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"ENVIRONMENTAL SUSTAINABILITY AND AMBIGUITY OF ENVIRONMENTAL OBJECTIVES IN EUROPEAN COMPANIES: A SURVEY ANALYSIS"

RELATORE:

CH.MO PROF. EMILIO PASSETTI

LAUREANDO: PIERDOMENICO PALMISANO

MATRICOLA   N. 1236049

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Table of contents

INTRODUCTION

In the past, socio-environmental issues have always played a marginal role for corporate management, which was not interested in the impact of the company on the territory, on the climate, on society and on the well-being of workers, and focused exclusively on maximizing profit and on meeting the expectations of shareholders alone, sometimes also operating to the detriment of the community. The ever more frequent environmental catastrophes, combined with unfavourable expectations regarding the future of humanity, have prompted us to reconsider the development process underway, in order to orient it towards sustainable development. Subjected to various pressures also from national and international institutions and to the growing requests for information on non-financial issues, the organizations, over time, have developed a new awareness and sensitivity towards socio-environmental issues, starting to internalize them in their management systems.

In this paper we study the topic of sustainable business development as a strategic decision-making tool with a view to sustainability, and as a support to the management activity.

It will also be treated the topic of corporate environmental objectives' definition, as a useful tool for implementing sustainability in the corporate management system.

The purpose of the paper, that is to analyse whether the companies actually carry out environmental management, or if it is an aspect which remains only at a formal but not operational level, will be prosecuted by means of an investigation about European SMEs, conducted through an online survey.

The thesis is divided into four chapters, in which will be addressed the issues necessary to outline the central concept, which is the relationship between corporate environmental objectives and their integration within the company.

In detail, the first chapter has the role of introducing the urgency for a change in the development model: indeed, the theme of sustainable development introduced by the Brundtland report, and the 9 planetary boundaries that threaten our species are addressed; subsequently are presented the 17 sustainable development goals (SDGs), imposed by the UN general assembly, to achieve a better and more sustainable future. Finally the theme of sustainability from the point of view of companies, which are the focus of our research, is dealt with; we start from Bowen's definition of corporate social responsibility (CSR), from the model developed by Elkington known as "Triple Bottom Line" (TBL), up to how environmental sustainability is concretely demonstrated today, through the use of environmental reporting standards such as EMAS and ISO14001.

Then, with the second chapter we go to analyse the relationship between sustainable development and management control. After introducing the management control system, listing the main characteristics, activities, and the various types of management control models, we will discuss one of the tools of the MCS useful for increasing company performance, namely the Management by objectives (MBO). Therefore will be emphasized the importance of integrating sustainability into the control system, and how MBO could be useful for realizing sustainable development. Finally, in this chapter one of the main contents of this study will be mentioned, that is the ambiguity of corporate objectives: the basic assumption of the thesis will be how an incorrect definition of the objectives, it can lead employees to not know what to do, and to decrease their commitment towards goals achievement, thus determining poor corporate performance (and environmental performance in case of ambiguity about environmental objectives).

The third chapter provides a description of the research methodology. It defines how a quantitative analysis questionnaire is structured, the use of Likert scale, the design of the variables under investigation, and finally the survey's administration process.

Finally, the last chapter deals with the analysis and discussion of the variables under investigation and their relationship; the analysis is divided into a descriptive part, in which the results obtained in the survey are measured, and in a correlative part, where the possible relationships between the variables under investigation, and the environmental performance of respondent companies are analysed.

Chapter 1: The rise of the sustainability theme

1.1 Brundtland report: "A global agenda for change"

Nowadays we are living in trying times where if on one hand we are enjoying an unprecedented economic condition, on the other we are facing many threats, and our critical responses to these threats will determine our future.

The Earth Overshoot Day (EOD), which indicates the point when humanity's Ecological Footprint overtake the amount of ecological resources that the Earth is able to generate within a year, in 2021 it fell on July 29. This represents a worsening trend, started in 1970 when EOD was on December 30, and it makes clear the negative impact that humanity is having on our planet. At present, the world is consuming natural resources and waste absorption capacities of 1.7 planets per time unit.

Due to the strong impact of human activity on Earth's climate and ecosystems, the biologists Eugene Stormer and Paul Crutzen in 2000 coined the term "Anthropocene" (Crutzen & Stoermer, 2000), which is (unofficially) referred as the most recent period in Earth's history, and scientists argue that we may be responsible of the "Sixth mass extinction" (Wake & Vredenburg, 2008). Biodiversity loss, extreme weather events, rising sea levels, ocean acidification are consequences of the well-known "climate change", and these factors, coupled with social problems, are undermining our economic development. Social problems, namely issues which make difficult for people in a society to have the same opportunity and so achieve their full potential, are dealing with social inequality, gender inequality, hunger, poverty, racism etc; all these social and environmental elements are treated among the Sustainable Development Goals (SDGs) identified by the United Nations in 2015, which I will talk about in the paragraph on SDGs.

According to estimates made by the United Nations, the world population will amount to nearly 11 billion by 2100 (World Population Prospects, 2019), and this continuous population growth linked with an increasing demand for services and resources does nothing but crumbles an already fragile development model. In order to survive and thrive it becomes necessary to pursue a more sustainable development model.

With the report "Our Common Future", better known as Brundtland Report (1987), we had the first introduction to the concept of sustainable development. The Brundtland Report owes its name to Gro Harlem Brundtland, who was called in December 1983 by Javier Pérez de Cuéllar, the Secretary-General of the United Nations, to establish an independent commission, the World Commission on Environment and Development (WCED) also known as Brundtland

Commission, to formulate "A global agenda for change". Brundtland was appointed as chairperson of the WCED because there was no other political leader who was Prime Minister, with a strong background, as environment minister, of many years of political struggle, nationally and internationally. The WCED was asked to address several points: to define the critical development and environmental issues and to propose realistic long-term strategies for dealing with them and achieving sustainable development by the year 2000 and beyond; to recommend new forms of cooperation among countries at different stages of development on these issues, that will influence policies to the achievement of common and mutually supportive objectives; to increase the level of understanding and the commitment by educational institutions, governments, companies, voluntary organizations and single individuals to action, in order to create public awareness on these themes and to push the world onto sustainable development paths. Because the environment does not exist as a separate sphere from human politics and due to the wide scope of the global agenda for change, the WCED was composed by people having different backgrounds and wide experience from all political fields, ranging from foreign ministers to policymakers in agriculture, science and technology.

The call for action by the General Assembly of the United Nations was made necessary because the economic development had brought several achievements but also failures, and was clear that development paths of the industrialized countries were unsustainable. If on one hand decline in infant mortality, increasing number of children starting school, the rising proportion of adults in the world who can read and write, the enhancement of human life expectancy and a global food production which grows faster than the population growth were all successes achieved thanks to the progress, on the other hand we experienced several drawbacks. These can be divided in "failures of development" and "failures in the management of the environment". Related to the development side the modern society was facing more hungry people in the world than ever before, in term of absolute number, and the same for people without healthy and safe homes or clean water; besides the gap between rich and poor countries was widening (the same trend is in place nowadays). About the environmental side, several threats were altering the planet and the lives of many species, including the human one: millions of hectares of productive dryland converted in unworthy desert each year; acid rain was killing lakes and soils; hectares of forests destroyed; global warming caused by the burning of fossil fuels; industrial gases were threatening to deplete the planet's protective ozone shield.

The urgency of a prompt action against these global challenges was corroborated by the events that occurred during the drafting of the report, as Chernobyl nuclear reactor explosion, the drought-induced environmental development crisis in Africa which put millions of people at

risk, or the death of estimated 60 million people due to diarrhoeal diseases linked to malnutrition and unsafe drinking water.

The report "Our Common Future" was presented to the General Assembly of the United Nations in April 1987, as a result of three years of public hearings held on five continents, intensive research and debate; its drafting provided also a practical example on how to overcome cultural, religious and historical barriers. This report formulated a guideline for sustainable development that is still valid today. The paper focuses its attention on different themes or "common challenges": population and human resources, food security, the loss of species and ecosystems, energy choices, industry efficiency, and the urban challenge, realizing that all of these are intertwined. The work's results identify that critical points and major social and environmental issues are mainly due to two factors, namely the poverty of the South and the unsustainable production and consumption model of the North. The environmental degradation, usually considered a rich countries' problem and a side effect of industrial wealth, had become a problem which undermined the survival of poor countries.

Nowadays developing countries, even if have contributed less to climate change, they are the ones that have been most affected by its effects (Mertz et al., 2009). Requiring them to reduce the use of fossil fuels, which are the cheapest ways to power economic growth, and increase the transition to renewables, when developed countries are in a condition of wealth built precisely thanks to the exploitation of fossil fuels, appears very hypocritical.

The report suggests to develop a greater sense of multilateralism, defined by Robert Keohane as "*the practice of coordinating national policies in groups of three or more states*" (Keohane, 1990). In order to undertake a sustainable development path, the countries ought to search multilateral solutions and to exploit a global co-operation system, strengthening international relationships. The need of pursuing a new strategy, in which the economic growth is forceful, and socially and environmentally sustainable at the same time is expressed in the well-known definition of sustainable development contained in the report, which is described as "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*" (p.41 of Brundtland Report). Emphasis is placed on two points: the sustainable development should allow the current generation to increase the world's GDP over time, but at the same time this economic growth should not come at the expense of future generations. Two key concepts arise, the concept of needs and that of limitations. Sustainable development requires that everyone meets their essential needs and has the opportunity to fulfil their aspirations for a better life; in particular should be given absolute priority to the basic needs of the world's poor. Furthermore, it implies limitations, which are imposed by the state of technology and social organization on environmental resources and by

the ability of the Earth to absorb the effects of human activities; even if technology and social organization can be both managed and improved. It is fundamental that fairness between rich and developing countries is ensured, but not merely securing the satisfaction of essential needs like food, clean water, clothing, housing and jobs; people from poor countries must be able to aspire to an improved quality of life similar to that of people living in developed countries. Regarding the limitations theme, the looming population growth might threaten environmental resources and in order to relieve this issue we must commit ourselves to allocating resources efficiently, and to adopting consumption standards in line with the productive potential of the ecosystem, therefore avoiding to operate in overshoot. As a rule of thumb "*sustainable development must not endanger the natural systems that support life on Earth: the atmosphere, the waters, the soils, and the living beings*" (p.42 of Brundtland Report). The report points out the different attitudes to keep towards natural resources, which are identified as renewable and non-renewable resources; about the former (e.g. forests, fish stocks), the recommended rate of use should be within the limits of regeneration capacity, about the latter, which encompass minerals and fossil fuels " *the rate of depletion should take into account the criticality of that resource, the availability of technologies for minimizing depletion… and should be calibrated to ensure that the resource does not run out before acceptable substitutes are availabl*e" (p.43 of Brundtland Report).

Furthermore, the report proposes seven strategic imperatives, to be used as principles in designing nations' environment and development policies, in line with sustainable development concept:

- *Reviving growth,* to stimulate economic growth, especially in developing countries, because poverty weakens the capacity of using resources in a sustainable way, so is a source of environmental degradation which affects the entire community.

- *Changing the quality of growth*, the revived growth must consider new themes like sustainability, equity and social justice, thus economic development should take into account the state of natural resources' stock and not only the standard economic indicators in its measurements of growth. Moreover, better income distribution, improved health, better education and reduced vulnerability to natural disasters, are all aspects that contribute to enhance the quality of growth.

- *Meeting essential needs for jobs, food, energy, water, and sanitation*, the satisfaction of basic human needs and further aspirations as discussed earlier.

- *Ensuring a sustainable level of population*, the dynamics of population growth affect the sustainable development, indeed the latter is more achievable if the population size is balanced to the productive capacity of the ecosystem. The population increase will happen mostly in developing countries, so these countries will have to promote female education, health care, measures to reduce fertility and urbanization programs, in order to put less pressure on big cities and on the overall environment.

- *Conserving and enhancing the resource base*, environmental resources must be conserved and enhanced. We must exploit new technologies to improve the efficiency of production processes so as to decrease natural resources consumption; besides a shift to non-polluting products and technologies is desirable in order to reduce waste.

- *Reorienting technology and managing risk*, we must spread technologic innovations especially in developing countries, and these technologies have to be reoriented, to pay greater attention to environmental and social issues. National and international institutional mechanisms must assess, in advanced, potential impacts of new technologies on the environment and arrangements should be required for interventions in natural systems such as forest clearance and river diversion; also, the enforcement of analyses of vulnerabilities to technology design can make accidents consequences less catastrophic.

- *Merging environment and economics in decision making*, sustainable development requires that ecological and economic goals must be made mutually reinforcing. Policy decision makers must be responsible for the impacts of decisions on the environmental resources; they must consider the ecological dimension of a policy at the same time as the economic, energy or agricultural dimensions, so as to anticipate and prevent environmental damages. Furthermore it is desirable a greater public participation on project proposals which affect the environment.

In addition to hoping for a greater multilateralism and a strengthening of the international cooperation in order to cope with all these issues, the Brundtland Commission wished to stimulate a change in the attitude of citizens, in particular of young people.

The Brundtland Report has paved the way for a greater interest of nations in sustainability, reflected in a series of initiatives as the adoption of Agenda 21 by United Nations' members in the Rio Summit (1992), the Agenda 2030 which contains the 17 Sustainable Development

Goals (or SDGs), and the Paris Agreement, which set the important goal of keeping global warming well below 2 degrees Celsius, in order to mitigate the effects of climate change, both signed in 2015.

1.2 Nine planetary boundaries not to be crossed

The message pointed out from the Brundtland Report is even more urgent today; indeed in 1987 we had not yet exceeded any global limits, while scientists argue nowadays that we have crossed four planetary boundaries: climate change, biodiversity loss, biogeochemical flow and land use. This is due to the unprecedented pressure placed on planet natural resources such as lands, water and forests, by uneven development, poverty, and population growth. The exponential growth of human activities has had a worrying impact on the Earth system, which risks encountering imbalances in biophysical systems and sudden and irreversible environmental changes, that would be catastrophic even for the human species itself. The new epoch that the planet Earth is facing is defined Anthropocene, as previously discussed; it is begun roughly by the industrial revolution, where human beings started to affect the functioning of the Earth system and Holocene's stability. The Holocene is a geological era started approximately 10000 years ago, characterized by a stable environment which allowed the development and the flourishing of agriculture and complex societies. During this epoch the environment of the Earth system remained stable despite some environmental fluctuations, which however never departed from a range of variability (so called resilience of the planet Earth). Nevertheless, with the advent of the Anthropocene this resilience and stability has disappeared, indeed we are pushing the planet outside the Holocene's range of variability for many key Earth system processes (Steffen et al., 2004).

The concept of planetary boundaries was introduced by a group of scientists led by Johan Rockström and Will Steffen in 2009, and aimed to define the planetary playing field within which mankind can operate safely. It does not represent a roadmap for sustainable development but rather it provides a precondition for this; indeed once defined biophysical boundaries at the planetary scale, humanity can choose between a series of pathways for human development and well-being, as long as these limits are not crossed. According to the researchers, the crossing of one or more planetary boundaries would trigger abrupt and sudden environmental changes that would be catastrophic for the planet and for all humanity. Since 2009 some borders have already been exceeded, while others are in imminent danger of witnessing the same fate. Crossing the thresholds of planetary boundaries triggers non-linear changes in the functioning of the Earth system, thus shaking its socio-ecological resilience. Thresholds are defined as non-linear

transitions in the functioning of coupled human-environmental systems (Lenton, et al., 2008), and are identified by a position along one or more control variable (like CO_2); not all the Earth System processes analysed are associated with tipping points, so boundaries' values are designed in order to avoid the crossing of global thresholds for processes with known thresholds, instead are set at a safe distance from a "dangerous level" for processes without them. However, thresholds are not precisely estimated: there is an uncertainty zone within which the threshold should be, and the boundary is set at the lower end of that range; the boundary position is also a function of the degree of risk the humanity is willing to take.

The researchers identify nine boundaries related to processes for which an ethical time horizon exists, that is where the time needed to cause irreversible environmental changes is short enough to stimulate action, but long enough to allow the construction of the basis for sustainability of future generations. The nine Earth-system processes are:

- *Climate Change*, the most known process on which humanity's main goal is to contain global warming within 2 °C above the pre-industrial level, to minimize the risk of disruption of regional climates and collapse of major climate dynamics patterns. The climate change boundary uses two control variables, which are atmospheric carbon dioxide concentration, and the increase in radiative forcing since the beginning of industrial revolution;

- *Ocean acidification*, it consists of an increase of CO_2 into oceans, which results in a lowering of the pH of surface seawater. Ocean acidification is a threat to all marine organisms, especially for molluscs, coral reefs, plankton, and coral algae, which undergo reduced rates of growth, development, calcification (of shell or other rigid elements) and a reduced chance of survival.

- *Stratospheric ozone depletion*, the stratospheric ozone layer is responsible for filtering ultraviolet radiation from the sun, which are considered potentially dangerous for human health and marine organisms. The ozone hole is an example of the lowering of the stratospheric ozone level that causes a greater intensity of ultraviolet radiation reaching the earth's surface, increasing the health risks of the human species and global warming.

- *Interference with the global phosphorus and nitrogen cycles*, it is mainly caused by environmental pollution due to the use of fertilizers in agriculture. Phosphorus and nitrogen are two elements closely related as biological nutrients, and the anthropogenic distortion of their cycle is changing the state of lakes, rivers, swamps and marine ecosystems (such as anoxia in the Baltic Sea).

- *Biodiversity loss*, it reduces adaptation and increases the vulnerability of terrestrial and aquatic ecosystems to climate change and ocean acidification. During the Anthropocene, the extinction rate of species has increased by about 1000 times as a result of climate change, pollution and destruction of the natural habitat of many species by man.

- *Global freshwater use*, it is estimated that about 25% of river basins dry up before reaching the oceans due to the enormous use of resources by man. The main consequences of this planetary boundary are: the loss of soil moisture (due to deforestation), a scarce quantity of water reaching the oceans, a shortage of water resources for humans and, finally, the impact on climate regulation.

- *Land-system change*, man has converted many forests and many other ecosystems into agricultural land thus undermining biodiversity, the regulation of fresh water flows, climate change and the self-regulation of the planet. According to experts, no more than 15% of the earth's surface without ice should be converted into cultivated land (currently the cultivated area is about 12%).

- *Aerosol loading*, it is considered a planetary boundary for two reasons: the influence it has on the climate system (by absorbing or reflecting solar radiation), and the negative effects it has on human health (it is often the cause of cardiopulmonary diseases, cancer and respiratory infections). The aerosol is composed of multiple particles (e.g., sulphur oxide, tropospheric ozone and so on), originated as a consequence of human activities that began in the pre-industrial era.

- *Chemical pollution*, it includes radioactive compounds, heavy metals and organic compounds of human origin. Most pollutants derive from human activity (in particular from agricultural and industrial activity), and water is one of the means by which they are spread, thus becoming part of our food chain, as well as being extremely harmful for marine and terrestrial ecosystems. Boundaries are interconnected, for this reason the shift of one planetary boundary may alter the safe level or the threshold of another; for example deforestation in the Amazon could lead to changing climatic conditions which affect the precipitation in Tibet as well as the surface temperature. This in turn can influence Asia's water resources, because a vast portion of the population rely on glaciers in the Himalaya-Hindu Kush region. These series of interrelationships show us how the freshwater boundary may be affected by shifts of the land-system and climate-change boundaries. Furthermore, the majority of these interactions tend to shrink rather than increase the boundary levels proposed; this enhances the attention we should pay in transgressing one planetary boundary. (Rockström, et al., 2009).

As of 2009, three planetary boundaries have already been transgressed: climate change, biodiversity loss, and changes to the global nitrogen cycle. Steffen and other researchers published a paper which updates the concept of planetary boundaries in 2015, according to which four boundaries have been crossed: climate change, biosphere integrity, biogeochemical flows, and land-system change (Steffen, et al., 2015). Regarding the others, it seems we are

moving in the wrong direction, with the imminent danger of crossing them (except for the ozone depletion boundary whose trend is decreasing). (see Fig. 1)
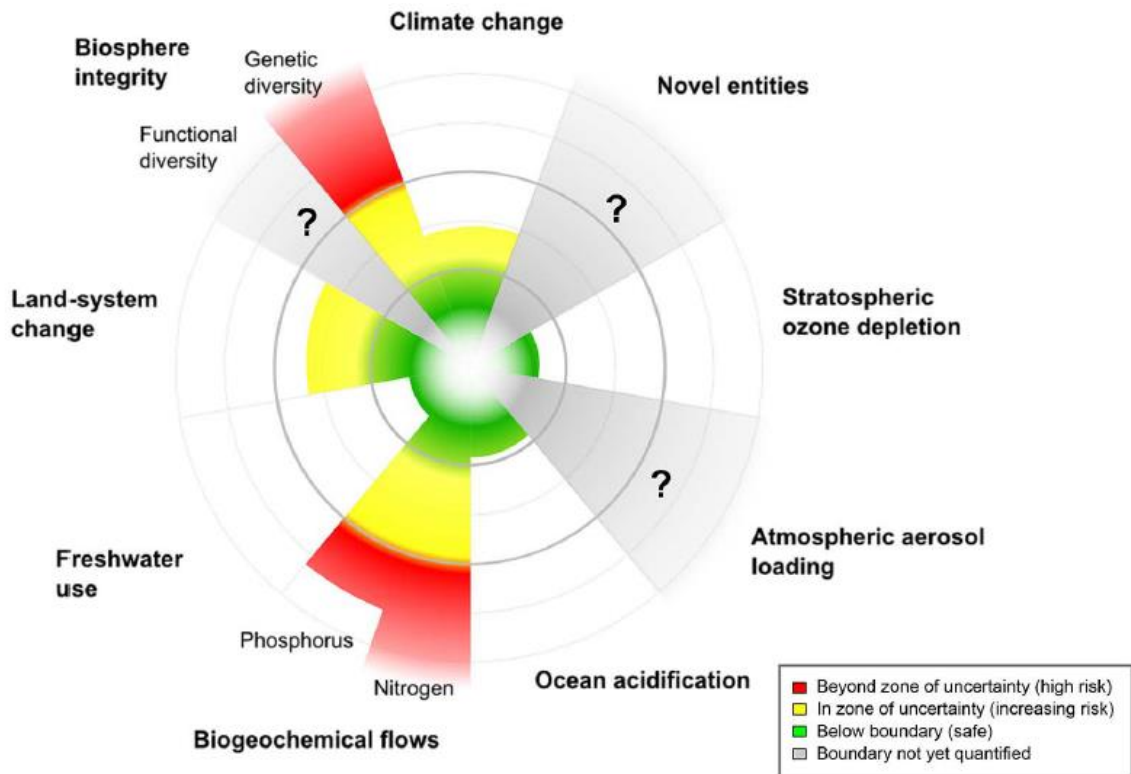
Fig. 1: *Planetary boundaries (Steffen et al., 2015).*

It should be noticed that only seven of the boundaries have been quantified, while for novel entities (earlier chemical pollution) and atmospheric aerosols, (as well as for the functional diversity of the biosphere integrity), scientists were not able to determine boundary levels; besides there are several knowledge gaps that need to be addressed about planetary boundaries framework, such as analysing the interrelationships and identifying all the Earth System thresholds.

The paper by Steffen et al., provided an important contribution to the planetary boundary framework. Firstly, they update the boundary levels and changed the name of two boundaries: "Chemical pollution" in "Novel entities" consisting not only of pollution but also of "*new substances, new forms of existing substances, and modified life forms that have the potential for unwanted geophysical and/or biological effects*", and "Biodiversity loss" in "Biosphere integrity". With the latter the researchers aim to account for two roles of the biosphere in the Earth System, the genetic diversity already caught by the extinction rate, but also the functional diversity measured by the biodiversity intactness index (BII), which assesses changes in animals and plants' populations due to human intervention.

But mostly they determined a hierarchy of planetary boundaries, identifying as core boundaries the climate change and the biosphere integrity; this is due to their fundamental importance for the Earth System, indeed if persistently transgressed, both have the potential on their own to drive the Earth System out of the Holocene state, and because they are highly linked to all the other boundaries.

