



JUTLP

Journal of University Teaching & Learning Practice

Awarded Research Grants as a Pathway to Sustainable Development Goals (SDGs)

Maha Inam¹, Salim S. Virani², Melaine D'Cruze², Veronica Robi³, Peter Gatiti³, Anil Khamis^{3,4}

¹Temple University Hospital, United States; ²Aga Khan University, Pakistan; ³Aga Khan University, Kenya; ⁴University College London Institute of Education, United Kingdom

Abstract

The United Nations Sustainable Development Goals (SDGs) are a set of global goals that provide an agenda for sustainable growth and development across all sectors and disciplines. However, the contribution of academic institutions from the developing world towards the SDGs has not received adequate attention from the scientific community. A review of all the awarded grants in 2022 and 2023 at an international academic institution was conducted. The objectives outlined in the grant proposals were used to map the SDGs accordingly. A quantitative frequency analysis was conducted to tabulate the results. A total of 293 grants obtained in 2022 and 2023 were included in our study. The mapping revealed a predominantly health-related focus with SDG3 (80.9%, n=237) as the most commonly covered goal, followed by achieving gender equality (SDG5, 11.6%, n=34), promoting education (SDG4, 10.9%, n=32), and ending hunger (SDG2, 10.6%, n=31). This aligns with the institution's original focus on the health sciences, with further expansion focusing on the social sciences, identifying both mandates as critical areas of need in the developing country context. A mean of 2.0 SDGs per grant, with 46% of grants covering more than one SDG. We report contributions from an academic institution's research portfolio towards the SDGs, assess current trends, and identify future areas of focus. We highlight the importance of developing an SDG monitoring and evaluation framework for universities and present an actionable solution for institutions to track their progress towards achieving the SDGs. We also stress the importance of contextualising focus and prioritising goals in line with institutionally relevant aims.

Keywords

Sustainable Development Goals, Low-Middle Income Countries, Research Grants

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Publication

Received: 24 May 2024
Revised: 8 November 2024
Accepted: 1 December 2025
Online First: 16 March 2026
Published: 26 March 2026

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Citation: Inam, M., Virani, S.S., D'Cruze, M., Robi, V., Gatiti, P., & Khamis, A. (2026). Awarded Research Grants as a Pathway to Sustainable Development Goals (SDGs). *Journal of University Teaching and Learning Practice*, 23(6). <https://doi.org/10.53761/c6kj3t37>

Introduction

The Sustainable Development Goals (SDGs), adopted by the United Nations (UN) in 2015, are a universal set of goals, targets, and indicators which are expected to shape the global agenda on economic, social, and environmental development for the next 15 years (*Transforming Our World: The 2030 Agenda for Sustainable Development* | Department of Economic and Social Affairs, n.d.). Globally, the SDGs provide a holistic and transformative framework to promote prosperity and sustainable growth through the organised and collaborative efforts of society (Morton et al., 2019).

The SDGs have a strong interrelationship between sectors and countries, which allows them to measure progress across various domains of development (Yamaguchi et al., 2023). Due to the unique nature of these interdependencies, it is imperative for national and international agencies to work collaboratively towards a common goal. Similarly, the SDGs have increasingly been used as a reference point for a systems-based approach for a wide range of public and private institutions, and provide a blueprint for institutional aims and objectives (Khaled et al., 2021, p. 2). There are substantial geographic and income-related disparities in SDG achievement, with low- and middle-income countries experiencing lower performance and greater unmet needs. Despite this, SDG-related research remains disproportionately concentrated in high-income settings, resulting in the underrepresentation of developing countries in the scientific literature (Asadikia et al., 2022; Mishra et al., 2023).

Our study aims to evaluate how awarded research grants within a low- and middle-income country academic institution align with and distribute across the SDGs using a combined SDG-mapping and bibliometric approach. We further aim to characterize the thematic distribution, strengths, and gaps of the institution's research portfolio across regions and time, and to assess how these patterns can inform institutional research strategy and progress toward development-oriented missions. Our research questions are: 1. How do awarded research grants within a low- and middle-income country institution align with and distribute across the Sustainable Development Goals (SDGs) in relation to global SDG priorities?, and 2. What does a combined SDG-mapping and bibliometric analysis reveal about the thematic distribution, strengths, and gaps of a low-middle income country based academic institution's research portfolio, and how can these findings inform institutional research strategy?

