Development without growth beyond the earth’s carrying capacity is true progress. The main ways to develop are through technical improvement in resource efficiency, and ethical improvement in our wants and priorities. Resource efficiency must be an adaptation to lower resource throughput. ... Limiting physical growth is necessary to force the path of progress on to development. Since physical growth has become uneconomic one might think that limiting it would not be so controversial! But of course most economists do not admit that growth is, or even could be, uneconomic. They seem determined to avoid discussion of arguments or evidence to the contrary” (Daly, 2013, pp. 65-66).



### 3.1.4 Sustainable development: 1980s-Onwards

The term “sustainable development came into the public arena in 1980 when the International Union for the Conservation of Nature and Natural Resources published the World Conservation Strategy (IUCN, 1980). This strategy aimed at achieving sustainable development through the conservation of living resources. However, its focus was rather limited, primarily addressing ecological sustainability, as opposed to linking sustainability to wider social and economic issues. It was not until 1987, when the World Commission on Environment and Development (WCED) published its report, ‘Our Common Future’, that the links between the social, economic and ecological dimensions of development were explicitly addressed (WCED, 1987). The WCED was chaired by Gro Harlem Brundtland, then Norwegian prime minister, and Our Common Future is sometimes known as the Brundtland Report” (Robert, Parris & Leiserowitz, 2005, p. 23). The World Commission on Environment and Development (1987) offered a definition of sustainable development that has become widely used: Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

In regards, Monkelbaan (2019, p. 10) argues that definition is:

- Normative (future generations should have the same possibilities—even though future generations do not have a voice and we do not know their needs);
- Subjective (it requires an assessment of future needs);
- Ambiguous (it does not specify what human needs are nor what needs to be sustained and how), and
- Not describing what sustainable development is, but what it should result in, which makes it not an actual definition.

Although there is further criticism on the understanding of sustainable development there is also a continuous and collective effort for bringing the advancement of human prosperity and well-being in lasting balance with planetary support systems (Monkelbaan, 2019). Sustainable development has been widespread used to

illustrate sets of goals to achieve economic, social and environmental development. Consequently, the SDGs were built on decades of work by countries and the United Nations, to adopt the 2030 Agenda, which is an urgent call for action.

### 3.1.5 The 2030 Agenda for Sustainable Development

The SDGs “were adopted on 25 September 2015 by the United Nations General Assembly (UNGA) through a formal Resolution titled Transforming our World: the 2030 Agenda for Sustainable Development. The SDGs sets out a global framework for achieving sustainable development by 2030. It includes an ambitious set of 17 Sustainable Development Goals (SDGs) and 169 associated targets, for countries and stakeholders to take forward” (European Commission, 2019, p. 47).

“The SDGs or ‘Global Goals’ are a follow-up of the Millennium Development Goals (MDGs). However, there are significant differences between the MDGs and the SDGs: the SDG agenda is more comprehensive (especially in terms of its environmental dimension) and is universal (all countries committed to achieving it). The SDGs are also much more integrated; the linkages between different goals and targets are both implicit and explicit” (Monkelbaan, 2019 p. 4).

These initiatives aim to determine the direction of governance to address global challenges, at the same time that envision an integrative way to deal with transdisciplinary approaches. Although it is not the purpose of this thesis to give an all-encompassing description of the 17 Sustainable Development Goals (SDGs). A selective analysis of SDG 8 and SDG 12 will be address.

## 3.2 Theoretical approach

First, I will present two central approaches to conduct the analysis, meaning ecological economics and green economy. Second, I will introduce additional theories to demonstrate that distinct theories could be connected to understand the issue of sustainable development. On one hand the ladder of sustainability, including weak versus strong sustainability, on the other hand, relative decoupling in comparison with absolute decoupling.

### 3.2. 1 Ecological economics approach

Ecological economics, “first and foremost, it is closely connected to nature and the eco-systems. Ecological economics connects to the physical, natural and social worlds” (Jakobsen, 2019, p. 147). “One of the basic organizing principles of ecological economics is ... a focus on (the) complex interrelationship between ecological sustainability (including system carrying capacity and resilience), social sustainability (including distribution of wealth and rights, social capital and coevolutionary preferences), and economic sustainability (including allocative efficiency in the presence of highly incomplete and imperfect markets)” (Revell, 2008 p. 11). “In yesterday’s empty world the limiting factor was capital; in today’s full world remaining natural resources have become limiting. This fundamental change in the pattern of scarcity has not been incorporated into the thinking of growth economists” (Daly, 2013, p. 62). In consequence, Ecological economics plays a key role to incorporate a new logic to address ecological systems and economic systems.

“The pioneers in ecological economics focus on three key goals: sustainable scale, fair distribution and efficient allocation” (Jakobsen, 2019 p. 126). Daly maintains that if “we keep the throughput within the natural capacity of the ecosystem to absorb wastes and regenerate depleted resources, then the scale of the economy is ecologically sustainable” (ibid, p. 127). A fair distribution is one where the degree of inequality is limited to or is within an acceptable range. The point is that everybody

should have access to the goods and services necessary for a good life. Daly and Farley also point to the fact that “a less unequal distribution of resources may generate public goods such as economic stability, lower crime rates, stronger communities, and better health” (ibid, p. 128). Efficient allocation for the ecological economist does not consider first which resources we should take and for what use, but which can and must remain in use by the ecosystem, regardless of potential human consumption (Hamstead & Quinn, 2005, p. 148). Stymne and Jackson, (2000, p. 219), affirm that “there are two types of equity according to the literature on sustainability: intergenerational and intragenerational. Intergenerational equity refers to the fairness in allocation of resources between current and future generations. The most frequently used definition of SD emphasizes this type of equity... Intragenerational equity refers to fairness in allocation of resources between competing interests at the present time. The concept of intragenerational equity has received less attention in the literature on sustainable development, and particularly that on ecological economics” (Jabareen, 2008, p. 184).

In summary, ecological economics has four centrally defining characteristics:

- challenges the growth paradigm of neoclassical and environmental economics;
  - integrates economic, social and ecological objectives in all models and decision-making processes;
  - is concerned primarily with scale, secondarily with distribution and thirdly with allocation; and
  - considers the balance of human and non-human access to scarce resources.
- (ibid, p. 149)

As reported by Hamstead & Quinn (2005, p. 149), “two important practical issues arise out of the theory of ecological economics. The first is that the question of scale is not one that can be readily addressed using market mechanisms. Instead, scale is a political and moral question that can only be addressed by educated, interested and aware populations and governments. The market cannot solve this problem

independently. Further, the issue of scale, or consumption, is linked inextricably to the issue of distribution. The second issue is, if not quantitative economic growth, then what?. Some have suggested that if we are to shift away from quantitative economic expansion as the primary measure of success, we must also incorporate measures or indices that quantify traditionally qualitative aspects (e.g. quality of life or well-being, longevity, stability and diversity) of our communities and products”

Ecological economics “aim is to sketch a framework for a new model of the economy based on the world-view and principles of ecological economics (Costanza 1991; Costanza et al. 1997; Daly and Farley 2004). Some of the ideas include: First, economy and society are deep-seated in our ecological system. Therefore, we must understand economy as part of the whole system. Second, focus on human well-being must be a priority, not simply improvement in material consumption, which is the main difference between growth and development. Third, a balance of four basic types of assets (capital) are necessary for sustainable human wellbeing: built, human, social, and natural capital (financial capital is merely a marker for real capital and must be managed as such)” (Costanza et al., 2015, p.283). Ecological economics, also accept that growth in material consumption ultimately is unsustainable because of fundamental planetary boundaries (Rockström et al. 2009) and, further, that such growth is or eventually becomes counterproductive (uneconomic) in that it has negative effects on wellbeing and on social and natural capital” (Costanza et al., 2015, p. 283). Ecological economists “take a strong sustainability approach, which assumes that technology will not necessarily be able to remove resource constraints, and that there are no substitutes for some (critical) natural capital. Instead of viewing natural capital as interchangeable with human capital, ecological economics views human capital as derived from natural capital and therefore dependent on natural capital. The ecological health of the planet therefore takes precedence over the economic needs of humans” (Revell, 2008 p. 13). “Daly and other ecological economists highlight that the neo-classical model of GDP measures a nation's prosperity by the volume of goods and services bought and sold but ignores the social and environmental cost of doing business. They argue that the use of GDP as a measure of the standard of living is misconceived if

increased consumption leads to degradation of natural capital, which in turn results in a reduction in the quality of life and general well-being of society” (ibid, p. 14).