Humanity can aspire to long-term social and economic development, but has to integrate the continued development of the society with the maintenance of the Earth System in a resilient state; in this sense the planetary boundary framework could be useful, defining a safe space for human development and so influencing environmental governance and management from local to global scales.

1.3 Sustainable Development Goals (SDGs) to be achieved by 2030

The stability of the Earth system is a prerequisite for a prosperous global society, therefore planetary boundaries must not be crossed to enable sustainable development around the world. Over time there has been an ever-greater awareness about sustainability by countries, individual citizens, and companies. Starting from the 90s, governments from all over the world have met several times to address social issues, but above all issues related to climate change, whose consequences represent the greatest threat humanity will face in the near future.

The Earth Summit held in Rio de Janerio in 1992, marks the beginning of the world conferences on the environment; during this conference, was signed the United Nations Framework Convention on Climate Change (UNFCC), the first international environmental treaty to address global warming, which imposed ongoing scientific research and regular meetings.

The parties to the convention started to meet annually from 1995 in the so-called Conferences of the Parties (COP), in order to assess progresses, and the turning point arrived with the Kyoto protocol, signed in 1997, which was the first agreement on the reduction of greenhouse gas emissions. However, we had the two major achievements of the UN in its work toward sustainability, prosperity, peace and human rights in 2015: the Paris climate change Agreement (that sets the important goal of limit global warming well below 2 degrees, and preferably within 1.5 degrees, above pre-industrial levels), and the drafting of sustainable development goals (SDGs). The definition of development goals by the United Nations begins with Millennium Development Goals (MDG) in 2000; they consisted of eight objectives to be achieved by 2015: to eradicate extreme poverty and hunger in the world, to make primary education universal, to promote gender equality and women's autonomy, to reduce infant

mortality, to improve maternal health, to fight HIV/AIDS, malaria and other diseases, to guarantee environmental sustainability and to develop a global partnership for development.

Considering the impact of humans on earth ecosystem, and the relative threat for humanity as a whole, Griggs and other colleagues suggested that the definition of sustainable development from the WCED had to be revised in "*development that meets the needs of the present while safeguarding Earth's life-support system, on which the welfare of current and future generations depends*" (Griggs et al., 2013). According to them planetary stability had to be integrated with MDG in order to include the security of people and the planet.

On 25 September 2015, the UN general assembly, adopted the Agenda 2030 for sustainable development, divided into 17 sustainable development goals (SDGs) which replaced the MDG. The two main differences between SDGs and MDG are: firstly, the SDGs are aimed at all countries regardless their level of development, unlike the MDG which were intended only for developing countries, (even if the focus remains the fight against poverty); then SDGs are the result of the participation of the UN States, which cocreate the goals by themselves, not as the MDG which were arranged by some politicians, scholars and economists under the leadership of the OECD. In this way a widespread consensus has been created, and so deep commitment is expected from each country.

The SDGs are considered "*the blueprint to achieve a better and more sustainable future for all*", and as compared to MDG is clear how they are all imbued with the sustainability theme. The 17 goals are: 1) No poverty, 2) Zero hunger, 3) Good health and well-being, 4) Quality education, 5) Gender equality, 6) Clean water and sanitation, 7) Affordable energy, 8) Decent work and economic growth, 9) Industry, innovation and infrastructure, 10) Reduced inequalities, 11) Sustainable cities and communities, 12) Responsible consumption and production, 13) Climate action, 14) Life below water, 15) Life on land, 16) Peace, justice and strong institutions, 17) Partnerships for the goals (United Nations, the 17 goals).

Each goal is split into several targets, (in total we have 17 goals and 169 targets), additionally each target is associated with a set of indicators, which allow to identify if the goals/targets are met. As stated in the Resolution adopted by the General Assembly on 6 July 2017, which make more actionable the SDGs, goals and targets will be revised annually using a set of global indicators that constitute the global indicator framework developed by the Inter-Agency and Expert Group on SDG indicators, and the majority of targets must be achieved between 2020 and 2030 (only for some targets there is no end date). The SDGs contain both "outcome" and "means of implementation" (MoI) targets: the former are circumstances to be attained (e.g target 4.1: "By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes"); while the latter

provide guidance on how the SDGs must be achieved, and they implicitly apply to all outcome targets and to the overall goal (e.g. target 4a: "Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all"). The letter-designated MoI targets were added late in the SDGs negotiation process, in order to address the concerns of member states on how to achieve the goals, defining the mix of financial resources, technology development and capacity building to exploit; however, MoI are often imperfectly conceptualized and formulated, and their related qualitative indicators are difficult to track (Bartram et al., 2018).

The indicators employed to review the targets, were originally divided in three tiers, according to the disposability of data at the global level, and the methodology used for their development. If on one hand tier 1 and tier 2 gathered conceptually clear indicators, which had well established methodology and, only for tier 1, whose data were available at least for some countries, on the other hand tier 3 accounted for indicators with no clear international methodology or standards (*IAEG-SDGs — Tier-classification*). The global indicator framework was revised in 2020 by the United Nations Statistics Division (UNSD), which deleted or modified some indicators, and decided to replace or to eliminate tier 3 indicators; furthermore, they aim to review again the framework in 2025 (*IAEG-SDGs —* UNSC-proposal).

As stated by Ban Ki-Moon (former Secretary General of the United Nations), the SDGs represent the most scientific, comprehensive and ambitious set of goals ever proposed.

The SDGs aim to address a wide range of social and economic development issues, that we can summarized in three main purposes: to end extreme poverty (the greatest challenge and an indispensable requirement for sustainable development), to fight inequalities and injustices, to limit climate changes. Since most of the thesis is focused on environmental sustainability, in this part I prefer to deepen the two purposes related to social sustainability, namely the fight against poverty and inequalities.

Poverty eradication was the main purpose of MDG; according to the World Bank this goal – to halve the number of people living in abject poverty (less than $ 1.25 a day) – had been achieved in 2010 (Ban, 2016). However, this was mainly due to the astonishing economic growth of China, therefore it was not a comprehensive result but a partial one (Sachs, 2012). The decreasing number of people living in extreme poverty (the poverty line was reviewed in 2015 and since then is set at $1.90), as well as the fall in poverty rate, have been a constant over the past thirty years, but still almost one person out of ten lives in conditions of extreme poverty; furthermore in 2030 half a billion people are expected to be below the poverty line. The progress against extreme poverty of the last decades was possible because the majority of poor people lived in countries which experienced strong economic growth as China, India, Ethiopia,

Indonesia and Ghana, while nowadays extreme poverty is mostly concentrated in Sub-Saharan Africa, a region with economies that are not growing (Roser, Ortiz-Ospina, 2019). It should be noted that poorest people in the world have lower access to education, suffer more hunger and have much poorer health; all these issues determined the drafting of SDGs n. 1 (No poverty), 2 (Zero hunger), 3 (Good health and well-being), 4 (Quality education), 6 (Clean water and sanitation).

Since the beginning of 1980, the acceleration of the globalization process coincided with growing wage disparities and so income's gaps between highly educated/skilled workers and lower-skilled workers have widened sharply. Besides the pre-existing inequalities within and among countries have been exacerbated by COVID-19: the International Monetary Fund estimates an increase in the Gini index for developing and emerging economies of more than 6% (Gini index measures the income inequalities, ranging from 0 or no inequalities, to 100).

These inequalities in income did not come by themselves, indeed another phenomenon that unfortunately we have been witnessing for some time is gender inequality. There is widespread consensus on the need to prioritize gender equality and women's empowerment in order to reach SDGs; nevertheless gender equality is still a long way off, even in more developed countries. According to the UN, in 2021 women representation accounts for 25.6% in national parliaments, 36.3% in local government, and 28.2% in managerial positions. Furthermore, they are too frequently victims of violence and tend to earn less than men. The gender pay gap, which measures the difference between men's and women's average hourly wages, is shrinking but still exists. For instance, in 2019, the unadjusted pay gap in US was at 21.4 %, while the adjusted one, which takes into account differences in education, occupations and hours worked, was about 4.9% (Chamberlain, Zhao, Stansell, 2019). In order to solve these inequalities issues, as well as discriminations about religion, sex, ethnicity and disabilities, the SDGs n. 4 (Quality education), 5 (Gender equality) and 6 (Reduced inequalities) play a key role.

Due to the difficulty in achieving all the sustainable development goals, their implementation requires a strong cooperation between governments, institutions and businesses. The goal number 17 "Partnerships for the goals", shows how to effectively implement the first sixteen SDGs: it is expected a collaborative, synergistic and proactive action by all the sustainable development actors.

Since the drafting of the 17 SDGs several advances have been made, such as: increasing women's participation in politics and business, higher girls' school enrolment, more access to electricity and safe water, improved maternal and child health, reduction of extreme poverty, the narrowing of gender pay gap etc. These first results were obtained despite any legally binding enforcement mechanism, proving two main things: the definition of goals to pursue and

precise targets to meet could help nations (but also single company as we will see later) to achieve results; also it seems that humanity is increasingly aware of social and environmental issues, and of the need to preserve the environment in order to allow us to thrive in the future. However, we are not on track to achieve some of the SDGs by 2030, and one possible reason is because we are not measuring the SDGs indicators. Countries have been slow to commit to reporting global SDGs indicators, even more developed ones are still not able to report more than 40-50% of the indicators; they prefer to use national proxy indicators in place of SDGs indicators, making it impossible to have international comparable data to assess the effectiveness of development interventions (Gennari, Navarro, 2020).

Besides as pointed out the 2020 SDG report, climate change is occurring faster than anticipated and this represents a terrible threat for the pursuit of sustainable development.

Nowadays the Division for Sustainable Development Goals (DSDG) of the UN Department of Economic and Social Affairs, offers support and plays a critical role on raising awareness about SDGs; it also supervises the evaluation of UN systemwide implementation of 2030 Agenda.

1.4 Sustainable development from the firm point of view

The SDGs framework integrates the social, economic and environmental dimensions, indeed in order to achieve sustainable development, these "sectors" need to come together. This approach, known as Triple bottom line, is also spread among the businesses, and defines the commitment undertaken by a company in terms of Corporate Social Responsibility (CSR). It implies that the valuation of business results must relied not only on profits (economic result), but must also take into account the social and environmental impact of operations. The social responsibility has come a long way, before being able to be taken into consideration and integrated into corporate management, and nowadays it is increasingly widespread.

1.4.1 Brief history on "Corporate Social Responsibility" (CSR)

The concept of Corporate Social Responsibility (CSR) has deep roots that can be traced back to the 1800s, when the separation between ownership and management led entrepreneurs to question what social responsibilities they should have towards the owners and the community in general. It was a concept of CSR that was not yet mature, but based on purely philanthropic ideas. Between the thirties and fifties of the twentieth century, the managers of large American corporations realized that they were influencing, with their actions, the lives of people in the society; therefore, they understood that in addition to engaging in making a profit, they should also fulfil social obligations. Corporate social responsibility was therefore considered as a

personal duty of the manager, and not of the company as a whole. In this sense, the first definition of CSR given by H. Bowen is exemplary: "*the obligations of businessmen to pursue those policies, to make those decisions, or to follow those lines of action that are desirable in terms of the objectives and values of our society*" (Bowen, 1953). The turning point came in the seventies when consumers and society began to ask companies not only to supply the goods and services they needed, but also to contribute, in a proactive way, to improving the quality of life of the community and the environment in which they operated. The ownership of moral obligations was therefore extended by individual entrepreneurs to the company as a whole.

CSR became a popular topic from the 1980s, in those years Carroll provided a new definition of CSR, according to him: "*Corporate social responsibility encompasses the economic, legal, ethical, and discretionary (philanthropic) expectations that society has of organizations at a given point in time*" (Carroll, 1979). Furthermore in 1991 Carroll proposed the same concept, drawing the so-called pyramid of priorities (fig. 2), that companies would have to consider in making decisions and establishing objectives to be pursue. If profit maximization and compliance with the law have always been essential, indeed they are put at the base of the pyramid, now two further areas of responsibility are introduced for the first time, which include the ethical and the discretionary ones. In order for a company to be considered socially responsible, fair and ethically correct behaviours are necessary, as well as those that contribute to improving the quality of life of a community, beyond legal obligations. The importance of Carroll in understanding the CSR is that he was the first to see the economic and social objectives as an integral part of the business framework of total social responsibility (Lee, 2008).

Fig. 2: Carroll's pyramid of CSR (self-made).

Another important contribution was made by Freeman, who elaborated "The Stakeholder Theory", which focused on the relationship that the company should have had with the surrounding environment. Freeman affirms that the company must identify the subjects to which it is responsible, defined stakeholders, and seek a fair balance of the interests at stake, trying to guarantee a minimum satisfaction to all these stakeholders; they affect the business of the company therefore are necessary for its survival, but at the same time are influenced by company's operations (Freeman, 1984).

During the 1980s began to emerge new societal concerns, that can be seen in several events such as: the establishment of the European Commission's Environment Directorate-General in 1981, the creation of the WCED in 1983, the drafting of the Brundtland Report in 1987, UN's adoption of the Montreal Protocol in 1987 and the foundation of the Intergovernmental Panel on Climate Change (IPCC) in 1988. Even when all these events were not directly linked to CSR, however they showed an increasing sense of awareness by the international community towards the environment and the sustainable development, and to a certain extent, to corporate behaviour (Agudelo et al., 2019). This context led to the birth of the "Business Ethics" concept, focused on moral values and ethical principles, on which company policies and activities must be based.

Between the 1990s and 2000s, in Europe, an increasing number of companies began to promote CSR strategies in response to economic, environmental and social pressures. The first major step taken in this direction by the European Union is the Green Paper, issued in 2001, whose aim was to open a debate on the concept of CSR and on the different ways in which the EU could promote and encourage it at national and international level. With this publication the European Commission gives the first official definition of CSR: "*The voluntary integration of social and environmental concerns of companies in their business operations and in their interaction with stakeholders*" (EU, 2001). The document encourages companies to adopt responsible conduct, underlining the impact that CSR has on the competitiveness and productivity of businesses, and stating that it can generate both direct and indirect positive economic effects.

From the 2000s onwards, companies have begun to be subjected to various pressures from national and international institutions, and to the growing requests for non-financial information also by consumers; for this reason, they have developed a new awareness and sensitivity towards socio-environmental issues, starting to internalize them in their management systems. Social responsibility has assumed an increasingly important role for society and companies, becoming a fundamental prerequisite for the competitiveness and durability of the company.

CSR has proved to be a critical success factor over time, as it pushes organizations to operate with a view to long-term sustainability, allowing them to improve their image and operate more efficiently in relation to multiple aspects.

1.4.2 The triple bottom line and the various facet of sustainable development

At the beginning of the 21st century, the economic and social changes connected to globalization, as well as the protracted consequences of the serious environmental crisis, showed that it was no longer possible for companies to operate with a strategy aimed exclusively at maximizing profits and satisfying shareholders' expectations alone. The need for a new approach was satisfied by the model developed by Elkington defined "Triple Bottom Line" (TBL). It represents an accounting framework adopted by companies where together with the bottom line (which refers to either the profit or the loss, because these are usually reported at the bottom line of the income statement), are introduced two other "bottom lines", the social and the environmental (or ecological) one. TBL states that firms should consider and measure also the social and environmental dimensions, rather than just focusing on the maximization of profit (the standard or bottom line) in order to evaluate their performances (Elkington, 1997). This approach is the basis of sustainable development, indeed it provides for the integrated management of economic, social and environmental results, seeking to create value not only for shareholders, but for all stakeholders who gravitate around the company.

The TBL dimensions are also known as the three Ps: profit, people and planet.

- Profit, the economic line

Economic sustainability is centered on the production of goods and services that make consumers' lives better, at the same time creating value for shareholders. The company's standard bottom line is the profit figure, which assess the value created by a company, its financial performance, deducting from the total revenues all the input's cost. In order to assess a company's financial performance, accountants record and analyse a wide range of numerical data (Elkington, 1997). The same approach is often suggested for the social and environmental accounting, even if it difficult to exploit this model in those new areas of corporate accountability. Strategic plan and key business decisions are set in order to maximize profits and at the same time reducing costs and mitigating risks. Whether a company has economically sustainable business operations depends on: cost structure, the sustainability of demand for products and services, competitiveness of the innovation rate on the long term, human capital, and sustainability of the profit margins.

Economic sustainability concerns the ability of an economic system to produce income and employment in a lasting way, therefore economic variables to be used in a TBL model deal with income, costs, taxes, employment factors, and business diversity factors; examples of economic measures examined through academic discourse are: personal income, job growth, cost of underemployment, revenue by sector, establishment sizes, percentage of firms in each sector etc. (Slaper, Hall, 2011).

If previously managers aimed to pursue only this type of performance, nowadays they are aware of the possibility, in driving their businesses, to positively influence the society and the world, without hindering the economic sustainability.

- People, the social line

Social sustainability in general is strictly related to the concept of equality, and can be defined as the ability to ensure that each person enjoys the same conditions of well-being, and therefore that can take advantage of the same opportunities and resources. It is an indispensable condition of sustainable development, because without equality in income distribution and in life conditions, there is no development at all; a failure in seeking solutions to ethical, social and political issues, will undermine progress on the environmental dimension (Elkington, 1997).

In order to pursue social sustainability, it is needed a radical change from institutions; they must be able to provide democratic and participatory systems that allow a fair level of opportunities and resources' distribution among people belonging to different countries, genders and positions in the social hierarchy. Research shows that sustainable development is more easily achieved in high-trust societies where there are also high levels of social capital, while high level of distrust in a society could impose a sort of tax on all forms of economic activity, undermining sustainable development. High levels of trust and other forms of social capital depend on the levels and fairness of investment in human capital: indeed, human capital needs investments in the health, nutrition and education fields. Social capital from the businesses' point of view deals with human capital, but also comprises broader measures of a society's health and wealth-creation potential. The ability of working together in order to achieve common goals in groups as well as in organizations, is critical to the required sustainability transition and it depends on virtues such as honesty, trust, and loyalty. The presence of these virtues between corporations and their external stakeholders is key in determining their long-term sustainability (Elkington, 1997). The emphasis on creating value for all stakeholders (consumers, employees, community members etc), and not only for shareholders, represents a recent change, demonstrating that companies have increasingly embraced sustainability. Companies can show their efforts in the social dimension for example by promoting a safe workplace, fair hiring conditions, fair salaries, or by supporting voluntary activities. Social

variables in TBL approach deal with measurements of education, health, equity, quality of life and social capital; despite the difficulty in evaluating the firm's impact on the society, researchers proposed several measures to take into account, such as: unemployment rate, female labour force participation, average level of education, crimes per capita, life expectancy, median household income (Slaper, Hall, 2011).

- Planet, the environmental line

Environmental sustainability concerns the protection of the ecosystem and the renewal of natural resources, which are used by humans to improve the quality of life, to develop and thrive. There are numerous possible actions to be taken to protect the environment, such as to reduce the pollution, to limit the use of fertilizers, to avoid waste but most of all to decrease gas emission, which are the main cause of climate change.

Even if the social agenda for business developed earlier than the environmental agenda, (just think of the issues related to slavery, child labor or working conditions), the latter has attracted more attention, and nowadays business people are more focused on environmental sustainability. If on one hand companies have historically been the main culprits of climate change, now they have the keys to driving positive change. In order to establish how environmentally sustainable a company is, the first step is to define natural capital; it represents the stock of natural resources which can be divided in "critical natural capital" and renewable one. The former is indispensable to the maintenance of ecosystem integrity, the latter could be repaired (e.g., desert reclamation), or substituted (e.g.. solar panels instead of fossil fuels). The managers must determine which forms of natural capital are affected by operations, and assess to what extent. It's interesting to know that the carrying capacity of ecosystems depends on the number and behavior of the economic actors operating within them, therefore the ecological bottom lines vary over time and space (Elkington, 1997).

Environmental variables in a TBL model ought to be variables that deal with measurements of natural resources and potential influences on their viability; examples of environmental measures are: electricity consumption, fossil fuel consumption, water consumption, sulphur dioxide concentration, change in land use etc. (Slaper, Hall, 2011).

Finally, a certain interdependence between environmental and economic sustainability must be recognized, indeed the way in which economy is managed impacts on the environment, and environmental quality has an impact on economic results.

The three dimensions are interconnected, and only a holistic approach can lead to sustainable development (Fig. 3). If only two types of development are promoted, we get development from a conservationist, ecologist, or socio-economic perspective.
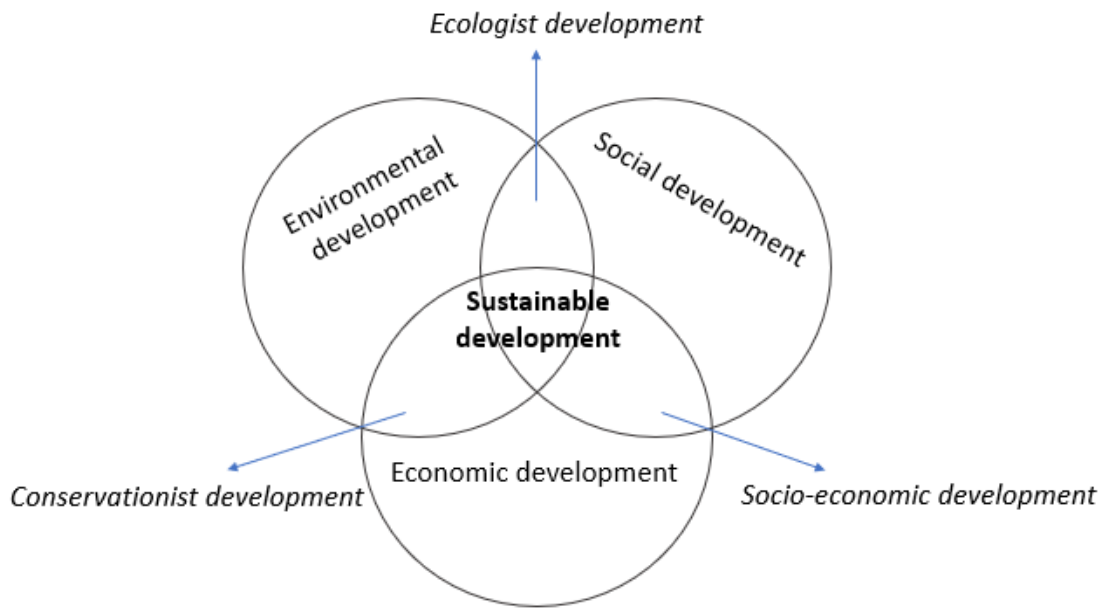
Fig. 3: The various facet of development (self-made).

In the past companies had to give an account only of their financial performance while CSR initiatives were typically voluntary, but over the last decade an increasing number of countries have adopted laws that explicitly require firms to undertake CSR, therefore many public companies have also the obligation to report their social and environmental performances.

The triple bottom line represents a possible framework to report business' impact on people and environment, however as previously pointed out, social and environmental accounting are the challenges of using the TBL approach. Nevertheless, the framework allows for a long term perspective and enables firms to measure the future consequences of decisions (Slaper, Hall, 2011).

Recently the TBL has evolved into the quadruple bottom line (QBL), which encompasses four dimensions, the last one is intergenerational equity. It has been extended in order to provide a long-term outlook for sustainable development. Humanity cannot pursue sustainable development if only short-term societal, economic, and ecological implications of a decision are taken into account; sustainable development requires also to think what future generations may need or want, even if today it seems impossible to identify (Waite, 2013).

1.4.3 The applicability of the CSR

There are several advantages in adopting CSR initiatives, such as the creation of financial value, and the attractiveness of long-term capital. Several studies on European firms, stated that companies which invest more in CSR tend to report better financial performance (higher ROE and ROA), in the short as in the long term; they create more value for all their shareholders,

because they gain loyal consumers but also more committed workers interested about these themes (Gaio, Henriques, 2020).

Furthermore, the investment choices of the funds are increasingly based on ethics and ESG (environmental, social and governance) criteria, both for reasons of economic return, and for institutional and public opinion pressures towards sustainability. Therefore, companies with a strong focus on CSR are more appealing to investments, and thanks to the greater availability of funds, are able to achieve higher financial performance; this represents a self-reinforcing loop which hopefully will foster more companies towards sustainability in the future.

