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Study of sustainable development goals of Syrian higher education: strategy, effects and future insights

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Abstract

Purpose – This research mainly aims to shed light on sustainable development in Syrian higher education during the Syrian crisis.

Design/methodology/approach – In this research, the authors mainly study sustainable development in the Syrian Arab Republic through the bibliometrics data of universities and research centres in Syrian Arab Republic, where these data are related to sustainable development. Also, the authors study the strategies used in the university with the largest research output of sustainable development in the Syrian Arab Republic. The authors extract research data arranged in sustainable development goals in the Syrian Arab Republic from SciVal database.

Findings – Based on the bibliometric data on sustainable development research in the Syrian Arab Republic, the authors find that universities and research centres in the Syrian Arab Republic have taken important steps towards the goals of sustainable development, especially in the year 2022. The authors also find that the University of Damascus had the largest share in research related to the goals of sustainable development, and the authors find that this is due to the strategies taken by the University of Damascus towards the goals of sustainable development, such as the policy of digital transformation, the policy of recycling and the increase of green areas in the university.

Originality/value – This study is the first of its kind to study the goals of sustainable development in Syrian higher education during the Syrian crisis period.

Keywords Sustainable development, Low-income country, Syrian Arab Republic, SDG, Future

Paper type Research paper

Introduction

As of 2015, the United Nations, through its General Assembly, launched the Global Goals (GGs) or the Sustainable Development Goals (SDGs). The first SDGs goal, SDG-1, is defined as "No Poverty" goal (Zavyalova & Krotova, 2021). The second SDGs goal, SDG-2, is defined as "Zero Hunger" goal (Vogliano *et al.*, 2021). The third SDGs goal, SDG-3, is defined as "Well Being" and "Good Health" (Makarenko, Plastun, Situm, Serpeninova, & Sorrentino, 2021). The fourth SDGs goal, SDG-4, is defined as (Topothai *et al.*, 2022). The fifth SDGs goal, SDG-5, is defined as "Gender Equality" (Kemechian *et al.*, 2023). The sixth SDGs goal, SDG-6, is defined as "Clean Water" and "Sanitation" (Girmay *et al.*, 2023). The seventh SDGs goal, SDG-7, is defined as "Affordable" and "Clean Energy" (Anaba & Olubusoye, 2021). The eighth SDGs goal, SDG-8, is defined as "Decent Work" and "Economic Growth" (Alsaad, Hamdan, Binsaddig, & Kanan, 2023). The nine SDGs goal, SDG-8, is defined as "Industry", "Innovation" and "Infrastructure"

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(Gyadu-Asiedu, Ampadu-Asiamah, & Fokuo-Kusi, 2021). The tenth SDGs goal, SDG-10, is defined as "Reduce Inequality" (Basnett, Myers, & Elias, 2019). The eleventh SDGs goal, SDG-11, is defined as "Sustainable Cities" and "Sustainable Communities" (Bounoua *et al.*, 2023). The twelfth SDGs goal, SDG-12, is defined as "Responsible Consumption" and "Production" (Schröder *et al.*, 2019). The thirteenth SDGs goal, SDG-13, is defined as "Climate Action" (Njoya *et al.*, 2022). The fourteenth SDGs goal, SDG-14, is defined as "Life" below "Water" (Tretjakova *et al.*, 2022), and the related goal, the fifteenth SDGs goal, SDG-15, is defined as "Life" on "Land" (Moller *et al.*, 2022). The sixteenth SDGs goal, SDG-16, is defined as "Peace", "Justice" and "Strong Institutions" (Haque, Salehin, Ferdous, Billah & Rahman, 2021). The seventeenth SDGs goal, SDG-17 and last one of the SDGs, is defined as "Partnerships for the Goals" (MacDonald, Clarke, Huang, Roseland & Seitanidi, 2018), and it is known as SDG-17 or GG-17. In Figure 1, we illustrated the full SDGs. Although each of the sustainable development goals has its indicators and determinants, these goals are linked to each other. Several important studies were conducted after its launch by the United Nations in its General Assembly in 2015. For example, Edziah, Sun, Adom, Wang & Agyemang (2022) discussed two significant factors for reducing CO2 emission. Al-Raeei (2023) discussed the increasing of the green areas of the intuitions and its effects on the environment. Sun, Sun, Geng, Yang & Edziah (2019) discussed the advantages of the natural resources and their effects on the education. In this study, we discuss the sustainable development goals output which is resulted from the higher education researchers of the higher education in the Syrian Arab Republic. We focus on the tow specific methodologies. The first is

