



MÁSTER EN INGENIERÍA INDUSTRIAL

TRABAJO DE FIN DE MÁSTER
COMPARATIVE ANALYSIS OF MULTINATIONAL
ENTERPRISES' PERFORMANCE IN IMPLEMENTING SDGS
USING AN EXTERNALITIES-BASED FRAMEWORK

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Madrid
Junio 2022

Declaro, bajo mi responsabilidad, que el Proyecto presentado con el título
Comparative analysis of multinational enterprises' performance in
implementing SDGs using an externalities-based framework en la ETS de
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ANÁLISIS COMPARATIVO DE LOS ESFUERZOS DE LAS EMPRESAS MULTINACIONALES EN LA APLICACIÓN DE LOS ODS UTILIZANDO UN MARCO BASADO EN LAS EXTERNALIDADES

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Entidad Colaboradora: Politecnico di Milano

RESUMEN DEL PROYECTO

Introducción

Esta tesis aborda el tema del desarrollo sostenible aplicado a las empresas internacionales. El estudio se basa en un conjunto de datos de 20 empresas fundadas en 11 países diferentes, tanto desarrollados como en desarrollo.

En primer lugar, se lleva a cabo una revisión de la literatura sobre estudios recientes que pretenden proporcionar un entendimiento común para que las empresas apliquen los ODS, ya que son objetivos a nivel de país, en lugar de objetivos a nivel de empresa. La línea de base del proyecto es un marco basado en la externalidad que agrupa los ODS en seis categorías para facilitar la implementación de los ODS por parte de las empresas. El modelo se presenta en la siguiente ilustración.

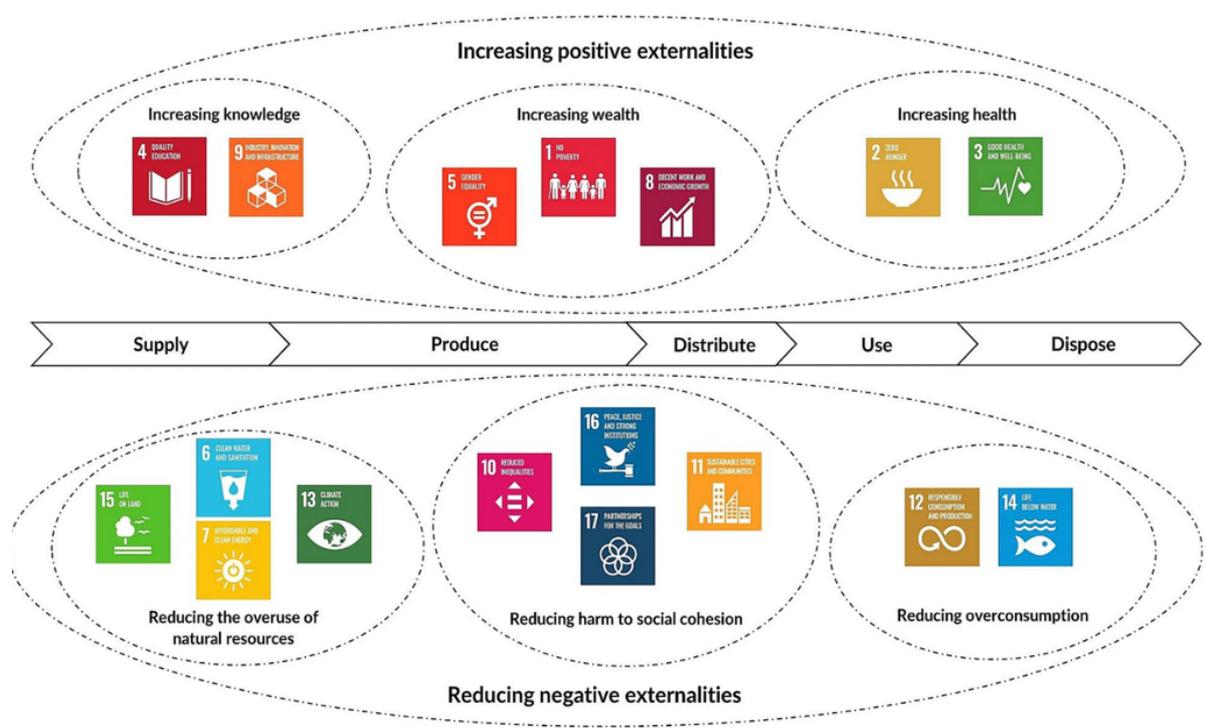


Ilustración 1: Modelo de los ODS aplicados a empresas basado en las externalidades

A continuación, se selecciona un sector para la aplicación del estudio, que en este caso es el sector agroalimentario debido a su gran impacto en las dimensiones de sostenibilidad medioambiental, social y económica. Se analizan las características del sector agroalimentario, su importancia para la consecución de los ODS y la situación actual tras la pandemia del COVID-19.

Metodología

Posteriormente, se presenta la metodología y los objetivos, indicando qué empresas han sido seleccionadas, cómo se han recogido y analizado los datos, y cómo se ha desarrollado un conjunto de indicadores para medir el compromiso y los esfuerzos de las empresas hacia los ODS y permitir la comparación entre ellas. En la ilustración 2 se muestran los pasos seguidos en la metodología para llegar a los resultados.

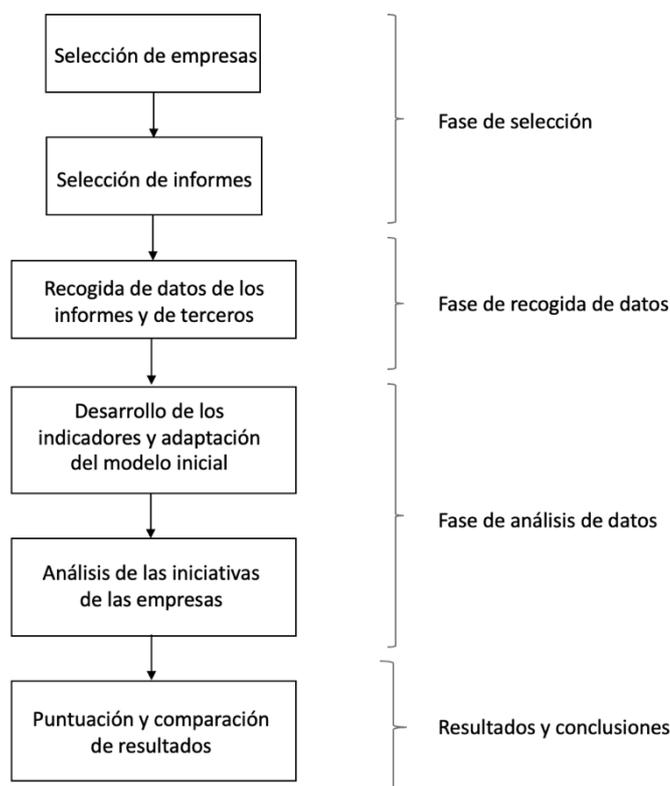


Ilustración 2: Pasos seguidos en la metodología y resultados

Se desarrollan un total de 85 indicadores para el análisis de las iniciativas de las empresas divididos entre las seis categorías del modelo de los ODS, utilizando como referencia una campaña de Oxfam de 2013 y 2016 en la que evaluaba a las empresas del sector alimentario en diferentes áreas relacionadas con la sostenibilidad.

Estas áreas no estaban alineadas con la Agenda 2030 pero sirven de referencia al tratar temas similares y estar desarrollados por expertos de diferentes instituciones y empresas.

Resultados

A continuación, tras el análisis de los datos, se obtienen y presentan los resultados, otorgando a cada empresa una puntuación en cada categoría en función de si aumentan las externalidades positivas o mitigan las negativas. Por último, se extraen conclusiones de los resultados y se constata que existen interesantes similitudes y diferencias en el nivel de esfuerzo realizado por las empresas agroalimentarias de los países desarrollados y en vías de desarrollo.

GROUP 01

CATEGORY	SCORE
Increase knowledge	7,01
Increase wealth	8,35
Increase health	7,41
Reduce overuse of natural resources	7,64
Reduce harm to social cohesion	6,73
Reduce overconsumption	6,77

GROUP 02

CATEGORY	SCORE
Increase knowledge	8,96
Increase wealth	7,27
Increase health	6,56
Reduce overuse of natural resources	6,63
Reduce harm to social cohesion	5,90
Reduce overconsumption	4,91

Tabla 1: Resultados obtenidos por las empresas de cada grupo (Grupo 01: empresas de países desarrollados y Grupo 02: empresas de países en desarrollo) en las seis categorías del modelo de externalidades de los ODS

Group	Increasing positive externalities scores	Reducing negative externalities scores
Developed Countries firms	7,54	7,05
Developing Countries firms	7,60	5,81

Tabla 2: Resultados globales

Conclusiones

Se puede entender que ambas realizan esfuerzos similares para reducir las externalidades negativas. Sin embargo, las multinacionales de los países en vías de desarrollo invierten más esfuerzos en aumentar las externalidades positivas, en particular dedican un número importante de recursos a aumentar el conocimiento. Tales esfuerzos se reflejan en las sólidas asociaciones con instituciones educativas locales, la gran cantidad de formación para sus empleados, así como los programas educativos tanto para los pequeños agricultores sobre temas relacionados con las prácticas agrícolas sostenibles y la agroeconomía, como para las comunidades rurales

que abarcan temas que van desde la lactancia materna hasta las nociones legales y financieras básicas.

Contar con profesionales mejor cualificados y una población altamente educada repercutirá potencialmente de forma positiva en el crecimiento económico de estas empresas y, posteriormente, de sus países. Este fuerte compromiso no se ve en la misma medida en las empresas de los países desarrollados, porque pueden tener ya empleados bien cualificados y contar con una infraestructura educativa que ya está avanzada en sus países de origen.

COMPARATIVE ANALYSIS OF MULTINATIONAL ENTERPRISES' PERFORMANCE IN IMPLEMENTING SDGs USING AN EXTERNALITIES-BASED FRAMEWORK

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ABSTRACT

Introduction

This thesis addresses the issue of sustainable development as applied to international companies. The study is based on a dataset of 20 companies founded in 11 different countries, both developed and developing. First, a literature review is conducted on recent studies aiming to provide a common understanding for companies to implement the SDGs, as they are country-level goals, rather than company-level goals. The project baseline is an externality-based framework that groups the SDGs into six categories to ease the implementation of the SDGs by companies. The framework is presented in the next figure.

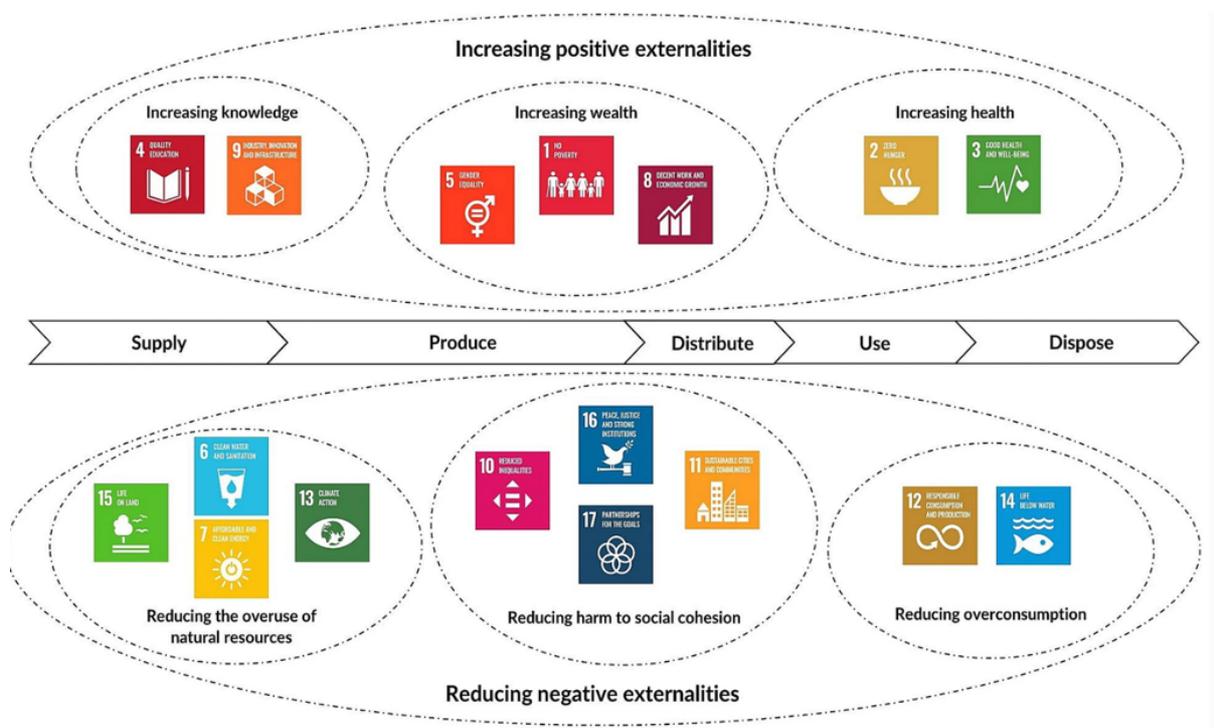


Figure 1: Externalities-based framework of SDGs

One sector is then targeted for the study's application, being the agri-food sector in this case due to its large impact on the environmental, social, and economic sustainability dimensions. The characteristics of the agri-food sector, its importance for the achievement of the SDGs and the current situation after the COVID-19 pandemic are discussed.

Methodology

Subsequently, the methodology and objectives are presented, indicating which companies have been selected, how the data have been collected and analyzed, and how a set of indicators have been developed to measure the companies' commitment and efforts towards the SDGs and to allow comparison between them.

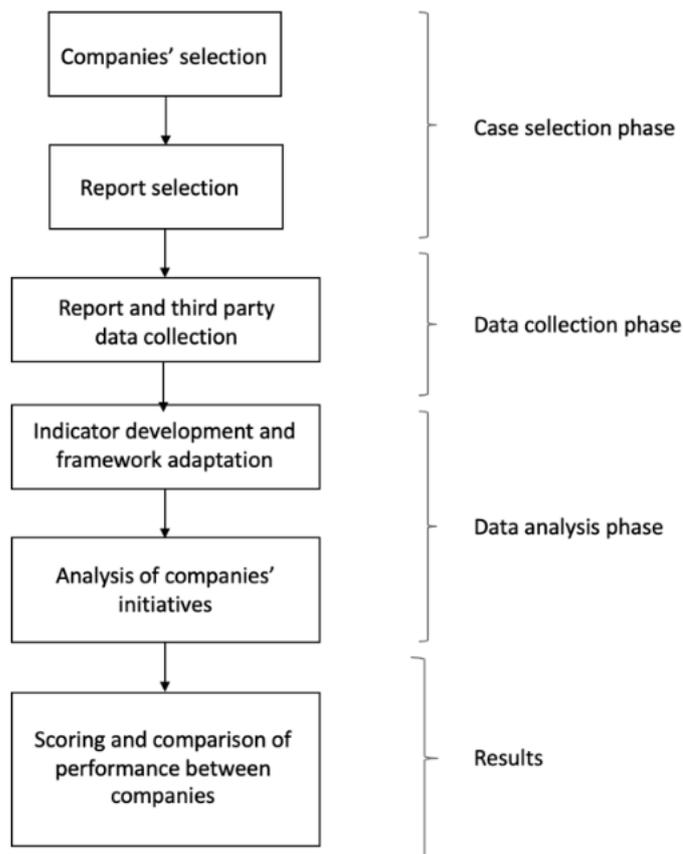


Figure 2: Outline of the phases and steps followed in the methodology

A total of 85 indicators are developed for the analysis of company initiatives divided among the six categories of the SDG model, using as a reference an Oxfam campaign from 2013 and 2016 in which it evaluated companies in the food sector in different areas related to sustainability.

These areas were not aligned with the 2030 Agenda but serve as a reference as they deal with similar topics and are developed by experts from different institutions and companies.

Results

Then, after the data analysis, the results are obtained and presented, having each company a score in every category according to whether they increase positive externalities or mitigate negative externalities.

GROUP 01

CATEGORY	SCORE
Increase knowledge	7,01
Increase wealth	8,35
Increase health	7,41
Reduce overuse of natural resources	7,64
Reduce harm to social cohesion	6,73
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Increase knowledge	8,96
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Reduce harm to social cohesion	5,90
Reduce overconsumption	4,91

Table 1: Results of the two groups of companies (from developed and developing countries) in each of the six categories

Table 2: Results of the two groups of companies (from developed and developing countries) in each of the six categories

Group	Increasing positive externalities scores	Reducing negative externalities scores
Developed Countries firms	7,54	7,05
Developing Countries firms	7,60	5,81

Figure 3: Overall results

Finally, conclusions are drawn from the results, and it is found that there are interesting similarities and differences in the level of effort made by agri-food companies from developed and developing countries.

Conclusions

It can be understood that both make similar efforts to reduce negative externalities. However, multinationals from developing countries invest more effort in increasing positive externalities, in particular they devote a substantial number of resources to increasing knowledge. Such efforts are reflected in the strong partnerships with local educational institutions, the large amount of training for their employees, as well as educational programs for both smallholder farmers on topics related to sustainable agricultural practices and agroeconomics, and for rural communities covering topics ranging from breastfeeding to basic legal and financial notions.

Having better qualified professionals and a highly educated population will potentially impact positively in the economic growth of these companies, and subsequently, of their countries. Such a strong commitment is not seen to the same extent in companies in developed countries, because they may already have well-qualified employees and rely on an educational infrastructure that is already advanced in their home countries.

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Introduction

Almost seven years after the 2030 Agenda, there is still a long way to go to reach sustainable development. Although the 17 Sustainable Development Goals are country-level targets, the need for international business engagement has become increasingly evident, and companies have indeed sought to adopt more sustainable practices throughout their business activities, as well as to report on their progress. Nevertheless, no common understanding has been articulated on how companies should embrace the SDGs. Here is where recent studies provide an insightful framework that aims to set a guideline by grouping the SDGs by their contribution to either increasing positive externalities or decreasing adverse externalities. Besides, following the outbreak of the COVID-19 pandemic, the vulnerabilities of the agri-food sector have been further exposed. The agri-food sector is considered one of the largest industries in the current economic scenario and a critical sector to address some of the critical challenges over the coming years. Such concerns may include food insecurity and malnutrition, climate change, natural resource depletion and social inequalities.

In this context, agri-food companies' strivings to implement sustainable practices and comply with the SDGs will be reviewed and assessed in this project. For the performance analysis, the externality-based framework from the recent literature will be exploited to ease the evaluation of the efforts undertaken by different businesses. The final objective of this thesis is to derive a comparative analysis of the commitment level of agri-food companies, both from developed and developing countries, to the SDGs and to the implementation of sustainable policies. To achieve this result, a set of indicators will be defined for each category of the study. The areas in the category of increasing positive externalities are improving knowledge, health and wealth, and for the category of reducing negative externalities, the areas are reducing overconsumption, overuse of natural resources and damage to social cohesion.

From the comparative analysis, conclusions can be drawn about the factors affecting companies' investments on SDGs depending on their country of origin. It is well known that there are a number of drivers influencing sustainability investments, ranging from financial resources to cultural mindset and awareness of the implications of unsustainable practices.

1. Literature review

The purpose of this chapter is to introduce the state-of-the-art regarding sustainable development and implementation of sustainable practices by multinational companies. A series of articles related to sustainability and international business from the AIB Academy of International Business were released at the end of 2021 and early 2022. Some of the insights of these papers have served as a baseline for this project.

The starting point for this project has been the concept of sustainable development and the United Nations 2030 Agenda and the 17 Sustainable Development Goals (SDGs). Next, attention has been drawn to the intricacies of SDG implementation by multinational enterprises. And lastly, this chapter presents the externality-based framework that will be employed for the subsequent analysis in this project.

1.1 Sustainable Development

In 1987, the first "official" concept of sustainable development was defined in the Brundtland Report, also known as "Our Common Future". According to the report, the concept of sustainable development is that societies should live and fulfill their needs in ways that do not jeopardize the future generations' capacity to satisfy their own needs. This definition proposed in "Our Common Future" or Brundtland report was broadly acknowledged and accepted. It considers not only present challenges but also future ones, including natural resources depletion and environmental concerns, as well as economic and social issues.

The International Union for Conservation, IUCN, illustrates this definition with this model of intertwined circles to illustrate how the three objectives must be better integrated, with actions to rebalance the dimensions of sustainability. It is illustrated in the following figure.

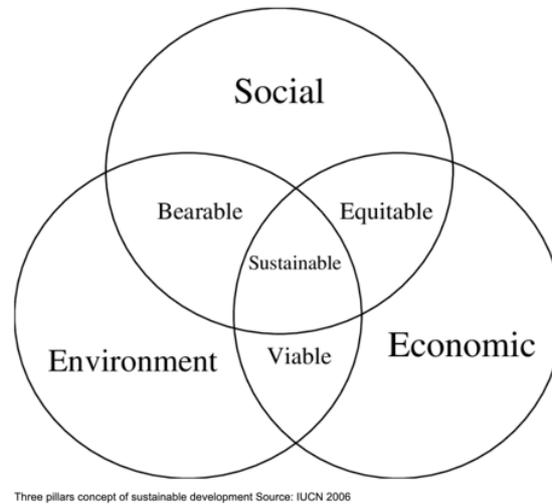


Figure 4: Interlocking circles model of the tree pillars of sustainable development. [48]

This idea of sustainable development started to gain importance over the twentieth century due to the different economic, social, and environmental crises including: the financial crisis of 1930, the oil shocks of 1973 and 1979, developing countries' debt crisis in 1982, Chernobyl nuclear disaster in 1986 and Erika disaster in 1999; as well as global warming, the ozone layer problem, biodiversity loss and air pollution. These various crises raised awareness and highlighted the need to adopt sustainable development practices, even if there are limitations, as stated by the World Commission on Environment and Development, due to technological development and the state of social organization in relation to environmental resources. [1]

Following the publication of the report "Our Common Future"; discussions on sustainable development emerged from different perspectives, while the concept was comprehensively expanded. Among the most significant events was the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992 (UNCED, 1992). Also known as the "Earth Summit", the meeting brought together more than 170 countries and launched Agenda 21, the "Rio Declaration on Environment and Development". The Commission on Sustainable Development, the Inter-Agency Committee on Sustainable Development and the High-Level Advisory Council on Sustainable Development were formed and set as follow-up mechanisms to the Summit.

