


# Sustainable development goals and the European Cohesion Policy: an application to the autonomous Region of Sardinia

Laura Cavalli <sup>1,\*</sup>, Sandro Sanna,<sup>2</sup> Mia Alibegovic,<sup>1</sup> Filippo Arras,<sup>3</sup> Gianluca Cocco,<sup>3</sup> Luca Farnia,<sup>1</sup> Emanuela Manca,<sup>3</sup> Luisa F. Mulas,<sup>3</sup> Marco Onnis,<sup>2</sup> Sandro Ortu,<sup>4</sup> Ilenia G. Romani<sup>1</sup> and Marta Testa<sup>4</sup>

<sup>1</sup>Fondazione Eni Enrico Mattei, Palazzo delle Stelline, Corso Magenta 63, 20123 Milano (MI), Italy, <sup>2</sup>Regione Autonoma della Sardegna, Centro Regionale di Programmazione (CRP), Via Cesare Battisti sn, 09123 Cagliari (CA), Italy, <sup>3</sup>Regione Autonoma della Sardegna, Assessorato della Difesa dell'Ambiente, Via Roma, 80, 09123 Cagliari (CA), Italy and <sup>4</sup>Assessorato del Lavoro, formazione professionale, cooperazione e sicurezza sociale—Servizio di supporto all'Autorità di Gestione del FSE, Viale Trieste 115, 09123 Cagliari (CA), Italy

\*Corresponding author. E-mail: [laura.cavalli@feem.it](mailto:laura.cavalli@feem.it)

Submitted: 15 February 2021; Received (in revised form): 15 October 2021. Accepted: 14 November 2021

## Abstract

Paramount to the implementation of the 2030 Agenda and the effective tackling of the 17 sustainable development goals (SDGs) is the cooperation and coordination of the different levels of government—i.e. the supranational, national and local levels. This is due to the very nature of the SDGs, which are multi-dimensional and intended to guide and boost sustainable development at multiple scales. The European Union (EU) demonstrated a full commitment to the Agenda, making sustainable development a top priority. In fact, the five strategic objectives of the EU are modelled on the principles of the 2030 Agenda and the Cohesion Policy, EU's most transversal policy, is designed to give a direct contribution to the tackling of the 17 SDGs. Introducing a new methodology to evaluate the sustainability of operational programmes co-financed by the EU, the following paper aims to contribute to the building literature around the question of monitoring public investments regarding sustainability criteria. By matching the 169 targets of the 2030 Agenda with the 143 intervention fields of the Cohesion Policy, with specific reference to Sardinia's European Regional Development Fund and European Social Fund 2014–2020 Regional Operational Programmes, the present work introduces the key features of the model developed and its first results. The model could be of valuable support to policymakers who now have an innovative tool to monitor investments' coherence with the sustainability standards of the 2030 Agenda.

**Key words:** sustainable development, sustainable development goals, cohesion policy, localization

## Introduction

During the development and implementation of its Regional Operational Programmes (ROPs), co-financed by the European

Structural and Investment Funds (ESIFs) for the current 2014–2020 periods, the Autonomous Region of Sardinia (RAS) has developed and applied an environmental sustainability

assessment model of its programmes. These were evaluated with reference to the environmental sustainability objectives defined at a regional level as part of the Strategic Environmental Assessment (SEA) procedure (Moro et al. 2014).

At the date of preparation of the Environmental Report, the Managing Authority did not have a structured and systematic reference framework which today is represented by the UN 2030 Agenda and the National Strategy for Sustainable Development (Strategia Nazionale per lo Sviluppo Sostenibile—SNSvS) (MATTM 2017). As a consequence, there were local objectives of ‘sustainable development’, which were regionalized and seen more as ‘environmentally oriented’, regarding the definition of ‘sustainable development’ contained in Article 8 of Regulation [European Union (EU)] 1303/2013.

With the adoption of the 2030 Agenda in September 2015, 193 UN Member States decided to make an important commitment: leaving no one behind. This challenge leads to the revision of policy settings and actions both at a global and at a local level. The European institutions, in defining the Cohesion Policy for the period 2021–2027, have highlighted the central role of the sustainable development goals (SDGs) of the 2030 Agenda and their strategic relevance for the future of the EU itself, also for the definition of the Multiannual Financial Framework (MFF).

The EU has been fully committed towards the implementation of the 2030 Agenda and the SDGs, as stated in the conclusions of the Council of the EU ‘A sustainable European future: The EU response to the 2030 Agenda for Sustainable Development’ (Council of the European Union 2017) and in the European Commission’s reflection paper ‘Towards a Sustainable Europe by 2030’ (EC 2019a). The latter affirms the centrality of the Union in the definition of the 2030 Agenda and sets itself the goal of fully integrating the SDGs in the EU policy and strategic framework. Moreover, as recently stated in the EC Staff Working Document ‘Delivering on the UN’s SDGs—a comprehensive approach’, ‘under the leadership of President von der Leyen, the Commission has presented an ambitious policy programme to deliver on sustainability in the EU and beyond. The SDGs are an intrinsic part of the President’s political programme and lie at the heart of the policymaking on internal and external action across all sectors’ (EC 2020b).

Considering this context, it is important to stress that the environmental assessment model already developed by the Sardinia Region in the SEA procedure can be replicated and adapted to support the Regional Administration in the evaluation of the contribution of the Sardinia European Regional Development Fund (ERDF) ROP to the National Strategy for Sustainable Development. This methodology can surely provide important elements of evaluation for the preparation of the Regional Sustainable Development Strategy and it represents a valid tool to assess the contribution of the ESIFs to the achievement of the new SDGs at the base of the 2021–2027 programming (Sanna et al. 2019).

The present study aims at implementing a sustainability assessment model of the operational programmes co-financed by the EU referred to the SDGs, taking into consideration the relevance that the SDGs have for the EU and the central role of Cohesion Policy for the SDGs’ achievement and given the recent commitments and objectives sanctioned by the European Green Deal (European Commission 2019b) and the ongoing reflections at the European Commission.

This article presents the assumptions and theoretical foundations of the model as well as its first results deriving from the pilot applications to the Sardinia ERDF and European Social Fund (ESF) 2014–2020 ROPs.

The article is divided into three parts: the first part describes the process currently in place in the Italian regions for the 2030 Agenda localization, and in particular the experience gained by the Sardinia Region in building its own Regional Sustainable Development Strategy; the second part describes the assumptions and the theoretical framework of the model deriving the first conclusions; the last part reports the result of the pilot application of the model referring to the ERDF and the ESF 2014–2020 ROPs. Although designed and built specifically for the 2021–2027 programming period, in fact, the model is still applicable to the current ROPs and the pilot application presented here is an interesting calibration and validation exercise.

## The 2030 Agenda—from global to local

With the adoption of the 2030 Agenda for Sustainable Development, 193 United Nation Member States have pledged to ensure that ‘no one will be left behind’ and to ‘endeavour to reach the furthest behind first’ (UN 2015).

The 2030 Agenda has to be achieved by every country within 2030—and some targets within 2020. It grasps the three dimensions of sustainable development: economic, environmental and social (UN 2015), through the 17 SDGs and their 169 targets. As it is stated in the publication ‘Agenda 2030—da globale a locale’ (Cavalli 2018), the Goals highlight the peculiarities of different local realities, hence it becomes fundamental defining SDGs implementation strategies through local or regional development plans.

