

The State of the Art of the Horizon 2020 Program Towards the Achievement of the 2030 Agenda. A Goal of the Multistakeholder Network

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Abstract

The paper aims to analyze the impact of the Horizon 2020 Programme, which promoted smart, sustainable, and inclusive growth strengthened by the adoption of the Sustainable Development Goals -SDGs. The ended program took place in 2014-2020. The research observes the results of the projects focused on SDGs. The data analyzed are published by the European Union. The SDGs want to promote an urgent call for action by all countries to operate in a global partnership. Therefore, multi-stakeholder collaboration is essential for suitable programming. For this reason, after providing an overview of the achievement of the SDGs and their investment, the research focuses on the analysis of the network composition of the winners' project. The objectives are: a) Theoretical framework on Sustainable strategic planning; b) Study the Dataset to understand the achievement of the 17 Goals of the Agenda 2030; c) Study the Composition of the Network of the Project. The research answers the following research questions: How much does the Horizon 2020 program contribute to the implementation of the Agenda2030 into the European Union policy? Which of the seventeen Sustainable Development goals has been reached the most thanks to the European projects? What is the activity of the main participants?

Keywords

Sustainable development; Horizon 2020; partnership; SDGs; project management; Agenda 2030; Network.

Introduction

The COVID-19 pandemic reminds us that full implementation of the United Nations' 2030 Agenda for Sustainable Development is crucial to strengthen resilience and prepare the world for future shocks as we embark on the twin green and digital transitions. In this regard, the European Union is at the forefront of developing new policies and actions to speed up the integration of Sustainability, as the adoption of a

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European Green Deal. The European legislators, adopting this vast program of reforms, deeply understand the necessity to completely transform the EU into a fair and prosperous society and to create a more resource-efficient and competitive economy. The Green Deal also aims to protect and enhance both the EU's natural capital and the health and well-being of citizens from environmental-related risks and impacts.

The current research aims to inquire how much the Horizon 2020 programme contributes to the implementation of the 2030 Agenda and the sustainable development goals achieved by the European projects. The paper answers the following research questions: How much does the Horizon 2020 program contribute to the implementation of the Agenda2030 into the European Union policy? Which of the seventeen Sustainable Development goals has been reached the most thanks to the European projects? What is the activity of the main participants?

After the Theoretical Framework, the work focuses on the analysis of the funded European project results to figure out which objectives have been achieved. The objectives are: a) Theoretical framework on Sustainable strategic planning; b) Study the Dataset to understand the achievement of the Goal of the Agenda 2030; c) Study the Composition of the Network of the Project.

Theoretical framework: Sustainable strategic planning

The ongoing economic and financial crisis has brought the European Union to support and launch reforms for economic growth, financial stability, job creation, and the quality of life and environment. To do that, the European Union environmental policy and legislation have promoted the process of eco-innovation and the development of strong industries in the energy field, sustainable water use, waste management, atmospheric protection, and climate change mitigation. To fulfill those crucial challenges, the European Council has adopted the Europe 2020 Strategy intending to achieve smart, sustainable, and inclusive growth (Dogaru, 2020). Since 2014 the European Commission has launched its new funding program for research and innovation, 'Horizon 2020'. With a budget of €80 billion, Horizon 2020 reflects the policy priorities of the Europe 2020 strategy and addresses major concerns shared by citizens in Europe and elsewhere. Horizon 2020 consists of three major sectors which are excellent science, competitive industries, and better societies. The most important aim of this program is to strengthen European research, tackle societal challenges, and bridge the gaps between research, the market, and society, and also to give a strong contribution to the development of the Sustainable Development Goals (Barlas et al., 2015).

Since the mid-1980s have begun to arise a stakeholder approach to strategy movement, especially through the publication of R. Edward Freeman's Strategic Management – A Stakeholder Approach in 1984. Several authors stated the necessity to set up a framework capable of solving managers' concerns toward unprecedented levels of environmental turbulence and change. Edward Freeman was deeply aware of the crucial need to design a brand-new conceptual framework, given the inconsistency of traditional theories. Regarding that, he tried to broaden the concept of strategic management by defining stakeholders as *“any group or individual who is affected by or*

can affect the achievement of an organization's objectives". The idea of the stakeholder approach to strategic management designed by Freeman shows that managers should elaborate and implement a process that takes into consideration only those groups of stakeholders who play an important role in the business. Next, the process must manage and improve the relationships and interests of a wide variety of shareholders, employees, customers, suppliers, and communities that can guarantee the long-term success of the firm (Freeman et al., 2001).

Multistakeholder participation at the International and European level is constantly playing a crucial role in developing strategies and policies to best implement the SDGs in their political agenda. The implementation of SDGs is essential not only for public authorities but even for civil society and the private sector (EU, 2015). Furthermore, mobilizing national-level stakeholders and regional communities is key to guarantee the SDGs' delivery, through a steady involvement of and cooperation with civil society organizations, social partners, national and sub-national authorities, and EU organizations (EC, 2020).

One of the most important aims of multi-stakeholders participation is to implement development issues and distribution of responsibilities among themselves in their decision-making progress to design collective solutions for public benefit, to distribute roles and activities among them and to work for community governance. Multi stakeholders' activities could improve both service delivery and participation at the international, national and regional level throughout the adoption of a holistic approach where each stakeholder can contribute substantially to the decision-making process (Panner et al., 2021).