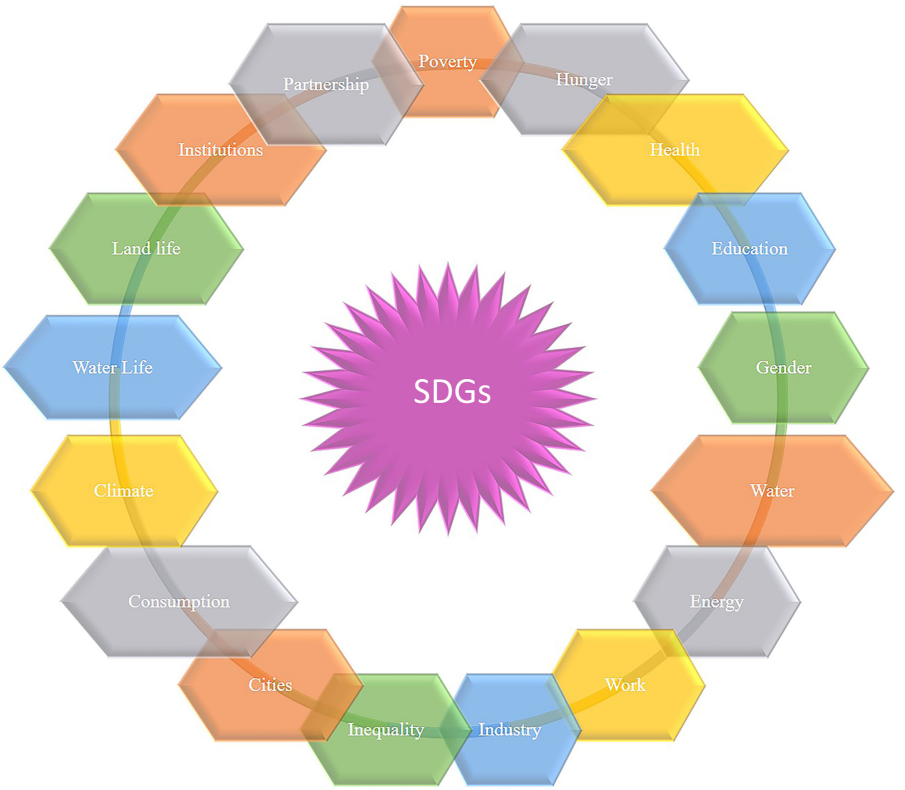

Figure 1.
The 17 sustainable development goals

Source(s): Figure by authors

related to the study of the bibliometric data resulted from SciVal and Scopus database where we extracted the data related to the sustainable development goals documents published by Syrian researchers and abstracted and indexed in Scopus database. We analyse the data for the full distribution of the Syrian researchers and focus on the higher education documents, which are mainly related to four universities or research centres. These four universities or research centres are Damascus University, Tishreen University, University of Aleppo and Atomic Commission of Syrian Arab Republic. The second is related to some strategies applied in Damascus University as a specific study because as we will see this university has the main key role of the sustainable development goals in the Syrian higher education. We focus on the last five years of the Syrian crisis in our study of the sustainable development goals of the Syrian higher education which is from 2018 to 2022. In the second section of this study, we discuss the main methodology which we employed for the study. In the third section we illustrate the main results related to the sustainable development goals in the Syrian Arab Republic. In the last section of the study, we discuss some conclusion remarks related to the SDGs in the Syrian higher education.

Methods

In this section, we explain the method used in this study. Where we begin to extract the research data of the SciVal website, the research data of the researchers of the Syrian Arab Republic. The method, which we use, depends on retrieving the Scopus and SciVal data of the sustainable development goals for a specific institution (Al-Raeei, 2023). For this purpose, we used two types of the string search in Scopus as follows:

1-The first search string returns to finding a specific country which is Syrian Arab Republic in our study.

2-The second search string returns to finding a specific sustainable development goal from the database.

