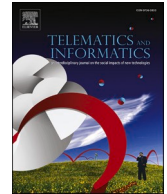




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COVID-19 and sustainable development goals: A bibliometric analysis and SWOT analysis in Malaysian context

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ABSTRACT

The COVID-19 crisis has been a core threat to the lives of billions of individuals over the world. The COVID-19 crisis has influenced governments' aims to meet UN Sustainable Development Goals (SDGs); leading to exceptional conditions of fragility, poverty, job loss, and hunger all over the world. This study aims to investigate the current studies that concentrate on the COVID-19 crisis and its implications on SDGs using a bibliometric analysis approach. The study also deployed the Strengths, Weaknesses, Opportunities, and Threats (SWOT) approach to perform a systematic analysis of the SDGs, with an emphasis on the COVID-19 crisis impact on Malaysia. The results of the study indicated the unprecedented obstacles faced by countries to meet the UN's SDGs in terms of implementation, coordination, trade-off decisions, and regional issues. The study also stressed the impact of COVID-19 on the implementation of the SDGs focusing on the income, education, and health aspects. The outcomes highlighted the emerging opportunities of the crisis that include an improvement in the health sector, the adoption of online modes in education, the swift digital transformation, and the global focus on environmental issues. Our study demonstrated that, in the post-crisis time, the ratio of citizens in poverty could grow up more than the current national stated values. We stressed the need to design an international agreement to reconsider the implementation of SDGs, among which, are strategic schemes to identify vital and appropriate policies.

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1. Introduction

Sustainable development has gained global interest regarding its interrelated relationship with the environment, economies, and societies (Bansal et al., 2020). “Sustainable development” is defined as the ability of mankind to develop and meet the increasing demands, without a compromise of the next generations’ demands (de Sousa, 2021; Iwuoha and Jude-Iwuoha, 2020). By September 2015, the UN presented a blueprint for 2030, which is called Sustainable Development Goals (SDGs). The blueprint entails 169 targets, 17 goals, and 244 indices. The UN’s SDGs are presented to respond to worldwide multilateral issues related to the sustainability of the environment, economies, and societies (Hall, 2019). SDGs encouraged researchers and decision-makers to strive together to find solutions for economic growth without negative impacts on the environment or community members. Based on that, three elements that form the pillars of sustainability (or sustainability tripod), which are environment, economy, and human development, were presented. Sustainable growth can only be accomplished if the three pillars are met and balanced (Daly, 1991).

Focusing on Asia and the Pacific, countries are struggling toward meeting the SDGs and the challenging aims, yet the progress is inadequate and has, in fact, been delayed (United Nations, 2015). Malaysia, as one of the developing Asian countries, has shown considerable and steady economic development. Malaysia’s efforts have been focused on addressing environmental, social, and economic issues. The sustainable development journey in Malaysia has begun in the 1970s and continued since then through adopting many efforts to meet the aimed 2030-vision (Khan et al., 2021). Referring to the SDG index report, Malaysia is ranked 68th and 4th among the ASEAN countries in 2019 (Khan et al., 2021). In 2009, a new economic model was developed, incorporating the main significant themes of SDGs that include sustainability, inclusivity, and high income (Economic Planning Unit, 2017). In the last years, the eleventh New Economic Model is taking place. Besides, Malaysia has taken huge initiatives to meet sustainable development by protecting and enhancing the environment (Sundram et al., 2021). Although Malaysia has wealthy resources, with a huge portion of the economy in the country depending on these resources, the ongoing consumption and utilization of resources are impacting the quality of the environment. Hence, decision-makers in the country need to utilize various forms of practices to reach broad deployment of sustainable practices, while utilizing environmental resources. Besides, the challenges of meeting these targets have been enlarged recently by the rise in the intensity and frequency of man-made disasters and natural crises, particularly the challenges of addressing the coronavirus disease pandemic.

COVID-19 was called SARS-CoV-2 by the International Committee on Taxonomy of Viruses. It has been considered an international challenge to the medical sector, which has induced a change in WHO strategies and priorities (Fagbemi, 2021; Nilashi et al., 2020). The COVID-19 crisis has impacted around 2,700,000 individuals worldwide, leading to 190,000 deaths (by April 23, 2020) and reaching a large proportion of individuals in countries around the globe (Nilashi et al., 2022; Sharma et al., 2020b). Several meteorological variables have been linked with COVID-19 spread and death ratios (Ahani and Nilashi, 2020; Sharma et al., 2021a). Particularly for South Asian countries, a considerable relation between COVID-19 number of cases, the number of deaths, meteorological variables, and the air pollutant, was found (Jain et al., 2021). The rise of the COVID-19 crisis, worldwide, with its severe influences on several disciplines of life (Abumalloh et al., 2021b; Rupani et al., 2020; Sood and Rawat, 2021), has dramatically impacted economic activities (Nilashi et al., 2021). It has modified the global concentration and changed the worldwide economy by presenting exceptional macroeconomic obstacles. To face this pandemic, several measures and interventions by governments were imposed to control the spread of the virus (McKibbin and Fernando, 2021), which has led to inescapable economic decline worldwide. The lockdown measures have led to slowing the production of goods, reducing trade activities, minimizing economic activities, increasing business risks, and declining exports, which led to financial mismanagement and caused various impacts on the local and global levels (Sharma et al., 2021b). Accordingly, the crisis has resulted in a growth in poverty ratios to some degree as several workers in many sectors have become under-employed or unemployed (Karunathilake, 2021). It is undeniable that the existing health crisis has steadily forced social, psychological, and economic spectrum over the globe.

As a consequence of the COVID-19 crisis, SDGs have gained increasing interest as a crucial global demand (Asadi et al., 2022; Contreras et al., 2020; Kim and Hall, 2021). In April 2020, the impacts on SDGs progression were discussed by Sustainable Development Solutions Network (SDSN), indicating the negative and positive influences to provide a recovery scheme (Macht et al., 2020). Focusing on the negative impact, COVID-19 has impacted the SDGs and declined the progression of the approved SDGs (Fagbemi, 2021). On the other hand, the current crisis has changed the focus towards a fresh framework entailing digitized and sustainable business, with less hostile impacts on society and the environment (Sharma et al., 2021c). Based on the above discussion, it is important to investigate the challenges faced by governments to meet the SDGs within the current crisis of COVID-19. This can be achieved through careful consideration of published studies in this context.

Previous literature has investigated many folds of research through bibliometrics analysis using various statistical approaches to explore the links among sources, countries, citations, and researchers (Elango and Ho, 2017; Merigó et al., 2015; Yu et al., 2017). Bibliometric analysis might include network, geospatial, topical, and temporal types of analyses (Milian et al., 2019). A group of studies that meet predetermined conditions can be inspected and visualized automatically through social maps, like co-keywords, co-citations, co-terms, and co-authorship diagrams using several tools such as VOSviewer, CiteSpace (Sood et al., 2022), and Cit-NetExplorer. In this study, VOSviewer software was utilized to conduct the bibliometric analysis. This tool allows a quick analysis of the data to generate bibliometric visualizations based on the defined clusters and their linked maps (Perianes-Rodriguez et al., 2016; Van Eck and Waltman, 2010). The VOSviewer tool is distinguished by visualizing the bibliometric data graphically through particular algorithms, enabling zooming of the visualizations, and presenting density metaphors (Barroso and Laborda, 2022). The generated maps can be explored and provide insights about different aspects of previous literature including keywords, countries, organizations, researchers, and journals. Different types of connections can be utilized to present the diagrams using VOSviewer, which include co-citation, citation, co-occurring, and co-authoring (Durana et al., 2020). Compared to CiteSpace, VOSviewer offers more user-friendly

and clear visualizations (Markscheffel and Schröter, 2021). Other tools such as the CitNetExplorer tool concentrates on analyzing the studies at the individual level, while VOSviewer concentrates on analyzing the studies at the aggregate level (Van Eck and Waltman, 2017).

Besides, in this study Strengths, Weaknesses, Opportunities, and Threats (SWOT) approach was performed to support the lack of literature in the context of the study, as a systematic analysis of the SDGs, with an emphasis on the COVID-19 crisis impact in the Malaysian context. The topic of the study is new and needs more elaboration using several approaches and focusing on several folds. Based on the above, the main goal of this study can be summarized as follows:

- i. To investigate the impact of COVID-19 on SDGs from different perspectives, with an emphasis on the Malaysian context.

To achieve the goal of the study, the following approaches are followed:

- i. A bibliometric analysis of previous works related to SDGs and the COVID-19 crisis.
- ii. A SWOT analysis of the SDGs in light of the current COVID-19 crisis to explore the strengths, weaknesses, opportunities, and threats during the COVID-19 crisis, with an emphasis on the Malaysian Context

In Section 2, a review of Sustainable Development Goals is presented. In Section 3, a review of SDGs in relation to disasters is provided. In Section 4, a description of the review methodology is presented. Section 5 presents the bibliometric analysis of the studies to visualize research keywords and occurrences. In Section 6 we present the SWOT analysis. The discussion of the results is presented in Section 7. Research contributions are presented in Section 8. Finally, the conclusion of this study is presented in Section 9. To summarize, we present a list of abbreviations used in this study in Table 1.

2. Introduction of sustainable development goals

Humans evolve through emerging advancements in several fields such as industrialization, globalization, urbanization, green revolution, and digitalization. Still, in these fields, the sustainability vision was not integrated, and as a consequence, the environment was impacted in several ways. Nowadays, as human beings are more advanced, they need mature plans that integrate sustainability into their schedules. This enabled the provision of SDGs by the UN (United Nations, 2015) that guide human activities, in which both communities and the environment develop as a united robust system. Based on the provision of these aims, the development of communities needs much concentration on SDGs to address emerging needs. Sustainable development goals are presented in Fig. 1. The 2021 SDG dashboards (levels and trends) for East and South Asia are shown in Fig. 2.

Several studies have explored SDGs focusing on the proposed goals individually or in general. A study by Grossi and Trunova (2021) investigated SDGs with an emphasis on smart cities. Based on the review of the literature, the authors indicated the need for a universal measurement system to capture the regional features of smart cities. Boess et al. (2021) investigated the activities of environmental impact assessment and strategic environmental assessment and how they can be impacted by the deployment of SDGs. By considering 45 cases, the authors concluded that there is a need to define basic instructions for SDGs implementation in order to fill the gap between theoretical and practical aspects considering environmental assessment activities. A study by Asadikia et al. (2021), adopted Boosted Regression Trees using ML and data mining approaches to define synergetic SDGs. The result of the study identifies SDG3, SDG4, and SDG7 as the most synergetic goals. Peng et al. (2021) explored the ecosystem service value in the time interval of

Table 1
List of Abbreviations in the Study.