The spreading of the pandemic caused by COVID-19 crisis, which have impacted all aspects of life across the world, has demonstrated that all the stakeholders have to work together to mitigate such impacts, by developing appropriate multi-stakeholder management strategies which can improve the effectiveness and efficiency of crisis and humanitarian actions (Kantameni, 2020).

To follow sustainable development principles, the concept of sustainable development needs to be incorporated into the policies and processes of a business. This does not include the necessity to come up with new management methodologies, but it requires a new cultural orientation and extensive refinements to systems, practices, and procedures. An effective management framework for sustainable development needs to take into consideration both decision-making and governance, integrating sustainability both into business planning and into management information and control systems (Hardi & Zdan, 1997).

The important issue of implementing sustainability in project management has brought a wide variety of researchers to come up with some specific theories and frameworks. Some experts have defined sustainability management as the formulation, implementation, and evaluation of both environmental and socioeconomic sustainability-related decisions and actions taken both at individual and social levels. Traditional management theories usually focus too much attention on the short-term, without recognizing the medium and long-term outcome of human, organizations, and

societies' activities, which could have an important impact both on the environmental and socioeconomic contexts. This is the main reason why it is compulsory to change the project managers' approach to the project management's processes and focus the attention not only on the project's output but also on its consequent and probable outcome at the environmental and socio-economic level, in alignment with the triple-bottom-line theory (Starik & Kanashiro, 2013).

This theory defines the three key sectors of sustainability which are People, Planet, and Profit. Concerning People, project managers should put a lot of effort into design projects with a strong focus on social sustainability, considering not only the needs of output consumers but also those of other stakeholder groups. Regarding the Planet sphere, sustainable managers should figure out new methods and actions to reduce the ecological resources consumption and cut out a lot of waste which could have a huge impact on the environment.

The feedback component of the projects carried out by enterprises, which includes a lot of stakeholders, from organizations to customers, results to be essential to integrate and cope with all the sustainable development challenges and take the most appropriate decisions and corrective actions in view to achieve sustainability into projects (Chawlaa, et al., 2018). Bansal and Roth (2000) have pointed out four key drivers for sustainable project management, Environmental, Economic & Socio-Economic, Social & Ethical, and Legislative drivers. There are a wide variety of environmental drivers to implement sustainability into project management, such as improving resource efficiency and cut the bad impacts of a project on the environment in terms of CO2 emissions and waste, especially in the long term. Considering the lack of the availability of natural resources due to excessive usage, the cost of projects for the enterprises is constantly increasing and this could lead companies to change their model business if they don't want to face an important loss of customers. About social and ethical drivers, they could improve the company's public picture which creates value and increase shareholders' satisfaction towards the companies. From the moment enterprises start to take their responsibilities to integrate sustainability in their business model, the sustainable approach could lead to a better work environment for their employees and increase their productivity. In economic terms instead, implementing sustainability in project management could allow both entrepreneurs and public authorities to save money thanks to cost reductions deriving from specific actions, such as reduction of waste, cutting out the use of raw materials and energy, and the costs correlated to waste treatment. During the last decade, a lot of countries, especially in the European Union, have been trying to adopt specific policies to promote and integrate sustainability in firms and companies. Legislative drivers could enhance a company's chances of investing in different countries with specific environmental standards (Kahachi, 2017).

Provided the fact that sustainability is broadening the areas of project management, new topics and areas must be introduced into the project management processes. For instance, the introduction of economic, environmental, and social aspects in the project management methodologies would substantially increase the number of stakeholders interested in the project deliverables. In some projects, there could be the chance that the project team should face and interact with stakeholders who have high power but a

negative attitude towards the project so that they could be considered as risks. In a situation like this, the project team should not see the risk but embrace the chances and see that kind of stakeholders as a source of information and suggestions to create a more valuable and worthwhile project. Efficient integration of sustainability to project management can benefit all business activities, both in the public and private sector, in a wide variety of spheres such as, reduction of gas emissions and waste to save both energy consumption and money, an increase of the enterprises' reputation towards both consumers and other competitors, and the recruitment of employees with high skills and competencies which can improve and speed the productivity up.

Networked governance

Governments have long been involved in reform processes (Cristofoli, Meneguzzo, & Riccucci, 2017). Under the umbrella concepts of the New Public Management, Public Governance and New Public Governance, a new model of administration emerged (Mandell, 2001; Agranoff & McGuire, 2003), based on collaborative relationships among public and private actors, non-profit organizations, and citizens for the solution of "wicked" problems. Within this context of connected and networked organizations, the current claim for sustainable development has further enhanced the importance of "Collaborative Administration", as a new way of involving public/private actors in the solution of the new global challenges in a collaborative manner (Agranoff, 2006; Klijn, 2008).

Since the early Nineties, public networks have been implemented in many countries to solve "wicked" public problems, addressing such issues as health, social care, local development, and education (Provan & Milward, 1995; Provan & Sebastian, 1998; Provan & Milward 2001; Hasnain-Wynia, et al. 2003). Then, with the diffusion of the Public Governance paradigm (Bekke, et al. 1995; Minogue, et al. 1998; Bovaird & Loffler 2003), providing public services through organizational networks has become more the rule than the exception, on both the sides of the Atlantic (Milward, 1996; Agranoff & McGuire, 2001, 2003; Milward & Provan, 2003; Ferlie & Andresani, 2006; Pettigrew & Fenton, 2006).

