

The Role of Sustainable Development Goals in Environmental Assessment

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Abstract: In the theoretical field, the integration of Sustainable Development Goals (SDGs) in Environmental Assessment (EA) has long been suggested, but in practice, it is not common yet. The present dissertation focuses on the investigation of the role of SDGs into EAs and its current use in practice to contribute to the overcoming of the theory-practice gap. A web search to gather EA reports integrating SDGs was conducted. In total 34 reports, in languages not previously studied by Ravn Boes et. al. (2021), were gathered and analyzed according to a framework that classifies the level of integration of SDGs in EAs. The results indicated a large number of EAs that only mention the SDGs, without them actually performing a role. In the reports that SDGs perform a function, it is still done in a non-transparent way and without a methodological pattern. The comparison between the findings of Ravn Boes et.al. (2021) has shown a great agreement between the studies. The divergences were found, mainly, in how the integration occurred, reinforcing the lack of an integration methodology. In conclusion, the role of the SDGs within EAs has been demonstrated as guiding, even if in a limited extent, the EA process in order to support the project/plan in achieving the global sustainability concept.

Keywords: Environmental Assessment, SDGs, Sustainable Development Goals, Integration, EIA, SEA

1. Introduction

The Sustainable Development Goals (SDGs) are part of the 2030 Agenda for Sustainable Development, adopted by the United Nations (UN) in 2015 as a common sustainability agenda for the international community for the period of 2015-2030.

The importance and benefits of integrating SDGs and EA (Environmental Assessment) are widely recognized (Hacking, 2019; Morrison-Saunders et al., 2019; IAIA, 2019; Del Campo et.al,2020). EA can bring increased tangibility and practical meaning to the SDG framework and therefore the integration of SDGs into EA process can be one of the keys to SDG achievement (IAIA, 2019).

Nevertheless, these debates have been remaining at a conceptual level in such a way that there are few studies in how to integrate EA and SDGs, leaving a knowledge gap between theoretical considerations and EA practice.

In this context, the author Ravn Boes et. al. (2021) conducted a research to explore how and in what extent the EAs have been integrating the 2030 Agenda and its goals. A total of 45 cases of environmental impact assessment (EIA) and strategic environmental assessment (SEA) written in English, Danish, Swedish, and Norwegian have been reviewed.

The present dissertation intends to focus on the investigation of the role of SDGs into EAs by analyzing EIAs and SEAs reports in Portuguese, Spanish and French. Amplifying the sample of EAs reports analyzed

by Ravn Boes et. al. (2021) and contributing to close the knowledge gap and further elaboration of a conceptual framework of SDG integration in EAs. Its objective therefore is to assess to what degree and how SDGs play a role in this type of assessments and, additionally, the results of this dissertation are aimed to be linked to the research outcomes of Ravn Boes et. al. (2021).

2. Methodology

The methodology has been framed in accordance with the methodology present by Ravn Boes et. al. (2021), in order to enable the linking between the two reviews.

The reviewed was based on a document text analysis and without any external consultation with plan/project stakeholders to understand their intention in the SDGs use. Thereby, the cases reviewed may contain unrecorded SDGs functions on the documents texts and may not be identified by the present study.

2.1. Gathering review material

A systematic review on web for EA reports which integrates SDGs was conducted to gather review material. The search was conducted in April 2021.

The source of the data collection was Google, as it is a global public domain search engine, enabling the collection of reports from different countries, languages, and that are openly available.

The input for the systematic review was a keyword string that followed the structures:

- i. (“1” OR “2”) AND (“3” OR “4”)
- ii. (“5” OR “6”) AND (“3” OR “4”)

Being the numbers respectively: 1. Environmental Assessment Impact; 2.EIA; 3. Sustainable Development Goals; 4. SDG; 5. Strategic Environment Assesment; 6. SEA. In the three languages under study:

- **Portuguese:** 1. *Avaliação de Impacto Ambiental*; 2.*AIA* 3. *Objetivo de Desenvolvimento Sustentável*; 4. *ODS*; 5. *Avaliação Ambiental Estratégica*; 6. *AAE*.
- **Spanish:** 1. *Evaluación de Impacto Ambiental*; 2.*EIA* 3. *Objetivos del Desarrollo Sostenible*; 4. *ODS*; 5. *Evaluación Ambiental Estratégica*; 6. *EAE*.
- **French:** 1. *Étude d'impacts environnementaux*; 2.*EIE* 3. *Objectifs de Développement Durable*; 4. *ODD*; 5. *évaluation environnementale stratégique*; 6. *EES*.