Abbreviation	Term
UN	United Nations
SDGs	Sustainable Development Goals
WHO	World Health Organization
SARS-CoV-2	Acute Respiratory Syndrome Coronavirus 2
COVID-19	Coronavirus Disease of 2019
SWOT	Strengths, Weaknesses, Opportunities, and Threats
MCO	Movement Control Order
MOH	Ministry of Health
PPE	Personal Protective Equipment
rRT-PCR	Real-Time Reverse Transcription-Polymerase Chain Reaction
ML	Machine Learning
UNDP	United Nations Development Program
NLP	Natural Language Processing
SDSN	Sustainable Development Solutions Network
GCC	Gulf Cooperation Council
UNDRR	United Nations Office for Disaster Risk Reduction
ICUs	Intensive Care Units
SFDRR	Sendai Framework for Disaster Risk Reduction
MCDM	Multi-Criteria Decision-Making
ICT	Information and Communications Technology



SUSTAINABLE DEVELOPMENT GOALS



Fig. 1. Sustainable Development Goals.

2015–2035 based on three contexts and inspected their impacts on the SDGs. The study presented an integrated scheme to evaluate the possible influences of land usage and modifications on the ecosystem service value, which could present basic directions for urban growth toward meeting the SDGs. [Malik et al. \(2021\)](#) analyzed the negative spillover impacts, with a focus on the safety of workers and occupational health based on two indexes: fatal and non-fatal incidents that occur in the global supply chains. Based on the study, several countries were indicated as being responsible for around 80% of fatal and non-fatal incidents. [Al-Saidi \(2021\)](#) focused on the GCC region to inspect interstate relationships between GCC countries. The study investigated how to meet inclusive sustainability results through local environmental collaboration. According to the authors, cooperative blueprints and problem representation should be strengthened to face the emerging increase in interstate competition and political rifts, which negatively impact the capability of regions to participate in future environmental performance. Focusing on food security, [Vogliano et al. \(2021\)](#) examined the progression and obstacles related to facing the hunger in Melanesia according to SDGs2. The research indicated the progression that has been achieved in minimizing wasting and stunting. On the other hand, the authors indicated the need to reverse the growing ratios of Non-Communicable Diseases and meet food security in the country.

3. SDGs and disaster

As defined by UNDRR, a disaster is a serious breakdown of the operations of a society or community at a particular level because of dangerous events linked with a situation of capacity, vulnerability, and exposure, causing environmental, economic, material, or human losses and influences ([Ainuddin et al., 2013](#)). Disaster Risk Reduction (DRR) practices have been derived from development ideas and they have become interconnected ([Lewis, 2012](#)). Disaster risk and sustainable development are internally interconnected ([Uitto and Shaw, 2016](#)). SDG indices have a significant impact on assessing the progression toward Disaster Risk Reduction, such as service access (SDGs 6, SDGs 7, and SDGs 11), education access (SDG 4), land tenure (SDGs 1 and SDGs 11), health (SDG 3), poverty (SDG 1), gender disparities (SDG 5), and others ([Chmutina et al., 2021](#)). One individual large disaster such as a natural disaster (storm, earthquake, landslide, or tsunami) can stop the progression and postpone the development for years. Most previous studies on SDGs and disaster recovery have concentrated on natural disasters ([Ahmad et al., 2018](#); [Kelman, 2017](#); [Koubi, 2019](#); [O'Brien et al., 2006](#)). Only a few studies have concentrated on health threats and SDGs, particularly the emerging COVID-19 crisis ([Ekwebelem et al., 2021](#); [Leal Filho et al., 2020](#)). Hence, to assure the progression of countries to meet the SDGs, a suitable plan to address the potential disasters is required.

Sustainable development is interconnected to crisis recovery as it should entail policies and choices regarding investment places, communities' exposures to risks, and places of occurrence of natural disasters ([O'Brien et al., 2006](#); [Paton and Johnston, 2017](#)). On the other hand, adopting unsustainable development methods have a large impact on disasters. As the SDGs present a beneficial blueprint to design regional sustainable development policies and control the efficiency of the deployed policies, they should present effective

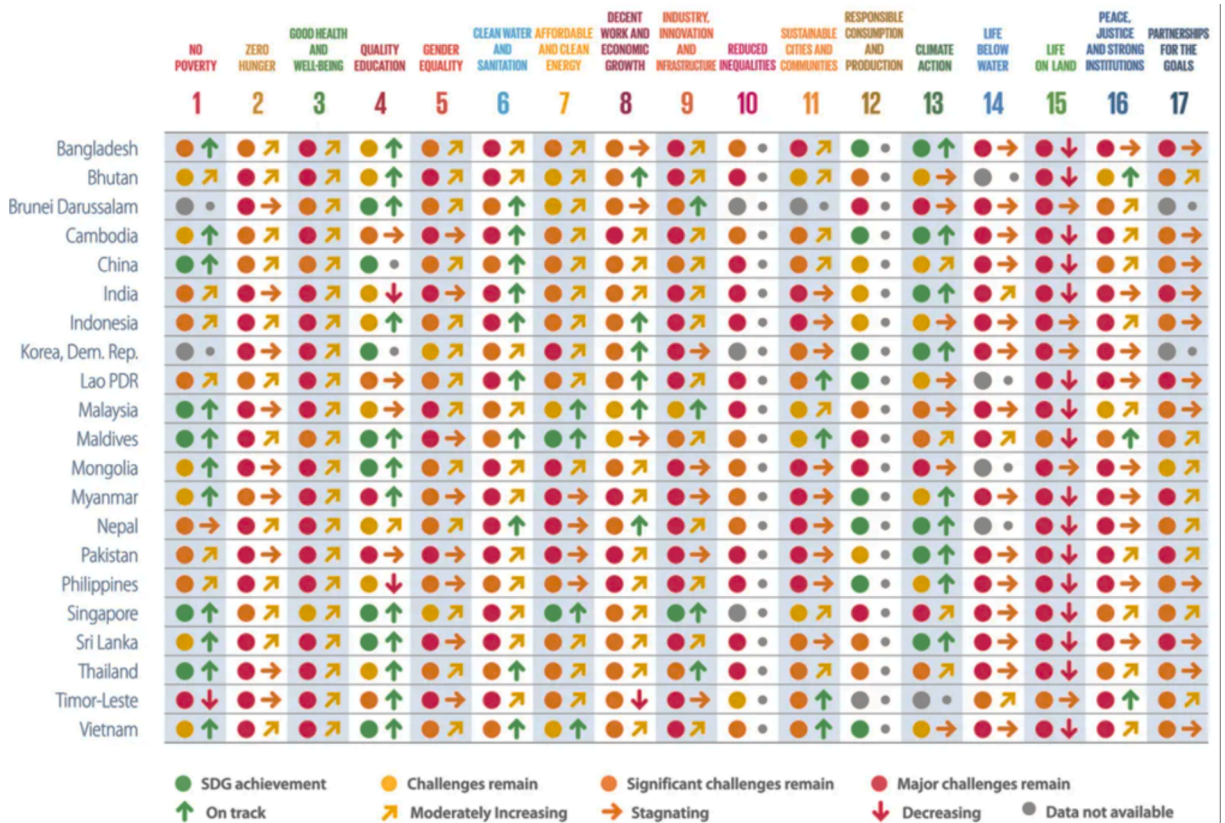


Fig. 2. The 2021 SDG dashboards (levels and trends) for East and South Asia (Sustainable Development Report, 2021).

strategies, in which the impact of multi-hazard threats on humans’ can be addressed (Pramanik et al., 2021). These threats, which have several economic, health, and environmental types, can hit the development of humans broadly. SDGs are developed to be performed in a universal style, in which coherent collaborations between interrelated aims are considered. This presents a crucial consideration to

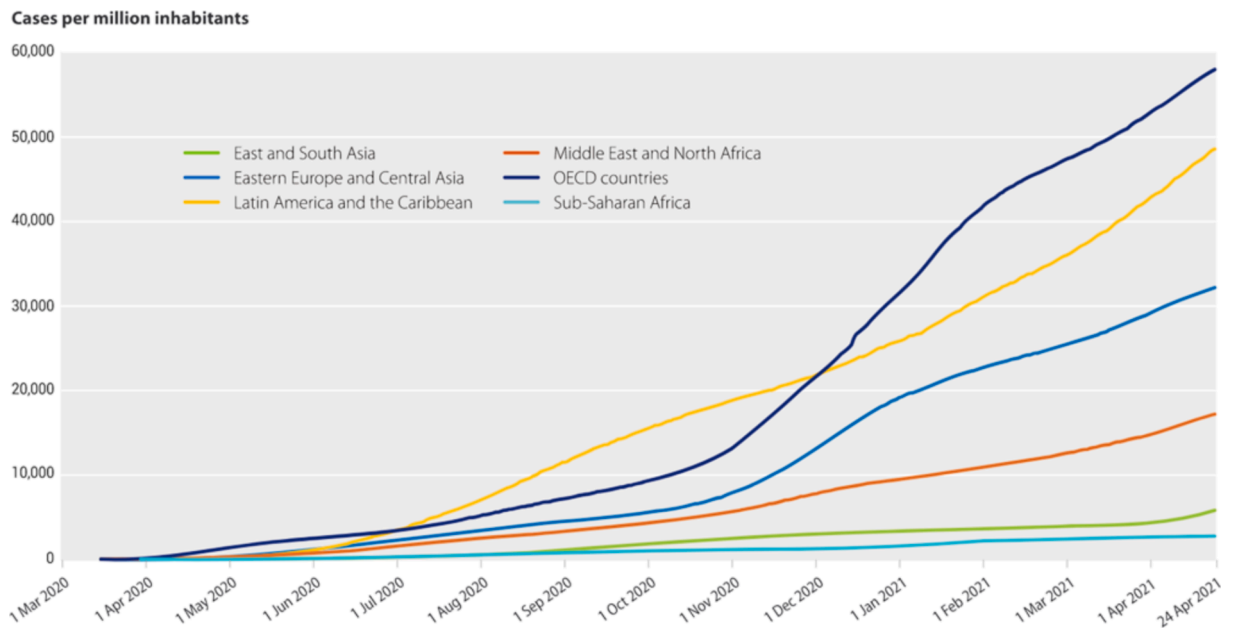


Fig. 3. Cumulative COVID-19 cases per million population.

investigate the several influences of the COVID-19 crisis on the short and long-run impacts on the SDGs. It is important to cover the human fold of sustainable development as a basic factor to meet sustainability development (von Schirnding, 2002). Referring to Fig. 3 (World in Data, 2021), COVID-19 impacted health outcomes and mortality all around the world and led to a decrease in life expectancy in many developed countries. Based on the Sustainable Development Report (2021), COVID-19 led to a world recession in 2020 and to a sharp increase in unemployment everywhere (see Fig. 4). School closures have short-term and long-term impacts on students' learning and well-being (see Fig. 5). After years of progress, extreme poverty increased in several regions in 2020 (Fig. 6). According to the (Sustainable Development Report, 2021), CO₂ emissions in major economies did not take long to come back to their pre-pandemic levels (Fig. 7). Please refer to Sustainable Development Report (2021) for more information about Fig. 2, Fig. 3, Fig. 4, Fig. 5, Fig. 6, and Fig. 7.

