

Integrating SDGs in environmental assessment

Unfolding SDG functions in emerging practices

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Integrating SDGs in Environmental Assessment: Unfolding SDG functions in emerging practices

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Abstract: Debates concerning the relation between Sustainable Development Goals (SDGs) and Environmental Assessment (EA) have long suggested their integration in some form. The purpose of this paper is to go beyond conceptual debates to explore practices of Environmental Impact Assessment and Strategic Environmental Assessment in terms of how they change in response to the Agenda 2030. A thorough web search for EA reports integrating SDGs resulted in 45 cases from five continents, which were then analyzed using a framework on levels of integration to examine and reflect on practice. The results show that in the majority of reports, SDGs are merely mentioned with no further function; that there is a trend towards focusing on positive impacts; and that there is a high variation in how contributions to SDGs are assessed and displayed. The paper concludes by identifying key directions for further research, such as ways to further understand practices and to close the gap between theoretical considerations and EA practice.

Keywords: SDGs, Sustainable Development Goals, integration, practice, EIA, SEA

1. Introduction

The United Nations Sustainable Development Goals (SDGs) have set a common agenda and have been accepted as shared sustainability objectives amongst 193 UN member states since their adoption in 2015 (United Nations). The 17 goals cover an intertwined range of social, economic and environmental issues deemed pertinent to address in future sustainable development and, through supplementary targets and indicators, the SDGs are operationalized and expected to be implemented in practice.

Much aspiration has been assigned to the relations between the SDGs and Environmental Assessment (EA) in the form of Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA), while the relevance of integrating SDGs and EA is widely acknowledged (UNECE, 2017; Nilsson & Persson, 2017; UNEP, 2018; Hacking, 2019; Morrison-Saunders et al., 2019; IAIA, 2019; Kørnøv et al., 2020; González Del Campo et al., 2020; Ravn Bøss et al. 2021b). However, there are different reasons and ways to integrate SDGs into EA. This paper has its point of departure in a conceptual framework, developed by Kørnøv and colleagues in 2020, that links the SDGs and EA and outlines different functions SDGs may perform in EA processes. The framework distinguishes between six levels of integration ranging from non-integration to radical integration.

A shared assumption among EA professionals is that embedding SDGs in decision-making through EA can be one of the keys towards their achievement. Integrating SDGs in EA means bringing SDGs into the core of formalised decision-making on policies, plans and projects worldwide. Further, EA can provide a systematic framework for understanding the effects of decisions on SDGs. Especially SEA as a driver for implementing the SDGs was first suggested by Nilsson & Persson (2017) and re-addressed by González Del Campo and colleagues (2020).

Recognizing this key role of SEA towards sustainability is not new. Already back in 1996, Partidário suggested that “SEA is used as a fundamental approach in the process of improving EA performance and as an invaluable tool in the integration of environmental concerns in the decision-making process and in the moving trend toward sustainability goals” (p. 32). Later, this has been supported by other scholars (e.g. Sadler, 1999). The authors recognize the potential through SEA to influence decisions earlier and at a higher decision level but consider both EIA and SEA as important instruments for the achievement of the SDGs. Furthermore, sustainability is found to constitute several roles in EA from implicit background policy to benchmarks or “a strong policy that helps to shape new forms of decision making in support of sustainable development.” (Partidário, 2000: p. 650).

The potential value creation is therefore mutual, and also EA practices can be strengthened in relation to its overall goal of supporting sustainable development (e.g. Hacking, 2019; Kørnø et al., 2020; González Del Campo et al., 2020). Hereunder, the SDGs could serve as inspiration for strengthening a broader scope of sustainability in EA and supporting a transition towards a more strategic and objective-led orientation.

The important role EA has to play in achieving SDGs is also recognized by the International Association for Impact Assessment (IAIA). In 2016 the IAIA Task Force on SDGs was established to create a transversal space for creative discussion and reflection with all members on how Impact Assessment (IA) can be used to enhance the good application of SDGs. The outcome of the discussions has later been published in a short document (IAIA, 2019). This document suggests that advantages of using SDGs in IA includes making IA more objective-led (rather than impact-led) and integration may make IA more relevant (since countries have agreed on the SDGs). On the other hand, IA will bring increased tangibility and practical meaning to SDG frameworks through strategic and sustainability assessments, and also through various forms of monitoring included in IA-based environmental, social, and health management plans. Regarding disadvantages of using SDGs in IA, the IAIA discussion emphasized the risk of making IA less context-specific and less effective; a potential decrease in ownership of the IA, since SDGs at project level are not the responsibility of company or communities; the burden/complexity that SDGs could add to an already complex, resource-consuming process.

Despite general agreement upon the potentials, the mutual benefit between EA and SDGs is internationally predominantly explored theoretically (Kørnø et al., 2020), which reflects that it is an emerging field. The sparse literature highlights an international need for developing EA to unfold its potential to support SDGs. Although the integration of SDGs in EA reporting does not necessarily always mean that achieving the SDGs is granted a higher priority, the review of cases provides an indication of both dominant and currently absent practice.

Practice has now evolved to an extent that makes it possible and interesting to provide overviews of how SDGs and EA are related in practice – in order to learn and inspire further developments. As an emergent relation, there is a significant potential for inspiration and learning by answering questions like: How are SDGs described, how many SDGs are included, how are impacts on SDGs displayed, for what purpose, etc.? This paper provides an element of such an overview, namely an overview of EA reports and an analysis of how SDGs are integrated. The aim is thus not to devise best practice nor establish a guidance document to help improve practice. It is instead to provide an analysis of current practice that may be a stepping stone for other actors to define practices worth highlighting as being more optimal than others. The paper's guiding research question is therefore: What are the functions of SDGs in EA according to current reporting practices? This research question limits the ambition of the paper and defines its intended boundary.

2. Methodology

Uncovering a state-of-the-art of SDGs in EA entails understanding the functions that SDGs currently perform within plan and project development. This state-of-the-art is based on the SDG functions exhibited through scoping and assessment reports, rather than a dialogue with plan/project stakeholders on the functions intended through SDG integration. In other words, this research investigates the function of SDGs as it has been recorded in document texts, and therefore, there may be SDG functions within the plan/project that remain unrecorded and as a result are not identified within this state-of-the-art. Furthermore, the focus on EA documents means that reasonings for integrating SDGs, concerns thereof and effects of this integration beyond what is stated in the text are not part of the study. This section describes how the case material was gathered and how the SDG functions were analyzed.

