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ACCOUNTING FOR SUSTAINABILITY: THE CHALLENGE OF ALIGNING SDG METRICS AT GLOBAL, NATIONAL AND CORPORATE LEVELS

Izveštavanje o održivosti – problem usklađivanja metrike na globalnom, nacionalnom i korporativnom nivou

Abstract

The adoption of the Sustainable Development Goals (SDGs) marks the most significant qualitative step forward in the pursuit of sustainable development, surpassing all previous efforts in that direction. They comprehensively address humanity's most pressing global challenges. Anchored in the principle of equity, the SDGs cover, in a balanced manner, diverse issues faced by both developed and less developed nations, with the overarching ambition to fulfil the goal of "leaving no one behind" by 2030. Therefore, within the SDG framework, in addition to addressing issues related to poverty, hunger, inequality, and child abuse, the challenges faced by developed countries such as the uncontrolled consumption of natural resources, environmental pollution, including negative spillover effects on other, mostly less developed countries, are also considered. It is even more important that behind the sustainable development goals lies a strong commitment to their successful implementation. The complexity of this process is determined by the global character and diversity of the goals as well as the intertwined responsibilities of institutions at the global and regional levels, governments of individual countries, companies, and the wider public. Loose institutional mechanisms at higher levels only amplify the challenges. In this paper, the focus is on measuring and reporting not only the activities related to sustainable development but also the progress made in that process. The imperative for reporting arises from the requirements of managing the SDGs at the global, regional, and national levels, as well as the need to transfer significant responsibility to companies that play a pivotal role in their implementation. Different responsibilities in this process require tailored metrics, which are challenging to be established institutionally due to the variety of goals and issues. A particular problem lies in the lack of clear understanding of the relationships between global, national, and corporate reporting needs, making it challenging to find universally applicable solutions. The presence of multiple conceptual frameworks in the field of corporate sustainability reporting highlights the significant complexities inherent in this area. Bearing the aforementioned in mind, although the primary focus is on sustainability measurement and reporting, equal efforts are devoted to clarifying the connections between global, national, and corporate reporting, as their understanding is a key prerequisite for establishing a high-quality and coherent sustainability reporting system.

Keywords: *sustainability, sustainable development goals, environmental protection, sustainability accounting, corporate sustainability reporting, SDG index, international spillover index, SDG targets, SDG indicators*

Sažetak

Usvajanje ciljeva održivog razvoja (SDGs) predstavlja najveći kvalitativni iskorak u dostizanju održivog razvoja u odnosu na sve prethodne aktivnosti preduzimane u tom pravcu. Oni na sveobuhvatan način obuhvataju najvažnije globalne probleme sa kojima se čovečanstvo suočava. Shodno principu pravičnosti ciljevi održivog razvoja se na jedan uravnotežen način odnose na sve probleme koji opterećuju razvijene i nerazvijene zemlje sa namerom da se do 2030 ispuni cilj „leaving no one behind", odnosno da niko ne bude izostavljen. U tom smislu, u okviru ciljeva održivog razvoja se ravnopravno sa problemima koji se odnose na siromaštvo, glad, nejednakost i zloupotrebu dece, razmatraju i problemi koji su svojstveni razvijenim zemljama po pitanju nekontrolisane potrošnje prirodnih resursa, zagađenja životne sredine, uključujući i prelivanje negativnih efekata na druge, najčešće nerazvijene zemlje. Još je važnije što iza ciljeva održivog razvoja stoji snažno opredeljenje u pogledu njihove uspešne implementacije. Kompleksnost ovog procesa je određena globalnim karakterom ciljeva, njihovom raznovrsnošću, kao i isprepletanom odgovornošću institucija na globalnom i regionalnom nivou, vlada pojedinačnih zemalja, preduzeća i najšire javnosti. Labavi institucionalni mehanizmi na višim nivoima čine izazove još većim. U ovom radu fokus je stavljen na merenje i izveštavanje, ne samo o ostvarenim aktivnostima

koje su povezane sa održivim razvojem, već i ostvarenom napretku u tom procesu. Neophodnost izveštavanja opredeljena je potrebama upravljanja ciljevima održivog razvoja na globalnom, regionalnom i nacionalnom nivou, ali i potrebom prenošenja značajne odgovornosti na preduzeća koja imaju važnu ulogu u njihovoj realizaciji. Različite odgovornosti u ovom procesu zahtevaju i različitu metriku, koju zbog raznovrsnosti ciljeva i problema nije lako institucionalno postaviti. Poseban problem je nedovoljno jasno prepoznavanje veza koje postoje između globalnih, nacionalnih i korporativnih potreba za izveštavanjem, što otežava dolaženje do univerzalnih rešenja. Različiti konceptualni okviri koji u ovom trenutku postoje na području korporativnog izveštavanja o održivosti na ubedljiv način potvrđuju velike izazove koji postoje na ovom području. Imajući ovo u vidu, iako je fokus na merenju i izveštavanju o održivosti, jednaki napori su uloženi na prepoznavanju veza koje postoje između izveštavanja na globalnom, nacionalnom i korporativnom nivou, jer je njihovo razumevanje ključni preduslov kvalitetnog i logično postavljenog sistema izveštavanja o održivosti.

Ključne reči: *održivost, ciljevi održivog razvoja, zaštita životne sredine, računovodstvo održivosti, korporativno izveštavanje o održivosti, SDG indeks, internacionalni indeks prelivanja, SDG targeti, SDG indikatori*

Introduction

There is no doubt that humanity has made enormous progress in various spheres during its long history, from numerous innovations, incredible economic achievements and increasing growth rates, increased food production, improvement in infrastructure and transportation, better quality of education, fascinating advancements in information and communication technologies, reduction in newborn mortality, to the improvement in gender equality, employment increase, higher healthcare quality, rise in population life expectancy, and enhanced well-being. However, there is another side to this story. The incredible development has, on the other hand, brought many problems that have been ignored for a long time. Namely, the price paid for the aforementioned achievements is quite high.

The development of industrial production has been accompanied by investments in the construction of production capacities, residential areas, infrastructure in the broadest sense, etc. All of this has led to the consumption of raw materials, deforestation, the reduction of fertile land, and so on. The depletion of natural resources leads to the grim fact that current generations are actually consuming resources that belong to future generations, which exacerbates intergenerational inequality. At the same time, the unequal distribution of wealth jeopardizes intragenerational equity, resulting in a widening gap between the rich and the poor. Moreover, despite significant development, the number of hungry people has not decreased. Additionally, climate change seriously threatens the planet. Global warming is a reality that is difficult to change. Large areas of fertile land are turning into worthless deserts. The destruction of large areas of forests not only depletes natural resources but also increases the risks of soil erosion. The reduction in biodiversity, through negative impacts on human health and climate change, directly endangers long-term sustainability and, consequently, the achievement of the sustainable development goals. If we also consider the significant irresponsibility towards the environment, resulting in water, soil and air pollution, disposal of large amounts of toxic waste with long lifespans, and degradation of the ozone layer, then it becomes quite obvious that we have truly paid a high price for the development we have experienced thus far.

The aforementioned infrastructure sectors, such as energy, transport, water, digital communications and construction, are alone responsible for 79% of total greenhouse gas emissions (50 billion tons) and 88% of the total costs of climate change adaptation (USD 81.6 billion for the period 2010-2015), including ensuring uninterrupted water supply, protecting infrastructure facilities in coastal areas from flooding, building early warning systems, establishing emergency infrastructure, relocating infrastructure facilities from threatened areas, among others [27, pp. 13-14]. Moreover, global construction activities within infrastructure sectors (energy, transport, water, and digital communications) are booming more than ever before. It is estimated that the implementation of the sustainable development goals will require investments of USD 50 trillion in these sectors in the period 2016-2050 [27, p. 18]. Therefore, the consequences that may arise if we disregard the principles of sustainability in infrastructure development seem crystal clear.

It is paradoxical that today the richest countries in the world and the wealthiest individuals are discussing climate change, the green economy, and sustainability.

These are the very economies, companies, and individuals that have contributed the most to climate change, excessive consumption of natural resources, and environmental pollution. This raises questions about honesty and ethics, particularly considering the need for new businesses, new technologies, the application of artificial intelligence, and other costly endeavors that are not accessible to everyone but still yield high profits. Now, these initiatives are being presented under the guise of environmental protection and in pursuit of other sustainable development goals.

Geopolitical interests still outweigh the sustainable development goals, as war conflicts directly undermine their achievement. The most developed and largest countries, which should have the greatest responsibility for shaping events on the international level, do not seem to be up to the task entrusted to them. It is obvious that geopolitical upheavals have not been caused by less developed countries. The war in Europe, in which, directly or indirectly, the largest countries of the world participate, has completely overshadowed the narrative of the green transition, climate change, and renewable energy sources. Armed conflicts lead to a great loss of human lives, substantial infrastructural destruction, destruction of natural resources, rises in food prices, increases in poverty, and the use of public funds for military purposes, etc. Today, world military expenditure is increasing, both in countries that directly participate in conflicts and in countries that are not involved in them. In 2021, for the first time, global military spending exceeded USD 2 trillion [29, p. 7]. The number of refugees in 2022 increased by 35% compared to 2021, reaching a record high of 36.4 million people by the end of 2022 [31, p. 14]. This requires the redirection of funds, among other things, from financial resources that could be used for the implementation of sustainable development goals. Consequently, their achievement by 2030 is highly questionable. In this sense, the system of measuring progress in implementing the SDGs must not be adapted to show that something has been accomplished when, in fact, it has not.

In light of the aforementioned facts, the primary objective of this paper is to explore the issue of measuring progress towards SDGs at the global and national levels as well as the role of corporate reporting in facilitating their achievement. At the global level, monitoring the implementation of the SDGs calls for the development of metrics that will evolve into a multidimensional global index or a comparable composite measure that would enable effective monitoring of progress and the ranking of individual countries based on their contributions to achieving these goals. At the national level, metrics should enable the monitoring of progress toward individual sustainable development goals and targets, contributing to enhancing sustainability within individual countries, in all parts of the world, and ultimately, on a global scale. Finally, responsibility for reporting on specific activities falls on the corporate level, and this reporting must align with expectations at both the national and global level. These efforts collectively aim to bolster the efficiency of sustainability management across all three levels.