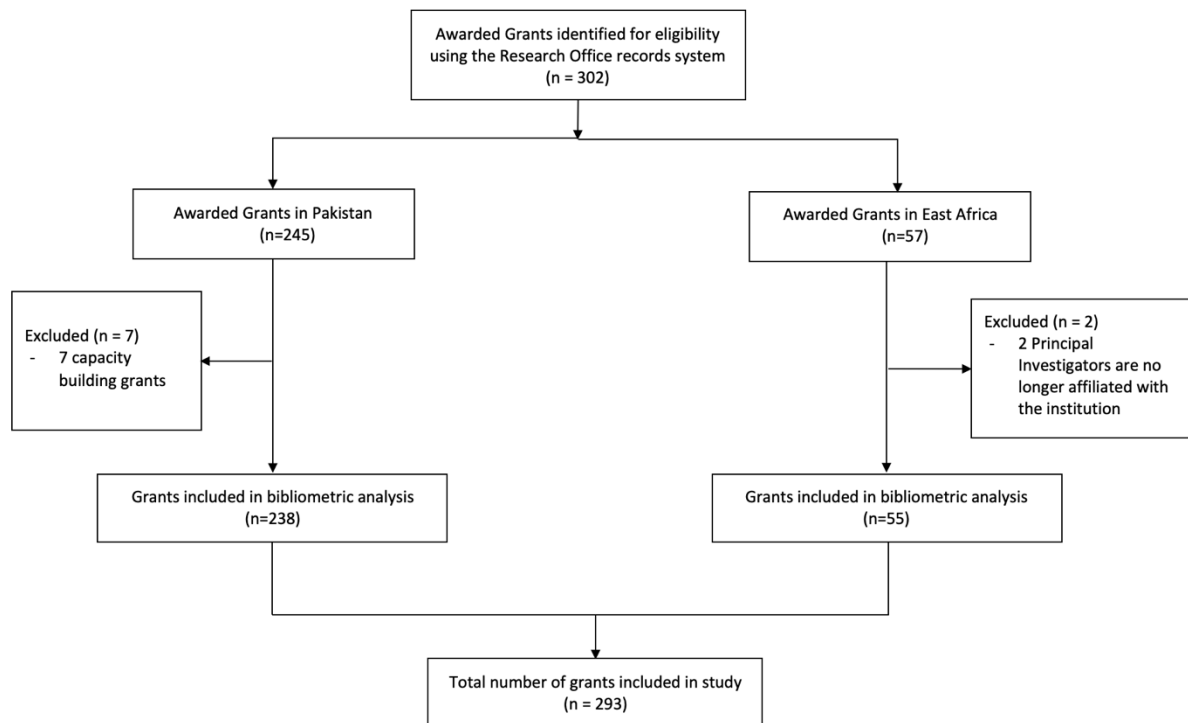
For this purpose, we provide an analysis of awarded extramural research grants, addressing specific SDGs which have been carried out by researchers affiliated with the Aga Khan University (AKU). AKU is an international institution with campuses in Pakistan, Afghanistan, Kenya, Tanzania, Uganda, and the United Kingdom that primarily serves the human development needs of the Majoritarian World. Our mapping serves to provide an overview of our scientific portfolio, establish trends, and identify gaps to serve as an example for academic institutions to determine their contribution to the SDGs and measure their progress. This mapping exercise, supplemented by a bibliometric analysis, presents an evidence base of the institution's research profile which validates growth towards its mission statement and mandate. Reflecting on internal reports allows for identification of areas of strength as well as gaps to address the SDGs, assisting in the creation of a strategic framework which can be targeted towards overcoming these gaps.

Method

This study aimed to examine and map the grants awarded to AKU in 2022 and 2023 to the SDGs as detailed by the UN in 2015. The lists of grants awarded in 2022 and 2023 were obtained from the research office databases in Pakistan and East Africa. The inclusion criteria included all extramural awarded grants in 2022 and 2023 to authors associated with AKU. A total of 302 grants were identified for eligibility, and 293 grants were included as part of our study following exclusion (see Figure 1).