### 3.2.2 Green economy approach

The green economy model address many of the problems of the current economy while still allowing growth to continue, e.g. by putting a price on carbon emissions (Costanza et al, 2015 p.283). The green economy is “an emergent approach to sustainable development launched at Rio+20. Herein environmental decision-making is increasingly achieved through economic processes and logic. The natural commons are quantified and managed as natural capital. However, the term ‘green economy’ was first coined in the Blueprint for a green economy (1989) report by Pearce, Markandya, and Barbier (Allen & Clouth, 2012, p. 7). In a paper titled ‘Green economy—The next oxymoron? No lessons learned from failures of implementing sustainable development’ Brand (2012b, p. 2) claims that “the concept of a green economy is, like sustainable development, rather an oxymoron which intends to bundle different, partly contradictory, interests and strategies and gives them a certain legitimacy and coherence”. The project is an amalgamation of conflicting agendas. On the one hand, it is a desperate attempt by scientists and environmentalists to convince industrialists and politicians to prioritize environmental concerns. On the other hand, it is the recognition by business of opportunities for profit in the creation of new green markets” (Boehnert, 2016, p. 398). “Green economics argue that relatively minor adjustments to the current economic model will produce the desired results. For example, they argue that by adequately pricing the depletion of natural capital we can address many of the problems of the current economy. Some of the areas of intervention promoted by green economy advocates, such as investing in natural capital, are necessary and we should pursue them” (Costanza et al, 2015, p. 281). However, the complexity of the current economic model and the impact it causes to the environment requires deep changes in order to regenerate ecosystems and reduce depletion of natural resources. Also, emphasis to interlink social, economic and environmental principles need to be scaled to overcome

global challenges. Following, the main characteristics between ecological economics and green economy will be display.

Table 1 The basic characteristics of the current economic model, the green economy model, and the ecological economics model

|  | <b>Current Economic Model</b>   | <b>Green Economy Model</b>  | <b>Ecological Economics Model</b>  |
|--|---|---|--|
| <b>Primary policy goal</b>                         | More: Economic growth in the conventional sense, as measured by GDP. The assumption is that growth will ultimately allow the solution of all other problems. More is always better. | More but with lower environmental impact: GDP growth decoupled from carbon and from other material and energy impacts.              | Better: Focus must shift from merely growth to “development” in the real sense of improvement in sustainable human well-being, recognizing that growth has significant negative by-products.                   |
| <b>Primary measure of progress</b>                 | GDP   | Still GDP, but recognizing impacts on natural capital.  | Index of Sustainable Economic Welfare (ISEW), Genuine Progress Indicator (GPI), or other improved measures of real welfare.  |
| <b>Scale/carrying capacity/role of environment</b> | Not an issue, since markets are assumed to be able to overcome any resource limits via new technology, and substitutes for resources are always available.                          | Recognized, but assumed to be solvable via decoupling.  | A primary concern as a determinant of ecological sustainability. Natural capital and ecosystem services are not infinitely substitutable and real limits exist.  |
| <b>Distribution/poverty</b>                        | Given lip service, but relegated to “politics” and a “trickle-down” policy: a rising tide lifts all boats.  | Recognized as important, assumes greening the economy will reduce poverty via enhanced agriculture and employment in green sectors. | A primary concern, since it directly affects quality of life and social capital and is often exacerbated by growth: a too rapidly rising tide only lifts yachts, while swamping small boats.                   |
| <b>Economic efficiency/allocation</b>              | The primary concern, but generally including only marketed goods and services (GDP) and market institutions.  | Recognized to include natural capital and the need to incorporate the value of natural capital into market incentives.              | A primary concern, but including both market and nonmarket goods and services, and effects. Emphasis on the need to incorporate the value of natural and social capital to achieve true allocative efficiency. |
| <b>Property rights</b>                             | Emphasis on private property and conventional markets.  | Recognition of the need for instruments beyond the market.  | Emphasis on a balance of property rights regimes appropriate to the nature and scale of the system, and a linking of rights with responsibilities. Includes larger role for common-property institutions.      |
| <b>Role of government</b>                          | Government intervention to be minimized and replaced with private and market institutions.  | Recognition of the need for government intervention to internalize natural capital.   | Government plays a central role, including new functions as referee, facilitator, and broker in a new suite of common-asset institutions.  |
| <b>Principles of governance</b>                    | Laissez-faire market capitalism.  | Recognition of the need for government.   | Lisbon principles of sustainable governance.   |

Source: Costanza et al, 2015, p. 282

### 3.2.3 The Ladder of sustainable development

First, “the concepts of ‘weak’ and ‘strong’ sustainability are frequently used in relation with sustainable development. The former refers to a position assuming that natural values can to a large extent be substituted by human-made capital (money, artefacts, knowledge, etc.), whereas the concept of ‘strong sustainability’ refers to a position according to which different types of capital are not necessarily substitutable, so that sustainability requires the maintenance of a fixed (or minimum) stock of each component of natural capital. The belief that eco-efficiency and dematerialisation will be able to keep up with continual economic growth is surely based on a ‘weak’ interpretation of sustainable development” (Næss, 2006, p. 212).

### 3.2.4 Weak sustainable development

Baker, (2016, p. 41) states, “the concept of ‘weak’ sustainable development, aims to integrate capitalist growth with environmental concerns. This position is closely associated with David Pearce and the highly influential Blueprints for a green economy reports (Pearce et al., 1989; Pearce, 1994; 1995; Pearce and Barbier, 2000). These argue that the best way to preserve critical ‘natural capital’, important natural resources or processes such as forests or the climate system, is to give it an economic value or price. The price is based on what people would be willing to pay to protect that natural capital. This figure can then be used to undertake a ‘cost–benefit analysis’ to determine the gains and losses involved in using that natural capital. If the gains outweigh the losses, then the natural capital should be used, or ‘drawn down’. However, this idea of ‘putting a price on the planet’ has been severely criticised (Dresner, 2002). The anthropocentric basis of this position is clear, and some argue that much of nature is beyond price”.

Pearce’s work “shows quite well the way in which the application of cost–benefit analysis to global environmental issues works against the principles of inter-generational equity and intragenerational equity that lay at the core of the Brundtland Commission’s definition of sustainable development. Because decisions are based



on ability to pay, less weight is given to the interests of the poor and the future. ... It is hard to see how [money] ... is a good measuring rod when comparing the preferences of Americans and Bangladeshis, or people today and people a hundred years from now. (Dresner, 2002, p. 116). The objective of policies to promote weak sustainable development remains economic growth, but environmental costs are taken into consideration through, for example, accounting procedures. This is possible because the environment is considered as a measurable resource” (Baker, 2016, p. 41). Alternatively, “weak sustainability has been defined on the basis of the concepts ‘economic capital’ and ‘natural capital’. Economic capital comprises machines, land, labour and knowledge. Natural capital covers resources, environment and nature. Under weak sustainability one strives for maintaining ‘total capital’, defined as the ‘sum’ of both types of capital. This allows the substitution of natural capital by economic capital, as it has been analyzed in economic growth theory” (van den Bergh, 2001, p. 17).