Challenges of measuring progress in achieving sustainable development goals

Despite the existence of some sustainability-focused activities before, albeit of a more partial nature, we could argue that the establishment of sustainable development goals by the United Nations, one of the most known and influential global institutions, was a pivotal and long-awaited process. It represents a universal call for heightened responsibility in safeguarding the planet and people from the spread of pollution, climate change, hunger, poverty, and unequal access to education and healthcare, fostering more conscientious production and consumption, protecting biodiversity, i.e. advancing towards creation of a fairer, safer and more responsible society. It also serves as a heartfelt plea for the preservation of the planet and all life inhabiting it, in a manner that does not jeopardize the rights and interests of future generations. Further, it is an attempt to guide the entirety of humanity towards behavior that promotes sustainability across all areas critical to the survival and functioning of the planet. At the very beginning of the 2030 Agenda, the directions of action are clearly defined: eradicate hunger, reduce poverty, enable a dignified life for all inhabitants of the planet, reduce pollution, ensure sustainable production and consumption, sustainably manage natural resources in the

interest of current and future generations, ensure gender equality, the right to healthcare, quality education and prosperity, just and inclusive societies, free from wars and other forms of violence. Activities in this direction should enable the green transition and sustainable development.

The adoption of comprehensive global sustainable development goals took place on September 25, 2015, at the United Nations Summit on Sustainable Development. Alongside this milestone, the 2030 Agenda for Sustainable Development was adopted [28], comprising a set of 17 Sustainable Development Goals (SDGs) to be achieved by 2030. Simultaneously with the adoption of the Agenda, responsibility for their implementation was delineated and distributed. It is an event of historical importance, especially considering that, in the context of sustainability, no country can claim to be sufficiently developed, regardless of its location in Europe, North America, Asia, or any other part of the world. Furthermore, countries with more developed economies have made significantly greater contributions to the adverse impacts of climate change, pollution, and the depletion of natural resources. Many countries consume resources far beyond their capacities. By importing raw materials, relocating production, and polluting technologies to other, less developed countries, they have depleted global resources, endangering sustainability beyond their borders, and widening the gap between the rich and the poor. For instance, "the EU uses almost 20% of the Earth's biocapacity although it comprises only 7% of the world population. In other words, 2.8 planets would be needed if everyone consumed at the rate of the average EU resident" [32, p. 6].

In addition to the numerous activities aimed at achieving the ambitiously set diverse sustainable development goals, effective management of these complex issues involves monitoring progress in their implementation. This underscores the challenge of measuring performance in reaching defined goals. Monitoring progress enables an assessment of the pace at which progress is being made toward achieving the SDGs, providing insights into how close or far a country is from reaching its sustainable development goals. Measuring progress helps in both setting and reviewing strategies, identifying weaknesses and risks associated with SDGs implementation, assessing deficits in financial resources, etc. The broad range of goals, along with numerous targets within each and a variety of metrics, presents a significant challenge, boiling down to the question: How can we establish a functional system for measuring the achievement of sustainable development goals that would simplify comprehensive monitoring of their implementation, making key dimensions of sustainable development visible? Answering this question is far from straightforward, as multiple complexities can be identified across different areas.

Although the SDGs are officially established by a resolution of the UN General Assembly, individual states have no legal obligation to integrate these goals into their legal systems. This does not mean that individual states do not undertake such integration, but rather that solutions in this regard are not universally applied. The extent of mandatory reporting can vary significantly, and the structure of reports may differ based on the chosen conceptual framework, leading to variations in metrics. These differences complicate the process of implementing sustainable development goals. The situation is further exacerbated by the lack of clear institutional oversight over the achievement of global goals [3]. In practice, states have the freedom to interpret the relative importance of individual SDGs, determine how to implement them, and track progress towards their achievement. Accomplishing the SDGs requires the utilization of substantial national capacities in the process of enhancing performance to achieve sustainability. Furthermore, "companies are expected to define their goals in compliance with the SDGs and to incorporate them into their strategies" [16, p. 93].

While the sustainable development goals have a global character and call for universal application, it is important to recognize that sustainability-related challenges at the national level can vary significantly. Each country must chart its own path and carry out the transformation of its society in line with the SDGs, thereby contributing to the sustainability of the planet. Indeed, the SDGs are established globally, but their achievement actually begins with addressing national-level issues, which requires the active involvement of governments, leveraging their powerful regulatory and incentive mechanisms, as well as companies that are often seen as major contributors

to the current state of the planet. Hence, the SDGs should be tailored to fit the national and local context, taking into account factors such as development level, attitudes towards the environment, exposure to risks, and so forth. These goals should first be transposed to the level of individual regions, which may be differently affected by specific sustainable development goals, then to the level of individual countries and, finally, to the level of the primary contributors to pollution, namely, companies. Translating global aspirations to the national level is imperative, as national strategies and policies require significant capacities which are not always readily available, primarily due to uneven development of national economies, disparities in the reliance on environmentally compromised technologies and technological processes, unequal access to sources of finance, cultural differences, varying levels of responsibility, etc. Some authors highlight that the ability to align the global aspirations, as defined by the 17 SDGs, with the implementation of these goals tailored to the needs of each nation, can also serve as a measure of progress in their achievement [3, p. 28].

Due to their general and multidimensional nature, expressing the sustainable development goals numerically is not an easy task. The multitude of targets within each goal further complicates the measurement process. Let us recall that the 17 SDGs are underpinned by 169 targets, with 252 indicators initially conceived for their measurement. In such circumstances, it is evident that developing a single, composite measure to serve as a basis for monitoring progress and ranking individual regions and countries poses a significant challenge. Such measures should account for the diversity between individual regions and countries, while simultaneously assessing/measuring the contribution of numerous dimensions of the SDGs to the ultimate achievement of the goals outlined in the 2030 Agenda. The complexity of the problem is vividly illustrated by the fact that today, as we reach the halfway point of the projected period for achieving these goals, measurement challenges persist both conceptually and operationally. Namely, there is no universally accepted conceptual framework for reporting, which would be logical given the global nature of the issues. Instead, there are numerous efforts to develop different conceptual frameworks that cover various reporting objectives. However, it is obvious that there is no sufficient capacity to apply all of these frameworks. Furthermore, it is worth noting that among the numerous indicators that have been identified, a significant number of them are not functional, regardless of whether the issue lies in the lack of clarity on how something should be measured or if the methodology has not yet been developed.

Multidimensional goals necessitate multidimensional metrics. The SDGs are quite diverse and encompass different spheres of economic, environmental, and social development. Moreover, individual national economies are unequally impacted by various SDGs. For instance, addressing the issue of hunger differs significantly between Africa and the USA or Europe. Similarly, tackling child exploitation in value creation processes varies across regions. This complexity adds further challenges to the measurement process, as it raises questions about how to weigh the importance of individual SDGs when assessing their achievement at the level of national economies. While the issue of internal and external reporting is typically linked to accounting frameworks, it is evident that accountants currently lack the interdisciplinary expertise required to independently undertake this process. The necessity for broad interdisciplinary knowledge raises at least two questions. The first question pertains to whether the necessary interdisciplinary skills could be exclusively developed within the accounting profession. In light of these circumstances, another question arises regarding how the education process could be adapted to meet evolving expectations. An alternative approach involves expanding competencies and responsibilities beyond the realm of accounting, which entails integrating non-accounting experts from various fields, such as those with technical, technological, IT, and environmental protection-related knowledge, etc., into the reporting process.

Transposing the SDGs and their accompanying metrics, including specific indicators, to the corporate level introduces additional complexity and confusion. While the direct relationship between sustainable development goals and corporate activities may not be immediately evident, companies actually bear a significantly greater responsibility than initially perceived. It is relatively easy

to recognize the connection between business activities and environmental pollution or climate change, but it may be less obvious for other sustainable development goals. Nevertheless, companies play an important role in numerous processes that have a negative impact on the achievement of sustainable development goals. However, we firmly believe that companies possess the greatest potential to be the primary catalysts for sustainable development. This belief is grounded in their capacity to: 1) decrease the excessive consumption of natural resources, 2) implement climate-friendly technologies, 3) allocate resources more substantially towards socially responsible projects, and 4) fulfill their mission of generating value for all stakeholders, including, of course, the broader community. Simultaneously, it is imperative for companies to contribute to state revenues through taxes, carbon taxes, and other regular payments. These revenues can be utilized, among other purposes, for the implementation of certain SDGs. However, it is equally important for companies to engage in individual activities and projects aimed at aiding communities in addressing various challenges. In this context, the creation of value represents a significant potential that should be partially directed towards sustainable development efforts. Keeping this perspective in mind, we can agree with the assertion that "The United Nations' Sustainable Development Goals are introduced as a business-relevant, universally applicable framework that may guide companies in better measuring and managing their impacts on sustainability in light of this expanded understanding of corporate sustainability" [23, p. 1]. However, it is obvious that the matter of sustainability reporting remains unresolved and presents an urgent challenge for regulators.

The implementation of the SDGs calls for a green transition of the economy, which also means embracing the principles of a circular economy. While it is clear that such qualitative leaps require substantial investments on a global scale, it is important to acknowledge that sources of finance are not equally accessible to all countries. Without delving extensively into these issues, it is sufficient to mention at this point that regardless of the sources of finance (green bonds, green credit sources, primary issues of corporate shares for green investment, taxes, carbon taxes and other fees, international financial institutions, state funds, etc.), the rational utilization of these sources requires the establishment of clear criteria for capital allocation decisions. In other words, the provision of finance is intricately linked to metrics. Financing the implementation of the SDGs entails developing a suitable methodology for evaluating the viability of individual projects aligned with the green transition, while also discouraging environmentally compromised projects. Despite potentially offering attractive returns to investors, such projects are ultimately unsustainable in the long run. It is evident that the adopted methodology must align with the aim of attaining the SDGs as well as with metrics that clearly promote attractive green investment projects.

Measuring progress towards the SDGs at the global level

Measuring sustainability is not a novel challenge. There have been numerous attempts to establish a metric focused on sustainability. Let us mention Environmental Sustainability Development Indices (Ecological Footprint, 1990, Environmental Sustainability Index, 2000, Environmental Performance Index, 2005, Well-being Assessment Method, 1999), Urban Sustainability Indices (City Development Index, 1996, City Prosperity Initiative, 2013), Economic Sustainability Indices (Measure of Economic Welfare, 1972, Index of Sustainable Economic Welfare 1989, Genuine Progress Indicator, 1995, Genuine Savings Index, 1999), Compilation of sustainable development indicators, Eurostat, 2005, MDG indicators aimed at measuring progress towards the MDGs (Millennium Development Goals) and others [4]. The key characteristic of all these attempts is the aim to develop a single, often composite measure that can assess the progress towards predominantly partial sustainability-related goals.