In addition, one of the agreements was to recognize the "Common but Differentiated Responsibilities" of industrialized and emerging countries in addressing global environmental issues, together with the requirement for developed countries to supply and transfer technology to developing economies. Targets and action programs for implementing environmental management were also formulated at this meeting, and a direction was set to establish a global partnership to solve environmental problems. [2]

It was the first occasion in world history that the sustainable development approach moved from a concept to global action, confirming its relevance at the international political level. Since then, sustainable development has become the collective agreement of all humankind. Furthermore, the conference discussed sustainable development as a central concept for resolving the apparent conflict between economic growth and environmental conservation, noting that sustainable development implies growth in a sustainable manner with respect to natural resources and the living environment. From this theoretical development, the three pillars of sustainable development were identified as the economy, society and the environment. [2]

In September 2000, the UN Millennium Summit was celebrated at the UN headquarters in New York. Participants from 189 countries embraced the “United Nations Millennium Declaration”; which adopted the Millennium Development Goals (MDGs) with the development and the eradication of extreme hunger as the focus, including eight strategic areas and 21 action-oriented goals. These targets emerged as an internationally recognized framework to guide domestic development and cooperation for the next 15 years and served as a roadmap for the evolution of the world over the next century.

After 1992, conflicts of concern among the economy, society and the environment became more and more evident. The necessity to introduce the notion of collaborative stakeholder governance at the global scale became more critical. In this background, the United Nations hosted the “Rio+20” Summit in 2012. The summit pointed out that the green economy was the clue to resolve the conflicts arising between both development and the environment. [2] In addition, global cooperative governance can solve the disputes between economic, social, and environmental concerns. At the end of the meeting, sustainable development evolved from three to four main pillars: economic, social, environmental and governance.

Over 150 government leaders and heads of state attended the United Nations Summit on Sustainable Development at the New York’s headquarters of the United Nations in September 2015. The meeting appraised the progress of the implementation of the MDGs and embraced “Transforming our World: the 2030 Agenda for Sustainable Development”. The summit also discussed the implementation of the MDGs and endorsed “Transforming our World: the 2030 Agenda for Sustainable Development”. [2]

In September 2015, the 2030 Agenda for Sustainable Development was adopted by the 193 Member States of the United Nations, which includes seventeen aspirational Sustainable Goals and 169 targets to drive governments’ actions towards sustainable development over the following years from 2016 to 2030. They are considered as a call to action for governments to end poverty, protect the planet, and ensure peace and prosperity by 2030. The Figure below illustrates the objectives if each of the 17 SDGs.



Figure 5: Overview of the 17 Sustainable Development Goals of the United Nations' 2030 Agenda. [3]

This Agenda includes a list of ambitious objectives for future prosperity as it is the successor of the Millennium Development Goals (MDGs). The partial achievement of the MDGs after the efforts invested in transforming developing countries inspired the creation of the SDGs as an expanded version of the previous goals. The 2030 Agenda outlines the roadmap for changing the world towards sustainability and resilience while transforming the living standards and following inclusive, dynamic, and sustainable trajectories. These comprehensive sustainable objectives are intended to end both poverty and hunger while restoring and effectively managing the natural resources. There are three dimensions integrated into these goals: economic, social, and environmental. The 17 SDGs are indissociable, as they were designed to be achieved together, none of the goals objective are intended to be addressed individually. Lastly, the SDGs are universal as they are relevant not only for developing but also for developed countries [4] not as the MDGs that were though only for developing countries.

Along with the 2030 Agenda, there are other initiatives that support global sustainable development. There are several stakeholders working with diverse populations in areas of environmental sustainability. Several certifications are also in place that recognize (mainly through the award of a seal) companies that do the most to protect the planet, such as the B-Corp movement, the Rainforest Alliance, the Fairtrade Foundation or the Conscious Capitalism movement. The Ellen MacArthur Foundation is at the very forefront of the circular economy and how societies and companies can bring their use of natural resources in line with nature. [1]

1.2 SDGs Issue: firms' implementation of SDGs

Lately, several companies across different sectors are reporting annually their progress towards sustainability and the 17 SDGs of the 2030 Agenda. However, SDGs are set at a country-level, and they are not designed for international businesses. Businesses' participation in the SDG agenda is quite challenging due to the large and complex scope of the 17 SDGs and the absence of a consolidated idea on how to implement them. Thus, it is unclear how can international businesses translate these country-level goals into firm-level actions. In this context, the concept of externalities becomes important and will be carefully defined for application in the development of this framework. [5]

SDGs grouping according to their contribution to externalities

Two different types of externalities are considered, positive and negative [5], distinguishing two different types of actions that international businesses can take in order to impact on SDGs. First, the suggested approach divides SDGs into six different categories and then focuses on how they impact on increasing positive externalities (knowledge, wealth, or health) or reducing adverse externalities (overexploitation of natural resources, damage to social cohesion, or overconsumption). In the next figure, the grouping of SDGs is illustrated.

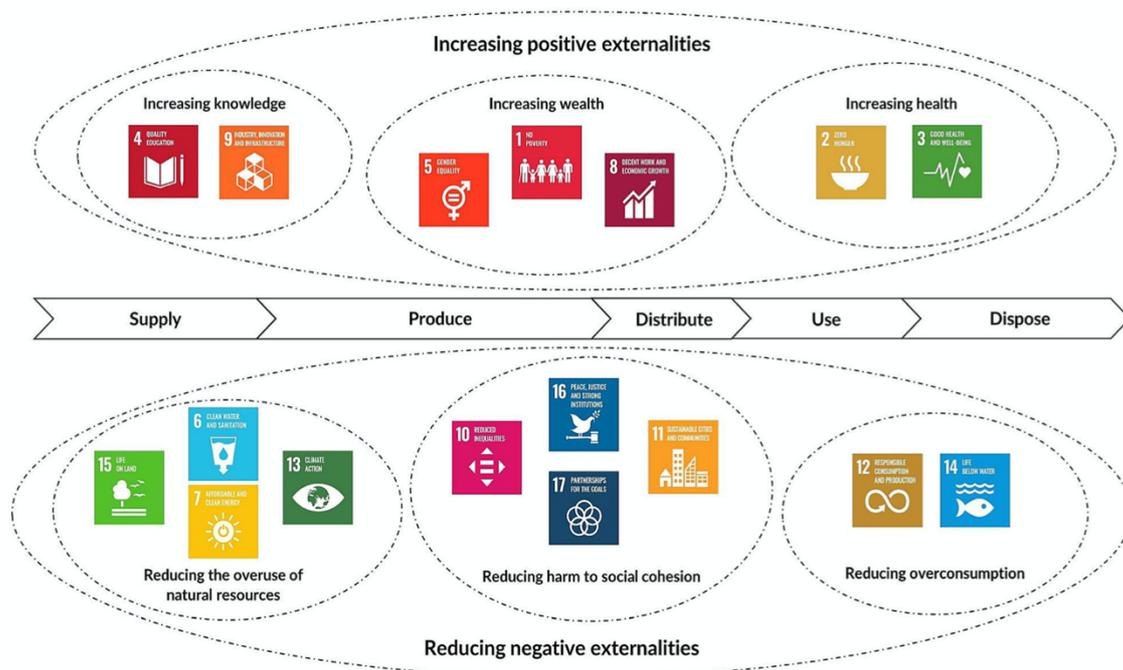


Figure 6: Translating SDGs into actionable goals for multinationals to address externalities. Note that the use of SDG icons is permitted under the United Nations Department of Global Communications [3] [5].

Externalities occur when third parties unintentionally suffer the costs or benefit from activities of the firms. Positive externalities are considered to be cases in which third parties' benefit from the actions of the firms but are not paid for it, typically the technological spillovers are a case of positive externalities. Alternatively, adverse externalities are situations in which third parties bear the costs of companies' activities without being compensated for it, a common source of negative externalities is pollution. The traditional view of externalities is to reduce both types, due to the fear of punishment related to the negative externalities and the fear of losing the advantage of positive ones. The vision presented differs from the traditional one, trying instead to increase the positive effects of companies.

Positioning the SDGs in the value chain

These six categories of SDGs [5] should be located within the **value chain** to foster their implementation. The value chain is an economic-based framework where business practices are distinguished into two main categories: the primary activities which are the ones that creates value directly and then, the activities that support the primary ones are the secondary activities. In Figure 1, the SDGs are allocated along the extended value chain. The SDGs are linked depending on their main objective and in relation to the groups of reducing negative or increasing positive externalities. Connect SDGs related to:

- Increasing knowledge to supply and production activities.
- Increasing wealth to production and distribution activities.
- Increasing health to distribution, use and disposal activities.
- Reducing the overuse of natural resources to supply and production activities.
- Reducing harm to social cohesion to production, distribution and use activities.
- Reducing overconsumption to use and disposal activities.

This approach proposed by [5] aims at clarifying the primary objectives and actions for companies to address the different goals.

Identifying internal and external investments

The third step towards the development of the framework, is the identification and assessment of both internal and external investments of multinationals in the host countries to pursue the attainment of the SDGs. External and internal investments are differentiated based on where they are made. Internal investments are undertaken by subsidiaries in host countries and are targeted at primary stakeholders, which are those that have an explicit contractual relationship with the company, such as employees, suppliers, and distributors. External investments, instead, are the ones that support host countries' community's development and target secondary stakeholders, which are those without an explicit contractual connection with the company.

Internal investments are defined [5] as those that directly generate benefits for the company and indirectly have the capacity to reinforce positive externalities or mitigate negative ones.

External investments are normally undertaken in conjunction with governments, non-governmental organizations, and transnational institutions; and the indirectly benefit multinational companies. These investments are intended to directly address

multinational's externalities and actively contribute towards the achievement of SDGs, while impacting positively on the firm. The final framework proposed is summarized and defined in the Figure 3.

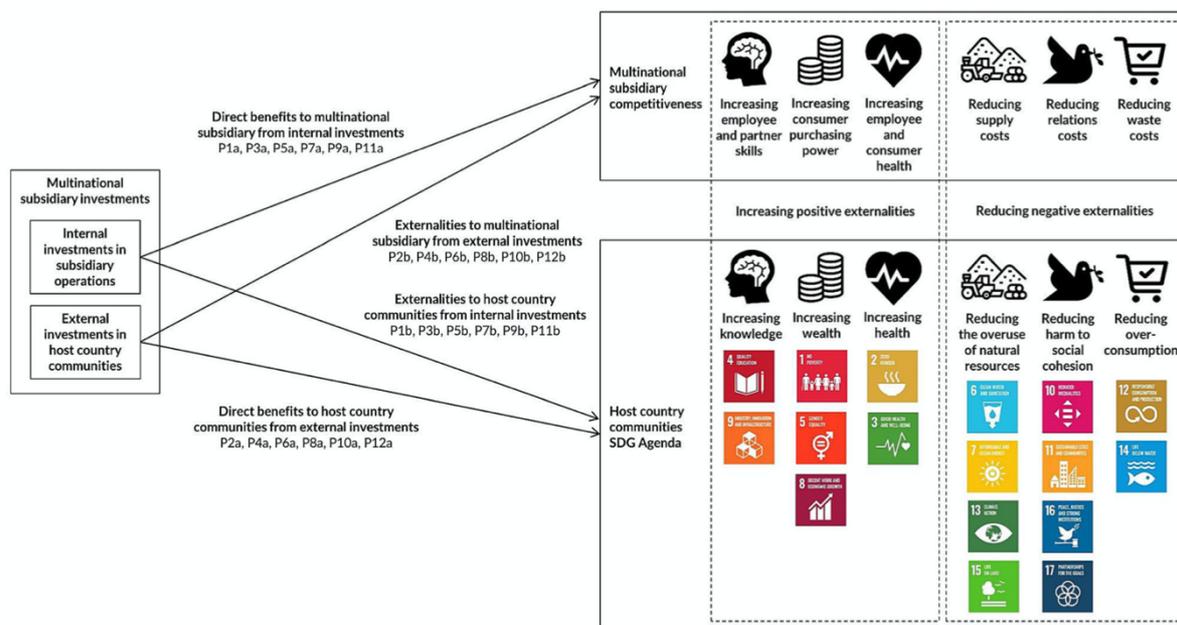


Figure 7: Investments by multinational affiliates and host country communities SDG Agenda. Use of the SDG icons is permitted by the United Nations Department of Global Communications (United Nations, 2019). The Noun Project grants permission to use the six icons representing the six externalities under a Creative Commons license [5].

1.3 Description of the framework used

Further explanation on how the companies could use this framework and focus their efforts on reducing negative externalities and increasing positive ones is given below:

Investments by multinationals addressing the SDGs to increase positive externalities
As stated before, some scholars defend reducing positive externalities of the companies in order to protect advantage and differentiating firms' operations from the investments with high positive externalities. But the idea suggested is to change these previous attitudes towards positive externalities and design investments and company's actions to contribute to SDGs. The proposal is to integrate the 17 SDGs within the value chain framework.

Multinationals can change or refocus their strategies to invest in improving the local communities to spread positive externalities to the community. Moreover, investments may be redesigned to also have a high impact on positive spillovers as an

essential core element of company's elements. The investments are evaluated in terms of the benefits brought not only to the multinational but also to the positive externalities brought to the local communities. Even if these investments may not yield financial benefits in the short term, they may bring future financial return thanks to improved brand image, reputation and stronger social contracts with local communities that sustain long term profitability. The three main areas where SDGs are fostering positive externalities is in the increase of knowledge, wealth and health as it is grouped [5].

Multinational enterprises' investments to enhance knowledge

The knowledge transfer may have an impact on both SDG 4 "Quality education: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all", and SDG 9 "Industry, innovation, and infrastructure: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation".

From the beginning of the pandemic, more than 1.5 billion children and young people were not enrolled in school, and almost 370 million children dependent on school meals needed to seek other sources for their daily nutrition [6, 7]. Multinationals have a special position to help create knowledge in host countries as they are able to generate, disseminate and apply this knowledge across the countries in which they operate.

Multinational enterprises' investments to increase wealth

Three interrelated SDGs address the positive externality of increasing wealth, and these are SDG 1 "No Poverty: End poverty in all its forms everywhere;" SDG 5 "Gender equality: Achieve gender equality and empower all women and girls;" and SDG 8 "Decent work and economic growth."

Gender seems to aggravate poverty. In developing countries, three out of four women are in the informal economy, being more unlikely to have a work contract, legal entitlements, or welfare protection, and are often not paid sufficiently to lift themselves out of poverty [8]. Multinationals are able to put actions to increase wealth which may have an impact on reducing inequalities in host countries. There are some specific actions such as employment opportunities that directly address poverty, particularly among women, who have not achieved economic equality anywhere yet making them more likely to be poor.

Multinational enterprises' investments to improve health

Investments in health-related issues support these two SDGs: SDG 2 "Zero hunger: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture." And [9] SDG 3 "Good health and well-being: Ensure healthy lives and promote well-being for all at all ages."

There is almost a 9% of the world population still lacking regular access to food, an increase of 60 million in 5 years [7]. A 31-year gap exists between countries with the lowest and longest life expectancies, and more than 400 million people still lack health care protection [9]. Health issues, both globally and locally, are fundamental to

multinationals' operations as they frequently tackle health concerns. Investing in host countries' health can help develop healthier lifestyles and build living conditions that keep stakeholders healthy.

Investments by multinationals addressing the SDGs to Reduce Negative Externalities

The second part of the proposal is the design of investments to reduce negative externalities from the multinationals' activities. Negative externalities do not refer to the competitive effect of displacing local competitors resulting from the increased competitiveness of subsidiaries. Pollution and waste produced from manufacturing, or the environmental degradation for companies of natural resources are the type of negative externalities considered in this case [5]. Negative externalities are typically addressed by government regulations and policies that forbid certain types of activities including the dump of toxic waste, forcing companies to compensate the communities affected or redesign property rights to align incentives. Managing negative externalities through government policies is limited due to the lack of appropriate regulations in many countries or to the ineffective enforcement of the regulations and prosecution of misbehavior.

Multinationals can attempt to reduce these negative externalities on a voluntary basis through a series of non-state market-driven standards. These standards might help reduce the regulatory penalties from harming local communities. The traditional approach is to reduce the harm of multinationals' activities to local communities in order to prevent damage to multinationals' operations and reputation.

The alternative approach proposed by the article consists of a proactive action by multinationals to build their competitive advantage relying on their ability to mitigate negative externalities. It basically entails the implementation of higher standards than those of local competitors to avoid negative externalities. The company may be perceived as a better company by the government and citizens of the host country, facilitating the innovation and product sales, just by applying higher standards than the local competitors to avoid negative externalities. Better and more qualified younger employees may be attracted by companies that are concerned about their actions' impact on local societies. The proactive approach is the one used for the integration of the SDGs within the value chain, especially addressing the value chain segments in which multinationals often have a negative impact on.

Accordingly, it is suggested to group SDGs related to alleviation of adverse externalities into three major topics: the overuse of natural resources, harm to social cohesion, and overconsumption. Each of the topics and their relationship to the SDGs will be discussed below.

Multinationals' investments to mitigate the overuse of natural resources

The efforts on reducing the overuse of natural resources may lead to a beneficial change towards achieving the following SDGs that are also interrelated: SDG 6 "Clean water and sanitation: Ensure availability and sustainable management of water and sanitation for all;" SDG 7 "Affordable and clean energy: Ensure access to affordable, reliable, sustainable and modern energy for all;" SDG 13 "Climate action: Take urgent action to combat climate change and its impacts;" and SDG 15 "Life on land: Protect,

restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.”

The overexploitation of natural resources at an uncontrolled rate has led to direct harmful externalities linked to the exhaustion and degradation of renewable and non-renewable resources, such as water, fertile soils, and forests. The exploitation of natural resources creates a massive deficit of resources, to the extent that it would take at least 1.75 Earths to regenerate the natural resources consumed and absorb the waste generated [10], which means that it takes eight months more to recover from the consumption of a year. Moreover, the excessive exploitation of natural resources has also led to indirect harmful externalities, including ecosystems pollution, and climate change which is the main consequence of the rise in greenhouse gas concentrations in the atmosphere. Due to human activity, earth’s temperature has warmed more than 1.1° Celsius degrees (almost 2 Fahrenheit) compared to 1880 levels. [11]. By integrating their impact on environment and, particularly, on natural resources, into their decision-making processes, multinationals can have a fundamental role in reaching the objectives.

Multinational enterprises’ investments to reduce harm to social cohesion

The SDGs offer a different perspective of alleviating social tension and threats to social cohesion through an open society that reduces inequality, fosters inclusion, and works through partnerships. Therefore, social cohesion, as the minimizing of social conflict and the strengthening of social ties and peaceful resolution of conflict, is related to four SDGs: SDG 10 “Reducing inequality: Reduce inequality within and among countries;” SDG 11 “Sustainable cities and communities: Make cities and human settlements inclusive, safe, resilient and sustainable;” SDG 16 “Peace, justice, and strong institutions: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels;” and SDG 17 “Partnerships for the goals: Strengthen the means of implementation and revitalize the global partnership for sustainable development.”

Social integrity, crucial to a country's prosperity, relates not only to the lack of social conflict, but also to the existence of conflict-resolving social bonds and institutions, along with civil society organizations that heal social fractures. The SDGs offer a strategic alternative for dealing with conflict and violence, potentially contributing to the achievement of social cohesion. By restricting access to the economic and political sectors to powerful elites, different developing countries control violence and conflict. Consequently, in return for not using violence, these elites gain economic benefits being able to control the access to the economy and politics of the country.

In underdeveloped countries, corrupt practices, bribery, fiscal fraud result in a \$1.26 trillions annual cost. This amount could potentially lift people living on less than \$1.25 a day out of extreme poverty for six years [12]. It is crucial to mitigate social tensions by addressing inequalities and promoting sustainable and inclusive communities. Building fair and resilient institutions by means of partnerships may contribute to nurturing strong social linkages and peacefully ending conflicts. Multinationals can

play an important role by taking actions to promote inclusiveness in the workplace, and anti-corruption programs while supporting communities making partnerships with grassroots non-governmental organizations and institutions that foster peace and sustainability.

Multinationals' investments to minimize overconsumption

Reducing the environmental footprint can be integrated into the firm's competitive advantage instead of being a tradeoff for competitiveness. The investments towards reducing overconsumption have especially impact in two SDGs that are interconnected: SDG 12 "Responsible consumption and production: Ensure sustainable consumption and production," and SDG 14 "Life below water: Sustainable use of oceans, seas, and marine resources."