### 3.2.5 Strong sustainable development

Strong sustainable development asserts that environmental protection is a precondition for economic development (Baker et al., 1997). Strong sustainable development also seeks a shift from quantitative growth, where growth is seen as an end in itself and measured only in material terms, to qualitative development, where quality of life is prioritized (Baker, 2016, p. 42). “Strong sustainability requires that ‘economic capital’ and ‘natural capital’ is maintained separately. Within ecological economics, usually some type of strong sustainability is emphasized, which is operationalized through goals such as protection of critical ecosystems, striving for at least a minimum area of nature, or maintenance of biodiversity” (Van den Bergh, 2001, p. 17).

Overall, “one of the major differences between strong and weak forms of sustainable development is in relation to whether ‘natural capital’ (oil, for example) can be drawn down and technology used as a substitute (replacing oil by solar technology), or

whether there is such a thing as ‘critical’ natural capital, which cannot be substituted by technology and should be preserved absolutely. Weak sustainability assumes almost total substitutability by technology, whereas strong sustainability assumes some substitutability, but imposes strict limits on how much human capital can compensate for running down natural capital. Overall, the weak form of sustainable development cannot perpetuate itself indefinitely, as it permits the draw-down of natural resources in order to support production. The stronger form of sustainable development permits growth only under certain limited conditions: when it is designed to deal with necessary development, and when it is balanced by reduction in growth elsewhere” (Baker, 2016, p. 43).

### 3.2.6 Decoupling and the dilemma of growth

According to Gusdorf (2019), “decoupling means producing an amount of goods and services with less resource extraction and less pollution. Decoupling is also called dematerialization, increasing resource productivity or efficiency, and technological progress. The conventional response to the dilemma of growth is to appeal to the concept of ‘decoupling’. It’s vital to distinguish between relative and absolute decoupling. The former refers to any decline in the material intensity (or the emission intensity) of economic output. It signals an improvement in the efficiency of the economy, but it doesn’t necessarily mean we’re using fewer materials (or emitting fewer pollutants) overall. Absolute decoupling refers to the situation when resource use (or emissions) decline in absolute terms, even as economic output continues to rise” (Jackson, 2016, p. 84).

Tim Jackson, also gives examples of decoupling and shows that they are all only relative, because rates of extraction are still going up. He concludes that because absolute decoupling has not occurred, it is not possible. On the other hand, Gusdorf (2019, p. 46) argues that some parts of the world still need growth. So, it would be nice if decoupling could be strong enough to raise the standards of living of a few billion people to some reasonable level without destroying their environments and

ours. In other words, “the objective should be to achieve Kate Raworth’s sufficient absolute decoupling to get the world economy within the ‘doughnut’ in which human needs and environmental limits are balanced” (Spash, 2017, p. 38). Of course, this would be easier if affluent countries were using fewer resources every year and sharing resource-efficient technology with the poor ones. The main way of increasing decoupling and decreasing rates of extraction and pollution has been mentioned in Gusdorf’s analysis as follows: incentives that will make it worthwhile for companies to invest in R&D that will increase energy efficiency, renewable energy, the efficient use of materials, and recycling. The same incentives would induce consumers to choose products and services that require less extraction and pollution, and to use less energy themselves.

In this section I have presented the theoretical approach of this thesis that will be incorporated in the next chapter to conduct the analysis.

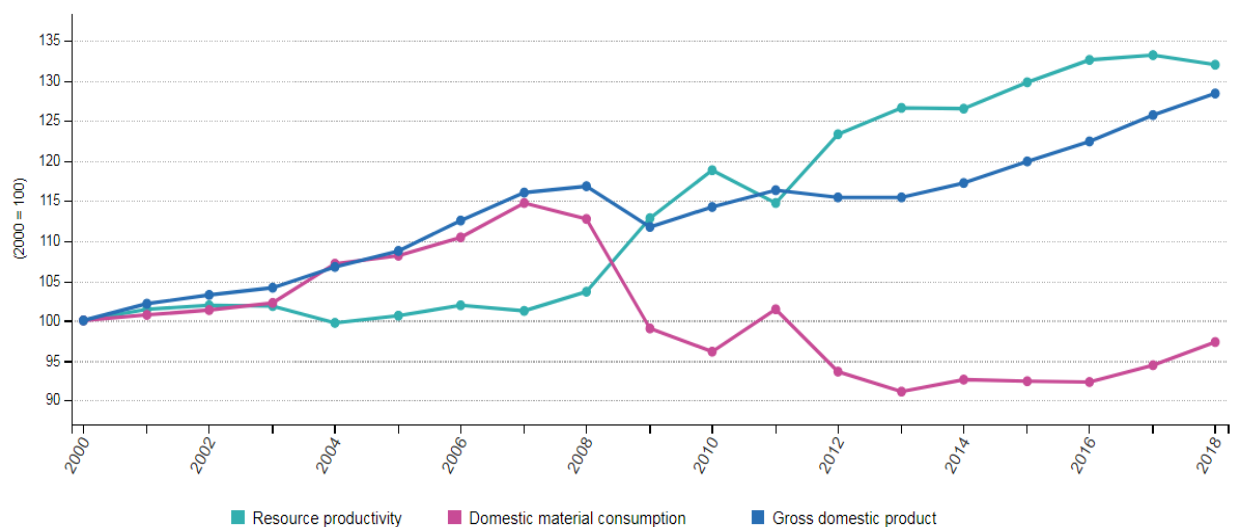
## 4. Analysis

This chapter is divided into four parts according to the supplying questions that guide the analysis. The first presents the analysis of how resource productivity “quantifies the relation between economic activity and the consumption of natural resources, and sheds light on whether they go hand-in-hand or the extent to which they are decouple” (Eurostat statistics explained, 2020). The second part focuses on the European approach to sustainable development. The third part combines the findings from the first and the second part in a discussion of the effectiveness of the EU strategy and which consequences it has for the overall progress of sustainable development. The last part of the analysis operationalized the theories in relation to the EU approach to sustainable development.

### 4.1 Resource productivity at EU level

**Figure 1**

*Development of resource productivity in comparison with GDP and DMC, EU-27, 2000-2018*



Note: GDP in chain-linked volumes, reference year 2010.

Source: Eurostat (online data code: nama\_10\_gdp; env\_ac\_mfa; env\_ac\_rp)

eurostat

Source: Eurostat Statistics Explained. (2020). Retrieved from <https://ec.europa.eu/eurostat/statistics-explained/index.php>

**Table 2**

|                               | 2014  | 2015  | 2016  | 2017  | 2018  |
|-------------------------------|-------|-------|-------|-------|-------|
| Resource Productivity         | 126.5 | 129.8 | 132.6 | 133.2 | 132   |
| Domestic material consumption | 92.6  | 92.4  | 92.3  | 94.4  | 97.3  |
| Gross domestic product        | 117.2 | 119.9 | 122.4 | 125.7 | 128.4 |

Source: Eurostat Statistics Explained. (2020). Retrieved from <https://ec.europa.eu/eurostat/statistics-explained/index.php>