In order to reach the Goals in a comprehensive way, local strategies must supplement the National Sustainable Development Strategies. With this in mind, Fondazione Eni Enrico Mattei (FEEM) has been developing several information and policy tools, with the dual aim of encouraging the consciousness of local administrators towards the sustainability issues of their areas, as well as increasing the just and inclusive transition public awareness towards the overall concept of sustainable development. As a consequence, FEEM has carried out several analyses of the Italian territory: the ‘SDSN Italia SDGs City Index’ (Cavalli and Farnia 2018)—updated in 2020 (Cavalli et al. 2020a)—outlines the sustainability achievement of the Italian municipalities; Cavalli et al. (2019) focus instead on the regional attainments, while Cavalli et al. (2020b) zoom into the condition of the Italian Provinces and Metropolitan Cities, in terms of sustainable development.

## The 2030 Agenda and the EU Cohesion Policy

With regard to the 2030 Agenda and its localisation, an interesting discourse is around the European institutions and in general the stakeholders involved in the definition of the EU Cohesion Policy 2021–2027. What immediately arises is a strong consensus around the importance of the SDGs vis-à-vis the definition of the MFF at stake, but mostly how the SDGs are considered of strategic significance for the very future of the EU.

The EU, with its Member States, has been fully committed towards the implementation of the 2030 Agenda and the SDGs, starting with the European Commission communication of the 22 November 2016 (EC 2016), to the conclusions of Council of the EU ‘A sustainable European future: The EU response to the 2030 Agenda for Sustainable Development’ (Council of the European Union 2017).

Another important document is the European Commission’s reflection paper ‘Towards a Sustainable Europe by 2030’ (EC

2019a), which reiterates the centrality of the Union in the definition of the 2030 Agenda and has set itself the goal of fully integrating the SDGs in the EU policy and strategic framework, as well as in its priority issues.

Moreover, the von der Leyen Commission has prioritised sustainability within its mandate, so much that all the SDGs are integrated in the six Political Guidelines. At the end of 2019, in fact, the Commission has presented the European Green Deal as a growth strategy, to set the European economy on the track to become competitive and efficient in terms of resource use, to turn environmental challenges into opportunities, and to ensure a just and inclusive transition (European Commission 2019b).

It is interesting to notice that, earlier in that year, the European Court of Auditors (2019) noted that ‘despite the EU’s commitment to sustainability and the United Nations’ SDGs, the European Commission does not report on or monitor how the EU budget and policies contribute to sustainable development and achieving the SDGs’. As a consequence, following the Political Guidelines of the von der Leyen Commission, the European semester integrated the SDGs within the Annual Sustainable Growth Strategy and the country-specific recommendations, which also consider the post-Covid-19 pandemic and its effects (EC 2019c; 2020a). Moreover, considering the European Court of Auditors’ remark (ECA 2019), the Commission is currently exploring the possibility of developing a methodology for monitoring the EU budget in terms of SDG expenditure (EC 2020b)—an issue which will be more thoroughly explored in section ‘The methodological model’.

Finally, the Conclusions of the European Council (July 2020) stated that ‘the importance of tackling climate change in line with the Union’s commitments to implement the Paris Agreement and the United Nations SDGs, programmes and instruments should contribute to mainstream climate actions and to the achievement of an overall target of at least 30% of the total amount of Union budget and NGEU expenditures supporting climate objectives’. In this regard, the European Commission had already introduced in Regulation no. 215/2014 (EC 2014) a methodology, based on the *Rio Markers* system (OECD 2011), also proposed for the programming period 2021–2027, to calculate ESI Funds contribution to the climate change objectives. This method consists in assigning a weighting, assessing whether and to what extent the ESI Funds impact the climate change mitigation and adaptation objectives. The weights are attributed directly to the intervention fields established by the nomenclature adopted by the European Commission.

The authors here believe that this approach cannot fully ‘measure’ the ability of the EU’s action to contribute to the SDGs, as for example, considering the ESF and its coefficients for the calculation of support to climate change objectives, the Regulation no. 215/2014 (EC 2014) and the Proposal assign null coefficients for all the ESF intervention fields.

Therefore, it becomes necessary to develop tools capable of providing an overview of the contribution of the funds towards the achievement of the Union’s overall strategies, of which, certainly, the 2030 Agenda represents one of the largest containers, as also highlighted by the European Court of Auditors (ECA 2019) and the European Commission (EC 2020b).

### The path towards the regional sustainable development strategy of Sardinia

Considering the process of localisation of the SDGs, it’s time to shift the focus from the EU level to the one of the Sardinia

Region. The commitment of the Region towards the Goals appears very clear, not only with its participation in the drafting process of the National Strategy but mostly with the arrangement of an own Regional Sustainable Development Strategy (in Italian ‘Strategia Regionale per lo Sviluppo Sostenibile’, abbreviated as SRSvS) (Regione Autonoma della Sardegna 2018). The path began surveying all of the regional policies of the past 5 years, in order to assess to what extent they can serve as a coherent and functional tool for the achievement of the National Sustainable Development Strategy. What was shown by the survey is that several of the regional policies analysed belong to the EU Cohesion Policies. This finding certainly calls for an extensive analysis and identification of the interconnections between the Sustainable Development Strategy and the new 2021–2027 Cohesion Policy programming.

Thereafter, Sardinia Region together with the Ministry of the Environment, Land and Sea (coordinating entity of the National Strategy) has established a multiannual work programme, which shall be seen as an awareness-raising path towards the importance of the implementation of the 2030 Agenda and its SDGs. The underlying reasoning is that, if we want to move from a sectoral to an integrated governance approach, thus following the Sustainable Development Strategies’ guidelines, we have to work and act in a novel manner. First, ceasing the sectoral rationales which act as an obstacle to such an integration, also enhancing and exploiting the good practices already in place in terms of sustainability; second, promoting mutual learning between the different regional and local stakeholders.

With this in mind, the 28 December 2018 Resolution of the Regional Executive (Regione Autonoma della Sardegna 2018) called for the establishment on an institutional ‘control room’ (in Italian ‘Cabina di Regia Istituzionale’), which would act as interdepartmental coordinating agency between the several regional players. The control room is made up of an interdepartmental working group of the representatives of each departments’ and regional agencies’ general directorates (in Italian ‘Direzione Generale degli Assessorati e delle Agenzie regionali’). The general directorates include the representatives of the Managing Authorities of the ROPs financed by ERDF, ESF, FSC (which is the Italian fund for cohesion and development, called ‘Fondo di Sviluppo e Coesione’), and European Agricultural Fund for Rural Development. Moreover, civil society and local institutions are involved in spaces for discussion and information through Territorial Boards (‘Tavoli Territoriali’) and a Regional Forum.

The working group aims at integrating the National Sustainable Development Strategy into the everyday regional administration, guaranteeing the sustainable development especially in those highly critical situations, identifying the emergency issues in the Region thanks to the expertise of the representatives in the working group, but also through the monitoring of the SDGs indicators yearly published by ISTAT.

The survey of the regional policies has then made it possible to identify certain priority issues for the Regional Strategy. The focus fell on those integrated interventions and implementations of the National Strategy which hopefully can be eligible for funding by the Operational Programmes of the ESIFs and the EU common agricultural policy.

Again, what emerged was a strong consistency between the 2021 and 2027 EU programming in the working groups, which have followed the policy objectives of the ‘Proposal for a Regulation of the European Parliament’ (EC 2018b). The regional application was carried out in accordance with the following themes: a smarter Sardinia, a greener Sardinia, a more

connected Sardinia, a more social Sardinia and a Sardinia closer to citizens.