Global consumption has been driven by the rapid growth of the world's population and the advent of more growth-oriented national economies. Such increased global consumption carries a cost, since it aggravates major environmental problems, particularly waste and pollution. For example, more than 2 billion tons of urban solid waste are produced annually, being more than one third of it improperly managed, while waste generation is projected to increase worldwide and reach, by 2050, 3.4 billion tons. Some studies have calculated that one million plastic bottles are used every minute and annually five trillion single-use plastic bags are consumed. Plastic waste dumped in rivers ends up in the oceans, weighing between 1.1 and 2.4 million tons annually, heavily polluting oceans and causing major environmental issues like the Great Pacific garbage patch.

Multinationals can alleviate the negative externalities caused by overconsumption in their value chains. For example, they are able to minimize post-consumer land-based waste and stop it from ending polluting marine ecosystems.

Concluding remarks

This approach aims to promote a new perspective from multinational companies to ease the integration of the UN's 2030 Agenda for Sustainable Development into their decision-making. Translating the SDGs into the broadened value chain areas where they are most likely to have an enhanced impact, and reframing efforts in terms of reducing adverse externalities or enhancing those that are positive, contributes to two streams of research. On the one hand, it assists international business research in tackling major concerns. And, on the other hand, it is now required to revisit the current forecast for multinational performance in order to formulate an improved multinational strategy incorporating positive and negative externalities in the model.

The SDGs offer a comprehensive set of global goals to be pursued collaboratively and in cooperation with governments and societies, not only in the home countries of multinationals, but also in host countries. Unlike other company-specific measures, such as the environmental, social and governance (ESG) standard, the SDG targets go beyond the boundaries of the corporate sector. The framework is intended as a roadmap for international companies and a guide for multinationals' actions. [5]

2. Agri-food sector

The agri-food sector is a quite concentrated industry, a few companies have most of the market-share and produce immense quantities of products at a global level, which will be further explained in this chapter. Food systems include several activities along the entire supply chain, all of these stages may have an impact on the environment, society, and economy. These stages include agricultural production, food processing, food wholesale, retail, and service, and are illustrated in the following figure. The scope of this study is centered on companies in the agri-food sector which mainly comprise food processing businesses that might also operate in agriculture or which source the necessary products from agricultural businesses or smallholder farmers. [13]

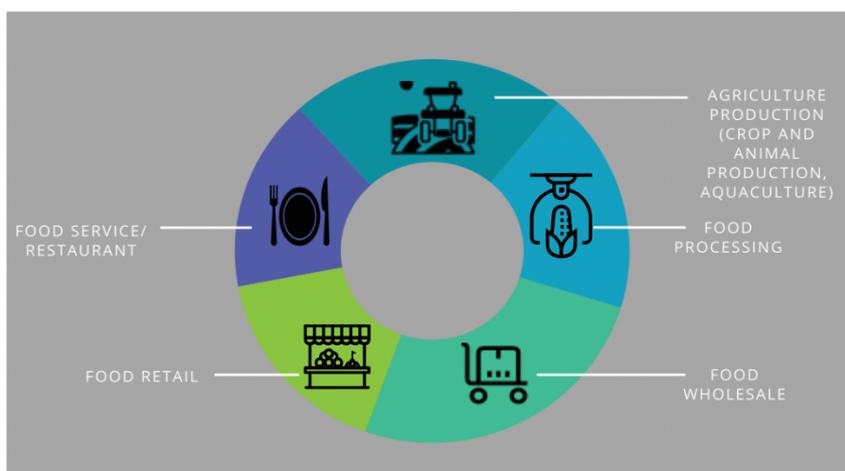


Figure 8: Stages of the agri-food system [14]

Food is one of the most essential commodities in the world; however, food production is a strongly concentrated industry. The major food producers are China, India, the United States and Brazil, which also happen to be the largest in geographical size. Food production is very demanding in terms of surface area and natural resource consumption.

China grows principally rice, wheat, vegetables, and sheep's milk amongst others, and also has the largest labor force worldwide, with a large number of workers involved in the food processing industry. India has very low agricultural productivity in spite of being one of the world's leading food producers, and has high levels of poverty, many of the citizens do not possess the purchasing power needed to buy the food produced locally. In contrast to the United States, which has the highest level of farm

productivity, and while having a significantly smaller labor force compared to China, it has almost the same level of agricultural production. And lastly, Brazilian agriculture, especially sugarcane, has been at the core of the country's economy. More than 30% of Brazil's total geographical extension is dedicated to agriculture, to the production of sugar cane, soybeans, coffee, and corn, as well as diverse types of fruits and beef. [15]

It is worth highlighting the relevance of the agri-food sector and the major impact it can have on the achievement of the SDGs. This sector, like so many others, has suffered the consequences of the pandemic and, in its aftermath, has different emerging trends that will shape the future characteristics of the agri-food sector. In the following subsections, it will be further explained the reasons why this sector has been targeted, other studies that also analyze agri-food businesses' performance and its current situation.

2.1 Why the agri-food sector?

Once the framework has been established in the first chapter, it is important to notice that the opening example of multinationals' initiatives mentioned in the article [5] is about Nutresa. Nutresa is a very important Colombian multinational company in the food sector. [5] directly cites the words of Claudia Rivera, Sustainability Director of the Colombian food multinational Grupo Nutresa, interviewed on July 1, 2020:

“At Grupo Nutresa, we understood that sustainability is the framework that encompasses the operation, that there is no profitable growth without integrating environmental or social issues. That's what makes an organization, and its stakeholders gain or lose value. [...] This has been the result of deep discussions because, after all, when you start building your strategy with the SDGs, [you see] they are very intertwined. However, we asked ourselves where we can have a stronger positive influence on the SDGs, and how we really manage to contribute to the global agenda.”

This citation together with other agri-food companies' examples in the article [5] emphasizes the relevance of this sector actions in the achievement of the SDGs. The UN's 2030 Agenda acknowledges that it is no longer possible to consider separately food, livelihoods, and natural resource management. Both rural development and investment in agriculture are crucial to help end poverty and hunger and achieve sustainable development. Agriculture plays a key role in the fight against climate change [4, 16].

The food industry is focused on the transformation of agricultural commodities into consumer products. Downstream activities of this industry such as post harvesting, agro-processing and commercialization have been gaining relevance in recent years. As these activities play a key role on creating jobs, food supply for non-farmers, energy and natural resource consumption, nourishment and health, pollution concerns... they have now been expanded further from agricultural production to entire food systems. Food systems are meant to be, foremost, the linking channels and actors that connect food production, processing and preparation, distribution and transportation, storage, waste management, and finally consumption; and also, supplier of agricultural inputs

including fertilizers and seeds, and regulating institutions and activities. Food systems are essential for reaching a sustainable and inclusive development.

In Europe, employment in agriculture has been steadily shrinking over the last years, while the share of farming in total employment is on the rise in developing countries, proving the great significance that agricultural production has for the societal development and prosperity of these countries.

Past year's unfolding developments have only emphasized the imperative need to confront the global inequality crisis urgently, spanning from COVID-19 through climate disasters to protests calling for an end to systemic racism. While businesses are increasingly recognizing the extent of inequality and their connection to it - and have been embracing human rights and sustainability commitments - the food chain is increasingly coming concentrated.

It has been observed that farmworkers' share of the end-consumer cost of a standard food basket has dropped by 44% over the last 25 years, whereas input vendors, food vendors, producers, and grocery stores all raised their shares. As the rights and livelihoods of the 2.5 billion people involved in small-scale agriculture worldwide are under threat, as more farmland is becoming concentrated within this global business' elites, allowing them to monopolize its profits. As a result of this global inequality, the financial power and profits of large corporations and other capital holders have grown at the cost of the grassroots, including the very same people that grow and produce food. As evidenced in the following figure, agri-food market concentration has spiked in every part of the supply chain to new heights.



Figure 9: food systems rising concentration [13]

The three issues at the heart of the business agenda for the coming years are biodiversity, climate change and inequality.

Most companies are leading the way in preparing for dramatic changes in both biodiversity and climate change. Yet, despite the urgency, it appears that effective action to address inequality is limited. [13].

Besides the impact of the agri-food industry on developing countries' employment and inequality, food security is another challenge that companies from this sector face. One of the main causes affecting food security is the lack of access to food, due to lack of physical access to food which may include not having the resources or financial resources to buy; or lack capabilities to produce sufficient food. Since Amartya Sen's work, food security has been understood as a question of access to food production or purchase rather than just a question of producing enough food to meet the needs of the poorest [17].

Nowadays, this issue has become even more critical as it is produced far more food than it is nutritionally needed, however, food security is not guaranteed just by food abundance [14]. One-third of the food that is produced in the world is either lost or thrown away. Dealing with food loss and waste is crucial to enhance both food and nutrition security, as well as to contribute to meeting climate goals and reduce the pressure on the environment. [18].

Millions of people do not have enough to eat or eat the inappropriate types of meals, giving rise to a double load of malnutrition that can lead to illness and health breakdowns. Based on a 2021 report, 720 million to 811 million people suffered from hunger in 2020, more than 10% of the population worldwide. Food insecurity can deteriorate the quality of diets and elevate the risk of several forms of malnutrition, which can lead to undernutrition and overweight and obesity. The affordability of healthy diets is inaccessible for more than 3 billion people in the world. [18]

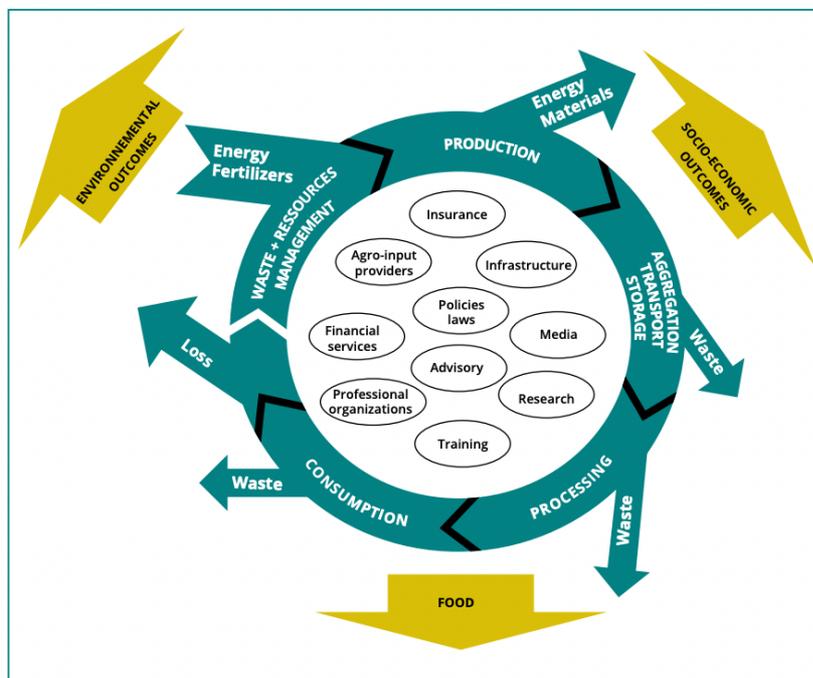


Figure 10: Food systems outputs [14]

Food systems have several outcomes that encompass the main output that is food, but also the environmental and socioeconomic outcomes that are the scope of this project. Since these outcomes have a direct and indirect impact on all aspects related to sustainability, the focus is on this sector. [14]

2.2 Studies analyzing agri-food companies' performance

Moreover, it is worth discussing the Behind the Brands campaign launched by Oxfam in 2013. The ten largest food and beverages companies in the world were analyzed and given a scorecard in terms of their activities' impact on different sustainable aspects such as climate, land, and women [13]. Oxfam's motivation for the campaign started eight years ago, when food prices were rising, and the enduring environmental concerns related with the industry.

Brands were called to implement more environmentally and socially responsible policies. After the campaign, companies made different commitments to change their strategies and reduce their impact. For instance, Mars, Mondelez, and Nestlé committed to address gender inequality in the cocoa supply chain. Or The Coca-Cola Company, Pepsico and others pledged to not tolerate land grabbing anywhere in their supply chain. The campaign pressure was evaluated 3 years after, in April 2016, and some differences were spotted. 700,000 actions were undertaken by citizens pushing the Big Ten Companies to move towards sustainability, and some scores were improving, but as said, more actions are needed in order to build a sustainable global food system.

Implementation of these commitments demands the resilience of companies. Oxfam has observed that, while the companies have made significant strides worldwide, the progress on translating these efforts to different countries and along the supply chain has stagnated. However, there are some successful examples and developments in key sourcing countries. Some local implementation efforts that promote the involvement of multinational and national companies, civil society, labor unions and governments, that are especially promising. However, the major barriers must be addressed, for instance, by ensuring the adequate incentives, outreaching, and encouraging suppliers to participate in the agenda and advocating for right policies to generate a large-scale positive impact.

Another factor that [13] considers is the fact that in the food supply chains there is a very high market concentration. Stating that "In a world with 7 billion food consumers and 1.5 billion food producers, no more than 500 companies control 70% of food choice". The statement remarks the very high impact and power of the larger agri-food sector companies globally.

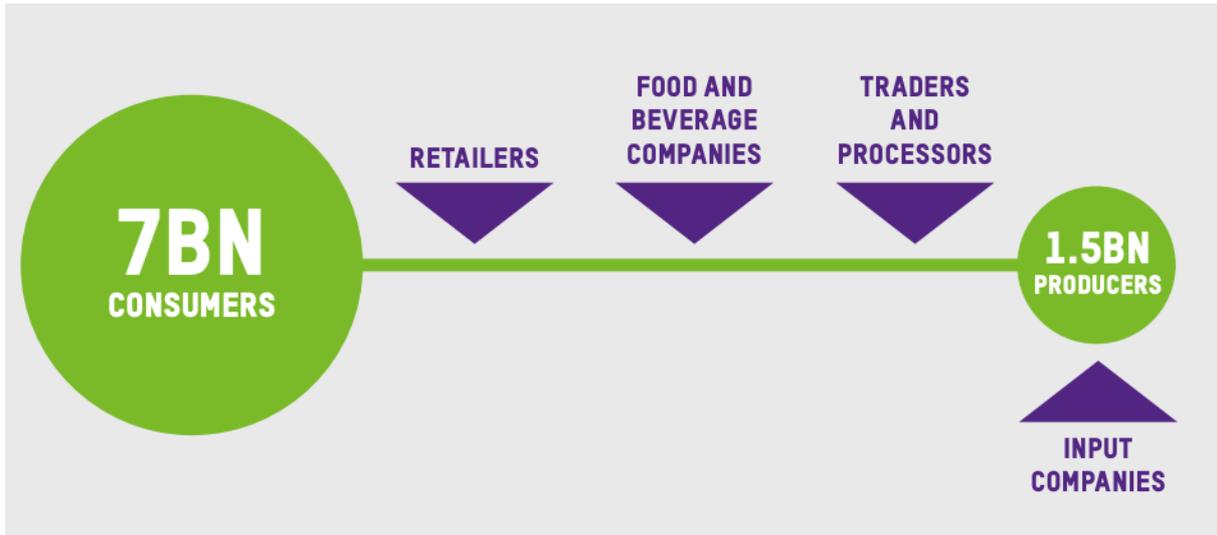


Figure 11: The high market concentration in food supply chains [13].

Oxfam not only assessed the food and beverages companies but in 2019, also did the first assessment of seven large global agribusinesses including: Cargill, Olam International, Archer Daniels Midland (ADM) and Wilmar International Limited. The companies were selected on the grounds of their close relation with food and beverage companies, their significant presence in the sugar, cocoa, and palm oil trade, as well as their relevant position in the “hot spot” of lower-income countries in terms of social and environmental challenges.

The analysis of the agribusinesses was conducted following the scorecard approach, examining how these companies managed human rights risks and impacts within their supply chain. Surprisingly, the initial results were that agribusinesses lagged behind the global brands, their direct customers. The vast majority of them, over 90%, scored below 50% having the poorest scores in transparency and accountability. The analysis was run again a year later, in 2020, and some improvements were noted, but there are still huge challenges to address and a remarkably wide gap compared to global food brands. The following figure illustrates an example of this situation, where Oxfam compared some food and beverages companies’ performance in action towards addressing gender inequality in contrast with agribusinesses performance in the same topic.

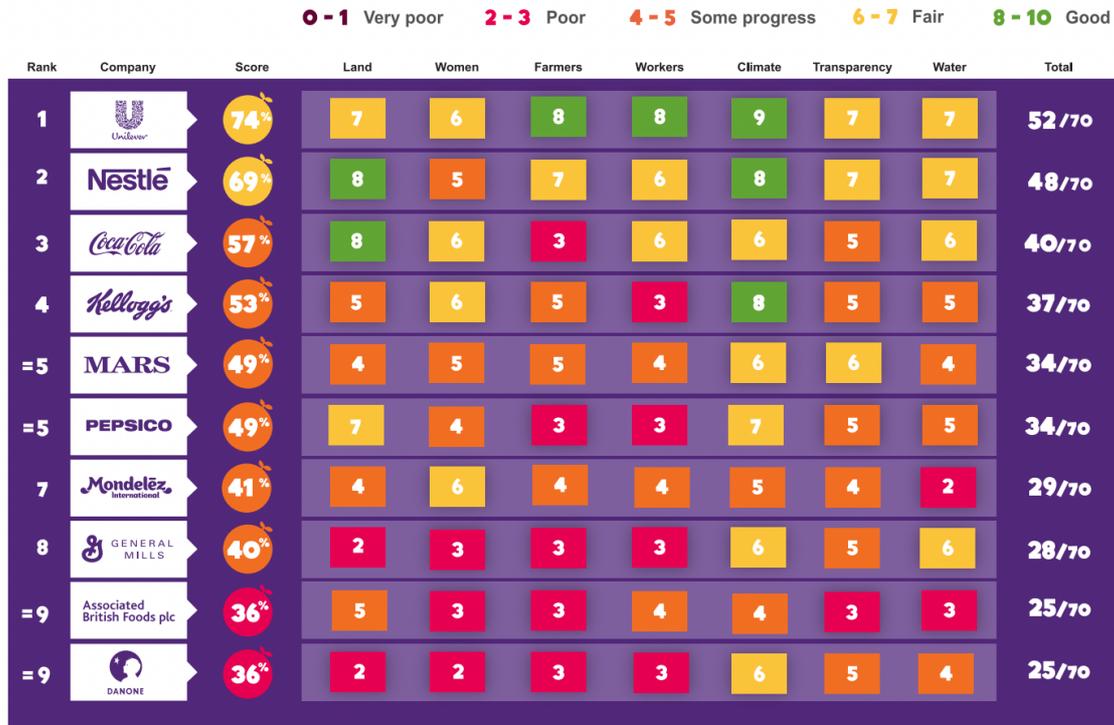
WOMEN	UN WEPs SIGNATORY	COMPANY-WIDE GENDER ACTION PLAN ²⁵	COLLECTION OF GENDER-DISAGGREGATED DATA ²⁶
Behind the Brands companies			
MARS	✓	✓	✓
MONDELEZ	✓	✓	✓
NESTLÉ	✓	✓	✓
Agribusinesses			
BARRY CALLEBAUT	✗	✗	✗
CARGILL	✗	✗	✗
OLAM	✓	✓	✓

Figure 12: Comparison of some food and beverages companies of Oxfam's campaign performance in terms of addressing women's inequality with some of the agribusinesses. [13]

In the report [13], there is further explanation on the situation of both types of companies, but it is strongly emphasized the clear need for the agribusiness companies to make an increased effort towards improving their performance in terms of sustainability. Behind the Brands, companies are called to push their suppliers also to reach these objectives. It is extremely risky for food and beverages company's credibility of their actions to have suppliers without a strong commitment nor robust policies.

Oxfam's method is to give a score to the seven themes chosen that include: transparency in business actions, women farmers along the value chain, workers, farmers (smallholder farmers particularly), land (both sustainable land use and land rights), water (including sustainable water use and access to clean water resources) and lastly, climate (emissions reduction and mitigation of climate change effects). Each of these themes (except transparency) is evaluated according to the following four indicators: awareness, commitments, actions, and value chain management.

BEHIND THE BRANDS: FOOD COMPANIES SCORECARD



Updated April 2016.
The latest version of this scorecard is available at <http://oxfam.org/behindthebrands>



Figure 13: Oxfam’s Behind the Brands Campaign results from April 2016.

Some aspects were not assessed in this campaign, as issues related to upstream value chain, such as nutrition. It was also not including the assessment of how the companies use their power to influence their suppliers’ actions.

Oxfam's campaign is prior to the publication of the 2030 Agenda, therefore it is not fully compliant with the targets established by the 17 SDGs, although it also addresses sustainability matters of major food businesses. It is also outdated as the latest dashboard is from 2016.

Nonetheless, this Campaign will prove very useful for this study as it tackles many sustainability themes, it relies on a lot of data provided by other relevant third parties and in the end, it served as a call to actions for companies to employ sustainable practices within their business activities.

2.3 Impact of Covid-19 on the agricultural sector and on the achievement of SDGs

Pandemics are not an unstudied phenomenon arising solely in contemporary societies, as they have been documented since ancient times. Each of them disrupts in different ways the global and local economy, politics, and society. Similarly, COVID-19 has impacted directly and indirectly in agri-food systems locally and globally.

Before the outbreak of the pandemic, the prospects for achievement of the SDGs by 2030 were looking fairly positive, particularly in developing countries. Many investments were coming from private and public sectors to SDGs-related activities. The disruption of COVID-19 made new investments from multinationals and the private sector fall by one-third [19]. Compared to pre-2015 levels, new investments in developing countries have declined by 20% since 2015. The food and agricultural sector projects, which is the aim of this project, have shrunk by as much as 50%. The following table depicts the impact of COVID-19 on investments that are directly relevant to the SDGs, depending on the region.