“Since 2000, the resource productivity in the EU-27 economy increased by around 40 % (see Figure 1 and Table 1), although growth has been stagnating for the latest years. The financial and economic crises (2008-2009) had a clear influence on the development path of the EU's resource productivity. After a moderate growth in the pre-crisis era, resource productivity had a marked increase during the crisis due to a very sharp decrease of DMC. The DMC fall was more pronounced than the decrease of GDP: the crisis affected the material-intensive industries of manufacturing and construction more than the rest of the economy, such as services industries. Resource efficiency means using the Earth's limited resources in a sustainable manner while minimising impacts on the environment” (Eurostat statistics explained, 2020). However, “improvement in resource productivity in the EU was a reflection of the economic crisis than real decrease in resource consumption, due to some industries were seriously affected, meaning that relative decoupling is still occurring at EU level. Absolute decoupling is said to occur when the environmental variable is stable or decreases while the economic driving force grows. Decoupling is said to be relative when the rate of change of the environmental variable is less than the rate of change of the economic variable” (Eurostat statistics explained, 2020). Overall, “resource efficiency in the EU-27 do not reflect accurately

progress on SDG 12 according with the 2030 Agenda, meaning that sustainable management and efficient use of natural resources are still missing. Therefore, improvement on advanced technological capacity is needed to contribute on innovation and alternatives to prevent acceleration of natural resources depletion. Increasing resource efficiency is one of the key elements to secure sustainable growth and jobs in the EU and has the potential to bring about economic opportunities, productivity, drive down costs and boost competitiveness. It aims to increase certainty for investment and innovation and to ensure that all relevant policies take account of resource efficiency in a balanced manner. Also, is the lead indicator of the flagship initiative of the Europe 2020 strategy. Resource efficiency and DMC are indicators derived from economy-wide material flow accounts: Regulation (EU) No 691/2011 on European environmental economic accounts provides a framework for the development of various types of environmental accounts” (Eurostat statistics explained, 2020).

In “2002 - 2017, real GDP per capita has grown by an average of 1.1% per year. Recently, the EU economy has been expanding at the highest pace since the onset of the 2008 crisis, with real GDP growth increasing to 2.2% in 2017. The total investment share of GDP in the EU was 20.8% in 2017, following a sharp drop during the economic and financial crisis. It has grown by 1.0% on average per year since 2013. (European Commission, 2019, p. 89). Moreover, since 2001, the EU has increased its resource productivity by 36.4% (2017) and its energy productivity by 29.2% (2016), meaning that more output (in terms of GDP) was produced per unit of used materials or energy. The EU economy depends on raw materials from the rest of the world. More than 60% of EU’s total physical imports are raw products” (European Commission, 2019, p. 101).

Although there is an increase in resource productivity, economic growth is higher, indicating that the EU is still characterized by relative decoupling. Despite the fact that the EU is positioned as one of the main forces to promote the global goals, there are challenges between the vision of the agenda and the mechanisms to achieve it. Social, economic and commercial needs are part of the current lifestyle, which also

need to be modified not only in the global north but also in the global south. In addition, developing countries weight economic growth over ecological preservation, this represents a setback not only at the EU level but also at the global level.

In a capitalist scheme, it becomes complex to make a balance between economic growth and sustainable consumption-production because the political and government priority is to encourage social welfare for its citizens. However, human benefits can become disadvantages when the environment is at risk. For instance, health problems caused by CO2 emissions or processed food is evidence that economic growth does not always result in human development.

#### 4.2 Addressing growth and sustainable consumption and production in EU policies

The achievement of Sustainable Development Goals has been scaled across EU institutions to coordinate and monitor progress among the Commission, the European Parliament, the Council of the European Union, the Member States, businesses, civil society organizations and citizens. However, there is a lot to do in order to meet Sustainable Development. On the ground that the analysis considers a limited period of time 2014-2019, the political agenda during the Juncker mandate has been using as a reference to investigate the status of sustainable development and implementation of the SDGs in the European Union. Therefore, I found that considering the ten priorities defined by its president, Jean- Claude Juncker, when the Commission took office in 2014, perspectives on economic growth and sustainable consumption-production are cover under the priority 1 on jobs, growth and investment. The two main policy highlights that could be connected with SDG 8 & 12 are: The Investment Plan for Europe, the so-called 'Juncker Plan' and the Circular Economy action plan.

The Investment Plan for Europe "is intended to mobilise EUR 500 billion in additional investments in the real economy through the European Fund for Strategic Investments (EFSI) by 2020" (European Commission, 2016b, p. 8). "The plan is targeted towards achieving smart, sustainable and inclusive growth by providing investments. In July 2018, the 'Juncker Plan's European Fund for Strategic

Investments reached its initial target of EUR 315 billion investment and by December 2018 it has mobilised EUR 371 billion in additional investment across the EU since 2015” (European Commission, 2019, p. 49).

Furthermore, “the EU support for the 2014-2020 period for innovation, SMEs, low carbon economy and environmental protection amounts to EUR 150 billion and many of these areas are contributing to the achievement of a circular economy” (European Commission, 2017, p. 11). The 2015 circular economy package “calls for a transformative agenda with significant new jobs and growth potential and stimulating sustainable consumption and production patterns. Focus on resource efficiency and minimizing waste in a context of rapid global resource depletion gives the EU a competitive edge and stimulates innovation. It creates local jobs, at all skills levels and with opportunities for social integration. The transition to the circular economy offers a chance for Europe to modernize its economy, making it more future proof, green and competitive, also contributes to lower carbon dioxide emission levels and energy savings as well as decreased air, soil and water pollution” (European Commission, 2016b, p. 9). Although the ambition of this initiative, the budget to implement action is smaller in comparison to the investment for economic growth.

In reference to the Juncker commission's strategy to address sustainable development and based on the information gathered. The agenda focused more on strengthening economic growth than sustainable consumption and production. The reason for this dynamic has a starting point prior to the start of the mandate and is related to economic and social phenomena that generated crises not only at EU level, but also at global level. In relation to sustainable consumption and production, the European Union has implemented policies and strategies, in the past two decades, which reflect ex-ante conditions to ensure improvement in a number of sectors, for instance, ‘The Sustainable Consumption and Production and Sustainable Industrial Policy (SCP/SIP) Action Plan and the 2015 Circular Economy Package’, which “contains four legislative proposals on waste and an action plan mapping out 54 actions



relating to a number of themes and focusing on five priority areas (plastics, food waste, critical raw materials, construction and demolition, and biomass and bio-based products)” (European Parliament, 2019, p. 4). However, these initiatives need to be pondered against economic strategies in order to make them effective.

In regard to the evaluation assessment of the Juncker commission, SDGs 8 and 12 present progress. However, key remaining issues include, addressing fair and equal economic and material distribution, large-scale transition to sustainable development and long-term ecological objectives.

The actions taken so far, are initial steps to promote a roadmap to a resource-efficient Europe. However, consumption and generation of waste has not presented significant changes comparing indicators from 2012 and 2017. For example, countries with greater economic power, such as Denmark or Sweden, maintain almost unchanged consumption levels, which means that resource productivity has not shown substantial changes, similar behavior occurs across EU-28 member states.

Considering, key remaining issues related with SDGs 8 & 12, equal economic and material distribution has a big impact at EU level. The interlinked nature of the SDGs not only connects the issue of inequality with SDG 10, but also with the fact of inter and intra-generational distribution considered by ecological economics and sustainable development. Economic disparities between EU countries has impact on social cohesion, which in consequence will generate social, economic and environmental crises, the economic growth strategy need to consider that if the current capitalist model continues the gap between rich and poor will increase causing disadvantages in terms of education, job opportunities and wages that in the long term would expose vulnerable groups to overexploit limited natural resources which these communities depend on economically. According to the tragedy of the commons (Garrett Hardin, 1968) all individuals are willing to maximize short term self-benefits, where overharvesting is the dominant game, this condition reflects that resource depletion could arise if strict measures and policies are not taken.

Furthermore, there are powerful groups that harvest resources and generate ecological damage without assuming the consequences, these factors cause the increase of inter and intra generational imbalances.

In relation to large scale transition to sustainable development, over-consumption of natural resources and waste generation need to be addressed. SDG 12 has to be included across policies, business strategies, production processes, but mainly it has to be oriented to inform individuals around the world regarding the impact of current consumption and production patterns. If society is willing to transform these patterns, eventually the business sector will see the need to develop mechanisms to produce sustainable and eco-friendly assets using renewable energy. Moreover, sustainable policies have to include statements oriented to prevent environmental disasters derived from industrial waste. Every economic and human activity has to be part of a global chain to protect the environment.