Such a thematic breakdown has enabled a common language and vocabulary being spoken between the Cohesion and the Sustainable Development policies within the working groups. The result was facilitating an effective and constructive approach towards the Strategy, as well as promoting mutual learning for an integrated and three-dimensional sustainability perspective across the entire regional administration.

Within this context, the present research was developed notably with the objective of an exploration of the 2030 Agenda targets and its interconnections, and an inquiry of the potential that the regional-level Cohesion Policy may have on the SDGs achievement. This work is bringing in significant results, especially when trying to understand to what extent the SDGs can be localized at the regional or sub-regional level and whether they can be achieved through the ERDF or the ESF. We can already anticipate that the Cohesion Policy funding does not allow to reach indistinctly and equally each 2030 Agenda target. This is a finding which validates the narrowness and incompleteness of any 'one size fits all' type solution for the achievement of the SDGs. Therefore, it is clear that the conjunction and the cooperation of different financial sources as well as the implementation of non-economic policies, such as regulations and partnerships, are essential for the realization of the 2030 Agenda both at global and at local levels.

### Sustainable development and 2030 Agenda in the Regional Development Programme of the Sardinia Region

The Regional Development Programme (in Italian 'Programma Regionale di Sviluppo', abbreviated as PRS) is the regional programming document which defines the policies and the strategies which shall be realized over the course of the legislative period (Regione Autonoma della Sardegna 2020a).

The 2020–2024 Regional Development Programme of the Sardinia Region was born in parallel with the definition phase of the European Reference Framework for the programming of the Cohesion Policy 2021–2027. As a consequence, the frame of reference for both of them consists of the 2030 Agenda as well as the National and Regional Sustainable Development Strategies. The aim is that of shifting from a sectoral to an integrated governance approach, with a strong sense of identity and capable of blending competitiveness, attractiveness and solidarity. Thus, with the PRS 2020–2024, the Regional Government seeks to define policies and strategies for the economic growth of the Region, while monitoring their impact on the environment, the preservation of biodiversity and while fulfilling social requirements such as the development of individual potentials or the attention towards community needs.

The Regional Development Programme is complex and ambitious and certainly requires major efforts but mostly appropriate tools and operating partnerships from the Regional administration. This is necessary if we want the approach to be translated into the real and effective achievement of the SDGs, at the regional and sub-regional levels, and not to remain a mere declaration of intents.

In this respect, the methodology developed by the present work allows the Regional Administration to be equipped with a support tool for the definition of the best-performing programming options vis-à-vis the 2030 Agenda.

## A mixed-method model

Before going into details about the model, it is useful to briefly outline the main points of the Cohesion Policy for the 2021–2027 period, based on the proposal presented by the European Commission in 2018, and the following amendments by various institutional actors during the negotiations, which are still ongoing. The regulatory framework arising from it constitutes the basic structure of the proposed model. Obviously, at the end of the legislative procedures and in case of further developments, any new model designed shall adapt to and follow the same framework.

### The Cohesion Policy of 2021–2027

The Cohesion Policy is the EU's main investment policy aimed at strengthening its economic, social and territorial cohesion, by providing benefits for all the regions and the cities in the EU.

The Article 174 of the Treaty on the Functioning of the EU (Official Journal of the European Union 2012) is the foundation of the European social, economic and territorial cohesion policy and makes explicit that the EU intends to strengthen its economic, social and territorial cohesion and to reduce disparities of development between the various regions. As a consequence, particular attention shall be paid to the regions suffering the most from severe and permanent natural or demographic difficulties.

The EU Cohesion Policy is 'one of the most transversal and cross-cutting policies, which contributes to most, if not all 17 SDGs. In addition, key cross-cutting principles and objectives, such as sustainable development, elimination of inequalities, promotion of equality between men and women, integration of gender perspective, as well as combatting discrimination are mainstreamed at all stages of implementation of the policy. Priority granted to the partnership principle makes sure that national and subnational actors are engaged and take ownership on delivering EU priorities through co-financed projects' (EC 2019a).

The MFF, the EU's long-term budget, finances the EU Cohesion Policy with a share of resources equal to €355 billion (around a third of the budget) in the current programming cycle 2014–2020. Instead, in the next 7 years, the MFF Proposal, currently under discussion, provides a similar allocation of resources. In fact, according to the conclusions of the European Council of July 2020 (European Council 2020), the commitment appropriations of the 'Cohesion, Resilience and Values' of the MFF 2021–2027 will not exceed €378 billion. Of this amount, around 330 will be allocated for the 'Economic, social and territorial cohesion' (sub-heading 2a), excluding the extraordinary interventions for recovery and resilience in response to the CoViD-19 emergency (*ibid.*).

Hence, the implementation of the Cohesion Policy occurs via the distribution of the resources allocated in the MFF through the ESIFs, whose structure for the next programming period—according to the Commission proposal [COM (2018) 375 final of 29.5.2018 and following amendments]—has been revised and simplified according to the following formulation:

- CF: Cohesion Fund
- ERDF: European Regional Development Fund
- ESF+: European Social Fund Plus
- EMFF: European Maritime and Fisheries Fund
- AMIF: Asylum and Migration Fund
- BMVI: Border Management and Visa Instrument
- ISF: Internal Security Fund
- JTF: Just Transition Fund

The ESIF directly contribute to the achievement of the Commission's priorities and growth strategy.

In particular, the Commission proposed to allocate €226.3 billion in 7 years to the ERDF, while the Cohesion Fund (CF), which does not have Italy among its beneficiaries, will be able to count on almost €47 billion (at current prices). Moreover, more than €100 billion (at current prices) are attributed to the new ESF Plus (ESF+).

In total, according to the recent conclusions of the European Council of July 2020 (European Council 2020), €322 billion of resources will be devoted for the 'Investment in jobs and growth' goal, while less than €8 billion will be allocated to the 'European territorial cooperation' goal (Interreg).

It is important to clarify that these numbers only refer to the proposed and not final MFF strategy. However, if some changes may happen during the ongoing negotiations, the financial amounts and their distribution through funds should not differ from those shown here.

The Cohesion Policy 2021–2027 will focus its resources on five policy objectives:

1. a Smarter Europe, through innovation, digitisation, economic transformation and support to small and medium-sized businesses;
2. a Greener, carbon free Europe, implementing the Paris Agreement and investing in energy transition, renewables and the fight against climate change;
3. a more Connected Europe, with strategic transport and digital networks;
4. a more Social Europe, delivering on the European Pillar of Social Rights and supporting quality employment, education, skills, social inclusion and equal access to healthcare;
5. a Europe closer to citizens, by supporting locally-led development strategies and sustainable urban development across the EU.

Most of the ERDF and CF investments cover the first two objectives: a Smarter Europe and a Greener, carbon-free Europe; ESF+ investments, instead, are entirely focused on the fourth objective, a more Social Europe. According to the first EC proposal, investments related to ERDF and CF funds should also contribute to the achievement of a contribution of at least 25% of EU spending devoted to climate action, an objective to be monitored through the EC methodology already adopted for the 2014–2020 period, based on the intervention fields established by the European Commission.