2.1. Gathering review material

Case-study EA reports that link to the SDGs were gathered through a web search. Since there is no common database for storing EA reports, the reports used in this research are ones that are openly available through public domain search engines, which in this particular review was Google. The input for the systematic review was a string of keyword phrases. In this research, it was considered pertinent to find examples of a wide array of EA reports, and the search was therefore not restricted to neither plan- nor project-level reports, and likewise, not restricted by report type. It covered both scoping and assessment reports.

The purpose of this search was to find a broad sample of EA cases using SDGs in order to gather an understanding of patterns within current practice. The search was conducted in October and November 2020 and yielded a total of 45 EA reports for further analysis. The keyword phrases were individually run through the public search domain. The keyword phrases included both unabbreviated and abbreviated EA report types. The same was the case for the SDGs in which the full term was used as well as its abbreviated form. In order to obtain a wider repertoire of reports, the keyword phrases were conducted in English, Danish, Swedish, and Norwegian, a result of the author's language competencies.

Although the searches yielded many results, some keyword phrases reaching millions of links, no exclusion words were incorporated to narrow search results. Since EA reports are typically long reports covering a vast number of topics, excluding certain keywords could unnecessarily exclude pertinent reports. The intention was not necessarily to find every example of SDGs within EA reports. Therefore, given the significant amount of search results, not every search result was consulted. For each keyword phrase, the first 200 – 250 results were browsed, which was determined to be a threshold, as initial additional browsing showed no concrete EA reports incorporating the SDGs beyond this number. This does however mean that this is a state-of-the-art of tendencies and does not claim to be conclusive of every case. In addition, the number of search results differs every time the keyword search is conducted, and therefore, the total listed below is a total recorded when the search was initially conducted. The keyword phrases were as follows:

- Environmental assessment AND (“EIA” OR “environmental impact assessment”) AND (“SDG” OR “Sustainable Development Goals”) – 1.550.000
- Environmental assessment AND (“EIS” OR “environmental impact statement”) AND (“SDG” OR “Sustainable Development Goals”) – 217.000 results
- Environmental assessment AND (“SEA” OR “strategic environmental assessment”) AND (“SDG” OR “Sustainable Development Goals”) – 6.450.000 results
- Environmental assessment AND “scoping report” AND (“SDG” OR “Sustainable Development Goals”) – 18.400 results
- “verdensmål” OG (“VVM” ELLER “miljøvurdering”)¹ – 3.700 results
- “verdensmål” OG “afgrænsningsrapport”² – 118 results
- “hållbarhetsmål” AND (“MKB” OR “miljökonsekvensbeskrivning”)³ – 6.630 results
- “bærekraftsmål” AND (“KU” OR “konsekvensutredning”)⁴ – 7.230 results

The search results were excluded if they were not examples of actual EA reports, but were for instance theoretical papers discussing the potential of linking SDGs and EA or were guidelines on how to conduct impact assessment, etc. The EA reports were thereafter excluded if the keywords “SDG”, “Sustainable Development Goals”, “verdensmål”, “hållbarhetsmål” or “bærekraftsmål” did not appear when searching within the text of the reports.

Following the search, the reports were sorted by report type, which resulted in 10 scoping reports (3 of which are for projects, and 7 of which are for plans), 14 EIAs and 21 SEAs. One SEA report is a combined SEA and SA (Sundbyberg Municipality), and four EIA reports are expanded to also assess social aspects (Mott MacDonald & UWP Consulting, 2017; GIZ, 2019; World Bank, 2017; World Bank, 2019). Sustainability Assessments (SA) reports were not included as a part of the keyword phrases. As framed by Ness and colleagues (2007), SA is an umbrella of tools consisting of indicators and indices, product-related assessments (e.g. Life Cycle Assessment) and integrated assessments (e.g. EIA/SEA and cost-benefit assessment). Searching for SA-related reporting therefore gives rise to a very wide range of documents – including companies’ reporting of sustainability and ex-post

¹ Translated from Danish – “Sustainable Development Goals” AND (“EIA” OR “environmental assessment”)

² Translated from Danish – “Sustainable Development Goals” AND “scoping report”

³ Translated from Swedish – “Sustainable Development Goals” AND (“EIA” OR “environmental impact assessment”)

⁴ Translated from Norwegian – “Sustainable Development Goals” AND (“IA” OR “impact assessment”)

assessments. It has been beyond the scope of present research to derive relevant reports within this broader tool categorization. In total, 18 reports were related to projects and 27 were related to plans, programmes and policies. The geographic distribution is shown in figure 1.