For the study of the sustainable development goal including the results of the institution, we merge between the two search strings using the operators in the Scopus database such as AND operator and OR operator. For example, for University of Aleppo and for the period between 2018 and 2022, we use the following search string: "AF-ID ("University of Aleppo" 60072762) OR AF-ID ("Aleppo Faculty of Medicine" 60072763) AND (LIMIT-TO (PUBYEAR, 2022) OR LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018))". So, if we need to discuss the fourth sustainable development goal of University of Aleppo, we use the previous search string related to University of Aleppo in addition to the search string returns to the SDG-4 which is given as: "TITLE-ABS-KEY ((school OR education OR educational) AND ({school attendance} OR {school enrollment} OR {school enrolment} OR {inclusive education} OR {educational inequality} OR {education quality} OR {educational enrolment} OR {educational enrollment} OR {adult literacy} OR {numeracy rate} OR {educational environment} OR {educational access} OR ({development aid} AND {teacher training}) OR {early childhood education} OR {basic education} OR {affordable education} OR {educational financial aid} OR {school safety} OR {safety in school} OR ({learning opportunities} AND ({gender disparities} OR empowerment)) OR ({learning opportunity} AND ({gender disparities} OR empowerment)) OR {youth empowerment} OR {women empowerment} OR {equal opportunities} OR {child labour} OR {child labor} OR {discriminatory} OR {educational inequality} OR {educational gap} OR ({poverty trap} AND {schooling}) OR {special education needs} OR {inclusive education system} OR ({schooling} AND ({gender disparities} OR {ethnic disparities} OR {racial disparities})) OR

{education exclusion} OR {education dropouts} OR {global citizenship} OR {sustainable development education} OR {environmental education} OR {education policy} OR {educational policies} OR {international education} OR {education reform} OR ({educational reform} AND {developing countries}) OR {educational governance} OR ({developing countries} AND {school effects}) OR {education expenditure} OR {foreign aid} OR ({teacher training} AND {developing countries}) OR {teacher attrition}) AND NOT {health literacy})". So, the full search string which we must use for the SDG-4 of University of Aleppo is: "TITLE-ABS-KEY ((school OR education OR educational) AND ({school attendance} OR {school enrollment} OR {school enrolment} OR {inclusive education} OR {educational inequality} OR {education quality} OR {educational enrolment} OR {educational enrollment} OR {adult literacy} OR {numeracy rate} OR {educational environment} OR {educational access} OR ({development aid} AND {teacher training}) OR {early childhood education} OR {basic education} OR {affordable education} OR {educational financial aid} OR {school safety} OR {safety in school} OR ({learning opportunities} AND ({gender disparities} OR empowerment)) OR ({learning opportunity} AND ({gender disparities} OR empowerment)) OR {youth empowerment} OR {women empowerment} OR {equal opportunities} OR {child labour} OR {child labor} OR {discriminatory} OR {educational inequality} OR {educational gap} OR ({poverty trap} AND {schooling}) OR {special education needs} OR {inclusive education system} OR ({schooling} AND ({gender disparities} OR {ethnic disparities} OR {racial disparities})) OR {education exclusion} OR {education dropouts} OR {global citizenship} OR {sustainable development education} OR {environmental education} OR {education policy} OR {educational policies} OR {international education} OR {education reform} OR ({educational reform} AND {developing countries}) OR {educational governance} OR ({developing countries} AND {school effects}) OR {education expenditure} OR {foreign aid} OR ({teacher training} AND {developing countries}) OR {teacher attrition}) AND NOT {health literacy}) AND AF-ID ("University of Aleppo" 60072762) OR AF-ID ("Aleppo Faculty of Medicine" 60072763) AND (LIMIT-TO (PUBYEAR, 2022) OR LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2018))." We apply the same previous search string for all universities and research centres in the Syrian Arab Republic. Also, we apply the search string for all of the sustainable development goals.

As we see from this search string, the search string includes the string returns to the fourth sustainable development goal in addition to the universities and research centres of the Syrian Arab Republic search string. The same procedure is applied for other SDGs. Based on the full searches, we find all bibliometrics data related to the sustainability results of the researchers in the Syrian Arab Republic. Also and as a specific case study, we deal with some of the policies which university of Damascus has been adopting of sustainable development in a large number of aspects related to the educational, societal and research aspects.