In total, 19 keyword phrases were used in the search, considering possible written and languages variations, combinations, and acronyms of the words above. Each keyword phrase was individually run through the public search domain. In some searches, the results were filtered to just show *pdf* files, in aim to increase the efficiency of the gathering as most of the EA reports found were large documents in *pdf*. There were no restrictions to neither plan nor project level reports and the search covered scoping and assessment reports.

This process has yielded 34 EA reports, of which 2 are scoping reports, 15 EIAs and 17 SEAs. Four EIAs reports are Environment Social Impact Assessment (Republique du Benin, 2020; Souleymane BALDE, 2018 ; Republique de Djibouti, 2019; AETS Consortium, 2019) and one of the SEA reports is a Strategic Environmental Social Assessment (Mundi Consulting et. al., 2018). One EIA (Republique du Benin, 202) and one SEA (PROYMASA, 2019) are simplified EAs reports, i.e., simplified assessment studies normally performed for smaller enterprises.

In total, 15 reports were related to projects and 19 were related plans. The classification was made based on how the report referred to the proposed action.

The geographic distribution of the reports gathered is shown in figure 1. Regarding the year of publication of the reports reviewed, most of them were published in 2020 and 2019, respectively a total of 14 and 11, and therefore an annual increasing trend.

2.2. Analysis of the SDGs integration into EAs

The analysis of each individual report is centered in the understanding of the SDGs role in the EAs. This was done by searching for “SDGs”, “Sustainable Development Goal” and “2030 Agenda” in the corresponding languages throughout the text reports and after the identification of the position of the SDGs mentions.

The first step of the analysis was made with the support of the conceptual framework from Kørnøv et al. (2020), reproduced in figure 2, to understand the level of integration of the SDGs into the EA. Cases are divided into the following levels:

- i. **SDG Dropping:** The SDGs are mentioned in the text report, but without an explicit function.
- ii. **SDG Scoping:** The SDGs are used to scope the assessment such as assess relevance of alternatives and impact categories.
- iii. **SDG Testing:** The SDGs are used as a framework to evaluate the impacts’ contributions to the goals.
- iv. **SDG Based:** The SDGs broaden the conventional EA scope to provide an overview on how SDGs can be achieved, constituting a decision-support tool.
- v. **SDG Led:** The SDGs frame the EA around the concept of absolute sustainability by setting targets or benchmarks for the impacts.