Region	2010–2014 average	2015–2019 average	Pre-COVID-19 trend ^(b) (%)	COVID-19 impact ^(c) (%)
Developed economies	79 036	86 739	10	21
Developing and emerging economies	124 571	151 779	22	- 33

Table 3: Value of Investment Projects (Millions of US Dollars) in SDGs sectors, comparing pre-COVID trends and COVID-19 impact by region [19]. Data source: UNCTAD (2021) and Financial Times, FDI Markets

This situation is, in fact, opposite to that in the developed world where a number of major public-funded infrastructure projects have been launched to promote post-pandemic recovery.

And several of these projects are directly linked to SDGs. As it can be understood from the data in the table, developing countries are much more vulnerable to post-pandemic consequences due to local governments' inability to fund major public projects. As a consequence of the pandemic and vaccination costs, developing countries have been further drowning in debts. Both poverty and inequality have increased due to unemployment and illness in families [20]. Moreover, the pandemic has highlighted significant vulnerabilities throughout the food system [13] and has altered the food systems working worldwide. Shorter food supply chains are beneficial not only for consumers but also for producers, for financial and managerial reasons, as it has been exposed after the pandemic. [21]

Some studies predict that COVID-19 will increase the gap between living standards in developed and developing countries. It has been shown that an "SDG Push" is needed to overcome the adverse implications of COVID that has set back progress towards the 2030 Agenda. [22]

In the long term, financing SDG-related projects in developing countries can help multinationals enhance their competitive position and improve their global image [19]. For example, Unilever has undertaken different actions in this line. It is creating

refillable and reusable bottles for several products in its portfolio. Unilever has committed to the goal of Net Zero emissions from its operations by 2030.

Besides having a dramatic impact on investment in the SDGs and on countries' progress toward sustainability, the pandemic has also affected severely food systems. Food security and hunger have been profoundly affected by COVID-19, food systems have been disrupted, incomes have declined, social inequalities have increased as well as prices. There has been a raise of more than 160 million people experiencing hunger in 2020 from 2019 levels, which is 800 million people facing hunger globally. Malnutrition rates experienced an increase from 8.4% to 9.9% in 2020, compared to the previous year.

Africa has the most hunger-affected population, with 21.0 million people, accounting for one-third of the world's malnourished population. Attaining food security goes deeper than eradicating hunger. Increasing levels of food insecurity mean that people are either prevented from having a healthy and well-balanced diet consistently, or they lack food for a day or more in the most severe cases. Sub-Saharan Africa reported the highest incidence of food insecurity with a 66,2%, followed by Latin America and the Caribbean. Women were 10% more likely to experience severe food insecurity than men, in comparison to 6% in 2019 [23].

The figure below illustrates the trend in the number of people suffering from undernutrition worldwide from 2015 to 2020. Demonstrating how the pandemic has exacerbated vulnerabilities in the food system, thereby undermining part of the progress made over recent years to combat hunger globally.

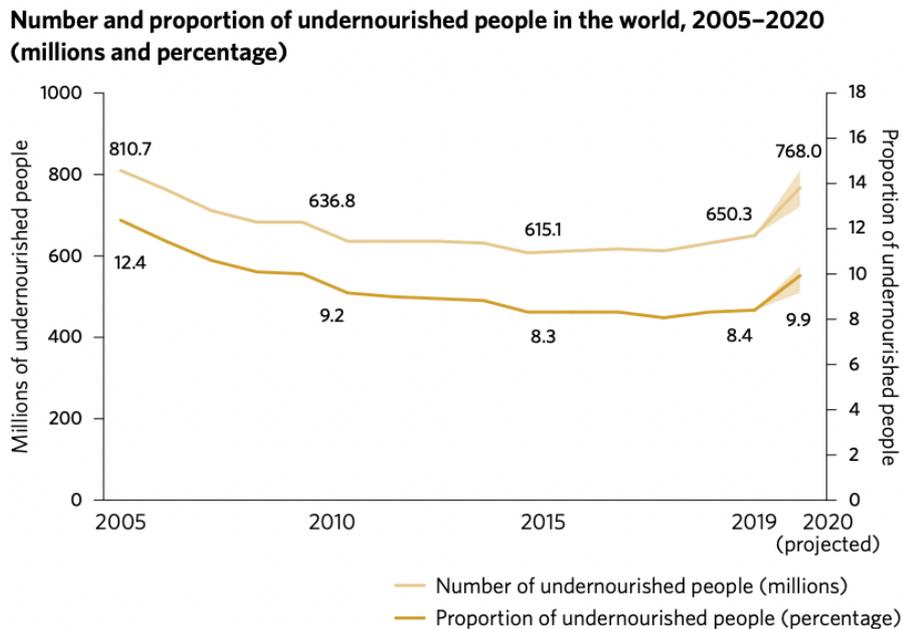


Figure 14: Graph on the number and proportion of undernourished people at a global level from 2005 to 2020 [23]

To summarize the findings, the pandemic has had a major impact on investment in SDGs, especially in developing countries. Investment in agricultural projects has been reduced by up to 50%, leading to major disruptions in food systems. A widening inequality effect is expected between developed and emerging economies due to the consequences of the pandemic. In addition to the adverse impact on the achievement of the SDGs, food insecurity has increased and caused the number of people suffering from malnutrition globally to rise after years of progress in reducing hunger.

2.4 Global trends in the agri-food sector

Several key trends in the agri-food sector may have a considerable impact on smallholder farmers and workers that, in fact, are the ones who create most of the value in the supply chains worldwide [13]. And, as a result, these trends can ultimately have implications regarding long-term sustainability. As Oxfam illustrates, they are outlined below:

1. The pandemic has aggravated inequalities and it is affecting global economy severely. Some of these consequences include job losses, pressure on wages and prices, and even deterioration of the working conditions.
2. The risk of the intricate and opaque supply chains has been further exposed, highlighting the need for improved transparency and shorter or simpler supply chains to manage risks more effectively.
3. The adoption of new high-end technologies and automation leads to job losses, higher inequalities, and a widening pay gap, which may eventually exclude small local producers from value chains. However, some of these technologies can offer the opportunity to enhance both traceability and more decentralized sourcing.
4. Low-income farmers may become more vulnerable due to climate change effects, as it directly impacts on the food types that can be locally produced and further divides the agricultural supply chain.
5. Decreasing biodiversity undermines ecosystem services such as clean air, safe water, pollination, thereby jeopardizing the basis of the food system.
6. The existing competition for the use of land, including conventional and sustainability-related uses, pressures the rights of smallholder farmers and local communities

The agri-food system has been gradually developing around the world and is experiencing rapid evolution. Recently, the technological advances have significantly altered the overall agri-food production system and the supply chain. This is true

independently of the socio-economic status of the region. Nevertheless, there are still a number of underlying sustainability challenges that need to be tackled.

In the next coming decades, the perspectives for the whole agri-food sector are promising; nevertheless, all stakeholders (farming community, trade unions, governmental and non-governmental organizations, ecological groups, suppliers and producers, agri-food scientists/technologists, policy managers, risk managers, consumers, and the general public) have to work together to contribute to a sustainable future [24].

Traditional agricultural methods, which are considered the cause of several environmental issues including deforestation, water, and land resources depletion and high GHG emissions, are not likely to help achieve sustainable production. In order to boost agricultural productivity while preserving and improving the natural resource base, innovative farming practices are urgently needed.

The evolution of food and agricultural systems towards more sustainable practices requires an understanding of the intricate relationships between producers and consumers, the availability of resources, population trends, productivity, technological developments and the climate change impacts [25].

The 2030 Agenda for Sustainable Development aspires to reach flourishing and fair societies, in which production technologies are based on limited resources in a way that does not endanger the prosperity of future generations and the earth [25].

To bring together all these emerging trends and the key challenges faced by the agricultural sector, these three drivers summarize and capture the issues discussed in this section, illustrating the relevance of the agri-food sector in the path to sustainability.

First, environmental effects cannot be regarded any longer simply as an externality of food production systems, but rather as one of their targets (Dury, et al., 2019). Food production's future is jeopardized as much by overexploitation or commodity depletion as by climate change, environmental deterioration, and the poverty that persists across many rural areas. Such risks are not external to food systems. It is crucial to implement development approaches that help capture carbon emissions, preserve biodiversity, and sustainably use natural resources.

The second factor is long-standing and was first highlighted by Amartya Sen: food insecurity is a matter of food access rather than availability. The goal of food security is therefore not just to produce sufficient food, but also to ensure that it is available to everyone, which implies fighting both poverty and inequality. Here again, a meaningful contribution to this aim can be made by food systems through price and income stability, where reserves (savings and equity, food stocks and seed banks) have a major role to play.

The third factor is nutritional transformation. Despite the fact that nutritional gaps are far from being eradicated, they are associated with severe malnutrition and greater security risks. Moreover, according to the development model, which may or may not favor healthy, varied, and sustainable nutrition, food systems can either uphold or undermine their impact on nourishment, wellbeing, and health, and thus on a country's economic situation [14].

So, over and above their initial aim of qualitative food production, food systems should also be assessed for their role in creating jobs, stabilizing livelihoods, narrowing inequalities among stakeholders and between regions, and maintaining and improving the integrity of the environment. The goal is not only to reduce these threats to the future of food production. It is to make a broader contribution to the Sustainable Development Goals, including those goals that do not directly address the issue of food security. It is about contributing more widely to the building of a sustainable planet in the long term.

Thus, transcending their original objective of providing quality food products, food systems must also be evaluated from the perspective of their contribution to job creation, the stability of rural populations' livelihoods, the alleviation of inequalities among stakeholders and among territories, and the environmental integrity preservation and enhancement. The real concern lies beyond mitigating the future threats to food production. It is about contributing to the Sustainable Development Goals, encompassing goals which do not tackle food security directly, thereby helping to create a more sustainable world in the long term. Attributing to food systems this multiplicity of purposes implies a comprehensive rethinking of these systems, an improved linkage among their results and an evaluation of them according to a variety of criteria rather than just to their production capacity [14].

3. Background

As discussed in the literature review, there is a substantial state-of-the-art void regarding a common understanding of how international corporations should be implementing the SDGs. A recent study has been presented that provides an externality-based framework for clustering the SDGs in order to ease both the understanding and measurement of international companies' investments on attaining sustainable development. Following the idea of this framework, this project aims to compare the engagement and compliance performance of various multinationals with respect to the SDGs.

This sector has been targeted in this study primarily as it is recognized worldwide as one of the most environmentally damaging sectors, it has been severely affected by the COVID-19 pandemic, and it has already been the subject of previous studies by international organizations such as Oxfam. Multinationals in this sector can significantly drive change to sustainability by embracing more environmentally responsible practices in all of their business activities.

The following chapters will present the companies on which this study will focus and the reasons why, the indicators and methodology followed to allow comparison between the companies in the sample and, finally, the results attained, and the conclusions drawn from the analysis.

4. Empirical analysis

As stated previously, multinational companies can play a relevant role in reaching the objectives set in the 2030 Agenda of the United Nations. This project aims to compare the performance of multinational companies in relation to the implementation of the SDGs, employing the externality-based framework explained above in section 1.3. Two groups of international companies have been studied, first from developed countries and then from developing countries, all of them in the agri-food sector. The agri-food industry has huge vulnerabilities that have been further exposed after the pandemic, as explained in chapter 2. This sector has an enormous impact on sustainability and mostly on developing countries where there are a lot of smallholder farmers and communities which suffer the consequences of the complex and non-transparent food industry value chain.

This section pretends to detail the methodology used for the comparative analysis, explain the selection of the cases, and how the data was collected for further analysis. First, it is essential to describe the empirical setting, and the phases of the process followed. Next, the selection of cases is explained, highlighting the relevance of the selected companies and the context in which they were chosen. Then, the data collection process is presented, including how the data required were collected for the subsequent analysis. For this purpose, the spotlight has been set on companies from this sector. And finally, it is reported how the indicators for the study were developed, and the process of data analysis employing those indicators is detailed.

4.1 Empirical setting

In order to draw conclusions and analyze the performance of the different agribusiness multinationals, it is essential to adopt a structured approach. The companies in the study belong to the agri-food sector and come from both developing and developed countries. Data from these companies will be drawn from corporate annual or sustainability reports, as well as from other external sources such as the Ellen MacArthur Foundation, international certifications, the United Nations Guiding Principles on Business and Human Rights, among others.

The study data will be primarily qualitative, relying on some quantitative data. The indicators for evaluating these qualitative data will be developed using the externalities framework. The final result provides scores for each company in each of the categories described within the positive and negative externalities, facilitating the comparison of the companies' performance, and will be presented in Chapter 5.

The methodology followed is explained schematically in the following figure, presenting each of the steps performed in the project.

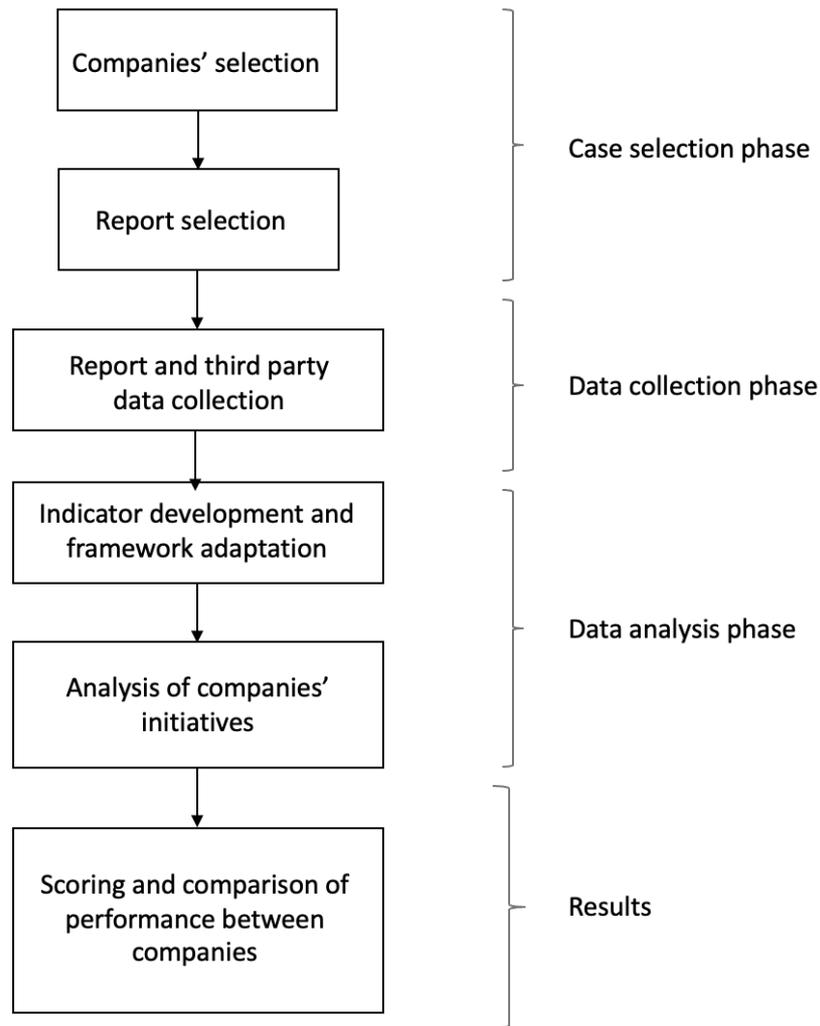


Figure 15: Outline of the phases and steps followed in the process

The procedure adopted for the empirical analysis section is, in first place, the identification of the cases that will be the subject of the project, followed by the gathering of the data required for the analysis and, ultimately, the evaluation of the data collected. Subsequent to these stages, the results will be obtained and compared in Chapter 5.

4.2 Case selection

COMPANIES' SELECTION

The companies chosen for the study are all listed in Food Engineering Magazine's [26] ranking of the 100 largest global food companies by revenue in 2021 (except Nutresa, although it was an interesting example from the literature review, being also a fairly large multinational).

All of the companies are part of the food and beverages industry or agribusinesses, all included in the agri-food sector. This selection has been made, firstly, by size and, secondly, on the basis of country of origin. Thus, some companies, which may not be the largest, are included in the database based on their countries of origin, in order to have heterogeneity in the database and to be able to make a comparative analysis. Having this heterogeneous database of countries allows comparison of commitments and investments in pursuing the SDGs. At national level, there are also many disparities in the level of progress towards the SDGs, with priorities being placed on different topics.

For the purposes of the comparative analysis, the selected enterprises have been grouped into two different categories according to their country of origin. The first group includes firms from developed countries, while the second group covers developing countries multinationals. The agri-food companies selected are shown in the tables below.

POSITION	COMPANY	ORIGIN	FOOD SALES
1	PepsiCo	USA	70.372
2	Nestle	Switzerland	67.708
4	Anheuser-Busch inBev	Belgium	46.881
5	Tyson Foods	USA	43.185
6	Mars	USA	37.000
7	ADM	USA	35.395
8	The Coca Cola Company	USA	34.300
10	Danone	France	26.297
11	Mondelez International	USA	26.581
12	Kraft	USA	26.158
17	Unilever	UK	21.820
28	Kellogg's	USA	13.770

Table 4: List of agri-food multinationals coming from developed countries

These twelve multinationals are included in the top 100 global food processing companies in 2021. Within this group, eight of the twelve companies are from the United States and the rest are European, from Switzerland, Belgium, France, and the United Kingdom.

This list contains the majority of the companies that Oxfam assessed in the Behind the Brands Campaign and that are also within the first thirty companies in the top 100 ranking. It is interesting to have them in the study in order to review the progress of these companies almost ten years after Oxfam's first campaign.

Associated British Foods which was in the Oxfam's Campaign it is not considered due to the time, and scope limitations of the project as its position it is currently in the 50th position in the ranking. General Mills is also not included as it is present in the ranking of the Food Engineering Magazine, but it is not listed in some other rankings contrasted for the study (top 33 in the Consumer Good Technology ranking) [27].

Anheuser-Busch inBev (top 3), Tyson Foods (top 5), and Kraft (top 12) are going to be further analyzed in this project, along with the eight companies that were also in Oxfam's campaign.

Anheuser-Busch inBev is considered interesting both because of its size and its origin (Belgium) which gives a little bit of diversity to the study. Tyson Foods is an American multinational food company known for meat processing and poultry which also adds diversity to the list. Kraft (top 13) is quite interesting as it is in the 110 positions in the Fortune 500 ranking in 2021 as a Food Consumer Products company with global presence.

The top 10 of the Food Engineering Magazine ranking also includes Cargill. Cargill is not considered, as less than one third (32,375) of its total revenues (114,600) come from food processing. It operates in other relevant industries such as beauty, pharmaceuticals, and carbon solutions, from which the company generates by far the majority of its revenues. Consequently, their impact on sustainability would be more substantial in other fields rather than just in the agri-food sector.

In order to illustrate the type of sustainable initiatives being undertaken by some of these companies, Mondelez's Cocoa Life Program is presented below.

THE CASE OF MONDELEZ INTERNATIONAL - COCOA LIFE PROGRAM

Mondelez is a very large company headquartered in the United States, that mainly commercializes snacks such as candy, chocolate, chewing gum, and cheese. It has global presence, in more than 150 countries across continents. Almost 75% of the revenues are generated outside the US.

Mondelez has developed a cocoa sustainability program called Cocoa Life. This program aims at tackling cocoa supply chain issues such as gender inequality, child labor, climate change and poverty. It was launched in 2012 to transform their cocoa supply chain. Cocoa Life is addressing the issues of six key communities including Brazil, Côte d'Ivoire, Dominican Republic, Ghana, India, and Indonesia.

Cocoa Life's efforts are focused on three main pillars:

1. Making cocoa farming a sustainable business

Since the beginning of the program more than 180,000 local farmers have been trained in Good Agricultural Practices, registering an increase on farmers' income of 22% in Ghana and 8% in Côte d'Ivoire comparing to farmers outside Cocoa Life program.

2. Creating empowered communities

In order to enable cocoa communities to take the lead in their own development, Community Actions Plans (CAPs) are essential. Almost 2000 Cocoa Life communities had an active plan of action in place by the end of 2020. CAPs have been activated in more than the 90% of Cocoa Life communities in West Africa, serving 2 million people, and being around 65% of these projects supported also by local governments. For the CAPs in the communities sponsored by Cocoa Life, educational infrastructure is the top priority, contributing to improve access to quality education and to make a long-lasting change.

3. Conserving and restoring forests.

Over 2.2 million non-cocoa trees were delivered by the end of 2020 and more than 167,000 farms were monitored for deforestation, accounting for over the 70% of Cocoa Life farms, 12% more than the previous year. In addition, Good Environmental Practices (GEP) training in West Africa is proving to make a difference: 82% of farmers have already improved their practices to lessen their climate footprint. [28]



Figure 16: Cocoa Life Program Pillars

With this initiative, it becomes very clear the directions companies should take in order to implement actions towards sustainability. Mondelez International Cocoa Life Program is an effort to fight against deforestation, empower farmers and local communities, and minimize the impact of agriculture on the planet. It is a proposal of how to ensure and lead the way towards responsible and sustainable sourcing of cocoa that could be applied to any other products or supply chains.