Figure 1

Study flow chart



The dataset included information on Proposal Identification (ID), Project Title, Country, Department Name, Entity, Principal Investigator, Granting Agency, Approved Currency, Grant Amount, Approved Budget, and Funding Source. Two researchers independently undertook the mapping of the SDGs, including goals and indicators, for each study based on the grant proposal information: outline, aims, objectives, and/or abstract. Mapping was defined as the assignment of one or more SDGs to a grant where its stated objectives aligned conceptually with the targets and indicators of that SDG. Grants were mapped to single or multiple SDGs to reflect all relevant areas of focus to understand the breadth of SDG coverage. No weighting was applied across SDGs, and all assigned SDGs were counted equally. Consequently, the total SDG counts across all grants exceed the total number of grants as shown in the results. This approach enables characterization of how institutional research output is distributed across the SDGs and how this distribution reflects broader global SDG priorities. An interpretive analytic approach was used to identify these alignments and thematic areas across the SGD framework. The resulting findings

were compared (inter-rater reliability), and any discrepancies were discussed and resolved with further interrogation of particular indicators available for each of the SDG Goals. All SDGs assigned to a grant were treated with equal weight and no weighting was applied to reflect differential contribution. The data was coded, and frequencies tabulated to arrive at the results. These distributions were used to identify thematic concentrations, gaps, and temporal or regional patterns within the research portfolio, providing an evidence base to inform institutional research strategy.

Data Collection

Using a list of awarded grants (n=302) provided by the Research Offices of Pakistan and East Africa, the grant proposals were retrieved from AKU's research software (PeopleSoft Enterprise Grants Management and Elsevier's Pure Award Management Module). The abstracts and grant information from the proposals comprised the primary dataset for this study and were used to generate the SDG mapping dataset. Data were independently collected using Google Sheets by each researcher and coded onto SPSS (24.0.0.0). The SDGs were mapped to the level of goals and indicators. A preliminary analysis of the first 25 grants was conducted independently by two researchers, which served as a pilot. The findings were then compared to validate the study methodology and results. An exemption from ethics review was approved by the AKU Ethics Review Committee (ERC).

Results

A total of 293 grant proposals and their corresponding goals were included in the analysis (Table 1, Figure 2). The awarded grants were from various departments: the Medical College, the School of Nursing and Midwifery, the Institute of Education Development, and the Graduate School of Media and Communications. Table 1 represents the count of SDGs as a percentage of the total number of grants (n), and Table 2 represents the frequency of the total number of SDGs covered by each grant as a percentage of the total number of grants (n). The figures show the total count of SDGs (n) as a percentage of the total number of SDGs, indicating how awarded research grants align with and distribute across the SDGs.

Table 1

Frequency of Sustainable Development Goals covered by Awarded Research Grants affiliated with AKU in 2022 and 2023

SDG	2022				2023				Total	
	East Africa (n=23)	Pakistan (n=99)	Total (n=120)	%*	East Africa (n=34)	Pakistan (n=139)	Total (n=173)	%	n = 293	%*
1	1	6	7	5.8	0	6	6	3.5	13	4.4
2	3	12	15	12.5	0	16	16	9.2	31	10.6
3	18	89	107	89.1	34	96	130	75.1	237	80.9
4	4	11	15	12.5	3	14	17	9.8	32	10.9
5	3	12	15	12.5	5	14	19	11	34	11.6
6	1	3	4	3.3	0	0	0	0	4	1.4
7	0	1	1	0.8	0	0	0	0	1	0.3
8	1	2	3	2.5	0	7	7	4	10	3.4
9	1	10	11	9.2	0	6	6	3.5	17	5.8
10	2	9	11	9.2	4	8	12	6.9	23	7.8
11	1	3	4	3.3	1	1	2	1.2	6	2
12	0	0	0	0	0	0	0	0	0	0
13	0	4	4	3.3	0	6	6	3.5	10	3.4
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0
16	1	3	4	3.3	0	2	2	1.2	6	2
17	1	10	11	9.2	3	3	6	3.5	17	5.8