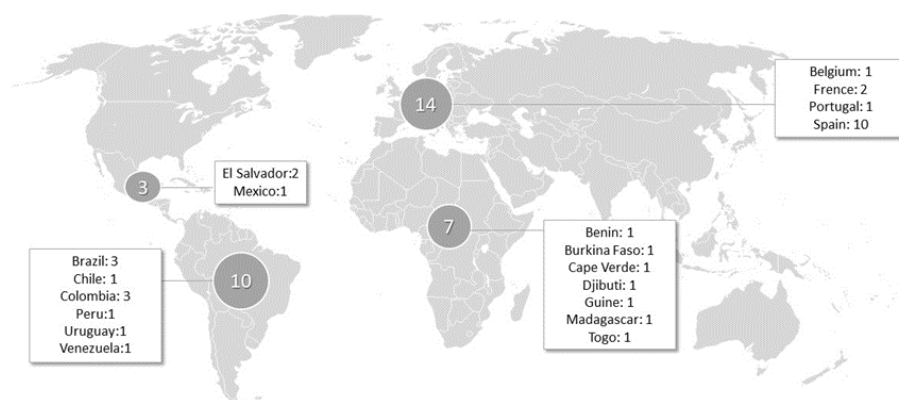


Figure 1: EAs geographical distribution. Source: own author

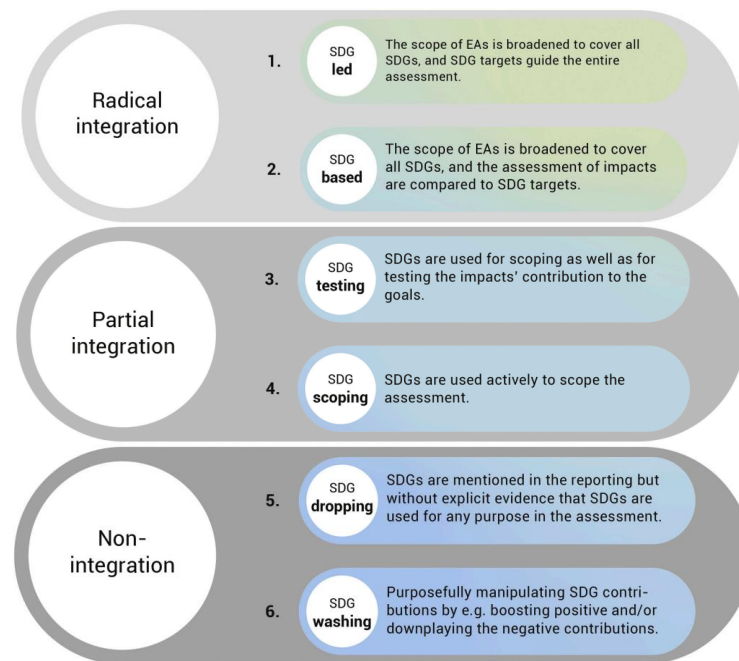


Figure 2: Conceptual Framework – The six levels of SDG and EA integration. (Lone Kørnø, 2020)

SDG washing was not considered to be within the scope of this research, since it includes a manipulation in the use of SDGs to ignore major negative impacts and/or exaggerated positive impact. This is impossible to conclude if the search was done only with written reports without external information as interviews with involved stakeholders.

The analysis was also based on the identification of the level of SDG usage – goal, target, indicator –, number of times mentioned, and if SDGs are used in an integrated manner.

The type of section in the report where the SDGs are mentioned was also identified, in aim to understand the continuity of its use and if it occurred in a punctual, structuring, or systematic manner.

All the outcomes of these analysis were compared with the achievements of Ravn Boes et. al. (2021). In addition, as the use of SDGs into EAs isn't procedurally defined by EA legislation, meaning that the SDG role in the report is up to interpretation of the present author, the interpretation could differ from the role primarily through by the EA authors (Ravn Boes et. al.,2021).

3. Results and Discussion

3.1. The SDG Function

The reports cases are classified across SDG dropping, SDG scoping, SDG testing, and SDG based as shown in table 1. No reports cases were found of SDG led integration.

3.1.1. SDG Dropping

Fifteen cases, out of the total of 34, were found with the SDG role of just mentioning them briefly without any explicit purpose in shaping the EA process. Those cases can be distributed in 3 main instances.

The first instance includes cases where the project/plan assessed is introduced as a contributor to the achievement of and/or in alignment with SDGs (Republique de Djibouti, 2019; AETS Consortium, 2019; Amaranto et.al, 2018; AEE, 2019; DNG GL, 2019), such demonstrated through the EIA report of the aqueduct expansion project in Colombia, “..., the expansion (...) implies progress in relation to the achievement of the SDGs.1 (...) as does goal six, (...) and goal ten.” (Translated from Amaranto et.al, 2018; p.1). In these cases, although the achievement/fulfillment of SDGs are mentioned, there are no advances on how this will occur and no indicative of measuring the SDGs achievement.

The second and biggest instance, with 14 cases, are EAs in which the SDGs' mention occurred within the review of main policies and programmes in the context of the project/plan assessed. (Caminos de las Sierras, 2021; Ageim ingénieurs, 2019; AETS Consortium, 2019; Republique du Benin, 2020; Souleymane BALDE, 2018; DNG GL, 2019; Pöyry Tecnologia Ltda.,2020; OMEGA energia, 2019; Díaz, 2018; Ministério do Turismo, 2020). In the case of the EIA report of a new road in Spain the SDGs are mentioned in the section that lists “(...) the international treaties to which the country has adhered, and which are in force: (...) Paris Agreement, the 2030

Table 1: A categorization of how the 34 EA reports is distributed across the six-level framework . Source: own author