Undoubtedly, the adoption of the UN 2030 Agenda has elevated sustainability to a new level of global significance. Today, it stands as one of the most pressing and research-worthy topics worldwide. Although sustainability is conceptually clear and currently has no viable alternative, managing sustainable development goals at the global

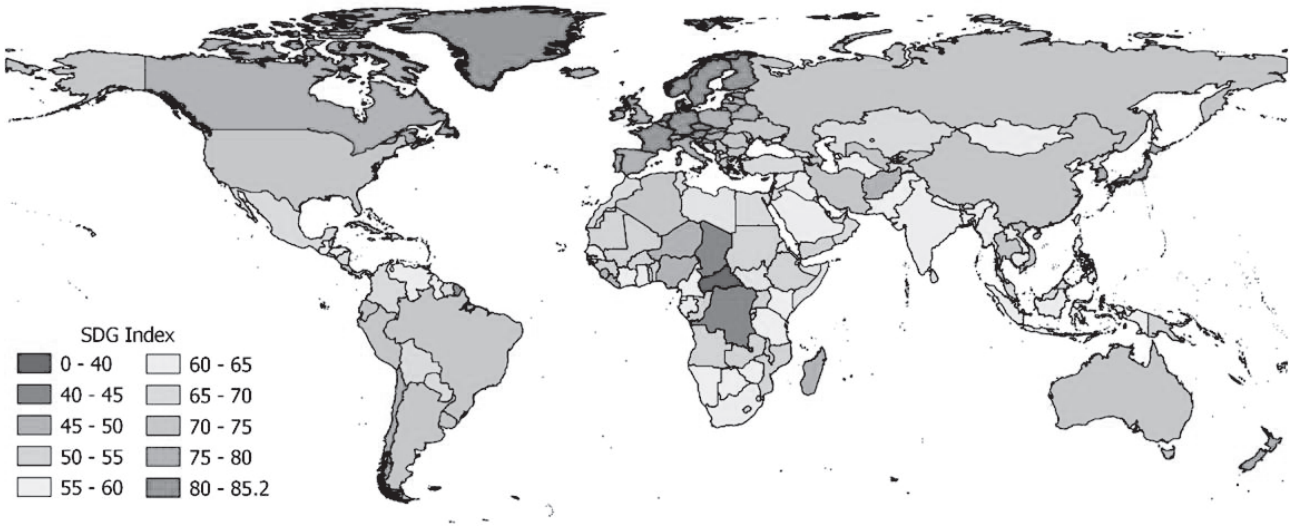
level is challenging due to the absence of comprehensive global mechanisms and often results in numerous debates on various aspects of sustainable development. A minimum requirement for more robust institutional monitoring of the fulfillment of sustainable development goals in the designated period is tracking progress in their implementation. Therefore, the global SDG index represents a significant advancement in creating metrics to assess the achievement of the SDGs.

The establishment of the sustainable development goals created an integrated framework that identifies key sustainability challenges through individual SDGs, targets aimed at achieving these goals, and numerous indicators measuring the progress toward each goal. In this regard, the SDG index, as a composite measure for assessing the global progress towards sustainable development goals, relies on a consistently established metric, enabling the ranking of countries based on their progress in achieving the SDGs and, consequently, enhancing the effectiveness of institutional management of these processes at the global level. While the SDG index is widely accepted as a comprehensive measure for monitoring progress in achieving the SDGs, it is not without its flaws. However, it has become the most widely used composite measure tracking progress in achieving the SDGs. The level of representation and expressiveness of the index in revealing progress towards the SDGs can be observed in Figure 1, which illustrates the positioning of certain regions and countries on the global map.

The calculation of the SDG index is based on a conceptual framework consisting of 17 SDGs elaborated through approximately 100 indicators. As information availability improves and methodology evolves, the set of indicators undergoes modifications, rendering the calculation of the SDG index a dynamic process. This process also entails periodic revisions of the methodology, driven by efforts to enhance the quality of individual indicators. Initially, individual indicators are calculated, and their arithmetic mean is determined to establish the score for each SDG. Subsequently, the scores for each of the 17 SDGs are averaged to derive the SDG index. The creators of the SDG index have opted for assigning equal weight to each SDG in the index creation process, underlining the belief that every SDG holds equal importance in the ultimate achievement of the goals outlined in the 2030 Agenda.

We have emphasized several times that creating a singular composite measure to encapsulate the multidisciplinary nature of the SDGs, as well as the nuances of regions and countries, varying levels of development, specific information needs, and numerous other disparities, is an exceptionally complex endeavor. A one-size-fits-all solution is challenging to achieve. Therefore, occasional adjustments are not only understandable but also necessary, encompassing the introduction of new indicators and

Figure 1: Map of the Sustainable Development Goals (SDG) Index reported for each country in the Sustainable Development Report 2019



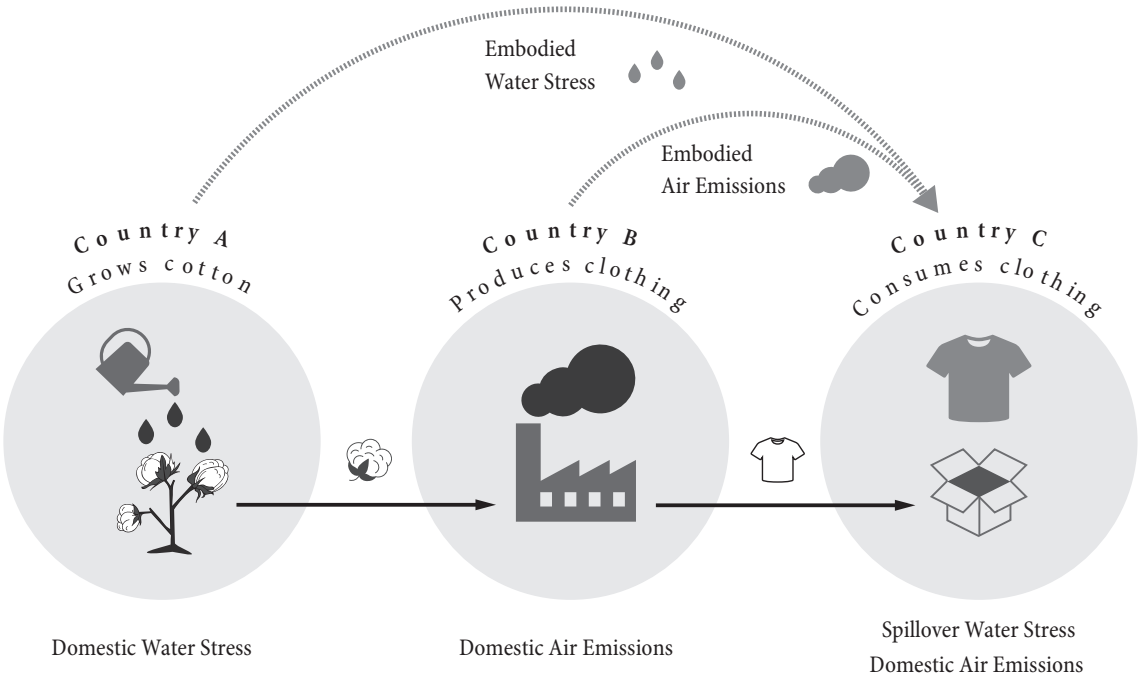
Source: [18, p. 2]

alterations in methodology to ensure the highest quality of information. At this point, we would like to underscore a particular issue that undoubtedly impacts the accuracy of the SDG index and the capacity to create a realistic portrayal of individual countries' contributions to global sustainability. Namely, it is a well-established fact that the ramifications of various corporate activities cannot always be neatly confined within narrow national borders. Certain negative effects of environmental pollution originating in one country can reverberate and inflict harm on others. Additionally, developed countries frequently outsource their production and environmentally detrimental technologies to other, less developed countries. One specific issue is the extraction of natural resources from less developed countries to fulfill the needs of developed societies, reaping benefits that extend beyond their own capacities. Consequently, the redistribution of wealth and the widening gap between the rich and the poor are inevitable outcomes. The emergence of international spillovers and their impact on the attainment of SDGs in other countries is depicted in a simplified manner in Figure 2.

Analyzing the illustration in Figure 2 underscores the crucial role of supply chains, whose activities span across multiple countries in the pursuit of sustainability goals. The stress stemming from water scarcity in the first country and gas emissions in the second country are not spillovers but rather domestic environmental impacts. However, they do represent spillovers to the third country where the demand for these products originates. So, it is important to note that not all sectors have the same level of impact on spillovers. Sectors such as construction, textile and clothing manufacturing often contribute to negative spillovers, but challenges may also arise in energy, forestry, water management, the chemical industry, and the trade sector. For instance, from the provided illustration, it becomes evident that negative spillover effects from one country to another, or across countries, hinder the effective addressing of sustainability issues from the perspective of the global community's interests. Redirecting these effects to other countries raises significant regulatory, business, and ethical concerns that warrant careful examination.

The impact of spillovers extends across several SDGs, with SDG 8 (Decent Work and Economic Growth), SDG 12 (Responsible Consumption and Production), and SDG 17 (Partnerships for the Goals) being frequently mentioned as particularly sensitive to these effects. The measurement of the impact of international spillovers on

Figure 2: Illustration of environmental impacts embodied in international trade



Sources: [24, p. 3]

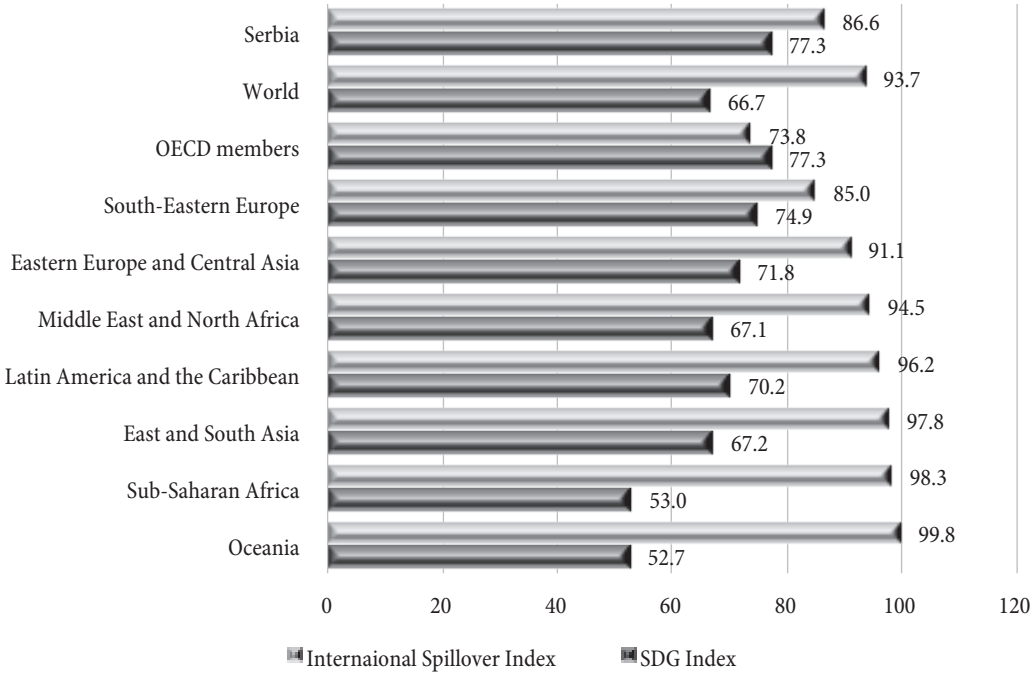
the achievement of the SDGs begins with identifying the likelihood of their emergence. In this context, it is useful to categorize spillovers into four distinct categories [20]:

1) Environmental and social spillovers embodied into trade – encompass negative effects associated with pollution, the use of natural resources from other countries, exports of toxic pesticides, illegal wildlife trade, and so forth.
2) Direct cross-border flows in air and water – entail effects transferred from one country to another due to emissions of harmful gases, water pollution, etc.
3) Spillovers related to economic and financial flows – involve investment flows, international financing, discretionary arrangements between banks and their clients, such as financial secrecy, corruption, etc.
4) Peacekeeping and security spillovers – cover negative externalities stemming from activities such as arms sales, organized international crime, and so on.