As Costanza (2015, p. 286) states, “forest is not just a warehouse of trees, it is an ecosystem that generates critical services, including life support for its inhabitants. These services are diminished when the structure is depleted or its configuration changed. So, another rule for guiding resource extraction and land use conversion is that they must not threaten the capacity of the ecosystem fund to provide essential services. It is increasingly obvious that the extraction of many resources to drive growth has already become uneconomic. Rates of resource extraction must therefore be reduced to below regeneration rates in order to restore ecosystem funds to desirable levels”. Therefore, short-term actions need to address long-term ecological objectives. The planet had already reached tipping points, CO2 emissions are depleting the ozone layer, rapid glacial melt in the Arctic and Antarctic influence ocean currents causing sea levels rise, coral bleaching result in the extinction of millions of marine species needed to support entire ecosystems, the list of environmental damages caused by humans could continue. However, there are some examples that show that ecological systems are capable to recover from loss & degradation if the way humans use resources on earth change. For instance, the

idea of the hope spots introduced by Sylvia Earle. “The hope spots have to be places where the potential is identified, the threats are identified, and some kind of concrete action is taken. By the 1980s in Cabo Pulmo, Mexico, so much have been taken from the surrounding water that nothing was left. In 1997, the people who live here took the ocean back. Together they created a Hope Spot 70 square kilometers around, making it a completely off limits to fishing and dumping and drilling. Since the protected zone was established, Cabo Pulmo has replaced fishing with ecotourism and the community is thriving” (Nixon et al, 2013). This is concrete case where economic growth depends on activities that do not harm the environment, characterized by organized individuals that take action. The same model could be replicated in different regions, including the European Union.

Considering the green economy perspective, technology can replace natural capital, however, from another point of view, technology can also optimize resource productivity or consumption and production mechanisms. Currently, there are multiple ideas and projects that seek to reverse environmental deterioration, therefore, the alliance between the public and private sectors is essential to promote such initiatives, instead of allocating economic packages as large as the Investment Plan for Europe, it should be more attention to invested in R&D, which is a vital contributor to human capital development as it creates knowledge and improves skills, making it a key enabling factor for smart, sustainable and inclusive growth. However, “EU expenditure on R&D in relation to GDP (R&D intensity) has shown only modest growth during the past 15 years. After prolonged stagnation between 2000 and 2007, R&D intensity has increased slowly and has stabilised at slightly above 2.0 % since 2012, reaching 2.06 % in 2017 (in absolute terms this corresponds to an R&D expenditure of nearly EUR 320 billion in 2017)” (Eurostat, 2019, p. 185). If the EU manages to increase investment in innovation, then the possibilities to develop strategies for sustainable consumption and production will increase and at the same time the extraction of scarce natural resources could be reduce or stopped, to replace them with renewable materials, at lower cost of production, greater efficiency and less environmental impact. On the other hand,

those who support the theory of green economy affirm that technology will be able to replace aspects that nowadays depend on natural ecosystems. From my point of view, technology has the capacity to innovate and create more efficient processes. However, what would be development without the capacity to interact with the environment, then the essence of what social welfare means will not be complete, sustainable development defends that social, economic and environmental factors must be together to achieve development.

#### 4.3 Is the EU plan effective to decouple economic growth from environmental impact?

This part of the analysis brings the findings into a discussion of the effectiveness of the EU approach towards the 2030 Agenda for sustainable development.

The first relationship to discuss is regarding the EU policy impact on resource productivity, which can be translate into environmental benefits derived from changes in the behavior of producers and consumers. However, the increase observed in the European Union during 2014-2018 was a consequence of the 2008 economic crisis, due to the decrease in production in the manufacturing and construction industries. Ideally, progress toward sustainable mechanisms should be a result from effective environmental policies, in conjunction with determination of the business sector and citizens to produce and consume durable goods to decrease waste. However, unpredictable phenomena such as the 2008 economic crisis, the 2015 migration crisis or the current 2020 health crisis, can generate results that are not always a reflection of sustainable processes. Overall, the European Union has made progress in policy formulation and strategies on the issue of decoupling growth from environmental impact, which represents some progress compared to other regions. Policy formulation requires assessment of the needs and scope of the strategies to be implemented. Furthermore, involving actors from the public and private sectors, as well as civil society in general facilitates the communication and credibility of environmental policies.

According to (Redclift, M., & Springett, D, 2015, p. 23), “the agendas of social and political institutions, and the institutionalization of the sustainable development agenda itself, need to be questioned (Redclift 1992; Sachs 1993; Martínez- Alier 1999). Indeed, one conclusion that can be drawn from the contestation for sustainable development is that power in itself does not provide vision or leadership. In a Foucauldian sense, that very exercise of power may give impetus to such leadership and vision being emancipated from below. Foucault (1980) maintained that power, while hierarchized, is not simply a top-down phenomenon, but also comes from below. The global and hierarchical structures in a society operate through local and low-level ‘capillaries’ of power relationships, raising the question of who holds ‘power’ over the concept of sustainable development and how sustainable development is constructed. The voices heard from NGO and grassroots groups at UNCED and Rio+20 as well as recent popular movements indicate that people are ready to exercise that power. Other ‘spaces of hope’ are opening up that may foster horizontal conjunctions of individuals to be included in the discourse, delivering greater social cohesion. We are witnessing new expressions of people power that may define ways of further democratizing the discourse, though not without bitter struggle”.

The 2030 agenda seeks to integrate actors from all levels (local, national, regional and global) and sectors. The EU plays a key role in promoting global goals as it is the largest common market worldwide, this represents a great opportunity to promote sustainable development among Europeans. During the Juncker Commission, there was an opening to integrate the 2030 agenda into the EU's political and economic priorities, reflecting progress in relation to human development, however, much remains to be done in relation to environmental goals and citizens engagement. Therefore, I consider that the policies implemented so far are not effective in mitigating the environmental impact caused by economic activities; large-scale extractive industries require special attention as well as inclusion of citizens to take part on European strategies.

The second element that combines the results of this research is the behavior of GDP, (as to be considered an indicator for SDG 8) in relation to the Investment Plan for Europe, which aim to boost growth and investment to create more jobs. “By 2019 investment under the Juncker Plan had increased GDP by 0.9% and added 1.1 million jobs. Building on the success of the Juncker Plan, the next InvestEU Programme will further boost investment, innovation and job creation in Europe and mobilise at least €650 billion in additional investment in the next long-term EU budget (2021-2027)” (European Commission Website, 2020).

The Investment Plan for Europe “has three objectives: to remove obstacles to investment; to provide visibility and technical assistance to investment projects; and to make smarter use of financial resources. As such, the plan is made up of three pillars:

- First, the European Fund for Strategic Investments (EFSI), which provides an EU guarantee to mobilise private investment. The Commission works together with its strategic partner, the European Investment Bank (EIB) Group.
- Second, the European Investment Advisory Hub and the European Investment Project Portal which provide technical assistance and greater visibility of investment opportunities, thereby helping proposed investment projects become a reality. The Hub is a joint venture with the EIB Group.
- Third, improving the business environment by removing regulatory barriers to investment both nationally and at EU level” (European Commission Website, 2020).

The investment strategy for economic growth shows that it has had positive effects on GDP. However, it is important to recognize that more investment plans are required to accelerate sustainable production and consumption, if the intention is to achieve decoupling in a short term. Furthermore, as investment for sustainable development increases, opportunities to create jobs and new sustainable business will also increase. The Juncker plan demonstrates that opportunities to incentivize

development in the European Union even after an economic and social crisis are feasible. Consequently, a large-scale proposal to achieve sustainable development must be put in practice to provoke environmental benefits. Regarding GDP, it should be noted that, although the indicator shows an increase, it is not a sufficient measure to calculate the environmental impact caused by the extraction of natural resources necessary to produce goods and services.