#	EA Reports	Integration level				
		SDG Dropping	SDG Scoping	SDG testing	SDG based	SDG Led
1	Travaux de construction/ rehabilitation du Lycee agricole Kika (Republique du Benin, 2020)					
2	Programme d'Appui à la Transformation de l'Agriculture Guinéenne/Volet Entreprenariat Agricole des Jeunes (Souleymane BALDE, 2018)					
3	Projet d'installation d'une centrale solaire de 30 mw dans le village de blitta losso (DNG GL, 2019)					
4	Projet d'Amélioration de la Performance du Secteur de la Santé (PAPSS) (Republique de Djibouti, 2019)					
5	Projet AEP Antananarivo (AETS Consortium, 2019)					
6	Projeto grota do Cirilo – pegmatito xuxa cava sul ampliação da cava norte (Vetor Soluções Ambientais,2020)					
7	Plan Control Territorial. Fase II (Gobierno de El Salvador,2019)					
8	Proyecto “Expansión del Acueducto Veredal Salibarba” (Amaranto et.al, 2018)					
9	Parque Eólico Valdejalón II (Linum,2020)					
10	Proyecto “Parque Eólico Muyu Y Su Línea De Transmisión” (Walsh Perú, 2020)					
11	Parque Eólico De Almonacid Del Marquesado (Salman, Gandárov Shadizhev 2020)					
12	Fábrica De Celulosa Y Puerto En Concepción (Pöyry Tecnologia Ltda.,2020)					
13	“Centro De Desarrollo De Manufactura Avanzada Para La Industria Electrónica Del Estado De Jalisco” (mLsambiental, 2017)					
14	Alternativa Ruta No 38-Tramo Variante Costa Azul-La Cumbre (Caminos de las Sierras, 2021)					
15	Complejo Eólico Delta 10 (OMEGA energia, 2019)					
16	Estudo De Avaliação Ambiental E Social Estratégica Do Setor Do Turismo Em Cabo Verde (Mundi Consulting et. al., 2018)					
17	Évaluation Environnementale Stratégique Du Plan D'aménagement Des Espaces Marins (Arcadis, 2018)					
18	Plan Climat Pays Basque (Communauté Pays Basque, 2020)					
19	Projet D'aménagement De La Centralité De Tanghin À Ouagadougou (Ageim ingénieurs, 2019)					
20	Plan Climat Air Énergie Territorial De Plaine Commune 2020-2026 (Plaine Commune, 2020)					
21	Plan Nacional Integrado Energia Y Clima 2021-2030 De España (AEE, 2019)					
22	Plan Andaluz De Acción Por El Clima (Junta de Andalucía, 2020a)					
23	“Modificaciones Puntuales Al Plan Regulador Comunal De Valdivia” (Municipalidad Valdivia, 2019)					
24	Redacción Del Plan De Residuos No Peligrosos De La Provincia De Sevilla (IDOM, 2020)					
25	Plan De Transporte Metropolitano Del Campo De Gibraltar. Plan De Movilidad Sostenible. (Junta de Andalucía, 2020b)					
26	Plan De Transporte Metropolitano Del Área De Málaga.(Junta de Andalucía, 2020c)					
27	Parque Natural Montes De Málaga Y Su Área De Influencia Socioeconómica .(Junta de Andalucía, 2020d)					
28	Transición Energética En Yucatán (Díaz, 2018)					
29	Plan Sectorial De La Zca Bañados Del Arroyo Pando (PlanProtecto Consultores, 2017)					
30	“Modificación Del Plan Regulador De La Comuna De Río Bueno” (Río Bueno Municipalidad, 2019)					
31	Los Escenarios De Expansión De Transporte De Hidrocarburos (Unión Temporal,2017)					
32	Plan Parcial Del Sector Sunpi-I “Los Almendros” (PROYMASA, 2019)					
33	Avaliação Ambiental Estratégica Do Município De Belo Horizonte (Ministério do Turismo, 2020)					
34	Alterações Ao Plano Estratégico De Desenvolvimento Da Apld (2017-2026) E Suas Unidades De Negócio (Partidário et al, 2020)					
	Total	15	15	3	1	0

Agenda SDGs for Sustainable Development “(translated from Caminos de las Sierras, 2021; p. 13-14). In 7 cases (Republique du Benin, 2020; Souleymane BALDE, 2018; DNG GL, 2019; Pöyry Tecnologia Ltda.,2020; OMEGA energia, 2019; Díaz, 2018; Ministério do Turismo, 2020) the SDGs are referenced within the scope of the policies in the chapter of plans, policies, or

framework reviewed. To exemplify it, in the EIA for a wind power complex in the state of Piauí, Brazil, the SDGs are mentioned as one of the purposes of the Northeast Regional Development Plan: “integration of the regional economy with the socio-technical standards proposed by the Sustainable Development Goals (solar energy, wind energy, water reuse, reforestation

reforestation, biodiversity, etc..” (Translated from *OMEGA energia*, 2019; p. 131). One exception was the SEA of the “Modifications on Valdivia Communal Regulatory Plan in which the SDGs were discarded as a strategic reference framework for the plan; it occurred during a query that discussed environmental and sustainability policies that could have had an impact on the plan.

In the last instance, the SDGs are mentioned in the Assessment Impact chapter but without an inherent function (Amaranto et.al, 2018). In the discussion of the positive and negative effect of an impact, the contribution of SDGs to the achievement is mentioned to emphasize a positive effect, but how the impact is going to contribute to the achievement of the goals is not evident.

3.1.2. SDG Scoping

Fifteen cases, out of the total of 34, were found with the SDG role of scoping the assessment. Those cases can be distributed in 4 main instances and consist of 1 scoping report, 6 EIAs and 8 SEAs.