The second group is formed by the agri-food multinationals that come from coming from developing countries, as listed below in table 3:

POSITION	COMPANY	ORIGIN	FOOD SALES
3	JBS Sa	Brazil	50.690
14	Olam International	Nigeria	22.842
23	Grupo Bimbo	Mexico	15.415
30	Marfrig Group	Brazil	13.107
37	China Mengniu Dairy Company	China	11.016
53	ThaiBev	Thailand	8.103
59	Brf Brasil Foods	Brazil	7.664
NA	Grupo Nutresa	Colombia	-

Table 5: List of agri-food multinationals coming from developing countries

All the corporations shown in Table 3 have their origin in developing countries and are listed in the Food Engineering magazine's ranking of the top 100 food companies in 2021 by revenue. Grupo Nutresa is also enlisted for the study even though it is not present in the ranking, as it is an interesting case from the literature review that can provide useful insights on the performance of this group of companies towards achieving the SDGs. The Chinese company Yili Group (top 26) is not included in this list, as no report is available.

Three Brazilian multinationals, one from China, one from Thailand, one from Colombia and one from Mexico are on the study's list. Also worth considering is the case of Olam International, since it is from Nigeria, being the only one originally from sub-Saharan Africa. Operating in 60 countries, Olam is one of the largest cocoa, coffee, cotton, and rice suppliers in the world. It was first established in Nigeria, operating in West and East Africa, then also India, and finally relocated the headquarters to Singapore.

In order to illustrate the type of endeavors these companies undertake to reach sustainability practices in their business operations, it is presented the case of Nutresa and its sustainable principles.

THE SUSTAINABILITY CASE OF NUTRESA

With its strong commitment to sustainability, Grupo Nutresa is a food processor that has been on the Dow Jones Sustainability Index* (DJSI) for six years in a row. It is headquartered in Colombia and is regarded as one of the major actors in the Latin American market, operating 45 production plants, with 45,000 employees and serving over one million customers.

Sustainable development is the core of their business model, with the objective of achieving an economic approach that combines social development and environmental sustainability.

Grupo Nutresa defined in 2014 six strategic categories to be addressed through sustainability practices and has endorsed them with collaborative development initiatives and with its main corporate governance. These six principles mentioned are:

- Acting with integrity.
- Promoting cost-effective growth and successful innovation.
- Fostering healthier living standards.
- Sustainably driving the value chain.
- Constructing a better society.
- Minimizing the environmental footprint of its operations and outputs.

With a focus on reducing energy and water consumption and cutting greenhouse gas emissions, Grupo Nutresa, the largest Colombian food processing company, has successfully decreased its environmental footprint. For instance, the company supports Colombian coffee producers in their efforts to grow coffee beans requiring 90% less water. Currently, its "Germinar" program fights undernourishment by educating disadvantaged local people about living from their own land in a sustainable way.

In a cooperative effort with UNICEF, the WFP, and the Colombian Ministry of Education, Nutresa promotes healthy lifestyles among Colombian children. It also aids food banks in the countries in which it is present. Because of these and other initiatives, Nutresa is the only Latin American food company included in the Dow Jones Sustainability Index, ranking second best in that particular category. [29]

* The Dow Jones Sustainability Indices (DJSI) are a series of benchmark indicators that provide a reference for investors seeking to incorporate sustainability and environmental concerns into their portfolios and serve as a useful engagement tool to commit companies to continue to implement corporate sustainability practices.

As mentioned previously all of the companies in these samples are agri-food sector companies, including companies from the food and beverage industry as well as agribusiness. The agribusiness companies chosen in this study (Archer Daniel Midland and Olam international) are tightly related to the food and beverages companies, and also have a key role in sugar, cocoa, and palm oil trade.

It is worth highlighting that even though food represents a major economic commodity, there are only a limited number of countries that are outstanding in terms of agricultural production. The four largest agri-food producers globally are China, India, the United States and Brazil [15]. In this study, companies from three of these four countries are considered.

In order to draw subsequent conclusions about the project, it is relevant to illustrate the spillover score of the different countries of origin of the sampled companies according to the UN indicator. Since this will provide an idea of the country-level outcomes in terms of positive-negative externalities, the UN spillover score pretends to demonstrate the balance between the positive and negative spillover effects. A high score signifies that the positive spillover effects outweigh the negative ones, which may be useful for the later understanding of the results of companies from different countries in either enhancing positive externalities or decreasing negative ones.

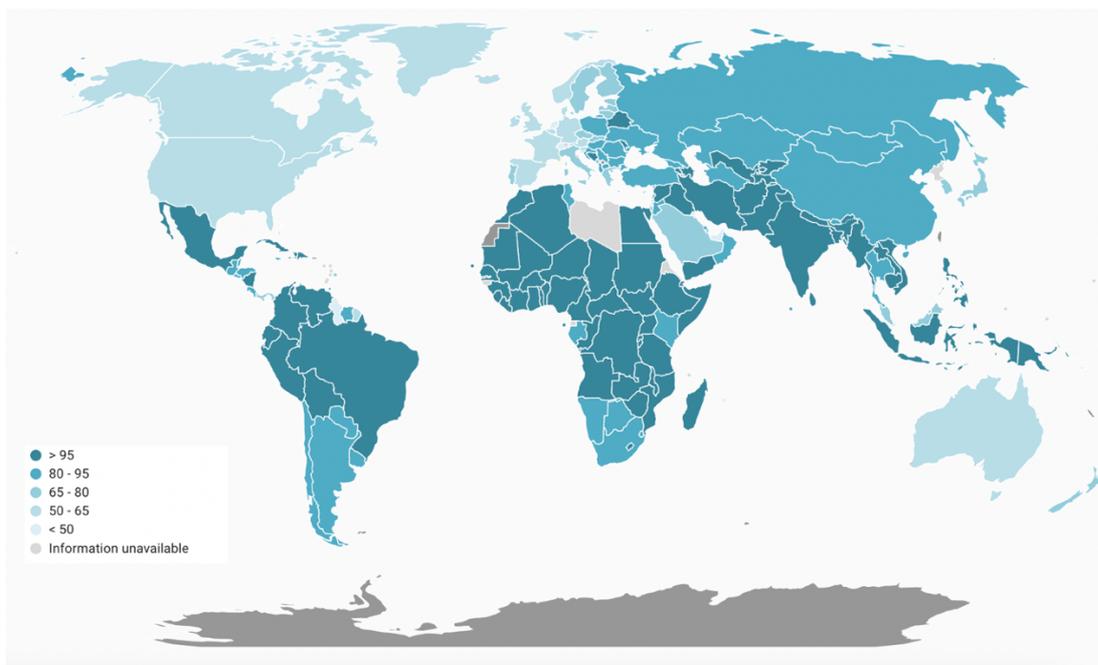


Figure 17: UN's interactive map on Spillover Score.

It is clear from the map that South American, African, and Southeast Asian countries overall are scoring significantly higher compared to Europe and North America in terms of spillover effects, their positive spillover effects are relatively higher, and the negative ones are fewer. The following table summarizes the UN's spillover scores for the list of countries discussed.

Country	Spillover Score
USA	62,14
Switzerland	41,66
UK	54,12
France	55,89
Belgium	61,97
Brazil	97,57
Nigeria	98,93
Colombia	95,19
Mexico	95,46
Thailand	88,68
China	94,62

Table 6: Countries' spillover scores

In summary, two groups of companies have been formed for the subsequent analysis, including heterogeneity in the sample, since companies founded in different countries have been selected. All the companies on the lists belong to the food consumer products or food production industries and have a broad portfolio of food brands. Given that the food sector is quite concentrated, the sample of 12 companies from developed countries and 8 from developing countries is considered enough for the scope of this analysis.

A more detailed table is presented below to better illustrate the performance of the different groups of countries in terms of SDG achievement and spillover index. OECD countries perform the best on the SDGs, although they are at the low-end of the spillover index, while Sub-Saharan Africa and East and South Asia are at the bottom of SDG index score but have the highest spillover index. The countries of Latin America and the Caribbean are in an intermediate situation.

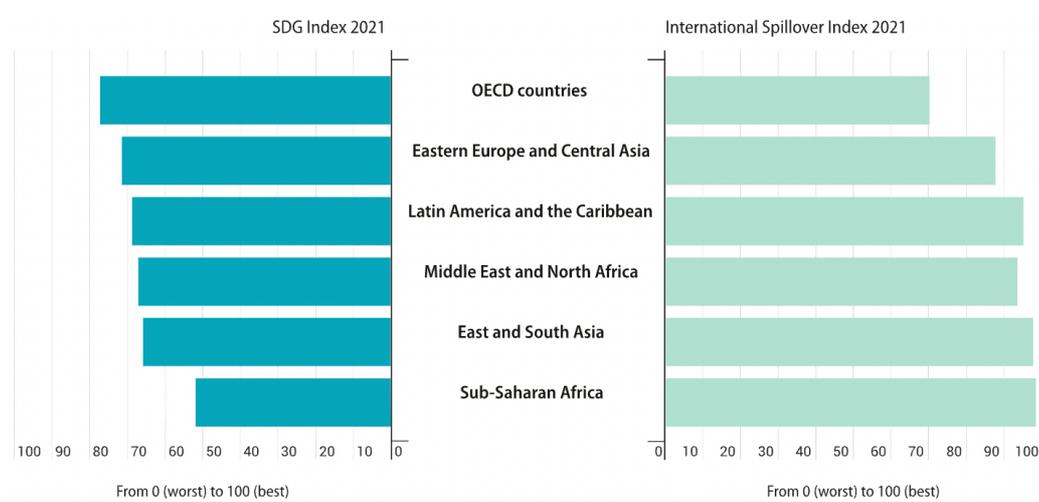


Figure 18: SDG and spillover index of different regions. [30]

REPORT SELECTION

Nowadays, most companies present an annual report or a sustainability report. These reports will be crucial to the study, as corporations rely on them to communicate their commitments and investments to stakeholders, shareholders, and the general public. There are different concepts used within the process of communicating sustainable practices including Environmental, Social and Governance criteria, Corporate Social Responsibility, sustainability reporting and SDG progress. These forms of reporting is further detailed and explained in subsection 4.3.1 Sustainability reporting, since it is a fundamental aspect of the project. The selected reports from each company are summarized in the following tables.

COMPANIES	REPORTS USED
PEPSICO	2020 Sustainability Report Summary (9 pages) and website: https://www.pepsico.com/esg-topics-a-z/
NESTLE	Creating Shared Value and Sustainability Report 2020.
ANHEUSER-BUSCH INBEV	2020 Environmental, Social & Governance Report (66 pages)
TYSON FOODS	2020 Progress Report (28 pages)
MARS	2020 scorecard (4 pages) and website: https://www.mars.com/sustainability-plan
THE COCA COMPANY	2020 Business & Environmental, Social and Governance Report (82 pages)
DANONE	Danone's contribution to UN's Sustainable Development Goals 2019 (16 pages); Integrated annual report 2020 (319 pages) and website: https://www.danone.com/impact/policies-and-commitments.html#HEALTH
MONDELEZ INTERNATIONAL	2020 ESG report (60 pages)
KRAFT	2021 ESG report (77 pages)
UNILEVER	2020 Annual report (209 pages)

Table 7: Reports used for the developed countries companies' analysis

COMPANIES	REPORTS USED
JBS SA	Sustainability report, Environment, Social and Governance Performance 2020 (257 pages)
OLAM INTERNATIONAL	Annual Report 2020 (306 pages)
GRUPO BIMBO	Annual Report 2020 (242 pages)
MARFRIG GROUP	Sustainability progress report 2020 (25 pages)
THAIBEV	Sustainability report 2021 (276 pages)
BRF BRASIL FOODS	Integrated report 2020 (195 pages)
GRUPO NUTRESA	Integrated report 2020 (126 pages)
WILMAR	Sustainability report 2021 (121 pages)

Table 8: Reports used for the developing countries companies' analysis

The annual or sustainability reports of each of the companies cited were analyzed. They represent a sample of twelve reports, more than 900 pages plus their websites in the case of the developed country group of companies, and over 1500 pages from the eight reports of the developing country companies. The most recent reports were selected in each case being most of them dated 2020, and a few dated 2021.

4.3 Data collection

The data for this study is qualitative, aims to answer to a series of questions or indicators to understand the awareness or actions implemented by the companies towards the different concerns included in the project. This data is directly collected from the reports illustrated in the Case Selection sub section.

Qualitative data permit a flexible way of collecting data, analyzing it, and drawing conclusions, while allowing for a more descriptive and realistic perspective of the issues presented when compared to the use of solely quantitative approaches.

This section will start with a review of sustainability reporting meaning, as this is the foundation from which the data will be collected. There are different concepts that need to be illustrated to understand the type of data that will be used and their relevance and connection to the SDGs

4.3.1 Sustainability reporting

Companies from different industries have been reporting and communicating their performance and efforts towards sustainability. It is worth mentioning and describing the differences between the terminology used in these reports, such as Corporate Social Responsibility (CSR); Environmental, Social and Governance (ESG) criteria and, finally, sustainability reporting and SDGs.

In the 2030 Agenda for sustainable development there are three dimensions for the goals: economic, social, and environmental. In this scenario, corporate stakeholders, public institutions, and non-governmental organizations will play a key part in mobilizing business socially responsible practices. Today, there are several tools, initiatives, and approaches (TIAs) to foster sustainability in companies. Among these TIAs there is CSR practice which is a tool and an approach; and sustainability reporting which is a voluntary activity that has two main objectives: assessing the state of the firm and communicating to stakeholders the performance in economic, environmental, and social areas. [31] Both these TIAs will be further explained below along with the ESG criteria and SDGs in order to set the baseline and differentiate these concepts in the literature [32].

What is Corporate Social Responsibility?

Corporate social responsibility, or CSR, is a governance approach whereby companies integrate social and environmental concerns throughout their operations and stakeholder relations [33]. In fact, some researchers have divided this approach into four types of responsibilities: economic, legal, ethical, and philanthropic. [34]. The first two categories are considered to be the required ones, economic and legal, then ethical responsibilities are described as the expected ones and, finally, philanthropic responsibilities are the desired ones. In order for the company to completely comprehend the practice of CSR, it must first understand these responsibilities. To further explain these responsibilities: [35]



Figure 19: Carroll's pyramid model of corporate social responsibility [36]

Some of CSR key issues to address are working conditions, gender balance, environmental management, responsible sourcing, human rights and good governance among others... These concerns are directly covered in the business's decisions, policies, and practices. The CSR commitments help shape the company's culture and values, they are typically autoregulated and differ from one company to another [33]. Businesses, and especially food and beverage processors, are moving forward to improve their efficiency in the use of natural resources and minimizing their environmental footprint by implementing the CSR practice [37].

What is Environmental, Social and Governance? [38]

Environmental, social and governance factors are evaluated by ESG to measure the sustainability of the company's practices. According to Lexology [39]: "While CSR aims to make a business accountable, ESG criteria make such business' efforts measurable."

ESG standards enable investors to make well-informed business decisions based on an understanding of a company's ethics and culture. In the same way they assist consumers in choosing which companies they want to engage with and which they do not [40].

- Environmental criteria cover the company's waste management, share of renewable energy, deforestation concerns

- Social criteria include diversity and inclusion programs, gender equality, monitoring of suppliers' actions, employee trainings and education programs.
- Governance criteria encompass executive management, financial transparency, management of the interests of the different stakeholders.

Sustainable Development Goals and Businesses

There is agreement between all businesses that the SDGs should be embraced by incorporating the concept of "sustainability", which encompasses economic, social, and environmental dimensions. While the majority of firms are already engaged in a number of sustainable practices, some have not yet linked their activities to the SDGs. Companies are able to communicate their performance and investments towards sustainability thanks to the shared indicators and priorities set by these goals.

SDG Compass was designed for major multinational corporations, but small and medium-sized enterprises (SMEs) and other organizations may also use it, adjusting it when needed. It is intended for use at corporate level and the guide is divided in the following five sections:

- SDGs understanding.
- Priority definition.
- Goal setting.
- Sustainability integration into the core business and governance.
- Communication and reporting on sustainable development performance through shared indicators and priorities.

The SDGs can be adopted by companies as an overall guiding structure to frame, drive, and report on their strategies, objectives, and initiatives. They may enable multinationals to leverage on a variety of benefits including the identification of potential business opportunities, strengthening corporate sustainability value, and reinforcing relationships with stakeholders.

To this end, businesses bringing their policies and objectives in line with the SDGs will have the insight and knowledge to maximize their CSR and development investments. Companies will stand in the strongest place to build trust and participate in principle-based partnerships with other stakeholders whether public or private, to the extent that they engage with these global goals and strategically adapt their approach to the SDG Agenda from a context-specific perspective. By participating in local associations or issue-based platforms, a firm's single engagement can broaden its commitment value, accessing domestic and global networks connected by a worldwide recognized Agenda, with a shared language and purpose [41].

CSR, ESG and SDGs

Companies that have a robust CSR mindset, these three sustainability areas seem to be perfectly aligned. The values supported by the CSR of the company are later measured by ESG, understanding the actual and quantified impact of the social responsibility measures. When ESG is directly in line with the objectives set by the United Nations, the company is able to contribute also to the Sustainable Development Goals [38].

It is not easy for companies to transform into sustainable businesses, however, benchmarking the goals of the UN's 2030 Agenda and the abundant ESG data sources, future benefits may come to the companies and the world.

Methods for quantifying impact: Companies sustainability reporting

At no time has business culture been as transparent or as critical as it is currently. Shareholders, investors, consumers, employees decide to engage with companies or not based on their culture and values. This is the reason why CSR and ESG are gaining importance over the years [38].

Companies disclose their impact and outcomes on several sustainability issues using sustainability reporting. It provides companies a transparent way to present their risks and opportunities in the environment, social and governance areas. Sustainability reporting gives stakeholders a better understanding of the companies' performance. Currently, sustainability issues are progressively being embedded into the decision-making progress of the companies.

The Global Reporting Initiative defines sustainability reporting as "an organization's practice of reporting publicly on its economic, environmental, and/or social impacts". In 2020, 80% of the N100 (global sample of the top 100 companies by revenue of the 52 countries) and the 96% of the G250 (world's top 250 companies by revenue) reported their sustainability performance, whereas in the late 1990s only 35% of the G250 and 24% of the N100 did it [42]. Sustainability reporting has become a standard practice in the companies to show both transparency and accountability, and to communicate with stakeholders.

Sustainability reporting standards are widely used by multinationals. Most of the companies in the groups mentioned (N100 and G250) employed some standard frameworks or guidelines to support their sustainability report. The most spread framework is the GRI standards, from 2017 have considerably increased their implementation. Some other commonly used standards for sustainability reporting are the Sustainability Accounting Standards Board (SASB) framework and International Standards Organization (ISO) standards.

4.3.2 Data collection from reports and third parties

To study the performance of businesses, an extensive amount of data is required in order as to allow for a comparative assessment of company performance. To start with, all the reports of the sampled companies are readily accessible and accessible for all; and businesses rely on these reports to disclose their sustainability progress and communicate their future targets for improving their performance. A certain heterogeneity can be encountered among sustainability reporting methods, as corporations may employ different baseline years or diverse methods to account for progress, nonetheless some initiatives promote specific standards or guidelines for benchmarking progress in particular aspects of sustainability. SDGs were originally tailored for country-level actions; therefore, an attempt has been launched by several third parties around the world to establish certifications, and alternative standards to assess companies' sustainability performance.

Some of these standards were used to develop the indicators and to acknowledge the transparency and commitment in the sustainability reporting. GRI standards are a great example. These standards have been adopted by many companies and continuously reviewed to ensure they are reflective of best practices on sustainability reporting worldwide.

So first, data was collected from the sustainability report and then it was double-checked, if possible, with some other sources or certifications.

CERTIFICATIONS, INITIATIVES, PROGRAMS AND GUIDELINES CONSULTED

Governments have a claim to uphold people's human rights and protect them from violations. Nevertheless, when governments either fail or are incapable of dealing with abuses, which is frequently the situation in long global supply chains like sugarcane, cocoa, or palm oil, companies tend to turn to formal multi-stakeholder initiatives (MSIs) as a means to boost sustainability throughout their supply chains. Some recent reports put into question the efficiency of MSIs in achieving the human rights agenda.

Although MSIs are rarely an appropriate alternative to mandatory regulations, they can potentially promote more sustainable behavior on businesses' activities. MSIs have the focus of a fairly wide range of firms: they can boost sustainability especially in commodity value chains. Under MSI Integrity, MSIs can also bring learning, encourage piloting, and assist in building trust between stakeholders, nevertheless, the role of MSIs in this regard must also be precisely framed and more clearly defined.

Amidst issues such as costs sharing, transparency and auditing, MSIs should look for the voices and engagement of the most concerned stakeholders. These parties should report on what issues MSIs give priority to and how they apply their standards. For example, over the past year, Oxfam has provided support to rural unions in Brazil, by allowing farmers to attend the Rainforest Alliance and Bonsucro's public consultations. For the very first time, these farmers had the opportunity to participate in the design of certifications that directly affect their lives and livelihoods [13].

Related to human rights

UNGP (United Nations Guiding Principles on Business and Human Rights): These principles aim to establish a holistic approach for both companies and governments to tackle human rights violations and to introduce human rights standards and best practices in order attain a socially sustainable development.

CLMRS (Child Labor Monitoring and Remediation System): is a program from ICI the International Cocoa Initiative, a swiss based non-profit foundation, that can be integrated into a business's activities and comprises four phases to effectively tackle child labor. It initiates with awareness raising, case identification, remediation support and finally monitoring and follow-up of the children. It is usually applied throughout the supply chain and is 50% effective to reduce child labor for identified children.

FPIC (Free, Prior and Informed Consent): FPIC attempts to guarantee the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), demanding the consultation and engagement of indigenous communities when companies are going to implement projects that use the land located in their territory.