Results and discussion

In this section, we talk about the main results related to the sustainable developments goals of the Syrian higher education based on the data which we extracted from SciVal and Scopus databases. Also, we talk about some procedures of a special case of the sustainability in the Syrian higher education which is Damascus University. First, in Figure 2, we plotted the number of SDG documents published by researchers in the Syrian Arab Republic during the last five years of the Syrian crisis, from 2018 to 2022. These documents are indexed and abstracted in the Scopus database. As we can see from Figure 2, the total number of the SDGs documents in 2022, in the Syrian Arab Republic, reach to a 35% of the total number of the SDGs published documents. This fact means that

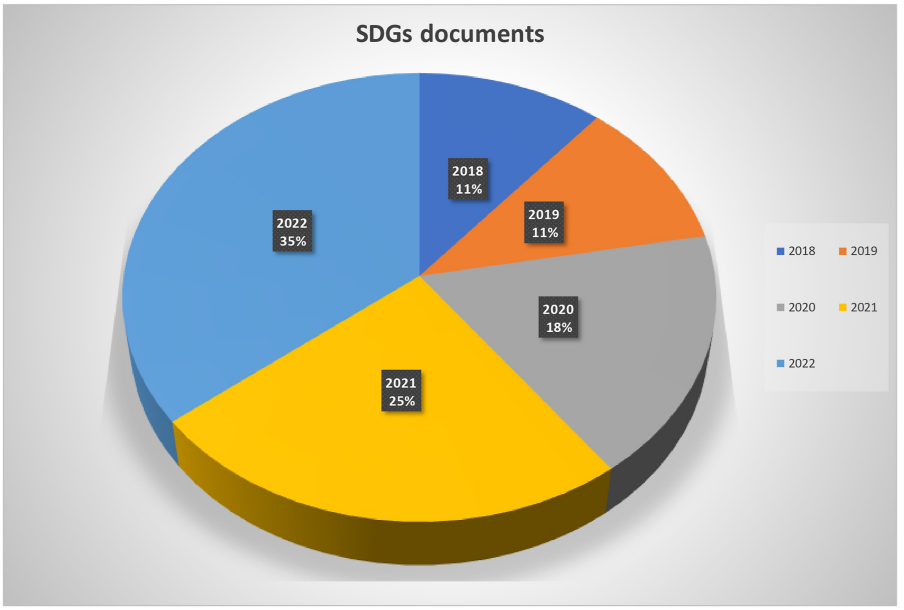

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Figure 2.
The sustainable development goals' documents of the Syrian Arab Republic

in 2022, there are effective procedures towards achieving the sustainable development goals in the different areas in the Syrian Arab Republic. Also, we can also see from Figure 2 that the SDGs documents in 2018 and 2019 represent only 11% of the total documents. In 2020, the number of the SDGs documents represents about 18% of the total documents. In 2021 the number of the SDGs documents represents 25% of the total documents. Based on the SciVal data related to the SDGs documents published by the Syrian researchers, we find that the total number of the SDGs documents equals to 1767 published documents. When we analyse the bibliometrics data of the published documents, we find that the higher education in the Syrian Arab Republic has the largest number of the research related to the sustainable development goals. The four research centres and universities which have the effective output are Damascus University, Tishreen University, University of Aleppo and Atomic Commission of Syria. For this reason, in Figure 3, we plotted the total number of the SDGs published documents by the researchers affiliated in each one of the previous four institutions in the same considered period. As we can see from Figure 3, the total number of the SDGs documents published by the researchers affiliated with the Atomic Commission of Syrian Arab Republic is 94 documents, where this is the smallest number of the SDGs documents of the four institutions. Also, we see from Figure 3 that the total number of the SDGs documents published by the researchers affiliated with University of Aleppo is 291 documents, and the total number of the SDGs documents published by the researchers affiliated with Tishreen University is 149 documents. The most significant aspect of Figure 3 returns to the total number of the SDGs documents published by the researchers affiliated with Damascus University. This number equals to 700 documents which is the highest number of the SDGs documents published by the researchers in the Syrian Arab Republic. Since the year 2022 was the year with the most publication of the SDG files in the Syrian Arab Republic. In Figure 4, we plotted the data of the sustainable development goals documents based on the Scopus database for each of