The five objectives mentioned above are then declined, for the ERDF and the ESF+, in further specific objectives: 21 and 11, respectively. These are pursued through investments traced into 135 intervention fields, in addition to those dedicated to outermost regions, institutional capacity of public authorities and cross-border cooperation, and technical assistance (minor modifications to above-mentioned objectives and intervention fields, as well as additional specific objectives, have been proposed by the EC and the other European institutions during the negotiations on the initial proposals, but no agreement has yet been reached on these amendments). Among these, each Member State and each region, according to their strategic choices, will select the intervention fields which best serve their objectives, taking into account the country-specific recommendations.

### The methodological model

Despite the EU's commitments towards sustainability and the UN SDGs, 'no systematic analysis or reporting framework [has

yet been published on] how individual programmes or parts of the budget contribute to the implementation of the SDGs' (ECA 2019). Taking up the European Court of Auditors' remark, the Commission is currently exploring the possibility of developing a methodology for monitoring the EU budget in terms of SDG expenditure (EC 2020b).

In particular, the European Commission has already introduced (Regulation no. 215/2014) a methodology to calculate the ESI Funds contribution to the climate change objectives. This method, based on the Rio Markers system (OECD 2011), consists in assigning a weight to each intervention field, assessing whether and to what extent the ESI Funds impact the climate change mitigation and adaptation objectives.

At this regard, a recent study (IEEP 2020) requested by the European Parliament's Committee on Budgets in order to investigate the possibility of adopting a more transparent, stringent and comprehensive methodology for the quantification of climate—and biodiversity-relevant expenditures—highlights how the methodology currently used by the Commission often leads to an excessively 'generous' quantification of the climate-relevant expenditure in many of the intervention fields. For this reason, a possible revision of that methodology could include, within the investment monitoring systems for the climate-biodiversity-relevant expenditures, only those expenditures capable of producing clear and verifiable results, linking 'the mechanisms for tracking the EU's delivery of climate and biodiversity outcomes towards the UN SDGs' (IEEP 2020).

In this context, the Autonomous RAS and FEEM have launched a joint research project specifically aimed at studying and implementing a model to assess the sustainability of the ROPs co-financed by the EU with reference to the 17 SDGs of the 2030 Agenda.

The methodology developed and presented here intends to provide the Regional Administration with a useful tool to support policy makers in defining the best-performing programming choices with regard to the 2030 Agenda, in compliance with the objectives of the political regional agenda.

In particular, RAS and FEEM jointly designed the methodology (Cavalli et al. 2020c) taking inspiration from the model developed by RAS in the SEA procedure of the 2014–2020 regional programmes, and so, they investigated the interconnections between the 169 targets of the 2030 Agenda and the 143 intervention fields proposed by the EC.

In particular, the development of the model has implied the following steps:

1. Given the ambiguity of some targets, the first step concerned their correct interpretation, taking into account not only their textual description but also the associated global indicators (UN 2020).
2. The second phase involved the creation of a 169×143 matrix populated by weights assessed considering the type of impact that each intervention field has on the individual target of the 2030 Agenda. As a result of a collective effort in which all the authors — with their specific expertise — analysed and discussed each case in order to reach the widest possible consensus, the impact was classified into none, indirect or direct, respectively, equal to 0, 0.4 and 1 for each target and intervention field combination. Specifically, a direct impact is an impact which directly involves the component without secondary steps, and, on the contrary, an indirect impact is an impact which involves one or more intermediate steps. The nature of this impact can be considered as intrinsic to the fields of intervention and therefore it is valid

for every territorial area (regional, national) for the implementation of the Cohesion Policy.

- The third step led to the creation of a second  $169 \times 143$  matrix populated, in this case, by weights that take into account the orientation and the magnitude of the impacts (with a non-zero weight). The impact was classified into positive or negative indicated with a plus (+) or a minus (-) sign, respectively—very low, low, medium and high equal to 0.1, 0.4, 0.7 and 1, respectively. Compared to the methodology developed by the Autonomous RAS in the SEA (Moro et al. 2014), a novelty has been introduced here: the coefficient 0.1, capable of tracing and considering also more modest cause-effect links between investments and SDGs. It is necessary to specify that the attribution of the entity of the impacts in this third step took into account, specifically, the territory, the characteristics and the needs of the Sardinia Region. Hence, unlike the first matrix, the assessments of this second matrix are not applicable in other contexts without prior verification and calibration of the coefficients that would require the intervention of experts of the specific geographical context of interest.
- Lastly, the third and final matrix was obtained from the product of the two aforementioned matrices (the matrix of zero, indirect and direct impacts and the matrix related to the orientation and the magnitude).

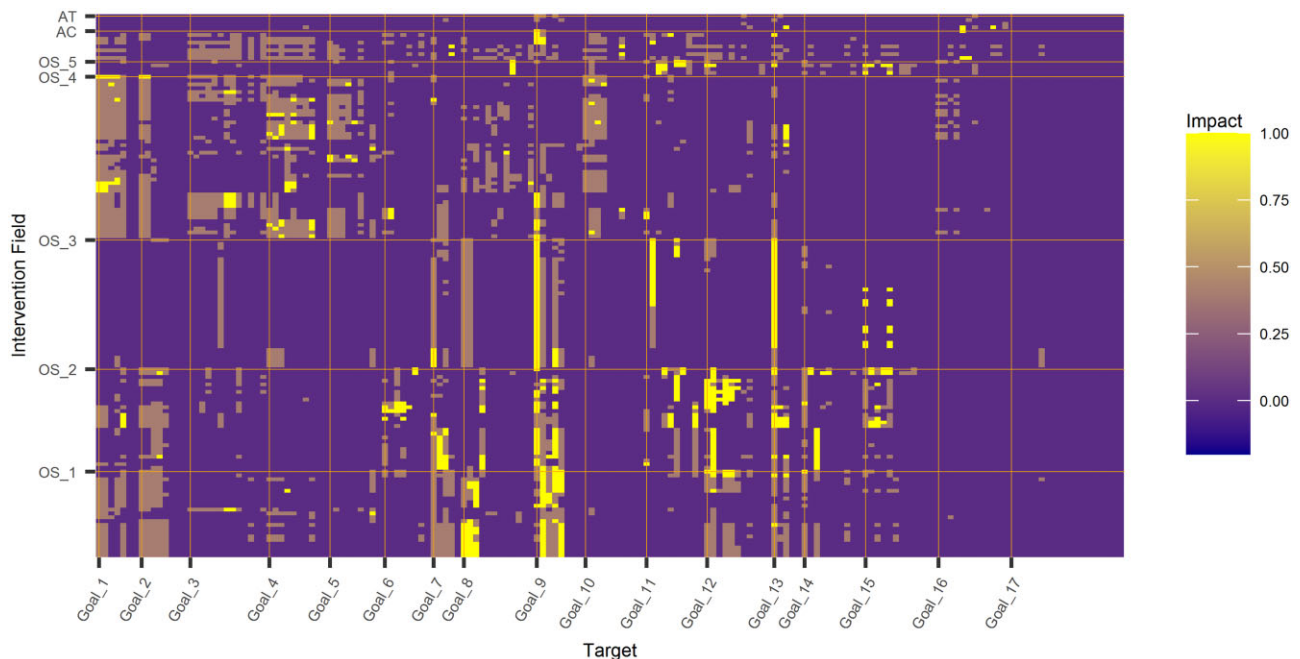
It was then necessary to construct a series of synthetic measurements capable of capturing the aggregate impact of each intervention field not only on the individual Goals but also on all of them. For the first purpose, the arithmetic mean of the impacts on the targets belonging to the same Goal was calculated for each intervention field; the value obtained therefore represents the expected average impact of a given field on a specific Goal. This step is made necessary by the nature of the targets, namely by their numerical asymmetry in the various SDGs.