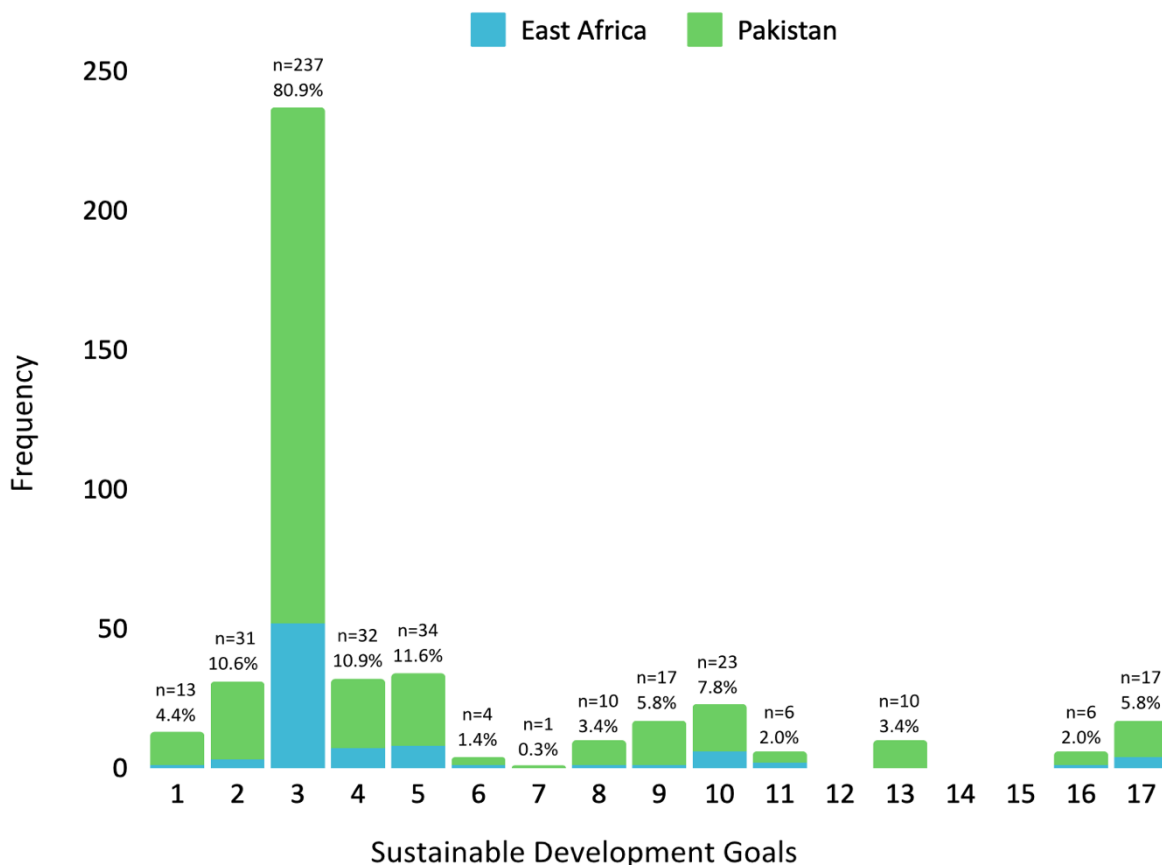
Note. * Percentages add up to more than 100% as some grants target more than one SDG

Our results revealed that SDG3, “Ensure healthy lives and promote well-being for all at all ages” (n=237, 80.9%), was the most prevalent theme targeted across the grants, followed after a large margin by SDG5, “Achieve gender equality and empower all women and girls” (n=34, 11.6%), SDG4, “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (n=32, 10.9%), and SDG2, “End hunger, achieve food security and improved nutrition and promote sustainable agriculture” (n=31, 10.6%). Other areas of focus included SDGs targeting inequality (SDG 10, n=32, 7.8%), infrastructure and innovation (SDG 9, n=17, 5.8%), global partnership (SDG 17, n=17, 5.8%), and poverty eradication (SDG 1, n=13, 4.4%). SDGs addressed but explored to a lesser extent by the awarded research grants include those related to economic growth (SDG 8, n=10, 3.4%), climate change (SDG 13, n=10, 3.4%), sustainable

cities and communities (SDG 11, n=6, 2.0%), peace and justice (SDG 16, n=6, 2.0%), clean water and sanitation (SDG 6, n=4, 1.4%), and clean energy (SDG 7, n=1, 0.3%).