All of this clearly underscores the need to measure and monitor spillover effects on the SDGs. Recognizing the challenges in this area led to the development of the International Spillover Index, which is published alongside the global SDG index. In the following part of the section, we delve into the analysis of the SDG index and the International Spillover Index (Figure 3), considering results at the regional level as outlined in the sustainability development reports. Additionally, we provide information for the Republic of Serbia, Southeastern Europe, to which our country belongs, alongside the score for the global community (World).

There are several notable observations to highlight. First, the SDG index scores reveal significant disparities among regions regarding the level of SDG achievement, reflecting the diverse challenges they confront. Second, a closer examination of the average index reveals that regions such as Oceania, Sub-Saharan Africa, East and South Asia, and Latin America fall below the average, while OECD countries, representing the most developed nations, surpass it. Third, Serbia demonstrates a favorable position in terms of the SDG index, aligning with OECD countries and slightly exceeding the average for Southeastern Europe, where Serbia is included. Fourth, the International Spillover index tends to be notably high, particularly in countries with lower SDG index scores. OECD countries exhibit the lowest Spillover Index, suggesting that these countries have the most pronounced negative spillover effects on others, as a higher score indicates a greater contribution

Figure 3: SDG Index and International Spillover Index



Source: Authors based on: Online database for the Sustainable Development Report 2023 [21]

to positive and lesser contribution to negative spillover effects. This outcome is unsurprising given that developed countries typically consume the most resources, many of which are sourced from less developed countries. Lastly, Serbia's Spillover Index is relatively elevated, though it falls below the global average yet surpasses the average for OECD countries.

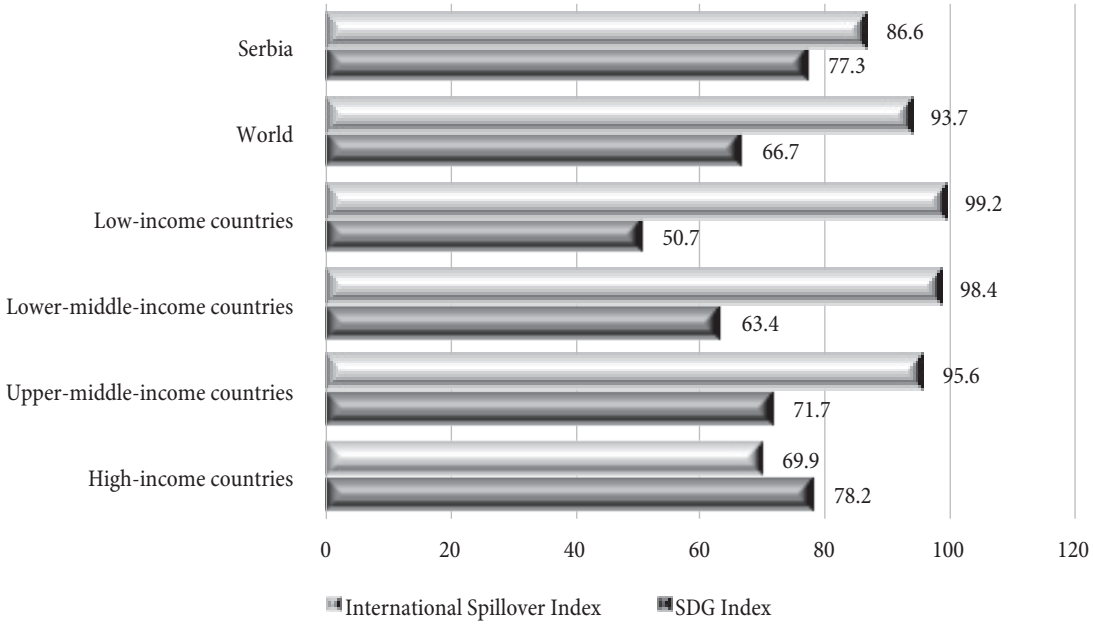
We can also analyze the Spillover and SDG indices in relation to income levels. From this perspective, countries are categorized into four groups: low-income countries, lower-middle-income countries, upper-middle-income countries, and high-income countries. Additionally, we include data for Serbia, as well as the global SDG and Spillover indices. The results are presented in Figure 4.

The analysis indicates that high-income countries exhibit the highest SDG index compared to all other groups we examined, including the Republic of Serbia and the global community average (World). However, high-income countries also generate the largest negative spillover effects compared to the other groups of countries included in this overview. This is attributed to unsustainable levels of consumption, financial secrecy, and the existence of tax havens [21, p. 32]. Conversely, the movement of the SDG index is inversely correlated with that of the Spillover index. From the viewpoint of low-income countries, as national income rises, so do the SDG indices, while positive spillover effects decrease. Concurrently, negative spillover effects, particularly those related to the environment, are influenced by low prices of natural resources and the adoption of national policies primarily focused on national goals rather than global interests aimed at preserving the planet [21, p. 32].

The developed SDG index offers numerous advantages. By encompassing all goals and available indicators in its calculation, it serves as a comprehensive metric for calculating the global index, providing detailed insights into progress in the implementation of SDGs across various fronts. The inclusion of all dimensions of sustainable development goals ensure that each goal receives equal attention, underscoring the importance of not overlooking any particular issue. Furthermore, despite the dynamic nature of its calculation, which affects the volatility of indicators not only due to progress or lagging behind but also due to changes in indicators and/or methodologies over time, it provides a consistent framework and a measure that can be the basis for gaining insight into the scores in different years in terms of progress towards the goals outlined in the 2030 Agenda.

However, we must point out that there are doubts about the potential bias in the calculation methodology of the SDG index due to the fact that predominantly underdeveloped countries tend to rank lower on the

Figure 4: 2023 SDG Index and International Spillover Index



Source: Authors based on: Online database for the Sustainable Development Report 2023 [21]

index, while developed countries, particularly those in Scandinavia and Western Europe, often occupy the top positions. Analogously, countries with lower GDP tend to face greater challenges in achieving the SDGs, as indicated by this index, which means that they lack sufficient sources of finance despite significant needs. Also, it should be noted that less developed countries do not have advanced industrial production and typically do not generate significant negative spillovers to other counties, unlike developed countries that often relocate polluting production capacities beyond their borders, exploit the natural resources of other countries, and exhibit high levels of consumption. Undoubtedly, developed countries are major contributors to environmental degradation and the hindrance of sustainable development goals. However, it is crucial not to overlook the greatest challenges faced by underdeveloped nations, including poverty, hunger, human rights, and child abuse. We believe that addressing these issues should be a priority for both less developed and developed countries.

Methodological challenges and the absence of official data in assessing cross-border impacts, or spillover effects, raises concerns about the reliability of the Spillover index. It appears that there may be a bias favoring developed countries over less developed ones. If this bias truly exists, it could obscure the true responsibility of developed countries for the current state of the planet.

The issue of prioritizing goals may not completely align with the principle of "leaving no one behind," but it cannot be entirely disregarded. It is important to recognize that different countries and regions face varying degrees of urgency in addressing specific SDGs. Additionally, achieving a synergistic effect across all SDGs can influence the sequencing of activities aimed at fulfilling individual goals. While political priorities should not be a decisive factor, they cannot be ignored given the reality of urgencies in addressing various issues.

The existing challenges in calculating the SDG index have prompted the search for alternative solutions. For instance, SDSN, the University of Tokyo, and Yale University have developed an alternative Spillover index known as the Global Commons Stewardship Index, which indicates that wealthy countries have the poorest scores in this index for 2023. Additionally, efforts are underway to enhance the utility of the SDG index.

When it comes to the objections regarding the bias of the SDG index, it is worth noting the views put forth by Puertas and Bermúdez (2020). They emphasize that the global average index is inadequate for monitoring the progress of individual countries or regions, particularly in terms of fairness, as some countries deviate significantly from the average. Consequently, the global SDG index average fails to indicate whether the progress pace of less developed countries is adequate for achieving the SDGs on a global scale.

Table 1: Indices for measuring progress towards achieving the SDGs

$$GSPI_1 = \frac{\Sigma \Delta (\text{SDG Index})}{n}$$

$$GSPI_2 = \frac{\Sigma \Delta (\text{SDG Index}) \times \text{Position}}{\Sigma \text{Position}}$$

$$GSPI_3 = \frac{\Sigma \Delta (\text{SDG Index}) \times \text{GDPRel}}{\Sigma \text{GDPRel}}$$

$$GSPI_4 = \frac{\Sigma \Delta (\text{SDG Index}) \times \text{GDPRel} \times C2}{\Sigma \text{GDPRel} \times C2}$$

Note: GSPI – Global SDG Progress Index; Position – Country's position in the SDG Index ranking; GDPRel indicates the relationship between the maximum GDP per capita (the one corresponding to the country with the greatest value) with respect to the GDP of the analyzed country; C_1 = Population; C_2 = ((ln (Population / Popmin) + 1) x ((ln (Area / Areamin) + 1); Popmin and Areamin are the minima for each of the two concepts.
Source: [18]

The first index presented in Table 1 (GSPI 1) is the simplest but also the least effective compared to all the indices presented here. While it indicates progress, it fails to identify which countries are propelling development. The second index is based on weighting the SDG index according to countries' positions on the SDG list, which means it should provide more incentive for countries with lower ranks, i.e., lower SDG indices. GSPI 3, on the other hand, weights the SDG index with GDPRel, likely aiming to highlight that countries with fewer available resources need to exert more effort to achieve the SDGs. Finally, GSPI 4 takes a further step to mitigate differences arising from the varying sizes of countries. For this purpose, two weightings related to population and area are employed. This final index aims to maintain the stability

of the SDG score. These suggestions indicate that further enhancements are feasible for the SDG index at the global level [18, pp. 6-9]. It is advantageous that the calculation of these indices builds upon the existing architecture of the SDG index, with additional information used for weighting being publicly available.