In the most basic integration scoping, the SDG function unfolds as a policy that frames the plan/program design (Plainne Commune, 2020; Junta de Andalucía, 2020a; Junta de Andalucía, 2020b, Plan de Andalucía, 2020c, Plan de Andalucía, 2020d; Rio Bueno Municipalidad, 2019; IDOM, 2020; Junta de Andalucía, 2020c; Salman, Gandárov Shadízhev 2020; Communauté Pays Basque, 2020; IDOM, 2020; PlanProtecto Consultores, 2017). Overall, the methodology used in the integration of SDGs into the plan/project design is not transparent and the framing can be presented as an active scoping or a passive scoping. In the SEA for the plan of Non-Hazardous Waste of the Province of Seville is stated that “*The Plan is fully aligned and designed to contribute directly to Sustainable Development Goal (SDG) 12*” (Translated from IDOM, 2020; p. 48), indicating an active scoping. And in the SEA of the modification of the regulatory plan of the commune of Rio Bueno, in Chile, the SDGs are classified as indirect instruments of the proposal framing. In 4 cases, the relevant SDGs were determined and used within the plan/program design. (Salman, Gandárov Shadízhev 2020; Communauté Pays Basque, 2020; IDOM, 2020; PlanProtecto Consultores, 2017). In the EIA of the Almonacid del Marquesado wind farm in Spain the SDGs goals were classified according to their alignment and relevance to the project. It was used the criteria of “high”, “medium”, “low” relevance and “not relevant”. Nevertheless, despite the classification of the relevance of SDGs, the criteria used is not explicit and there are no further analysis about the relation of the project impacts and the SDGs.

Secondly, there were 2 cases in which the SDGs are used to frame the EA mitigation plan according to the themes addressed and considered relevant to the plan/project scenario (Walsh Perú, 2020; PROYMASA, 2019). In the EIA for Muyu wind farm project in Peru, the actions’ purpose by the mitigation plan regarding local development are defined as in alignment with SDGs, as can be seen in: “*(...) actions aimed at the creation of shared value will be mainly promoted, and the themes aligned to the SDGs (...)*” (Walsh Perú, 2020; p:121). Therefore, some examples of actions promoted are: a circular economy programme and a local product and/or services procurement programme. However, these programmes do not have indicators based on the SDGs to measure its success and the use of SDG as a scoping function is done only in one section of the mitigation plan rather than in a systemic way through it.

In 3 cases the SDGs are used as parameter in the evaluation of a baseline’s topic (Vetor Soluções Ambientais,2020; Linum,2020; mLsambiental, 2017). In the baseline’s studies of social context in the EIA of a mining expansion in Brazil topics (Vetor Soluções Ambientais, 2020), the SDG target 3.2. was used as parameter to evaluate the progression of the topic “Longevity, mortality and fertility” in the project region and therefore performed the role of scoping and established the baseline measurement to the further assessment of the impact.

Lastly, it was identified a case in which the SDGs are used in the analysis of the project/plan alternatives as a criteria to the choice of the “better alternative” (*Gobierno de El Salvador,2019: p. 29*). In the preliminary EIA report of the Territorial Control Plan of El Salvador government “*Among the alternatives for the Programme, the following were studied and analysed (...) Considering: - The positive socio-environmental impacts (...), in line with the Sustainable Development Goals. (...)*” (*Gobierno de El Salvador,2019: p. 29*). Then it was classified as *scoping* because the selection of the project alternative scoped the EA process, which was elaborated to the alternative which presents positive socio-environmental impacts aligned with the SDGs.

3.1.2. SDG Testing

Three cases, out of the total of 34, were found with the SDG role of framing the impact assessment. Those cases can be distributed in 2 main instances and consist of 1 Strategic Environment and Social Assessment (SESA) and 2 SEAs.

The first instance consists of cases where the SDGs were used in the evaluation of the project/plan alongside the assessment chapter within the EA report (Mundi Consulting et. al., 2018; Arcadis, 2018). In the SESA of the Tourism sector in Cape Verde the SDGs are used to

justify the positives impacts of the plan within a specific topic, as seen in: *“It is verified that the impact of the actions that will be undertaken in the tourism sector will also cause an impact on Goal 5 of these SDGs”.* (Translated from Mundi Consulting et. al., 2018; p.76). And in the SEA of Belgium's Marine Spatial Plan (PAEM), it uses a specific assessment framework based on SDGs to evaluate the plan's impacts, being them negative or positive. A difference between the cases is the manner the impacts were measured, one used qualitative indicators (Mundi Consulting et. al., 2018) and the other quantitative (Arcadis, 2018).