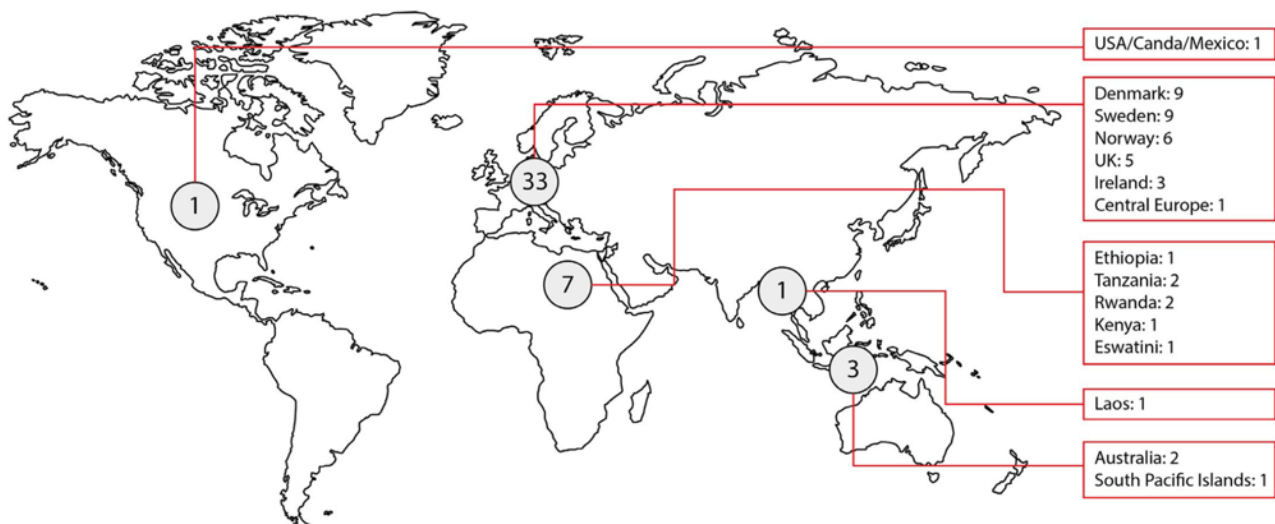


Figure 1: The geographic distribution of the EA reports collected for review. (source: own figure; adapted from Ravn Bøss et al. 2021a).

2.2. Initial analysis of function

This analysis is centered around exploring the reported function of SDGs in EA practice. This function analysis first examines where the SDGs within the various reports are mentioned and then distinguishes between functions based on integration levels from Kørnø et al. (2020).

SDGs are not procedurally bound to EA legislation, meaning that their applicability to the procedure is up to interpretation. Therefore, when assessing function, it was considered applicable to determine whether there are particular tendencies to apply SDGs to a specific methodological section of the EA, and likewise whether linking them to particular EA sections also reflects similar functions. This investigation was done by searching for “SDG” and “Sustainable Development Goals” in corresponding languages throughout the text of the reports, and then recording where these keywords were mentioned – do they appear in a section about relevant policy, a separate sustainability chapter, etc.? This also provided insight into whether the SDGs are voluntarily integrated into otherwise mandatory parts of EA procedure, or whether they supplement the procedure in previously unexplored ways.

The next step in the analysis investigated more closely the function that these SDGs performed, meaning how they influence the assessment process. Here, the functions took point of departure in the conceptual framework supplied by Kørnø et al. (2020), reproduced in figure 2. Cases were divided into the following categories:

1. **SDG dropping:** The SDGs are merely mentioned in the report, without serving an additional function.

2. **SDG scoping:** Relevant SDGs have been used to scope the assessment.
3. **SDG testing:** The SDGs have been used as a framework for assessing impact, such as a consideration of positive or negative impact resulting from the project/plan.
4. **SDG based:** The SDGs broaden the conventional EA scope to consider how project/plan and provide decision-support to achieving SDGs.
5. **SDG led:** The SDGs and targets set benchmarks for impacts and frame the EA around the concept of absolute sustainability.

SDG washing is interwoven with manipulative intention behind using SDGs, which in this research was considered impossible to decipher from written reports – it cannot be determined whether negative impacts were purposely ignored or whether positive impacts were exaggerated, etc. This would require supplementary studies and interviews with actor participants. For this reason, SDG washing was not considered to be within the scope of this research.

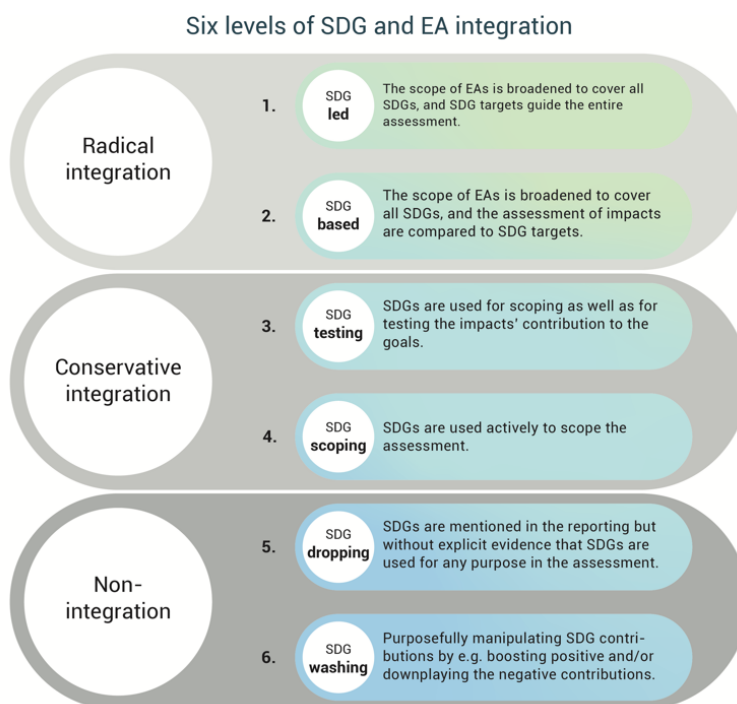


Figure 2: Analytical framework for the six levels of SDG and EA integration. (source: Kørnøv et al. 2020, p. 6).

Referencing the levels of SDG integration provided a basic overview of most common tendencies and to what extent the SDGs have been included in the reports. The function was determined by again searching for instances of “SDG” and “Sustainable Development Goals” throughout the different reports in corresponding languages, and then examining the surrounding context in order to get a sufficient understanding of how the SDGs have been used.

3. Results

This section provides an overview of the most significant tendencies regarding SDG function within the 45 EA reports. This includes first a description of the section where the SDGs primarily occur

within the contents of the reports and thereafter an analysis of function according to the six-level conceptual framework. Details for each EA report can be seen in supplementary material. Examples from the text of the referenced reports can be seen in Ravn Bøss et al. (2021a).

3.1. Primary occurrences of SDGs within EA reports

If analyzing location of SDGs within the reports, there are three noteworthy tendencies. The first is that a majority of reports mention SDGs while providing background information for the project/plan in an introduction or while describing relevant policies or programmes that relate to the project/plan. In most cases, this occurs towards the beginning of the report, as with the ESIA for the Nandi Hills water supply and sanitation project (GIBB Africa Ltd., 2020). In other cases, such as the scoping report for the Agri-food strategy (RSK, 2020), the SDGs appear within an appendix outlining relevant policies. Depicting relevant policies and programmes within EA is often made mandatory through EA legislation (e.g. as required through the European SEA Directive, see Article 5(1)). Therefore, bringing the SDGs into the EA through this context demonstrates a recognition that the SDGs are relevant on project/plan levels. This applies to a total of 32 reports, of which 13 reports mention SDGs in an introduction providing background information on the project/plan and 19 reports mention SDGs as relevant policies.