It is important to mention SFDRR, as a basic scheme for disaster risk reduction around the globe, which is approved by the UN in 2015 (Chmutina et al., 2021). The SFDRR provides a comprehensive scheme for addressing various threats with varying levels of severity and influence. It focuses on Investing in Disaster Risk Reduction by enhancing the level of readiness, response, and resilience, to allow the reconstruction, rehabilitation, and recovery components of the disaster risk reduction in the development strategy (Sukmara and Pradita, 2021). It integrates the concept of "build back better" to deal with disaster risk. The SFDRR tried to address the shortcomings of previous frameworks by focusing on poverty and inequality as essential reasons for humans' vulnerability and, consequentially, disaster vulnerability. Meeting the SFDRR needs appropriate goals of decentralization along with collaborative work. Still, the emergence of the COVID-19 disaster, with all its consequences and the huge number of impacted people, raised a question about whether SFDRR helps us to move forward with actual progress toward disaster risk reduction. The adoption of SFDRR has been linked to the SDG 2030 Agenda as a guide for the deployment of higher-level goals that are focused on disaster-related SDG goals (Wright et al., 2020). SDGs and SFDRR goals can be achieved based on both economic and social efforts (Chmutina et al., 2021). The schemes of the two instruments are interconnected, as 10 of the 17 SDGs have 25 disaster risk reduction-related targets (UNDRR, 2015). SFDRR adopted many of the SDGs (SDG1, SDG11, and SDG13) and their interrelated targets (target 1.5, target 11.5, target 11.b, and target 13.1) (UNDRR, 2015). SFDRR targets from A to E are linked to these SDGs, including 13.1.1, 11.b.2, 11.b.1, 11.5.1, 11.5.2, and 1.5.4. Still, there is a difference between SFDRR and SDGs, as the indicators in the former are being focused on disaster risk reduction strategies at a national level. The basic concept of SFDRR is not about struggling with causes of vulnerability but it is centered on reaching less impact of the disaster. Careful monitoring of SDGs implementation will aid in locating the causes and development of crisis overtime.

In the context of the COVID-19 crisis, focusing on risk reduction, SFDRR mentions the biological threat as a pandemic or crisis. The SFDRR focuses on human, technological, environmental, and biological threats such as the current COVID-19 crisis (Djalante et al., 2020). Adding biological threats indicates the importance of incorporating appropriate management of risk in all areas of medical care and emphasizing the collaboration between medical bodies with all involved stakeholders to enhance risk management in the country (Aitsi-Selmi et al., 2015; Marome and Shaw, 2021). SFDRR entails more than 30 references related to medical and health aspects to improve the well-being of individuals under the threat of crisis and disasters (WHO, 2020).

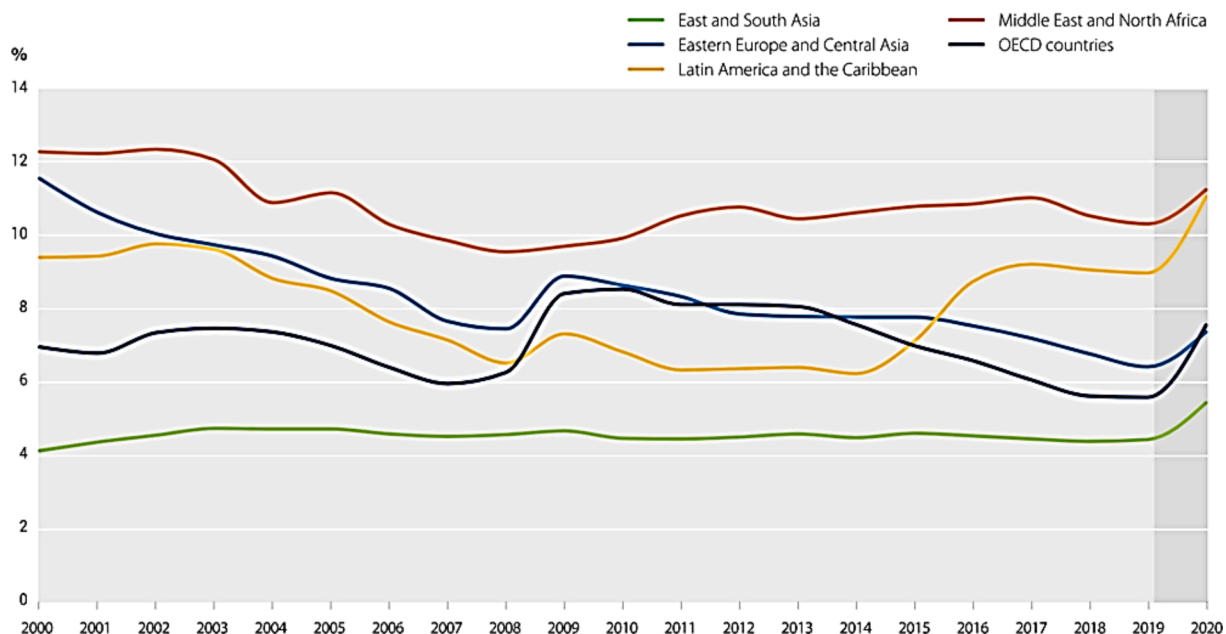


Fig. 4. Unemployment rate (as a percentage of the total workforce).

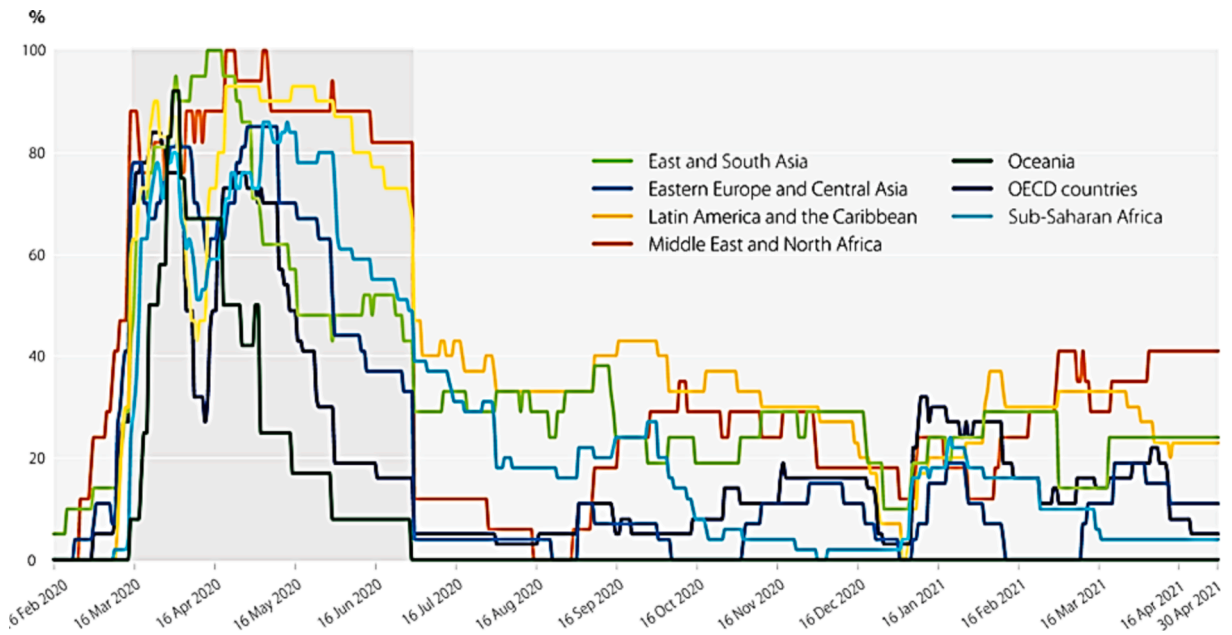


Fig. 5. Percentage of school closures during COVID-19 (UNESCO, 2021).

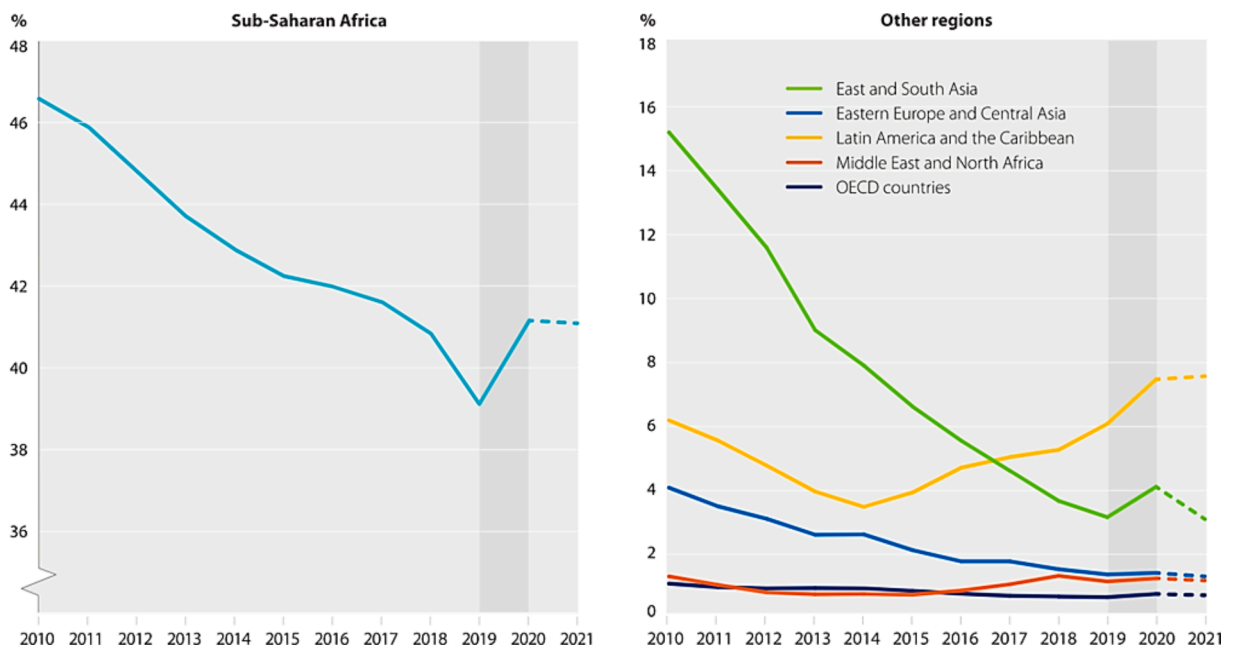


Fig. 6. Percentage of poverty (less than \$1.90 a day) (Sustainable Development Report, 2021).