Networked governance is essential to start a multi-sector partnership to achieve the objective of the Green Deal (including academic, public administration, for-profit, non-profit sectors, and civil society). Building a network between the various actors operating in the area is a crucial step, including communicating with society and the territory and creating a virtuous circle for social, economic, and sustainable development (SDGs). Therefore, Government to achieve the 17SDGs must change their "modus operandi", opening their decision-making and service-delivery processes to the engagement of multiple stakeholders in collaborative networks. Sustainability (Green Deal and 17SDG) cannot be reached without the collaboration between Governments, firms, non-profit organizations, and citizens.

The co-creation creates public value by networks operating in and for the public sphere. This allows widening the diversity of units of analysis, considering also the complex relationships that public, private, and third sector organizations may generate in their attempt to pursue public value (Bryson, et al., 2017), shared value (Porter &

Kramer, 2011), and social value (Jordan, 2008). As such, the value created at the intersection of operations between the State (public value), the market (economic and/or shared value), and the third sector/civil society (social value) should be better recognized, represented, communicated, and assessed; still too little is known about managerial and inter-organizational drivers facilitating collaborations to establish and sustain value chains (Bryson, et al., 2006; Bonomi, Savignon & Corvo, 2018).

Network success is an ageless theme in the public network literature. Since Provan and Milward's (1995) seminal piece, a multitude of studies has investigated the determinants of network performance, with different and multiple results. They have shed light on different facets of the problem, analyzing the action useful to create a successful network. The first action is to the importance of network structure and context, (Provan & Milward, 1995; Provan & Sebastian, 1998; Huang & Provan, 2007; Raab, Mannak, & Cambré, 2015). A second action is the importance of network managers and network management for successful public networks, focused on coordination tools and mechanisms (Kort & Klijn, 2011; Mandell, 2001; Koppenjan & Klijn, 2004; Klijn, Steijn, & Edelenbos, 2010; Steijn, Klijn, & Edelenbos, 2011; Agranoff & McGuire, 2001, 2003). There are many actions to manage partner interaction, Steijn, Klijn, and Edelenbos (2011) categorized them into four different groups: connecting actors, exploring content, arranging the structure of the interaction, and establishing process rules (Klijn, Steijn, & Edelenbos 2010). Thirdly, is the criticality of "soft" factors (Edelenbos & Klijn, 2007; Provan & Kenis, 2008; Klijn, Edelenbos, & Steijn, 2010; Nolte & Boenigk, 2011) such as interorganizational trust, leadership and culture. The fourth and final action is a multi-dimensional approach and investigated the predictors of the network success (Sørensen & Torfing 2009; Verweij, et al., 2013; Raab, Mannak, & Cambré, 2015; Wang, 2016). So, to make a successful network there are many suggests but there isn't a "standard" to make a successful network. The network is strongly linked to the territory's need.

Research design

After analyzing the socio-economical context and the literature framework, the current research focuses on an empirical analysis of data throughout the adoption of the research pattern illustrated in Figure 1.

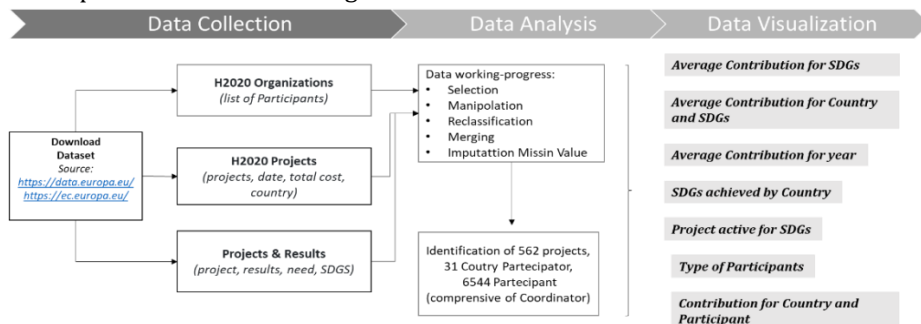


Figure 1. Research methodology (author's elaboration)

Discussion and results on SDGs achieved of Horizon 2020 Program

The research studies 562 Project and, most of the time, each project is divided into many actions. The Dataset shows that in the period 2014-2020 in means the program H2020 achieved the Agenda 2020 like in Figure 2, distinguished by SDG e average contribution of Total Project. The contribution is defined as the weighted average contribution in the Project because the action of the same project could be achieving the same SDG.



Figure 2. Average Contribution for SDGs
(author's elaboration)

The dataset contains 562 projects proposed by coordinators from 31 countries. The contributions received by the EU as total funding for the project and the SDGs achieved by each country were linked to understand which country has contributed most to the achievement of the SDGs. To observe the impact of all the projects (with their internal activities), the weighted average by funding for each Goal was calculated. Figure 3 shows only the 6 countries that have contributed most to the achievement of the SDGs. On the other hand, some countries have concentrated resources to achieve a single SDG. For example, Kenya has obtained a contribution of € 1,000,000.00 and invest them to projects to reach SDG 11 (Sustainable Cities and Communities) or Hungary has received more than double € 2,484,917.50 fully invested on SDG4 (Quality Education). Malta and Romania focused on objective 9 (Industry, Innovation and Infrastructure), obtaining respectively € 2,814,766.28 and € 5,064,437.50.