In the other instance, the SDGs are used to measure the efficiency of the monitoring plan (Unión Temporal, 2017) as an indicator of its effectiveness. In the SEA of a project of expansion scenario for hydrocarbons transport in Colombia, in the efficiency measure method, the SDGs were used as a *“measured in terms of whether the scenarios proposed for the different sectors comply with the country's sustainability precepts”* (Unión Temporal, 2017; p. 303).

3.1.2. SDG Based

In the SDGs-based, the scope of EA is formulated to consider how the plan/project could achieve the SDGs and provide decision support to this aim (Kørnøv et al., 2020). Among the 34 cases analyzed, only one EA was classified as SDGs-based due to the integration of SDG as a decision support-tool in the EA process.

The SEA of the alteration of the Strategic Development Plan of the Administration of the Ports of Douro, Leixões and Viana do Castelo, in Portugal, used the SDGs as base for the identification and justification of the critical decision factors (CDF) of the assessment through an integrated analysis. Thus, since the CDFs are crucial to the support of the assessment decision making, the EA was formulated considering the SDGs in the decision support. In addition, in a second moment the SDGs perform a function in the Assessment of Strategic Options of the plan, in which are evaluated environmental and sustainability opportunities and risks of the options.

The biggest difference between the cases classified as SDG-testing and this case classified as SDG-based is the manner the SDGs are integrated into the decision process. In the SDG-testing reports, the SDGs were limited to the evaluation of the plan/project impacts according to relevant SDGs. On the other hand, in the SDG-based case the SDGs have been integrated into the entire decision process, since in the definition of the CDF as in the alignment of the different plan alternatives with the SDGs.

As an important point to highlight, not verified in the SDG-based case, was the non-use of SDGs measuring tools as the use of qualitative and quantitative indicators.

3.2. SDG level usage

Regarding the way SDGs were included in the report, there are four levels to be considered: whole policy, goal, target and/or indicator level.

None of the reports reviewed refer directly to the indicator level. In the other usage levels, patterns were found according to the SDG integration function: Dropping cases using SDGs in the form of whole policy; Scoping cases using SDGs in a goal level; and Testing cases using SDGs in the form of target level.

Regarding SDG dropping level, the majority cases just mention the SDG as a whole policy (AETS Consortium, 2019; Caminos de las Sierras, 2021, République du Benin, 2020; Souleymane BALDE, 2018; Pöyry Tecnologia Ltda., 2020; Ageim ingénieurs, 2019; Ministério do Turismo, 2020; OMEGA energia, 2019). SDGs were used in a goal level in cases the project/plan is presented as a contributor to the achievement of and/or in alignment with specific goals considered related to the plan/project scenario (AEE, 2019; République de Djibouti, 2019; Amaranto et.al, 2018).

In the SDGs scoping cases, overall, the SDGs are used at a goal level. The occasions where SDGs are used as a whole policy are cases the SDG policy have influenced the plan/program design (Plainne Commune, 2020; Rio Bueno Municipalidad, 2019). The trend verified in SDG scoping cases which uses the goal level are the cases in which the relevant SDGs to the plan/project are defined (Salman, Gandárov Shadízhev 2020; Communauté Pays Basque, 2020; IDOM, 2020; PlanProtecto Consultores, 2017). A unique scoping-case used target level (Vetor Soluções Ambientais, 2020).

All the reports classified as SDG testing used the SDGs at the target level. The trend identified was the use of the SDGs targets as parameters in the evaluation of the project impacts (Mundi Consulting et. al., 2018; Arcadis, 2018). However, this was not verified in the SDG based case, in such a way that it's not possible to conclude that as the level of integration of SDGs into EAs increase the tendency is to use a deeper SDG level as targets and indicators inside the report.

Moreover, in individual goal level cases, a variation on how many SDGs are considered was found. Regarding SDG count, the results range from indicating the use of one goal (PROYMASA, 2019; DNG GL, 2019; Linum, 2020) to fourteen goals (Salman, Gandárov Shadízhev 2020).

The Gandárov Shadízhev (2020) was the only case where an explicit evaluation of the relevance was

verified, although it was classified as scoping because the relevant SDGs were not used along the assessment. In all the other cases in which there was a mention of the relevant SDGs for the project/plan, it was not possible to identify an explicit evaluation of all the SDGs, in such a way that in many times the justification of the relevant goals was that they are related to the scope of the project/plan, i.e., in an EA of an energy project the goals considered relevant are the directly related to energy. There was no example of a case that worked with the SDGs in an integrated manner, i.e., with interrelations between SDGs, including synergies or tradeoffs.