In this regard, “an aggregate measure of the real economy that has been developed as an alternative to GDP called the Index of Sustainable Economic Well-Being (ISEW) or a variation called the Genuine Progress Indicator (GPI). The GPI attempts to correct for the many shortcomings of GDP as a measure of true human well-being. For example, GDP is not only limited—measuring only marketed economic activity or gross income—it also counts all of this activity as positive. It does not separate desirable, well-being-enhancing activity from undesirable, well-being-reducing activity. An oil spill increases GDP because someone has to clean it up, but it obviously detracts from society’s well-being. From the perspective of GDP, more crime, sickness, war, pollution, fires, storms and pestilence are all potentially good things, because they can increase marketed activity in the economy. GDP also leaves out many things that *do* enhance well-being but are outside the market, such as the unpaid work of parents caring for their own children at home, or the nonmarketed work of natural capital in providing clean air and water, food, natural resources, and other ecosystem services. And GDP takes no account of the distribution of income among individuals, even though it is well known that an additional dollar of income produces more well-being if one is poor rather than rich. The GPI addresses these problems by separating the positive from the negative components of marketed economic activity, adding in estimates of the value of nonmarketed goods and services provided by natural, human, and social capital, and adjusting for income-distribution effects” (Costanza et al., 2015, p. 283-284).

A third meeting point has to do with the analysis of levels of material domestic consumption and living standards in the EU. Overall, Europeans have on average a higher living standard than two decades ago. “Since the start of the economic

recovery in 2013, DMC has increased by 3.6 %. Despite the recent increase, in 2017 total DMC was still 17.7 % lower than in 2007, the year before the start of the economic crisis. This development was mostly caused by the rapid slowdown in construction activities, which account for the lion's share of total material use, but contribute, in relative terms, much less to the EU economy. (Eurostat, 2019, p. 235). The consumed materials can be classified into two types: renewable materials, such as biomass, and non-renewable materials, such as fossil fuels, metals and non-metallic minerals. Non-metallic minerals (such as marble, granite, sand and salt) are the largest category of materials consumed, with a share of 47.1 % in total DMC in 2017. They are mainly used for building infrastructure such as roads, homes, schools and hospitals, and for producing many industrial and consumer products such as cars, computers, medicines and household appliances. Biomass is the second largest category (25.3 % in 2017), followed by fossil energy materials/carriers (22.5 %) and metal ores (5.0 %)” (Eurostat statistics explained, 2019).

Consumption of non-metallic minerals “decreased by 10.7 % over the long-term period (2002 to 2017), but has increased by 4.2 % in the short term, since 2012. In contrast, consumption of fossil energy materials (including coal, natural gas and oil) has fallen both in the long- and short-term periods, with an especially noteworthy 19.2 % decrease between 2002 and 2017. This decline may have been driven in part by a decrease in overall economic activity in the aftermath of the economic crisis, but also by a long-term increase in the use of renewable energy and an improvement in the overall energy efficiency of the EU economies. The consumption of biomass has increased by 3.9 % in the short term (since 2012), while it has remained nearly unchanged in the long term (since 2002). Only the consumption of metal ores increased significantly in both the short and the long term, by 24.9 % and 16.4 %, respectively” (European Environment Agency, 2016, p. 35).

In general, the consumption of non-renewable materials in the European Union has been increasing from 2014-2019. This behavior is due to higher demand in the construction sector. Demanding health, education and social welfare services in the European Union also generates impact on the environment, as more goods are required to operate these services, more consumption of natural resources is



necessary. Due to inequality between EU member states, there are countries with higher living standards, such as northern Europe, which also has effects on consumption rates and waste generation. In this regard, I consider that promoting sustainable lifestyles also implies adapting consumption and production patterns by using products as much as possible, as well as limiting consumption according to needs and not based on the economic potential to acquire more goods. “A lifestyle that is rich in free time, and less rich than it could be in goods and services produced in the economy, is a ‘greener’ lifestyle. Environmental policies can contribute to people adopting this lifestyle” (The Economy, 2017).

Costanza (2015, p. 285) states “once society has accepted the world-view that the economic system is sustained and contained by our finite global ecosystem, it becomes obvious that we must respect ecological limits. This requires that we understand precisely what these limits entail, and where economic activity currently stands in relation to them”. Young generations promote lifestyles in greater balance with the environment, individual actions that, if they become general, can contribute to more sustainable lifestyles, for example, modifying diets that require less use of energy and resources for food production, using means of transport such as cycling to reduce the emission of CO<sub>2</sub> gases, developing leisure activities raising awareness of ecosystems protection and their species, or limiting consumption of goods as much as possible. All these measures on a global scale could generate benefits for the environment, but also for humans. “If a society giving priority to environmental sustainability and equitable distribution is ever to be realised, a change in the prevalent values and attitudes among the population will probably be required. In particular, the currently widespread consumerist ideas and short-sighted instrumental views on nature need to be replaced by ideas appreciating the intrinsic value of each human being as well as of nature” (Næss, 2006, p. 222).

As reported by the European Commission Website (2020), “consumption and production patterns have wide environmental impacts. Sustainable production and consumption patterns use resources efficiently, respect resource constraints and reduce pressures on natural capital in order to increase overall well-being, keep the

environment clean and healthy, and safeguard the needs of future generations. The rise in living standards and the quality of life in Europe since the end of World War II has been made possible through increases in income, production and consumption, which so far have gone hand in hand with more resource extraction and growing pressures on natural capital (air, water, land and biodiversity) and the climate. Since we live on a planet with finite and interconnected resources, the rate at which they are used has relevant implications for today's prosperity and lasting effects on future generations. It is thus important for the EU to decouple economic growth and the improvement of living standards from resource use and the eventual negative environmental impacts. This involves increasing the circularity of materials in the economy, thereby reducing both the need for resource extraction and the amount of waste ending up in landfills or incineration. It also means managing chemicals safely and shifting away from carbon-intensive energy carriers towards sustainably produced renewable energy sources. Such an approach would not only reduce environmental pressures, but also provide major economic benefits”.

#### 4.4 Connecting ecological economics and the EU agenda

Ecological economics and green economy are theories that develop a discussion regarding two systems (economic and ecological) that for a long time had been treated separately. However, each school takes different perspectives on the relationship between economy and natural resources. For ecological economists, the economic and social aspects are embedded in the ecological system, while for green economy, natural capital can be replaced by economic capital. In addition, the arguments of each theory can be analyzed and linked to a specific geographical context. For this purpose, the European Union at the regional level represented a feasible case of study given the conditions to collect statistical and qualitative information on sustainable development.

By connecting the Juncker Commission's agenda on sustainable development with ecological economics theory it is possible to identify similarities and differences, which I will discuss based on the four basic characteristics that define the ecological economics approach, mentioned above.

First, the European agenda reflects priority to economic growth, which means affinity with the capitalist economic model, this differs from the first characteristic which claims against the growth paradigm.

Second, the 2030 Agenda links economic, social and ecological aspects, as a result The Juncker Commission's ten priorities have sought to integrate objectives in the three areas to enhance sustainable development of the EU. This aspect match description of the second component of the ecological economics framework.

Third, the three key goals of ecological economics are sustainable scale, fair distribution and efficient allocation. However, the European Union do not indicate attainment to maintain the scale of the economy within the natural capacity of the planet. Fair distribution of goods and services is not equal among EU member states, creating social imbalances in the region. Efficient allocation is not yet considered in terms of preserving critical natural resources. In general, I found variation between the three key goals of ecological economics and the goals of the EU agenda.

Fourth, nowadays remaining natural resources become limited. Therefore, environmental regulations need to ensure strict policies to avoid wildlife predation, however, given the conditions of the economic system the balance between natural species and humanity continues to threaten ecosystems, in the European framework the picture is no different, therefore, it is not possible to comply with this characteristic.