In order to understand the intervention field's transversality, the sum of the respective impacts on the Goals was then taken into account. The higher this value, the more the investment in an intervention field is suitable for the achievement of the 2030 Agenda; values  $<1$  represent the cases in which only a portion of the investment is beneficial to the 2030 Agenda; values greater than unity are instead desirable as the entire investment is channelled into the SDGs.

Reading the coefficients of the conceptual mathematical model developed in this research project (graphically represented in Figs. 1 and 2) allows us to come to an important conclusion. The analysis indeed highlighted how the EU's Cohesion Policy may fail to guarantee the commitments undertaken by the European and national institutions to achieve the targets of the 2030 Agenda. This confirms that the investments supported by this policy cannot be a 'one size fits all' type solution. Rather, this process requires conjunction and cooperation from different financial instruments and sources as well as the implementation of non-economic policies (regulation, partnership, etc.). As the graphs show, the majority of the intervention fields have low or no impacts on SDGs, especially for Goal 16 (Peace, justice and strong institutions) and 17 (Partnerships for the Goals). While on the contrary, SDG 9 (Industry, innovation and infrastructure) are the most affected ones, followed to some extent by Goal 13 (Climate action), 1 (No poverty) and 7 (Affordable and clean energy).

These first results are influenced by the 'global' nature of the 2030 Agenda targets, some of which refer exclusively to the developing countries, and whose difficulties certainly cannot be addressed with the European Cohesion Policy.

At this point, it is necessary to specify that these are only the preliminary results of the research, which is still in a second *ex post* control phase and that was developed and tested on the architecture of the 2021–2027 programming proposed by the European Commission. Hence, the study will be updated after the final approval of the regulations, expected due to the first months of the next year.



**Figure 1:** Heatmap representing the impact matrix, populated by weights assessed considering the type of impact (null, indirect or direct) that each intervention field (Y-axis) has on each target of the 2030 Agenda (X-axis).

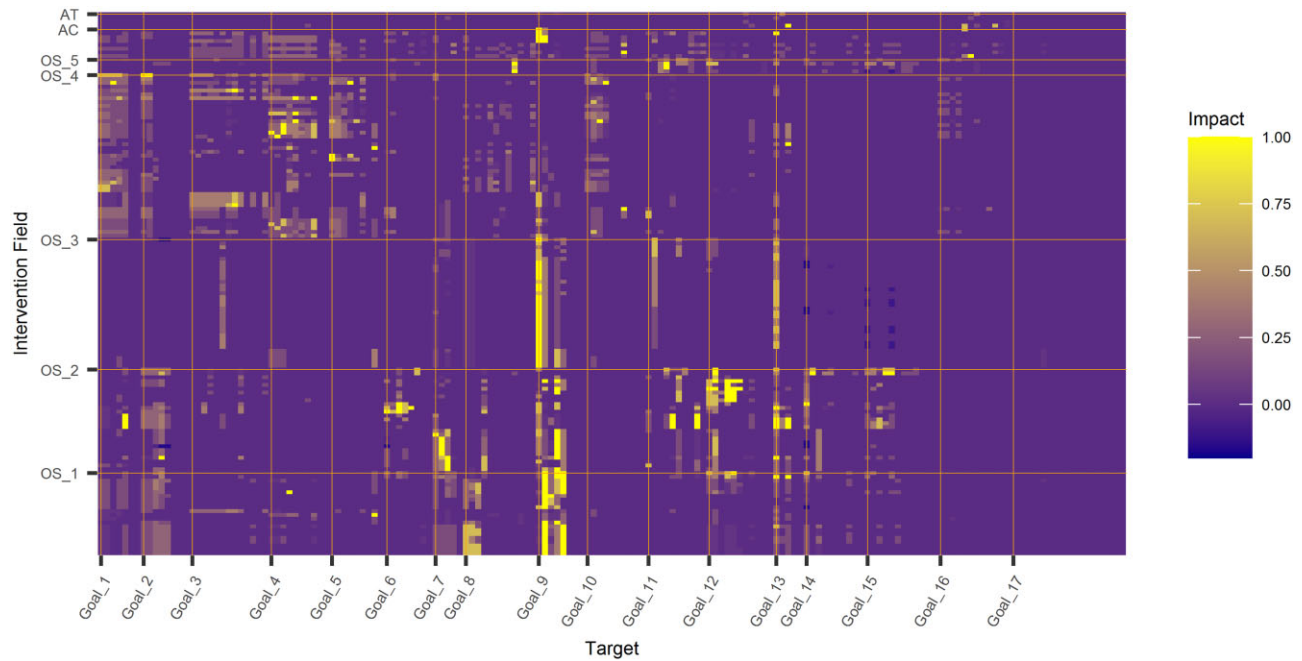


Figure 2: Heatmap representing the final product matrix, created multiplying the first impact matrix and the second matrix related to orientation (positive/negative) and magnitude (very low, low, medium and high). The product matrix hence considers the type, the orientation and the magnitude of impact that each intervention field (Y-axis) has on each target of the 2030 Agenda (X-axis).

Moreover, the application of the model also allows calculating the synthetic sustainability index of a given Programme starting from the financial resources associated with each intervention field. By weighing the financial assets activated by the ROP on each intervention field with the coefficients calculated as described in the previous section for each Goal, it is possible to determine which resources contribute directly or indirectly to the achievement of the SDGs at the regional level. The composite index is nothing more than the ratio between these amounts, assessed at the Priority Axis and/or the whole Program level, and the relative appropriations. Therefore, the synthetic sustainability index represents the extent of the portion of the ROP resources which contribute to the 2030 Agenda, compared to the total programmed resources.

### First results from the model

This section will illustrate the first results of our conceptual mathematical model. It is necessary to specify that these are only the preliminary results of the model, which is currently in a second *ex post* control phase. Specifically, the results refer to a matrix built specifically for the Sardinia Region and that is composed horizontally by the targets of the 17 Goals of the 2030 Agenda and vertically by the 143 intervention fields. A first horizontal analysis deals with the intervention fields that in a greater or lesser way contribute to the achievement of the SDGs. Then, a vertical analysis looks at the Goals that are more or less impacted by the Cohesion Policy.

What emerges, briefly, is that the intervention field which has the greatest impact on the Goals of the 2030 Agenda is 022, which is 'Research and innovation processes, technology transfer and cooperation between enterprises focusing on the low carbon economy, resilience and adaptation to climate change'. Specifically, this intervention field presents its biggest contributions to the achievement of Goals 9 (Industry, innovation and

infrastructure) and 13 (Climate Action). Then, at the second place in terms of contribution to the SDGs, we find the intervention fields 027 ('Support to enterprises that provide services contributing to the low carbon economy and to the resilience to climate change') and 040 ['Water management and water resource conservation (including river basin management, specific climate change adaptation measures, reuse, leakage reduction)']. As predictable, the former contributes more to SDG 7 (Affordable and clean energy), while the latter to SDG 6 (Clean water and sanitation).