Other countries have concentrated contributions by defining projects with few SDGs:

- Luxemburg contribution 992.554,06€ for the SDG4, SDG9, SDG11
- Czech Republic 7.493.107,50 € for the SGD 9, SGD 3
- Lithuania contribution 1.331.751,67 € for the SDG 9, SDG7, SDG11
- Israel contribution 1.060.907,04 € for the Goal SDG 3, SDG 12, SDG 13, SDG 8
- Bulgaria contribution 1.657.248,33 € for the SDG 11, SDG 13
- Latvia 639.520,83 € for the SDG 13, SDG3, SDG9.

Furthermore, other countries have contributed to the achievement of more sdfs even if with different economic amounts, such as Poland obtained a contribution of 333,278.75 for SDG 4 and SDG10, a contribution of 2,465,070.41 for the SDG9 but for the SDG3 it got 7.613.993, 91 €. Iceland also had a contribution of € 5,275,426.25 for the 3SDG, but a contribution of € 1,060,907.04 for the 11SDG, 12SDG, SDG8.

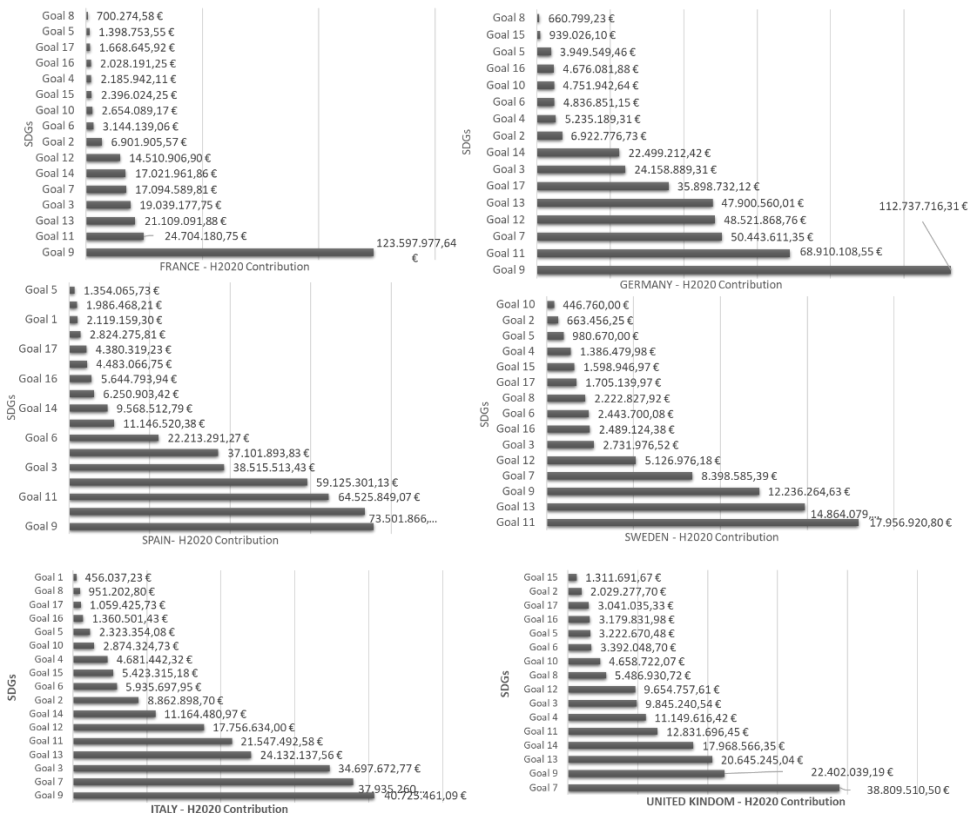


Figure 3. Top six Average Contribution for country and SDGs (author's elaboration)

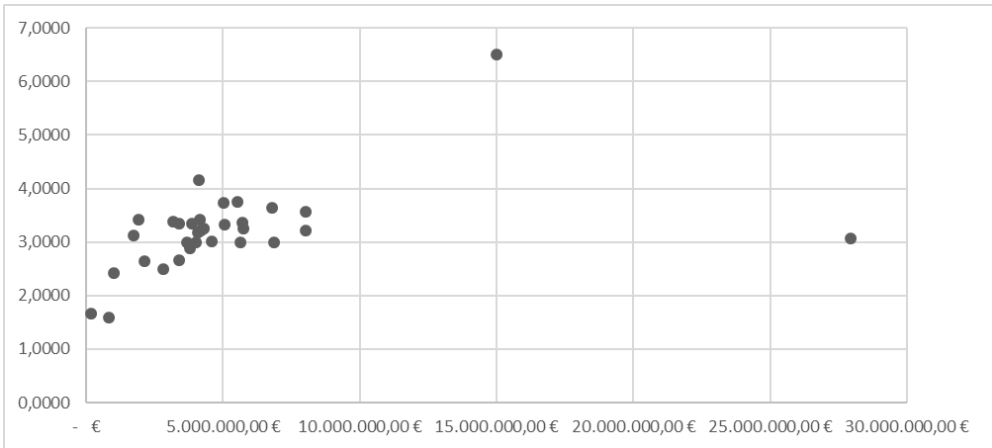


Figure 4. Country Average Contribution for year
(author's elaboration)