In the financial field, the ESG criteria are used to indicate all activities related to "responsible investments", namely with positive repercussions on the community and, by extension, they also act as a criterion for assessing the responsibility or not, of the companies that issue them or that they use to finance themselves. Sustainable finance places environmental, social and governance (ESG) considerations at the hearth of investment decisions, aiming to create value for the long term, investing in activities which can have a positive effect on society and the environment, without sacrificing financial returns.

Companies can then use CSR behaviours to demonstrate their positive impact on society, an important aspect however is that of effectively communicate the commitment to CSR, without falling into greenwashing or social washing. These phenomena consist of practices aimed at improving the reputation of a company through environmental or social responsibility initiatives or communications, that are not effective, but rather facade, with the main objective of an economic return. Firms manage in a deceptive way their reputation with the public, institutions, and financial community, so as to conceal problems, fault, to ensure a good reputation, to attribute blame to others, and seek to appear in a leadership position (Laufer, 2003).

For example, one way to effectively communicate the environmental sustainability of a company, is through the use of environmental reporting standards recognized internationally, which allow to have reliable information, but also comparable with other similar organizations, so that stakeholders are able to make appropriate assessments.

The two most recognized are EMAS and the ISO 14001. The International Organization for Standardization (ISO) is the world's leading organization for the definition of voluntary international standards that support innovation and provide solutions to global challenges; the ISO 26000 represents the international standard for CSR, while the ISO 14001 establishes the criteria for an environmental management system and can be certified.

On the other side EMAS (Eco-Management and Audit Scheme), is an eco-management and audit system to which organizations inside, (but also outside), the EU can voluntarily join;

however, in order to register for EMAS and get the certification, organizations must comply with several requirements. It is a tool developed by the European Commission in 2009, that allows companies to assume environmental and economic responsibility, to improve their environmental performance and to communicate the results obtained to interested parties. Unlike ISO 14001 (which is a private-type certification), the EMAS procedure provides for the mandatory drafting of the public Environmental Declaration, therefore it is possible to consult the public register. As of October 2021, a total of 3955 organizations are registered in the EMAS scheme; Germany, Italy, Spain, and Austria, are the European states with the largest number of certified organizations, and the majority of the organizations belong to the following sectors: "Waste collection, treatment and disposal activities" (NACE code 38), "Public administration" (NACE code 84), "Electricity, gas, steam and air conditioning supply" (NACE code 35), "Manufacture of chemicals and chemical products" (NACE code 20), which therefore result the sectors that pay more attention to environmental sustainability.

Finally, the EU do not set absolute requirements about environmental performances in order to be registered in the EMAS; they rather require organizations to set goals and targets in line with the current situation and with their own environmental policies.

Chapter 2: Management control system and the adoption of environmental sustainability

2.1 Introduction to management control

Companies continually establish strategies to grow, therefore they need tools that allow them to implement strategies correctly and evaluate their results. Management control is essential for businesses because it allows to compare actual performances with planned ones; in case there are deviations from standards, firms will pursue corrective actions.

2.1.1 Management control: definition and activities

Management control is "*the systematic process by which the organizaton's higher level managers influence the organization's lower level managers to implement the organization's strategies*" (Anthony, et al., 2014). Management control helps higher level managers to increase long-term performance of the business, determining whether the organization is able to perform operations effectively, and to meet its goals. Top management team should design and use control system elements such as budgeting, strategic planning, resource allocation, responsibility centre allocation, performance measurement, evaluation and reward, in order to stimulate lower level managers to behave in line with strategic objectives; the management control systems (MCS) consist of the various ways available to senior management.

Decentralized organizations underlie the need for MCS, indeed if power to make decisions which affect company performance is shared among several managers (higher or lower levels), it is essential to rely on MCS. In many cases companies' failures are the result of wrong MCS, which lead to behaviour of individuals not in line with organization's overall objectives.

As it was described, MCS imply that people in organization do not automatically behave in line with company strategy, therefore management control has a behavioural orientation. Why decentralized managers may not act in line with the strategies outlined must be sought in three main reasons: lack of direction, lack of motivation, and personal limitations. According to the first, employees do not understand the goals and strategies developed by top managers, nor how they can be useful in dealing with those goals and strategies; usually goals and strategies are defined at the organizational level, so are not immediately meaningful to all employees.

According to the second reason, lower-level managers may not agree with goals and strategies developed by higher-level managers, therefore they choose to act against organization's interest; this is due because managers may have private goals which are incompatible with

organization's goals, or can be due to a self-interested behaviour, where individuals prefer to be lazy, or to exploit organization's internal goods and services, to the detriment of the firm.

The third issue deals with personal limitations, therefore decentralized managers may not be able of doing what is expected of them; they do not have the resources needed to perform accordingly to strategic objectives, indeed they need personal skills, as well as physical and monetary resources to act in line with organizational goals and strategies.

The role of MCS is twofold: on one hand if top managers fail to implement proper management controls, there is the risk that lower level managers should not have a clear vision about what decisions to take, what are the results to achieve, how to use the resources at their disposal and where to lead employees under their responsibilities (top- down role of MCS); on the other hand senior managers need appropriate MCS, to be informed about what decisions lower levels managers will take, what results have been achieved, and how they are using resources and people under their responsibility (bottom-up role of MCS).

Management control main purpose is that of influencing the behaviour of employees in a company in order to make it goal-congruent, that is the type of behaviour which helps organizations to achieve their goals and missions, in fact the actions which people take following their self-interest are the same that the organization would like them to take.

However, it is difficult to have employees with goal-congruent behaviour for at least three reasons. First lower level managers may have lack of direction, lack of motivation, or personal limitations, as already discussed. Second there could be a timing problem, indeed when decisions and actions' consequences manifest time later than when they were taken, goal-congruence can be seen only ex post. Finally, even if management control is widespread in the organization, it could be difficult for managers to exercise it in a good manner; it requires that organization's main goals, which usually are long-term, abstract and financial, needed to be translated in goals at lower level in the hierarchy, which have to be short-term, concrete, and operational, in order to make clear what actions and decisions managers should take. Therefore, managers throughout the organization must understand what are the organizational strategies and must communicate them to the people under their responsibilities in the right way to obtain goal congruence.

Given that management control is costly, it is important in order to make it effective, to construct MCS in organization on principles of human motivation which are generally recognized. Anthony identified three sources of managerial motivation which are useful in designing and using MCS in organizations; managers can be motivated: by the goals they are asked to achieve, by rewarding them with performance-related rewarding systems, or by the

social context within which they take decisions and make actions, which is affected by cultural norms (Anthony, et al., 2014).

Despite control is one of the basic managerial functions, alongside other functions as planning, organizing, staffing, and leading, the main distinction between general management and management control is that the latter goes beyond these managerial functions, because it does not concern only the way in which managers decide and act, but it encompasses how they cooperate across the entire organization. Management control connects different layers in the organizational hierarchy in order to achieve organizational strategies; it comprehends the set of tools and techniques, such as balance scorecard, budgeting, and incentive system, which managers apply in top-down and bottom-up management control activities. These type of tools and techniques traditionally rely on the management accounting system of the organization, which deals with the preparation, interpretation and communication of financial information to management.

There are four factors that influence the designing of MCS in an organization: the size and spread of the enterprise, types of responsibility centres, decentralization and delegation, people and their perceptions.

- The size and spread of a small firms compared to a bigger one is very different, thus also the content and nature of the MCS will be different to suit individual purposes.
- MCS should be implemented accordingly to each responsibility centre since the performance of each branch within the organization should be measured in different ways (in terms of expenses, profit, ROI etc.), depending on the type of responsibility centre.
- The organizational structure, the extent of decentralization and delegation, differ from company to company, and also within the same company the degree of decentralization and delegation can change due to new environmental challenges and arising opportunities, therefore MCS have to adapt accordingly.
- Since each person in the company has a different perception on work ethic, job satisfaction, or promotions, these differences must be duly considered when designing MCS.

Management control process in general consists of programming, budgeting, executing, measuring and evaluating actual performances to define and assess organizational goals and targets, more specifically its function is carried out through various managerial activities which are the following:

- *planning*: managers have to define the long-term as well as the short-term goals of the company, and the relative set of actions needed for their achievement;

- *communicating*: higher level managers must communicate information about the objectives and the plans for action previously established to all the different layers;
- *coordinating*: the activities of employees belonging to different hierarchical levels of the organization;
- *evaluating*: the activites performed;
- *controlling*: to check ex post whether actions and activities are performed according to plans, and if there are deviations from the expected results, to define what kind of actions should be taken;
- *influencing*: higher level managers must influence people under their responsibilities to change their behaviour for goal achievement, to implement organizational strategy.

Management control does not imply that all actions are linked to determined plan, indeed the plans are based on circumstances and if these change at the time of implementation, the actions related to the plan may be no longer viable. Therefore, if managers discover better approaches to achieve organizational strategy than the predetermined plan, MCS should not block their implementation.

2.1.2 Various types of MCS

MCS in an organization should fulfill the following characteristics: they should be aligned with the strategy and goals of the company; MCS should be designed to fit the individual managers' responsibility in the decision-making process as well as the organizational structure; finally effective systems should stimulate employees throughout the organization to exert efforts toward common goals, through a variety of rewards tied to the attaining of those organizational goals.

Management control system (MCS) includes formal as well as informal control systems that companies put in place to compare the strategy and expected goals with current outcomes; according to Jaworski et al. "*both formal and informal controls can be in place at the same time*" (Jaworski, et al., 1993, p.58).

A formal MCS implies a series of clear rules, standard operating procedures and guidelines linked to the various management aspects, needed to inform, conduct and motivate employees and managers at all organizational levels; thanks to a defined set of formal instruments, the company is able to coordinate all the behaviours within it, toward the achievement of common goals.

There is a variety of formal control systems which a company may exploit, for example: management accounting system, cost accounting system, human resource system, quality maintenance system etc.

Instead, informal MCS deal with implicit codes of conduct, unwritten norms about what kind of good behaviour is expected by employees and managers, corporate culture built on shared values and beliefs, ethics value, loyalties, and mutual commitments among people inside the firm. The informal MCS contribute in the implementation of organizational goals and strategies, and help to achieve a high degree of goal congruence and engagement by organization's employees.

When organizations grow in size, the communication and control of strategic goals become more important but at the same time more difficult to carry out, thus success would be determined by using performance measurement and control systems effectively. Managers rely on two types of control systems in order to communicate strategies to employees and monitor the implementation of intended strategies in a correct way: diagnostic control systems and interactive control systems. The difference between the two lies in how managers use these systems, not in their technical design features (Simons, 2000).

Diagnostic control systems are "*the formal information systems that managers use to monitor organizational outcomes and correct deviations from preset standards of performance*" (Simons, 1995, p.59). These systems are used to communicate critical performance variables, and control strategy implementation; for this reason they play the traditional feedback role in supporting the implementation of strategy (Henri, 2006). Diagnostic control systems measure the critical success factors of an organization and are used to encourage goal congruence through the attainment of preset goals. As noted by Simons, a formal information system can be used diagnostically if there are four distinguishing features: (1) the existence of preset goal, (2) the ability to measure outputs, (3) the possibility to calculate performance variances, and (4) the ability to use these variances as feedback and take corrective actions if there are deviations from preset goals and standards (Simons, 2000).

The two main motivations for using a system in a diagnostic way are: to preserve scarce management attention, and implement strategy effectively. In the first case managers can use performance measurement and control system diagnostically, in order to avoid to dedicate too much time in monitoring internal processes and comparing actual performances with preset targets. Thanks to staff accountants managers can receive periodic reports, quick to review, and only in case of significant deviations, they can invest more attention and time on the causes of such deviation (this kind of process is known as "management by exception").

Particularly in case of big corporations, the diagnostic control systems are useful to communicate and implement strategy effectively; managers are interested in systems which report variance information about critical performance measures. This measures or factors must be achieved in order to implement successfully the intended organizational strategy, and in so doing diagnostic control systems are used as top-down monitoring tools for implementing strategy as a plan.

To be able to exploit diagnostic control system effectively, managers must know how to set key targets and make adjustments as conditions change; however, the recourse to diagnostic control systems is not without risk. Business managers must devote attention to the following risks: measuring wrong variables; employees trying to build slack into performance targets, in order to meet those goals easily; gaming the system, namely when people work hard to enhance the measure on which bonuses are tied, but increasing the measure do not lead to progress of the underlying goal; illegal acts that employees may pursue to reach the targets and related bonuses. If managers are interested in ways to grow the business and exploit market opportunities in a dynamic market, they can rely on a different type of control system, the interactive one.

Interactive control systems are used as levers to modify existing strategies as competitive markets change, creating new ones. The interactive use of control systems plays a more active role compared to the diagnostic one, indeed it is associated with the need to focus organizational attention on strategic uncertainties, trying to stimulate dialogue and support the birth of new strategies (Henri, 2006). Strategic uncertainties involve emerging threats as well as emerging opportunities, that businesses need to overcome or exploit, in order to survive and thrive over time. Senior managers signal what employees must pay attention on (top-down pressure), through the use of one or more control systems in an interactive way. Interactive control systems are used by managers to stimulate ongoing dialogue throughout the organization, to challenge the thinking and action plans of subordinates, and to force them to understand the market changing conditions (Simons, 2000). The debate and dialogue at all levels of the company, are based on assumptions and new information gathered by subordinates, and force organizational learning, which is necessary to adjust the business strategy; the emerging strategy therefore can result as an indirect consequence of bottom-up experimentation and action plans.

Any control system can be used interactively if are met the following four characteristics: (1) the information generated by the system must be easy to understand; (2) interactive control systems must produce information about the strategic uncertainties; (3) the information systems must be used throughout the organization by a broad array of managers; (4) interactive control systems must provide new action plans.

Due to the fact that management attention is costly and scarce, and people have cognitive issues in processing large amounts of information, managers tend to use only one control system interactively; the choice about which system to use interactively concerns factors as complexity of the value chain, regulation of industries in which managers operate, or the technological dependence of the business.

Every control system must be aligned with incentives, and in case of control system use interactively, the incentives need to reward people's effort and contribution in creating new strategy. This can be done only based on subjective assessment by senior managers, which must be able to evaluate the contribution of the individual in the interactive process.

The diagnostic and interactive control systems can work simultaneously and the joint use of MCS in a diagnostic and interactive way is needed to balance the organizational tension; indeed, according to Simons, the essence of MCS is in managing the tension between creative innovation and predictable goal achievement (Simons, 1995). Applying simultaneously diagnostic and interactive control systems allow on one hand to implement intended strategy, on the other hand to position the organization for tomorrow's changing marketplace.

2.1.3 Three forms of Management Control

Even if in the end what is evaluated is the achievement or not of the strategic goal, management control can be applied in three different forms: on managerial inputs, on managerial decisions, and on final results. These three forms of control directly affect the managerial process, which basically is composed of managers providing inputs, that are transformed through effort in performance; the managerial process need to be checked to make sure the three components are goal-congruent (Fig. 4).
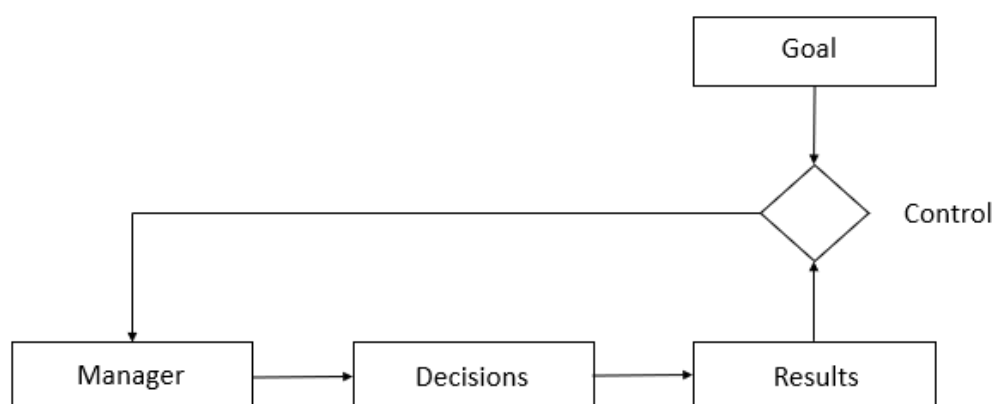
Fig. 4: The fundamental managerial process (self-made).

The first element which can be subject to control are the managerial inputs (symbolized with "manager" in the picture above), they are the capabilities, skills, characteristics and instruments which a manager may bring in the process. Control on staffing, development, and culture building, normally exercised by the human resource management, should increase the probability that manager will engage in behaviour consistent with strategic objectives. About culture building, often higher level managers set the example in their attitudes, what they do and their opinions for lower-level managers, who try to act accordingly. This situation known as "tone at the top" is a strong way to influence managers behaviour, so represents an instrument of management control, but can be also risky if higher managers do not think and act in the best interest of the organization.

Because of their managerial role, managers engage in actions and choices that may not be in line with organizational goals, therefore management control can be applied also by controlling their decisions. Managers may not undertake the correct actions for the already discussed three reasons (they do not know, do not agree, or do not have the needed resources), thus implementing control can help them to take the right choices. There are various ways to control managerial decisions such as: the formal delegation of authority or delegation of decision-making responsibility to lower level managers, and the prescription of certain behaviours to keep in some specific situations (codes of conduct).

Finally, control can be exercised on managerial outputs, that is controlling managers behaviour by making them accountable for certain results. For example accountability for results can be made by stating performance targets, thus managers are instructed to attain specific goals: balanced scorecard and management by objectives (MBO) both rely on this way of controlling managers behaviour (the former will be properly explained in the following paragraph). Other ways to make managers accountable for results are by linking performances to promotion, compensation and rewards.

In general managers behaviour is controlled through a combination of the aforementioned types of control, so designing MCS involve putting the appropriate emphasis on controlling inputs, controlling effort and controlling managerial output.

2.2 Management by objectives

Managers in any kind of business are interested in how to exploit goals in implementing organizational strategy; each individual within the company requires guidance on how he can contribute toward the achievement of the intended strategy, and the management model known

as Management By Objectives (MBO thereafter), provides that guidance, aligning tangible objectives with an organization's vision (Dinesh, Palmer, 1998).

2.2.1 General characteristics

MBO is a process that aims to improve performances through goal congruence: setting specific objectives shared by both management and employees, and deciding how to pursue each objective, boosts commitment and motivation among employees. The actions plan defined helps to align goals across the organization, and allows employees and managers to work accordingly, one step at a time.

The concept of MBO was first introduced by Peter Drucker, in his book "The Practice of Management". In his opinion it is necessary setting objectives in all those fields where activities and results affect the survival and well-being of the company (Drucker, 1954); furthermore, he firmly believed in the importance of the participatory dimension. MBO involves the collaboration of all in the decision-making process: indeed, the more employees are involved in the management of the organization together with higher-level managers, and with the goal-setting, the more they will feel their responsibility and will be committed to achieve the preset objectives. This participatory dimension needs a frequent exchange of views and dialogue among managers at the various levels of the organization; also continuous involvement in the identification and achievement of goals, may allow future managers to be trained in the field.

This management approach was further developed by authors such as McGregor, Humble, and Odiorne. According to the latter MBO is a system in which managers and subordinates jointly define specific objectives to accomplish within a time frame, and for which the subordinates are then held accountable. Thus these measures are used as a guideline for operating the business, and for assessing each individual contribution according to his/her area of responsibility.

It could be useful to provide a distinction which some companies make between the terms: goal, objective and target. Goals usually represent general aspirations, the end which managers wish to achieve (e.g., become profitable, increase efficiency, or provide excellent customer service); objectives and target are rather more specific, they indicate the measurement standards as well as the time-frame in which track the progress (e.g., to reduce the transportation costs by 20% in the following sixth months, or to boost retail revenues up to 15% in the next year). However there are firms which use this distinction, while others relate objectives to general aspirations and goal to measurable targets; what is important is that goals and/or objectives are made actionable only if are linked to specific measures (Simons, 2000). Indeed, in the MBO

perspective is important to compare the actual performance of employees and managers with the performance goals, which denote the desired level of accomplishment, or the standard set in advance.

In companies that do not use MBO system, top managers set goals and objectives which are common to the entire organization, then these are passed downward, from one level to the other throughout the hierarchy; thus subordinates do not intervene in the decision-making process, but they are told what to do and that will be responsible for those results. The MBO approach change this process, introducing a dialogue between one managerial level and another. In this way superiors propose goals and objectives to subordinates during a meeting, but the latter are free to contribute to those objectives and measures, providing useful insights which they see as appropriate for better reaching the final job. Managers and subordinates establish together goals and objectives to be achieved, and the time available to attain those goals, after which subordinates will be held responsible. Managers and subordinates may have also future meetings in which discuss about the realized progress and possible reviews, but at the end of the pre-set period, subordinates will be judged on their outcomes; based on these they will be rewarded if they achieve the relative objectives, otherwise they will be fired or transferred to other job duties (Thomson, 1998).

MBO process can be identified by several recurring steps:

- *identification of organizational strategy*: the first step consists of determine or revise long-term strategic goals for the entire company. The organizational goals should be derived from the vision and mission of the company.

- *collaborative goal setting*: to stimulate the direct participation of individuals in the setting of their specific objectives. After sharing strategic goals with employees, from the top to the bottom, they should help superiors defining their own objectives, in order to reach larger organizational ones; the goals must be consistent throughout the entire organization.

- *rewards linked to goals*: the individual objectives identified previously should be connected to rewards; collaborative reward setting, as well as goal setting, proves to be strong motivational tools for subordinates.

- *development of action plans*: the action plans as the goal setting should be made collaboratively by managers and subordinates; in it are identified the areas on which to act, and could be useful for resource allocation.

- *cumulative periodic reviews of subordinate results against targets*: the subordinates' outcomes should be monitored regularly, because if unexpected problems arise managers have to support employees. The periodic performance reviews compare actual results with pre set

objectives, and in case subordinates' performances are in line or above the expectations, they are rewarded with monetary compensation, promotions, or public recognition.

- *review of organizational performance*: the final step of MBO system implies a regular review of the whole system, and reconnects to the first step; this review enables to check if organizational plans are being correctly implemented and if the focus remains on strategic goals (Dinesh, Palmer, 1998).

Through the MBO approach, can be set objectives in all areas of activities of the firm (production, sales, marketing, finance, R&D etc.); some of them may be collective and others may be specific for a single worker, the important thing in setting them is that they are "SMART". The acronym SMART was coined by Doran in 1981, where he argued about the importance of objectives and how difficult is to set them (Dorian, 1981); this term began to be associated to MBO concept, and it received contributions from several authors, that changed the meaning of some letters.

An objective to be SMART must be:

- *Specific*: It should not leave room for ambiguity, because sometimes it happens that when a company starts prefiguring a goal, they only have a vague idea on what are the needed actions to perform in order to achieve it, and this may lead to inevitable failure. Objectives must describe clearly the desired results, in a well defined and focused way, besides must be stated why that objective is important, and how the company think to attain the intended purpose. A useful tip could be that of avoiding misleading or ambiguous phrases or to use action-oriented verbs that describe what actions need to be done.

- *Measurable*: The objective must be measurable because it will enable to know if the goal is reached, and to be measurable it should define an outcome that is related to a number, frequency or percentage. The organizations should be able to asses without any problem, whether will be able or not to reach the desired objective; therefore the firms must dispose of a measurement system that allow to keep track of the progresses, in order to understand if they are moving in the right direction during the implementation, and whether or not they have achieved the final goal.

- *Achievable* (originally Assignable, to specify who will do it): Objectives must be achievable otherwise if they are too much difficult or too simple to attain, they demotivate action; hence they must be difficult to reach but at the same time possible. When we aim to pursue a new objective, if the final goal and the parameters created are not realistic, we may be led to perceive a feeling of failure linked to the project. Several studies underlined the relation between goal difficulty and performance, stated that the

latter is directly proportional to the former, until a certain point (Mento, Steel, Karren, 1987). Objectives can be said to be achievable if are available enough resources to reach them and if similar results have already been achieved by other firms in analogous circumstances. The objectives should be tailored also to people responsible for their attainment, otherwise if are assigned to employees who are not willing to pursue them considering their personal skills, they are likely to lose enthusiasm and motivation.