In contrast, the intervention fields that contribute less to the achievement of the 2030 Agenda refer to those included in 'Technical Assistance': 141, 142 and 143, which correspond to 'Preparation, implementation, monitoring and control', 'Evaluation and studies, data collection' and 'Reinforcement of the capacity of Member State authorities, beneficiaries and relevant partners', respectively. This is not a surprising result because the actions of the Technical Assistance policy objective are aimed at strengthening the Public Administration and the communication strategy of the ERDF ROP. Therefore, rather than being presented as investment fields aimed at achieving the SDGs, they are more a sort of transversal tool at the service of the regional organization.

Another aspect worth mentioning is the presence of intervention fields that could negatively impact specific Goals of the 2030 Agenda. For example, investments in 080 'Seaports (TEN-T)', 081 'Other seaports', 082 'Inland waterways and ports (TEN-T)', 083 'Inland waterways and ports (regional and local)' have negative impacts on Goal 14 (Life below water) or the intervention fields concerning the construction of roads and highways and railway lines have negative effects on Goal 15 (Life on land).

In regard to the vertical analysis of the SDGs, the most impacted Cohesion Policy Goals are Goal 9 (Industry, innovation and infrastructure), Goal 13 (Climate action) and Goal 1 (No poverty). Specifically, Goal 9 is mostly impacted by the intervention

fields 022 'Research and innovation processes, technology transfer and cooperation between enterprises focusing on the low carbon economy, resilience and adaptation to climate change' and 023 'Research and innovation processes, technology transfer and cooperation between enterprises focusing on circular economy'; Goal 13 is mostly affected by the fields 035 'Adaptation to climate change measures and prevention and management of climate related risks: floods (including awareness raising, civil protection and disaster management systems and infrastructures)', 036 'Adaptation to climate change measures and prevention and management of climate related risks: fires (including awareness raising, civil protection and disaster management systems and infrastructures)' and 037 'Adaptation to climate change measures and prevention and management of climate related risks: others, e.g. storms and drought (including awareness raising, civil protection and disaster management systems and infrastructures)', while Goal 1 is mainly impacted by the intervention field 127 'Addressing material deprivation through food and/or material assistance to the most deprived, including accompanying measures'. Instead, considering the Goals less affected by the Cohesion Policy, we find first of all Goal 17 (Partnership for the Goals), followed by Goal 16 (Peace, justice and strong institutions) and then Goal 15 (Life on land).

### Application of the model to the Sardinia ERDF and ESF 2014–2020 ROPS

Although designed and built precisely for the 2021–2027 programming period, the proposed model is easily applicable to current programmes. Indeed, applying the pilot to programmes already under implementation, whose selected projects and effects are hence already known, can be an interesting exercise of calibration and validation of the model functioning's hypotheses.

The model was applied to evaluate the contribution of the two programmes towards the SDGs, starting from the financial monitoring data of the Sardinia ERDF and ESF 2014–2020 ROPS (*Regione Autonoma della Sardegna 2020b*). Since it expresses the expected medium- and long-term results, it was applied to determine the contribution of the selected operations towards the SDGs. The contribution was assessed considering the cost of selected operations (total eligible cost) and not the expenditures already made, which instead would have introduced an underestimation of the expected contribution. The important information regards all the investments that the programme is going to sustain and not only the operations already completed or in progress. For example, the programme allotted €7 million on Cycling infrastructure. As of 31 December 2020, the monitoring system recorded an amount of total cost of selected operations of €M9.51, whereas the expenditures already made amounted to only €M1.65. The total cost of selected operations better represents the programme's contribution to the SDG.

### Assessment of the impact of Sardinia ERDF and ESF 2014–2020 ROPS on the SDGs

The application of the model to the Sardinia ERDF and ESF 2014–2020 ROPS displays overall a good level of reliability in terms of assessments and compliance with the needs investigated in this study.

On the one hand, the Sardinia ERDF 2014–2020 ROP reports a sustainability synthetic index of 0.69, which is equivalent to claiming that almost 70% of the selected operations contribute directly or indirectly to the achievement of the global Goals of

the 2030 Agenda at the regional level. Moreover, the results show that the ERDF ROP is more incisively oriented to certain SDGs, namely Goal 9 'Industry, innovation and infrastructure', Goal 13 'Climate action' and Goal 7 'Affordable and clean energy' (Fig. 3) There is a need to find additional funding sources to assess the achievement of the other Goals.

On the other hand, the Sardinia ESF 2014–2020 ROP reports a sustainability synthetic index of 0.65, which means that approximately 65% of the selected operations contribute directly or indirectly to the achievement of the 2030 Agenda at a regional level. The results confirm the vocation of the Social Fund: the Goals that are most impacted are, in decreasing order, Goal 4 'Quality education', Goal 1 'No poverty', Goal 5 'Gender equality' and Goal 10 'Reduced inequalities' (Fig. 4). ESF also gives an important contribution to Goal 13 'Climate action', mainly due to target 13.3 'Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning'.

The contribution of the ERDF and the ESF to the 2030 Agenda shows how the two Operational Programmes impact different Goals and how some Goals remain 'uncovered', as they are not included within the objectives of the Structural Funds. For example, as can be seen from Fig. 5, both funds have a significant impact on Goal 1 'No poverty', while neither of them focuses on Goals 16 'Peace, justice and strong institutions' and 17 'Partnerships for the Goals'.

### Conclusion

The tool we present to evaluate the sustainability of operational programmes within the SEA procedures is useful for the preparation of the programmes and the related environmental report done by the Proceeding Authorities (e.g. Managing Authority). In addition, it can assist in the evaluation phases made by the SEA Competent Authorities, the Environmental Authorities and all the parties called to contribute within the procedure.

In this regard, it is appropriate to recall the provisions of the Legislative Decree 152/2006, wherein paragraph 5 of article 34 it is stated that 'sustainable development strategies define the reference framework for environmental assessments in the present decree' (*Gazzetta Ufficiale della Repubblica Italiana 2006*). This regulatory provision, however, can become impassable in case no suitable assessment tools—such as the ones presented here—are to be detected. The assessment tool has to be capable of identifying, within the plans and programmes, not merely the 'environmental dimension' but, more widely, the interconnections and the impacts of the latter with the components related to the economic growth, the fulfilment of the social requirements connected with the development of individual potentials, as necessary prerequisites for competitiveness and employment growths.

Nonetheless, the developed methodology allows the identification of not only the contribution of the intervention fields to the achievement of the Goals but also the negative impacts of them, making it possible to identify specific mitigating and/or compensatory measures. Moreover, the analysis highlighted how the EU's Cohesion Policy may fail to guarantee the commitments undertaken by the European and national institutions to achieve the targets of the 2030 Agenda, confirming that the investments supported by this policy cannot be a 'one size fits all' type solution for the achievement of all the SDGs, which instead require conjunction and cooperation from different financial instruments and sources as well as the implementation of non-economic policies (regulation, partnership, etc.).