The research observes that the amount of funding increases proportionally as the duration of the project increases, Figure 4. Moreover, Figure 5 show the numbers of project activated by each Country subdivided by SDGs.

n.	Country	SDG	n.	Country	SDG	n.	Country	SDG	n.	Country	SDG	n.	Country	SDG	n.	Country	SDG
13		Goal 9	41		Goal 14	115		Goal 3	17		Goal 8	2		Goal 17	19		Goal 4
9		Goal 11	29		Goal 11	78		Goal 8	13		Goal 4	2	LT	Goal 8	12		Goal 5
7		Goal 13	29		Goal 3	74		Goal 10	10		Goal 6	2		Goal 17	11		Goal 15
7		Goal 9	27		Goal 3	62		Goal 16	7		Goal 2	1		Goal 16	7		Goal 8
5		Goal 7	15		Goal 9	58		Goal 16	5		Goal 10	1	LU	Goal 9	6		Goal 14
5		Goal 12	14		Goal 15	50		Goal 12	4		Goal 3	1		Goal 6	5		Goal 17
4	AT	Goal 3	12		Goal 14	28		Goal 7	3		Goal 1	1		Goal 4	3	PT	Goal 4
4		Goal 14	8		Goal 7	18		Goal 13	3	IE	Goal 15	1	LV	Goal 15	3		Goal 10
4		Goal 13	5		Goal 11	10	ES	Goal 7	3		Goal 3	1		Goal 16	2		Goal 17
1		Goal 13	4		Goal 4	10		Goal 6	2		Goal 10	1	MT	Goal 10	2		Goal 9
1		Goal 13	4		Goal 5	8		Goal 17	2		Goal 15	27		Goal 7	1		Goal 4
1		Goal 9	4		Goal 16	6		Goal 6	1		Goal 2	27		Goal 9	1		Goal 8
1		Goal 7	3		Goal 13	6		Goal 13	1		Goal 2	19		Goal 11	1		Goal 8
21		Goal 9	3		Goal 13	6		Goal 3	1		Goal 7	16		Goal 9	1		Goal 16
19		Goal 11	2		Goal 12	6		Goal 9	1		Goal 5	15		Goal 9	1	RO	Goal 6
17		Goal 9	2		Goal 8	3		Goal 4	3		Goal 7	11		Goal 5	22		Goal 14
16		Goal 11	13		Goal 2	2		Goal 9	1		Goal 8	11		Goal 5	22		Goal 13
10		Goal 11	12		Goal 11	7		Goal 3	1		Goal 5	5	NL	Goal 14	14		Goal 16
3		Goal 9	7		Goal 16	5		Goal 4	1		Goal 8	4		Goal 15	13		Goal 17
3	BE	Goal 14	6		Goal 4	3		Goal 2	1		Goal 7	4		Goal 15	7		Goal 16
2		Goal 13	6		Goal 17	2		Goal 11	1		Goal 13	3		Goal 3	4		Goal 9
2		Goal 6	4		Goal 2	2		Goal 17	1		Goal 17	3		Goal 10	4		Goal 7
1		Goal 7	3		Goal 3	1	FI	Goal 2	1	IL	Goal 15	2		Goal 4	4	SE	Goal 11
1		Goal 12	3		Goal 7	1		Goal 17	1		Goal 9	2		Goal 10	3		Goal 2
1		Goal 3	1		Goal 3	1		Goal 5	1		Goal 13	1		Goal 16	3		Goal 6
1		Goal 13	1		Goal 15	1		Goal 10	1		Goal 10	10		Goal 5	2		Goal 5
1		Goal 12	6		Goal 14	1		Goal 2	1		Goal 17	6		Goal 12	2		Goal 4
1		Goal 11	6		Goal 9	1		Goal 7	1		Goal 16	5		Goal 8	2		Goal 8
1	BG	Goal 7	3		Goal 13	67		Goal 17	1		Goal 8	5		Goal 10	1		Goal 2
1		Goal 7	3		Goal 6	22		Goal 4	35		Goal 3	3		Goal 8	1		Goal 6
10		Goal 3	3		Goal 14	21		Goal 12	33		Goal 10	3	NO	Goal 12	43		Goal 13
8		Goal 9	3		Goal 5	19		Goal 7	31		Goal 17	2		Goal 13	34		Goal 5
5		Goal 3	2		Goal 14	16		Goal 16	31		Goal 8	1		Goal 1	34		Goal 15
2		Goal 2	2		Goal 10	15		Goal 10	20		Goal 7	1		Goal 7	30		Goal 2
2	CH	Goal 11	1		Goal 10	9		Goal 4	20		Goal 9	1		Goal 4	23		Goal 12
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1		Goal 3	30		Goal 12	4	FR	Goal 14	14		Goal 12	3		Goal 4	22		Goal 11
1		Goal 10	21		Goal 3	4		Goal 11	11	IT	Goal 4	2		Goal 9	19		Goal 15
6		Goal 12	18		Goal 12	3		Goal 6	9		Goal 6	2	PL	Goal 11	13		Goal 5
4		Goal 6	17		Goal 12	3		Goal 3	9		Goal 8	1		Goal 4	13		Goal 11
3		Goal 11	6		Goal 9	3		Goal 17	9		Goal 12	1		Goal 11	11		Goal 6
2		Goal 12	6		Goal 11	2		Goal 15	7		Goal 3	10		Goal 17	11		Goal 13
1		Goal 13	5		Goal 10	2		Goal 11	3		Goal 15	6		Goal 2	7		Goal 9
1	CY	Goal 7	4		Goal 6	1		Goal 3	3		Goal 8	4		Goal 2	4		Goal 3
1		Goal 13	4		Goal 14	1	HU	Goal 3	2		Goal 9	4	SI	Goal 1	4		Goal 9
1		Goal 13	3		Goal 8						Goal 16	3		Goal 2	1		Goal 16
1		Goal 11	3		Goal 1					1	KE	Goal 12	2		Goal 3		
1		Goal 14	3		Goal 9								1		Goal 9		
			3		Goal 9												
			3		Goal 3												
			2		Goal 17												
			2		Goal 4												