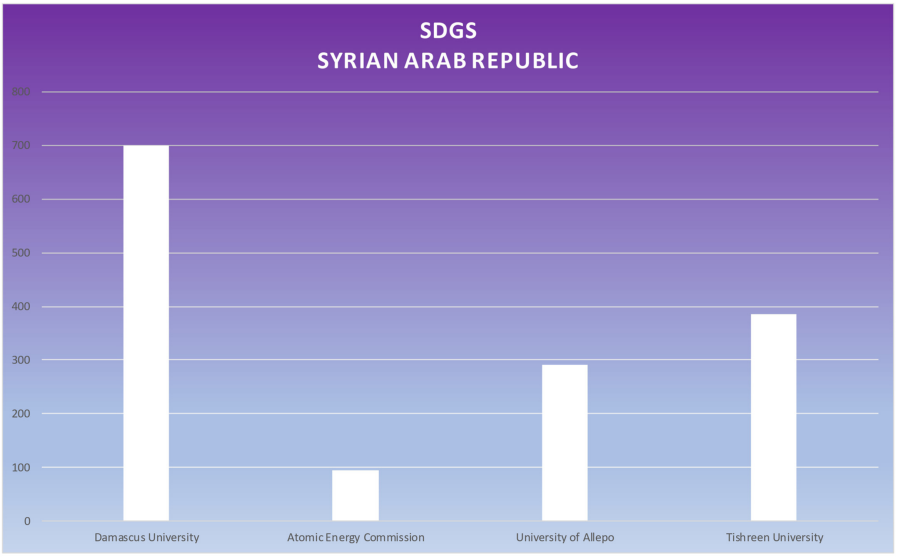

Figure 3.
The total number of the sustainable development goals documents of Damascus University, Tishreen University, University of Aleppo and Atomic Commission of Syria

Source(s): Figure by authors

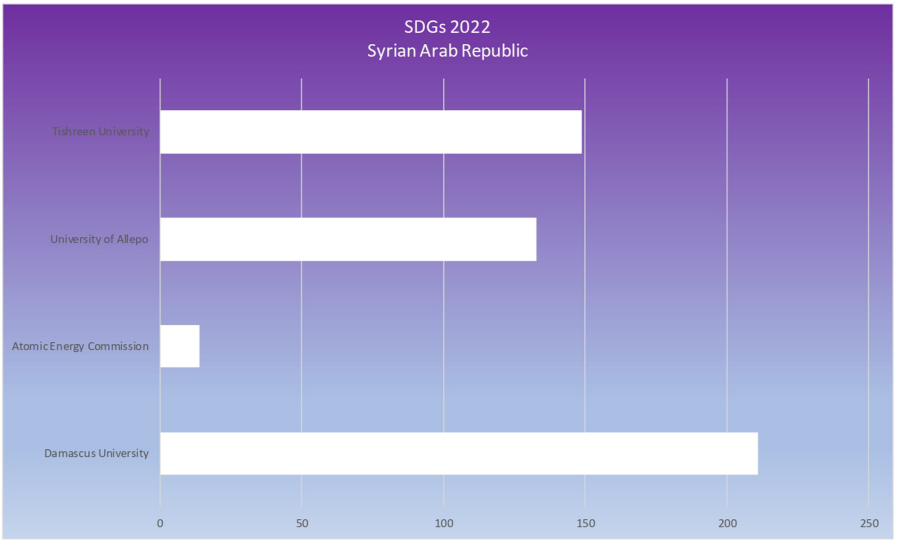

Figure 4.
The SDGs documents in 2022 for Damascus University, Tishreen University, University of Aleppo and Atomic Commission of Syria

Source(s): Figure by authors

the four previous institutions in that year. We note from Figure 4 that the total number of sustainable development goals documents in the year 2022 was the lowest for the Syrian Atomic Energy Commission with only 14 files, whilst the largest number was for the University of Damascus with 211 files. Given that the University of Damascus had the largest share in sustainable development research files at the level of the Syrian Arab Republic, we present at the end of this section three of the most important measures taken