Ecological economics has been linked to the concept of strong sustainability, which is part of the theory "the ladder of sustainability" and which I will discuss in the next part of the analysis, in relation to European policies.

#### 4.5 The scale towards sustainable development

Regarding the first rung on the ladder of sustainability, refers to the concept of weak sustainability, in which natural resources are classified as capital. The current economic system, makes use of natural resources to produce other goods that acquire prices in the market, is the way in which economic systems have worked. The alarming thing about this idea is that we cannot enter into a scheme in which

absolutely everything on the planet has a price, the reason is simple, if we assign a monetary value to each natural resource, then those who have the economic capacity to acquire it will do it and then more resources will continue to be extracted from the environment, until everything is depleted.

From my perspective, natural resources in general cannot be replaced by man-made goods, each resource and ecosystem are unique, diverse and complex, so neither technology, money or knowledge can replace them. If we continue to believe that technology or innovation are capable of replacing everything, there will be no time to reverse the damage that the ecosystems already present. I consider that the best way to preserve natural resources is by excluding them from the economic system. Therefore, environmental policies should be restrictive regarding natural resources. The role of the European institutions must be aimed at preserving the environment, connecting environmental, economic and social policies will not be enough if it is committed to voluntary compliance. In emergent situations, it is necessary to respond with strict policies, capable of regulating, monitoring and enforcing them by mandate. In this regard, I consider that the 2030 agenda represents an ambitious effort to integrate the social and economic system within ecological limits, however, the commitment must be mandatory rather than voluntary, the reason is that the planet requires immediate actions. The scientific community warns that “some level of environmental deterioration called a tipping point, which if passed, sets in motion a process leading to abrupt and hard-to-reverse destruction of an environmental resource. When this is the case, environmental policy must go beyond balancing the costs and benefits of the abatement of environmental damage. Instead, policymakers must devise measures to ensure that a tipping point—especially if it is uncertain—for a critical resource is not passed. In this context, a prudential policy would seek to avoid the risk that the given situation may itself be radically and irreversibly degraded” (The Economy, 2017).

Furthermore, promoting stringent environmental policies could contribute to reducing intergenerational inequality, if countries with higher levels of consumption are forced to limit consumption despite purchasing power, then there will be an economic

surplus that can be distributed to countries with greater inequality. This vision may seem idealistic and outside the capitalist economic context system. However, there is an urgent need to address strong sustainability. Hence, I consider that the European Union has the capacity to lead a process in this direction if commitment is proven.

Strong sustainability considers that ecological systems deserves relevance over economic systems, specially preservation of critical ecosystems. From this perspective, quality of life goes in harmony with the environment, as a result, greater importance is given to interaction with the environment, family time, less working hours, as well as less consumption. The qualitative factors of human development weight over the quantitative aspects, which means that quantity of production and consumption may decrease. Furthermore, it is assumed that natural resources are limited and cannot be substituted easily. It is true that, strong sustainability has not been reached anywhere. Therefore, the European Union by promoting greater well-being and growth in favor of Europeans does not reflect this approach of thinking. The anthropocentric position of the European agenda towards sustainable development is clear, greater importance is assigned to human well-being than to the environment, on which humans depend. Then, I confirm that the European agenda on sustainable development does not reflect a process of strong sustainability.

The ladder of sustainability helps to understand the scale at which progress towards sustainable development can be identified, however, it lacks precision around the processes or mechanisms to achieve strong sustainability. On the one hand, it helps the reader to understand in a simple way both dimensions, weak scale versus strong scale however, the theory requires a deeper understanding of the role of the various actors that may be involved in the process, and how this ladder can be translated into implementation. Also, other factors may influence achievement of the strong rung, for instance, it may be influenced for social factors such as the lack of empathy and solidarity among EU member states to achieve equal and efficient distribution of resources or depending on unexpected crisis.

## 4.6 Decoupling and future technologies

Decoupling “introduces the idea of producing an amount of goods and services with less resource extraction and less pollution. It can mean producing more with the same amount of extraction-pollution, the same amount with less, or a smaller amount with even less” (Gusdorf, 2019, p. 35). At all levels, the objective is to increase resource productivity, throughout technological efficiency.

The economy (2017) states, that “improvements in technology can enlarge efficiency, lowering the opportunity cost of an improved environment or may improve methods of producing goods, reducing the environmental costs of consumption as a result. The rents from innovation drive progress and the improvement of productivity. If the right incentives exist to create innovation rents, we would expect technological breakthroughs that can deliver substitutes for some resources that would otherwise be used up, or that need to stay in the ground if climate change is to be safely limited. One such case is the technological progress achieved in solar energy. The idea that environmental regulation can create greater efficiency and be an incentive to innovation is known as the ‘Porter Hypothesis’, because it was first argued by Michael Porter, an economist, in 1995. He argued that the costs of regulation led firms to look for cleaner, more efficient technologies. The benefits of these technologies compensate both the costs of regulation, and the costs of innovation”.

Although I have warned that technology cannot replace any natural resource, it is also true that given current development conditions it has become part of everyday processes. Technology can be translated into a country's progress and development, creates conditions to improve production processes, and makes the use and extraction of resources more efficient. It is important to note that technology must be focused on innovating to reduce the use of natural resources, however, in many cases when innovation processes occur, the business sector encouraged by consumer demand, focuses on producing as much as possible which generates setbacks rather than progress related to resource productivity.

This discussion, leads to focus once more on the role that environmental regulation occupies, creating stricter policies can not only limit the use of natural resources, but also encourages the business sector to innovate to decrease production costs, at the same time that promotes more responsible consumption when higher prices are awarded to products that represent a greater risk to the environment. However, this reasoning does not always apply in all sectors, for example, clandestine logging or illegal fishing, they have a lower price in the market than those products that are regulated and follow legal production processes. The responsibility to produce and consume products that include and respect ecosystems, must fall not only on the industrial and business sectors, but also on the final consumers, to ensure that the chosen products meet adequate production norms and standards and that they are also created through innovative processes that include less extraction of resources or that use renewable energy during the production process. In response to climate change, industries and the service sector seek to generate products based on the idea of eco-design and eco-friendly. For example, plastic substitutes made from corn husks or fish scales are initiatives that can contribute to sustainable development but require large-scale momentum to achieve real effects. Less resource extraction, less pollution and more technology could increase resource productivity, these elements are part of the contribution of decoupling to sustainable development. Initiatives to monitor material use and resource productivity are essential to accomplish the SDG 12.

Examples of initiatives that support the monitoring of material use and resource productivity include:

- Regulation No 849/2010 on waste statistics;
- Economy-wide material flow accounting (EW-MFA) as one of three modules in the Regulation on European environmental economic accounts (EU 691/2011), which entered into force with the 2013 data collection;

- Development of a monitoring framework for the circular economy, a measure planned for 2017 (COM(2015) 614 final). (European Environment Agency, 2016, p. 27).

However, as reflected in the December 2015 Circular Economy Package, the European Commission does not envisage work on a target for resource productivity, either for the EU as a bloc or for Member States individually. It may, however, be worth noting that nine EU Member States have adopted their own targets for improving resource productivity (ibid, p. 29).



## 5. Findings and Concluding Remarks

Below, I first summarize and interpret the main findings of the case study in relation with the literature review and theoretical approach; second, I present the conclusion of this thesis. Finally, this section ends with comments on further research.

### 5.1 Main findings

First, Gros Domestic Product (GDP) has limitations to measure the negative effects of economic activity, as well as income distribution among individuals, as a result, the unit of measure does not accurately represent the impact on the environment and equitable distribution of resources. In general terms, GDP is not an absolute indicator for the purpose of SDG 8 aimed at contributing to economic growth while respecting planetary boundaries, neither to measure inequalities, as to a key aspect of sustainable development.