A second location for SDGs is within a separate chapter on sustainability, often found towards the end of the report. It ranges from whether this chapter addresses sustainability solely in terms of the SDGs, or whether the SDGs are one of several sustainability considerations. This applies to 3 reports.

The last tendency was for the SDGs to appear within the empirical content of the report, meaning that they are integrated into the context of scoping or assessing the project/plan. One example is Nyborg municipal plan strategy, in which the SDGs are mentioned in conjunction with an assessment of impacts according to EA topics (Nyborg Municipality, 2019). Here, the impact of the EA topics on the SDGs is written as an integrated part of the text for the impact assessments. Another example is the SEA report for the Irish National Marine Planning Framework, in which relevant SDGs are indicated alongside the SEA topics and are a designated part of a table for determining what topics will be relevant to assess in the plan (Government of Ireland, 2019). Despite its variation in display, this was recorded in 6 reports.

It should be noted that in some reports, the SDGs appear in multiple sections. Regardless of where the SDGs are mentioned in the reports, there is significant variation in whether SDGs are included at goal (15 reports), target (11 reports), while no reports refer directly to the indicator level. There are also instances in which the SDGs are mentioned as a whole policy, rather than recognized on individual goal-levels (17 reports) which tends to be the case when mentioned in the introduction or as a relevant policy for the EA. Lastly, there is variation in how many SDGs are considered to be relevant for the project. Regarding SDG count, the results range from indicating the relevance of one goal (World Bank, 2019) to eleven goals (Sundbyberg Municipality) and three targets (COWI, 2020c) to seven targets (Integra Consulting & Zavita, 2020).

3.2. Findings of SDG function

Although some patterns occur, the location of the SDGs within the EA report does not necessarily determine the SDG function. The following section explores the 45 EA reports according to the levels of SDG integration from Kørnøv et al. (2020), entailing also the variation of integration found in practice. No reports were found to exhibit SDG based or SDG led integration, and for this reason, the cases distribute themselves across SDG dropping, SDG scoping and SDG testing. Figure 3 categorizes the 45 reports according to the levels of SDG integration.

Accepted version

	Integration level				
	SDG dropping	SDG scoping	SDG testing	SDG based	SDG led
EA Reports					
Scoping reports					
Afgrænsningsnotat af: Miljøvurdering af kommunplantillæg nr. 14 og lokalplan 5.5 – "Boliger på Smedeland 8A" (Albertslund Municipality, 2018)					
Strategic Environmental Assessment of Denmark's first maritime spatial plan, Scoping (COWI, 2020c)					
Udtalelse om afgrænsning af indholdet i miljøkonsekvensrapporten for Svanemøllen Skybrudstunnel (Danish Environmental Protection Agency)					
Hambleton District Council Local Plan: Sustainability Scoping Report (Hambleton District Council, 2016)					
Strategic Environmental Assessment of Interreg Central Europe 2021-2027 Programme, Scoping report (Integra Consulting & Zavita, 2020)					
Draft revised, Sustainability Appraisal Scoping Report for the Local Plan (London Borough of Richmond upon Thames, 2020)					
Reguleringsplan for Gulkista Masseuttak, Forslag til planprogram (Rambøll, 2020b)					
Strategic Environmental Assessment (SEA) Scoping Report, Agri-Food Strategy to 2030 (RSK, 2020)					
Glasgow Airport Investment Area, Scoping Report (Sweco, 2016)					
Environmental and social impact assessment study for the Nhlanguano - Siphambanweni water and sanitation project, Scoping report (World Bank, 2019)					
Assessment reports - projects					
EIA - Executive Summary (Arup, 2018)					
MKB Veddesta Etapp 2, Granskningsskede (Ekologigruppen, 2019a)					
Nandi Hills Water Supply and Sanitation Project, Environmental and social impact assessment, study report (GIBB Africa Ltd., 2020)					
Mwanza Environmental and Social Impact Assessment Report for construction of a faecal sludge treatment plant (Mott MacDonald & UWP Consulting, 2017)					
Project Sea Dragon, Stage 1 Legume Grow-out Facility, draft Environmental Impact Statement (NTEPA, 2016)					
Parkeringshus og stibro i Vejle, Miljøkonsekvensrapport of miljørapport (Rambøll, 2020a)					
Udvidelse af Søby Havn, Ikke teknisk resume, VVM-redegørelse og Miljørapport (Rambøll, 2020c)					
Sydney Gateway Road Project, Environmental Impact Statement/Preliminary Draft Major Development Plan (NSW Government & SYD, 2019)					
Miljøkonsekvensbeskrivning för detaljplan för del av rörum 11:19 (Simrishamn Österlen Municipality, 2019)					
Draft Environmental Impact Assessment, Guidelines for Coastal Tourism Development in the Pacific Region (SPREP, 2017)					
Miljøkonsekvensbeskrivning och teknisk beskrivning till tillståndsansökan för vattenverksamhet i Norra hamnen, Malmö (Sweco, 2020a)					
Detaljplan för del av vappa 15:2, Nyt avloppsreningsverk, Enköping (Sweco, 2020b)					
Miljøkonsekvensbeskrivning, Tullholmsågen, MKB i detaljplan för Tullholmsågen inom fastigheten viken (Sweco, 2020c)					
Alamata-Combolcha II-Legetafo 230 KV Transmission Line Reinforcement Project, Environmental and Social Impact Assessment (ESIA) (World Bank, 2017)					
Assessment reports - plans, programmes, policies					
Strategic Environmental Assessment for the Milton Neighbourhood Plan, Draft Environmental Report (AECOM, 2018)					
Planbeskrivelse, Kommunedelplan (KDP) med konsekvensutredning (KU), Dobbeltspor Stokke - Larvik, InterCity Vestfoldbanen (Bane Nor, 2019)					
Reguleringsplan med konsekvensutredning for industriområda og dypvannskai på Husøya, Tillegsutredning (COWI, 2014)					
Roskilde Kommune, Miljørapport, Miljøvurdering af forslag til Kommuneplan 2019 (COWI, 2019)					
Miljøvurdering af Kommuneplantillæg nr. 10 og Lokalplan 200 for besøgscenter og parkering ved Boesdal Kalkbrud (COWI, 2020a)					
Miljøvurdering af Landsplandirektiv for skakt på Svanemøllen Kaserne i forbindelse med Svanemøllen Skybrudstunnel (COWI, 2020b)					
MKB Översiktsplan 2030 Töreboda kommun (Ekologigruppen, 2019b)					
Strategic Environmental Assessment of the Northern Periphery and Arctic Programme 2014-2020 (European Policies Research Centre, 2014)					
SEA Statement for the Dublin Docklands, Visitor Experience Development Plan (Fáilte Ireland, 2020)					
Environmental and Social Impact Assessment (ESIA) for the Programme Lao PDR Emissions Reductions Programme (GIZ, 2019)					
National Marine Planning Framework, SEA Environmental Report (Government of Ireland, 2019)					
Kommuneplanens arealplan, Konsekvensutredning av kommuneplanens samlede virkninger 2019 - 2030 (Kongesvinger Municipality, 2019)					
Konsekvensutredning, Kommuneplan for Moss 2019 - 2030 (Moss Municipality, 2020)					
Miljøvurdering af Kommuneplanstrategi 2019 (Nyborg Municipality, 2019)					
Detaljregulering med konsekvensutredning, E6 Kvængsfjellet, Planprogram (Nye Veier, 2020)					
IWRM Programme Rwanda, Sebeya Catchment Plan 2018-2024 (Republic of Rwanda, 2018a)					
Muvumba Catchment Management Plan (2018-2024) (Republic of Rwanda, 2018b)					
Hållbarhetsbedömning, Översiktsplan för Sundbyberg (Sundbyberg Municipality)					
Miljøkonsekvensbeskrivning, Bilaga till nationella avfallsplan och avfallsförebyggande program 2018-2023 (Swedish Environmental Protection Agency, 2017)					
MKB för Fördjudad översiktsplan för Norra Vallentuna och Lindholmen (Vallentuna Municipality, 2018)					
Sustainable Rural Water and Sanitation Program (SRWS), Environment and Social Systems Assessment (ESSA) (World Bank, 2018)					
Total	25	9	11	0	0