- *Relevant*: Originally the "R" stood for "Realistic" to achieve given available resources, a concept almost identical to achievable mentioned earlier. Instead with relevant we mean the objective should be relevant from the organizational point of view, therefore coherent with the overall purpose of the company and the corporate mission; the relevance to the business activity is important in order to understand whether it is meaningful or not, to spend time and resources in its attainment. A relevant goal makes sense if it can be aligned with the business model, the strategy, the market, the customers and the sector to which the organization belongs.

- *Time-bound*: It is necessary to establish a deadline by which the objective must be accomplished and this in turn contributes in making the objective measurable. The time frame may be weeks, months or even years, depending on the complexity of the objective itself, the important thing is that there is always a deadline, otherwise there is the risk to not devote the right attention and consideration to achieving the results. Setting a deadline is a good way to create the sense of urgency, motivation, and to prompt actions in people who are responsible for the objective, instead not having a deadline may reduce the motivation, and may result in failure to accomplish the goal or excessive delays. The time frame should consider not only the end date, but it should have also specific delivery or verification's dates, for the various steps identified in the planning process.

The MBO approach varies among different companies, in relation to the structure it assumes, how formalized it is in the organization, and to what extent subordinates are authorized to set their own goals. Indeed, there are situations where the MBO is well structured and formalized (specific review scheduling, precise formats with which to present objectives and measures to allow for review and debate, set evaluation techniques etc.), and others where it is very informal (the minority). To what extent subordinates are allowed to set their own goals depends on the type of business the company is involved in, because not always they have freedom and room for innovation.

Despite the type of MBO approach used in a company, this goal-based management system has several advantages, among which: to force employees to commit themselves to specific

achievement; to direct the attention of company's managers toward results; to align people in the organization with their skills, knowledge and educational experiences. Assigning tailored objectives to employees, brings a sense of importance to them, thus enhancing loyalty toward the company, and increasing their desire to contribute; this is made possible by allowing them to feel that objectives are theirs because they contribute in formulating them, and by making clear how subordinates' tasks fit into the overall strategy (Thomson, 1998). Furthermore MBO facilitates the communication across all levels in the hierarchy, as managers and employees meet regularly, and this also improves relationships within the organization. Finally this management system helps managers to monitor and coordinate subordinates activities, knowing who is accountable for what and how the single parts fit together; in so doing management team can create objectives which may lead to company's success.

The MBO systems ideas about goal congruence, began to be put into practice during the sixties starting at General Mills, and due to the successful application there, MBO became increasingly popular in several industries during the 1960s and the 1970s (Dinesh, Palmer, 1998). Among the various firms which have used this system and praise its effectiveness, we can find renowned companies such as Hewlett-Packard (HP), DuPont, and Xerox.

2.2.2 Limitations of MBO and the emerging of Management by performance (MBP)

Initial success in organizations like General Mills, stimulated the introduction of MBO as managerial performance system during the sixties and seventies, but despite its goal of improving organizational performances thanks to goal congruence, the overall implementation was very disappointing. Indeed, the same companies that adopted MBO as a performance management system, afterwards claimed that it turned out to be an obstacle rather than a help (Van Tassel, 1995).

The failure of MBO may be due to two main reasons: according to an empirical study performed in the 1960s and 1970s, management teams who adopted MBO did not understand the core concept of the system, which is the goal congruence throughout the organization, indeed only a small part of managers stated goal alignment as a reason for using MBO; second the main reason why managers introduced the MBO, was for its use to evaluate performances, thus companies focused only on a step of the system, because they implement MBO just for performance appraisal purposes (Reddin, Kehoe, 1974).

Other surveys carried out in the nineties corroborate the choice of MBO as an appraisal system in specific areas of the company, it was especially used for individual appraisal of top

management (Poister, Streib, 1995). Further searches underlined as a key factors that led to MBO failure to work in practice, the lack of collaborative communication, and focus on human capital, in fact the focus was mainly on individual performance rather than on teamwork. However according to Odiorne this management system requires to consider employees as "people" and not as "labour", and also requires the passage from an autocratic vision of power to a more shared one (Dinesh, Palmer, 1998).

Because MBO's attention is devoted to the attainment of goals and objectives, one of its drawback is that it ignores factors such as work ethics, codes of conduct, social and environmental issues; furthermore if on one hand it does not consider the importance of the context in which goals are set, on the other it overestimates the importance of goal setting to achieve objectives, rather than the drafting of a systematic plan.

A risk of MBO is that it can be used improperly: indeed, although the system is built on communication between managers and employees, and personal development, it may lead to the superior putting too much pressure on the subordinate for achieving the goals in a define time frame. This may happen even to well intentioned managers, because they sometimes lack appropriate interpersonal skills or knowledge of human needs, so they end up misusing MBO, forgetting to stimulate commitment, effort, and management development.

Furthermore, several managers see the system as a total one, therefore they think that once introduced, it can handle any management problem; this has led to MBO being used on issues for which it is not equipped to deal with, and the resulting failures tend to nullify even the good results it may have (Thomson, 1998).

Among the main opponents of the MBO system, W. Edwards Deming argued that the setting of objectives such as production targets, may encourage workers to reach those targets through any possible means, including shortcuts that can lead to poor quality, or false representation of the achieved targets. Deming thought that a reward system like MBO, can drive superiors who are able to manage a work group, to strive mainly for the attainment of individual objectives; so there is the concrete risk that people in the organization focus their efforts on achieving goals, at the expense of operational business activities. Besides the MBO system put emphasis on short-term goals, focusing on sectoral efficiency, so preventing the company from pursuing its long-term strategic objectives.

In order to overcome MBO limitations, a new management style know as Management By Performances (MBP) has emerged, with which it is possible to have a systemic vision of the organization; indeed it allows for a real link between strategic objectives and operational activities. The MBP as a system allows to measure business results through the alignment of the latter with corporate strategy, also it identifies the financial as well as non-financial

performance measures, suitable in supporting decision-making consistently with the strategic objectives, and with all the improvement initiatives to be undertaken, in order to fulfill the strategies themselves.

In general MCS should aim to develop, gather and provide financial as well as non-financial information throughout the entire organization; indeed both non-financial and financial measures leave a direct impact on the business, which needs to be monitored. The same is true for MBO and MBP, which comprise together with classic financial/economic measures, even non-financial ones, indeed financial ones alone are not enough to attain organization's long-term goals.

2.2.3 The importance of non-financial measures

Non-financial measures play an increasingly important role in evaluating companies' performance, because financial measures alone are not able to determine whether company's results are truly good or not; indeed improvements in financial results may depend on factors which are not related to activities of the company itself, such as: subsidies, regulations, new laws, or simply "creative accounting techniques".

An increase in firm's value can be pursued only if both stakeholders and shareholders' interests are satisfied, and non-financial indicators are usually the drivers behind good financial performances (Petersons, Kovaleva, 2009).

Non-financial measures have three main advantages: first they are better linked with long-term corporate goals, thus they lead to the alignment of strategy, and also help with the identification of strategy improvements; second non-financial measures concern intangible assets (e.g. human capital, consumer loyalty etc.), so they provide visibility of efficiency and effectiveness of actual operations; third because better financial performances based on cheating will result from non-financial measures, the latter help in identifying cheating in managerial actions aim to enhance short-term results, therefore are useful to improve the focus on long-term goals.

Given the recent push towards sustainability, more and more non-financial measures have to do with sustainability. Non-financial measures focus on customer perspective, internal business process perspective, and learning and innovation perspective, which are analysed by the balanced scorecard (a MCS tool), together with the financial perspective; the sustainability or the environment perspective can be implemented with the others through the balanced scorecard system.

The main drawback in using non-financial measures, is the absence of quantitative reliable data: indeed these measures are often associated with qualitative data, and given that there is no a

unified system for non-financial measures comparison, results' evaluation is subjective; also for this reason implementation of non-financial measures is usually expensive and takes a lot of time (this can be seen also using environmental performance measures).

2.3 The use of management control system to pursue environmental sustainability

As we seen MCS allow top managers to influence all people in the company to perform accordingly to organization strategies, this in turn lead to better economic long-term performance; however MCS could be useful also to enhance the environmental sustainability of companies.

There may be several reasons for a company to pursue environmentally sustainable practices, the major drivers are: financial benefits (reducing costs and generating profits), pressure from owners and shareholders, the use of environmental sustainability as a marketing strategy (to attract customers), legal requirements (Khatter, et al., 2021).

In different studies it has been documented how the use of MCS tools, such as the use of Environmental Performance Measures (EPM), leads to better environmental performance (Lisi, 2015), and therefore these tools are increasingly used recently by companies.

2.3.1 How MCS is useful to the cause of sustainability

The adoption of MCS by the firm is necessary in order to have an effective and efficient management, which leads as a final result to the achievement of good economic performance. Control systems have been developed in order to reach goal congruence, to align the structure, from an organizational and behavioural point of view, with economic objectives of the company, and to help pursuing an improvement in economic performance.

Since the last decades however a new paradigm has begun to emerge, according to which the company must not focus only on maximizing profits, but must also consider the other dimensions of sustainable development, namely the social and environmental ones. The firm must pursue not only economic goals, but also must set social and eco-efficiency objectives, to be integrated into its strategy.

MCS' tools and practices can push organizations towards sustainability, if used properly, indeed they play a key role in strategy-making, and help the implementation of strategy (diagnostic use) and the emergence of new ones (interactive use).

Given the limitations of traditional MCS in incorporating the interests of all stakeholders, in addressing social and environmental issues, and also their relations with financial issues (Bonacchi, Rinaldi, 2007), several internal sustainability accounting systems have been developed and exploited by companies (e.g., environmental budgeting, sustainability planning, environmental performance evaluation systems etc.).

Control systems which address social and environmental issues, take the name of Sustainability Control System (SCS), and are often considered as a separate sphere of MCS (Burritt, Saka, 2006). Instead SCS enable to integrate sustainability within organizational strategy only if are coupled with traditional MCS, and not used autonomously; if SCS and MCS remain separate, the former is decoupled from core business activities, and therefore is not able to reshape strategy (Gond, et al., 2012).

The strategic orientation towards sustainability depends on the type of configurations of MCS and SCS within companies; the possible configurations are "ideal-types", which are identified through the combination of the uses (diagnostic or interactive), and modes of integration, of control systems.

As already discussed, control systems are used diagnostically (or as "management by exception tools"), if they serve to correct people's actions in order to implement the intended strategy effectively; while are used interactively if they serve to focus attention on strategic uncertainties, in order to modify existing strategies creating new ones.

The integration of MCS and SCS is related to the degree of overlap between the two control systems, and encompasses three dimensions: cognitive, technical, and organizational.

- *Cognitive integration*: This dimension is crucial in order to integrate sustainability in organizations; a complete integration of regular and sustainability control systems should also lead to an overlap in shared cognitions, between managers involved in the strategy or control and those working on sustainability. MCS and SCS can be seen as communication platforms that increase opportunities for dialogue among people with different thoughts and practical viewpoints regarding sustainability issues.

- *Technical integration*: If SCS are run in parallel to regular MCS, decision-making process does not consider all the available information in the organization about economic, environmental and social data. The methodological integration of MCS and SCS is possible, and technical integration is based precisely on methodological connections, such as the presence of a common infrastructure which collect information for both types of systems.

- *Organizational integration*: Integrating sustainability into management control and strategy is linked to something people do, indeed organizational integration concerns actors' practices in relation to MCS and SCS. The organization can reach a certain level of integration, if it

defines the roles of actors and the formal organizational structure, in such a way as to improve the skills of accountants in sustainability reporting and control, and the skills of sustainability managers in financial accounting. The organizational integration is reached if people belonging to different part of the company, own similar skills in reporting and management control; therefore there are managers and accountants using both or different systems, that share a set of common practices.

These three types of integrations may co-exist within an organization and may reinforce or compensate each other in order to favour the link between MCS and SCS; besides integration in one dimension, usually leads to tighter connection on both the other dimensions (or on just one of the two).

According to Gond et al., the degree of integration of sustainability within company strategy depend on the various types of organizational configurations, defined by the use of the two control systems and their overall integration; the capacity to elaborate and pursue sustainability strategies, is different for each configuration or "ideal type".

What emerged is that loose coupling between MCS and SCS, as well as a diagnostic use of SCS, are associated with poor environmental performances. Indeed the best possible configuration, even if rare, it happens when both systems are used interactively and are highly integrated (so called integrated sustainability strategy), and has the capacity to enhance simultaneously the environmental, social and economic dimensions. This configuration corresponds to the highest level of sustainability implementation, and leads to long-term high performances in all the three dimensions of the TBL (Gond, et al., 2012). Furthermore, is a stable configuration because business strategy and sustainability strategy may eventually reinforce each other.

If on one hand the interactive use of both systems can heighten organizational performance on multiple dimensions, by triggering processes of changes and organizational learning, on the other hand a diagnostic use of the systems leaves little room for organizational learning and innovation; indeed a diagnostic use of SCS leads to low attention to sustainability and weak environmental performances.

The most frequent situation for a company is when the MCS and SCS are run in parallel (low decoupling), and only the MCS is used interactively. This happens when the development of SCS is driven by external pressures by stakeholders or legal entities, in order to report on social and environmental issues; usually it is seen in the early stages of sustainability integration, and there is the high risk to be perceived as greenwashing (Banerjee, 2008).

Moves across configurations can explain a change in the strategic orientation toward sustainability, and what is generally hoped for is a transition of companies towards an ever-

greater integration of sustainability in their strategies. The paths which lead to sustainability integration in strategy are dealing with processes of systemic integration, (in case the organization has to move from a low to a high integration level between MCS and SCS), and of strategic mobilization (from diagnostic to interactive use of the systems).

However, there are also some drawbacks in integrating sustainability in strategy, such as an exceeding economic rationalization of the sustainable strategy, or an excessive bureaucratization of sustainability management through increasing control systems (Gond, et al., 2012).

2.3.2 Difficulty in integrating environmental sustainability in MCS

Although many companies around the world have embraced the sustainability rethoric through their mission statements, discourse and external reports (Newton, Harte, 1997), in reality is not clear how they aim to achieve environmental targets. The weak attention devoted to MCS role in supporting sustainability within organizations may suggest that all these reports and statements are "facade elements", which hide the real interests of companies.

The environmental activities undertaken by organizations to attain sustainable goals may simply be greenwashing; this is the case when companies willing to meet environmental objectives do not change practices, and a discrepancy exists between the expected activities and the actual ones (Nishitani, et al., 2021).

For company willing to pursue environmental sustainability, environmental performance measurement and control systems may support the decision-making process, the coordination of managers, organizational learning, and may help in promoting goal congruence between single people and the organization as a whole (Arjaliès, Mundy, 2013); however several problems emerge.

The stakeholders who represent the drivers in implementing and sustaining environmental sustainability, play also a major role in creating barriers to the implementation; other barriers are represented by: time, lack of resources, expertise, no clear government policy, or the absence of short-term economic return and profitability (Khatter, et al., 2021).

Firms using environmental performance measurement systems may experiment commensuration and technical issues, which hinder their effectiveness (Lisi, 2015); if these performance measures are related to a reward system, given their low controllability and technical validity, they may have a dysfunctional effect (Virtanen, et al., 2013).

Furthermore, a well known issue specific of the environmental domain is represented by the challenging decision-making setting, where ethical motivations which are key, are often at odds with economic or financial considerations (Figge, Hahn, 2013).

Academic research on SCS is mostly aimed at the development of environmental or sustainability management accounting and control tools (e.g., environmental budgeting, sustainability balanced scorecard etc.), instead few studies considered the integration of SCS within MCS. It will be crucial to dispose of more studies about the interplay between SCS and MCS, and their contribution in pursuing a sustainable strategy, in order to overcome that these systems are run in parallel, and instead move towards a more integrated and dynamic use of the two, supporting the development of new business opportunities.

The integration of sustainability within regular MCS is tricky because it requires to align many technical, cognitive, and organizational factors.

An example of case study in which have been examined the relationships between the two systems is provided by Norris and O'Dwyer, they examined the control mechanisms of an English firm which had published environmental and social reports in the past. What emerged was that the environmental and social responsibilities results of the company were not formally measured, and that the firm itself was structured based on a marked informal approach (Norris, O'Dwyer, 2004). The dominant influence of informal controls systems (e.g., social and self-controls), favoured a high level of awareness with regard to social responsibility objectives among managers, but it also created problems in achieving those goals, because sometimes they were not reflected and included in formal control mechanism.

The strategic plan was aimed at follow social responsibility practices, but it did not refer to how these were to be achieved. Indeed, the company had not defined clearly social responsibility objectives, and this in turn had contributed in increasing the difficulty of sustainability integration within control systems, and also in creating confusion in how to measure and monitor progresses. This was the typical situation where the external report was done more for favourable advertising than for real company's interest in sustainability.

2.3.3 MBO for realising sustainable development

Performance management and measurement systems can play a key role in integrating economic and environmental objectives within company's strategy, spreading the principles of sustainability to the whole company. Indeed a well-defined performance measurement system can help managers in formulating economic, social and environmental goals, and allows to

achieve a greater understanding of performance linked to sustainability, and its business impact on stakeholders' expectations.

Firms implementing environmental management control systems (EMCS), which are mechanisms designed by managers within the organization to guide desirable activities in the environmental field, normally enhance their environmental performances. When companies incorporate also sustainable goals into their business targets, this allows them to improve their environmental performances even further, at least regarding waste production and resource efficiency (Nishitani, et al., 2021).

In order to integrate CSR issues within the company strategic management, it is required that companies set long-term objectives which include social and environmental aims (Prado-Lorenzo, et al., 2009). This is made possible if the CSR Manager or the Head of the Environmental Management is involved in the decision-making process and in the organization's strategic planning (Strand, 2013), aside from moving from a passive to a proactive approach toward sustainability.

In order to have an efficient integration between sustainability and strategic management (avoiding so just a formal adoption of sustainability practices), it is necessary that in addition to the definition of social and environmental objectives there is a continuous monitoring of these objectives, and according to Cordeiro and Sarkis, that their achievement is linked to managerial incentives or bonuses (Cordeiro, Sarkis, 2008). They found however that top managers compensation was explicitly linked to environmental performance only for the compliance and spill indices, not for the toxic emission indices, thus indicating potential greenwashing conditions.

The environmental objectives can be measured through quantitative or qualitative indicators, and their use imply a medium/long-term planning, since social and environmental issues usually required long-term timescale (Mahoney, Thorne, 2005); indeed sustainability indicators are ordinarily related to medium and long-term incentives such as stock options (Di Cagno, Venturelli, 2007), and not to bonuses for short-term performance objectives.

Research conducted on Italian listed companies determined however which are not needed hard incentives in order to promote the pursue of sustainability objectives, given that half of the companies analysed in that study did not include sustainability indicators in their reporting procedures (Mio, Venturelli, Leopizzi, 2015). Indeed according to past literature and some empirical studies, for the attainment of objectives in certain areas (like CSR), monetary incentives schemes are not needed, and instead their achievement depend on pre-existing intrinsic motivation of individuals (Frey, Oberholzer-Gee, 1997).

Therefore the conditions to fulfill in order to enhance the effectiveness of MBO use, are the following: goals must be clear and explicit, participation at all levels in the drafting and implementation of goals, distribution of responsibility, regular feedback of results in order to take corrective actions if needed. Nevertheless there are some shortcomings that may affect the efficiency of the environmental objectives system; the issues deal with imprecise objectives, difficulty to evaluate, and the absence of rules to solve goal conflicts.

First if objectives are imprecise, they are not sufficiently operational and so do not guide action sufficiently well; imprecise goals often emerged from negotiation and compromise with different competing opinions involved in the decision-making process.

Second the lack of precision may lead to objectives difficult to evaluate, and thus it becomes difficult to determine to what extent they have been achieved; besides goals evaluation is useful in order to understand whether the course of actions should be modified or kept.

Finally, must be taken into account actual or potential goal conflicts, which are common in environmental domain, and result in unclear priority-setting between different objectives.

Goal conflicts usually arise in multigoal systems, so organizations needed to dispose of rules and principles able to address these conflicts, and stating tangible objectives could be a way to identify conflicting activities.

2.3.4 How environmental objectives and targets are set

As previously stated objectives must be "SMART", so specific, measurable, achievable, relevant, time-bound, and also must be challenging; in this way they are not too easy to attain, but also not that difficult to reach, so they stimulate in the right way people to put effort in them.

Guidelines provided by ISO help us in defining better the procedures in setting environmental objectives and targets:

- The environmental objectives if appropriate, should be broken down and allocated to different people and business departments within the organization.
- Objectives are wider, related to organization or department, while the corresponding environmental targets are specific, and may also be divided in smaller contributions from individuals or groups.
- In the drafting and reviewing of objectives and targets, the organization should consider several aspects, such as the legal, financial, operating requirements, the significant environmental aspects (concentration on activities and products with high environmental impacts), technological options, and views of interested parties; the

environmental objectives must be technologically achievable, practical considering the available budget constraints, and consistent with operational strategy.

- Full participation by "stakeholders" is strongly recommended, indeed those responsible for achieving the objectives and targets should intervene in setting them.

- Involving interested parties through surveys or other means, could help shape environmental management plans and the objectives.

- The firm has to deploy the correct amount of resources to allow employees to reach objectives; resources must be reviewed regularly to ensure continuing priority and relevance.

- The environmental objectives and targets must be documented/recorded, manually or electronically, and kept up to date.

2.4 The dimensions of goal ambiguity

To integrate environmental issues within the strategy, as well as in the control systems, it is necessary for a strategic, comprehensive and integrated implementation of sustainability principles; however, it is not clear how companies try to pursue environmental sustainability.

Setting SMART goals, as we already seen, may be a good way to stress the importance of environmental sustainability for the company, and helping it to achieve those goals.

To introduce sustainability theme within the company's strategic objectives, is a prerequisite for internal development of an effective development process towards sustainability management. It is important that sustainable development objectives are clear, concise and possibly expressed in measurable terms, in order to asses if they have been achieved, otherwise we can have an ambiguity situation related to the integration between sustainability and control systems.

Typically, the organizational goals of a company are expressed through its corporate mission, and are then made practical by defining more specific objectives and guidelines to be pursued to achieve them.

If usually hard to measure and vague goals were associated with public companies, some studies relying on managers' responses about whether their organizations have clear and hard to measure goals, found that even private companies have goal clarity problems (Chun, Rainey, 2005). Many organizations encounter difficulties in assessing the achievement of objectives, due to their vagueness; indeed according to various researches objectives are often vague, imprecise, difficult to measure, and multiple so in conflict with each other.

An organizational goal can be said ambiguous if it can be interpreted in various ways, indeed "*organizational goal ambiguity refers to the extent to which an organizational goal or set of*

goals allows leeway for interpretation, when the organizational goal represents desired future state of the organization" (Chun, Rainey, 2005, p.531).

However, the definition does not provide what characteristics the goals must have to be considered ambiguous; there is a lack of clarity about the relationships among goal attributes such as vagueness, complexity, multiplicity, conflict, specificity, measurability, and tangibility, therefore with goal ambiguity Chun and Rainey imply a general concept which involve all these seemingly interrelated goal attributes. Rather than elaborating on the concept of goal ambiguity, using these possible characteristics, they define different dimensions along which goals can be ambiguous. The dimensions are four and are dealing with: the communication of the reasons why the company exists (mission comprehension ambiguity), directing organizational activities (directive goal ambiguity), the valuation of performances (evaluative goal ambiguity), and decisions about organizational priority (priority goal ambiguity).

- *Mission comprehension ambiguity*: It refers to the amount of interpretive leeway that an organizational mission has, in the ability to understand, explain, and communicate the organizational mission itself (Daft, 1999). Organizational mission statements become more and more present in every type of company, implying that its comprehension can lead to better performances, while a high ambiguity of the same is linked to weak performances. Management of the company promulgate mission statements in order to increase the organization's legitimacy and employees' commitment, rousing a "sense of mission". Past studies about mission statements have analysed the clarity of the same, referring to the degree to which it is easily readable and understood (Campbell, Nash, 1992). Accordingly, mission comprehension ambiguity is related to the level of understandability of the mission statement; if the latter can be understood, explained, and communicated without problems, there will be less room for interpretation, and greater sharing on its meaning.