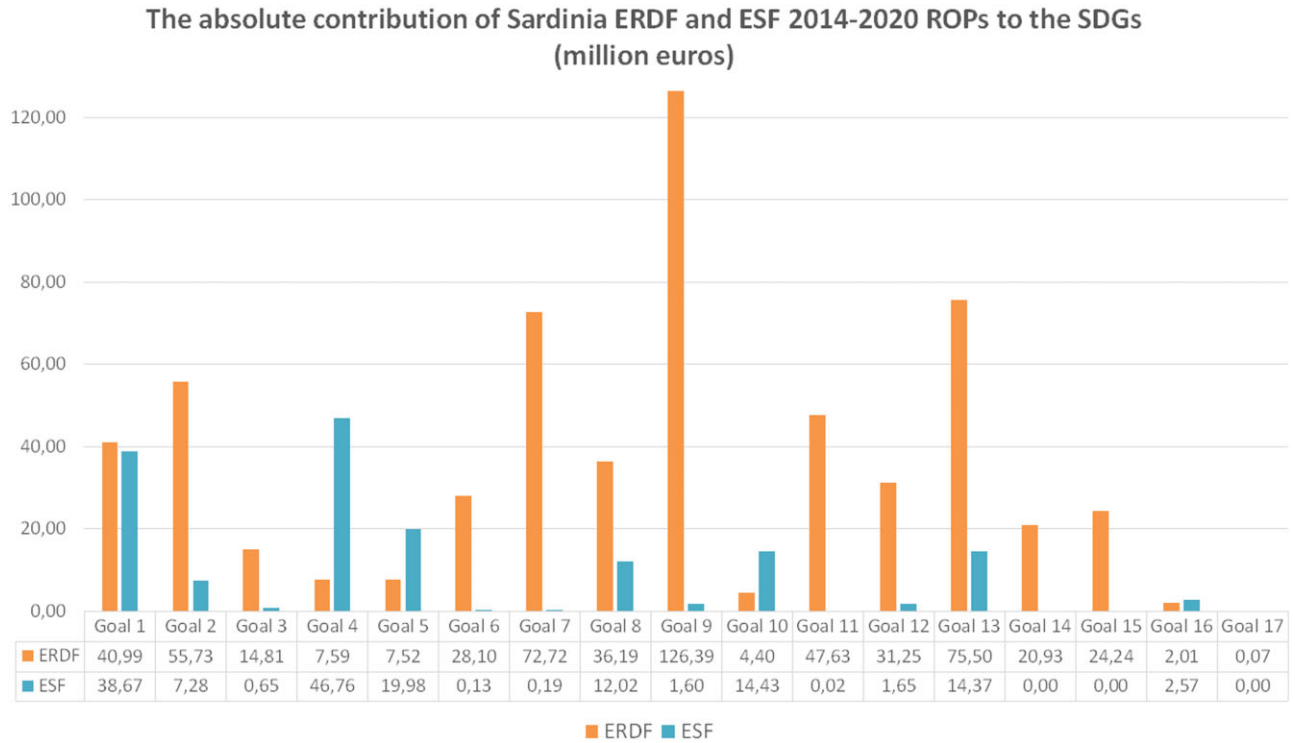


Figure 3: Contribution of Sardinia ERDF (European Regional Development Fund) 2014–2020 ROP to the SDGs.

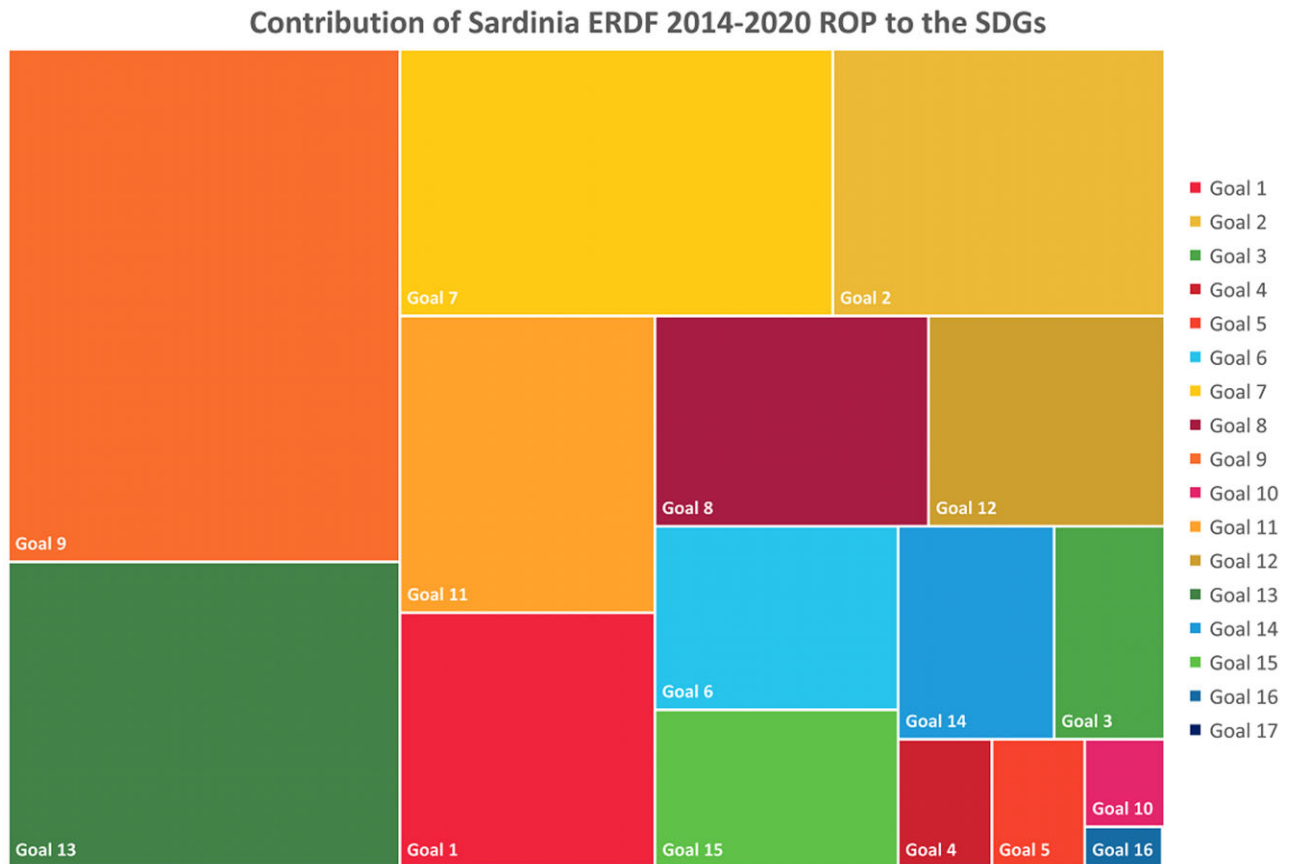


Figure 4: Contribution of Sardinia ESF (European Social Fund) 2014–2020 ROP to the SDGs.

## Contribution of Sardinia ESF 2014-2020 ROP to the SDGs



Figure 5: The absolute contribution of Sardinia ERDF and ESF 2014–2020 ROPs to the SDGs (million euros).

Our research suggests that the evaluation and monitoring of the contribution of the EU to the 2030 Agenda requires a tool capable of capturing which and how many investments financed by the EU through all European policies contribute to the SDGs. Given that, this methodology is also proposed to ensure a harmonized approach in the monitoring of the expenditures related to the 2030 Agenda in various EU policies in line with the need expressed by the European Court of Auditors (ECA 2019) and the ongoing reflections of the European Commission (EC 2020b). IEEP (2020) has stated that the ability of these investments to contribute to the 2030 Agenda also has to be explored in terms of actual results. Thus, further analysis and evaluations will become necessary, along with the monitoring of the performance indicators connected to the SDGs, in order to evaluate any improvement over time and to capture, when possible, even a direct correlation with the expenditures. We recommend other Managing Authorities should participate in this testing, which seems reasonable since some regions and the Italian Ministry of the Environment have already expressed their interest during recent institutional meetings. The involvement of various actors could be decisive for reaching a shared model applicable throughout the whole national territory from the earliest stages of the 2021–2027 programmes. Allowing policymakers to track and align spending to support the SDGs provides a solid baseline that can guide public authorities (whether at the local, national or European level) during future budget processes and allocations.