Second, Domestic Material Consumption (DMC), does not consider consumption of raw materials and products originating in areas outside the European Union despite the fact that final consumption occurs in the European market. Therefore, the measurement presents a gap between the extraction of resources for human consumption and the impact it generates on the environment. I consider that this indicator should have variations, including relative and absolute consumption, so that monitoring in relation to SDG 8 and SDG 12 is accurate.

Third, since 2013 the DMC increased as a result of the demand of goods and services, after the economic crisis. Furthermore, this demand has been concentrated in non-renewable materials, mainly for building and industrial sectors. This behavior shows that economic activity and consumption patterns have not displayed significant changes despite the constant warning about climate change.

Fourth, apropos the Juncker Commission's 10 priorities, only two have an approach related to SDG 12 'responsible consumption and production', while in relation to SDG 8 'decent work and economic growth', at least 5 priorities can be identified.

Furthermore, as part of the priority 1 'A new boost for Jobs, growth and investment', it can be seen that the budget linked to SDG 8 was 3.3 times higher than the budget assigned to SDG 12. This is a simple representation of the European approach to sustainable development.

Fifth, an overview of EU-28 progress towards the SDGs over a five years period (2014-2019) shows that SDG 8 has been improving. However SDG 12, has shown unfavorable trends. As a result, decoupling economic activity from environmental impact has not progressed at EU level.

Sixth, against the four main characteristics of ecological economy theory, only one can be related to the European context in terms of implementation of the 2030 Agenda. This consideration concerns decision-making processes in which economic, social and ecological objectives are integrated to formulate agendas, policies and strategies for sustainable development. However, in practical terms the approach finds greater similarity with green economy theory, which has been criticized because it tries to combine contradictory agendas. The European discourse express interest and commitments to transform the economy towards a sustainable scheme, however, interests in economic growth, investment and well-being continue to be weighted over 'natural capital'.

Seventh, the ladder of sustainable can be used as a logical model to understand different phases towards sustainable development. Nevertheless, implementation towards the strong rung of sustainability is lacking. Although the theory contributes to compare the weak vs. strong level, it does not propose additional arguments to represent each stage.

Eighth, resource productivity is not always a reaction to environmental policies or economic strategies, other factors may influence the behavior of consumption and production patterns. However, economic activity must be separate from resource depletion, to this purpose, technology plays a key role to innovate efficient processes, products and services. In general, I found that the term resource productivity has great potential to create new economic models in greater balance with the environment, at the same time that performs benefits for individuals,

investing on innovation and technology is the best path to achieve responsible consumption and production.

## 5.2 Conclusion

First, with respect to the study of sustainable development, integrating economic, social and environmental systems is the starting point that makes a difference with respect to previous models. For the purpose of policy formulation, the European Union integrates the three sectors (economic, social and ecological) in order to transform the current system towards a model of sustainable development. However, for the purpose of policy implementation, this thesis concludes that the EU approach towards sustainable development does not associate economic growth and sustainable consumption-production at the same level of priorities. In fact, after conducting this analysis I resolve that the EU agenda address both issues under separate perspectives.

On one hand, the Juncker Commission's term focused on increasing jobs, investment and above all economic growth within the Union in order to overcome the effects of the 2008 economic crisis, promoting the economy was a strategy to maintain the competitiveness of the European market. On the other hand, sustainable consumption and production were incorporated into the agenda through the 2015 circular economy package, however, this strategy did not have the same emphasis as that aimed at growth, this might be derived from the fact that discussions for the package were driven at the same time as the adoption of UN 2030 Agenda.

Indeed, I consider that the connection economic growth and sustainable consumption-production depend on the capacity of the market to create alternative products that substitute depletion of resources from ecosystems. Therefore, innovation and technology development need to be incorporate under the policy priorities. To this respect the EU has shown initial progress towards monitoring resource productivity as an indicative to address decoupling, which at the moment indicates to be relative for the EU context. "Although sustainable development can

be criticized for lack of clarity and difficulty of being put into practice or maybe, on one side hides the protectionism of developed countries, it represents an acknowledgement of the fact that the planet's natural resources are limited and that the natural environment shows a limited capacity for waste absorption. These limits, once surpassed, compromise the capacity of future generations to satisfy their own needs. Thus, sustainable development, before everything, is a way of performing our activities, day by day, a way of acting such as to ensure a balance between the planet's natural limits, the satisfaction of present needs and the satisfaction of future needs" (Ienciu & Popa, 2013, p. 254).

Second, given the lack of conditions to create a bridge between economic growth and sustainable consumption-production at the level of policy implementation, it is not possible to reflect a strong sustainable development approach in the EU context. Although, I consider that the EU has the capacity to accomplish the strong rung of the ladder of sustainability, the EU commitment towards sustainable development is weak. That said, it is important to recognize that humanity has overpassed planetary boundaries, therefore, talking about commitments is not enough to accomplish the sustainable development goals. In this regard, coercive regulatory capacity has to be developed in regard to environmental policies.

Considering the basic organizing principles of ecological economics at the EU context. I consider the following; regarding the economic aspect, strategies should be formulated outside the idea of competitiveness and profits, instead, proposing innovative ideas that contribute to resource productivity should be a central pillar for the business sector. Regarding the social aspect, greater commitment is required at individual level to decrease consumption and adapt lifestyles towards truly sustainable approaches. In the ecological aspect, coercive environmental policies must be substitute voluntary commitments, in order to stop threatening the environment. These actions might influence transformation to promoting sustainable development.

This thesis states that, indicators to measure economic growth and sustainable consumption-production lack elements to quantify negative effects of economic activities, generating gaps to track sustainable development progress. For instance, resource productivity has shown progress in relation to external phenomena.

In relation to the implementation of the 2030 Agenda, the EU develops alternative plans at national and regional levels, in accordance to the priorities of the European Commission. Assessment of the Juncker mandate showed progress in economic growth and job creation (SDG 8). However, the progress was not reflected in relation to sustainable consumption-production, in fact, for the year 2019 there was a setback compared to the previous year. These trends reflect that the EU has not decoupled economic growth from environmental impact, meaning that the EU context can be associated with the green economy model, because economic growth depends on extraction of natural resources, which are considered a type of capital.

In general, given the results of my analysis, it is arguably that economy and ecological systems require a strong sustainable approach, in order to achieve progress and recover our ecosystems. I argue that, on one hand, ecological economics has an approach to strong sustainability and absolute decoupling while on the other hand, green economy can be associated with weak sustainability and relative decoupling. Overall, the capacity of the ecosystem to sustain global consumption and production is limited as we are reaching tipping points, therefore, allowing continue economic growth against resource depletion is not sustainable. This distinction outlines the importance of understanding each approach in order to give a better picture of the scope of sustainable development.

### 5.3 Further Research

The research presented in this thesis, is not including the aspects of decent work related with SDG 8. An analysis of the relationship between decent work and inequalities can provide a more comprehensive picture of the social aspect of sustainable development in relation with economy and ecology. By conducting a broader investigation of social development, the finding could confirm or reject the

assumption that individual behaviors are representative for the overall success of the 'global goals'. Conducting interviews with European citizens can provide a closer approach on the awareness of the population on the Sustainable Development Goals and how it can affect the effectiveness of the 2030 Agenda.

Moreover, my findings indicate that it could be interesting to research the progress on innovation and technology to address resource productivity in order to identify potentials initiatives that could generate more knowledge and solutions to tackle climate change.

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## Appendix

### Appendix 1: Overview of EU-28 progress towards the SDGs



Source: Eurostat. (2019). Overview figure of EU-28 progress towards the SDGs over the past 5 years [infographic]. Retrieved from <https://doi.org/10.9774/gleaf.3062.2001.wi.00007>