Figure 3: A categorization of how the 45 EA reports are distributed across SDG dropping, SDG scoping and SDG testing.

3.2.1. SDG dropping

In its most basic implementation, the SDGs are merely mentioned in the report, without serving a clear function in shaping the EA process. This is often a recognition that the SDGs are a global strategy that can be considered in project and plan development, as is demonstrated through the SEA for the Northern Periphery and Arctic Programme which merely refers to the Rio+20 conference, that “... launched a process to develop a set of Sustainable Development Goals...” (European Policies Research Centre, 2014: p. 14). In this case, the applicability of the SDGs is not elaborated further. Another instance is in the ESIA for a new transmission line for improving energy access in Ethiopia that claims in the report introduction that, “Improving access to electricity to urban and rural population meets the... Sustainable Development Goals (SDG) of 2030” (World Bank, 2017: p. viii). There is neither a specification of particular SDGs nor an elaboration of what this link may mean for the assessment of project/plan impacts. SDG dropping was present in 25 reports.

There are also instances in which the reports, primarily strategic, refer to other plans or strategies as a reference for how the plan correlates to the SDGs. These cases, in which the correlation is not elaborated further, has been recorded as SDG dropping. Despite any potential to influence project/plan design, the SDGs do not have an inherent function in the scoping nor assessment reports and their influence on the EA procedure is unclear. This is the case in the expansion of Sjøby port, in which the SEA report refers to the SDGs considered in southern Denmark’s regional growth and development strategy for 2020-2030, but the SDGs, despite being a part of that strategy, are not used within the SEA (Rambøll, 2020a). This is also the case in the SEA for the municipal plan for Roskilde and the SEA for the Larvik Intercity plan that both reference a corresponding municipal plan for details on how the SDGs are linked, but the SDGs have no further function in the assessments of the plans themselves (COWI, 2019; Bane Nor, 2019).

Overall, the reports exhibiting SDG dropping tend to consider the SDGs within either the introduction to the project/plan or when outlining relevant policies and programmes. This is the case for 23 of 25 reports with SDG dropping. The first exception is a Swedish SEA on a waste management and waste prevention programme (Swedish Environmental Protection Agency, 2017). In the report, it is written that the SDGs support the evaluation scale for assessments, but the influence of the goals on the evaluation scale appears minimal, if not absent. The second exception is an SEA for the Dublin Docklands Visitor Experience Development Plan (Fáilte Ireland, 2020). In this report, the SDGs are mentioned in a response to a hearing submission, that requests that the plan is aligned with achieving relevant SDGs. The response indicates that the SDGs have been considered in the scoping report, but how and to what extent is not evident.

3.2.2. SDG scoping

SDG scoping indicates not only those considerations have been made regarding which SDGs are relevant to consider within the project/plan course, but also that the SDGs are influential in scoping and identifying “... major issues and impacts in the decision-making process” (Kørnøv et al., 2020, p. 6). In the simplest of cases, this function unfolds as an assessment of significant impacts that sets the frame for what SDGs are relevant. However, the factors that go into using the SDGs are thereafter quite nuanced. SDG scoping entails 9 of the 45 EA reports, consisting of 5 scoping reports, 1 EIA and 3 SEAs. The scoping reports highlight the SDGs that would be relevant to address in the

upcoming assessment report (COWI, 2020c; Danish Environmental Protection Agency; Hambleton District Council, 2016; Integra Consulting & Zavita, 2020; London Borough of Richmond upon Thames, 2020). 3 reports discuss SDGs in the context of relevant policies and programmes to consider in the EA (Hambleton District Council, 2016; London Borough of Richmond upon Thames, 2020; Sweco, 2020b). In the scoping report of the local plan for Thames, it is stated in an appendix of relevant policies, plans and strategies that “... the council should be mindful of SDG 16...” and that the local plan “... should take account of all the goals, but with particular focus on SDG 11...” (London Borough of Richmond upon Thames, 2020: p. 117), implying that the upcoming EA will actively account for the mentioned SDGs. 6 reports mention SDGs in the empirical scoping procedure (Republic of Rwanda, 2018a; Republic of Rwanda, 2018b; Government of Ireland, 2019; COWI, 2020c; Integra Consulting & Zavita, 2020; Danish Environmental Protection Agency). This is for instance the case when linking SDGs to EA topics or integrating them into stakeholder dialogues for scoping the project/plan, examples which are elaborated below.