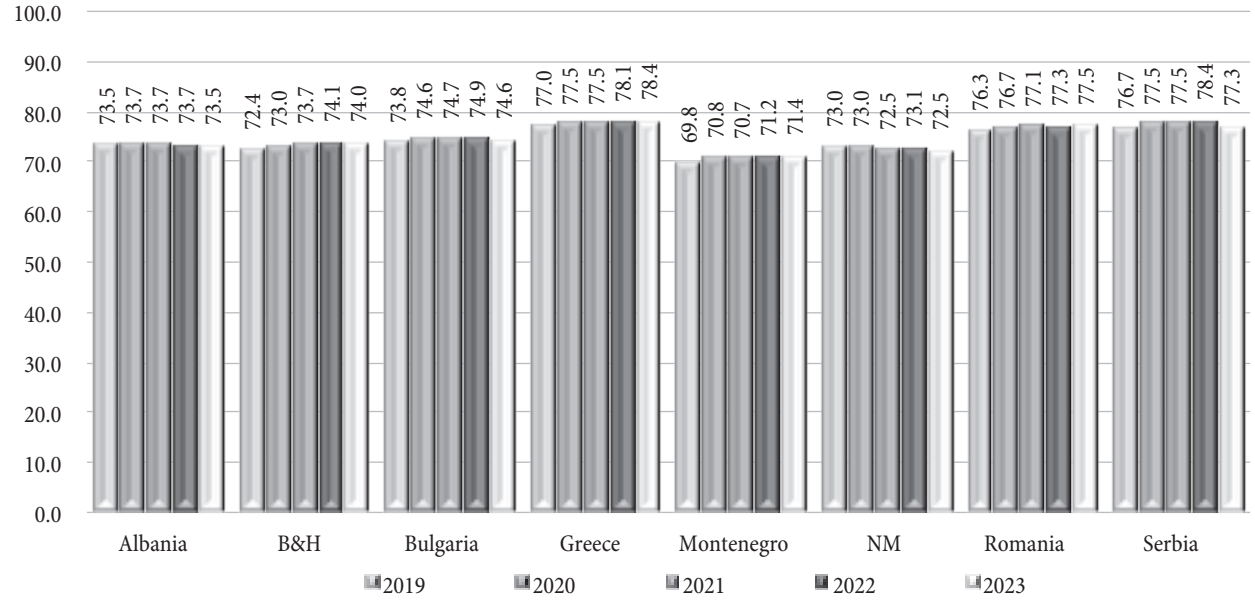
Finally, as anticipated, the global SDG index primarily assesses the level of achievement of the SDGs at the level of individual countries, first for each SDG individually, and then aggregates the scores into a national-level score as a weighted average. The ability to analyze the contribution of individual SDGs to the national-level index offers valuable insights into areas of less or greater progress, stagnation, or lagging behind. This is particularly important for decision-makers, especially at the state level, as it enables them to identify areas requiring greater effort and resource allocation to improve the current situation. Last but not least, the significance of the global SDG index lies in its ability to rank countries according to their progress towards achieving the SDGs. It provides an overview of each country's current position, its comparison with other similar countries or regions, and allows for the analysis of trends indicating the pace of progress or potential limitations in achieving the goals. The transparent publication of results as well as the availability of open databases make this information accessible to various stakeholders, including national, regional, and global policymakers, decision-makers, academic institutions, research organizations, regulatory bodies, civil society, and other interested parties.

Implementation of SDG metrics at the national level

National governments are in charge of the implementation of the SDGs in their countries. However, appropriate metrics and data collection systems are prerequisites for directing, measuring and monitoring national progress towards SDGs. A country's overall SDG Index score could be a good starting point. It is calculated on the premise that each SDG is equally important and consequently equal weights are assigned to each SDG. However, it should not lead to the conclusion that low performance of one goal could be compensated by high performance of some other one, since the 2030 Agenda requires progress on the whole spectrum of goals. The overall country index should be seen as average performance of the country across all 17 goals. Figure 5 shows this index for Serbia and other countries in South-Eastern Europe for the period 2019-2023.

In the given period, no significant changes could be identified in SDG index for South-Eastern countries. It is not surprising considering generally unfavorable conditions

Figure 5: South-Eastern European Countries' SDG Index scores for the period 2019-2023



Source: Authors based on: Online database for the Sustainable Development Report 2023 [21]

in this period due to the pandemic and geopolitical crises, which caused stagnation in the world average SDG index score, reducing the chances of meeting the SDGs by 2030. However, six out of eight countries slightly rose (up to two points) their scores in 2023 compared to their 2019 levels. Generally, the countries' performances were quite similar, since the whole region has some same attributes which influence individual SDGs in the same way. All scores were in the range from 69.8 to 78.4, whereby in 2023, Greece had the best achievement and reached score of 78.4. Serbia had the third-best achievement in 2023, but experienced a slight decline in the score compared to the 2022 level. It should be noticed that the score data from the original yearly reports are adjusted to reflect changes in methodology from year to year, so improving the comparability. However, this also contributes that time series are more smoothing.

The overall SDG Index could, however, blur low performance on some of SDGs if a country performs well on other SDGs. It is therefore necessary to look into the achievement of each SDG separately. In order to enable the measurement of a country's performance on each SDG, UN-backed Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs) developed indicators for each SDG and its related targets. The last revision of indicators resulted in 231 indicators (248 with repetition). However, the calculation of SDG index includes a lower number of indicators to make the operationalization more effective, whereby some indicators exactly match those from official UNSTATS list of indicators or align with them closely, but there are indicators that are out of UNSTATS system. The approach employed is based on the intention to bridge some of the indicator and data gaps and provide useful metrics wherever possible. Table 2 presents the number of indicators per goal in 2023 SDG index and, for the purpose of comparison, the number of indicators per goal in UNSTATS.

The number of indicators varies significantly across the 17 SDGs. Although the average number of indicators per SDG goal is around 6 considering SDG index indicators used for non-OECD countries (7 for OECD countries), only 2 indicators (3 for OECD countries) are used for SDG 1 and SDG 10, while SDG 3 is covered with the highest number of indicators, 14 (17 for OECD countries). Since each SDG is rather broad by its nature, the usage of only a few indicators could produce some biases. The relative weight of indicators related to some SDGs decreases as the number of indicators increases, as the score per goal is computed as the arithmetic mean of indicator scores. It is also evident that the SDG index indicators

Table 2: Number of indicators across the 17 SDGs

SDG	SDG Index Indicators non-OECD countries	% SDG Index Indicators non-OECD countries	SDG Index Indicators OECD countries	% SDG Index Indicators OECD countries	SDG Indicators (UNSTATS)	% SDG Indicators (UNSTATS)
SDG 1	2	2.04	3	2.46	13	5.24
SDG 2	8	8.16	9	7.74	14	5.64
SDG 3	14	14.29	17	13.94	28	11.29
SDG 4	4	4.08	8	6.56	12	4.83
SDG 5	4	4.08	5	4.10	14	5.64
SDG 6	5	5.10	7	5.74	11	4.44
SDG 7	4	4.08	4	3.28	6	2.42
SDG 8	7	7.14	8	6.56	16	6.45
SDG 9	7	7.14	11	9.02	12	4.84
SDG 10	2	2.04	3	2.46	14	5.65
SDG 11	4	4.08	6	4.92	15	6.05
SDG 12	7	7.14	7	5.74	13	5.24
SDG 13	3	3.06	4	3.28	8	3.23
SDG 14	6	6.12	6	4.92	10	4.03
SDG 15	5	5.10	5	4.10	14	5.65
SDG 16	11	11.22	12	9.83	24	9.68
SDG 17	5	5.10	7	5.74	24	9.68
Total	98	100	122	100	248	100

Source: Authors (based on web page of Sustainability Development Report [13] and list of UN indicators [30])

and the UNSTATS framework differ to a large extent not only because of a number of indicators, but also due to distribution of the total number of indicators across the 17 SDGs. It is clear that including some indicators or not influences the final assessment of the SDGs achievement.

Insight into the score of each SDG can help national governments to identify the areas of concern and inform their policies accordingly. The progress towards the SDGs indisputably demands an active role of government [5]. Table 3 details the score per goal for South-Eastern countries over seven-year period. The whole region especially excels in SDG 1 (No Poverty), which is the highest achieving goal, scoring above 94 for all countries. On the other side, the lowest performance was observed in SDG 9 (Industry, Innovation, and Infrastructure), with 22 scores below 50 during the given period. More striking, three countries did not achieve to move the score above 50 even in 2023. This result reflects huge problems of developing countries with weak infrastructure. Innovation is also hindered by the lack of resources [33]. However, innovation is an important source of economic growth. SDG 5 (seven scores), SDG 14 (seven scores), SDG 17 (four scores), SDG 2 (one score) and SDG 10 (one score) are found to be below 50 for one or two countries. However, only Bosnia and Herzegovina remained with such a score in 2023 for SDG 5 (Gender Equality).

In general, there is still considerable room for improvement at the individual country level in advancing sustainable development. In 2023, in relation to SDG 2, Serbia was the best performer with score of 75.8, while the worst performing country was Montenegro with score of 51.8. For other goals, the best and the worst performers were: SDG 3 – Greece (90.3) and Montenegro (75.7); SDG 4 – Greece (97.1) and Bosnia and Herzegovina (64.1); SDG 5 – Bulgaria (71.6) and Bosnia and Herzegovina (47.1); SDG 6 – Greece (97.1) and Montenegro (65.2); SDG 7 – Albania (84.3) and North Macedonia (69.9); SDG 8 – Romania (83.2) and Montenegro (61.6); SDG 9 – Greece (81.6) and Albania (43.6); SDG 10 – Albania (88.1) and Bulgaria (51.0); SDG 11 – Greece (85.6) and North Macedonia (65.6); SDG 12 – Serbia (85.4) and Greece (64.8); SDG 13 – North Macedonia (92.8) and Greece (80.2); SDG 14 – Romania (86.7) and Albania (50.2); SDG 15 – Bulgaria (94.1) and Montenegro (54.3); SDG 16 – Montenegro (78.5) and Albania (60.7); SDG 17 – Montenegro (85.7) and Romania (51.3). Serbia made a significant progress in SDG 9 (industry, innovation, and infrastructure) and SDG 10 (reduced inequalities) during this 7-year period. In 2023, Serbia achieved 100% on SDG 1 (no poverty), but scored worst on SDG 15 (Life on Land) and SDG 16 (Peace, Justice and Strong Institutions).