4. Review methodology

At the beginning of this research, we identified the following research goal: to investigate the impact of the COVID-19 pandemic on SDGs. A search was performed in the Scopus database to get the bibliographic data on July 10, 2021, by utilizing the following search words (“Sustainable Development Goals” OR “SDGs” OR “SDG”) AND (“COVID-19” OR “Coronavirus” OR “SARS-COV-2”). Several studies have used the Scopus database to conduct a systematic literature review and bibliometric analysis in several disciplines of research such as medicine (Abumalloh et al., 2021b; Rodrigues et al., 2014), tourism (De la Hoz-Correa et al., 2018), and SDGs (de Sousa, 2021). Particularly, bibliometric analysis has gained increasing attention from researchers to explore the development of research topics and emerging research trends in-depth such as the work by (Yu et al., 2018) and the work by (Yu et al., 2019). While

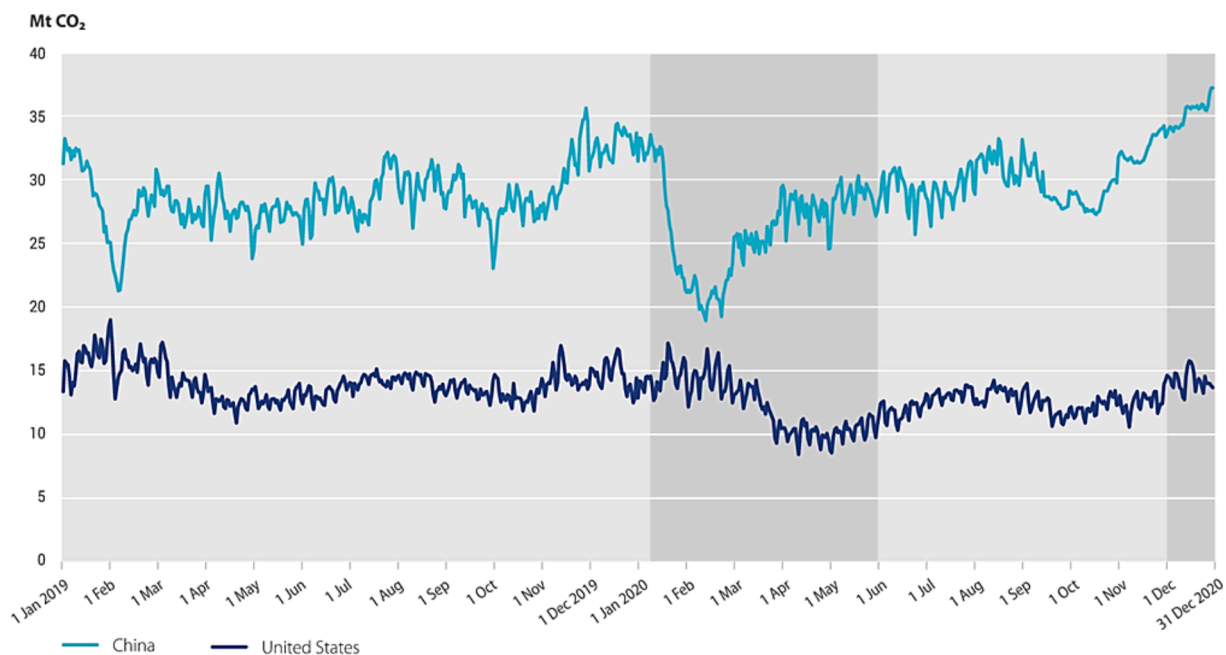


Fig. 7. Daily CO₂ emissions (Mt CO₂).

(Yu et al., 2018) focused on the development of fuzzy theory research, (Yu et al., 2019) concentrated on the development of applied intelligence research using bibliometric analysis. The present study considered Scopus for data collection as it has wider journal coverage compared to the WOS (Aksnes and Sivertsen, 2019; Mongeon and Paul-Hus, 2016), and indexes only the peer-reviewed scholarly literature which is not the case with Google Scholar. Hence, we retrieved 378 studies. English language studies were only obtained. In this article, the VOSviewer tool was used to analyze the bibliometric data. The VOSviewer program is used to generate maps based on links between research papers (de Sousa, 2021). This tool enables swift and easy analysis of the electronic resources and presents simple visualizations that reflect particular segments of data (Perianes-Rodriguez et al., 2016; Van Eck and Waltman, 2010). Besides, this tool allows the visualization of affiliations, countries, authorships, keywords, and citations to emphasize the relationships between the selected research studies. A unified method of mapping and segmentation is deployed by the program, which is based on providing a co-occurrence array and measuring the similarity to present the strength of links between words (Van Eck and Waltman, 2010). Two types of files were exported to the program: Scopus.csv and Scopus.bib. The review protocol is presented in Fig. 8.

5. Bibliometric analysis

Bibliometric research presents a holistic perception of many disciplines linked to a particular topic of research. The deep analysis of the retrieved studies helps researchers to visualize the existing knowledge of a specific topic and aids to highlight future directions. Bibliometric analysis can be considered a specific type of library science (Bonilla et al., 2015), which has two basic techniques: analyzing the performance and visualizing scientific research (Noyons et al., 1999). The first technique focuses on investigating the scientific piece of research by evaluating all the data incorporated from the published studies (keywords, affiliations, authors, countries, etc.) quantitatively. On the other hand, the second analyses the associations that are resulted from the retrieved data, which are visualized in organized networks (Montalván-Burbano et al., 2020). Several studies have utilized bibliometric analysis focusing on many areas, such as mobile learning (Goksu, 2021), teaching (Yilmaz et al., 2019), fitness (Liu and Avello, 2021), and plastic waste (de Sousa, 2020). These studies have adopted bibliometric analysis to explore published studies based on algorithmic analysis of words, citations, and authorships using particular tools (Elango and Ho, 2017; Merigó et al., 2015; Yu et al., 2017).

After retrieving the articles from specific electronic resources, the bibliometric analysis technique can be used to scrutinize these articles and analyze the retrieved data based on year, subject, organization, and country of study. Bibliometrics can also incorporate the retrieved data automatically based on social links, such as keywords, co-citations, and co-authorship. Keyword links indicate the co-occurrence of keywords between the two studies. Co-citation links refer to the studies that are being cited by the same research (Small, 1973). Many types of research have been performed focusing on bibliometric analysis (Yu, 2015; Yu and Shi, 2015; Zhang and Feng, 2014).

5.1. Keyword Co-occurrence, Subject, and worlcloud visualizations

Before proceeding to the bibliometric analysis of the surveyed studies, it is useful to investigate the distribution of subjects of the published articles. In Fig. 9, we display the subjects of the surveyed studies based on their records in the Scopus database. Among the

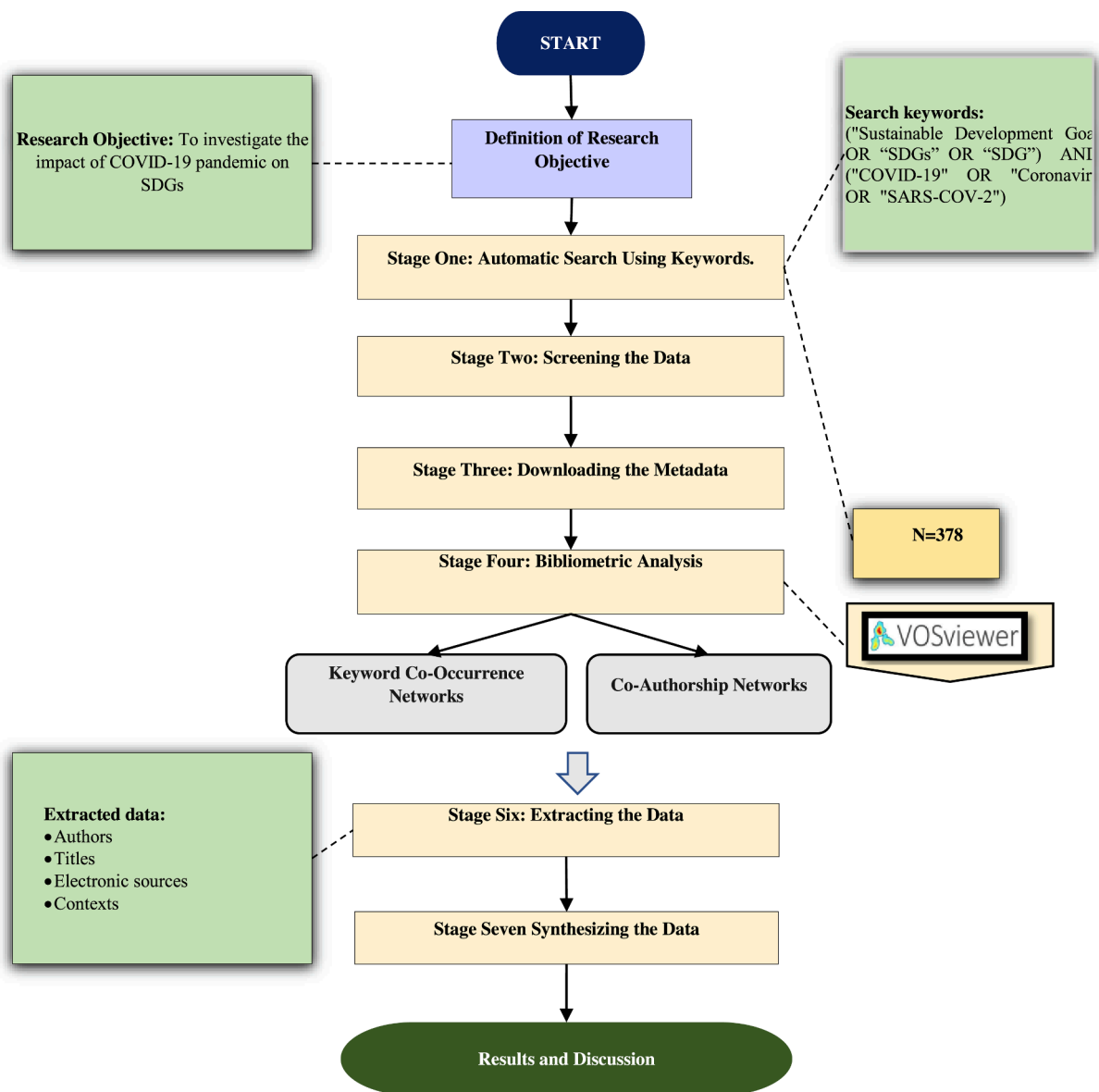


Fig. 8. The Review Protocol.

surveyed studies, 176 studies belong to the social science category. 135 studies are categorized under environmental science. 86 studies are from the medical field. The energy field has 83 studies. Next, the business, management, and accounting fields have 42 studies. 41 studies belong to the economics, econometrics, and finance fields. The engineering field has 30 studies. This result indicates the multidisciplinary nature of the research topic as research articles have been categorized under various subjects, focusing primarily on social sciences and environmental research.

Word cloud is used as a graphical representation to reflect a set of terms based on their related quantitative calculations. Additionally, word clouds can help scholars to get indications about what a study or several studies may contain (Felix et al., 2018). Such diagrams are usually generated using a set of NLP approaches to retrieve the most occurred words. The diagram is organized in a space-enhanced concise structure, in which the font size reflects the number of indices of items. Wordcloud of the abstracts of the obtained research is displayed in Fig. 10. As presented in the diagram, the most occurred words in the surveyed studies are disease, health, goals, education, social, policy, climate, and pandemic. These words reflect the main topics that were discussed in the surveyed studies.