Initiative	Abbreviation	Links
United Nations Guiding Principles on Business and Human Rights	UNGP	https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf
Child Labor Monitoring and Remediation System	CLMRS	https://www.cocoainitiative.org/our-work/operational-support/child-labour-monitoring-and-remediation-systems
Free, Prior and Informed Consent	FPIC	https://www.fao.org/3/i6190e/i6190e.pdf

Table 9: Links of the initiatives consulted related to human rights support

Related to gender equality

The UN Women's Empowerment Principles (WEP) are a set of UN guidelines that offer orientation concerning good practices to foster women's empowerment and gender equality. It encompasses three main places in which businesses can undertake actions to empower women at workplaces, in the markets, and in their communities.

Initiative	Abbreviation	Links
United Nations Women's Empowerment Principles	UNGP	https://www.weps.org/about

Table 10: Links consulted related to gender equality promotion

Related to natural resources exploitation and overconsumption

Scientific-based Target initiative (SBTi) to meet Paris Agreement objects by limiting global temperature rise well below 2°. Science-based targets deliver a well-defined roadmap for businesses towards reducing greenhouse gas (GHG) emissions, ultimately preventing climate change's worst effects, and preparing businesses' future growth.

Net zero emissions by 2050: this is also a science-based target that establishes a comprehensive emission cutting strategy for businesses.

RE 100: is the worldwide renewable energy business program involving hundreds of major and far-reaching enterprises that are fully engaged in achieving a 100% renewable electricity use within their activities.

Responsible sourcing and sustainable farming Roundtables:

- RSPO (Roundtable on Sustainable Palm Oil): it is a certification that ensures that the Palm Oil used in production of end products is sustainable. All organizations in the supply chain are inspected to ensure that they do not oversell or add conventional (not sustainable) palm oil to the products.
- RTRS (RoundTable on Responsible Soy): it is a globally acknowledged management instrument, used for sustainable soy and corn production strategy.
- Bonsucro: The Production Standard enables farmers and mills to assess both productivity and key environmental and social aspects of their sugarcane production. And the Chain of Custody Standard allows brands to trace sugarcane from source to final product.

Circular economy and plastic pollution reduction initiative:

- Ellen McArthur Foundation: This foundation fosters globally the transition towards a circular economy. It has created Global Signatory Reports featuring companies and institutions that communicate their ongoing progress in plastic reduction and their expanded efforts in designing recyclable products as well as the incorporation of recycled materials to replace virgin plastic.

Initiative	Abbreviation	Link
Scientific-based Target initiative	SBTi	https://sciencebasedtargets.org/how-it-works
RE 100	RE 100:	https://www.there100.org/
Net Zero target for 2050		https://sciencebasedtargets.org/net-zero
Related to responsible sourcing: <ul style="list-style-type: none"> - Roundtable on Sustainable Palm Oil - RoundTable on Responsible Soy - Bonsucro 	RSPO RTRS Bonsucro	https://rspo.org/ https://responsiblesoy.org/ https://bonsucro.com/what-is-certification/
Ellen MacArthur Foundation Signatory reports	N/A	https://ellenmacarthurfoundation.org/global-commitment/signatory-reports

Table 11: Links consulted for overuse and overconsumption reduction certifications and initiatives

4.3 Data analysis

To begin with, the framework explained above in section 1.3 is used as the baseline. This framework proposes to group the SDGs into six categories and divide them by differentiating between those that contribute to enhance positive externalities (increase wealth, health and knowledge) and those that mitigate negative externalities (reduce overconsumption, social harm and overuse of the natural resources) of multinational companies, is used as the baseline. [5]

Moreover, it takes as a reference Oxfam's Behind the Brands Campaign that evaluates in a similar the awareness, action, and performance of the ten biggest food and beverages in 2013 on various sustainability themes. The indicators used by Oxfam in their Behind the Brands campaign have served as a starting point for the development of qualitative indicators, adapting them to the new categories used in this project.

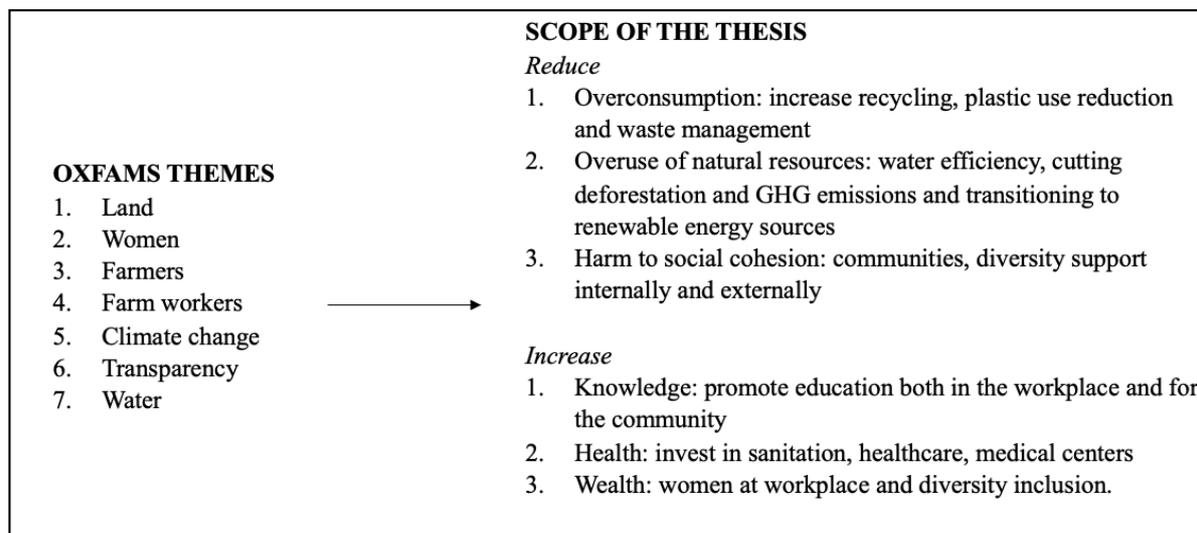


Figure 20: Translation of the Oxfam's themes to the scope of this analysis

Taking these themes and using the baseline of the SDGs, the different indicators have been developed. To the extent possible, broadly recognized and accepted best practices have been adopted in the construction of the dashboard. The Carbon Disclosure Project (CDP) metrics on environment and water were adopted by Oxfam and, consequently, they have also been used for this project. In order to cover all of the aspects present in the externality-based approach, it was deemed necessary both to tailor these metrics and, eventually, to incorporate certain additional indicators to assess overall business performances more comprehensively. These additions were identified with reference to appropriate un or other global standards, as well as to certain international business practice certifications.

Areas in each category are itemized into multiple indicators that, collectively, assess the matter. Every indicator comprises a specific question or criterion, which has three types of responses where the businesses are given a 'yes', a 'partially' or a 'no'. The weightings given to each of the indicators in every category were chosen in order to achieve a score that proportionally reflects the efforts of the companies in raising awareness and acknowledging the issues, and taking actions (both internally and externally), adapting them in each case to the scope of the theme evaluated.

Points are assigned to each of the questions based on the answers given according to the following criteria:

- If the answer is "No", the score awarded is 0 because subject was not addressed.
- If the response is "Partially", the rating is 0.5 as the topic was not fully addressed, further engagement and endeavor should be undertaken.
- If the answer is "Yes", point scored is 1, since the issue was both identified and approached

As a result, a dashboard has been prepared containing 85 prompts, which are integrated to provide a rating for each company in the described categories. The most critical categories are overconsumption and reduction of overexploitation of natural resources, since the scope of this project covers agri-food companies, which is an extremely resource-intensive sector with a massive environmental footprint. The indicators for each category are described in the following pages.

Increasing knowledge

This category comprises actions that contribute to enhancing the knowledge of both employees and people in the communities affected by the companies' activities. The main objective of these initiatives is increasing employee and stakeholders' competencies.

Internal investments are considered to be those that contribute to improving employees' knowledge, such as staff training and educational programs. It will be assessed whether the company conducts these trainings for its employees and reports the hours of training and the number of employees benefiting from them.

External investments, meanwhile, include activities such as training programs for communities, partnerships to improve schools and educational infrastructure, and the provision of education scholarships to communities. It also includes the company's commitment to support local smallholder farmers in gaining access to technology, inputs, resources, and sustainable agricultural practices. In the following table the indicators chosen to evaluate the efforts towards increasing knowledge are presented.

INDICATORS	WEIGHTS
Awareness	33%
Has the multinational assessed the importance of training and educating people to empower them through knowledge?	50%
Does the company recognize that smallholder farmers need trainings and support?	50%
Internal	33%
Has the company promoted training and educational programs for staff?	50%
Is the number of annual hours of training per employee reported?	50%
External	33%
Is the company committed to support farmers to gain access to knowledge, resources, inputs, and technologies?	25%
¿Has the multinational promoted training programs for communities? Including sustainable farming, health, and nutrition educational programs	25%
Does the multinational grant scholarships in local communities?	25%

Does the company collaborate with local schools or educational infrastructures?	25%
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Table 12: Indicators and their weights on increasing knowledge

Increasing wealth

This category evaluates investments and efforts to reduce inequalities for women and communities that may eventually have an empowering impact on consumer purchasing power. Multinationals have an important role in ensuring dignified and fair working conditions and promoting diversity within their workplaces, as well as throughout their value chain.

Women

Gender inequality is a global concern that must also be tackled by multinationals. Initiatives to address women's inequalities can include internal investments, such as plans to promote women within the company and having corporate goals to increase the percentage of women in leadership positions; and external investments, such as empowering women within their communities or sponsoring women entrepreneurs. These efforts are embodied in the United Nations Women's Empowerment Principles, which aim to promote women's equality at work, in the marketplace and within their communities. The seven principles highlight actions to promote women in education, in leadership positions within companies, ensure women's health, and support human rights and non-discrimination at work. Whether or not companies express a direct commitment to these UN WEP principles in their sustainability reporting will be analyzed.

Communities

Organizations must recognize the importance of providing equal opportunities for all in the workplace, which can be translated into specific actions such as implementing diversity and inclusion programs or expanding access to employment regardless of ethnicity, background, gender...

This issue can also be addressed with external investments, through the improvement of the agricultural economy and the promotion of entrepreneurship projects focused on poor consumers. Not to mention the fight against child labor and the monitoring of suppliers' actions to eliminate it. Child Labor Monitoring and Remediation Systems (CLMRS) are integrated into companies' supply chains to detect, tackle, and eradicate child labor. Their effectiveness in reducing child labor among identified children is as high as 50%. This section will assess if companies are committed to CLMRS [28].

INDICATORS	WEIGHTS
WOMEN	50%
General	33%
Does the multinational acknowledge and understand the disadvantages that women face?	50%
Does the multinational recognize the inequality faced by women in terms of access to inputs, land, and increased food insecurity challenges? Does the multinational recognize the inequality faced by women as waged workers or unpaid family workers?	50%

Internal	33%
Does the company report the percentage of women in senior management?	25%
And the target of percentage of women in these positions they are willing to reach?	25%
Is the gender pay gap issue acknowledged and assessed	25%
Does the multinational company have any programs for increasing gender balance or promoting women in the workplace?	25%
External	33%
Is the multinational reporting the number of women agricultural producers it is sourcing from? Or has the company reported the intentionality of sourcing from female farmers?	25%
Does the multinational made any investments in programs to empower farmer women and women in local communities	25%
Has the company committed to Women's Empowerment Principles UN WEP?	25%
Has the company reported any progress in the implementation of UN WEP? Including women's empowerment initiatives	25%
COMMUNITIES	50%
General	33%
Does the company acknowledge the importance of providing equal opportunities to everyone and the value added of having diversity within the workplace	100%
Internal	33%
Does the multinational have diversity and inclusion programs in the workplace?	50%
Does the company report any progress to increasing diversity and inclusion in the workplace?	50%
External	33%
Does the company invest on improving farm economics? Or does the company ensure decent work conditions along the entire value chain?	25%
Does the company support entrepreneurship projects focused on poor consumers?	25%
Does the company monitor and fight against child labor?	25%
Is the company committed to Child Labor Monitoring and Remediation System (CLMRS)?	25%

Table 13: Indicators and their weights on increasing wealth

Increasing health

Both external and internal investments can promote healthier lifestyles not only for the employees but also for the communities in which the company operates. This area is centered on trying to reduce hunger and improving health for employees and local people.

Internal investments cover actions and training to promote healthy lifestyles in the workplace and healthier nutritional choices, as well as health coverage or support for all employees, or at least those who may need it.

External investments aim to improve community health by addressing water, sanitation, and hygiene (WASH) issues, collaborating with local hospitals or medical centers, and implementing health and nutrition education programs for the community. In addition, efforts to enhance community well-being may also include promoting healthier lifestyles, donating food or medicines to communities that lack access to them (such as COVID-19 vaccines recently), including in the portfolio affordable products tailored to the poorest segments of society, and committing to front-of-package labeling with clear nutritional information following a guideline such as the GDA, as well as following responsible marketing practices. The GDA (Guideline Daily Amount) label indicates the calorie count and the quantity in grams of sugars, fats, saturated fats, and salt per food serving [43].

INDICATORS	WEIGHTS
Awareness	25%
Does the company acknowledge the water, sanitation, and hygiene issues in the world? and especially in Africa?	50%
Has the multinational assessed the health issues among employees and local communities'	50%
Internal	25%
Has the company made direct investments to promote healthier employees and workplaces?	50%
Does the company provide healthcare coverage or helps employees in need with healthcare support?	50%
External	50%
Does the multinational invest on programs to improve local communities' health? Like investments on food availability among farmers or distribution of medicines/ vaccines	16,67%
Does the company promote healthy lifestyle and nutritional choices?	16,67%
Does the company have affordable and customized products in the portfolio for targeting the poorest segments of society?	16,67%
Does the company provide clear front labeling on nutritional information of the products? (Like GDA labelling) And supports responsible advertising?	16,67%
Does the multinational invest on promoting human right through WASH improvement programs	16,67%
Does the company collaborate or support local hospitals or medical centers?	16,67%

Table 14: Indicators and their weights on increasing health

Reducing the overuse of natural resources

Given that the agri-food sector is the subject of this study, applying a responsible use of natural resources can have a considerable impact at the global level. The agri-food sector is known to be resource-intensive and sustainable practices need to be put in place. These actions can even help reduce the supply costs. Initiatives to reduce this overexploitation of environmental resources can be divided into the following areas:

Deforestation reduction

This area includes efforts towards achieving 100% responsible sourcing of all the products, primarily palm oil, soy, and sugarcane. Sustainable sourcing, also called supply chain responsibility, is a company's voluntary commitment to consider social and environmental concerns when handling its supplier relationships. [44]. Meaning that companies will actively monitor their corporate activities - throughout their supply chain - to assure that they do not have a detrimental impact on the planet or on people. Actions for increasing the traceability along the supply chain and transparency about suppliers will be assessed in this sub-section.

Water leadership

In order to address the global water crisis, companies should seek to minimize the intensity of water use and implement methods to improve water management and enhance water-use efficiency to invest in helping replenish water used in the local watershed, particularly in areas of high-water risk.

Emissions reduction

Companies should assess the quantity of carbon emissions along the supply chain including third party emissions. Greenhouse gas emissions are classified into three categories by the Greenhouse Gas (GHG) Protocol which is the best-known global accounting tool.

- Scope 1 includes direct emissions from both owned and controlled sources.
- Scope 2 describes indirect emissions from bought electricity, heating and refrigeration used by the organization.
- Scope 3 covers all other indirect emissions arising in a company's value chain from sources which the company does not control.

Some companies in the sector have committed to the NetZero emissions target for 2050 to further reduce their business activities footprint.

Sustainable energy use

Companies' efforts towards reducing the energy intensity and increasing the share of renewable energy will be assessed. Also, whether or not and at what level they are committed to RE100, which is the global renewable energy initiative for businesses involving hundreds of large and far-reaching companies committed to 100% renewable electricity. [45]

INDICATORS	WEIGHTS
Deforestation	25%
Does the company acknowledge the consequences and risks of deforestation?	11%
Is the company implementing responsible sourcing along the supply chain?	11%
Has the company obtained any certifications for responsible sourcing such as RTRS or RPSO?	11%
Does the company have a target for achieving 100% responsible sourcing?	11%
Is the company transparent when providing information about suppliers and partnerships in the report?	11%
Does the company invest in traceability along the supply chain? Does the company monitor deforestation in supplier's operations?	11%
Does the company collaborate with stakeholders to reduce environmental and social outcomes associated with palm oil, cocoa production among others	11%
Has the company defined the criteria and cut-off date for ending deforestation	11%
Does the company promote regenerative agriculture?	11%
Water leadership	25%
Does the company acknowledge water risks and impacts? Does the company raise awareness on water conservation?	14,29%
Raise awareness on water conservation	14,29%
Has the company reduced the overall water usage in the past 5 years?	14,29%
Has the company invested in improving water use efficiency in agricultural supply chain in high-risk water areas? Has the company reported any progress on increasing the operational water-use efficiency?	14,29%
Has the company implemented improved water management in the upstream supply chain for coffee, sugar, dairy, and cereals in high priority locations	14,29%

Has the company committed to replenish the 100% of the water used back into the local watershed in high water-risk areas?	14,29%
Does the company invest in building infrastructure to improve water access?	14,29%
Emissions reduction	25%
Does the multinational acknowledge the need to reduce scope 1 and 2 GHG emissions?	20%
Has the company made improvements towards the reduction of emissions?	20%
Has the multinational assessed and promote the reduction of scope 3 emissions?	20%
Has the company committed to reach NetZero emissions by 2050?	20%
Has the multinational committed to the goal of reducing emissions based on a scientific assessment that constrains long-term temperature rise to 2°C? CDP	20%
Energy	25%
Does the company made efforts towards transitioning to renewable energy use?	33%
Does the multinational made investments to reduce the energy intensity of its operations?	33%
Does the company support the RE100 initiative or has committed to reaching 100% of renewable energy?	33%

Table 15: Indicators on reducing the overuse of natural resources

Reduce harm to social cohesion

This area includes all initiatives taken to mitigate social unrest, make societies more inclusive and promote peace, while reinforcing partnerships for sustainability. Both internal and external efforts can be made to ensure human rights.

Internal efforts involve training employees on human rights, covering employees on collective bargaining agreements, broadening access to employment, and refraining from corruption. Some of the initiatives are gathered in the United Nations Guiding Principles on Business and Human Rights, which are based on three pillars: protection, respect, and remediation.

External efforts include addressing the impact of business activities on human rights, monitoring child labor, partnering with local NGOs, and training disadvantaged social groups. Broadening the access to employment is a crucial aspect of this category as it is really important to hire and promote local people in order to enhance their economy and tackle their challenges. There are even companies that have expressed their commitment regarding this matter by favoring the hiring of national talent rather than having expatriate managers.

It is also assessed in this section whether companies refer or not to Free, Prior and Informed Consent (FPIC) to local communities. FPIC seeks to ensure the involvement and consultation of local, indigenous communities before using the natural resources of the territory or starting to use the land [16]. Profit-seeking corporations are driven to pursue environmental resources exploitation even if in the process adversely affect indigenous lands. As a result of these human rights violations of local communities, several social conflicts arise from these practices. For this reason, FPIC acquires importance, as it guarantees the recognition and participation of the indigenous population in the businesses' land use programs.

INDICATORS	WEIGHTS
Awareness	20%
Does the company acknowledge the human rights issues?	50%
Does the company express awareness of the social conflict and inequalities issues?	50%
Internal	40%
Does the company provide trainings on human rights for employees?	20%
Does the multinational follow the UN's Guiding Principles on human rights? Including: freedom of association, recognition of the right of collective bargaining, elimination of all forms of forced labor and elimination of discrimination in terms of employment	20%
Has the company widened access to employment for everyone?	20%
Does the company promote the access to employment to local people rather than expat?	
Does the company refrain from corruption and bribery in the report?	20%
Does the company report the percentage of employees covered by collective agreements?	20%
External	40%
Does the company conduct human rights impact reviews and assessments in the upstream supply chain?	25%
Has the company made partnerships with grassroots NGOs?	25%
Does the multinational refer to Free, Prior and Informed Consent (FPIC) for local people and communities?	25%
Does the company provide trainings and support to social disadvantage groups? Including ex-guerrilla fighters, migrant workers, former drug traffickers	25%

Table 16: Indicators and their weights on reducing harm to social cohesion

Reduce overconsumption

Companies can contribute to reducing overconsumption in different ways, most notably by reducing the amount of plastic used and minimizing waste and food loss. Multinationals, especially those in the agri-food sector, which is the scope of the study, consume large quantities of plastic and other materials to be used for packaging, such as glass, metals (laminates, tinplate, and aluminum) and cardboard.

Multinationals, especially the ones in the agri-food sector which is the scope of the study, consume large quantities of plastic and other materials that may be used for packaging such as glass, metals (laminates, tinplate, and aluminum) and cardboard. Applying the three "R's" (Reduce, Reuse and Recycle) in food processing can significantly mitigate the environmental footprint of these companies. This category will assess companies' awareness of the stresses placed on the planet by the large quantities of plastic being used and the enormous amounts of waste being produced, including food waste, along with their actions to address these issues.