Figure 2

Frequency of Sustainable Development Goals in Awarded Research Grants affiliated with the Aga Khan University in 2022 and 2023



SDG12, “Ensure sustainable consumption and production patterns”, SDG14, “Conserve and sustainably use the oceans, seas, and marine resources for sustainable development”, and SDG15, “Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss”, were not included in any of the grants. The trend of SDGs between countries (Figure 3) and years (Figure 4) was highly consistent. Across both Pakistan and East Africa, awarded grants predominantly addressed a health-related (SDG 3) focus, accounting for 99.6% and 91.3% of funded projects, respectively. A similar pattern was observed through the combined SDG-mapping and bibliometric analysis across 2022 and 2023, indicating stable prioritization of health-related research across regions and over time. In terms of a thematic distribution, the results revealed a greater health-related focus with notable gaps in SDGs targeting economic growth, climate change, peace and justice, and sustainable energy.

Figure 3

Percentage of Sustainable Development Goals in Awarded Research Grants affiliated with the Aga Khan University in 2023

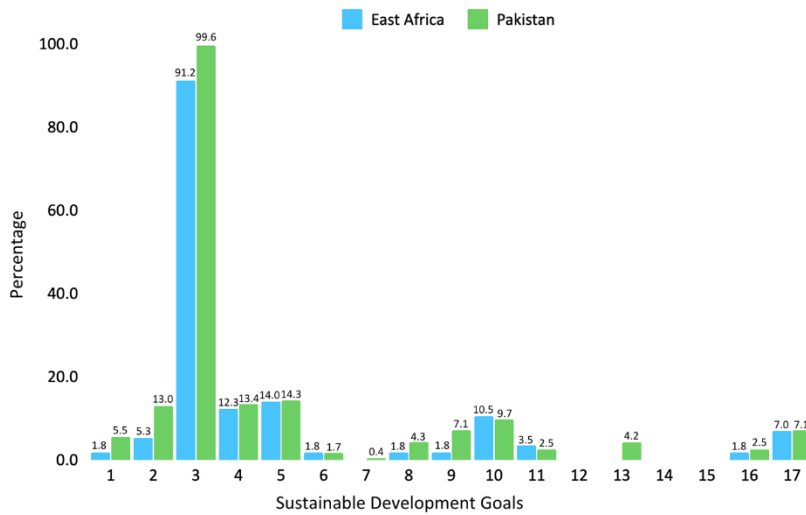
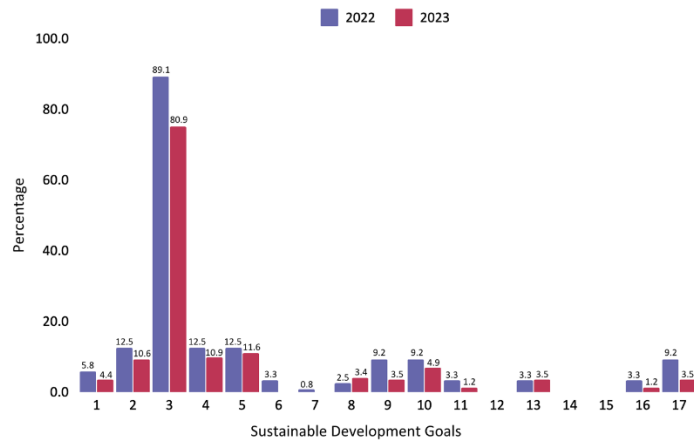


Figure 4

Percentage of Sustainable Development Goals in Awarded Research Grants affiliated with the Aga Khan University in 2022 and 2023



In terms of the number of SDGs covered by the awarded grants, the mean number of SDGs mapped per grant was 2.0 (Table 2, Figure 5). Of all the awarded grants, 46% of them targeted two or more SDGs.

Figure 5

Frequency of Number of Sustainable Development Goals covered by each Awarded Research Grant affiliated with the Aga Khan University in 2022 and 2023

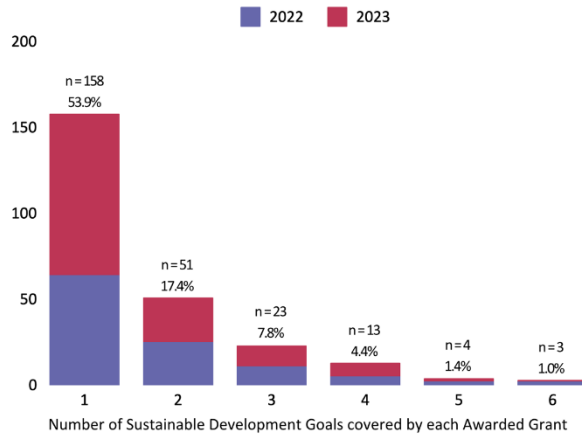


Table 2

Frequency of Total Number of Sustainable Development Goals covered by each Awarded Research Grant affiliated with AKU in 2022 and 2023