VOSviewer tool was used to segment the keywords of the retrieved data and present the links between these keywords. In Fig. 11, the structure of the keywords in the studies is presented. Based on the specified terms, these studies were retrieved from the Scopus database. The visual image of the keywords presents the thematic structure of the topic and classifies the included studies. Based on the figure, this research has a multidisciplinary nature, in which several themes were incorporated. Basically, the figure utilizes the co-

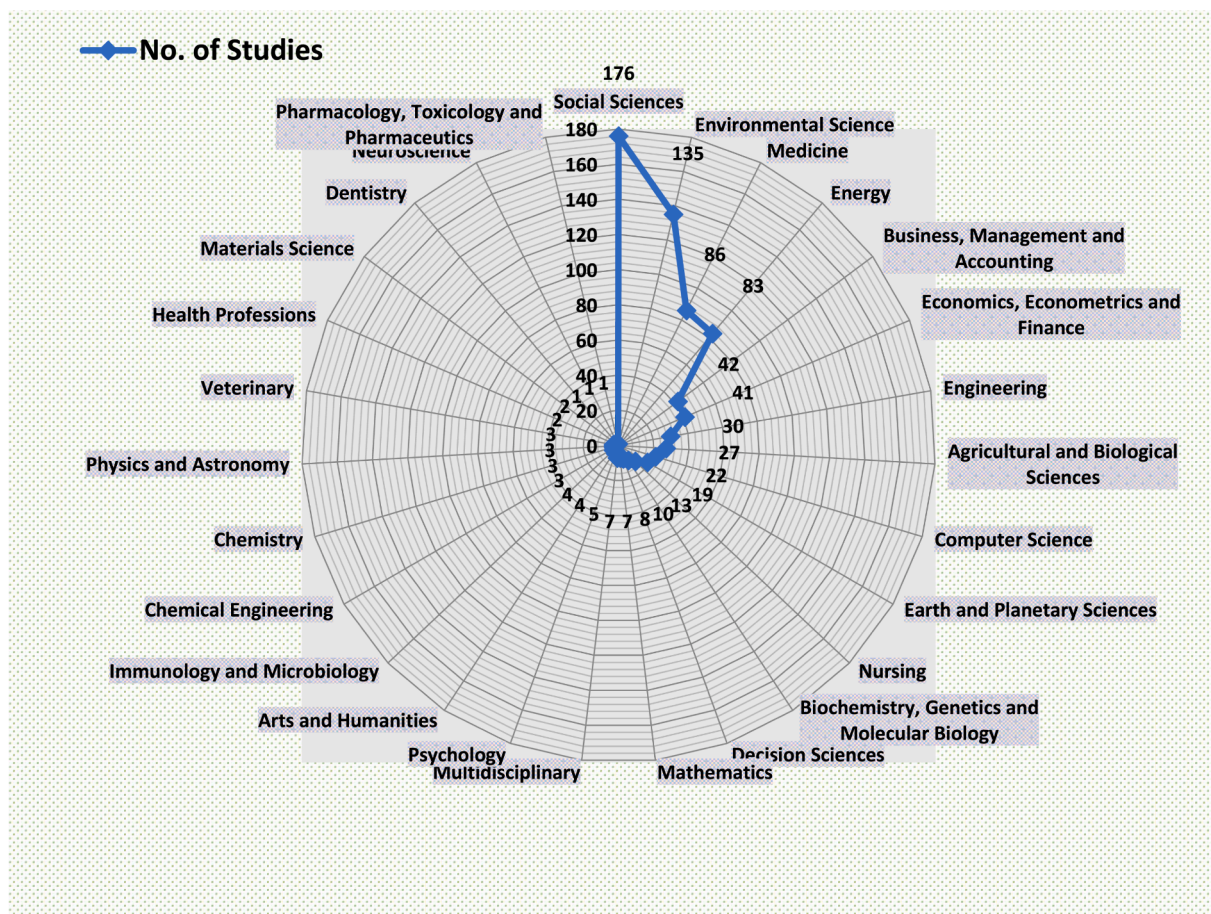


Fig. 9. Distribution of Papers per Subject.

occurrence-keyword technique to present the segments of keywords. The “Full counting” approach was used and “all keywords” was used as the analysis unit. To integrate the words with similar meanings such as “coronavirus infection” and “coronavirus infections”, “coronavirus disease 2019” and “COVID-19”, or “environmental factor” and “environmental factors”; we prepared a thesaurus file to be used by the program.

In the figure, 340 keywords were included among 2640 words. To be included in the analysis, 3 occurrences of words should exist in the titles, abstracts, or keywords of the studies. General keywords that don’t have a specific relation to the topic of research were excluded, like “Journal”, “Study”, or “Article”. Besides, we included only keywords with the most total weights of the co-occurrence associations with other keywords. The length of the path between two keywords is established based on the number of articles that entail the two keywords. More indices of keywords indicate shorter links among them and are represented by circles of bigger sizes.

Segment 1 has 104 items, segment 2 has 76 items, segment 3 has 64 items, segment 4 has 49 items, and segment 5 has 45 items. The red color segment concentrates on the current crisis and its relation with sustainable development goals, as “sustainable development goals” appeared 239 times and “COVID-19” has 207 indices. In the green color segment, “humans” is the main keyword with 76 indices. The blue color segment focuses on the areas related to the disease as a current health crisis. Hence, the “pandemic” has 81 indices, “epidemic” has 23 indices, and “SARS-COV-2” has 27 indices. In the yellow color segment, “Coronavirus infections” has 17 occurrences. “Virus pneumonia” has 16 occurrences. In the purple color segment, “education” is the main keyword, with 22 indices, and “e-learning” has 11 occurrences. Based on the result of the bibliometric analysis, the impact of COVID-19 on SDGs has been mostly investigated focusing on the human factor, health factor, and education factor.

5.2. Term Co-occurrence Network

Using the VOS viewer tool, we generated a term-co-occurrence diagram, which is based on the terms obtained from abstracts and titles of the studies. In this diagram, we choose to ignore standard titles of abstract and copyright sentences. We deployed a binary counting technique with the minimum count of terms to be considered in the obtained studies as 5. This resulted in 544 terms being considered among 9853. A measure of relevance was calculated for each term, in which most linked terms were held, thus; only 326 terms were involved. The default setting of the program is set to keep 60% of terms, which leads to five groups of terms. A diagram of

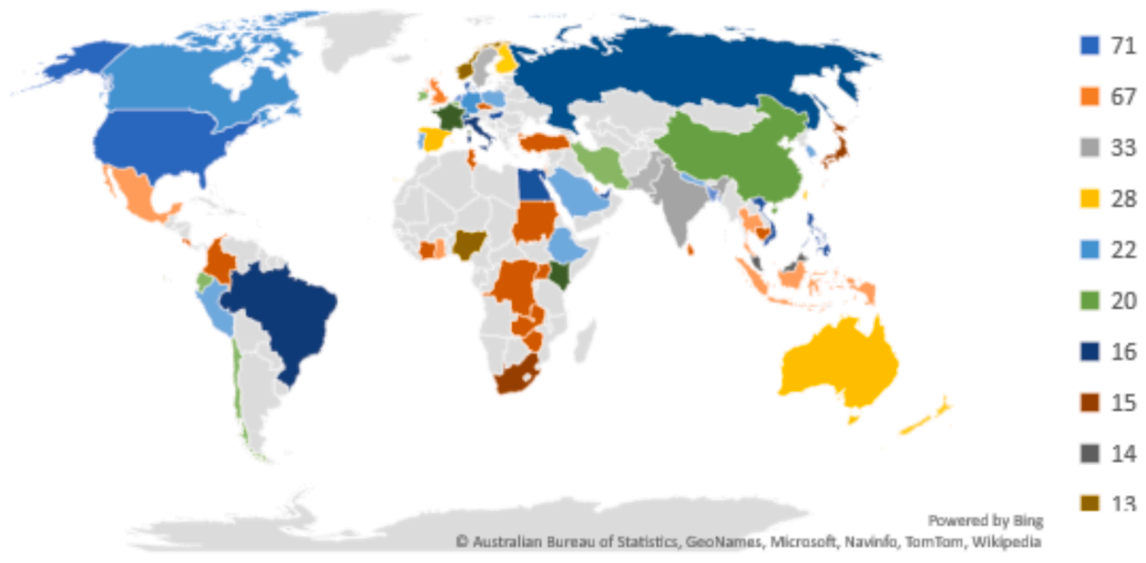


Fig. 13. Distribution of Papers per Country.

collaboratively to perform this agenda. It also aims to support worldwide peace with a focus on freedom. Besides, reducing poverty levels in all styles and folds is the hugest international challenge and essential demand for sustainable development. SDGs are general criteria that entail all actors from the community. It moves beyond the burdens of governments and should be considered in a wider range to combine several stakeholders from the community while considering the concept of “leave no one behind” in the deployment process. Each area has particular capabilities and can participate in an integrated manner to meet these ambitious goals. SDGs allow more investment in the environment. Sustainable Development can’t be achieved without the recovery of the environment. Environmental problems have transfrontier essence. Still, ocean pollution, air pollution, ecosystem issues, climate change, and several other environmental problems cannot be faced at the local level, which needs more care and collaborative work. SDGs highlight the need for fostering environmental recovery at the regional level.

6.2. Weakness

SDGs suffer from several weak points, which we aim to elaborate on. The first challenge is related to the coordination strategies to achieve the SDGs, which appears when addressing poverty, energy, health, food, water, education, biodiversity, and several other folds in the SDGs. It is important to consider how involved stakeholders can participate in the SDG’s implementation at a suitable time and in a suitable manner. SDGs essentially entail many various stakeholders functioning at several different measures, from local authorities to international governments. It is assumed that appropriate stakeholders will be available to serve together at the appropriate time and position to address complicated sustainability issues. For example, considering Goal 7, which focuses on providing sustainable energy for all, it is vital to determine the stakeholders who will participate in advancing, generating, establishing, and retaining the techniques to present globally obtainable energy. Besides, we should reconsider who can be involved in deciding what falls within “reliable affordable energy” for various societies in various areas of the globe. It is vital to rethink how authorities, societies, and public companies participate in determining suitable and sustainable energy resources in various environments.