The useful tool developed in the form of SDG Dashboards helps countries to manage more effectively their performance towards achieving the SDGs. It classifies the level of performance per each goal into one of four colors, from green for SDG achievement over yellow, suggesting that some challenges remain, to orange which denotes significant challenges, and red that warns of major challenges ahead. These four-color ratings that mark a country's performance on each goal are assigned based on two indicators which had the worst values among all indicators within the respective goal. This approach could be seen as too stringent, but it penalizes low values across all performance dimensions, thereby forcing countries to make progress in their worst-performing areas. Better achievements will bring benefits to sustainable development, but also help countries to boost their progress. Research shows positive link between green economy standards implementation and national economies' competitiveness [6].

Table 4 presents the SDG dashboards for South-Eastern European countries. Across all countries, South-Eastern Europe had a majority of SDGs in orange rating (61.8%), indicating significant efforts are needed to improve them and redirect to the track of sustainable development. More striking, 11% ratings are red, calling for urgent actions. Each country has one to three red ratings and should give priority to the related SDGs. In Serbia, SDG 15 and SDG 16 require particular attention. For the whole region, one-fourth of all ratings are green (5.1%) or yellow (19.9%).

Another important perspective in the measurement of progress towards SDGs relates to analysis of trends. Table 5 summarizes trends for South-Eastern Europe countries.

Since the 2030 Agenda requires the achievement of SDGs by 2030, it is necessary to look into the rate of progress

Table 3: South-Eastern European countries' SDG Index scores and scores per goal for the period 2019-2023

Country	Year	SDG Index	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
SRB	2017	74.8	100.0	72.9	81.0	95.4	61.3	74.5	70.8	76.5	52.0	58.6	75.5	84.6	86.7		59.3	69.6	78.7
SRB	2018	75.7	100.0	66.0	79.9	96.6	61.8	74.6	70.3	76.9	57.4	69.6	78.7	84.3	85.7		59.3	69.2	80.3
SRB	2019	76.7	100.0	75.1	82.6	96.1	62.0	74.8	71.2	78.2	59.9	73.5	71.9	84.4	85.6		60.2	70.4	81.2
SRB	2020	77.5	100.0	76.2	83.0	94.5	64.0	74.9	71.0	79.7	64.6	75.3	74.3	84.3	85.6		60.7	69.9	81.4
SRB	2021	77.5	100.0	77.2	81.6	94.2	64.5	75.0	71.4	79.7	65.3	75.3	73.2	84.3	85.5		60.7	68.7	83.6
SRB	2022	78.4	100.0	75.8	82.0	93.6	64.8	75.0	71.4	81.9	70.7	75.3	76.5	85.4	88.5		60.8	68.3	83.8
SRB	2023	77.3	100.0	75.8	82.5	93.6	64.9	75.0	71.4	81.7	71.9	75.3	73.2	85.4	88.5		60.8	65.9	83.5
ROU	2017	75.5	97.3	66.9	79.1	84.6	52.9	75.5	77.0	83.0	53.0	79.3	88.3	79.7	88.5	85.1	79.5	72.1	42.6
ROU	2018	75.9	97.8	71.9	78.6	80.8	57.1	75.7	76.5	82.0	60.3	72.7	89.2	79.3	88.0	85.2	79.5	73.2	43.0
ROU	2019	76.3	98.1	74.3	79.5	82.5	57.0	75.9	76.3	82.5	62.1	73.0	86.0	78.8	87.2	85.4	79.5	73.5	46.0
ROU	2020	76.7	98.2	73.3	80.0	83.4	57.5	76.1	76.4	83.3	64.0	77.2	84.5	78.6	87.5	86.2	79.5	71.5	47.1
ROU	2021	77.1	98.1	69.6	81.4	84.5	57.4	76.3	76.4	82.0	64.7	77.2	85.7	78.6	87.7	86.4	79.5	73.9	50.9
ROU	2022	77.3	98.4	72.9	80.7	84.6	54.8	76.3	76.4	83.0	68.0	77.2	84.9	79.2	87.2	86.7	79.5	74.4	50.0
ROU	2023	77.5	98.6	72.9	80.6	84.6	55.1	76.3	76.4	83.2	69.4	77.2	85.3	79.2	87.2	86.7	79.5	73.4	51.3
MKD	2017	71.1	94.4	64.9	76.0	71.5	50.8	71.2	71.9	60.2	43.5	76.0	69.9	81.0	90.8		80.7	71.0	63.2
MKD	2018	71.6	94.7	60.7	76.7	73.6	53.3	71.4	70.6	64.8	44.3	77.1	71.9	80.8	90.2		80.7	71.6	63.8
MKD	2019	73.0	95.1	64.5	76.4	75.0	56.3	71.6	72.3	66.0	45.1	81.5	73.3	80.8	90.7		80.7	72.8	65.8
MKD	2020	73.0	95.6	62.6	76.9	72.8	58.2	71.7	69.7	68.1	45.5	81.5	73.1	80.6	89.9		80.7	73.1	68.6
MKD	2021	72.5	95.1	62.8	75.7	66.6	58.0	71.8	69.9	68.3	45.9	81.5	67.8	80.6	91.0		81.2	72.4	70.8
MKD	2022	73.1	95.6	62.6	77.4	66.6	58.8	71.8	69.9	70.1	46.7	81.5	69.9	81.2	90.8		81.2	73.5	72.6
MKD	2023	72.5	96.2	62.6	76.9	66.6	59.0	71.8	69.9	70.0	46.7	81.5	65.6	81.2	90.8		81.2	73.9	72.7
MNE	2017	68.2	98.7	51.2	74.3	81.4	58.3	63.9	82.0	57.7	49.1	59.9	76.3	71.5	91.8	37.4	53.5	75.9	76.3
MNE	2018	69.6	98.8	51.1	76.4	85.9	58.3	64.3	78.2	61.6	51.3	66.5	76.3	71.0	91.5	45.8	53.3	76.1	77.7
MNE	2019	69.8	98.8	51.7	75.4	87.4	55.1	64.8	80.4	62.5	56.0	66.7	74.3	70.4	90.3	45.2	53.2	75.4	79.8
MNE	2020	70.8	98.9	51.4	75.2	87.6	58.4	65.0	79.0	62.5	58.3	66.7	77.3	69.9	89.9	51.5	54.7	76.4	80.8
MNE	2021	70.7	98.8	51.6	75.8	90.2	55.3	65.2	79.1	59.8	61.0	66.7	73.1	69.9	90.0	52.1	54.6	76.0	83.5
MNE	2022	71.2	98.8	51.7	75.8	88.2	56.7	65.2	79.1	60.8	61.9	66.7	73.1	70.4	92.8	52.1	54.5	76.2	86.4
MNE	2023	71.4	98.9	51.8	75.7	88.2	56.9	65.2	79.1	61.6	61.6	66.7	74.7	70.4	92.8	52.1	54.3	78.5	85.7
GRC	2017	75.7	98.6	67.8	88.4	94.4	63.0	87.6	76.5	64.2	61.2	77.2	86.9	68.1	78.7	63.4	81.4	72.1	57.6
GRC	2018	76.2	99.1	68.0	88.6	94.4	62.4	87.6	76.2	64.2	73.6	80.9	82.9	68.0	78.8	59.5	81.4	72.1	57.1
GRC	2019	77.0	100.0	65.8	89.2	95.1	62.6	87.6	77.0	66.8	75.3	85.5	86.7	66.9	77.9	59.9	81.4	73.5	57.5
GRC	2020	77.5	99.2	66.2	90.5	96.0	64.0	87.7	76.4	68.0	77.0	84.6	84.8	66.9	78.8	65.9	81.4	73.4	57.4
GRC	2021	77.8	99.0	66.5	90.2	97.1	64.6	87.7	76.4	69.0	78.8	84.6	78.3	66.9	80.4	65.9	81.3	75.3	60.6
GRC	2022	78.1	99.1	66.6	90.7	97.1	65.2	87.7	76.4	72.1	80.6	84.6	81.1	64.8	80.2	65.8	81.3	73.7	61.4
GRC	2023	78.4	99.2	66.6	90.3	97.1	65.4	87.7	76.4	73.8	81.6	84.6	85.6	64.8	80.2	65.8	81.2	71.1	60.8
BGR	2017	73.3	100.0	65.2	77.4	86.5	68.0	65.9	70.3	78.5	53.5	50.6	79.5	76.4	85.3	61.9	93.3	68.7	65.2
BGR	2018	73.9	100.0	67.3	78.2	82.1	70.1	65.9	69.6	80.9	55.6	52.8	81.1	76.0	84.5	61.6	93.3	70.5	67.6
BGR	2019	73.8	100.0	67.4	78.5	79.1	70.1	66.3	71.8	81.6	60.8	47.8	74.8	75.9	84.2	61.9	94.2	69.6	71.2
BGR	2020	74.6	100.0	67.7	79.2	79.5	71.4	66.3	71.4	81.0	63.5	51.0	77.2	75.7	84.5	65.3	94.2	68.9	72.1
BGR	2021	74.7	100.0	65.2	79.4	79.4	72.0	66.3	71.3	80.2	64.6	51.0	79.3	75.7	85.6	65.5	94.2	69.2	71.6
BGR	2022	74.9	100.0	68.2	79.3	79.5	70.8	66.3	71.3	81.7	66.5	51.0	80.4	75.1	84.2	65.6	94.2	68.0	71.9
BGR	2023	74.6	100.0	68.2	79.3	79.5	71.6	66.3	71.3	82.3	66.2	51.0	73.4	75.1	84.2	65.7	94.1	68.5	71.9
BIH	2017	71.0	99.7	64.8	74.1	56.1	40.1	73.2	65.2	67.4	40.7	80.8	78.7	78.7	85.3	73.5	79.7	71.2	77.8
BIH	2018	70.9	99.7	60.6	74.8	58.8	41.1	73.2	62.0	69.8	42.8	80.8	76.2	78.3	84.4	73.7	79.7	70.9	78.7
BIH	2019	72.4	99.8	65.9	76.5	64.1	41.2	73.3	71.4	70.4	44.0	80.8	78.1	77.9	84.3	74.1	79.7	67.9	81.5
BIH	2020	73.0	99.8	65.7	77.0	64.1	43.4	73.2	71.3	73.4	43.2	80.8	75.4	77.8	84.8	83.6	79.7	66.8	80.6
BIH	2021	73.4	99.8	67.2	76.1	64.1	46.1	73.2	71.3	73.3	44.8	80.8	74.2	77.8	84.6	83.8	81.3	67.8	82.2
BIH	2022	74.1	99.8	63.8	76.5	64.1	47.2	73.2	71.3	76.7	47.3	80.8	74.6	78.3	88.2	83.8	81.3	68.5	84.8
BIH	2023	74.0	99.9	63.8	76.9	64.1	47.1	73.2	71.3	76.9	47.3	80.8	74.6	78.3	88.2	83.7	81.3	66.2	84.7
ALB	2017	71.1	96.5	49.5	80.9	96.5	53.7	73.0	84.7	62.6	35.0	78.5	75.8	82.0	91.0	44.5	80.3	63.3	61.1
ALB	2018	71.9	96.7	56.9	81.7	93.8	55.5	73.3	81.5	64.3	37.0	81.0	77.5	81.8	89.9	45.1	80.1	62.6	62.8
ALB	2019	73.5	97.4	57.6	82.5	96.1	56.1	73.5	84.6	65.6	38.7	90.5	80.6	81.8	90.3	45.4	80.2	64.1	65.4
ALB	2020	73.7	98.5	58.3	82.6	95.2	57.4	73.6	84.2	66.1	39.3	88.1	78.1	81.7	90.3	49.4	80.1	63.4	65.7
ALB	2021	73.7	98.4	59.0	82.7	94.3	57.3	73.7	84.3	65.1	41.3	88.1	76.6	81.7	90.5	50.3	79.9	63.5	65.9
ALB	2022	73.7	98.5	59.1	82.1	86.8	60.7	73.7	84.3	66.1	43.6	88.1	77.4	81.7	90.6	50.2	79.8	63.6	66.1
ALB	2023	73.5	98.6	59.3	81.9	86.8	60.8	73.7	84.3	66.2	43.6	88.1	77.4	81.7	90.6	50.2	79.6	60.7	66.1