Number of SDGs covered per grant	2022				2023				Total	
	East Africa (n=23)	Pakistan (n=99)	Total (n=120)	%	East Africa (n=34)	Pakistan (n=139)	Total (n=173)	%	n = 295	%
1	11	53	64	53.3	25	69	94	54.3	158	54
2	7	18	25	20.8	4	22	26	15	51	17.4
3	3	8	11	9.2	1	11	12	6.9	23	7.8
4	0	5	5	4.2	4	4	8	4.6	13	4.4
5	0	2	2	1.7	0	2	2	1.2	4	1.4
6	0	2	2	1.7	0	1	1	0.6	3	1

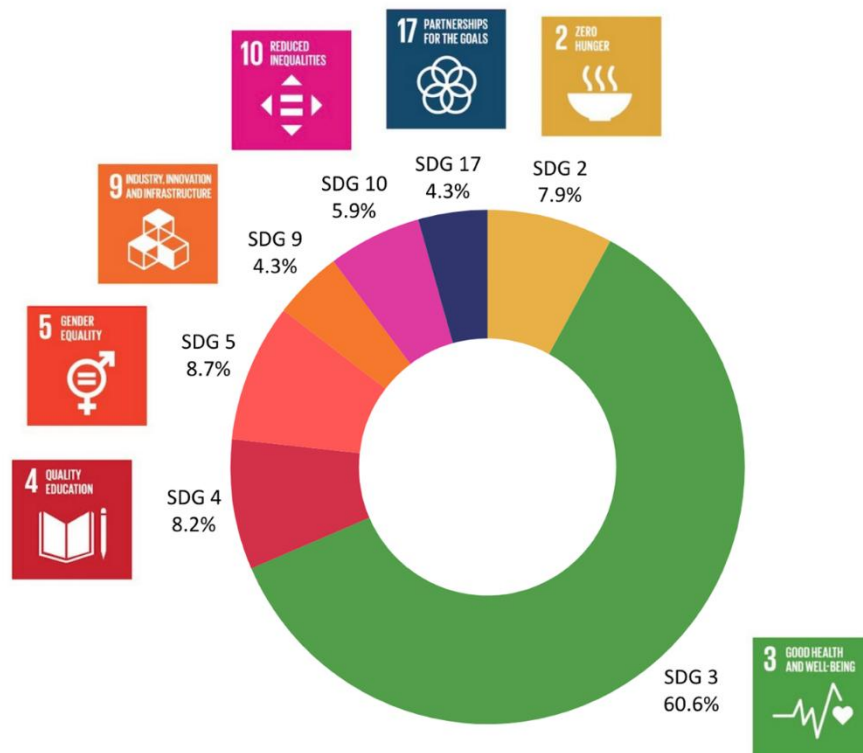
Of note is that each grant was mapped to one or more SDG based on its aims and objectives. As a result, the total frequency of our tabulations in terms of SDGs is greater than the total sample size (n=293) as each SDG frequency is calculated as a percentage of the total grants.

Discussion

The SDGs aim to focus on interrelated and holistic global challenges by addressing aspects of social development, healthcare needs, environmental protection, and economic growth. For higher educational institutions, the SDGs present a valuable and potentially powerful framework to assess institutional research contributions to sustainable development (Belmonte-Ureña et al., 2021; Bordignon, 2021; Yamaguchi et al., 2023). Our analysis of the research contributions of an academic university situated in the Global South provides unique insights into its efforts to address pressing global challenges and promote sustainable development (Figure 6). Together, these findings illustrate how the institution's research portfolio distributes across the SDGs and aligns with globally articulated development priorities.