The second weak point is related to the trade-off decisions. There will be several co-advantages if SDGs were deployed, as achieving one aim will also aid in achieving other SDGs at the same time. In this context, it is evident that facing climate change issues will help in addressing other issues such as health, energy security, oceans, and biodiversity. Still, the SDGs will also entail trade-off choices. It is vital to investigate potential trade-offs when reaching complex decisions, particularly in the short-run context. For example, biodiversity will be endangered with the cutdown of forests, particularly with the expansion of the production of agriculture to address the food security issue. Besides the security of food could be impacted if the crops are replaced by biofuel for meeting energy security goals. On the other hand, the security of water could be impacted by choices to intensify or increase agriculture or to develop hydropower for meeting the security of energy or mitigating greenhouse emissions. The overlapping among several SDGs can present negative results if governments neglected the universal essence of the SDGs and implement the goals separately. Besides, the correlations among the goals require careful consideration by decision-makers from various areas (Pradhan et al., 2017). Thus, a comprehensive investigation of the trade-off between various SDGs is of great importance to meet permanent sustainable development outcomes. Besides, a broad range of technologies and analysis techniques is required to inspect the complications and to meet the goals for the remaining time until 2030 (McCollum et al., 2017). Additionally, several competing stakeholders can be involved in these trade-off decisions. For example, when addressing the climate change problem, although the expected benefits, several parties will be influenced in the short run like companies and employees of fossil fuel companies. Reaching complex trade-off decisions can be a basic administration weak

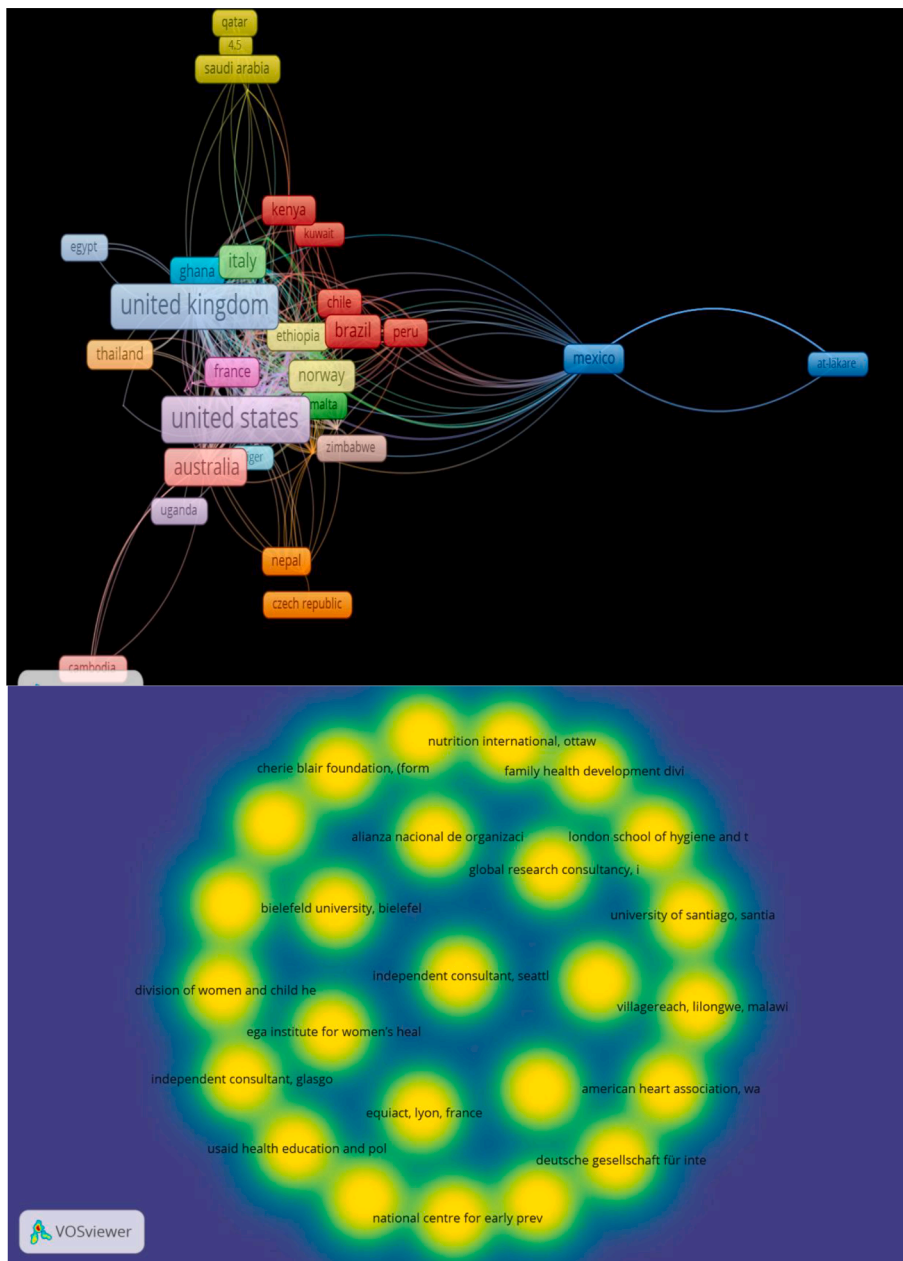


Fig. 14. Visualization of Co-Authorship Analysis: (A) Countries and (B) Organization.

point, particularly for the difficult issues within the SDGs where responsibility is scattered and the concerns of various stakeholders can contradict. Meeting the SDGs will need the collaboration of local authorities, private sectors, non-profitable sectors, and societies to reach complex choices based on a considerate and authentic obligation to the SDGs.

The third challenge is related to how and who will be responsible for the deployment of the SDGs. The implemented approaches to meet the SDGs should be integrated on national and international scales. It is important to determine the appropriate indicators to be used to evaluate the achievement of the goals. We need to assess both the inputs and the outputs considering several aspects of the SDGs. Still, we need robust methods to collect these outcomes and assess them based on the performance goals, in order to allow the responsible political decision-makers to monitor the achievement of involved stakeholders. Stakeholders entail members of authorities, the private sector, or even members of the common society. This loop will assure that SDGs are being followed and the implementation schedule is monitored.

Fourth, the implementation of SDGs based on the regional degree is “under-appreciated”. There is a need to firm internal and external policies to achieve the SDGs. Incorporating SDGs on the regional level enables better conceptualization of regional trends,

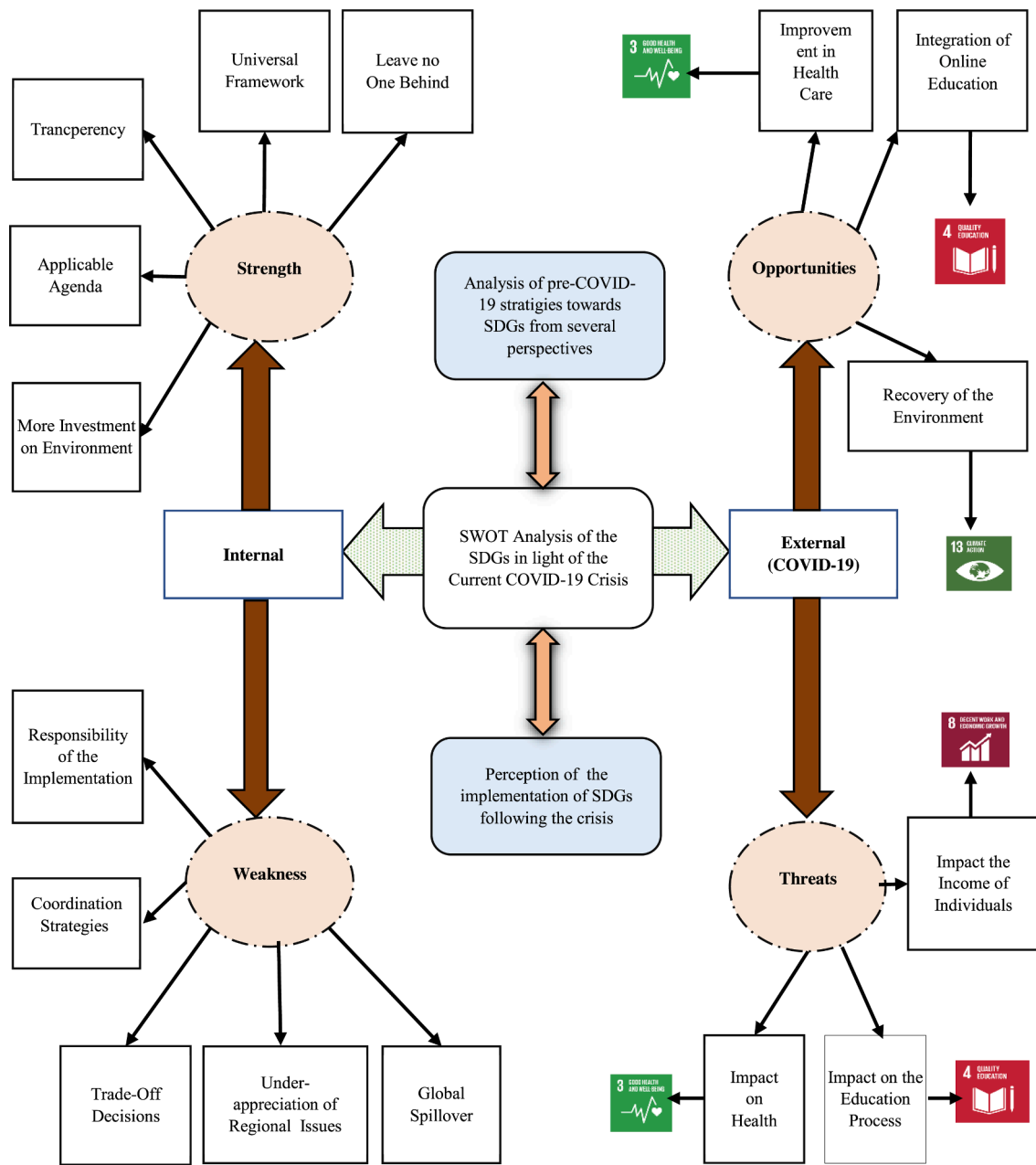


Fig. 15. SWOT Analysis of SDGs in the Current COVID-19 Crisis.

dynamics, relations, general problems, political developments, environmental needs, and economic developments. This enables the design of appropriate policies and plans to better aid countries in their deployment of the SDGs.

Fifth, as countries are interconnected, their actions could have negative impacts on other countries and can hinder them from meeting SDGs. The deployed policies to meet the SDGs should be performed to several degrees without leading to negative influences on other regions (Sachs et al., 2020). Global spillovers happen when the activity of one country enforces costs on other countries (Malik et al., 2021). Spillover impacts require a coherent implementation of SDG strategies with the inclusion of strategic tools to be integrated into the implementation process.

6.3. Opportunities

In this section, we aim to focus on the opportunities presented by the external impact of COVID-19 on the deployment of SDGs. Although COVID-19 has several negative impacts on humans, it has raised several opportunities for humans, including health care,

education, the economy, and the environment. The emerging conditions presented by the crisis may provide opportunities to increase the motivation to complete the SDGs and a reconceptualization of future goals to be met (Fenner and Cernev, 2021). These opportunities, if carefully considered, can aid in the deployment of SDGs. First, as health crises can endanger all humans, without any exception of the region, country, population, or race, it is vital to concentrate on developing health systems over the world. Enhancing healthcare systems is not an option anymore, in which the design of emergency management systems has become a long-term development goal. The prevention and monitoring of future public health epidemics is a significant requirement to manage societies by developing a modern governance system and managing current governance capabilities.

Given that COVID-19 is an emerging viral disease and by focusing on Malaysia as a developing country with restricted resources in the medical sector, several counter-actions were implemented (Rahim et al., 2021). These measures entail (1) the design of a new inspection tool to instantly detect infected people, (2) performing immediate isolation through tracing of individuals, and (3) quarantining individuals with close contact with infected people. Proper utilization of information can be performed to decide what suitable countermeasures are in the regions that have more obstacles in following the response and preparedness plans. As indicated by Hamzah et al. (2021), low-density regions with larger sizes of the population in Malaysia have more available resources than other areas with higher density and lower sizes in populations. Hence, more care should be provided to resource allocation, particularly in these areas. Since the emergence of the crisis, MOH in Malaysia has arranged to meet the worst scenarios, illustrated a clear plan, and provided accessible instructions to community members (Ministry of Health Malaysia, 2020). During the crisis, both public and private medical fields collaborated to recover from the crisis. An example of this is the deployment of rRT-PCR tests by both certified private and public centers, either in hospitals or stand-alone centers. Besides, among 150 public hospitals, 34 hospitals were allocated to face the COVID-19 crisis based on several criteria, among which support systems, count of beds, medical staff, and available equipment (Hashim et al., 2021). Private hospitals have also offered their services to face the pandemic.