by the University of Damascus towards achieving the goals of sustainable development. In Figure 5, we represent the most important goals of sustainable development that Damascus University has reached a number of its indicators, and we will talk about three of them in greater detail. The first important point that we are talking about within the framework of Damascus University's procedures towards achieving the goals of sustainable development is the university's digital transformation policy, which has emerged through a large number of exits. For example, the adoption of the electronic book in the year 2023, and the adoption of the open-source journal system (OJS) in internal publishing related to university journals, in addition to the issuance of examination results electronically instead of paper. The second important point that we are talking about is starting with the waste recycling policy issued by the University of Damascus. As the university tended to recycle all the paper waste issued by it. The amount of waste generated by the university in all its four branches (the main headquarters in Damascus and the branches of As-Suwayda, Daraa and Quneitra) is 5450 kg per day, and the amount of paper waste that is recycled daily at the university is 53 kg per day. As for the last important point that we are talking about in this study, it is increasing the green area in Damascus University. This green area has its effects on the climate changes (Climate Strategy, 2023). The green area has reached more than sixty percent of the total area of the university, which is reflected in the entire city of Damascus. Of course, there are other indicators of the sustainable development goals that Damascus University has achieved and followed up on, such as education in medical sciences (Shehada, Alfakhry, Jamous, Aljoujou, & Abdul_hak, 2023; Alfakhry *et al.*, 2023) and general and public health (Al-Raeei, 2022; Alsuliman *et al.*, 2023), as this is reflected in a number of sustainable development goals. The significance of the results obtained in this study compared to previous studies is that it is the first study of its kind that sheds light on the goals of sustainable development in Syrian higher education. Where we shed light on the research of sustainable development goals in universities and research centres in the Syrian Arab Republic with a bibliometric study of these goals, whilst linking that study to the strategy of Syrian higher education within the goals of sustainable development through the largest university in the Syrian Arab Republic.

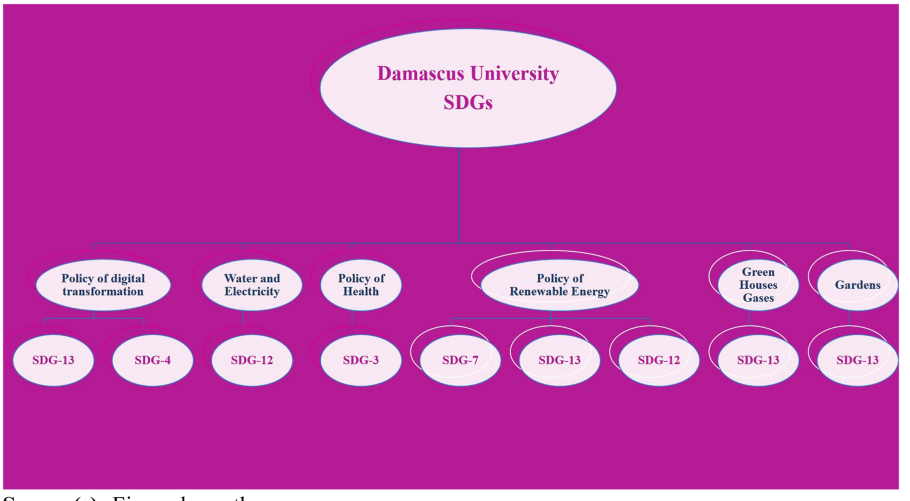

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Figure 5.
The main procedures of Damascus University towards the sustainable development goals

Conclusions

This study mainly aimed at studying the goals of sustainable development in Syrian higher education, with a focus on studying the most prominent strategies of sustainable development in the university with the greatest contribution to reaching the indicators and determinants of sustainable development goals, which is the University of Damascus.

We mainly extracted bibliometric data on the sustainable development goals for research published by researchers in the Syrian Arab Republic, based on the SciVal data. We found that the greatest impact on the SDGs is due to research published by Syrian higher education researchers. Where we found that four universities or research centres had the most prominent role in these researches, namely: Damascus University, Tishreen University, University of Aleppo and Atomic Commission of Syrian Arab Republic. The largest progress in sustainable development researches of the Syrian Arab Republic in the year 2022 and the largest share in these researches belongs to the University of Damascus. For this reason, we presented a number of sustainable development goals measures at Damascus University. Damascus University has reached to SDG-4, SDG-7, SDG-3, SDG-13 and SDG-12. Also, the university has reached to other indicators of the SDGs partially. The university has adopted a policy of digital transformation, increasing green space and a recycling policy in addition to its procedures related to health, education and mud sustainability. Damascus University is following up on its future measures towards achieving a greater number of indicators and determinants of the sustainable development goals through a number of things, the most important of which is increasing the recycling policy, increasing the digital transformation policy, in addition to increasing support for the health sector in its university hospitals.

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