- *Directive goal ambiguity*: It refers to the level of existing interpretative leeway in translating the general goals of the company, into directives and guidelines for specific actions to be taken to pursue its organizational mission (Dess, Miller, 1993). Scholars consider the amount of interpretative margin in translating the organizational mission into concrete actions and behaviours as an important aspect of goal ambiguity. The relationship between directive goal ambiguity and company performances is twofold, on one hand there are those who view goal clarity in directing organizational activities as a key element in establishing accountability and meeting the expectations of stakeholders, on the other hand those who conceive it as an impediment for the process

of learning through trial, and to flexible changes due to environmental shift (Berman, 1978). Strategic goals are long term goals, therefore to be achieved they require a coherent definition of a system of short-term objectives, through which to guide managers' choices and to monitor results.

We incur in directive goal ambiguity when the terms used in goal statements are too vague and further specifications are needed to understand which actions are to be taken, so there is a lack of clarity in the guidelines and directives formulated to fulfill the organizational mission. Misunderstandings can arise already at mission level, when company's purposes are translated into general goals and directives, that can give rise to different possible interpretations, creating a directive goal ambiguity situation.

- *Evaluative goal ambiguity*: It refers to the level of interpretive margin an organizational mission or goal has in assessing progress towards mission's achievement; it tells us how difficult is to objectively evaluating progress towards organizational goals achievement. Companies need to translate the organizational goals and mission into performance indicators and targets, in order to correctly evaluate performances.

Evaluative goal ambiguity is usually negatively related to organizational effectiveness, indeed clear and measurable targets should enhance performances (Behn, 1991).

Companies differ in the extent to which performance targets can be described clearly, and if are available performance indicators which are valid and objective. There are organizations which express their performance targets in measurable and objective way, leaving little room for interpretation, while others may find difficult to define objective and quantitative performance indicators which are focus on outcomes, therefore they may use process indicators or workload instead of outcome indicators in assessing company performances (Grizzle, 1982). When organizations describe their performance targets in a subjective manner, this allows for more interpretative leeway in determining whether or not performance targets have been reached; evaluative goal ambiguity is therefore located at performance indicators and targets' level.

- *Priority goal ambiguity*: It refers to the amount of interpretive leeway in assessing the priority order among multiple objectives or goals. Priority order imply taking decisions on which goal should take precedence over others at a given time, or forming a hierarchy in which objectives are arranged vertically through means-ends relationships (Richards, 1986). Indeed in case of multiple goals, without prioritization and a clear defined hierarchy, many doubts arise as to which goal should take precedence, and which is the correct priority order.

Several existing concepts of the goal ambiguity literature are close to this dimension, such as the construct of goal focus, goal complexity or goal conflict (Lee, Locke, Latham, 1989).

Doing several things at once does not seem to be a good way to get results, instead companies should set goals priorities and stick to them, because priority goal ambiguity is indirectly related to organizational performance. This form of ambiguity is present when is not clear to employees which specific goals and task should be pursued prior to others, in order to fulfill the mission.

(Chun, Rainey, 2005)

In addition to these dimensions we must also think about the concept of goal conflict, although close to priority goal ambiguity, that is more likely in case of situations with multiple objectives. Goal conflict can happen at the same or at different hierarchical levels (Behn, 1991), and at the same level may assume two separate forms: direct and indirect conflict. We have a direct conflict whenever pursuing one goal directly inhibits achieving another (Lee, Locke, Latham, 1989), so represents a situation of explicit trad-offs; while an indirect goal conflict has to do with possible competitions in acquiring resources by different goals, for example if there is an imbalance between the available resources and the objectives to achieved, potential conflict could emerge.

In summary there is a situation of goal ambiguity whenever there is room for interpretation about the goal itself, and there is not a clear explanation of what is the future state desired by the organization.

There is a widespread consensus on the fact that the ambiguity of the objectives must be minimized, as unclear, not identifiable, and unmeasurable goals inevitably lead to poor business performance, as they do not stimulate employees to put effort into their operations.

This concept is connected to the "goal setting theory", according to which setting specific, measurable, clear and challenging goals improve productivity, thus better individual as well as organizational performance (Locke, Latham, 1990).

Goal ambiguity exists because goals often contain multiple subgoals that are linked to various attributes at the same time, some of which are difficult to measure, and it certainly represents a strong obstacle to the achievement of excellent performance; indeed employees are less able to understand the important information related to the goal, and as it loosens the responsibility towards goals achievement.

Ambiguity negatively affects performance management, because it leads to difficulties in evaluating company and individual performance; performance management which can be defined as "*systematic, regular and comprehensive capturing, measurement, monitoring and*

assessment of crucial aspects of organizational and individual performance through explicit targets, standards, performance indicators, measurement and control systems" (Diefenbach, 2009, p.894). Performance management systems can help stimulate performance, however in order to rely on results, rather than on input or processes, it is necessary to settle possible good results through the definition of clear goals. Therefore, the goal ambiguity problem must be solved in order to make performance management system efficient.

Chapter 3: Research questionnaire

3.1 Quantitative analysis questionnaire

The survey questionnaire is a measuring tool useful to gather information on the variables which are being investigated. We can distinguish between two types of questionnaires: quantitative, and qualitative questionnaires. If on one hand the qualitative ones are good for describing the issues investigated, providing impressions and point of view, a quantitative research (the one chosen in the present thesis), helps to have a general view of the phenomena under study; a quantitative questionnaire aims to objectively analyse the results, using measurements, thus statistical and structured data.

The questionnaire is structured in several questions which help to collect at the interviewee the information being investigated. This type of analysis is useful because it is possible to obtain a homogeneous classification of the data collected, indeed the model is uniform for each interview, and it allows to ask always the same questions, in the same sequence to all the interviewees. The questions must be clear and simple, in order to allow everyone to understand and to answer accurately and in a tamely manner; besides the content of the questions must make it possible to meet the research objectives.

The questions may be of two different types, and should be chosen based on the needs of the respondents and the researchers: open questions and closed-ended ones. For open questions researchers do not provide any answer modalities, therefore there is no constraint on answers, and is given to interviewees a free-form answer. Closed questions (or pre-coded) are simpler and less demanding both for the interviewee, who must choose as part of what was already predetermined in the questionnaire setting phase, and for the data processing.

A special case of a closed question is when you ask the interviewee to position themselves along a sequence of responses, graduated according to a precise criterion. This type of closed question is called "scale", and it can consist of numeric response options, that allow for a better quantitative analysis of results, or it can be a scale based on verbal response options (such as strongly disapprove, disapprove, neutral, approve, strongly approve), concerning a variety of opinions on a topic; the latter has the advantage of easier understanding by any interviewee.

A scale with many levels allows for greater precision in the results, and it is also more valid, however such a scale leads to severe problems of clarity and interpretation by the interviewee. On the other hand a scale with a low number of levels has the advantage of being clear and easier to interpret, but does not provide adequate precision and sufficient detail of results.

We adopted a Likert scale, so called because of its creator, the American social scientist Rensis Likert, who did it in 1932 in order to develop a new tool, more simply than others, useful for measuring opinions and attitudes with a larger degree of nuance than a binary question like "yes/no". Likert scales are widely used because are easy to structure and represent one of the best ways to get reliable opinions, behaviours and perceptions (Likert, 1932).

A Likert scale, usually referred to as a satisfaction scale, may be a 5- or 7-point ordinal scale, which ranges from one extreme attitude to another, and includes a neutral or moderate option within it. A Likert scale consists of a series of statements about attitudes that are to be analysed; the aspect of the one-dimensionality of the attitudes under investigation is important, in fact the statements used must refer to the same concept, therefore they must reveal the same attitude. Each respondent is asked to answer expressing his/her degree of agreement or disagreement with each statement, choosing between 5 or 7 answer modalities, that in the original version defined by Likert range from: strongly agree, agree, uncertain, disagree, and strongly disagree. To each answer modality is then assigned a score (5, 4, 3, 2, 1 or 4, 3, 2, 1, 0); the (average) sum of the scores on each individual's responses on the entire battery of questions represents the individual's position on the concept under investigation (for this reason the Likert scale is an additive scale). The response modes are ordered along an underlying continuum that expresses the orientation of the attitude and of the answers given, therefore the attitude is considered as a continuum. It is also important to note that in Likert scales it is supposed that the response categories are equidistant, that is it is assumed that the distance between "strongly agree" and "agree" is equal to that between "strongly disagree" and "disagree", like this as compared to the "uncertain" category.

Finally, we must emphasize that the questionnaire can be administered either by direct interview, therefore with the direct involvement of the interviewer, or by an online survey; with this second method the interviewer is absent but interactivity is guaranteed by the platform.

3.2 The drafting of the questionnaire administered

Correct preparation of the questionnaire is crucial to ensure that the questions and scales are correct and arranged according to an efficient and effective structure, besides the sequence in which the questions are asked is also an important aspect to keep in mind, given that it can greatly influence the response rate.

The questionnaire includes a series of questions not strictly related to the research topic, aimed at obtaining an additional level of detail on the interviewee and on his/her company.

These questions involve the following topics: the country from which they answer, the organizational position covered, respondent's educational level, and work experience in the current position; the questions were all open-ended, except the closed one on the educational level (possible options: Master degree/doctorate, Bachelor degree, High School). These questions were helpful in understanding the level of knowledge and familiarity of the interviewee with business processes and corporate culture.

It was also asked if the company has EMAS/ ISO14001 certifications since at least three years (binary question, yes or no), in which sector it operates (multiple choice questions), and how many employees it has (open question); these variables allowed us to categorize the respondent companies.

Furthermore, there is one question where is asked the extent to which each of the following stakeholders (regulators, customers, local community, labor unions, environmental interest groups, and trade associations), influence the environmental choices and activities of the organisation.

The rest of the questionnaire aims to analyse the process of defining and measuring corporate environmental objectives, assuming that the definition of environmental objectives is an important management control tool capable of empowering the company structure and improving environmental performance, towards greater corporate sustainability.

Given the importance of safeguard and protection of the environment by organizations, the survey aims to investigate the relationship between the definition of environmental objectives, their difficulties, and environmental performance.

In this regard the following variables were identified and analysed:
- Ambiguity in understanding the environmental mission;
- Ambiguity in the definition of environmental objectives;
- Ambiguity in the assessment of environmental objectives;
- Ambiguity about the priority of environmental objectives;
- Flexibility of environmental objectives;
- Difficulty of environmental objectives;
- Environmental performance

These variables may be divided in three separate clusters, which define three distinct themes of investigation. The first four refer to the goal ambiguity's theme in its four interpretations, discussed in paragraph 2.4 (mission comprehension ambiguity, directive goal ambiguity, evaluative goal ambiguity, priority goal ambiguity). The fifth and sixth variables refer to two characteristics of organizational environmental objectives. Finally the last one refers to

environmental performance, even if it will subsequently be divided into two sub-variables (managerial environmental performance, and operational environmental performance).

For studying the variables under examination, statements taken from existing questionnaires were used as far as possible; in some cases it was necessary to create them from scratch.

- In order to analyse the **first variable** about **ambiguity in understanding the environmental mission**, the following question was asked, according to a 1-5 Likert scale: "*To what extent do you agree/disagree with the following aspects concerning the mission of your organisation*"; and the following statements, based on one of the scales of measurement developed by Journeault (2016) for the analysis of environmental management control, have been adopted:

  • Our mission statement clearly communicates the firm's environmental value to our workforce;

  • It is easy to explain the environmental values and goals of this organisation to outsiders;

  • Our workforce is aware of the firm's environmental values and targets.

- In order to analyse the **second variable** about **ambiguity in the definition of environmental objectives**, the following question was asked, according to a 1-5 Likert scale: "*To what extent do you agree/disagree with the following aspects concerning your organisation*"; and the following statements have been adopted:

  • Environmental preservation is a major and formally goal (Banerjee, et al., 2003);

  • Environmental goals are formally assigned within the company's strategic planning process (Journeault, 2016 and Pondeville, et al., 2013);

  • Employees are formally supported in the achievement of the environmental goals and targets with adequate resources.

- In order to analyse the **third variable** about **ambiguity in the assessment of environmental objectives**, the following question was asked, according to a 1-5 Likert scale: "*To what extent do you agree/disagree with the following aspects concerning your organisation*"; and the following statements have been adopted:

  • There are formal meetings to discuss environmental performance results and objects achievement (Pondeville, et al., 2013);

  • Environmental objects achievement is linked to non-financial rewards (recognition, service awards, etc) (Tung, et al., 2014);

• Environmental objects achievement is linked to financial rewards (pay, bonuses, etc) (Tung, et al., 2014);

• Objective indicators, i.e. indicators whose information is available within the company information system, are implemented and used to evaluate the achievement of environmental objectives (developed based on the definition of Chun, et al., 2005);

• Subjective indicators, i.e. indicators whose information is collected through specific surveys and analyses, are implemented and used to evaluate the achievement of environmental objectives (developed based on the definition of Chun, et al., 2005);

• The environmental results obtained are compared with the environmental results of other companies.

- In order to analyse the **fourth variable** about **ambiguity about the priority of environmental objectives**, the following question was asked, according to a 1-5 Likert scale: "*To what extent do you agree/disagree with the following aspects concerning your organisation*"; and the following statements have been adopted:

• Environmental objects are weighted on par with economic objects (Journeault, 2016);

• Economic objects are much more important than environmental objects;

• The pursuit of short-term environmental objectives does not contrast the pursuit of the other company objectives;

• The pursuit of medium/long-term environmental objectives does not contrast the pursuit of the other company objectives.

The Likert scale used for these first four variables, ranging from totally disagree to totally agree, is an inverse Likert scale, therefore higher values in these variables correspond to situations with less ambiguity.

- In order to analyse the **fifth variable** about **flexibility of environmental objectives**, the following question was asked, according to a 1-5 Likert scale: "*To what extent do you agree/disagree with the following aspects concerning your organisation*"; and based on the work of Arnold and Artz (2015), the following statements have been adopted:

• Environmental targets are updated on a regular basis (e.g., monthly or quarterly) to a new business environment;

• Environmental targets are usually adjusted during the year to those circumstances that could not be foreseen at the time the target was drawn up;

• Usually, any change in environmental target levels during the year is not tolerated;

• There is a continuous monitoring to assess whether environmental targets are still realistic or have to be changed.

- In order to analyse the **sixth variable** about **difficulty of environmental objectives**, the following question was asked, according to a 1-5 Likert scale: "*To what extent do you agree/disagree with the following aspects concerning your organisation*"; and based on the work of Arnold and Artz (2015), the following statements have been adopted:

• Environmental targets levels for the business units are only achievable with maximum effort;

• Environmental targets level difficulty can be considered as very high;

• Achieving environmental target levels requires extensive skills.

- The **seventh variable** about **environmental performance**, was divided into two sub-variables, which are managerial environmental performance, and operational environmental performance. The former refers to how company management deals with environmental issues, that is, not how resources are managed, but concerns the impact that environmental management has on the company. The latter, on the other hand, refer to the operating performance achieved by the company in the environmental field, therefore they deal with environmental protection, containment in the production of waste etc., analysing how environmental resources are used.

In order to analyse the **managerial environmental performance**, the following question was asked, according to a 1-5 Likert scale (ranging from Not at all, to To a great extent): "*Please indicate the extent to which your organisation has achieved each of the following environmental performance in the last three years, PLEASE DO NOT CONSIDER THE COVID PERIOD*"; and based on the work of Tung et al. (2014), the following statements have been adopted:

• Reductions in the costs of regulatory compliance;

• Reductions in the time taken to respond to environmental incidents and minimizing their impact;

• Reductions in the costs associated with cleaning up environmental damage;

• Reductions in the fines paid and remediation costs regarding environmental damage;

• More effective and efficient decision making regarding environmental issues;

• Producing goods/services in a more environmentally conscious manner.

In order to analyse the **operational environmental performance**, the following question was asked, according to a 1-5 Likert scale (ranging from Not at all, to To a great extent): "*Please indicate the extent to which your organisation has achieved each of the following environmental performance in the last three years PLEASE DO NOT CONSIDER THE COVID PERIOD*"; and based on the work of Tung et al. (2014), the following statements have been adopted:

• Reductions in energy consumption;

• Reductions in water usage;

• Reductions in material costs due to the efficient use of material;

• Reductions in the levels of green house gas emissions;

• Reductions in other air emissions;

• Reductions in levels of waste.

(You can find the complete questionnaire in the appendix A for consultation).

3.3 The survey's administration stage

As already said, the questionnaire aims to investigate the definition, measurement of corporate environmental objectives, and how their ambiguity influences the environmental performance, through the seven variables mentioned above: ambiguity in understanding the environmental mission; ambiguity in the definition of environmental objectives; ambiguity in the assessment of environmental objectives; ambiguity about the priority of environmental objectives; flexibility of environmental objectives; difficulty of environmental objectives; environmental performance.

The survey is composed by 16 questions, which gravitate around these variables plus other topics not strictly related to the research, aimed at better classifying the interviewee and his/her company.

The reference sample is made up of 799 small and medium-sized European companies, regularly registered in the EMAS register. The companies have been selected based on whether or not they belong to the following sectors identified by the SIC code:

- 01-09 Agriculture, forestry, fishing

- 10-14 Mining

- 15-17 Construction

- 20 Food industries

- 21 Tobacco products industries

- 22-23 Textile and clothing industries

- 24-25 woodworking and furniture industries

- 26-27 paper and related industries

- 28 Chemical industries

- 29 Oil and coal industries

- 30 Rubber and plastic industries

- 31 Leather & leather products industries

- 32 Stone and glass industries

- 33-34 Metallurgical and metal products industries

- 35 Industrial machinery and computer industries

- 36-37 Electrical and electronic equipment industries

- 38-39 Various manufacturing industries

- 40-48 Transportation & Public utilities

- 49 Distribution of electricity, water, gas, related services

- 50-51 Wholesale trade

On the other hand, companies belonging to the following sectors were excluded from the research: retail trade, finance, insurance, real estate, services, and public administration.

The item "Other sectors" was also added to the survey, in order to allow those who could not identify themselves in one of the sectors mentioned above, to select an item. With the exception of the option "Other sectors", which was the most selected, thus demonstrating a lack of knowledge by respondents about the sector of competence of the company, the most selected items result: 01-09 Agriculture, forestry, fishing (8.70%); 30 Rubber and plastic industries (7.25%); 33-34 Metallurgical and metal products industries (7.25%). So we could assert that these are the sectors that, at least according to our survey, were the most sensitive to the issue of environmental sustainability.

Starting from 506 emails sent to European SMEs registered in the EMAS register, and 393 emails sent to Italian SMEs, respectively 64 for European companies and 36 for Italian ones, have not been forwarded successfully, both because some addresses were invalid, and because they were blocked by the company email system, thus arriving at a net sample of 799 organizations.

The research questionnaire has been administered to companies in January 2022, as follows:

For European firms, a first delivery was made on 4 January, while for Italian firms on 11 January; then for both, following this first delivery, a reminder was made on the 18 January.

The questionnaire was sent by e-mail to organizations, and was explicitly addressed to the CSR Manager or to the Head of the Environmental Management System, or the Quality, Safety and Environment Manager (QSA) of the company.

The responses received were collected through Survey Monkey, an online service that allows to create customized surveys, and analyse results.

The actual responses received were 70, but must be noticed that 63 of the answers come from Italian companies, therefore the response rate for them is high (18%), while given that only 7 answers come from European firms, the response rate obtained from them is 2%, which represents a very poor percentage based on other analyses carried out.

The answers to the questions useful in understanding the level of knowledge and familiarity of the interviewees with business processes and corporate culture, show us that the analysed sample has a good knowledge of company dynamics in the environmental field, and that they are reliable (see table 1 below for a brief summary). Indeed most of the interviewees cover an organizational role strictly linked to the management of environmental sustainability, such as: head of the environment department, QSA manager, HSE manager.

Furthermore, they have a high level of education on average, indeed more than half have at least a bachelor's degree (61% have a Master degree/doctorate), and they have quite high work experience in the current position (average seniority in the current role of 15 years).

In terms of size 76% of companies can be considered small (≤ 50 employees), and all fall within the 250 employees (the limit to be considered SME), with an average size of 37 employees.

The rate of companies which have EMAS/ ISO14001 certifications since at least three years it is incredibly high (97%), emphasizing once again the importance that environmental sustainability covers within SMEs analysed.

Educational level	• 61% Master degree/doctorate • 9% Bachelor degree • 30% High school
Work experience in current position	• 15 years
Average size	• 37 employees
EMAS/ ISO14001 certifications since at least three years	• 97% Yes • 3% No

Tab. 1: *Characteristics of respondents*

Chapter 4: Analysis

4.1 Descriptive analysis

The need to analyze objectives' ambiguity, as far as environmental management is concerned, is due to the fact that in order to achieve good environmental performance, a clear and precise definition of the environmental objectives is required. In defining the environmental objectives, however, there may be some cognitive and organizational barriers which may hinder a full integration of sustainability into the organizational strategy (Battaglia, et al., 2016); indeed, in order to correctly integrate sustainability within the organization there should be the alignment of several interrelated technical, organizational and cognitive aspects (Gond, et al., 2012). There may be: technical barriers such as the absence of a common information system within the broader system of management control, able to collect also social and environmental information, and the use of sustainability indicators within the performance measurement system (Battaglia, et al., 2014); cognitive barriers which are related to the people' thought about sustainability, indeed it could be difficult to have a common frame of reference among managers and employees; or organizational barriers such as a lack of discussion and analysis on sustainability topics among all the actors within the organization, due to poorly designed roles and formal structure of the company.

In this paragraph will be carried out a descriptive analysis of the results obtained from the survey, about the seven variables under investigation, which will be followed in the next paragraph by a correlative analysis between the ambiguity of the environmental objectives and the environmental performance. The analysis aims to demonstrate the level of ambiguity of environmental objectives for European SMEs, the difficulty in pursuing them, the flexibility in adapting them over time, and the environmental performance achieved by companies. The analysis will be useful in determining whether environmental sustainability is pursued by European small and medium-sized enterprises only at a formal level, or whether it is correctly implemented in management practices.

The first variable to be analyzed is the "**ambiguity in understanding the environmental mission**", which is composed by three statements or items. The analysis of this variable allows us to identify the amount of interpretive leeway that an environmental mission has, in the ability to understand, explain, and communicate the environmental mission itself.

The following table (Tab. 2) shows the values of the mean, the median and the standard deviation for each single item concerning the aforementioned variable, while the following

picture (Fig. 5) provides a graphical representation of the mean of the three items, and the total mean of environmental mission ambiguity.