Focusing on the education sector, the spread of COVID-19 has resulted in vital amendments in the modes of interaction among community members, in which educational institutions have been impacted significantly. Several measures of “social distancing” have tried to minimize physical contact and reduce the transmission of the disease among students and their families, particularly in locations with a large density of population such as universities and schools (Weeden and Cornwell, 2020). Hence, to respond to this extraordinary condition, a rapid transition to an emergency e-learning protocol has been imposed in several countries over the world. The demand for the de-securitization of traditional learning is evident. The normalization of urgent online learning does not indicate the choice to face the obstacles imposed by traditional learning during the COVID-19 crisis alone (Abumalloh et al., 2021a). It indicates the policies that form the broad adoption of electronic learning as a route to a new normal rather than an emergency plan.

Although COVID-19 has an undeniable impact on the SDGs agenda, it has raised several opportunities such as the swift shift towards technology adoption. The important part of ICT as a key enabler for meeting the SDGs objectives over the world has been addressed by International Telecommunication Union (Chien et al., 2021). The huge advancement in ICT can allow economies to enhance their connectivity, utilize information and knowledge to meet emerging issues, and promote their competitive advantage through technology spillovers (Sinha et al., 2020b). Still, previous literature that explored SDGs and technology has been scarce and has focused on limited areas of research (Sinha et al., 2020a). On the organizational level, the adoption of online or virtual infrastructure during the crisis was quite challenging. Integrating ICT in the field of crisis management is an important topic that aims to support governments in reaching their sustainability goals, particularly the management of unforeseen crises (Sood and Rawat, 2022).

Focusing on the economy, although this crisis originated at a time when the economy is interconnected over the world, this interconnectedness has led to the fast spread of the disease along with a chain response of economic breakdowns (Sharma et al., 2020b). However, the current crisis has opened new opportunities for the development of economies over the world. A circular economy should be repositioned to replace classical linear economy frameworks that are focused on energy-gulping and profiteering to meet economic growth over the world (Ibn-Mohammed et al., 2021).

Lastly, the temporary impact of the crisis on the environment, which is represented by several noticeable changes in air quality, wildlife, air pollution, and bodies of water, has gained the attention of communities and governments (Rupani et al., 2020). This crisis has been combined with a stunning recovery in the environment, particularly with broad social distancing and quarantine rules that were regulated over the globe. Such a change in the environment over the world, in a relatively swift time, would be impossible without the current crisis and its vital impacts (Paital, 2020). This change can be considered to design effective policies that can protect the environment over the world by revising and analyzing unsolved problems related to nature. Governments should provide appropriate blueprints to protect nature while persuading development in several sectors over the globe. The growing interest of business managers to invest in sustainable policies has led to the broad adoption of greener practices (Sharma et al., 2021d).

6.4. Threats

SDGs can be considered a blueprint for human beings. They cover every discipline of communities' lives and well-being. The implementation of SDGs can guarantee a stable and wealthy life for humans without harming the planet. The crisis has caused a severe interruption to SDGs implementation. COVID-19 has influenced the implementation of SDGs with a broad hit on the main folds of income, education, and health. Besides, the COVID-19 crisis has caused an unprecedented “income shock” that is assumed to prompt food insecurity in developing economies. Several factors that threaten the continuity of the SDGs have emerged. COVID-19 has impacted local economies, triggered changes in the deployed policies in the education process in countries (Abumalloh et al., 2021a), and implied unavoidable adjustments in medical care systems (Rupani et al., 2020).

The crisis has influenced developing countries the most. The volume of the economic influence of the crisis in Asian countries relies on the level of the epidemic and the spread of the disease. A severe but short-term decrease in national consumption was reported in the

countries impacted by the crisis (Susantono et al., 2020). The number of travelers to several Asian countries decreased severely because of movement rules and preventive measures employed for disease control. Based on global constraints, the cancellation of global flights has led to wide variations in export and import businesses. Hence, this decrease in business travel and tourism activities raised a request for other areas and markets to be advanced (Joshi et al., 2021). There has been a considerable interruption in the supply chain as a consequence of imposed closures of markets and the workers' inability to reach their work because of border shutdowns and travel restrictions. Particularly, thousands of individuals who rely on day-to-day income have been impacted by the COVID-19 crisis. Considering the security of food, the COVID-19 crisis has substantially influenced almost all Asian countries (Joshi et al., 2021), which is reflected by shortcomings in the supply chain of food. Besides, this crisis has impacted the energy sector and should be analyzed focusing on its influence on sustainability progression. The price of fossil fuel has dropped, and accordingly, the transition of energy will be influenced in the post-COVID era. The energy sector has encountered several troubles to meet the sustainability directions and to follow the most economic-effective route, particularly in developing regions with a very low concentration on renewable energy.

Referring to the travel and social distancing rules, Malaysia was not an exception and followed restricted rules to compact the spread of the disease. By 25 January 2020, the government declared the first case of COVID-19 (Nazri et al., 2021). Following that, by the 18th of March 2020, MCO was declared by the government to control the spread of COVID-19 (Azra et al., 2021). The MCO aimed to limit the activities on both governmental and private levels to basic essential services (Aziz et al., 2020). MCO aimed to control the spread of COVID-19 locally (Othman and Latif, 2021). Based on that, the government banned mass gatherings, suspended business activities, and transferred academic activities to online mode (Kamaludin et al., 2020; Rahim et al., 2021). COVID-19 has impacted several domestic markets, which influenced the economy in the country including tourism and hospitality, accommodation, catering, construction machinery, power heating, and several modes of transportation (plane, rail, and road).

Second, considering the threats faced by the world to meet the SDGs and focusing on the health of communities, a significant aspect to be considered is the ability of countries to fight any new health crisis with devastating impacts like COVID-19. This crisis has doubted the coping capabilities of medical systems over the world (Hashim et al., 2021). Medical systems can reach their limits with inappropriate management and operation. Other unavoidable threats to medical systems are the availability of manpower and the supply of PPE. Both manpower and PPE should be managed properly, particularly during an unprecedented crisis such as COVID-19. The monopolization of PPE during this crisis can lead to increasing demand and insufficient supply. The shortage of PPE in several regions has raised the number of infections (Channel News Asia, 2020; The Jakarta Post, 2020). Another threat that has to be faced by governments in developing countries is the adequacy of the number of allocated beds for COVID-19 in hospitals and ICUs. Other health threats have emerged during this crisis. For example, the deployment of MCOs by the government of Malaysia for beating the infection chain of the COVID-19 disease has led to the emergence of new dengue cases.

Third, COVID-19 has enormous impacts on students' learning outcomes, the development of staff, research outcomes, and the learning process (Ceessay, 2021). To control the disease spread over the world, several countries, including Malaysia, have shut down their educational institutions and the majority of countries decided to temporarily postpone face-to-face learning and moved to a distance learning scheme. Focusing on the impact of COVID-19 on schools over the world, long periods of shutdowns caused various obstacles that entailed a shortage of appropriate nutrition among students, the interruption of the learning process, and a negative influence on academic outcomes (Mukuka et al., 2021).

7. Discussion

Before the COVID-19 crisis, the world was already following an unsustainable development track. The development was highly reliant on fossil fuels, in which the consumption and production models were heading against the world's limits. Increasing inequality in several regions was causing pressure among community members, while various countries experience several conflicts. The need for economic development and economic well-being left less focus on managing crucial aspects such as human health. Anticipating the future of SDGs within the current crisis is complex, in which the deployed strategies in the individual countries and the impact of the crisis on these countries are subject to high levels of uncertainty. Based on (UNDP, 2020), three scenarios are possible. The first assumes a fast V-shaped recovery, which is unlikely to happen. The second scenario proposes a protracted recovery with lasting impacts, which is the most likely to happen. The third scenario entails a worldwide meltdown with fragmentation, wide output losses, delocalization, social unrest, and an increase in the number of migrants to safer regions. There is a need to present coordination policies to contain the crisis and forbid economic fallout which is likely to happen in the third scenario.

In Fig. 16, we present a framework for the deployment of the SDGs with the consideration of the current COVID-19 crisis and by utilizing SWOT analysis. As presented in Fig. 16, for each of the SDGs, the evaluation of the performance can be assessed using SWOT analysis. SWOT analysis focuses on analyzing both the internal and external variables, with the impact of the COVID-19 crisis. Basically, COVID-19 is linked tightly to SDG3 (Good Health and Well-being). However, the impact of COVID-19 on this goal has resulted in interrelated impacts on other sustainable development goals. These interrelations have various significance in each country based on the severity of the disease spread, the lockdown measures, and the readiness of the country to face the crisis. For example, the impact of COVID-19 on the environment was very clear at the beginning of the crisis with lockdown measures reaching a stopping point for tourism activities (Rupani et al., 2020). This impact has decreased with the release of lockdown measures and getting back to normal. As presented in Fig. 16, the evaluation of the progression of SDGs is based on assessing the current situation and the perception of the needed changes. The evaluation process is still under unprecedented shock, but a revolutionary quick amendment in the evaluation approach is required. The perception of the required changes is converted to strategic choices to meet the 2030 agenda. Following that, a list of strategic choices can be presented. However, based on the emerging crisis, many of these SDGs could not be achieved and need to be planned and rescheduled. The chosen strategy can be deployed based on a specific implementation schedule.

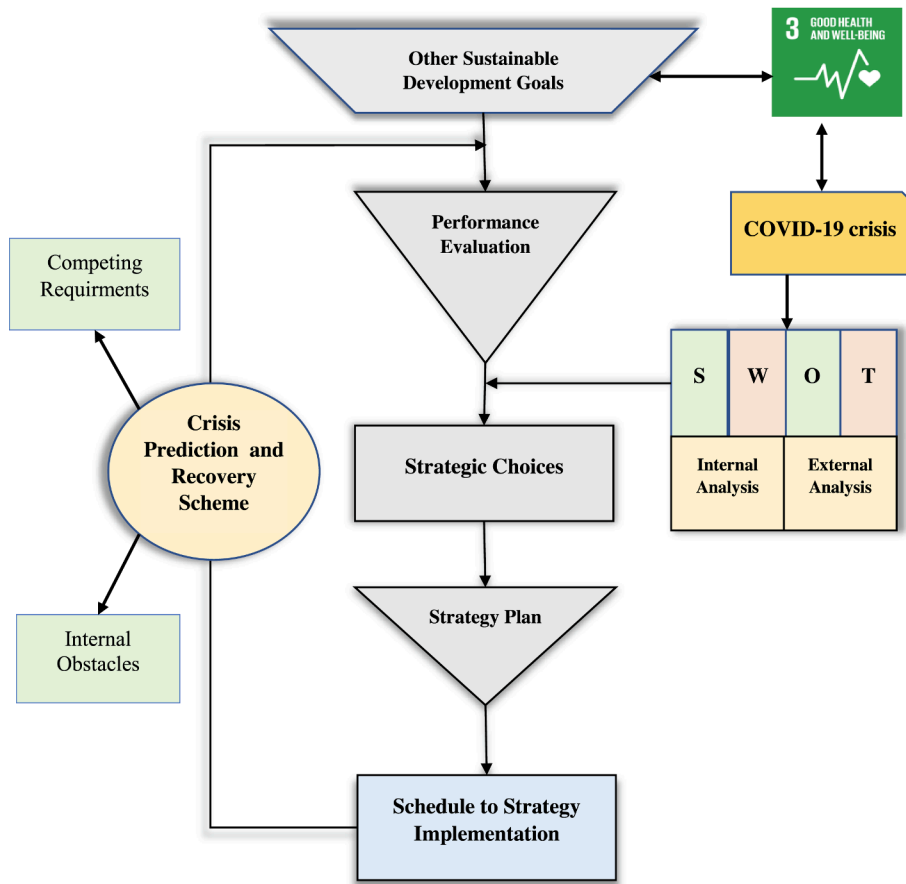


Fig. 16. Proposed Framework of SDGs in Light of COVID-19 Crisis.