3.2. Continuity of SDG use across the EA

The review of the location of the SDGs within EA identified some noteworthy tendencies. In line with the results of Ravn Boes et. al. (2021), the majority of the reports mention SDGs while describing relevant legal frameworks, policies or programmes that relate to the project/plan or in the introduction during the provision of background information for the project/plan. This applies to a total of 24 reports, of which 16 mention SDGs while describing relevant legal frameworks, policies, or programmes and 8 reports in the introduction.

This tendency is recurrent in SDG dropping cases, 64% of the total cases (9 reports) mention SDGs inside the “Reference to legal framework, plans and programmes” section, and in 27% of the total cases the SDGs appear in the “Introduction”.

The second trend is that 3 out of the 4 cases, in which SDGs are used in the “Diagnostic of the Environment and Social Parameters”, are classified within a SDG scoping function. In these cases, the SDGs are used in the evaluation of the baseline’s topics (Vetor Soluções Ambientais,2020; Linum,2020; mLsambiental, 2017).

The cases with a higher level of integration – testing and based – use the SDGs in other sections: Diagnostic of the Environment and Social Parameters (1 SDG testing case), Assessment Impacts/Alternatives (1 SDG based case and 1 SDG testing case), Mitigation and Monitoring Plan (1 SDG testing case).

Finally, in 28 of the 34 cases reviewed, the SDGs appear in a unique section. In the six cases, the SDGs appears in multiple sections: 2 are Dropping, 1 Scoping, 2 Testing, and 1 Based. From these results, the findings demonstrate that in general, in Dropping and Scoping cases, the reference and use of the SDGs occurs only in one section. This differs from the findings of Testing and Based cases, in which the use of the SDGs occurs in more than one section, except for one Testing case (Mundi Consulting et. al., 2018). However, the amount of cases with a higher level of integration was only 4 out of 24 cases, thus, to validate the previous statement we

would have to expand our sample of Testing and Based cases.

3.3. Linking the results with those of Ravn Boes et. al. (2021)

Table 2 summarizes the results of Ravn Boes et. al. (2021) for each of the integration levels and classifies them into 3 levels of verification, according to the results of the present review:

- **Verified:** Same results in both EAs reviews - **Color in table: green**
- **Partially Verified:** Minor divergence among results of EAs reviews – **Color in table: blue**
- **Not Verified:** Different results among EAs reviews – **Color in table: red.**

3.3.1. Verified outcomes

Regarding the cases of Dropping, all the outcomes observed by Ravn Boes et. al. (2021) were also observed in the review conducted in this study.

Only one Scoping outcome was verified, the instance which the project/plan framework is being used to indicate relevant SDGs (Salman, Gandárov Shadízhev 2020; Communauté Pays Basque, 2020; IDOM, 2020; PlanProtecto Consultores, 2017).

In relation to the SDG testing level, it was verified that the Testing is communicated in different parts of the EA reports. It could be used alongside the assessment chapter within the EA report (Mundi Consulting et. al., 2018; Arcadis, 2018) or in the mitigation measures chapter (Unión Temporal,2017).

The variation in how results are presented throughout the reports was likewise noted. Two cases just used written text, justifying the positives impacts of the plan through SDGs (Mundi Consulting et. al.) or assess the impacts using a framework based on SDGs (Arcadis, 2018). The use of table was also observed, with SDG based indicators aimed at measuring efficiency (Unión Temporal,2017).

A common challenge between the two reviews was the determination of the SDG influence in EA, mainly due to the lack of methodology transparency. Some aspects were implied by the written text but there was no way to confirm them since it was a primarily textual analysis. In this context, it is observed the possibility of future reviews of SDG integration in EAs being done by other means, such as interviews with authors and stakeholders involved in the EA process.

3.3.2. Partially verified outcomes

A major part of the Scoping outcomes was partially verified. A justification is that the sample of scope reports in this review is smaller than the sample of Ravn Boes et. al. (2021), which analyzed 10 reports against only 2

reports in this review. Therefore, the similarities were identified in the assessment reports.

Regarding the SDG Testing, all cases described the SDGs with which the project/plan is expected to contribute positively. None of the cases reviewed described negative evaluations of the SDGs, while in the Ravn Boes et. al. (2021) review, some cases of this type were identified. However, in 2 cases the use of

quantitative indicators occurs (Arcadis, 2018; Unión Temporal, 2017), with which it is possible to assess the degree of a certain impact (i.e., how positive or negative an impact is). Thus, it is not possible to conclude that, in these testing cases, negative impacts were purposely ignored or whether positive impacts were exaggerated.