Figure 5. SDGs achieved by country (author's elaboration)

The most achieved SDGs are the SDG 13- Climate action, the SDG 9- Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation, and the SDG 11- Make cities and human settlements inclusive, safe, resilient, and sustainable, Figure 6.

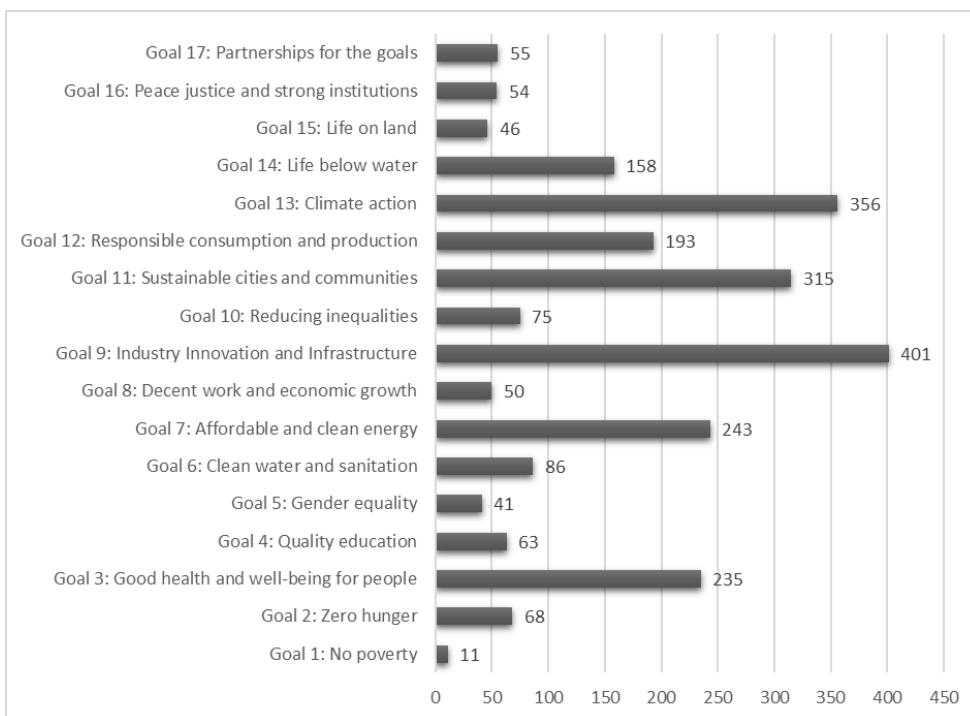


Figure 6. Project active for SDGs
(author's elaboration)

Multistakeholder collaboration

The observation of the dataset shows that in programme 6544 subjects collaborate to the promotion of a project that has been achieved the goal of the Agenda 2030. The number minimum of the participant for the project is 1 and the number maximum is 117, so it means that almost 1 project is composed by also one participant (and coordinator) and almost 1 project is composed by a network of 117 partners. In means, the project is composed of a network of 12 partners. The project Networks are made up of 6 types of subjects distinct for their activity (Figure 7):

1. Private for-profit entities
2. Higher or Secondary Education Establishments Contribution for Country
3. Public bodies
4. Private for-profit entities
5. Research Organizations
6. Other.

Their characteristics and contributions are analyzed in Figures 8 to 14.

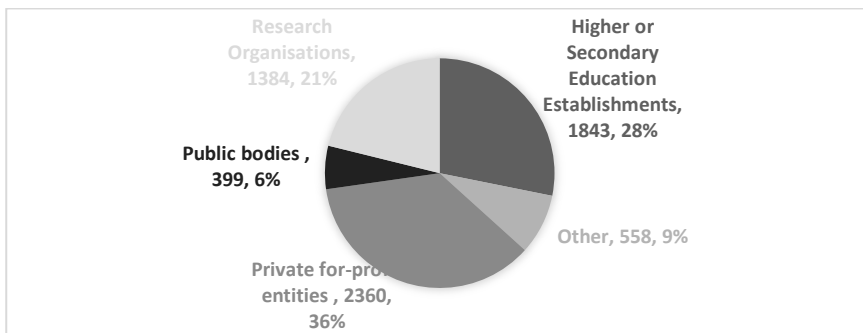


Figure 7. Type of Participants
(author's elaboration)