Variation in how certain SDGs are considered relevant

Generally speaking, there is variation in whether the SDGs are considered relevant because they link to overall project or plan objectives in general, or because specific elements of the assessment process, such as EA topics or environmental goals, are related to SDGs. The scoping report for the Maritime Spatial Plan of Denmark highlights 3 relevant SDGs and a corresponding target for each (COWI, 2020c). The goals are linked to the overarching plan and although there is no depiction of the direct function of the SDGs, then what distinguishes this case from SDG dropping is the explicit intention that the three SDGs will be considered in the upcoming SEA report. In 2 cases, the SDGs are deemed relevant in order to guide the plan vision, and through a scoping workshop centered around the SDGs, align stakeholders from different sectors (Republic of Rwanda, 2018a; Republic of Rwanda, 2018b). In both of these reports, a footnote describes how “At the original scoping workshop, taking the United Nations (UN) Sustainable Development Goals (SDGs) as a starting point, a broad range of catchment stakeholders reached a common understanding on the water and land resource issues and opportunities...” (Republic of Rwanda, 2018a: p. 39; Republic of Rwanda, 2018b: p. 36). The more concrete results of these scoping workshops are further described in an annex of the reports. In the Muvumba catchment plan, for instance, it is stated how stakeholders have agreed to prioritize SDGs 2, 6 and 15 as a result of the workshop (Republic of Rwanda, 2018b).

In 3 cases, the relevant SDGs have been linked to EA topics, and are thereby systematically coupled to the empirical content of the report itself. This includes the scoping report for a stormburst tunnel in Svanemøllen, Denmark, in which 7 SDGs are coupled to corresponding EIA topics (e.g. SDG 3 is coupled directly to EIA topics *human population and health*, and SDGs 12, 13 and 14 are coupled to *soil, water and climate*) (Danish Environmental Protection Agency). A similar link to SEA topics can also be seen in an SEA report for the National Marine Planning Framework in Ireland, linking for instance SDG 3, 6 and 11 to *population and human health* (Government of Ireland, 2019). Although not a scoping report in itself, the SDGs appear in the chapter documenting how the SEA topics have been scoped. In this report, assessment criteria set the frame for how the SEA topics will be assessed. Although not explicitly stated, it is clear that SDG targets from the selected SDGs have helped to inspire the assessment criteria, such as in this case where the assessment criteria “Avoid pollution of the coastal and marine environment” draws direct parallels to SDG 14.1 “By 2025, prevent and significantly reduce marine pollution of all kinds...” (Government of Ireland, 2019: p.

100; United Nations). This is not the case for the stormburst tunnel report in which it is difficult to infer the same parallels between EA assessment criteria and SDGs (Danish Environmental Agency). The third case is a scoping report for the Interreg Central Europe Programme, in which the SDGs are related to SEA topics, and are sources for policy objectives and targets to consider when determining SEA topic impact (Integra Consulting & Zavita, 2020). Some of the policy objectives and targets considered for the SEA topics relate to SDG indicators. For example, SDG 11 is linked to EA topic *air* and its impact on *human health and well-being* in which the policy objective to “attain limit values for... particulate matter (PM10 and PM2.5)” can be linked to SDG indicator 11.6.2 “Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities” (Integra Consulting & Zavita, 2020: p. 18; United Nations). However, in referencing the SDGs, the scoping report refers primarily to SDG targets and does not mention SDGs on the indicator-level; the latter can be merely inferred. For each policy objective considered, it is indicated whether the commitment is legally binding or aspirational, implying that there are impact assessments grounded in SDG indicators that go beyond conventional assessments, such as SDG 13.1 has been identified as an aspirational policy objective for climate change adaptation to “strengthen resilience and the capacity to adapt to climate-related hazards and natural disasters in all countries” (Integra Consulting & Zavita, 2020: p. 20).

The SDGs have also been linked to other environmental goals, such as with several of the Swedish reports that have a preestablished tendency to consider their national environmental goals (*miljömål*) in EA reports (Swedish Environmental Protection Agency). The one case under SDG scoping links local, national and global goals, the latter being the SDGs (Sweco, 2020b). However, when it comes to assessing the plan in terms of these environmental goals, it is only the national goals that are assessed. Thereby, the correlation between the SDGs and the plan assessments is indirectly established through these other national goals.

3.2.3. SDG testing

This grouping consists of the reports that demonstrate an assessment of how the project/plan performs according to the relevant SDGs. This involves a total of 11 reports. There are no scoping reports amongst those exhibiting SDG testing. The SDG testing is communicated in different parts of the EA reports: 5 of the 11 reports portray SDG testing alongside the assessment chapter within the EA report (Nyborg Municipality, 2019; COWI, 2020a; COWI, 2020b; Sweco, 2020a; Sundbyberg Municipality), 2 reports describe positive or negative contribution in a section outlining relevant policies and programmes (Moss Municipality, 2020; Sweco, 2020c), 3 reports assess SDGs in a separate sustainability chapter (Ekologigruppen, 2019a; Ekologigruppen, 2019b; NSW Government & SYD, 2019) and 1 report uses SDGs in developing mitigation measures (Arup, 2019). Additionally, there is a distinction to be made on *how* the report displays this assessment as well as *what* the SDGs are being tested up against.