per each SDG and each country. The usage of 4-arrow system sheds light on these trends. Only when a trend is described as "on track" the goal score is increasing at the rate needed for the achievement of the goal. For South-Eastern Europe, more than half of all goal scores (60.3%) are on track (14.0%) or increase moderately (46.3%) in accordance with calculations for the year 2023. However, 36.1% goal scores are in the stagnation and 3.7% goal scores are decreasing. For all countries except Bulgaria, a majority of goals are on the track or moderately increase, although only Serbia and Greece have 70.6% goals (12 of 17 SDGs) with such trends, while Romania is in the third place with 64.7% goals. In the case of Bulgaria, the achievement of 53% SDGs is either stagnant or decreasing. It could be seen as a positive result for the whole region that only 3.7% of goal scores are decreasing.

Corporate sustainability reporting

It is undeniable that governments and companies play pivotal roles in achieving the sustainable development goals. Yet, without high-quality reporting on the SDGs at the corporate level, assessing companies' contributions to these goals becomes impossible. Sustainability reporting has been integrated into the reporting practices of numerous companies for a long time, on a voluntary rather than a mandatory basis, but even among reporting entities, comparing sustainability performance has been hindered by the availability of the diverse array of reporting frameworks developed by various private and public initiatives. The connection with the SDGs can be established either directly or indirectly, facilitated by various methodological tools. For example, the SDG

Table 4: 2023 SDG dashboards by South-Eastern European countries

Countries	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
Greece	yellow	orange	yellow	orange	orange	yellow	orange	orange	orange	yellow	orange	red	orange	red	orange	orange	orange
Romania	green	orange	orange	yellow	red	orange	yellow	yellow	orange	orange	yellow	orange	orange	yellow	orange	orange	orange
Serbia	green	orange	orange	yellow	orange	orange	orange	orange	orange	orange	orange	orange	orange	grey	red	red	yellow
Bulgaria	green	orange	orange	orange	orange	orange	yellow	yellow	orange	red	orange	orange	orange	red	yellow	orange	yellow
Bosnia and Herzegovina	green	orange	orange	orange	orange	orange	orange	orange	orange	orange	red	orange	orange	yellow	orange	orange	yellow
Albania	green	orange	orange	yellow	orange	orange	yellow	red	orange	yellow	orange	orange	green	red	orange	red	orange
North Macedonia	yellow	orange	orange	orange	orange	orange	orange	orange	orange	orange	red	orange	yellow	grey	orange	orange	yellow
Montenegro	green	red	orange	yellow	orange	orange	yellow	orange	orange	orange	orange	grey	yellow	red	red	orange	yellow

Note: Green – SDG achievement; Yellow – Challenges remain; Orange – Significant challenges remain; Red – Major challenges remain; Grey – Data not available.
Source: Authors based on: Online database for the Sustainable Development Report 2023 [21]

Table 5: 2023 SDG trends by South-Eastern Europe countries

Countries	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
Greece	↗	→	↗	→	→	↑	↗	↗	↗	↑	↗	↓	↗	↗	↗	→	↗
Romania	↑	↗	↗	→	↗	↑	→	↗	↗	↗	↗	→	↓	↗	→	→	↗
Serbia	→	↗	↗	→	↗	↑	↗	↗	↗	↑	↗	↗	→	o	↗	→	↗
Bulgaria	↑	↗	↗	↓	↗	→	→	↗	↗	↓	→	→	→	→	↗	→	↗
Bosnia and Herzegovina	↑	↗	↗	o	↗	→	↗	↗	↗	o	→	→	→	↗	↗	→	↗
Albania	↑	↗	↗	↓	↗	↑	↗	→	↗	↑	→	→	↗	→	→	→	→
North Macedonia	↑	↗	↗	→	↗	↑	→	↗	→	↑	→	→	→	o	↗	↗	↗
Montenegro	↑	→	↗	↗	→	↑	→	→	↗	↑	→	o	↑	↗	→	↗	↑

Note: ↑ - On track; ↗ Moderately Increasing; → Stagnating; ↓ - Decreasing; o - Data not available
Source: Authors based on: Online database for the Sustainable Development Report 2023 [21]

Compass links GRI indicators, which are based on the widely accepted framework of sustainability reporting according to the GRI standards, with the SDGs. However, a more operational and transparent SDG reporting system should explicitly align with the conceptual framework of the SDGs, as an integral component of sustainability reporting.

According to a KPMG study covering the period soon after the adoption of the SDGs – from July 2016 to June 2017, four out ten of the world's top 250 companies by revenues already referenced the SDGs in their corporate reports, which implies that the SDGs were recognized as an influential initiative from their very beginning. However, reporting contents differ significantly among companies and often could be described as poor, reflecting a probably low level of companies' engagement with the SDGs. In that context, it is worth mentioning that the majority of companies (84%) invested efforts to identify the SDGs which are the most relevant to their business and marked them as priority ones but, on the other hand, very few companies (only 2%) were advanced in performance measurement by setting both SMART performance goals as well as indicators related to the SDGs [15].

One of the reasons for the absence of SDGs-related metrics is the complexity of translating the SDGs and their defined targets to the corporate level. Indicators developed by UN (currently 231 indicators) are applicable to the level of national economies, helping governments in directing their efforts towards SDG achievement. However, many of these indicators are not suitable for companies, necessitating the development of tailored metrics for businesses. Leveraging existing reporting systems developed by companies according to established sustainability reporting frameworks would be justifiable and beneficial for this purpose. The challenge that needs to be overcome in this process is that companies should not remain in a 'business-as-usual' mode, merely seeking to relabel existing practices as SDG-related, as much more needs to be done "if there is to be any hope of achieving these goals" [22, p. 381]. More striking, Bebbington & Unerman [2, p. 9] pointed out that companies could misuse the SDGs-related rhetoric and in that way camouflage 'business-as-usual'.

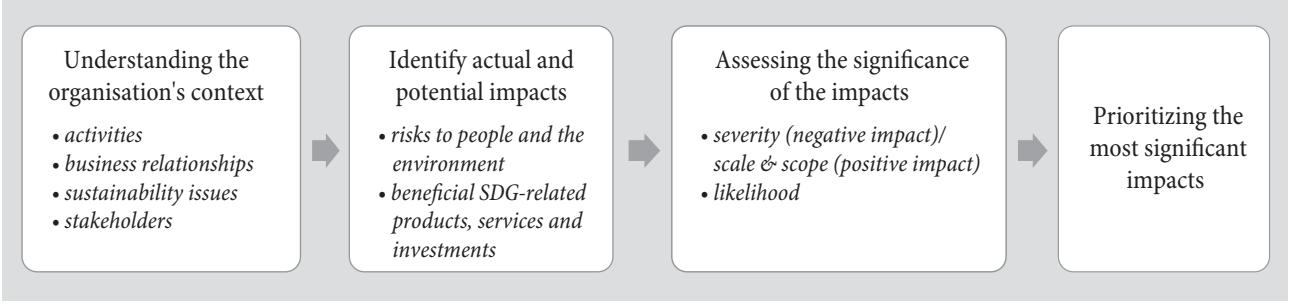
A distinctive feature of the SDGs relative to other conceptual frameworks of sustainability is the comprehensive setting of goals and targets across all aspects of sustainability. Consequently, the SDGs provide a necessary context for other initiatives that companies may have already implemented. As the broadest framework, the SDGs serve as a foundational starting point for analysis, which could unveil new opportunities and risks for companies, prompting them to undertake activities and make shifts in their current business models to align with the SDGs. To operationalize contributions to the sustainable development goals, companies should begin by focusing on individual targets. One of the proposed approaches for integrating the SDGs into reporting consists of three steps, where the first step includes the process of principled prioritization of SDG targets based on significant impacts that companies have on people and environment, the second step involves setting goals, strategies and metrics to monitor progress towards the selected SDG targets, and in the third step companies develop SDG reporting in accordance with best practices and the information needs of stakeholders [8]. Even though reporting is the final step in this approach, it is essential to acknowledge that reporting plays a crucial role in encouraging companies to adopt SDG strategies and carry out related activities [1], and that the absence of reporting can hinder the integration of SDGs in businesses. In accordance with the theory of targeted transparency regulation, Hombach & Sellhorn [12] explain that real effects in terms of changes in corporate behavior could be induced by mandatory corporate disclosures in two ways. The transparency-action chain is initiated by companies' disclosures in line with new requirements, which then trigger changes in the behavior of stakeholders as information users and finally cause companies to respond by taking relevant actions and improving their performance. The second way of influence is through the change of companies' internal information sets which in turn enhance the efficiency of managers' decision-making related to the disclosure area. Moreover, it could be argued that increasing pressure for sustainability disclosures by introducing mandatory reporting would indeed lead to real changes in corporate behavior.