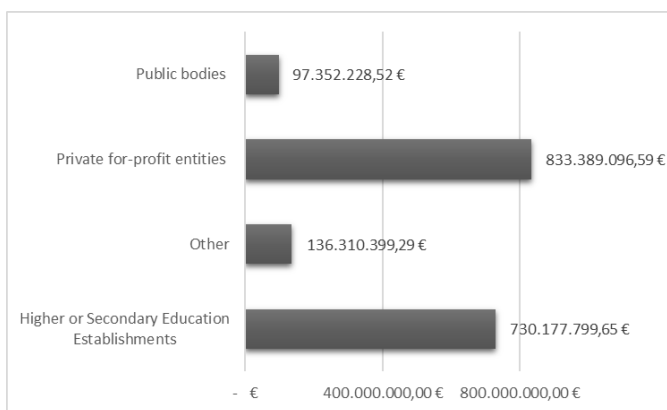


Figure 8. Total Contribution for Participants
(author's elaboration)

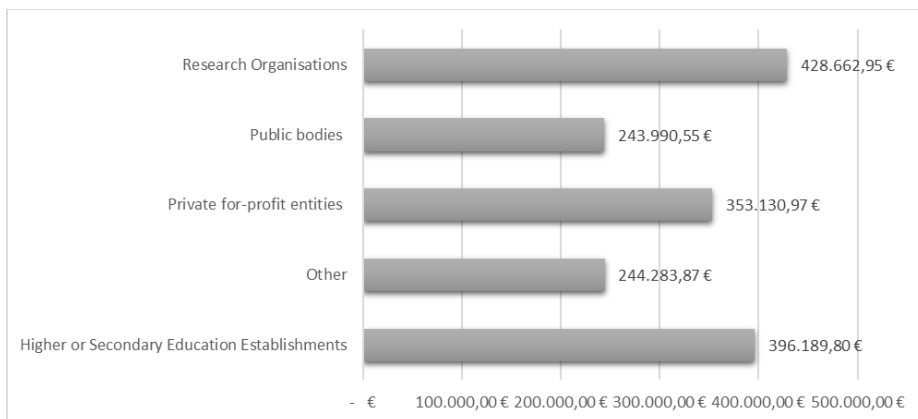


Figure 9. Average Contribution for Participants
(author's elaboration)

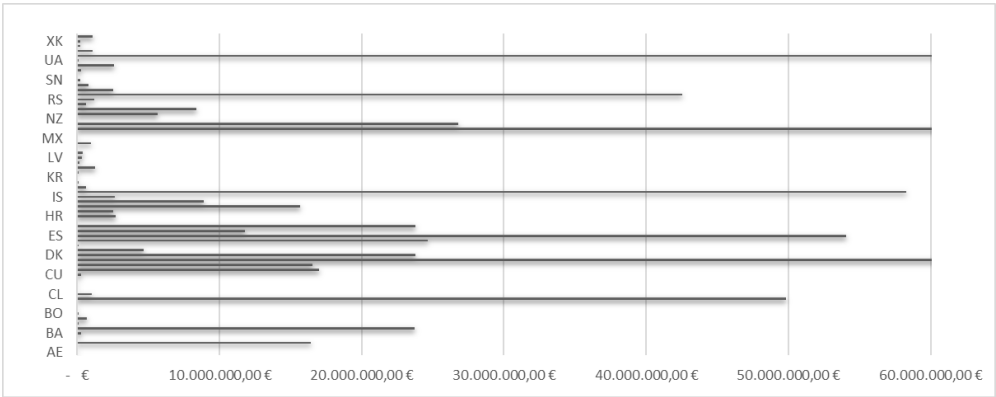


Figure 10. Higher or Secondary Education Establishments Contribution for Country
(author's elaboration)

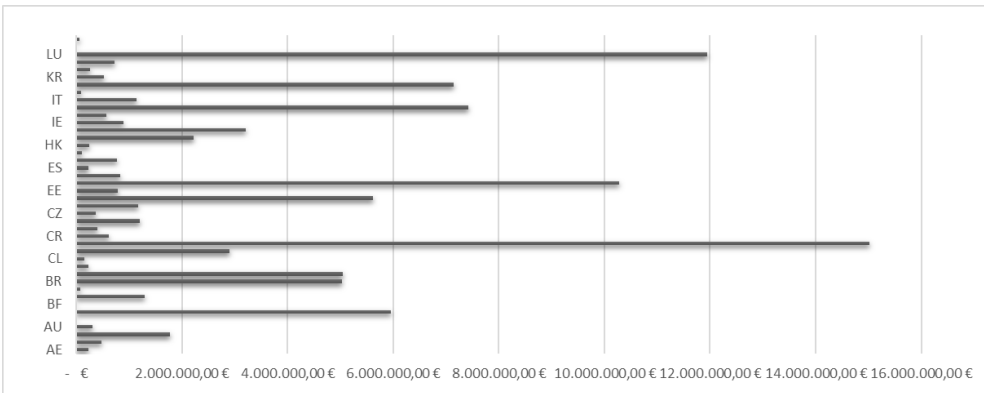


Figure 11. Public bodies Contribution for Country
(author's elaboration)