	Mean	Median	Std Dev
Clarity of the environmental mission for employees	4.41	5	0.77
Corporate environmental objectives easy to disclose	4.04	4	1.01
Workers aware of corporate environmental objectives	4.26	4	0.85
Ambiguity in understanding the environmental mission	**4.24**	**4.33**	**0.88**

Tab. 2: Ambiguity in understanding the environmental mission
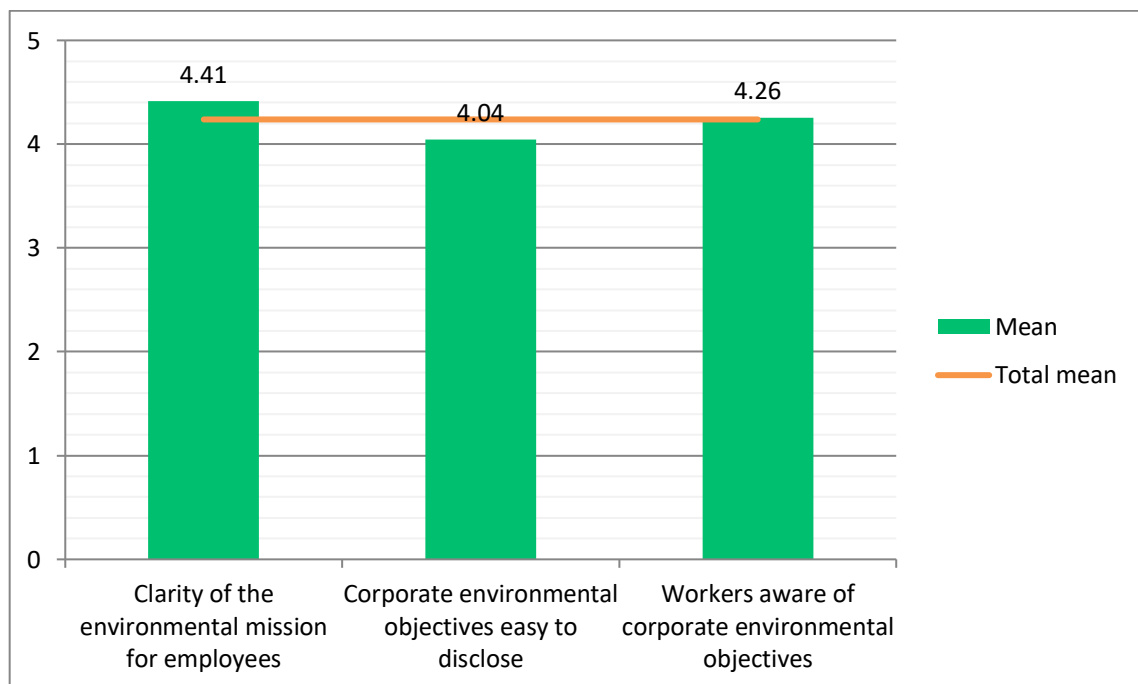
Fig. 5: Ambiguity in understanding the environmental mission

As already pointed out the Likert scale used for the variable referred to the ambiguity in understanding the environmental mission is an inverse scale, therefore a high value of the mean in this variable corresponds to a situations of low ambiguity.

The level of ambiguity in understanding the environmental mission in general is low, indeed we obtained high values in each item, even if with few differences.

The first item related to the clarity of the environmental mission is very high, it even results in a median of 5, meaning that more than half of the respondents state that they have a clear idea of the company environmental mission. However, if we go more specifically and address the issue of environmental objectives, we notice a greater ambiguity, albeit very limited.

The statement about how corporate environmental objectives are easy to disclose, is the one that implies a greater degree of ambiguity, even though 40% of the interviewees claim they totally agree that environmental objectives are easy to communicate. Even if satisfactory, a higher perceived ease in the disclosure of environmental objectives would lead to greater understanding by subjects external to the company, making the company more committed to sustainability in the eyes of stakeholders; moreover it would also increase awareness of people within the company, thus allowing them to channel their efforts and contribute to the achievement of these goals. However, the average level of awareness of corporate environmental objectives by workers is already high and in line with the total mean determining the ambiguity in understanding the environmental mission, indeed more than 85% believe that workers are well informed.

Since a good understanding of the organizational mission can lead to better organizational performance, a low level of ambiguity about the environmental mission should "theoretically" lead to good environmental performance; therefore the good understanding of environmental mission resulting from these data, it should suggest that European SMEs should be able to achieve above-average environmental performance.

The second variable to be analyzed is the "**ambiguity in the definition of environmental objectives**", which is composed by three statements or items. The analysis of this variable allows us to identify the level of existing interpretative leeway in translating the general environmental goals of the company, into directives and guidelines for specific actions to be taken to pursue its environmental mission.

The following table (Tab. 3) shows the values of the mean, the median and the standard deviation for each single item concerning the aforementioned variable, while the following picture (Fig. 6) provides a graphical representation of the mean of the three items, and the total mean related to the ambiguity in the definition of environmental objectives.

	Mean	**Median**	**Std Dev**
High importance of environmental objectives	4.79	5	0.48
Formal assignment of environmental objectives	4.41	5	0.75
Sufficient resources to achieve environmental objectives	4.43	5	0.69
Ambiguity in the definition of environmental objectives	**4.54**	**5**	**0.64**

Tab. 3: Ambiguity in the definition of environmental objectives
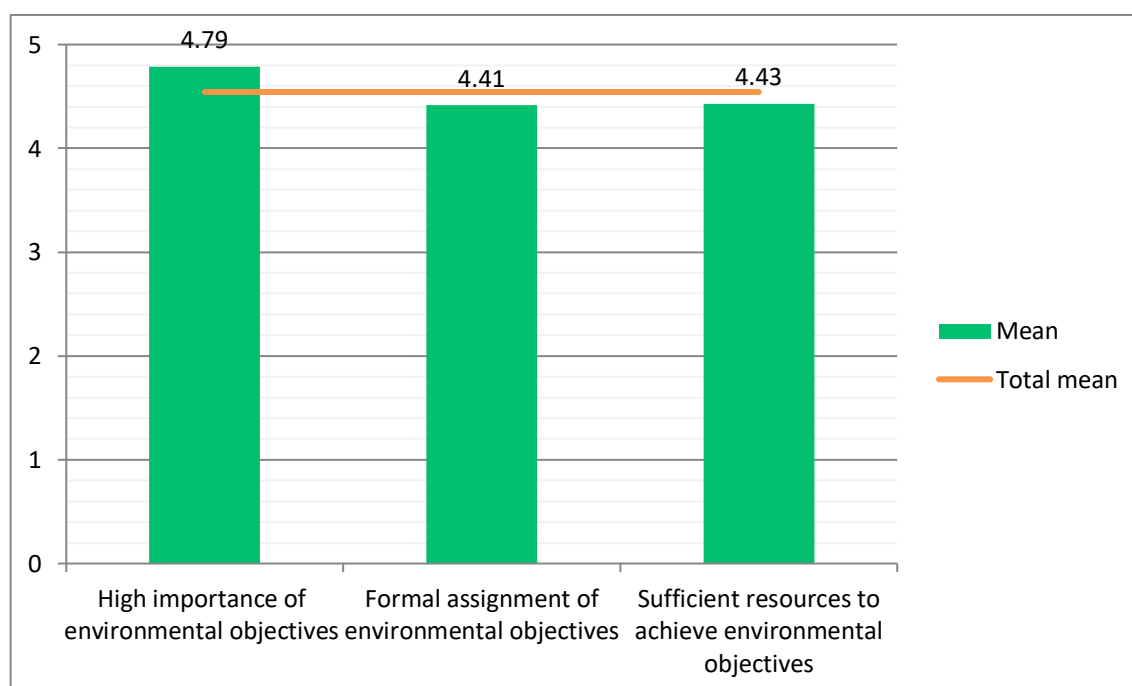
Fig. 6: Ambiguity in the definition of environmental objectives

As already pointed out the Likert scale used for the variable referred to the ambiguity in the definition of environmental objectives is an inverse scale, therefore a high value of the mean in this variable corresponds to a situations of low ambiguity.

The general level of ambiguity in the definition of environmental objectives is very low, indeed we got incredibly high value for each item, suffice it to say that the total median is equal to 5.

Furthermore the standard deviation is small for all the three items, so we can say that there is greater homogeneity, and that the mean is more reliable; indeed the more the standard deviation tends to zero, the lower the volatility of the data collected.

The answers gathered for the first statement which deals with the importance of environmental objectives, summarize the company's commitment to sustainability; more than the 80% of the respondents totally agree that environmental preservation is a major and formally goal for their organizations. Albeit less sharply, the other statements also lead toward a low level of ambiguity. Given the importance of environmental objectives, companies tend to assign in a formal way the environmental objectives within the organizations, and provide enough resources to reach them. This is demonstrated by the fact that for both other items, more than the majority of respondents totally agree that environmental goals are formally assigned in the strategic planning process, and that employees are supported with adequate resources in order to pursue environmental goals and targets. A low level of ambiguity in the definition of environmental objectives is essential to successfully pursue the implementation of sustainability within the company. The items analysed here relate to the discussion made in chapter two about setting "SMART" objectives, in fact it is important that the objectives should not leave room for ambiguity, they must clearly describe the needed actions to perform, and should also be relevant from the organizational viewpoint. Besides there must be enough resources available to achieve them (thus making them achievable), and they must be tailored to people responsible for their attainment, thus formally assigned within the organization. Above all it is important that environmental objectives are formally assigned, delegating them to different units or responsibility centres, and at the same time by allocating sufficient resources to reach them. This assignment of responsibility allows the company to pursue decentralization, which is the main driver of organization's need for goal congruence. The main purpose of management control system is precisely to ensure goal congruence, and to favour the decentralization process there is a need to delegate authority, provide sufficient material and formal resources, and assign accountability and responsibility for the quality of decision making.

The third variable to be analyzed is the "**ambiguity in the assessment of environmental objectives**", which is composed by six statements or items. The analysis of this variable allows us to identify the level of interpretive margin an environmental mission or goal has in assessing progress towards mission's achievement, seeing if the environmental mission is translated into performance indicators and targets.

The following table (Tab. 4) shows the values of the mean, the median and the standard deviation for each single item concerning the aforementioned variable.

	Mean	Median	Std Dev
Periodic control of environmental results	3.77	4	1.09
Link between environmental objectives and non-financial rewards	2.53	2	1.34
Link between environmental objectives and financial rewards	1.89	2	1.11
Use of objective indicators for environmental performance	4.14	4	0.89
Use of subjective indicators for environmental performance	3.37	3	1.28
Comparison of the results obtained with others companies	2.47	2	1.35
Ambiguity in the assessment of environmental objectives	**3.03**	**2.83**	**1.18**

Tab. 4: *Ambiguity in the assessment of environmental objectives*

As already pointed out the Likert scale used for the variable referred to the ambiguity in the assessment of environmental objectives is an inverse scale, therefore a high value of the mean in this variable corresponds to a situations of low ambiguity.

From a first glance we can see how in this case the situation is very different with respect to the two variables, on the environmental mission ambiguity, and the ambiguity in the definition of environmental objectives, previously analysed.

The following picture (Fig. 7) provides a graphical representation of the mean of the six items, and the total mean related to the ambiguity in the assessment of environmental objectives.
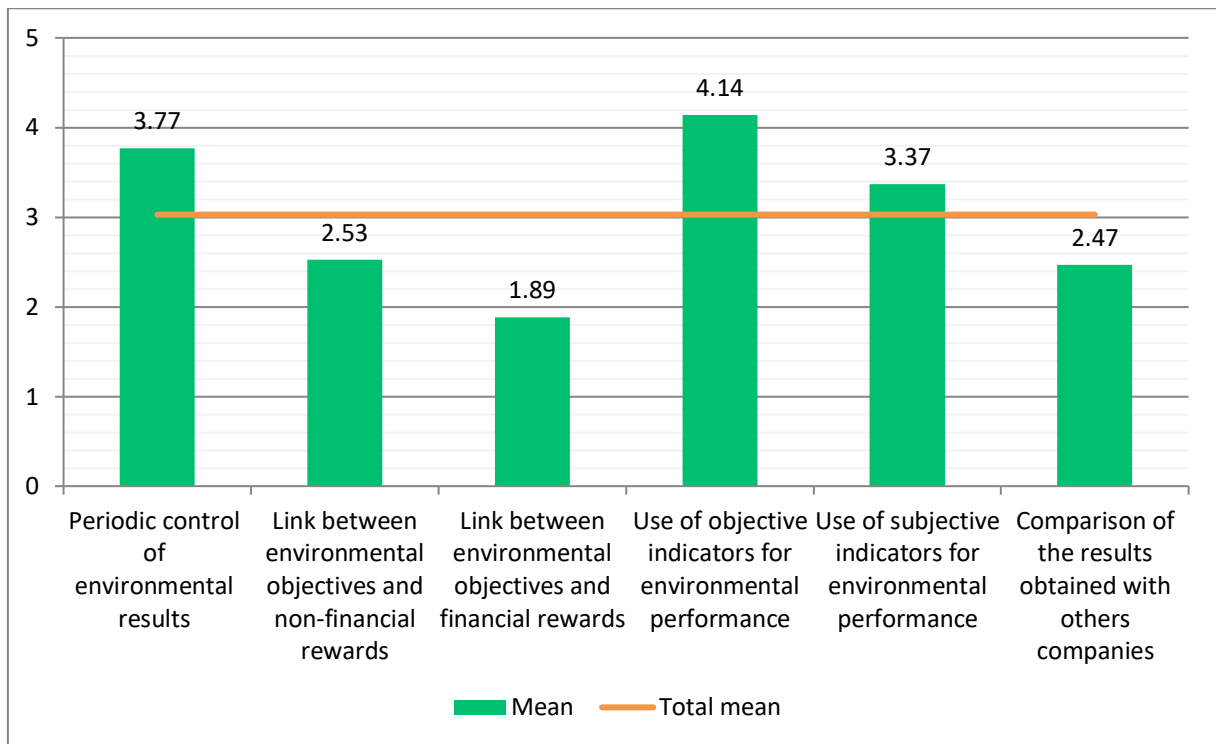
Fig. 7: Ambiguity in the assessment of environmental objectives

The level of ambiguity in the assessment of environmental objectives in general is medium-high, besides with respect to the first two variables analysed we have a greater variation, both between the answers for each item, and between the means of the items themselves.

If previously we have noted a fair assignment of environmental objectives at a formal level, this should be followed by an evaluation of the achievement of these objectives and an incentive mechanism, otherwise a medium-high level of ambiguity in the assessment of environmental objectives could lead to poor environmental performance.

Unfortunately, from the answers gathered about European SMEs, it seems that they carry out a periodic check of the environmental results, indeed the 67% of the respondents claim to do so, but there is not a link between environmental objectives and rewards; however it is important that objectives within an organization are measurable and linked to incentive systems, so that they stimulate employees to put their efforts into pursuing them. The fact that the sustainability's issue is not associated with both monetary and non-monetary rewards plays to the disadvantage of the company, in its aim to implement sustainability in management, discouraging virtuous behaviours of employees.

We can see from figure 7 that organizations slightly prefer to assign non-financial rewards to the achievement of environmental objectives, rather than financial ones, even if the latter probably tend to be more effective in stimulate commitment from employees. The means of the second and third items are very low, indeed a large part of the respondents state that they do

not use incentive systems (financial or otherwise), with regard to environmental results, and specifically almost 50% declare themselves totally disagree with the use of financial rewards as an incentive (as we can presume from the third column in figure 7).

A positive fact is that companies widely use objective indicators to check the achievement of environmental objectives and evaluate the performance obtained, indeed the average value attributed to the item on the use of objective indicators is high. On the contrary, responding companies seem to be less inclined to use subjective indicators, and this leads to less flexibility in the assessment of environmental objectives. In any case, the positive aspect in the greater use of objective indicators for environmental performance is that the latter leave less room for ambiguity, in fact they are measurable and allow to easily determine whether the environmental objectives have been achieved or not.

The last item of this variable contributes to create a medium-high level of ambiguity in the assessment of environmental objectives, indeed the majority of the companies investigated do not make comparisons of the environmental results with other companies. This is a weak point because comparison is needed to make continuous improvement and implement changes in the business practices, and a lack of comparison in the environmental field could lead organizations not to innovate and seek more effective solutions about the sustainability issue.

The fourth variable to be analyzed is the "**ambiguity about the priority of environmental objectives**", which is composed by four statements or items. The analysis of this variable allows us to identify the amount of interpretive leeway in evaluating the priority order among multiple objectives or goals.

As already pointed out the Likert scale used for the variable referred to the ambiguity about the priority of environmental objectives is an inverse scale, therefore a high value of the mean in this variable corresponds to a situations of low ambiguity.

The following table (Tab. 5) shows the values of the mean, the median and the standard deviation for each single item concerning the aforementioned variable, while the following picture (Fig. 8) provides a graphical representation of the mean of the four items, and the total mean related to the ambiguity about the priority of environmental objectives.

	Mean	Median	Std Dev
Equal importance of environmental and economic objects	3.57	4	1.04
Greater importance to economic objects	3.03	3	1.15
Short-term environmental objectives in line with other objectives	3.93	4	0.87
Medium/long-term environmental objectives in line with other objectives	4.06	4	0.82
Ambiguity about the priority of environmental objectives	**3.65**	**3.75**	**0.97**

Tab. 5: *Ambiguity about the priority of environmental objectives*
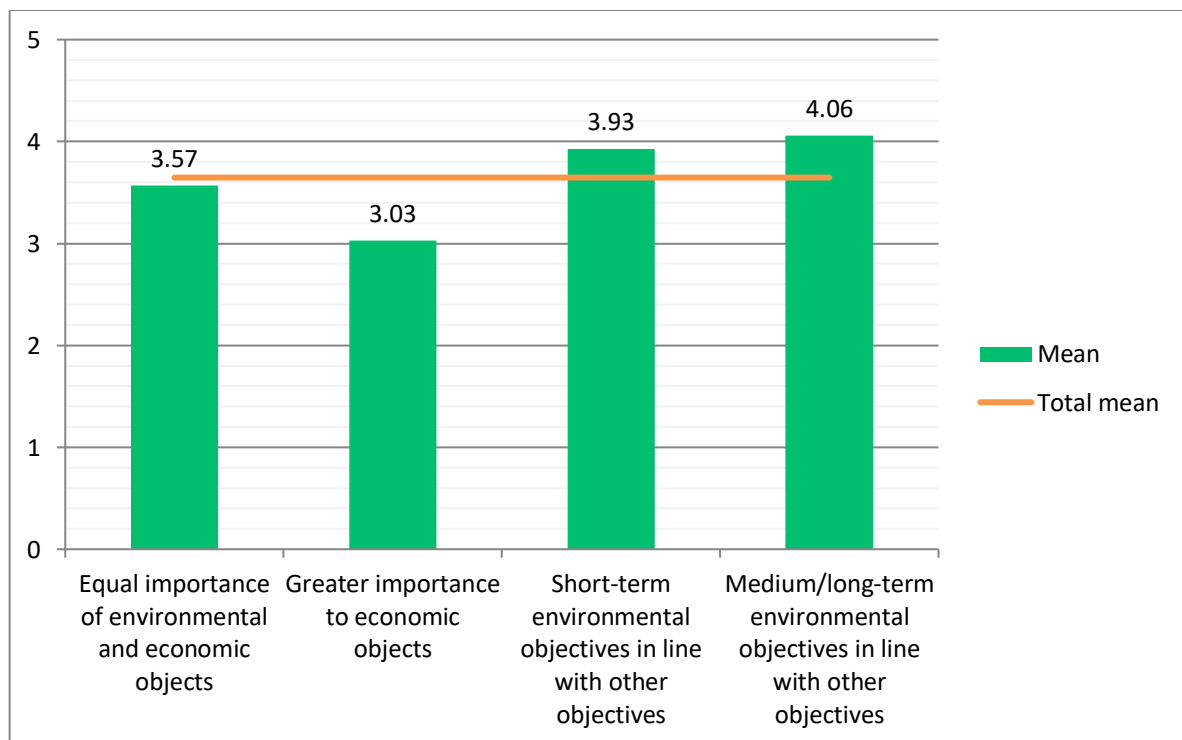
Fig. 8: *Ambiguity about the priority of environmental objectives*

The level of ambiguity regarding the priority of environmental objectives is medium-low, and given that the total mean is close to the total median, our sample of responses is quite homogeneous.

What stands out, looking at the graph in figure 8, it is the second item, which actually decreases the value of the total mean. It is a reverse item, normally used to see if there is coherence between the responses of the participants; indeed the first and second items deal with the same concept, that is the importance of economic objectives compared to environmental ones, and we would expect a certain basic coherence (not entirely verified in this case). Reverse items often require a greater cognitive load both for those who respond and for those who analyse the data, in fact in this case, in order to obtain a fair total mean of the ambiguity in the priority of environmental objectives, the score associated with the responses on the second item has been inverted, therefore: with "totally agree" the score was not 5, but 1, (to indicate greater ambiguity), while with "totally disagree" the score was not 1, but 5, (to indicate high importance on environmental sustainability and therefore a low degree of ambiguity).

The items relating to the priority between the economic and environmental objectives leave room to a certain amount of ambiguity (among other things, the variability of the answers given by the standard deviation is higher), indeed their means highlight how to environmental and economic objectives is not fully attributed the same importance.

On the other hand the items 3 and 4 leave little room for ambiguity about the priority of environmental objectives, and they are extremely important.

More than three quarters of the interviewees claim that both short-term environmental objectives and long-term ones, are in line with other objectives pursued by the company.

Having environmental objectives in line with the general ones of the company, allows to follow a coherent mission which is the basis of good corporate management.

It should also be noted that the medium / long-term environmental objectives are considered slightly more in line with the other objectives of the company than the short-term ones, even if the means are almost the same, around 4, which represent a situation with low level of ambiguity.

Therefore, being the environmental objectives in line with the others within the company, we can affirm that the importance given to environmental objectives by European SMEs is medium-high.

After having listed the first four variables relating to the ambiguity of environmental objectives, we can make a brief summary; here below in figure 9, are represented the average levels of ambiguity referred to each of the four variables, and the total mean.
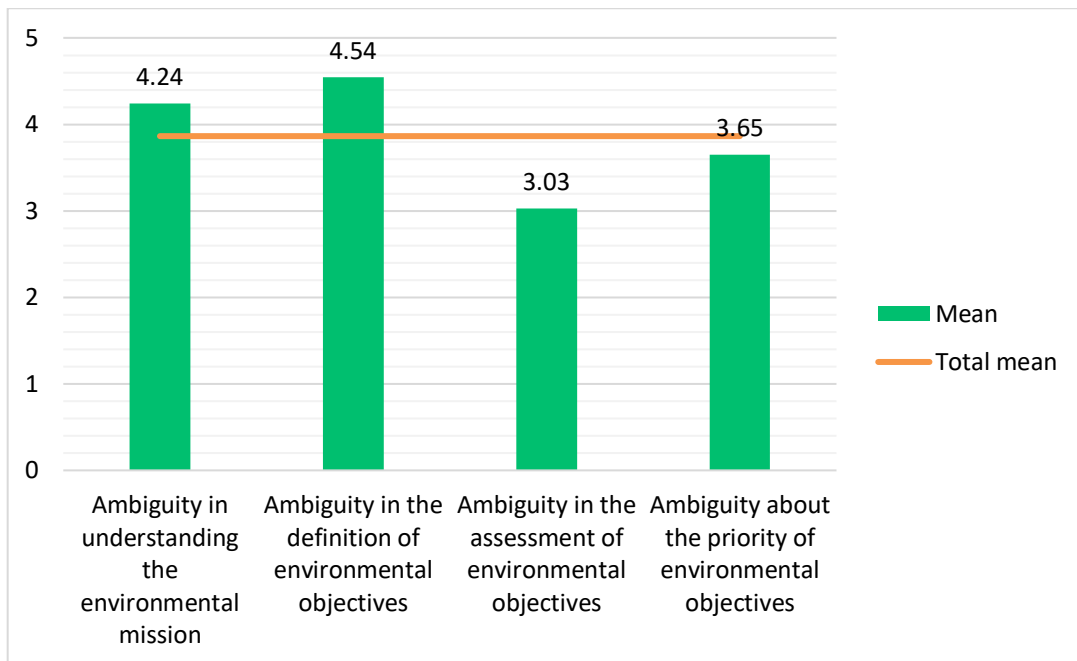
Fig. 9: Summary on environmental objectives' ambiguity

The total mean of the 4 variables analysed related to ambiguity in understanding the environmental mission, ambiguity in the definition of environmental objectives, ambiguity in the assessment of environmental objectives, and ambiguity about the priority of environmental objectives, is equal to 3.86, which in our Likert scale ranging from 1 to 5, explains a rather low level of ambiguity. The result emerges from a general situation where the ambiguity in the definition of environmental objectives, is extremely low, because the organizations make a formal assignment of these objectives to several responsibility centres, and provide the correct amount of resources to achieve them.

The ambiguity in understanding the environmental mission is also low, indeed the mission is very clear, even if companies do not think environmental objectives are completely easy to disclose.

Instead, the ambiguity about the priority of environmental objectives is medium-low, due to the fact that environmental objectives are in line with others, but not all the companies think that they have the same importance of the economic ones.

The only variable which shows a medium-high level of interpretative margin is the ambiguity in the assessment of environmental objectives, because environmental performance are usually not linked to financial and non-financial rewards, and even if most of the respondents claim to carry out periodic control of environmental results, they do not make comparison with similar companies, thus preventing an improvement in the processes and consequently in the environmental performance.