### Acknowledgements

We wish to thank GREEN-Bocconi University for granting us the opportunity to present this work at the International

Conference ‘How to achieve the SDGs through local action’ organized together with Urban Europe Research Alliance (UERA) in collaboration with the *Journal of Urban Ecology*, and for having fostered discussion on such an important issue.

Conflict of interest statement. None declared.

### Data availability

Financial monitoring data of the Sardinia ERDF 2014–2020 ROP are available at the following link: <https://www.sardegnaprogrammazione.it/index.php?xsl=1384&s=278013&v=2&c=12950>.

Financial monitoring data of the Sardinia ESF 2014–2020 ROP are available at the following link: <https://www.sardegnaprogrammazione.it/index.php?xsl=1384&s=280416&v=2&c=13076>.

### References

- Cavalli, L. (2018) *Agenda 2030—da globale a locale*. Milan: Fondazione Eni Enrico Mattei (FEEM).
- , and Farnia, L. (2018) *Per un'Italia sostenibile: SDSN Italia SDGs City Index*. Milan: Fondazione Eni Enrico Mattei (FEEM).
- , ——, and Vergalli, S. (2019) *Verso la sostenibilità: uno strumento a servizio delle Regioni*. Milan: Fondazione Eni Enrico Mattei.
- et al. (2020a) *The SDSN Italia SDGs City Index Two Years Later: Update Report*. Milan: Fondazione Eni Enrico Mattei.
- et al. (2020b) *Conoscere il presente per un futuro sostenibile: l'SDGs Index per le Province e le Città Metropolitane d'Italia*. Milan: Fondazione Eni Enrico Mattei.

- et al. (2020c) *Sulla Valutazione del Contributo delle Politiche DI Coesione 2021-2027 All'agenda 2030. UNA Proposta Metodologica*. XLI Conferenza Italiana di Scienze Regionali AISRe.
- Council of the European Union. (2017) *A Sustainable European Future: The EU Response to the 2030 Agenda for Sustainable Development*, Brussels, 20 June 2017 (10370/17).
- European Commission. (2014) *Commission Implementing Regulation (EU) No 215/2014*, 7 March 2014.
- . (2016) Communication from the Commission to The European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions. *Next Steps for a Sustainable European Future European Action for Sustainability*, Strasbourg, 22 November 2016 (COM(2016) 739 final).
- . (2018a) Communication from the Commission to The European Parliament, The European Council, The Council, The European Economic and Social Committee and The Committee of the Regions. *A Modern Budget for a Union that Protects, Empowers and Defends The Multiannual Financial Framework for 2021-2027*, Brussels, 2 May 2018 (COM(2018) 321 final).
- . (2018b) *Proposal for a Regulation of the European Parliament and of the Council Laying Down Common Provisions on the European Regional Development Fund, the European Social Fund Plus, the Cohesion Fund, and the European Maritime and Fisheries Fund and Financial Rules for Those and for the Asylum and Migration Fund, the Internal Security Fund and the Border Management and Visa Instrument*, Strasbourg, 29 May 2018 (COM(2018) 375 final).
- . (2019a) *Towards a Sustainable Europe By 2030*, Reflection Paper, (COM(2019) 22 final of 30 January 2019).
- . (2019b) Communication from the Commission to The European Parliament, The European Council, The Council, The European Economic and Social Committee and The Committee of the Regions. *The European Green Deal*, Bruxelles, 11 December 2019 (COM(2019) 640 final).
- . (2019c) Communication from the Commission to The European Parliament, The Council, The European Central Bank, The European Economic and Social Committee, The Committee of the Regions and The European Investment Bank. *Annual Sustainable Growth Strategy 2020*, Bruxelles, 17 December 2019 (COM(2019) 650 final).
- . (2020a) Communication from the Commission to The European Parliament, The European Council, The Council, The European Central Bank, The European Economic and Social Committee, The Committee of the Regions and The European Investment Bank 2020 *European Semester: Country-Specific Recommendations*, Bruxelles, 20.5.2020 (COM(2020) 500 final).
- . (2020b) *Delivering on the UN's Sustainable Development Goals—A Comprehensive Approach—Staff Working Document*, Bruxelles, 18 November 2020 (SWD(2020) 400 final).
- European Council. (2020) *Special Meeting of the European Council (17, 18, 19, 20 and 21 July 2020) – Conclusions*, Brussels, 21 July 2020 (EUCO 10/20).
- European Court of Auditors. (2019) *Rapid case review. Reporting on Sustainability: A Stocktake of EU Institutions and Agencies*, June 2019.
- Gazzetta Ufficiale della Repubblica Italiana. (2006) *Norme in Materia Ambientale (GU Serie Generale n.88 del 14-04-2006 - Suppl. Ordinario n. 96)*, Decreto Legislativo 3 April 2006, no 152.
- Institute for European Environmental Policy (IEEP). (2020) *Documenting Climate Mainstreaming in the EU Budget—Making the System More Transparent, Stringent and Comprehensive (Study Requested by the European Parliament's Committee on Budgets)*, Policy Department for Budgetary Affairs Directorate-General for Internal Policies, PE 654.166–July 2020.
- MATTM. (2017) *Strategia Nazionale per lo Sviluppo Sostenibile*. Direzione Generale per lo Sviluppo Sostenibile, per il Danno Ambientale e per i Rapporti con l'Unione Europea e gli Organismi internazionali—Divisione I.
- Moro, L. et al. (2014) *La VAS Nell'ambito della Programmazione dei Fondi Strutturali per il Periodo 2014-2020: Un Approccio Metodologico*. Paper presented at XXXV Annual Scientific Conference AISRe, Padua.
- OECD. (2011) *Handbook on the OECD-DAC climate markers*. Paris: Organisation for Economic Co-operation and Development. Retrieved April 14, 2014, from <http://www.oecd.org/dac/stats/48785310.pdf>
- Official Journal of the European Union. (2012) *Consolidated Versions of the Treaty on European Union and the Treaty on the Functioning of the European Union*, C 326/47, 26 October 2012.
- Regione Autonoma della Sardegna. (2018) *Indirizzi per la Costruzione della Strategia Regionale per lo Sviluppo Sostenibile (SRSvS)*. Deliberazione N. 64/23 del 28 December 2018.
- . (2020a) *Programma Regionale di Sviluppo (PRS) 2020-2024*. Deliberazione N. 9/15 del 5 March 2020.
- . (2020b) *Relazione Annuale di Attuazione 2019 del por FESR 2014-2020*.
- Sanna, S. et al. (2019) *Il Ruolo Strategico dell'Agenda 2030 per l'impostazione delle Politiche di Coesione 2021-2027 e l'integrazione degli Obiettivi di Sviluppo Sostenibile nella Predisposizione dei Programmi Operativi Regionali*. Paper presented at XL Annual Scientific Conference AISRe, L'Aquila.
- United Nations. (2015) *Transforming Our World: The 2030 Agenda for Sustainable Development*. Resolution adopted by the General Assembly on 25 September 2015 (A/RES/70/1).
- . (2020) *Global Indicator Framework for the Sustainable Development Goals and Targets of the 2030 Agenda for Sustainable Development*, A/RES/71/313.