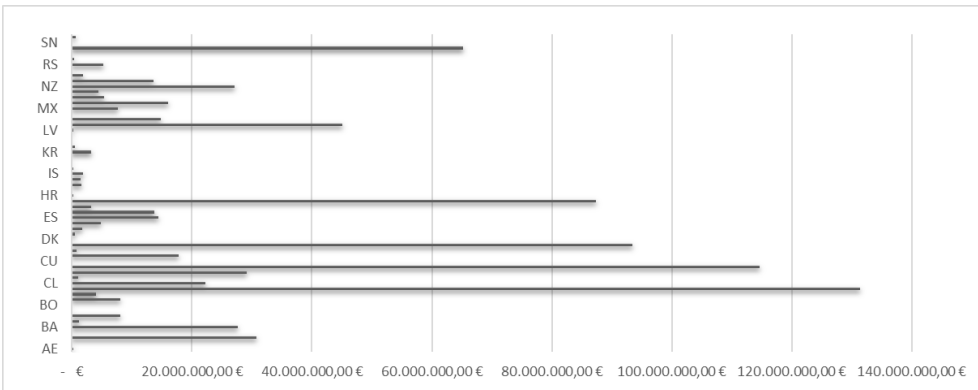


Figure 12. Private for-profit entities Contribution for Country
(author's elaboration)

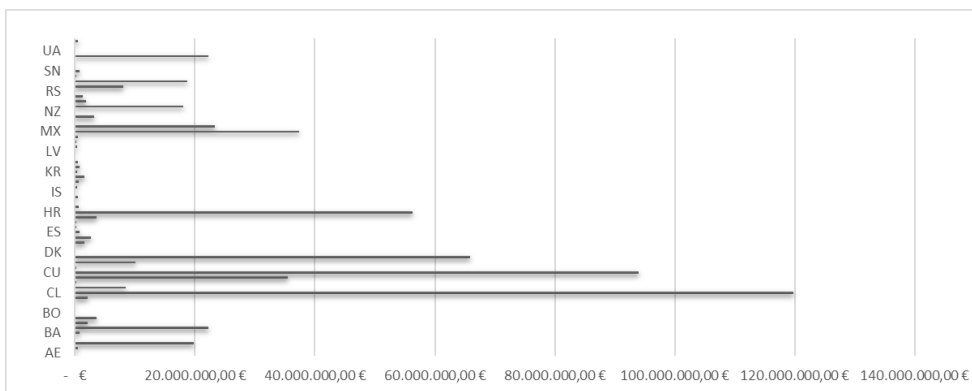


Figure 13. Research Organisations Contribution for Country
(author's elaboration)

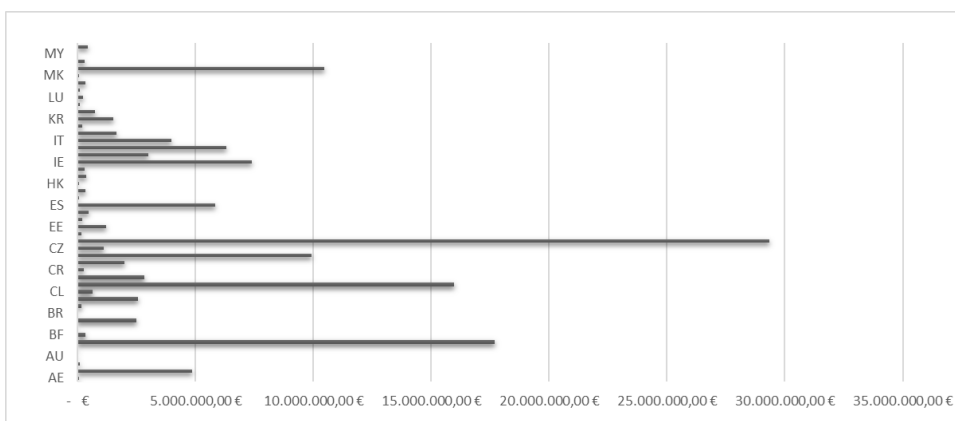


Figure 14. Other Contribution for Country
(author's elaboration)

Conclusion and discussion

The research shows that countries have considered a priority to invest in projects to implement the Industry, Innovation and Infrastructure sector - SDG 9 and secondly (with just under half of the economic contributions) in the health and wellness sector - SDG 3. The least popular goal is the reduction of poverty-SDG1. These first results show that the SDGs have been defined as general objectives for countries that are in different levels of economic and social evolution. An example of this is precisely the little investment in objective 1. This raises the first limitation of the analysis due precisely to a generic analysis that does not consider the socio-economic environment. The research tried to overcome the aforementioned limit by observing the different investment for SDGs for the 6 countries that received the most contributions, highlighting for example that Italy has invested almost the same amount on Goal 9 and 7 (Affordable and clean energy).

The projects started highlight the need for collaboration between different subjects. In particular, however, the most active types of subjects are in Private for-profit entities and Research Organizations, followed by Higher or Secondary Education Establishments Contribution for Country, although Research Organizations are those that on average receive the most contributions. For these reasons, the research hopes for future implementations in this regard, on an interesting and rapidly evolving topic.

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