Variation in impact measures

There is first and foremost a distinction in whether the report addresses both positive and negative evaluations. All 11 reports exhibiting SDG testing describe those SDGs to which the project/plan is expected to contribute positively. A total of 6 reports also include negative evaluations (Ekologigruppen, 2019a; Ekologigruppen, 2019b; COWI, 2020a; Sweco, 2020a; Sweco, 2020c; Sundbyberg Municipality). Evaluating the degree of a certain impact (for instance how positive or negative an impact is) is not common amongst the reports. Only the EA for the Sundbyberg

municipality indicates that some SDGs are being contributed towards more than others, when comparing the plan alternative with the 0-alternative (Sundbyberg Municipality). This evaluation appears to be qualitatively determined and is not supported by quantitative measures. In fact, of the 11 SDG testing reports, there are no cases quantitatively evaluating positive and negative impacts. In addition, there are no cases that consider the interrelations between SDGs, including synergies or tradeoffs in efforts to contribute to SDGs.

An EIA of the United Bid to stage the 2026 FIFA World Cup links the SDGs to mitigation measures for the project (Arup, 2019). In this EIA, the SDGs are proposed as “...performance objectives to measure the success of the sustainability and environmental protection goals and initiatives” (Arup, 2018: p. 7). They suggest that testing SDGs becomes a way to measure success of the project and that measuring SDG progress “...could then act as a benchmark for future large-scale events and collaborations between nations” (Arup, 2019: p. 86). The mitigation measures proposed are a way of minimizing negative impact on the SDGs. The SDGs are linked to relevant EIA topics and are presented on target levels that relate directly to the proposed measures. For instance, in order to minimize the negative impact on SDG 7.2 which reads, “increase substantially the share of renewable energy in the global energy mix”, the EIA proposes to “uptake use of renewable energy (e.g. install solar panels in stadiums, partner with renewable energy providers to power fan fest venues)” (p. 87).

Variation in how results are displayed

Lastly, there is inevitable variation in how results are presented throughout the reports. Some reports provide tables that depict positive/negative impacts on SDGs (Ekologigruppen, 2019a; Ekologigruppen, 2019b; COWI, 2020b; Moss Municipality, 2020). However, some EA reports adopt a more visual approach and demonstrate assessments through figures, such as the EA for the Sundbyberg Municipal Plan, in which the impact on the SDGs of the 0-alternative is compared to the plan alternative in a spider web model (Sundbyberg Municipality), and a water resource management project in Norra port in Malmö in which positive and negative influence of the overall project is presented in an SDG wheel (Sweco, 2020a). Other reports, such as the SEA of the municipal plan strategy 2019 for Nyborg municipality describes how the plan/project is expected to impact the SDGs directly in the written text, assessing the impacts on the EA topics (Nyborg Municipality, 2019). For instance, in the section outlining impacts on *biodiversity, flora and fauna*, it says, “The initiatives in the municipal plan strategy are expected to contribute positively to the work with SDGs 14 and 15 – life under water and life on land” (Nyborg Municipality, 2019: p. 26, *translated*).

4. Discussion

The six-level conceptual framework, of which only three levels were reflected in the reviewed EA reports, has provided a frame for analyzing the function that SDGs have in EA reports. By revealing the nuances in the use of SDGs in practice, these results can further refine the conceptual framework by Kørnøv et al. (2020). This section delves into a discussion of how a lack of methodological transparency in EA reports complicates determining the use of the SDGs. It further discusses how gaps in the SDG narrative may result from insufficient methodological approaches to

SDG integration. Perhaps more trials of SDGs in EA practice can help to solidify these methodological approaches, minimizing the gap between practice and theory and using cases from EA practice to further nuance the conceptual framework.

4.1. Challenges in determining direct influence

In some of the reviewed cases, the surrounding context provided a slight indication of how the SDGs have influenced the EA process, such as aiding in vision creation (Republic of Rwanda, 2019a), the comparison of alternatives (Sundbyberg Municipality), or in unfolding assessment criteria (Government of Ireland, 2019). For SDG scoping, a primary portion of the reports implying active use of relevant SDGs are scoping reports, perhaps a reflection that this phase is an optimal point for highlighting relevant project/plan factors that then become an integrated part of later assessments and project considerations; it is early enough in the EA process to be able to influence the design of the project/plan and thereby use relevant SDGs to scope out impacts. For SDG testing, evaluating contributions to SDGs can be a matter of displaying positive or negative impacts of a project/plan but is only a part of actively shaping the project/plan if these evaluations inspire project changes.

Yet, as is the case in all reports, as long as an explicit methodology is lacking, the precise influence of selecting and evaluating SDGs can only be inferred. The methodological considerations that determine what SDGs are relevant to the project/plan assessment are not transparent, and thus, it is difficult to decipher precisely why and how particular SDGs have been selected for either scoping or testing, let alone their function in project/plan assessment. It is also not transparent who has been involved in selecting and integrating SDGs; whether relevance has been determined by the consultant conducting the assessment, or whether there has been a dialogue between consultant, project developer and/or authority.

It is also not clear to what extent the SDGs have directly influenced the assessment process, so determining an active function as the conceptual framework implies is difficult based solely on what has been reported. Whether in the analyzed cases integration of SDGs in EA has been directly influential is impossible to say without a supplementary study, including interviews of participating actors.

4.2. Gaps in the SDG narrative

As Kørnø et al. (2020: p. 6) suggest, integrating SDGs is a part of "... providing a more elaborate understanding of sustainability". Through the reports it appears SDG testing tends to focus on the positive impacts of the SDGs. Only seldomly do SDGs reveal negative impacts. Considering EA practice has been mostly reactive, emphasizing negative impacts and their best mitigation, the SDGs can play a significant role in reverting this tendency of EA. SDGs can be used to stimulate the project/plan to support a positive transition towards sustainable development. When this happens, we might see an increasing number of SDG based and SDG led EAs, not otherwise observed in the sample analyzed. In addition, it may allow the EA to change its narrative to become more encouraging of better, more sustainable practices, so often excluded by assessment processes.

However, is the narrative of sustainability complete if it does not also address negative impacts? And does this also apply to the tradeoffs at stake when meeting different SDGs? Ignoring that SDGs

are intertwined in complex interactions, as suggested by Blanc (2015), may cause inability to understand the full impact of a project/plan. Therefore, this intertwined nature of SDGs should be recognized in EA processes as well.