Plastic use reduction

This area focuses on actions to reduce virgin plastic use, reuse plastic packaging, and recycle it. Some multinationals are investing in recycle facilities or innovation for packaging in order to tackle this concern. In addition, multinationals may increase the use of recycled plastic in the food packaging to minimize the amount of virgin plastic. These efforts are also evaluated by the Ellen McArthur Foundation signatory report where some companies share their data related to plastic use concerns. The Global Commitment, driven by the Ellen MacArthur Foundation in partnership with the United Nations Environment Program, has brought together more than 500 organizations in a shared understanding of a circular economy for plastics. Circular economy is characterized by three principles: the elimination of waste and pollution, circulation of materials and products and the regeneration of natural resources. The companies' commitment and signature of these initiatives will also be evaluated in this area [46].

Other materials

Packaging does not only include plastic, but also other materials. The responsible use of these materials by the multinational companies will be assessed.

Waste reduction

As already explained, food security today is more related to lack of access to food rather than to insufficient production. In general, far more food is produced than is actually needed, leading to a global food waste problem. This paradox of people not being able to meet their food needs while so much food is thrown away needs to be addressed. Improvements in waste management and efforts to reduce food loss are measured in this section.

INDICATORS	WEIGHT
General	25%
Does the company provide meaningful and accurate environmental information and dialogue?	100%
Plastic reduction	25%
Has the company reported to Ellen McArthur foundation their progress towards reducing plastic pollution?	14,29%
Has the data reported been verified by a third party?	14,29%
Does the company acknowledge the severity of the plastic pollution issue?	14,29%
Has the company committed to reducing the quantity of virgin plastic use by 2025?	14,29%
Has the company committed to reducing the quantity of overall plastic use by 2025?	14,29%
Has the company reported the progress towards increasing the share of plastic that is reusable, recyclable, or compostable in the portfolio?	14,29%
Has the company committed to increasing the recycled content in the plastic packaging by 2025?	14,29%
Other materials use reduction	25%
Does the company report the amount of recycled content (not plastic) in the packaging?	20%
Does the company report the share of packaging that is reusable, recyclable, or compostable in the portfolio? Not plastic	20%
Has the company committed to a target of increasing reusable, recyclable or compostable packaging in 2025?	20%
Does the company invest in innovation for packaging?	20%
Does the company invest in establishing product repair, reuse and recycle facilities?	20%
Waste reduction	25%
Does the company report any efforts in reducing general waste?	33%
Is the company investing in reducing food loss?	33%
Has the company established local waste management facilities? Or has invested in trainings for local waste collectors?	33%

Table 17: Indicators used for evaluating the reduction of overconsumption

5. Results

This section presents the results obtained after the exhaustive analysis of the selected companies against the indicators that were developed in the previous section, using as a framework the grouping of six categories of SDGs based on the concept of positive and negative externalities [5].

The scores obtained will be presented following the six categories division: increase of knowledge, wealth and health and reduction of overuse of natural resources, harm to social cohesion and overconsumption. Tables will be presented with the results achieved by each agri-food company in the sample and dividing them as previously shown in two groups depending on their country of origin.

This gathering of results will permit achieving the study's purpose, which is to compare the undertakings and accomplishments of different agri-food corporations to achieve sustainable practices within their business activities.

INCREASING KNOWLEDGE

This category studies the actions undertaken by agri-food companies to improve the knowledge of both employees and the local communities. These results are collected in the following tables.

COMPANIES	KNOWLEDGE INCREASING SCORES
MONDELEZ	7,5
COCA COLA	7,1
NESTLE	7,1
DANONE	7,5
MARS	3,33
PEPSICO	5,8
UNILEVER	7,9
KELLOGGS	6,2
KRAFT	8,3
ANHEUSER BUSCH INBEV	7,5
TYSON	7,50
ADM	8,33

Table 18: Increasing Knowledge Scores of developed countries multinationals

Knowledge enhancement encompasses a number of initiatives that can be implemented by multinational companies. In this context, it appears that most companies from developed countries have made a significant commitment to contribute positively to knowledge enhancement. Not as strongly engaged with this issue are Mars, PepsiCo, and Kellogg's. PepsiCo and Kellogg's' principal distinguishing factor is the lack of direct collaboration with local schools or other educational infrastructures they report. Mars, on the other hand, does not report conducting training courses for employees to improve their skills.

Most of the companies belonging to the first group offer training programs for local communities, in addition to showing their commitment to small farmers by supporting those lacking knowledge, resources or technology.

COMPANIES	KNOWLEDGE INCREASING SCORES
JBS SA	9,17
OLAM INTERNATIONAL	7,92
GRUPO BIMBO	9,58
GRUPO NUTRESA	8,75
THAIBEV	9,58
MENGNU	7,92
MARFRIG	8,33
BRF	8,75

Table 19: Increasing Knowledge Scores of developing countries multinationals

It is worth noting the exceptionally high score of companies in developing countries in the category of knowledge enhancement. The vast majority of them collaborate with local schools and offer training programs for the local population. These courses may be in cooperation with local NGOs and cover a broad spectrum of topics, from breastfeeding to financial and legal fundamentals to fostering socio-economic entrepreneurship.

All recognize the needs of smallholder farmers and train them in sustainable farming practices and agro-economics. They provide regular staff training to upgrade their expertise and ensure a better qualified workforce. Such programs are monitored and assessed by reporting the number of hours of instruction and the total number of employees who participate.

GROUP	SCORES
DEVELOPED COUNTRIES	7,01
DEVELOPING COUNTRIES	8,96

Table 20: Average scores on increasing knowledge

Developing countries multinationals have made an increased effort towards enhancing knowledge both in the workplace and in the community. More importance is given to educational programs, specific training, sustainable agricultural practices trainings by developing countries companies. It is noteworthy that all the companies in the second group, excluding Olam International, report on the number of hours of training and the number of employees benefiting from them and the follow up of the program, as well as on program follow-up, while the multinationals from developed countries, with the exception of ADM, only mention the provision of training without specifically stressing in the report the extent of the efforts undertaken.

INCREASING WEALTH

MNEs' wealth-enhancing measures are examined in this category. Increasing wealth covers two relevant areas: first endeavors to reducing gender inequality and promoting women not only in the workplace but also in the marketplace and communities; and second, communities' enhancement by promoting diversity and inclusion programs within the business activities and improving the economic conditions of indigenous populations. Findings are displayed in the subsequent tables.

COMPANIES	WEALTH INCREASING SCORES
MONDELEZ	8,7
COCA COLA	9,0
NESTLE	8,7
DANONE	9,6
MARS	9,4
PEPSICO	9,0
UNILEVER	8,5
KELLOGGS	7,1

KRAFT	7,3
ANHEUSER BUSCH INBEV	9,0
TYSON	6,04
ADM	7,29

Table 21: Increasing Wealth Scores of developed countries multinationals

The results in the category of increasing wealth for the first group of companies is diverse, however, most are high scores around 8 and 9. Most of the firms, have acknowledged and assessed the gender pay gap issue and all of them have taken actions to promote women in the workplace. For the gender inequality issue, all of the firms report the percentage of women in senior leadership in the company and the target they are willing to reach, excluding Tyson Foods. The following table shows the quantitative data reported by the firms regarding percentage of women in senior management positions.

Companies	% of women in senior management 2020	Target for 2025 [%]
Mondelez	34%	38%
Coca Cola	34%	50%
Nestle	26%	30%
Danone	42%	NA
Mars	41%	NA
Pepsico	41%	50%
Unilever	50%	50%
Kelloggs	36,60%	50%
Kraft	37%	50%
Anheuser Busch InBev	24%	NA
Tyson Food	25%	NA
ADM	27%	NA
Average	34,77%	

Table 22: Percentages of women in senior leadership positions in 2020 and targets for 2025 for each company of group 1

Most have undertaken several initiatives to empower women in the workplace and in the community. There are only three companies of the study, Kraft, Tyson Foods, and ADM, that have not yet made a commitment to the UN Women's Empowerment Principles.

As for the community section, only three companies are certified by CLMRS, while all of them monitor and fight against child labor. All of them are committed to improving farm economics and promoting decent work conditions for smallholder farmers and, the majority also support entrepreneurship projects of local people.

COMPANIES	WEALTH INCREASING SCORES
JBS SA	6,67
OLAM INTERNATIONAL	9,79
GRUPO BIMBO	8,12
GRUPO NUTRESA	7,71
THAIBEV	7,71
MENGNIU	6,04
MARFRIG	5,83
BRF	6,46

Table 23: Increasing Wealth Scores of developing countries multinationals

These companies report the percentage of women in senior leadership position, which in fact is much lower compared to the percentages of the first group companies and Olam is the only company of this group that express a specific target on the percentage of women in these positions that they are willing to reach. The quantitative data supporting these statements are shown in Table 22, with the specific percentages provided by the second group of companies.

Companies	% of women in senior management 2020	Target for 2025 [%]
JBS Sa	25,20%	-
Olam International	3%	15%
Grupo Bimbo	15-20%	-
Grupo Nutresa	25%	-
ThaiBev	34%	-
Mengniu	37%	-
Marfrig	NA	-
BRF	15%	-
Average	19,89%	

Table 24: Percentages of women in senior leadership positions in 2020 and targets for 2025 for each company of group 2

The gender pay gap issue is not directly acknowledged; only the willingness to achieve gender equality is mentioned. Two out of the eight companies of this group have committed and implemented the UN's WEP principles, Olam and Grupo Bimbo.

The eight companies support entrepreneurship projects targeting poor consumers. All of these firms monitor and address child labor concern across their business activities, but none of them, except for one, is certified on CLMRS.

GROUP	SCORES
DEVELOPED COUNTRIES	8,35
DEVELOPING COUNTRIES	7,29

Table 25: Average scores on increasing wealth

Investments coming from multinationals from developed countries to increase wealth are higher than the ones from developing countries companies. The main differences remain in the percentage of women in senior management positions and the commitment to reach a higher one, the pay gap issue acknowledgement and, partially, in the CLMRS certification.

INCREASING HEALTH

This category examines the health improvement measures of agri-food companies. Improving health encompasses a range of actions that businesses can undertake, starting from improving nutritional standards through to investment in water, hygiene, and sanitation programs for local communities. The results of the evaluation of the implementation of actions to tackle these challenges are illustrated in the following tables.

COMPANIES	HEALTH INCREASING SCORES
MONDELEZ	6,7
COCA COLA	7,7
NESTLE	9,2
DANONE	9,0
MARS	6,7
PEPSICO	9,2
UNILEVER	7,5
KELLOGGS	5,8
KRAFT	7,1
ANHEUSER BUSCH INBEV	6,7
TYSON	7,50
ADM	6,04

Table 26: Increasing Health Scores of developed countries multinationals

In this category there is too a large variety in the results, having the highest scores: Nestlé, Danone and PepsiCo, and the lowest scores are the ones of Kellogg's and ADM. Businesses can implement a diverse set of initiatives to improve health, ranging from nutritional upgrading to investing in water access facilities for local communities.

All of the multinationals included in this group are investing in promoting healthier workplaces and lifestyles for their employees, and most of them provide health care coverage or support for all or some of the employees that may need it.

Regarding nutritional enhancement, all are aware of the critical role of a healthy diet and pledge to provide clear front-of-pack labeling in compliance with standards such as the Guideline Daily Amount (GDA) standard, as well as to foster responsible marketing. Only six of them have reported their commitment towards designing customized and affordable products targeting the poorest segments.

The amount of donations and investments in medical supplies has significantly raised compared to previous years, as most have donated healthcare materials or even

vaccines to financially support local hospitals lacking the resources to attend COVID patients.

With respect to water, sanitation, and hygiene, is being addressed by only a few of the companies that acknowledge this issue and tackle it. Nestlé, The Coca-Cola Company and PepsiCo are investing in sanitation and hygiene programs to, consequently, improve local communities' health.

COMPANIES	HEALTH INCREASING SCORES
JBS SA	7,50
OLAM INTERNATIONAL	7,50
GRUPO BIMBO	6,67
GRUPO NUTRESA	5,42
THAIBEV	6,25
MENGNIU	7,08
MARFRIG	6,25
BRF	5,83

Table 27: Increasing Health Scores of developing countries multinationals

These agri-food companies are more closely aligned with one another with regard to the improvement of health concerns. Nonetheless, Grupo Nutresa and BRF are lagging slightly behind regarding this concern.

Each of the organizations listed is making significant financial and strategic investments to promote healthier lifestyles and workplaces for their employees, yet only three of the eight companies actually report providing staff with health coverage or support.

Addressing the nutritional issue, most of the multinationals within this group have been implementing clear front-of-package labeling practices, also in accordance with certain international standards. Affordable products aimed at the most economically disadvantaged segments of society are also being incorporated into their portfolios.

Most of them cooperate with local hospitals and medical establishments at variable involvement levels, ranging from the provision of donated medical equipment through to partnerships with local hospitals.

Olam International is the only company belonging to this group that recognizes the water, sanitation and hygiene issue in the sustainability report and promotes initiatives to enhance the access to clean water and improve sanitation.

GROUP	SCORE
DEVELOPED COUNTRIES	7,41
DEVELOPING COUNTRIES	6,56

Table 28: Average scores on increasing health

Health investments by developed countries' multinationals outweigh those of companies from developing countries. Such difference is directly related to the greater involvement of developed countries' companies with regard to providing healthcare support for employees, as well as to the higher proportion of businesses in the developed countries group that are collaborating with healthcare institutions, and that are also addressing the water, sanitation, and hygiene concern.

REDUCING OVERUSE OF NATURAL RESOURCES

This category analyzes management actions to curtail the overexploitation of natural resources by multinational companies. It will be evaluated the commitment and endeavor level to ending deforestation, promoting water use efficiency, cutting overall emissions, and transitioning to renewable energy sources. Results are shown in the following tables.

COMPANIES	OVERUSE REDUCTION SCORES
MONDELEZ	6,8
COCA COLA	6,7
NESTLE	8,9
DANONE	9,0
MARS	6,8
PEPSICO	9,0
UNILEVER	8,3
KELLOGGS	7,3
KRAFT	7,6
ANHEUSER BUSCH INBEV	8,1
TYSON FOODS	5,90
ADM	6,99

Table 29: Reduction of Overuse of natural resources Scores of developed countries multinationals

With respect to this group of companies, the findings previously presented show that there are widely differing degrees of commitment to minimizing the overexploitation of natural resources. Ratings vary from 5,9 of Tyson Foods to a 9,0 of Danone.

The entire list of companies included in this group except Kellogg's, have received responsible sourcing certifications, such as RoundTable Sustainable Palm Oil (RSPO) certification. There is a common agreement to reduce deforestation and achieve 100% responsible sourcing, although not all companies start from the same base in this regard. Half of these companies promote regenerative agricultural practices to reverse environmental degradation and improve the water cycle.

In terms of water leadership, there is still room for more of these companies to implement enhanced water management upstream in their supply chain, or to commit to replenish 100% of the water used at least in the most water-stressed areas.

Most of them have already committed to the Science-Based Targets Initiative (SBTi) to limit warming to 2° (if not 1.5°, an even stronger commitment) above pre-industrial temperature levels; and they have also committed to the Net Zero goal of achieving zero emissions from their business activities by 2050. Although some of them, the smaller part, have not specifically committed to these international targets, all the sampled companies in this group have made progress in reducing Scope 1 and 2 emissions and communicated it in their sustainability reports.

On renewable energy, all of the group except Kellogg's have reported their transition to renewable energy sources and some are also decreasing their energy intensity. Meanwhile, only about half of the group has reported endorsement of the RE 100 initiative, which calls for a transition to 100 percent renewable energy sources.

COMPANIES	OVERUSE REDUCTION SCORES
JBS SA	7,24
OLAM INTERNATIONAL	8,35
GRUPO BIMBO	7,18
GRUPO NUTRESA	6,40
THAIBEV	6,82
MENGNIU	4,70
MARFRIG	6,76
BRF	5,60

Table 30: Reduction of Overuse of natural resources Scores of developing countries multinationals

Looking at this cluster of agri-food multinationals, from the above results is evident that the levels of implementation efforts to mitigate the excessive use of natural resources are quite uneven. The scores range from the company Mengniu, with a score of 4,7, to Olam International, with a score of 8,35.

As for deforestation, six of the eight firms sampled in this case have received a sustainable sourcing certification like RSPO or RTRS. Only 50% of them have advocated a commitment to regenerative agricultural practices.

There is still no common understanding of water management concerns and none of them have committed to replenish water used in high water risk areas. However, most are promoting greater efficiency in water use in the agricultural value chain.

There is still no common understanding of water management concerns and none of them have committed to replenish water used in high water risk areas. However, most are promoting greater efficiency in water use in the agricultural value chain.

The average scores obtained for each group of companies is presented for the further analysis in the following table.

GROUP	SCORE
DEVELOPED COUNTRIES	7,61
DEVELOPING COUNTRIES	6,63

Table 31: Average scores on reducing the overuse of natural resources

The data presented reflect that both groups of businesses are highly committed to mitigating the excessive natural resources exploitation, as reflected in the data presented. Most companies are combating deforestation, transitioning to renewable energy sources, reducing emissions across their business operations, and improving water efficiency.

Nevertheless, it is important to note that the efforts of companies in developed countries are somewhat more intense and that their initiatives have been underway for a longer period of time. This makes the progress of developed country multinationals towards reducing overexploitation more significant.

REDUCING HARM TO SOCIAL COHESION

In this category, as explained in section 4.5, it will be assessed the awareness and actions of firms to ensure human rights throughout the entire value chain. The scores obtained for the reduction of harm to social cohesion are displayed in the following tables.

COMPANIES	HARM TO SOCIAL COHESION REDUCTION SCORES
MONDELEZ	8,3
COCA COLA	7,2
NESTLE	6,0
DANONE	6,5
MARS	5,9
PEPSICO	7,2
UNILEVER	6,8
KELLOGGS	5,5
KRAFT	6,4
ANHEUSER BUSCH INBEV	6,9
TYSON	6,50
ADM	7,60

Table 32: Reduction of harm to social cohesion Scores of developed countries multinationals

The first group of companies has a wide range of scores, from 5,5 to 8,3, suggesting that actions to reduce social conflict and guarantee human rights have been pursued with varying levels of intensiveness or gravity. Nine out of the twelve enterprises in this group have fully committed to follow and report according to the United Nations' Guiding Principles (UNGP) on Business and Human Rights. This commitment illustrates companies' awareness of the gravity of human rights violations, such as child labor or forced labor in their business activities, and their acknowledgment of their duties and responsibilities in this regard.

All companies belonging to the first group regularly conduct human rights impact assessments, albeit with varying frequency. In addition, all of them provide training to their employees on respecting and promoting human rights in the workplace. However, although most of them mention in their report their commitment to the collective bargaining agreement for employees, it is a minority that gives the actual percentage of employees covered by such agreement.

COMPANIES	HARM TO SOCIAL COHESION REDUCTION SCORES
JBS SA	6,70
OLAM INTERNATIONAL	7,50
GRUPO BIMBO	5,00
GRUPO NUTRESA	5,60
THAIBEV	6,80
WILMAR	5,30
MARFRIG	4,00
BRF	6,30

Table 33: Reduction of harm to social cohesion Scores of developing countries multinationals

In the second group, there is likewise a wide spectrum of scores ranging from 4 to 7,5, showing the variation in the intensity of the companies' efforts towards mitigating harm to social cohesion.

Olam International and ThaiBev are the only two companies of the second group that have fully committed to the UNGP on Business and Human Rights. However, most of these companies have made great efforts to expand access to employment and have even strongly promoted the hiring of skilled local people rather than bringing expatriate employees into the subsidiaries.

Free, Prior and Informed Consent is only established and reported by Olam, while the rest of the companies belonging to the second group do not refer to it. Land use rights is a critical subject that must be addressed in order to find peace and end social conflict.

GROUP	SCORE
DEVELOPED COUNTRIES	6,73
DEVELOPING COUNTRIES	5,90

Table 34: Average scores on reducing the harm to social cohesion

Investments made to lessen the damage to social cohesion and alleviate conflict are similar between the two groups, with a slightly stronger commitment from the first group. In both cases, a considerable variety is shown in the level of efforts in addressing and implementing actions to tackle the stated problem.

The main differences between the results of the two groups appear to be in the following of the UN Guiding Principles on Business and Human Rights. And it has been reflected that almost none of the firms in the study have reported or engaged in Free, Prior and Informed Consent to local populations (except for the strong engagement of Coca Cola Company, PepsiCo and Olam International Limited).

REDUCING OVERCONSUMPTION

The efforts towards reducing the overconsumption of multinational companies are analyzed in this category. Initiatives to minimize the quantity of materials used for packaging, particularly virgin plastics, to increase the share of recycled content in the packaging as well as investing in waste and food loss reduction are covered in this category. The results obtained are included in the following tables.

COMPANIES	OVERCONSUMPTION REDUCTION SCORES
MONDELEZ	7,1
COCA COLA	6,5
NESTLE	8,0
DANONE	8,3
MARS	6,1
PEPSICO	6,6
UNILEVER	8,0
KELLOGGS	7,2
KRAFT	8,5
ANHEUSER BUSCH INBEV	6,7
TYSON FOODS	7,47
ADM	6,01

Table 35: Overconsumption Reduction Scores of developed countries multinationals

Notably, among these companies, Kellogg's consumes the least amount of plastic packaging, up to 45 times fewer metric tons than other companies in the study. Their efforts to reduce plastic use may not be the strongest, but they are already starting from a remarkably low level of plastic usage. Complete company scores in each of the sectors are shown in the Appendix, as well as some quantitative data supporting the results.