We can say that in general European SMEs are aware of the environmental mission and objectives, they know how to proceed, but there is a certain margin of interpretation in the valuation of environmental objectives and which objectives are to be preferred or not.

The fifth variable to be analyzed is the "**flexibility of environmental objectives**", which is composed by four statements or items. The following table (Tab. 6) shows the values of the mean, the median and the standard deviation for each single item concerning the aforementioned variable, while the following picture (Fig. 10) provides a graphical representation of the mean of the four items, and the total mean related to the flexibility of environmental objectives.

	Mean	Median	Std Dev
Periodic updating of environmental objectives	3.84	4	0.94
Ongoing modification of environmental objectives	3.53	4	1.10
Non-tolerability of any change in environmental targets level during the year	3.77	4	1.21
Periodic review of environmental objectives suitability	3.86	4	0.94
Flexibility of environmental objectives	**3.75**	**4**	**1.05**

Tab. 6: *Flexibility of environmental objectives*
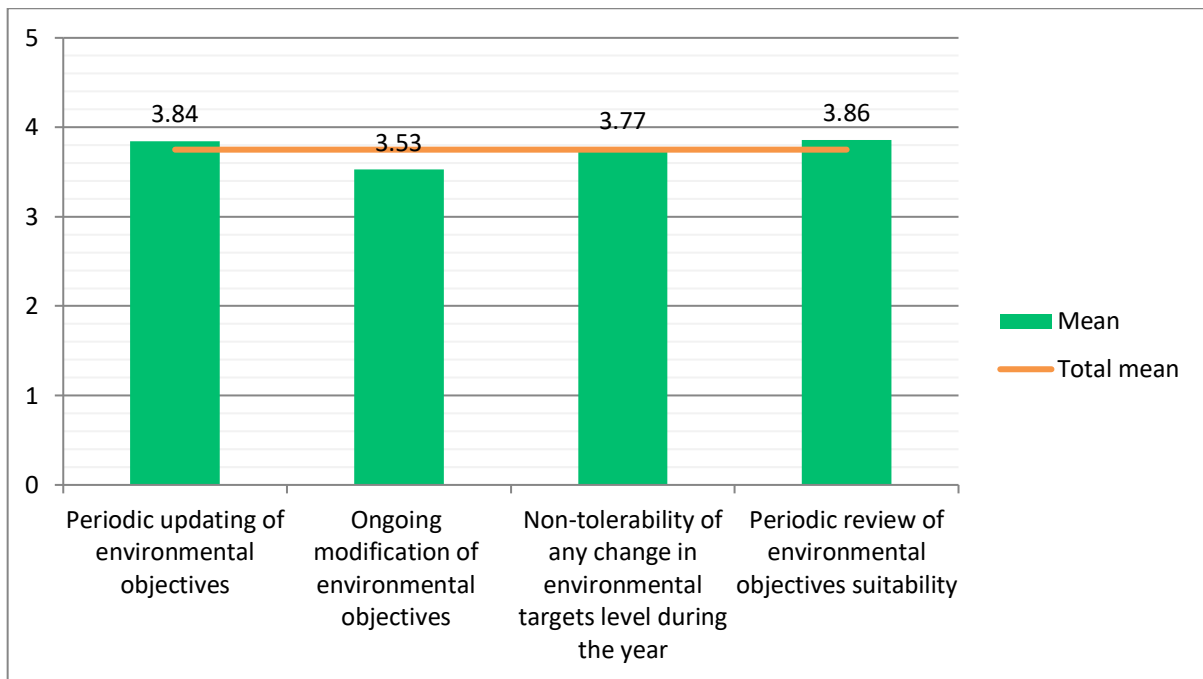
Fig. 10: Flexibility of environmental objectives

The total mean tells us that the flexibility of environmental objectives can be considered as quite high, and all the four items are close to it.

The responses received show us that between 65% and 70% of organizations carry out a periodic review of environmental objectives suitability, and periodic updating of environmental objectives. As we could expect at a medium-high level of verification and updating of environmental objectives, a medium-high level follows in the third item. Also, in this case it is a reverse item, so in order not to offset the total mean of the flexibility of the environmental objectives, the scores associated with this statement were reversed; indeed, if the other three items are constructed in such a way that a high score means high flexibility, this third item has a negative construction (non-tolerability), therefore high scores would indicate little flexibility. In any case, more than 80% of the interviewees say they are tolerable of any change in environmental objectives during the year, which supports the idea of flexibility and change.

It is important to check, periodically update and possibly modify the objectives of the firm in general, as it is thus possible to make them adaptable to internal and external conditions and therefore achievable, as well as challenging; in fact, obsolete or unattainable objectives tend to decrease the motivation and commitment of employees. However, although these aspects are also important with regard to environmental objectives, from the second item we note that companies are not entirely willing to modify existing environmental objectives: indeed if previously more than 80% of the respondents state in item 3 that they are tolerable of any change in environmental objectives during the year, with the second item about 55% say they are in favour of changing them during management, once established. However the mean of the third

item, which can be considered medium, is almost in line with the total mean of the flexibility of environmental objectives, which is barely greater.

The sixth variable to be analyzed is the "**difficulty of environmental objectives**", which is composed by three statements or items. The following table (Tab. 7) shows the values of the mean, the median and the standard deviation for each single item concerning the aforementioned variable, while the following picture (Fig. 11) provides a graphical representation of the mean of the three items, and the total mean related to the difficulty of environmental objectives.

	Mean	Median	Std Dev
Achievability of environmental objectives only with maximum effort	3.93	4	0.94
High difficulty to reach the environmental objectives	3.29	3	1.08
Extensive skills required for the achievement of environmental objectives	3.93	4	0.84
Difficulty of environmental objectives	**3.71**	**3.67**	**0.95**

Tab. 7: Difficulty of environmental objectives
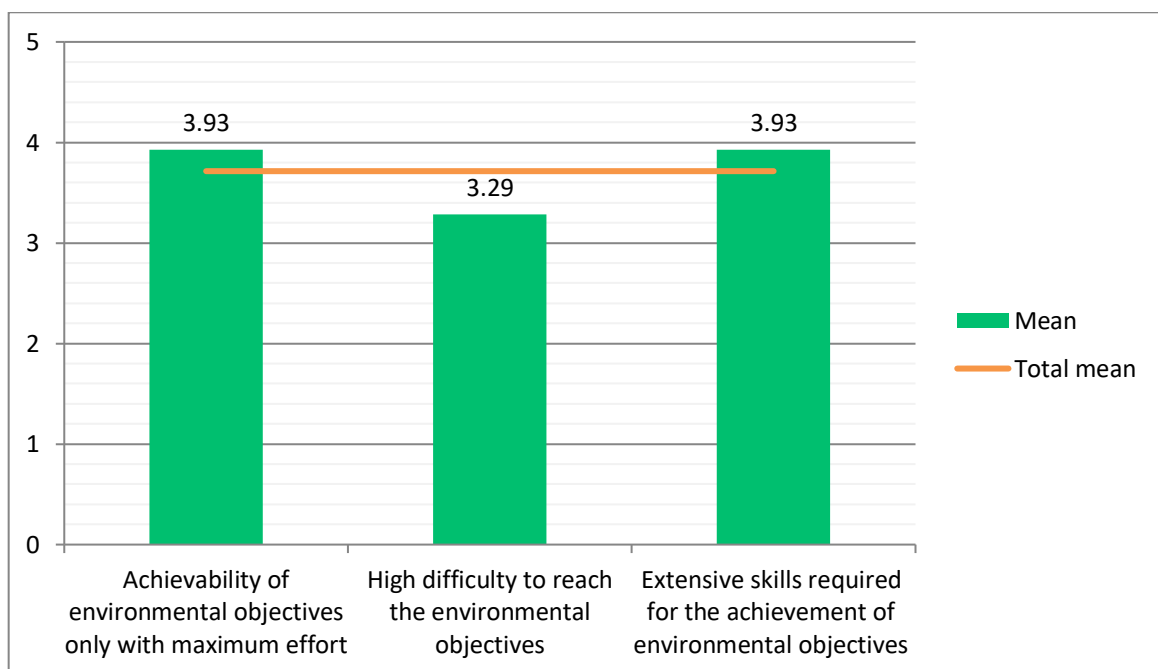
Fig. 11: Difficulty of environmental objectives

From the answers gathered, the difficulty of environmental objectives is perceived by European SMEs as medium-high. Analysing the three items used here, we notice that the vast majority of companies believe that the use of extensive skills, and of maximum effort, are essential for the achievement of environmental objectives; respectively just about the 5% of respondents, and 4% of them, consider that maximum effort, and extensive skills, are not required to attain environmental objectives. As already pointed out, it is important that objectives are challenging, and therefore require effort and skills.

The second item in which is asked whether it exists a high difficulty in reaching environmental objectives, show us a response rate in the middle, thus indicating a medium level of difficulty.

The total mean obtained in this variable is satisfactory, in fact there is a strong relationship, as already explained, between the difficulty of the objectives and the performance. Several studies found a significant positive linear relationship between goal difficulty and performance, until a certain point where the goals are perceived as too difficult to attain.

The fact that the difficulty in reaching environmental objectives is medium-high is perfect, because if they are too difficult, they are seen as unreachable, and the workers may be led to perceive a sensation of failure related to the project, and therefore do not put effort in it; on the other hand, if they are too easy to accomplish, they do not motivate employees anyway.

A medium-high difficulty in environmental objectives makes them challenging and as such capable of stimulating more action in people.

The difficulty' theme of environmental objectives is strictly related to the past variable of flexibility; indeed the latter concerns the continuous monitoring, updating, and modification of objectives by companies, in order to adapt them over time, avoiding that they become too difficult to achieve, and instead remain challenging.

The theme of investigation of the third cluster of answers deals with environmental performance, which are split in two sub-variables: managerial environmental performance, and operational environmental performance.

Managerial environmental performance, which refer to how corporate management deals with environmental issues, are analysed through six statements or items. The following table (Tab. 8) shows the values of the mean, the median and the standard deviation for each single item concerning the aforementioned variable, while the following picture (Fig. 12) provides a graphical representation of the mean of the six items, and the total mean related to the managerial environmental performance.

	Mean	Median	Std Dev
Reductions in the costs of regulatory compliance	3.09	3	0.99
Reductions in the time taken to respond to environmental incidents and minimizing their impact	3.82	4	0.89
Reductions in the costs associated with cleaning up environmental damage	3.80	4	0.92
Reduction of fines for environmental damage	4.16	4	0.95
Development of decision-making skills concerning environmental management	4.14	4	0.75
Production of goods/services in a more environmentally conscious manner	3.76	4	0.84
Managerial environmental performance	**3.80**	**3.83**	**0.89**

Tab. 8: Managerial environmental performance
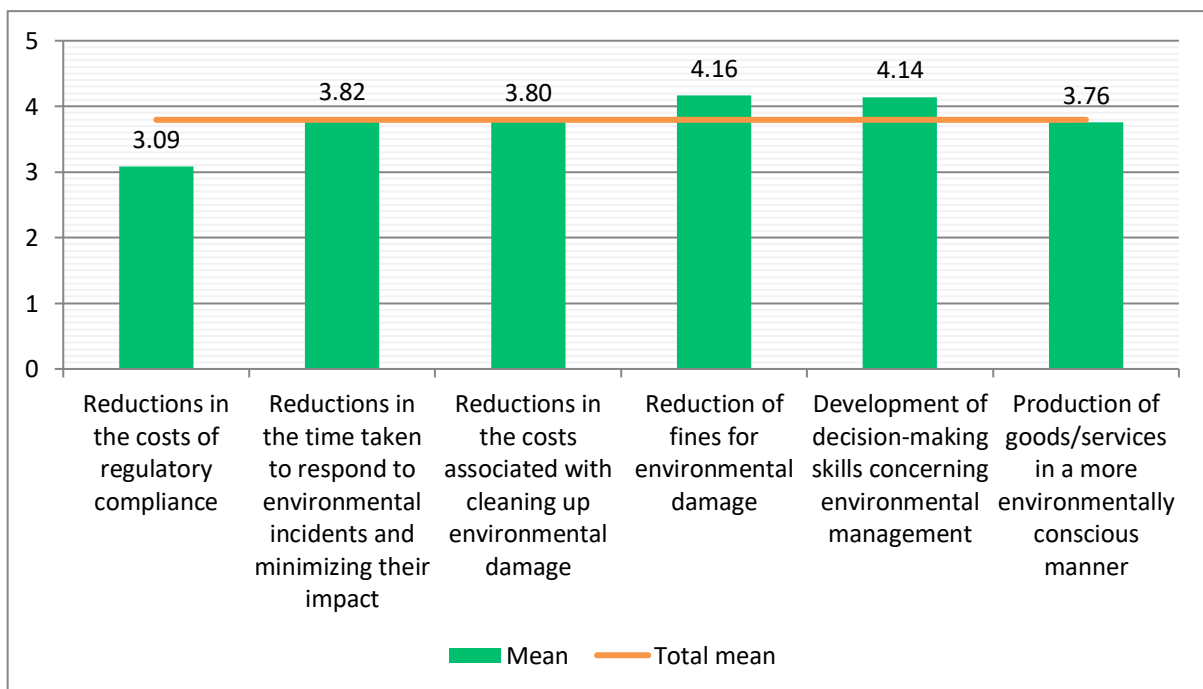
Fig. 12: Managerial environmental performance

The European SMEs demonstrate quite high managerial environmental performance, therefore in general the impact of time taken to respond to environmental incidents, of fines, and cost associated with cleaning up environmental damage are well absorbed by the company; besides we can affirm that environmental management has a positive impact on the company itself, and on the external environment.

The organizations are asked to respond the extent to which they achieved several environmental performance in the last three years (not considering the Covid period), and the item that certainly goes a little against the general trend is the first: in fact less than 6% of respondents say they have achieved reductions in the costs of regulatory compliance beyond expectations. In this regard companies should try to work harder, in order to make more efficient the process of regulatory compliance on environmental sustainability, from an economic point of view.

However, with the exception of this not entirely positive item, for the other performances in items 2, 3, and 4, at least 20% of the respondents stated that they reached them beyond expectations. The important data that we can extrapolate from the second item is that about 70% say they have minimized the impact of environmental damage, demonstrating how companies are increasingly concerned about safeguarding the environment for damage deriving from their activities. Also the items 3 and 4 are closely linked to the importance of protecting the environment by the company; in fact, in the last three years, the respondent firms have managed to make environmental damage's management less expensive, simultaneously reducing the costs associated with cleaning up environmental damage, and the costs of fines (for the latter, more than 40% say they have reduced the costs of fines for environmental damage). Another positive feedback is that most companies have produced goods and services in a more environmentally conscious manner in recent years.

All these good results are possible because organizations have been able to develop good decision-making skills in the environmental management field. The high value of the mean obtained in the fifth item suggests that both the managers and employees of the company have been empowered with respect to the issue of environmental management.

These very positive results only tell us the "formal" interest that companies have in environmental sustainability, in order to reduce the impact of wrong conduct; to see if this interest at the managerial level is also followed by actions in line with sustainable development by companies, however, it is necessary to analyse the operational performance obtained. **Operational environmental performance** are analysed through six statements or items. The following table (Tab. 9) shows the values of the mean, the median and the standard deviation for each single item concerning the aforementioned variable, while the following picture (Fig.

13) provides a graphical representation of the mean of the six items, and the total mean related to the operational environmental performance.

|	Mean	Median	Std Dev
Reductions in energy consumption	3.27	3	0.95
Reductions in water usage;	3.29	3	0.82
Reductions in material costs due to the efficient use of material	3.38	3	0.84
Reductions in the levels of green house gas emissions	3.67	4	0.83
Reductions in other air emissions	3.65	4	0.89
Reductions in levels of waste.	3.40	3	0.95
Operational environmental performance	**3.44**	**3.33**	**0.88**

Tab. 9: Operational environmental performance
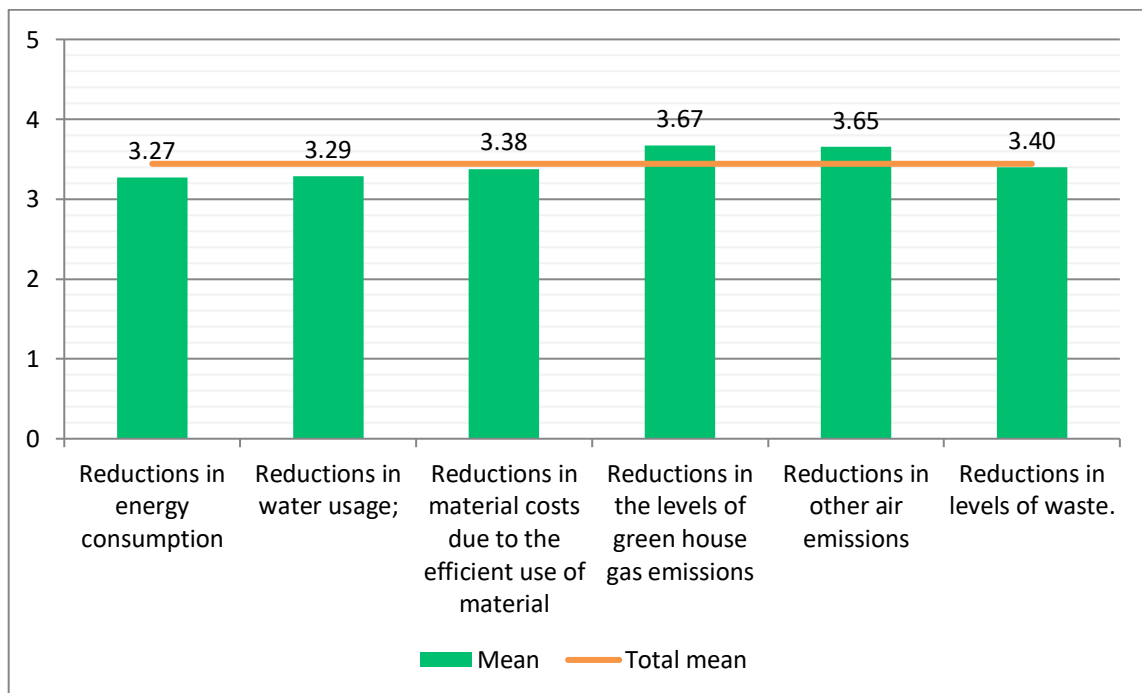
Fig. 13: Operational environmental performance

It results a medium level of operational environmental performance, where the values of all 6 items tend to converge towards the total mean. The results show that the companies interviewed managed to reduce the consumption of natural resources and emissions only partially. The best results in the last three years were obtained with regard to greenhouse gas emissions and other air emissions, in fact more than 60% of the companies responded positively to the fourth and fifth items; on the other hand reductions in material costs due to the efficient use of material and waste reductions were lower. Instead the levels reached with regard to energy and water consumption are not satisfactory, companies should pay more attention to reducing energy and water consumption, in order to also have economic benefits.

Comparing the managerial and operational environmental performance the picture that emerges is the following showed in figure 14.
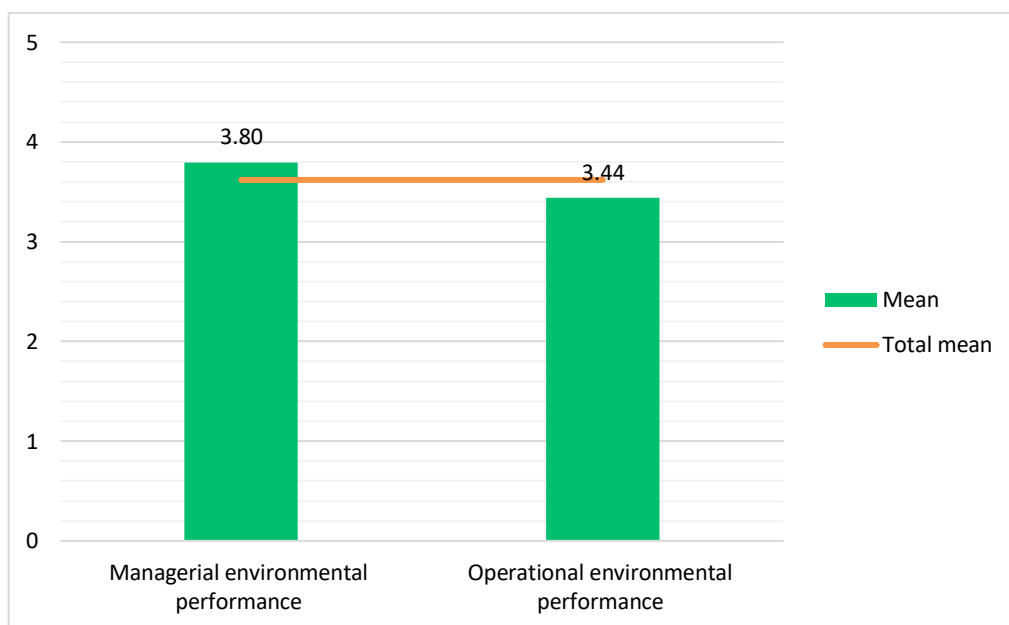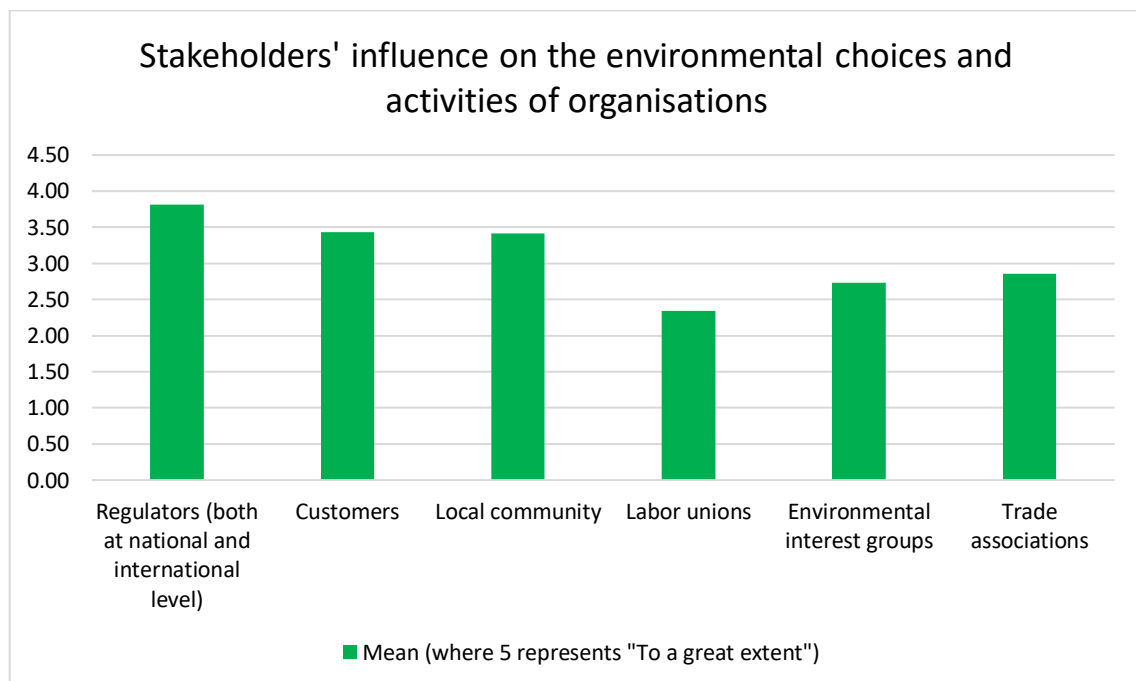

Fig. 14: Managerial and operational environmental performance

The European SMEs interviewed seem to put more emphasis at a managerial level, rather than taking concrete action at the operational level, and this is not in line with what would be expected to pursue sustainable development. The total mean could be considered quite acceptable, but the critical point is that operational environmental performance should be higher, and not lower as in this case, to show a real commitment in the environmental sustainability.

The point is that managerial performance are mainly linked to the company's internal policies towards sustainability, therefore attention to legislative and environmental regulations, in order to mitigate costs; it is essentially a sustainability undertaken at a formal level.