Efficient collaborative implementation strategies for crisis recovery need a balance of competing requirements and facing internal obstacles. Hence, it is important to incorporate the crisis recovery and prediction scheme in SDGs implementation and performance evaluation. The crisis recovery should address two aspects of competing requirements and internal obstacles.

8. Research contributions

The research has several contributions in terms of methodology and practice that we will summarise in this section. The deployed methodology which investigated the previous literature through two types of analysis; bibliometric and SWOT, can present several insights for decision-makers and explore the existing body of knowledge from different views. While the bibliometric analysis explores the literature through specific visualizations focusing on specific items and the relations between them to understand how previous literature has manipulated a specific topic, the SWOT analysis aims to appraise four folds of strengths, weaknesses, opportunities, and threats that influence a specific issue. Hence, integrating these methods can present a broader perception of the topic under study. Although each of the SDGs and COVID-19 has gained increasing attention from researchers and has been explored in different contexts, there is a lack of research on the impact of COVID-19 on the implementation of SDGs (Elavarasan et al., 2021). Hence, deploying the bibliometric and SWOT analyses on this particular topic can help scholars to understand the research trends, directions, and themes.

The research indicated several practical contributions for governments and decision-makers. First, the impact of the crisis on the performance of SDGs indicates that each goal needs a careful analysis based on the performance of each country and based on the emerging crisis and its consequences (Ameli et al., 2022). This emerging crisis calls for novel strategies to aid people to reach sustainable well-being (Sharma et al., 2020a). For example, and focusing on the environment, nations with limited natural resources can control the harmful impacts on the environment by restricting imports and consumption rates of fossil fuels (Merino-Saum et al., 2018). Besides, natural resource degradation can be minimized by adopting sustainable strategies and carefully managing natural resource consumption and utilization, which accordingly allows the restoration and replenishment of these resources (Khan et al., 2021). Second, COVID-19, as an emerging communicable disease, has a direct relation to SDGs, particularly SDG 3. For instance, based on the crisis, decision-makers may decide to intensify the provided support to the medical sector, particularly in developing regions. They should also concentrate on the socio-economic influences of the pandemic. Other interrelated variables that have resulted from

the crisis should be considered in the recovery plans. Third, the current epidemic indicated that countries require immediate actions to meet the 2030 view of the SDGs. Governments had to balance the demand for mitigation to enforce appropriate emergency policies based on the assumption of herd immunity (Heggen et al., 2020). Hence, meeting the evolutionary vision of the SDGs by 2030 needs a basic restructuring of most countries' local policies toward long-run, collaborative, and significantly expedited strategies (The Lancet Public Health, 2020). Fourth, sustainable management can only be followed when awareness is improved among community members. Decision-makers should utilize various forms of media to spread knowledge about sustainable actions and how to protect natural resources. Additionally, researchers' efforts should be focused on and induced by appropriate investment to address the shortcomings in the existing production practices. Fifth, traditional development practices should be replaced with sustainable economic development practices, by adopting environmental-friendly plans and acquiring effective innovations with flexible financing choices. This can be also deployed by providing motivation to industries with environmental-conducive strategies and regulating more taxes on industries that cause pollution through unhealthy activities. Finally, countries' innovation capacities have played an important role in development, which has been reflected by economic progress, society's development, and environmental quality (Sinha et al., 2020b). Technologies, tools, equipment, and appliances should be utilized to allow maximum effectiveness in deploying domestic and global commercial practices. This will aid in meeting sustainable development goals and allow fast recovery from the crisis. Even before the crisis, the deployment of technologies has been explored with a focus on meeting the SDGs in several contexts, such as improving environment quality (Sinha et al., 2020a), emerging economies (Liu et al., 2022), and health and well-being (Yadav et al., 2022). In the context COVID-19 crisis, several technologies are anticipated to play a major role in the crisis recovery focusing on the industry (Ebekeozien and Aigbavboa, 2021), the green economy (Shah et al., 2021), and hospitality management (Chadee et al., 2021). Hence, more focus should be allocated by decision makers to utilize the emerging technologies to recover from the crisis aiming to meet the SDGs.

9. Conclusion

SWOT analysis is a reliable and widely used tool for strategic planning (Kaymaz et al., 2021). Strengths and weaknesses represent the internal variables of SWOT, while opportunities and threats represent the external variables. Investigating internal variables means identifying and assessing the managerial views that may impact the achievement or failure of the deployed policies in the applied field. On the other hand, the analysis of external variables entails other environmental variables, which cannot be supervised by the organization, but they impact the achievement of the organization (Tavana et al., 2016). Hence, SWOT enables the classification of variables, that impact the decision, as internal and external, thus allowing the comparison of various variables based on the presented classification (Etongo et al., 2018). Finally, policies are presented to promote development by deploying strengths, reducing weaknesses, considering opportunities, and preventing threats (Khan, 2018). Hence, SWOT can be used to analyze the current situation of SDGs deployment to present practical insights for decision-makers.

Although SDGs have been introduced as independent targets, they are systematically interconnected to each other (Harris et al., 2020), in which one goal has a positive or negative influence on other goals (Omer and Noguchi, 2020; Pradhan, 2019). Several studies have investigated SDGs focusing on several disciplines of research including water poverty (Ladi et al., 2021), energy (Elavarasan et al., 2021), smart cities (Grossi and Trunova, 2021), environment (Boess et al., 2021), and soil (Erdogan et al., 2021). Nowadays, meeting SDGs presents a vital challenge to governments as the performance of these goals requires the design of an innovative and integrated plan with the collaboration of several stakeholders at the country level. This will demand more resources, innovations, and technologies (Bebbington and Unerman, 2018). Countries can provide required regulations, follow up the performance, and revise the achievement of these goals at regional, national, and local degrees (Yin et al., 2019). In each country, meeting each goal will be linked with various levels of challenge based on the current development situation, such as urban and economic growth (Osborn et al., 2015). The emergence of the COVID-19 crisis has presented a new challenge to the deployment of SDGs on the global and local levels.

COVID-19 has caused wide challenges and huge opportunities for meeting the SDG's agenda. With the advent of the current crisis, the whole sustainable development progression has been delayed and vital issues have been enlarged. The pandemic has impacted the countries of South Asia with an increasing regional representation of 4% by May 2020 (Karunathilake, 2021). This crisis has challenged traditional crisis-recovery methods. Hence, the post-crisis stage demonstrates the urgent demand for effective sustainable development policies (Elavarasan et al., 2021). Several strategies would be presented at this point, but the most effective solution which has the most sustainable features should take priority and should be deployed. Understanding the origins of epidemics and investigating their determining factors will aid in developing policies that could prevent future crises. On the other hand, the crisis has shown us the common sense of what is essential in the SDGs; the obstacles we meet cannot be beaten by each country separately. Good plans can be defined from other peers to further enhance overall performance and accordingly improve the level of preparedness and response. Hence, an important aspect to be considered is the partnership with other countries to face the pandemic and recover from its impacts.

This research has some shortcomings referring to the inclusion criterion of studies, as only articles indexed in the Scopus database were included. A future study can be conducted to include other databases. Scopus database was chosen as it includes journals with high-impact articles. Another reason for this choice is that databases from various sources generate different files with various forms that are difficult to merge and analyze using the chosen software for bibliometric analysis. Future research can be expanded, as a systematic literature review, to include other electronic databases and interpret the outcomes following inclusion and exclusion conditions and quality assessment procedures. Future research can investigate decision-makers perceptions to go in-depth with the analysis of the factors that impact the deployment of SDGs using Multi-Criteria Decision-Making (MCDM). MCDM can help to design a blueprint for the implementation of the SDGs on the regional level (Aljaghoub et al.).

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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Appendix A: Number of Citations and Total Link Strength based on Organization.

Organization	Citations	Total Link Strength
Department of Natural Sciences, Manchester Metropolitan University	47	4
European School of Sustainability Science and Research, Hamburg University of Applied Sciences	47	4
Faculty of Engineering and Architecture (FEAR), University of Passo Gundo (UPF)	47	4
Faculty of Finance and Management, WSB University in Wrocław	47	4
The Business School, University of Winchester	47	4
Department of Economics, Faculty of Management Sciences, Al-hikmah University	42	10
Department of Industrial Engineering, College of Engineering, American University of Sharjah	42	10
Department of Management, Birkbeck University of London	42	10
Faculty of Economics and Management, Universiti Kebangsaan Malaysia	42	10
Faculty of Economics, Kyushu University	42	10
Faculty of Engineering and Science, University of Nottingham	42	10
Kent Business School, University of Kent	42	10
School of Life Sciences, University of Nottingham	42	10
School of the Built Environment and Architecture	42	10
Sheffield University Management School, the University of Sheffield	42	10
Warwick Manufacturing Group, the University of Warwick	42	10
AgResearch –Lincoln Research Centre	40	4
Agriculture and Agri-Food Canada, Lethbridge Research and Development Centre	40	4
Inrae-agir, Auzeville	40	4
Institute for Study and Development Worldwide	40	4
International Livestock Research Institute	40	4
Department of Economics and School of Global Environmental Sustainability	40	1
Department of Economics and School of Global Sustainability	40	1
Department of Public Health and Informatics, Jahangirnagar University	35	5
Department of Statistics, Jahangirnagar University	35	5
Department of Statistics, Islamic university	35	4
Infectious Diseases Division, International Centre for Diarrhoeal Disease Research	35	4
Institute of Statistical Research and Training, University of Dhaka	35	4
Beihang University	31	1
The University of New South Wales	31	1
Department of Basic, Vietnam Academy for Ethnic Minorities	26	13
Alumnus, Graduate School of Economics	25	2
Social Science Research Institute, Tokai University	25	2
Keio University and Visiting Professor, National Graduate Institute for Policy Studies	25	2
Independent Expert	23	2
Renewable Energy Consortium for R&D	23	2
“Galileo Ferraris” Energy Department, Polytechnic of Turin	23	2
Climate Change Programme	22	2
Department of Disaster Management	22	2
Department of Environmental Sciences	22	2

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