An increasing body of empirical research about companies' reporting on SDGs sheds light on whether companies report on their contributions to SDGs as well as on the content and quality of reports. In their research covering 2,000 of the world's largest stock-listed companies, Waal & Thijssens [34] found that 58% companies published sustainability report in 2017, and only 23% reported on SDGs (39% of the companies providing sustainability reports). However, qualitative analysis shows that even in cases of the most extensive reports related to the SDGs, companies mainly disclosed intentions and future actions, while reporting on current actions taken, explicit business cases, measurable indicators or the processes of SDGs operationalizing was largely missing revealing limited companies' efforts to contribute to the achievement of the SDGs. Although some other studies indicate a growing interest in reporting on the SDGs, the quality of reports seems to be still questionable [25], [14]. Silva [25] discovered that two-thirds of Financial Times Stock Exchange (FTSE) 100 companies referenced the SDGs in their 2018 reports on sustainability performance, but only 23% made general reference, 31% provided some information on specific goals, while 13% reported on goal and target-level details. However, a lack of appropriate indicators to measure companies' contributions to the SDGs was noticed also for the last group of companies with target-level disclosures. Meanwhile, evidence from Europe, focusing on the sample of companies listed in the STOXX Europe 600 index indicates an increase in the number of companies addressing the SDGs in their annual reports from 15% in 2015 to 58% in 2018 coupled with an increase in the quality of disclosures but, despite this increase, reporting on potential and actual negative effects on the SDGs, as well as information on quantitative targets and outcomes of activities related to achieving the SGDs, remained at a low level [14].

The content of SDG disclosures which is mainly descriptive, without an appropriate metric, could be seen as the sign of superficial engagement with the SDGs and the potential exploitation of cherry-picking and SDG-washing practices by companies [11]. On the other hand, companies need both competencies and resources to operationalize the SDGs as well as reporting infrastructure to provide the necessary disclosures. Prioritization in SDG-related work is essential, not to give advantage to one goal over another, but to recognize areas where a company exerts significant impacts. It is in line with concept of materiality and demands systematical and comprehensive approach, as suggested in Figure 6.

The presented process of SDG prioritization should discourage companies from selecting certain SDGs simply because they are easier to contribute to. To demonstrate genuine commitment to the SDGs, companies are encouraged to disclose their prioritized SDGs as well as information on the process of SDG prioritization in their sustainability reports. Some SDGs could be recognized as being more close to businesses than others, and empirical research on multi-sector samples confirms this fact, as SDG 8 (Decent Work and Economic Growth), SDG 13 (Climate Action), and SDG 12 (Responsible Consumption and Production) commonly appear among the top three prioritized SDGs, while SDG 1 (No Poverty), SDG 2 (Zero Hunger), and SDG 14 (Life below Water) tend to have the lowest priority [11], [14], [25]. However, each organization should take into account its specifics, although some factors (e. g., sector affiliation) can influence which issues and SDGs

Figure 6: Principled prioritatization process



Source: Adapted from [7, p. 102], [8]

are given priority. Manes Rossi & Nicolo [17] found that energy sector companies most commonly disclosed SDGs related to the environment, precisely SDG 7 (Affordable and Clean Energy), SDG 9 (Industry, Innovation, and Infrastructure), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action), which is expectable due to heavy environmental impact of energy companies' activities. One study of Indonesian companies offers interesting evidence that SDG 11 (Sustainable Cities and Communities) was the most addressed goal by companies, which can be explained by the country's context, where companies engage in numerous activities to support the government and help increasing community welfare [10]. Nevertheless, the process of principled SDG prioritization should be conducted and disclosed, since otherwise material impacts could be missed, limiting companies' potential for meaningful engagement with the SDGs. The GRI & UN Global Compact [8] suggest that companies should not only understand the SDGs but also the specific targets associated with each SDG, and then further focus on certain SDG targets in their selected SDGs.

The operationalization of SDG targets at the company level requires the integration of priority targets into the company's objectives, strategies and business model. In addition, creating appropriate indicators to gauge progress towards the achievement of targets is the necessity, but also one of the most challenging issues as well. Waal & Thijssens (2020) pointed out that measurement of companies' contributions to SDG targets and indicators "is still a bridge too far". However, metrics are crucial, and attempts must be made to identify appropriate indicators. Some companies have already developed good practices demonstrating substantial commitment to the SDGs. The case of Smurfit Kappa shows that this company recognized its impact on water as one of the main elements in the paper industry and, among other SDGs, it selected SDG 6, focusing on targets 6.3, and then identified a suitable indicator for tracking progress toward this target – Chemical Oxygen Demand (COD) of water, commonly used to measure the polluting factor of water returned to nature. It set an objective of achieving a 60% reduction in COD by 2025 against the 2005 baseline, and measures progress toward this objective each year [26]. However, in a global study of sustainability reports of 1,340 companies, authors find that only 29% of companies made some connections between their strategies and/or objectives and objectives and targets of the SDGs, while a very small percentage of companies (2%) included KPI related to the SDGs [11, p. 323].

As a form of guidance to help companies to measure and report their progress against the SDGs, GRI & UN Global Compact [9] provide a useful inventory of qualitative and quantitative disclosures related to each SDG target, adjusted for company-level application. These disclosures are aligned with some of already developed frameworks for sustainability reporting (GRI Standards, SASB Standards, etc.). In this way, relevant disclosures are collected from different sources and presented together, making it easier for companies to identify ways to engage in the process of achieving the SDGs. Still, appropriate metrics are not always available, especially quantitative indicators. It makes it difficult for companies to deal with some topics. Additional efforts are required from companies to find solutions, and even in cases where metrics have already been developed, existing sustainability reporting infrastructure may not support them. Furthermore, the multiplicity of sustainability reporting frameworks and standards creates a complex reporting environment for sustainability in general, and reporting on the SDGs in particular.

Generally, the tendency of companies to address the SDGs is influenced by different factors. Rosati and Faria [19] identify the relevance of institutional factors and show that organizations reporting on the SDGs are more likely to be located in countries with higher levels of climate change vulnerability, national corporate social responsibility, company spending on tertiary education, indulgence and individualism, and lower levels of market coordination, employment protection, power distance and long-term orientation. However, in order to achieve stronger corporate SDG involvement, it is important for national governments to provide an appropriate environment. The existence of a national agenda related to the SDGs serves as an impetus for companies' engagement with the SDGs. Empirical evidence indicates that governments should not only develop but also communicate their SDG priorities

to encourage companies to follow them, since otherwise some national priorities may not receive sufficient support from businesses [10]. Besides communication, addressing gaps in the support of specific SDGs of national priority could be achieved through quality regulation framework, technical support, and different type of incentives.

Conclusion

Despite the fact that challenges in measuring and reporting sustainability have been recognized and addressed since the adoption of the sustainable development goals, it is evident that numerous issues persist unresolved to this day. At the global level, there is a pressing need for a comprehensive global index to accurately track the progress made by the global community towards the defined goals. The key is to develop metrics that are unbiased in depicting progress across both developed and less developed countries. The existing SDG index, calculated as an average index of all countries, has limitations, notably in its tendency to underscore the polarization between developed nations, with predominantly high scores, and less developed countries, which tend to have lower scores.

In this regard, efforts should be directed towards enhancing the existing methodology and adjusting the metrics to align with the requirements of global reporting and institutional management. It can be said that the existing SDG index is conceptually well established, but corrective measures are necessary to mitigate its biases. A similar approach should be taken with the International Spillover Index, which appears to overemphasize positive impacts of spillovers compared to negative ones, again in favor of developed countries. It is essential to consider that the growing importance of sustainability will likely further motivate developed countries and large corporations to prioritize maintaining top positions in sustainability rankings, which could potentially hinder efforts to improve metrics in this field.

Probably the biggest challenge in sustainability reporting lies at the corporate level, despite continuous and concerted efforts in this area. While numerous conceptual frameworks have been developed to this day, a universally acceptable solution still remains elusive. The global character of the sustainable development goals suggests a need for universal solutions in the field of reporting. A key issue is the failure to recognize the necessity for establishing links between global, national, and corporate reporting. Of course, achieving absolute alignment may not be feasible due to the diversity of goals and the fact that the necessity for corporate sustainability reporting is directly apparent only in certain SDGs. Hence, a flexible approach to sustainability reporting is imperative, wherein companies will acknowledge their duty to report transparently. In this segment, a high level of commitment from management to transparent reporting is much needed. Indeed, companies have an added responsibility to refrain from activities that contribute to the depletion of natural resources, environmental pollution, and negative impacts on climate change. This responsibility extends beyond activities conducted within national borders to encompass those undertaken in other countries, which once more emphasize the importance of measuring and reporting on spillover effects.

The reporting challenge extends beyond companies and requires institutional solutions. The role of governments of individual countries can be clearly identified in the part related to setting strategies, policies, implementing adequate regulations, and establishing effective control mechanisms. Ensuring a commitment to quality sustainability reporting is paramount, necessitating a clear stance from institutions and the corporate community against practices like greenwashing.

Undoubtedly, many of the issues jeopardizing the planet's survival today have roots in history. The industrial economy, which has been prevalent for over a century, has undoubtedly brought about successes such as advanced technological development, economic growth, high shareholder returns, and increased employment. However, these achievements have come at a significant cost. We now witness the adverse impacts of climate change, heightened pollution levels, excessive resource consumption, a widening gap between the rich and the poor, etc. In such circumstances, it is unrealistic to expect that problems stemming from long-standing lax behaviors can be swiftly resolved. This also applies to overly optimistic assessments regarding the attainment of sustainable development

goals, particularly in circumstances where geopolitical interests dominate over environmental preservation and the ongoing armed conflicts impede efforts to achieve these goals. Despite the absence of genuine optimism regarding the attainment of the established SDGs by the projected deadline of 2030, the critical inquiry persists: will they be met by 60% or perhaps 80%? In this context, unbiased and impartial metrics are imperative, ensuring accurate assessment of SDG attainment, free from any inclination to prematurely affirm their achievement when reality suggests otherwise.

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