Table 2: Comparison between the results of Ravn Boes et. al. (2021) and the present study. Source: own author based on Ravn Boes et. al. (2021)

Results of Ravn Boes et. al. (2021)	Observed in the present Study
SDG Dropping	
SDGs are considered within either the introduction or when outlining relevant policies and programmes	Green
SDGs are recognized a global strategy that can be considered in project and plan development, but the applicability is not further elaborated	Green
Reference to other plans or strategies as a reference for how the plan correlates to the SDGs	Green
SDG Scoping	
Cases which assess significant impacts that sets the frame for what SDGs are relevant, although the factors that go into using the SDGs are thereafter quite nuanced	Green
Scoping reports highlight the SDGs that would be relevant to address in the upcoming assessment report	Blue
SDGs are discussed in the context of relevant policies and programmes to consider in the EA	Blue
Cases which SDGs are mentioned in the empirical scoping procedure - linking SDGs to EA topics or integrating them into stakeholder dialogues	Blue
SDG Testing	
The SDG testing is communicated in different parts of the EA reports	Green
All reports exhibiting SDG testing describe those SDGs to which the project/plan is expected to contribute positively. Only a few includes negative evaluations	Blue
Evaluating the degree of a certain impact (for instance how positive or negative an impact is) is not common. And it is not supported by quantitative measures.	Blue
No cases consider the interrelations between SDGs, including synergies or tradeoffs in efforts to contribute to SDGs	Green
Variation in how results are presented throughout the reports	Green
SDG Based	
No SDG based cases were identified	Red

3.3.3. Different outcomes and complementary findings

Regarding the different outcomes among the EAs reviews, the first difference found was the proportion of the results classification in the integration levels. The review by Ravn Boes et. al. (2021) found 56% Dropping cases, 20% Scoping cases and 24% Testing cases, while the results in the present study were respectively: 44%, 44% and 8%.

Regarding SDG-Dropping, there was only one exception in the patterns previously identified by Ravn Boes et.al. (2021), which was the case where SDGs are mentioned in the Assessment Impact chapter but without an inherent function (Amaranto et.al, 2018).

On the levels with higher integration, although the macro trends were totally or partially verified, the way this occurs varies a lot, i.e., in which part of the EA process this integration occurs, the lack of a standard in how this is performed and different integration methods. All these aspects identify the lack of a recognized methodology to perform this integration in practice.

Thus, while in theory the importance of SDG use is defended, in practice the role of the SDGs in the EAs is still very incipient. The intention to achieve the SDGs is mentioned a considerable number of times within the EAs, but this does not extend to the incorporation within the assessment process. And usually when this incorporation is done, it is not in a clear and integrated way. The exceptions are the Testing and Based cases found; however, they are isolated cases.

Finally, it is important to highlight that the number of reports in the sample collected showed a trend of increasing use of the SDGs over the years, with 2020 being the year with the highest number of EAs (14 of the 34 cases). Hence, it is stressed that the integration of SDGs into EAs "is an emerging field, and that the prominence of the SDGs may grow in conjunction with more frequent experimentation and the development of methodologies" (Ravn Boes et.al.,2021: p.8). The divergences and shallowness in the integrations found during these studies are natural of a process that is not yet consolidated and widespread among the EA community.

4. Conclusions

The present dissertation has reviewed the function that SDGs perform in 34 EAs reports. The results of this review indicated a large number of EAs that only mention the SDGs, without them actually performing a role. While in cases where the role of the SDG is to collaborate in the scoping of the EA process, the integration is still done in a non-transparent way and the influence of the

SDGs on the scoping differs, ranging from active to passive.

There were only 3 cases where the SDGs are used as a framework for assessing impacts. In these cases, no pattern of integration was found, and different ways of assessing impacts through the SDGs were identified.

In a specific case, the role of the SDG was identified as supporting the project/plan in achieving the SDGs, and the EA was formulated for this purpose. This case represents the form in which the SDG was integrated in a more radical form, having been the basis for the construction of the entire assessment process. However, since it was the only one identified, it still represents a very young and not very widespread form of integration.

Comparing these results with those of Ravn Boes et.al. (2021) there was general agreement between the studies. The majority part of the findings of Ravn Boes et.al. (2021) were partially or fully verified in the reviewed EAs. The strongest similarity of results occurred when the SDGs did not play a role in EA. In the cases where SDGs exercised a role some divergences were found, mainly in how the integration occurred, reinforcing the lack of an integration methodology.

In conclusion, the role of the SDGs within EAs has been demonstrated as guiding, even if to a limited extent, the EA process in order to support the project/plan in achieving the global sustainability concept. For future research it is understood as necessary to study the integration of the SDGs in practical cases based on consultations with decision makers and authors of the EA process, with the aim of better understanding their perspective and motivations for this practice.

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