Therefore there is a possible risk of greenwashing, where companies declare themselves supporters of environmental sustainability, just doing the minimum and simply complying with the laws. This can also be explained by the answers obtained in the question regarding to what extent certain stakeholders influence the environmental choices and activities of the organisation, indeed from the data collected it emerges that stakeholders who most influence the definition of environmental objectives are primarily regulators (almost one person out of three indicates that they influence to a great extent), and later customers and local community (for both 57% of the respondents perceive an influence above the average from them); while it is very marginal the influence of labor unions, indeed just the 17% claims that their influence is above the average (Fig. 15).

Fig. 15: *Stakeholders' influence on organizations environmental choices and activities*

On the other hand, operational environmental performance refer to the operating performance achieved by the company in the environmental field, therefore they deal with environmental protection, containment in the production of waste etc., analysing how environmental resources are used. What matters is what companies actually do for the environment, in order to determine if they are actually moving towards sustainable development. For this reason operational environmental performance should be equal, or even better, higher than managerial ones, demonstrating that managerial sustainability policies are then effectively followed by concrete actions, capable of reducing pollution and the exploitation of natural resources.

However this is not our case, thus it seems European SMEs interviewed do not actually develop what they define at a formal level, regarding sustainable development.

4.2 Correlation analysis

After having conducted a purely descriptive analysis, in this section we wanted to investigate the relationship between the 6 variables analyzed previously and the two types of environmental performance.

In this paragraph I use the simple regression model, a statistical technique that use an explanatory variable to predict the outcome of a response variable. The general formula of the model is: $Y_i = \beta_0 + \beta_1 X_i + \varepsilon_i$, (i=1,...,n); where Y_i represents the dependent variable, β_0 is the constant or intercept, β_1 is the regression coefficient of independent variable 1, and ε_t is the error term. The analysis is conducted using the managerial and operational environmental performance as dependent variables, and the four dimensions of ambiguity, the difficulty, and the flexibility of environmental objectives as independent variables, in order to determine whether a higher score in the variables mentioned was associated with better environmental performance or not.

First, I computed the significance test for the regression coefficient associated with each independent variable, to determine whether the model fits the data well and whether the assumptions underlying regression analysis are met. The null hypothesis, i.e. that there is no relationship between the variables and environmental performance, and therefore that a variation in performance is not in any way connected to the other variables, but rather due to chance, was tested using the p-value. The significance level is defined as a value (P), and represents the probability that the null hypothesis can be rejected when it is true. The significance level is conventionally set at 5% (or 0.05), therefore a p-value of 0.05 will be used below. If the p-value is less than 0.05, thus getting very close to 0, it means low probability that the observed difference can be ascribed to chance, and therefore we speak of statistical significance.

In case of significance, I drew the scatter plots and computed the correlation coefficient "r" (or Pearson correlation index), which measures the force and direction of a linear relationship between two quantitative variables. The correlation coefficient r can assume values between -1 and 1. Positive values indicate the existence of a positive linear correlation; negative values indicate a negative correlation; the value 0 indicates no correlation. Generally speaking the closer the correlation coefficient is to 1 (in case of positive correlation), or -1 (in case of negative correlation), the better the correlation is.

In case of significance, I also computed the coefficient of determination R^2 for ascertain the goodness of fit; it expresses the variability in the dependent variable explained by the independent variable, that is R^2 represents the change in the values of y that can be justified by

the change in x. Following are the results of the relationship of each variable with the environmental performance.

- Ambiguity in understanding the environmental mission

By placing the mean of the ambiguity in understanding the environmental mission for each individual company as an independent variable, and the mean of the managerial environmental performance of each individual company as a dependent variable, the relative p-value was calculated. The p-value here is 0.069, therefore there is **no statistical significance**.

Although a higher score in the variable under consideration (therefore a lower level of ambiguity) should lead to better environmental performance at an operational level, the p-value of the relationship between ambiguity in understanding the environmental mission and operational environmental performance is still higher than 0.05; it is 0.083 therefore there is **no statistical significance**.

- Ambiguity about the priority of environmental objectives

By placing the mean of the ambiguity about the priority of environmental objectives for each individual company as an independent variable, and the mean of the managerial environmental performance of each individual company as a dependent variable, the relative p-value was calculated. The p-value here is 0.19, therefore there is **no statistical significance**.

Then using the mean of operational environmental performance for each company as dependent variable, the p-value is 0.53, therefore there is **no statistical significance**.

- Ambiguity in the assessment of environmental objectives

Even if evaluative goal ambiguity is usually negatively related to organizational effectiveness, indeed clear and measurable targets should enhance performances (Behn, 1991), the relationship between valuation ambiguity and environmental performance are not significant.

By placing the mean of the ambiguity in the assessment of environmental objectives for each individual company as an independent variable, and the mean of the managerial environmental performance of each individual company as a dependent variable, the relative p-value was calculated. The p-value here is 0.10, therefore there is **no statistical significance**.

Then using the mean of operational environmental performance for each company as dependent variable, the p-value is 0.17, therefore there is **no statistical significance**.

- Difficulty of environmental objectives

The relationship between the level of difficulty of environmental objectives and environmental performance is not clear at all: indeed we should expect poor performance both in case the difficulty is too low, or is perceived too high, because employees are stimulated to put effort in the achievement of objectives only if the difficulty of those is high, but not so high to discourage workers, making the objectives unreachable; the difficulty should be set in order to make the objectives challenging. Even in this case we can say that the relationship is not statistically significant, indeed by placing the mean of the difficulty of environmental objectives for each individual company as an independent variable, and the mean of the managerial environmental performance of each individual company as a dependent variable, the relative p-value is 0.97, therefore there is **no statistical significance**. Then using the mean of operational environmental performance for each company as dependent variable, the p-value is 0.46, therefore there is **no statistical significance**.

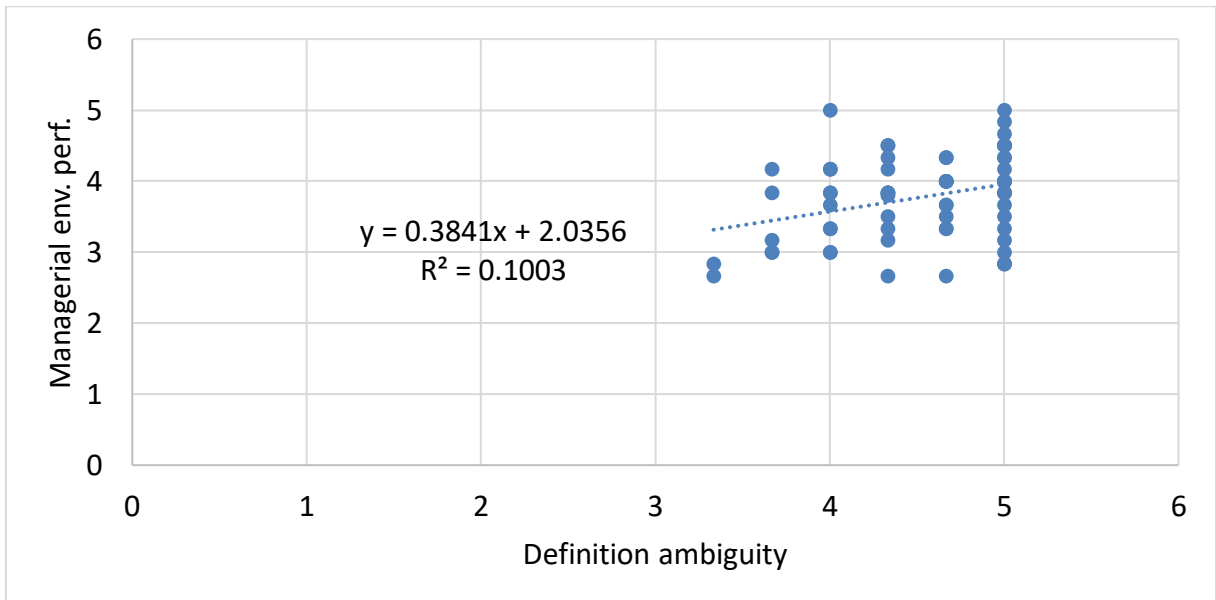- Flexibility of environmental objectives

Even in this case the relationship between the flexibility of environmental objectives and the environmental performance is not clear at all, we can just think that a medium-high flexibility should help companies to pursue their environmental goals. By placing the mean of the flexibility of environmental objectives for each individual company as an independent variable, and the mean of the managerial environmental performance of each individual company as a dependent variable, the relative p-value was calculated. The p-value here is 0.11, therefore there is **no statistical significance**. Then using the mean of operational environmental performance for each company as dependent variable, the p-value is 0.46, therefore there is **no statistical significance.**

- Ambiguity in the definition of environmental objectives

By placing the mean of the ambiguity in the definition of environmental objectives for each individual company as an independent variable, and the mean of the managerial environmental performance of each individual company as a dependent variable, the relative p-value was calculated. The p-value here is 0.008, therefore the null hypothesis is rejected because is lower than 0.05, and the result is **statistically significant**.

The scatter plot results as follow in figure 16.

Fig. 16: Scatter plot definition ambiguity - managerial environmental performance

I remember here that high value of the x variable, are associated with low level of ambiguity in the definition of environmental objectives. The regression coefficient for the independent variable is 0.38, and statistically indicates the increase that will occur in the value of managerial environmental performance, from a one-unit increase in the independent variable. The correlation coefficient "r" is 0.32, therefore we can say that a **positive correlation** exists between the ambiguity in the definition of environmental objectives and managerial environmental performance; an increase in the variable x, (ie a decrease in the level of ambiguity), leads to an increase in the level of managerial environmental performance. However the **correlation is weak**, as shown by the low value (0.32) reached by r, and by the low value (0.38) of the parameter that determines the slope of the line, also known as regression coefficient.

For ascertain the goodness of fit, I compute the coefficient of determination R^2, which indicates the proportion of variability of the dependent variable accounted for or explained by the independent variable. The coefficient of determination is equal to 0.10, thus the 10% of the variation of managerial environmental performance is explained by the independent variable, ambiguity in the definition of environmental objectives.

Instead by placing the mean of the ambiguity in the definition of environmental objectives for each individual company as an independent variable, and the mean of the operational environmental performance of each individual company as a dependent variable, the relative p-value is 0.0006, therefore the null hypothesis is rejected because is way lower than 0.05, and the result is **statistically significant**. The scatter plot results as follow in figure 17.
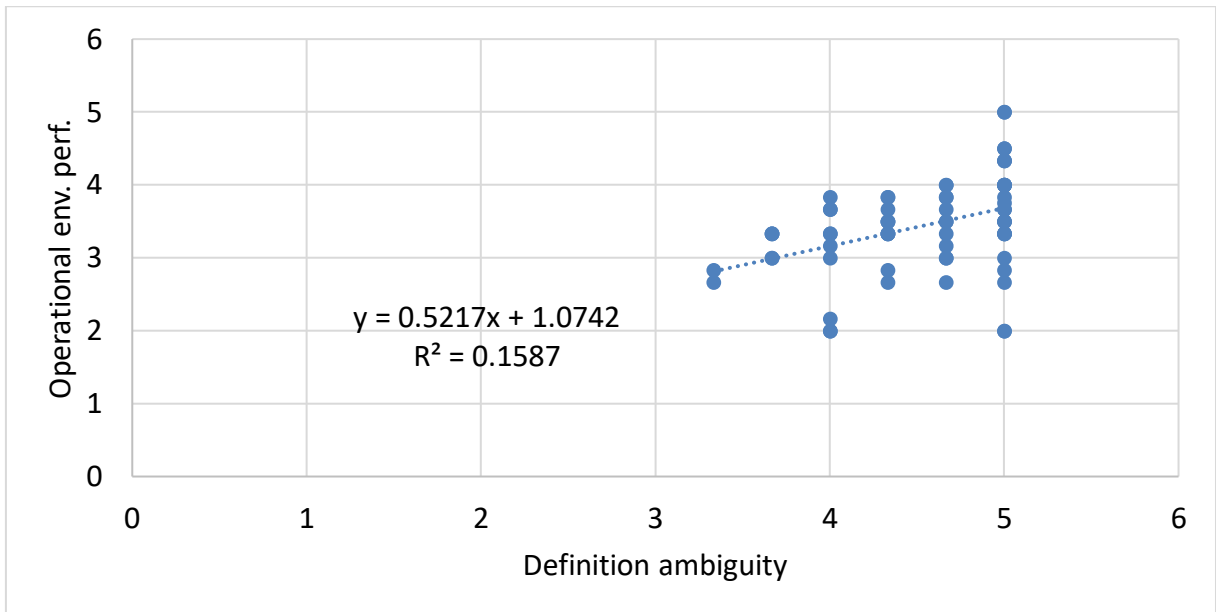
Fig. 17: Scatter plot definition ambiguity - operational environmental performance

The regression coefficient for the independent variable is 0.52, and statistically indicates the increase that will occur in the value of managerial environmental performance, from a one-unit increase in the independent variable.

The correlation coefficient "r" is 0.40, therefore we can say that a **positive correlation** exists between the ambiguity in the definition of environmental objectives and operational environmental performance; an increase in the variable x, (ie a decrease in the level of ambiguity), leads to an increase in the level of operational environmental performance. However the **correlation is quite weak**, as shown by the rather low value (0.40) reached by r, and by the rather low value (0.52) of the parameter that determines the slope of the line, also known as regression coefficient.

For ascertain the goodness of fit, I compute the coefficient of determination R^2, which indicates the proportion of variability of the dependent variable accounted for or explained by the independent variable. The coefficient of determination is equal to 0.16, thus the 16% of the variation of operational environmental performance is explained by the independent variable, ambiguity in the definition of environmental objectives.

The following table (Tab. 10) contains the analysed variables, the p-value of the correlations, and their relative significance.

Independent variable X	Dependent variable Y	P-value	Statistical significance
Ambiguity in understanding the environmental mission	managerial environmental performance	0.069	NO
	operational environmental performance	0.083	NO
Ambiguity about the priority of environmental objectives	managerial environmental performance	0.19	NO
	operational environmental performance	0.53	NO
Ambiguity in the assessment of environmental objectives	managerial environmental performance	0.10	NO
	operational environmental performance	0.17	NO
Difficulty of environmental objectives	managerial environmental performance	0.97	NO
	operational environmental performance	0.46	NO
Flexibility of environmental objectives	managerial environmental performance	0.11	NO
	operational environmental performance	0.46	NO
Ambiguity in the definition of environmental objectives	managerial environmental performance	0.008	YES
	operational environmental performance	0.0006	YES

Tab. 10*: Summary table of correlations*

4.3 Conclusions

The world is constantly changing, and we citizens are faced with urgent challenges such as climate change, demographic transition, pollution, overexploitation and depletion of natural resources, which threaten the opportunity of future generations to meet their needs. Unfortunately, these phenomena have been growing exponentially in recent years, bringing humanity and the planet closer to a point of no return, and if nowadays just some planetary boundaries have been crossed, there is an imminent risk that others will be exceeded, causing a so-called tipping point.

The development of mankind in a sustainable perspective is becoming increasingly necessary, and precisely with the Brundtland report, a document published in 1987 by the World Commission on Environment and Development (WCED), the concept of sustainable development is introduced. The emphasis is therefore placed on satisfying the needs of the present without compromising the ability of future generations to satisfy their own ones. For the purposes of the analysis, we focused on sustainability at the corporate level, which has been interpreted in the literature with the term corporate social responsibility (CSR). If profit has always been the main element for companies, over time we have increasingly questioned the

need to consider, alongside the main objective of profitability, also the impact that entrepreneurial activity has on the social and environmental context; hence the need to create sustainable development, based on the so-called triple bottom line. The triple bottom line represents an accounting framework adopted by companies, according to which firms should consider and measure also the social and environmental dimensions, rather than just focusing on the maximization of profit (the standard or bottom line) in order to evaluate their performances. Management control was therefore presented as a useful tool for introducing sustainability in planning decision, capital allocation and evaluation of performance; indeed management control system (MCS), could be useful not only to have better economic performance, but also to enhance the environmental sustainability of companies.

One of the tools of the MCS was therefore discussed, namely the management by objectives (MBO), as a useful tool capable of leading to better corporate performance. Indeed, based on the pre-existing literature, in which the determination of "SMART" objectives (which stands for specific, measurable, achievable, relevant, and time-bound), would favour company performance, we decided to investigate whether the same principle was also applicable in field of sustainability, and therefore if better environmental performance were associated with clear, specific and measurable environmental objectives. In so doing we have also analysed the so-called ambiguity of objectives, introduced by Chun and Rainey, who identify the different dimensions in which the ambiguity of objectives can be present: mission comprehension ambiguity, directive goal ambiguity, evaluative goal ambiguity, and priority goal ambiguity; one of the assumptions on which this thesis is based is that a higher level of ambiguity in the environmental objectives, should lead to worse environmental performance, and vice versa.

In the research questionnaire, starting from the assumption that the definition environmental objectives is a useful management control tool, capable of empower the company structure and improve environmental performance towards greater corporate sustainability, the degree of ambiguity in the 4 variables mentioned above was studied, in addition to the degree of flexibility and difficulty of the environmental objectives, and how all these variables impact environmental performance.

What emerges is that the total ambiguity of the environmental objectives for European SMEs can be said to be medium-low, indeed employees are aware of the environmental mission and objectives, and are provided with sufficient resources to achieve them; in addition there is a formal assignment within the organizations of these objectives, and a periodic review of environmental results. Although not all the companies interviewed consider environmental objectives on a par with economic ones, given the low level of ambiguity in the definition of environmental objectives and their difficulty, which makes them to be perceived as challenging,

quite high environmental performance would be expected, but the data collected do not fully support this relationship.

Indeed, the operational environmental performances are on average, maybe because companies do not incentivize employees to achieve environmental goals, linking them to monetary and non-monetary rewards. However since the managerial environmental performance are superior, this suggests that the European SMEs are more concerned at a formal level with promoting sustainability, probably in order to avoid any fines for environmental damage, or because they are strongly pressured by current regulations on environmental sustainability, rather than making a concrete commitment, for example, by promoting sustainable practices and comparing their environmental results with those of other competitors, in order to continuously improve.

The result is that the hypothesized relationship between medium-low ambiguity of environmental objectives and good environmental performance is not fully verified, because only the managerial environmental performance are quite high, and not so the operational ones.

In this regard, a statistical analysis was also conducted in order to evaluate the correlation between the ambiguity, flexibility, and difficulty of the environmental objectives, and the environmental performance; the results suggest that only the ambiguity in the definition of environmental objectives seems to be correlated with both environmental performance, (more precisely, a lower ambiguity corresponds to higher performance, especially at an operational level), although the environmental performance are just slightly affected by a variation in the aforementioned ambiguity, and so the correlation is quite weak.

Given the importance of the sustainability issue, and how little has been analyzed the use of "smart" environmental objectives as a way to increase environmental performance, we strongly encourage future research on this context, in order to address the limitations of this study, and provide, or not, evidence to support the assumptions mentioned here.

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Appendix A (Research questionnaire)

1. Please can you indicate your organisational position:

[   ]

2. Please can you indicate your level of education:

◯ Master degree/

   Doctorate

◯ Bachelor degree

◯ High School

3. Please can you indicate your work experience in the actual position:

[   ]

4. To what extent do you agree/disagree with the following aspects concerning the mission of your organisation:

	Totally disagree				Totally agree
Our mission statement clearly communicates the firm's environmental value to our workforce	◯	◯	◯	◯	◯
It is easy to explain the environmental values and goals of this organisation to outsiders	◯	◯	◯	◯	◯
Our workforce is aware of the firm's environmental values and targets	◯	◯	◯	◯	◯

5. Please indicate the extent to which your organisation has achieved each of the following environmental performance in the last three years, PLEASE DO NOT CONSIDER THE COVID PERIOD (Part One):

	Not at all				To a great extent
Reductions in the costs of regulatory compliance	◯	◯	◯	◯	◯
Reductions in the time taken to respond to environmental incidents and minimizing their impact	◯	◯	◯	◯	◯
Reductions in the costs associated with cleaning up environmental damage	◯	◯	◯	◯	◯
Reductions in the fines paid and remediation costs regarding environmental damage	◯	◯	◯	◯	◯
More effective and efficient decision making regarding environmental issues	◯	◯	◯	◯	◯
Producing goods/services in a more environmentally conscious manner	◯	◯	◯	◯	◯

6. To what extent do you agree/disagree with the following aspects concerning your organisation:

	Totally disagree				Totally agree
Environmental preservation is a major and formally goal	○	○	○	○	○
Environmental goals are formally assigned within the company's strategic planning process	○	○	○	○	○
Employees are formally supported in the achievement of the environmental goals and targets with adequate resources	○	○	○	○	○

7. Does your company has EMAS e/o ISO14001 certification(s) since at least three years?

[   ]

8. To what extent do you agree/disagree with the following aspects concerning your organisation:

	Totally disagree				Totally agree
Environmental targets levels for the business units are only achievable with maximum effort	○	○	○	○	○
Environmental targets level difficulty can be considered as very high	○	○	○	○	○
Achieving environmental target levels requires extensive skills	○	○	○	○	○

9. Please indicate the extent to which the each of the following stakeholders influence the environmental choices and practice of your organisation:

	Not at all				To a great extent
Regulators (both at national and international level)	○	○	○	○	○
Customers	○	○	○	○	○
Local community	○	○	○	○	○
Labor unions	○	○	○	○	○
Environmental interest groups	○	○	○	○	○
Trade associations	○	○	○	○	○

10. In which sector operates the company: (the number indicates the SIC code of the sector):

[   ]

11. To what extent do you agree/disagree with the following aspects concerning your organisation:

	Totally disagree				Totally agree
Environmental objects are weighted on par with economic objects	◯	◯	◯	◯	◯
Economic objects are much more important than environmental objects	◯	◯	◯	◯	◯
The pursuit of short-term environmental objectives does not contrast the pursuit of the other company objectives	◯	◯	◯	◯	◯
The pursuit of medium/long-term environmental objectives does not contrast the pursuit of the other company objectives	◯	◯	◯	◯	◯

12. Please indicate the extent to which your organisation has achieved each of the following environmental performance in the last three years, PLEASE DO NOT CONSIDER THE COVID PERIOD (Part Two):

	Not at all				To a great extent
Reductions in energy consumption	◯	◯	◯	◯	◯
Reductions in water usage	◯	◯	◯	◯	◯
Reductions in material costs due to the efficient use of material	◯	◯	◯	◯	◯
Reductions in the levels of green house gas emissions	◯	◯	◯	◯	◯
Reductions in other air emissions	◯	◯	◯	◯	◯
Reductions in levels of waste	◯	◯	◯	◯	◯

13. How many employees has your organisation?

14. To what extent do you agree/disagree with the following aspects concerning your organisation:

	Totally disagree				Totally agree
Environmental targets are updated on a regular basis (e.g., monthly or quarterly) to a new business environment	◯	◯	◯	◯	◯
Environmental targets are usually adjusted during the year to those circumstances that could not be foreseen at the time the target was drawn up	◯	◯	◯	◯	◯
Usually, any change in environmental target levels during the year is not tolerated	◯	◯	◯	◯	◯
There is a continuous monitoring to assess whether environmental targets are still realistic or have to be changed	◯	◯	◯	◯	◯

15. To what extent do you agree/disagree with the following aspects concerning your organisation:

Totally disagree   Totally agree

There are formal meetings to discuss environmental performance results and objects achievement	◯	◯	◯	◯	◯
Environmental objects achievement is linked to non-financial rewards (recognition, service awards, etc).	◯	◯	◯	◯	◯
Environmental objects achievement is linked to financial rewards (pay, bonuses, etc).	◯	◯	◯	◯	◯
Objective indicators, i.e. indicators whose information is available within the company information system, are implemented and used to evaluate the achievement of environmental objectives	◯	◯	◯	◯	◯
Subjective indicators, i.e. indicators whose information is collected through specific surveys and analyses, are implemented and used to evaluate the achievement of environmental objectives	◯	◯	◯	◯	◯
The environmental results obtained are compared with the environmental results of other companies	◯	◯	◯	◯	◯

16.   Please can you indicate from which country do you answer?