COMPANIES	OVERCONSUMPTION REDUCTION SCORES
JBS SA	4,96
OLAM INTERNATIONAL	4,53
GRUPO BIMBO	5,80
GRUPO NUTRESA	5,91
THAIBEV	5,23
MENGNU	5,26
MARFRIG	2,00
BRF	5,63

Table 36: Overconsumption Reduction Scores of developing countries multinationals

It can be seen that in this category of reducing overconsumption, the scores obtained by companies from developing countries are significantly lower. Apart from the overall scores, it is worth calculating the average of the scores obtained from both groups of companies to further compare their performance.

GROUP	SCORE
DEVELOPED COUNTRIES	6,8
DEVELOPING COUNTRIES	4,91

Table 37: Average scores on reducing the overconsumption

From the results obtained, it is worth emphasizing that the efforts of developed countries to mitigate overconsumption are greater than those of companies in developing countries. A closer look at each of the indicators shows that:

- First, only half of developed countries multinationals in the study addressed directly in the report the food loss issue, while most of the companies from the developing countries companies expressed concern and action towards solving it.
- Second, multinationals from developed economies have made greater efforts to reduce the amount of plastic and other materials utilized for food processing, especially in packaging, and over a longer period of time relative to the developing country multinationals' investments.

- Third, none of the multinational companies coming from developing countries have reported to the Ellen MacArthur Foundation their commitment and progress towards tackling plastic pollution challenge.

OVERALL RESULTS

Developed countries

- *Increasing positive externalities*

CATEGORY	AVERAGE SCORE
KNOWLEDGE	7,01
WEALTH	8,35
HEALTH	7,41

Table 38: Developed countries scores in increasing positive externalities

- *Reducing negative externalities*

CATEGORY	AVERAGE SCORE
OVERUSE OF NATURAL RESOURCES	7,64
HARM TO SOCIAL COHESION	6,73
OVERCONSUMPTION	6,77

Table 39: Developed countries scores on reducing negative externalities

Developing countries

- *Increasing positive externalities*

CATEGORY	AVERAGE SCORE
KNOWLEDGE	8,96
WEALTH	7,27
HEALTH	6,56

Table 40: Developing countries scores on increasing positive externalities

- *Reducing negative externalities*

CATEGORY	AVERAGE SCORE
OVERUSE OF NATURAL RESOURCES	6,63
HARM TO SOCIAL COHESION	5,90
OVERCONSUMPTION	4,91

Table 41: Developing countries scores on reducing negative externalities

SUMMARY OF SCORES

GROUP	INCREASING POSITIVE EXTERNALITIES SCORE	REDUCING NEGATIVE EXTERNALITIES SCORE
DEVELOPED COUNTRIES	7,54	7,05
DEVELOPING COUNTRIES	7,60	5,81

Table 42: Overall scores of the two groups regarding both externalities' categories

With this ultimate data gathering, it can be seen that both groups of countries are making similar efforts to increase positive spillovers, slightly higher the developing countries' firms scores. However, when examining the category of reducing negative externalities, it should be noted that the developed countries' companies' endeavors are considerably greater.

Developed countries

With regard to the performance of developed country multinationals in raising positive spillovers, it is clear from the scores derived that the attention is centered on increasing wealth. Much effort has been placed on achieving gender equality and diversity and inclusion, as mentioned above. Next, in terms of health and knowledge, which are nearly at the same level, businesses have been investing in education programs for communities and staff, as well as promoting healthier lifestyles inside and outside the company, while encouraging better nutritional choices.

Following this, concerning the reduction of negative externalities, the strongest investment is made in the reduction of excessive natural resource use, but followed closely by the two other areas of reducing damage to social cohesion and overconsumption.

Developing countries

Expanding each section, within the improvement of positive externalities, by far the largest contribution of the group of companies from developing countries is in knowledge improvement; considerable effort has been invested in staff training programs and partnerships with educational institutions, as well as in teaching sustainable agricultural practices. The second largest area of investment by the second group of companies is in wealth enhancement, with health following in last place.

In order to mitigate negative externalities, most of the attention has been focused on reducing the overexploitation of natural resources, as these companies have generally committed to several international targets, such as reducing emissions, deforestation or transitioning to renewable energy sources. Although these engagements are fairly recent, they are still relevant for the scope of the study, as companies are acknowledging the problem and are investing to pursue the aforementioned goals.

These results obtained highlight several interesting points which will be discussed in detail in the following chapter, in which conclusions are presented.

6. Conclusions and future development

Although the SDG targets are set at the national level, an ever-growing number of companies are adopting sustainable practices and reporting on their investments and initiatives for sustainable development. There is not yet a common understanding on how businesses should approach the SDGs, but some progress has been made. This project is grounded in an externality-based framework, described in the literature review, that groups the SDGs into six different categories.

This thesis has analyzed the level of involvement and actions of different multinational companies in the agri-food sector towards sustainable practices and the SDGs. Agri-food businesses play a key role in achieving long-term social, environmental, and economic development. Due to the COVID-19 pandemic outbreak, the vulnerabilities of this sector have been further exposed, beckoning businesses in the agri-food sector to take action. It has been constructed a heterogeneous list of companies in terms of their origin and, a set of indicators has been developed using a framework based on the externalities of the SDGs.

The indicators developed have been used to evaluate companies' performance towards the different aspects of sustainable development. After the data analysis, each agri-food company in the study was given a score in each of the SDG categories, following a qualitative analysis of the sustainability reports and multi-stakeholder initiatives sources.

The companies in the study are classified according to their country of origin into two groups, those from developing countries and those from developed countries. This analysis was undertaken from the perspective of firms' contribution to the enhancement of positive externalities and mitigation of negative externalities. The insights drawn from the analysis in both categories are presented below.

Reducing negative externalities

All companies, regardless of their country of origin, are making a considerable effort to reduce negative externalities, despite cultural diversity and resource allocation disparities. Mitigating adverse externalities entails reducing overexploitation of natural resources, minimizing overconsumption, and reducing harm to social cohesion.

From the outset, due to the well-known harmful impacts of multinationals, it could have been expected that developed countries' firms would make a much greater effort to mitigate them compared to those from developing countries. In general, multinationals from developed economies have been operating for a longer period of time and recklessly exploiting the natural endowments of emerging countries. Indeed, some of the corporations from higher income countries in this study have been involved several times in controversial matters regarding plastic pollution issues or child labor concerns within their value chains.

Developed country multinationals outperform developing country multinationals in all three areas of reducing negative externalities. **In reducing both overexploitation and overconsumption**, it is certain that companies in this group should make stronger efforts, as their environmental footprint is considerably larger than that of companies in the second group. Substantial investments have been made to cut down on deforestation in the supply chain and to decrease the massive amounts of plastic used, which are some of the categories with the largest environmental impact. And **in terms of reducing harm to social cohesion**, they have committed to following some guidelines such as those of the UNGP to comply with human rights.

These companies have become more conscious of their footprint and the urgent need to invest in policies to mitigate their massive impact on the planet. They are currently reshaping the way they were doing business as they realized that such practices can no longer continue. Additionally, such firms have also been called to action by certain organizations such as Oxfam that assess their strides to sustainability. Yet, these companies' steps to improve their environmental and social performance may also have been influenced by their bad press and negative brand image and may be trying to offset this. Regardless, progress has been made to tackle these concerns, and there remains a great amount of work needed to attain sustainable practices.

The efforts of companies from developing countries to mitigate these adverse externalities are remarkable. This might be attributable to their greater sensitivity and awareness of the serious impacts of the improper use of natural resources and social unrest since they suffer more closely the repercussions. These companies begin to engage in initiatives to combat both climate change and social conflict. However, they start from a less environmentally damaging base, which means that their efforts may not require the same investment level. Notwithstanding, there is still room to implement some of the initiatives mentioned in this study in order to concentrate the efforts on minimizing the environmental burden. It should be borne in mind that the resources of these companies are considerably lower than those of the companies mentioned in the study from developed economies.

Increasing positive externalities

As for the category of rising positive externalities, developing countries' multinationals are making an extraordinary effort to promote education and enhance employees' skills. They are seemingly much more aware of the value of knowledge to their communities and how necessary it is to achieve sustainable development.

Knowledge spillovers can help local people to progress and, ultimately, to attain economic and social empowerment. Most of the companies coming from emerging economies provide regular training to their employees in technical skills, nutrition, and health, and report the number of hours of training and employees benefiting from

them. All recognize smallholder farmers' needs and they also have developed customized educational programs for them covering sustainable farming practices, resource management and agroeconomics. In addition, they have established strong partnerships with local schools and collaborate with NGOs to offer workshops to local communities in a variety of topics, from breastfeeding to legal and economic basics.

The commitment of companies from developed countries in this area is considerable, but not as high as that of companies from developing countries.

Developed countries already count with skilled workers, and just need specific technical skill trainings or trainings in soft skills or other diversity

Developed countries outperform developing countries companies in the area of **wealth increasing**, this area is a particular one as it covers gender equality issues. In the sample of developing countries firms, there are five out of the eight companies from Latin America and Caribbean countries. This region, according to UNICEF, [47] is the one with the greatest levels of inequality, violence, and discrimination across the world. Nigerian and Thailanders women also face discrimination, poverty, and exploitation. Women, young girls, and adolescents in all their diversity continue to suffer greater disadvantages due to their gender condition. This cultural and institutional view of the role of women may be affecting these countries' progress toward rising wealth, which encompasses eliminating gender inequality.

Health increase investments of developed countries' firms are slightly higher, which may be due to their greater availability of financial resources to make donations and their readiness to establish partnerships with medical institutions, as well as to cover their employees with health care.

In summary, investments by developing countries' firms in enhancing positive externalities, in particular knowledge, appear to be powerful. Importantly, as discussed in the empirical analysis chapter, emerging countries tend to perform better than developed countries in terms of having more positive spillovers and less negative ones.

The results have shown that the efforts of firms in developing countries to enhance positive externalities are substantially high, which might be supported by the idea that they are more aware of the importance of access to knowledge, adequate health care and increased wealth. In addition to their greater awareness, they have a greater willingness to improve their home countries, both to have better economic conditions and more skilled workers, and to upgrade the overall economic and social situation of their country, while safeguarding the environment.

FINAL REMARKS

As a final comment, it is worth noting that Olam International was founded in Nigeria and continued growing in Sub-Saharan Africa and India, but the headquarters were relocated to Singapore which is not a developing country. It is interesting to discover the performance of this case as it provides useful insights for the study to further understand the performance of the different companies and the parameters that affect their level of commitment and investment to SDG achievement. The outstanding overall performance of Olam International in the categories compared to the other companies in the group of those coming from developing countries may demonstrate two things.

First, efforts to increase positive externalities may not only be a matter of economic resources, but also a question of awareness of their importance and cultural aspects. Companies from emerging countries are making significant efforts to foster higher educational and learning opportunities, potentially reflecting their recognition of the enormous importance of knowledge spillovers for their communities. In contrast, investments in health are not as significant, possibly related to the intensity of financial resources in the sector rather than a question of awareness. Finally, the score in the area of increasing wealth is not as high compared to developed countries, as this might be related to cultural issues concerning the role of women in these societies.

Second, financial resources play a key role in companies' actions to reduce negative externalities. Actions to mitigate adverse externalities may require the pursuit of sustainable practices that involve rapid change in many business practices (such as reducing emissions, transitioning to renewable energy, or innovating in packaging material). It is more difficult for companies in developing countries to implement all these shifts simultaneously, considering also that they do not start from the same base of environmental impact. Meanwhile in terms of reducing harm to social cohesion, both groups could make a greater effort to comply with human rights.

FUTURE DEVELOPMENT

As it is a qualitative study there are several aspects to consider. First, a study like this one offers a better insight into a realistic perception of the actual world that the statistical tests and numerical studies do not allow to understand or experience. It allows a detailed description and holistic view of the subject of the study. In this context, it has been detailed the context and situation of the agri-food sector companies as well as the different ways and levels of commitment of the firms in the study. Just by looking at the numbers a lot of relevant information on companies' interests and efforts is missing.

The scope of this project was limited due to time and resources constraints, however, there are ways in which it could be further developed.

First, the research methodology could be upgraded by using artificial intelligence for the researching process. There is software available online that allow the analysis of unstructured data by enabling the user to identify, code and note findings in the raw data material, as well as weighing and assessing their relevance to the project and complex linkages among them. It could be directly applied to search several key words

in the set of documents, in this case sustainability reports, and counting the times they appear while weighing their significance to the study. An example of this software is *Atlas.ti*.

Second, the database could be enlarged by adding other relevant companies in the agri-food sector and reaching conclusions for them.

Third, the set of indicators could be improved by adding more relevant aspects or evaluating the weighing structure.

7. Bibliography

- [1] YouMatter, 2020. [Online]. Available: <https://youmatter.world/en/definition/definitions-sustainable-development-sustainability/#:~:text=The%20Brundtland%20Report%20And%20Sustainable%20Developm>.
- [2] L. Shi, L. Han, F. Yang and L. Gao, "The Evolution of Sustainable Development Theory: Types, Goals, and Research Prospects.," *Sustainability*, 2019.
- [3] U. N. 2019. [Online]. Available: <https://www.un.org/sustainabledevelopment/news/communications-material/>.
- [4] FAO, 2016a. [Online]. Available: <https://sdgs.un.org/sites/default/files/publications/2313foodandagriculture.pdf>.
- [5] I. Montiel, A. Cuervo-Cazurra, J. Park, R. Antolín-López and B. W. Husted, "Journal of International Business Studies," 2021. [Online]. Available: <https://link.springer.com/article/10.1057/s41267-021-00445-y>.
- [6] United Nations, 2020a. [Online]. Available: <https://www.un.org/sustainabledevelopment/education/>.
- [7] United Nations, 2020b. [Online]. Available: <https://www.un.org/sustainabledevelopment/hunger/>.
- [8] Oxfam, 2020b. [Online]. Available: <https://www.oxfam.org/en/why-majority-worlds-poor-are-women>.
- [9] United Nations Development Programme, 2020. [Online]. Available: <https://www1.undp.org/content/oslo-governance-centre/en/home/sustainable-development-goals/goal-3-good-health-and-well-being.html>.
- [10] Global Footprint Network, 2022. [Online]. Available: <https://www.footprintnetwork.org/our-work/ecological-footprint/#:~:text=World%20Footprint&text=Today%20humanity%20uses%20the%20equivalent,we%20use%20in%20a%20year..>
- [11] NASA, 2020. [Online]. Available: <https://earthobservatory.nasa.gov/world-of-change/global-temperatures?src=eo-a-features>.
- [12] United Nations, 2020c. [Online]. Available: <https://www.un.org/sustainabledevelopment/peace-justice/>.

- [13] Oxfam, 2021. [Online]. Available: <https://oxfamilibrary.openrepository.com/bitstream/handle/10546/621163/bp-behind-the-brands-update-170321-en.pdf;jsessionid=B64B9289E58DCE602112A04E8A85FA06?sequence=1>.
- [14] S. Dury, P. Bendjebbar, É. Hainzelin, T. G. (Eds) and N. Bricas, *Food Systems at risks: new trends and challenges*, DOI: 10.19182/agritrop/00080 ed., Rome, Montpellier, Brussels: FAO, CIRAD and European Commission., 2019.
- [15] S. Ross, "Investopedia," 2021. [Online]. Available: <https://www.investopedia.com/articles/investing/100615/4-countries-produce-most-food.asp>.
- [16] FAO, 2016b. [Online]. Available: <https://www.fao.org/3/i6190e/i6190e.pdf>.
- [17] A. Sen, *Poverty and famines: an essay on entitlement and deprivation*, London: Clarendon Press, 1982.
- [18] WorldBank, 2021. [Online]. Available: www.worldbank.org/en/topic/agriculture/overview#1.
- [19] P. N. Ghauri, 2022. [Online]. Available: <https://insights.aib.world/article/31077-the-role-of-multinational-enterprises-in-achieving-sustainable-development-goals>.
- [20] UN/DESA , 2020. [Online]. Available: <https://www.un.org/development/desa/dpad/publication/un-desa-policy-brief-81-impact-of-covid-19-on-sdg-progress-a-statistical-perspective/>.
- [21] M. Dudek and R. Spiewak, "Effects of the COVID-19 Pandemic on Sustainable Food Systems: Lessons Learned for Public Policies? The Case of Poland," *Agriculture*, vol. 12, no. 1, p. 61; <https://doi.org/10.3390/agriculture12010061> , 2022.
- [22] United Nations Development Programme, 2021. [Online]. Available: <https://www.undp.org/library/leaving-no-one-behind-impact-covid-19-sustainable-development-goals-sdgs>.
- [23] United Nations, 2021. [Online]. Available: <https://unstats.un.org/sdgs/report/2021/The-Sustainable-Development-Goals-Report-2021.pdf>.
- [24] S. Gillman, "IHS Markit," 2022. [Online]. Available: <https://ihsmarkit.com/research-analysis/the-sustainability-trends-set-to-shape-the-food-system-in-2022.html>.
- [25] FAO, *The future of food and agriculture – Alternative pathways to 2050.*, Rome, 2018.
- [26] C. Laughman, "Food Engineering MAGazine," 2021. [Online]. Available: <https://www.foodengineeringmag.com/2021-top-100-food-beverage-companies>.
- [27] Consumer Goods Technology, 2021. [Online]. Available: https://consumergoods.com/top-100-consumer-goods-companies-2021?utm_source=2020list&utm_medium=website&utm_campaign=Top+100+2021.
- [28] Cocoa Life, 2020. [Online]. Available: <https://www.cocoalife.org/progress/cocoa-life-progress-impact-2020>.
- [29] Fortune, 2017. [Online]. Available: <https://fortune.com/change-the-world/2017/grupo-nutresa/>.
- [30] J. Sachs, G. Schmidt-Traub, C. Kroll and G. L. a, *Sustainable development report: The Decade of Action for the Sustainable Development Goals*, Cambridge, 2021.

- [31] R. L. "Analysing the use of tools, initiatives, and approaches to promote sustainability in corporations," *Corporate Social Responsibility and Environmental Management*, vol. 27, no. 2, pp. 982-998, 2019.
- [32] L. Conca, F. Manta, D. Morrone and P. Toma, "The impact of direct environmental, social, and governance reporting: Empirical evidence in European-listed companies in the agri-food sector," *Business Strategy and the Environment*, vol. 30, no. 2, pp. 1080-1093, 2020.
- [33] UNIDO, 2012. [Online]. Available: <https://www.unido.org/our-focus/advancing-economic-competitiveness/competitive-trade-capacities-and-corporate-responsibility/corporate-social-responsibility-market-integration/what-csr>.
- [34] A. B. Carroll, "A Three-Dimensional Conceptual Model of Corporate Performance," *Academy of Management Review*, vol. 4, no. 4, p. 497-505, 1979.
- [35] A. B. Carroll and K. M. Shabana, "The Business Case for Corporate Social Responsibility: A Review of Concepts, Research and Practice," *International Journal of Management Reviews*, vol. 12(1), pp. 85-105, 2010.
- [36] A. B. Carroll, "The pyramid of corporate social responsibility: Toward the moral management of organizational stakeholders Author links open overlay panel," *Business Horizons*, vol. 34, no. 4, pp. 39-48, 1991.
- [37] S. Rajic, V. Đorđević, I. Tomasevic and I. Djekic, "The role of food systems in achieving the sustainable development goals: Environmental perspective," *Business Strategy and the Environment*, vol. 31, no. 3, pp. 988-1001, 2021.
- [38] Antea Group, 2021. [Online]. Available: <https://us.anteagroup.com/news-events/blog/esg-csr-definitions-differences-sustainability#:~:text=CSR%20is%20the%20ideal%20and,ESG%20as%20the%20quantitative%20side..> [Accessed March 2022].
- [39] Lexology, 2022. [Online]. Available: <https://www.lexology.com/library/detail.aspx?g=80bbe258-a1df-4d4c-88f0-6b7a2d2cbd6a>.
- [40] Corporate Finance Institution, 2022. [Online]. Available: <https://corporatefinanceinstitute.com/resources/knowledge/other/esg-environmental-social-governance/>.
- [41] SDGF, 2022. [Online]. Available: <https://www.sdgfund.org/universality-and-sdgs>.
- [42] KPMG, 2017. [Online]. Available: https://assets.kpmg/content/dam/kpmg/be/pdf/2020/12/The_Time_Has_Come_KPMG_Survey_of_Sustainability_Reporting_2020.pdf.
- [43] Food and Drink Federation, 2014. [Online]. Available: <https://www.gdalabel.org.uk/gda/explained.html>.
- [44] International Chamber of Commerce, 2008. [Online]. Available: <https://iccwbo.org/content/uploads/sites/3/2008/10/ICC-guide-to-responsible-sourcing.pdf20to,managing%20their%20relationships%20with%20suppliers>.
- [45] RE100, 2022. [Online]. Available: <https://www.there100.org/>.
- [46] Ellen MacArthur Foundation, 2022. [Online]. Available: <https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview>.

- [47] UNICEF, 2019. [Online]. Available: <https://www.unicef.org/lac/en/gender-equality>.
- [48] IUCN, "The Future of Sustainability Re-thinking Environment and Development in the Twenty-first Century," [Online]. Available: https://www.globalnature.org/bausteine.net/f/6379/iucn_future_of_sustainability.pdf?fd=2.

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Annex I

Final remark regarding the alignment of the project with the SDGs

The basis of this project is the way in which companies can implement the SDGs. The model that divides the SDGs according to the externalities of multinationals is presented in this thesis, data from companies regarding their investments in sustainability and the 2030 Agenda are analyzed and, finally, the findings are compared to draw conclusions on investment trends according to the country of origin of the companies. In summary, it is intended to continue the research to encourage the implementation of the SDGs by multinational companies, a greater awareness, and a call for action.

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