The visualization of impacts, and their interconnections anchored in SDGs, is therefore crucial for arguing with relevant stakeholders on the sustainability of the project/plan. However, also here there is a fine balance between wanting to be transparent with the sustainability of a project/plan and the selection of the SDGs that are to be displayed. The way in which a report visualizes impact can thereby significantly influence whether a project/plan appears sustainable or not and may also be critical in assigning SDG function.

Similarly, the number of SDGs used, or whether they are linked at goal or target levels, should not be equivalent to mean a better integration. Yet, while this is the case, attempts to draw from a larger pool of SDGs may provide a more comprehensive overview of how the project stands in relation to collective goals. Thus, precisely what should and should not be detailed through SDG integrations, whether through SDG scoping or testing, is open ended as long as there is no methodology on how SDGs can be used in EA. As it stands now, the SDGs and the components that determine relevance or positive/negative impacts will always be determined differently for each individual case.

Lastly, a lack of methodological transparency does not exclude the possibility that the SDGs may have performed a more influential function than is apparent from the EA reports. However, it does perhaps speak to the prominence that the SDGs have had throughout the planning process, assuming that if the SDGs were to have a central role in the assessment process, this would likewise be reflected in the report. In this case, the limited presence of SDGs in EA reports indicates a limited presence in the EA assessment overall. It should additionally be noted however that a lack of transparency in SDG integration across projects/plans may be more an indication of the absence of an accepted methodology than an indication of effort or willingness to integrate the SDGs. The fact that there are reports using SDGs implies that it is an emerging field, and that the prominence of the SDGs may grow in conjunction with more frequent experimentation and the development of methodologies.

4.3. Unfolding the framework according to practice

These points of discussion open avenues for further unfolding the conceptual framework so that experiences from practice make their way into the considerations that aim to analyze them. It is anticipated that a larger experimentation of drawing SDGs into EA practice will help to solidify methodologies for SDG integration. Based on this study, it is already possible to unfold SDG scoping and SDG testing regarding how they appear in the 45 selected reports (Where in the report are they present? Does the report link to goals, targets or indicators? Are both positive and negative impacts considered? etc.). Yet, more solidified methodological approaches can help to also determine the level of influence that the SDGs have on the assessment process. Being more precise regarding integration possibilities in the various levels will allow being more concrete about active and passive functions in the various levels, as well as how the levels unfold according to different EA phases. This calls for not only an extended examination of practice that goes beyond investigating how the SDGs appear in reporting and delves into undocumented learnings, but also an increased

experimentation with SDGs in practice to also gain more experience with the influence that different methodologies impose.

Additionally, gathering cases from other avenues of practice, such as EA reports in other languages than the ones explored in this research would further help to minimize the gap between the framework and practice. The authors are aware of an on-going Portuguese case concerning an SEA of the Montijo Municipal Master Plan, where SDGs are being used at multiple stages of the plan development process, in setting the strategic reference framework (the macro-policies objectives and targets that set the referential for the assessment) and in the strategic evaluation framework (the assessment tool as criteria and indicators in the assessment). Conducting a similar analysis for a wider geographic range may reveal new functions within practice and help to further elaborate the conceptual framework.

Lastly, new insight may also be gained from exploring the integration of SDGs in other types of assessment processes, such as sustainability assessments (SA). When countries wish to accommodate a broader understanding of opportunities and consequences of project, plan and policy initiatives, SA represents an actual, or potential case for the integration of SDGs.

5. Conclusion

This paper presents a review of the functions that SDGs perform in the 45 EA reports collected. The mere fact that the actual search process for finding EA reports in which SDGs were mentioned did not lead to a higher number of relevant reports is indicative that the integration between SDGs and EA is still a young practice. The role of EA in contributing to the SDGs is not straightforward, cf. the levels and expected functions described in the framework used in the paper. This, combined with the fact that the 17 goals and 169 targets are difficult to embrace, may help to explain the findings. To this, of course, are factors of more institutional nature both in relation to a national/regional embrace of the sustainability agenda as well as in the operationalization of SDGs through instruments such as EA. As our research has been based solely on the written reporting of the EA, we cannot deduce reasons for the practice found, and even less so, deduce the real influence of the SDG integration in EA-related decision-making processes.

As seen in the paper, integration of SDGs in EA is a practice under development. In 56% of the analyzed EA cases, the SDGs are mentioned, without there being any indication of any substantial function in relation to the factors considered in the EA, how and with what effect for the activity and decision in question. Of the 44% with partial integration, 20% involve SDGs only for scoping purposes and 24% advance in testing the project/plans performance according to SDGs. No cases of SDG based or SDG led EA were found.

The analyzed cases show a clear trend towards focusing on positive impacts, while the negative impacts and trade-offs in cases of conflicting SDGs have minimal attention. Without deeper analysis, this may suggest a practice of omitting relevant and significant aspects and potentially unintentional

adverse effects, inviting accusations of 'SDG washing'. This may create resistance among EA practitioners with respect to improving the integration of SDGs into EA practice.

Further research is needed in order to clarify the function and added-value, as well as the possible limitations, with integrating SDGs into EA. Future research should also deepen the understanding of actors, their perceptions and ambitions when using SDGs, or when resisting to its adoption, and the influence that EA context plays in the relationship between SDGs and EA. Although not attempting to conclude on best practices, the following learnings could provide a starting point for further examinations and thereby guide future integration initiatives:

- SDG integration can highlight ways forward for the project/plan, giving direction and opening up options or alternatives that will represent contributions for achieving the SDGs, also providing a more comprehensive understanding of how a project or plan performs according to sustainable objectives.
- Positive effects on SDGs appear to dominate in the current practice EA reporting, which calls for research into why this is so, and how a more balanced assessment of both positive and negative effects can be supported.
- A lack of methodological transparency in current practice makes it difficult to conclude the functions of SDGs in EA and could be aided by consulting EA-practitioners on undocumented considerations.
- With SDG dropping dominating current practice, there is wide opportunity for experimenting with other levels of SDG-integration and deriving experience on the influence of these integrations directly from practice.
- An analysis of practice can help to nuance and further develop the conceptual framework, but there are still unexplored avenues in terms of e.g. analyzing SDGs within EA reports in other languages covering a wider geographic range and exploring integration into other assessment types, such as sustainability assessments.

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