Figure 6

Frequency of Sustainable Development Goals covered by Awarded Research Grants affiliated with the Aga Khan University in 2022 and 2023



AKU, in line with its founding mandate, strives to advance medical knowledge, promote innovation, improve healthcare outcomes, and make impactful contributions to the well-being of individuals and communities in developing country contexts. This vision and mission served to inform AKU's research priorities at its inception 40 years ago and has since expanded to include aims directed towards the social sciences, arts and humanities, and quality education. With a primary focus on healthcare outcomes and encompassing a broad range of health-related targets, it is reasonable to find SDG3 as the most prevalent goal amongst the research studies undertaken at a health-sciences-focused academic institution. Additionally, it has been found that high-

income countries (HIC) in Europe and Central Asia are the primary regions in which there is a predominant focus on SDG17 and SDG12. These findings portray the differences in development goals and priorities between nations based on economic growth. They also highlight the importance of contextualising SDGs to focus on those which are of institutional and national need.

This study reflects work from research institutions in low-middle income countries, where research institutions have predominantly prioritized SDG 3, addressing critical health challenges and strengthening health systems in resource-limited settings characteristic of the Majority World. (Asadikia et al., 2022). This agenda reflects a strong correlation between poverty and health-related outcomes, as good health is identified as one of the most important factors contributing to economic growth (Daepf & Arcaya, 2017; Ogundari & Awokuse, 2018). Additionally, healthcare systems in low-middle income countries are known to be significantly underfinanced and require drastic financing reforms if the SDG targets are to be met (Kodali, 2023). This draws into the concept of health equity and the need to develop and strengthen health inequality monitoring with the goal of promoting robust, systematic, and transparent practices (Hosseinpour et al., 2012).

These arguments draw attention to the fact that health cannot improve in isolation. Improvements in health outcomes are heavily dependent on the social determinants of health, including but not limited to food security, safe housing, sufficient and stable income, quality education, and gender equality (Chotchoungchatchai et al., 2020). These factors that focus on economic growth and community must be taken into consideration when evaluating health outcomes. Hence, there is a need to focus on research that covers several SDGs in order for it to have maximal impact.

Our analysis revealed a focus – in addition to health (SDG3) – towards addressing zero hunger (SDG2), quality education (SDG4), gender equality (SDG5), industry, innovation, and infrastructure (SDG9), reduced inequalities (SDG10), and partnerships (SDG17). The results note a lack of studies addressing sustainable approaches to energy (SDG7), economic growth (SDG8), sustainable economies and consumption (SDG12), marine resources (SDG14) and ecosystems (SDG15). These findings are in accordance with a large-scale bibliometric analysis of the SDGs, which revealed that good health and well-being are the predominant thematic areas of research for the developing world, whereas climate action and sustainable energy have received more research focus in high-income countries (HICs) (Mishra et al., 2023). This thematic pattern highlights both areas of concentration and relative gaps within the research portfolio, providing insight into institutional strengths and underexplored SDG domains.

An institution cannot logistically target all the SDGs at once (also known as SDG evenness), nor should this be the aim. Maximum efficiency and impact can be achieved by contextualizing priorities and redirecting focus towards those SDGs which are relevant and can be explored in an impactful manner given a particular institutions' specialty, capacity, and strengths. An analysis of SDG progress on a global scale extrapolated data, which revealed that SDG progress evenness within countries will result in approximately only 30% of the countries being able to achieve the SDGs by 2030. Although the findings from our study show reduced inclusion of research targeting sustainable energy and ecosystems (SDG12, SDG14, and SDG15), it is more relevant for a tertiary health care academic centre in a low-middle income country to be aiming for research work around quality education (Goal 4), gender equality (Goal 5), and climate change (SDG 13). While work in these areas has been proven, there is room for further improvement and focus in an institutionally relevant manner. Such contextualized prioritization underscores how SDG

mapping can be used to support strategic decision-making within low-middle income country based academic institutions.

A review highlighting the importance of region-income-based prioritisation of SDGs emphasizes that a country's geographical location and income level have a significant relationship with the overall SDGs achievement (Asadikia et al., 2022). Using the gradient boosting machine algorithm, the study finds that SDG prioritization varies for countries with a specific income level located in different regions. For instance, SDG10 is among the most commonly focused on goals for HIC, SDG9 for upper-middle-income countries, and SDG3 for low-middle income countries. This aligns with our findings that show SDG3 as the most prevalent goal studied in within our settings.

Emerging studies have explored the interrelationships and complexities between the SDGs and emphasise the importance of adopting a multidisciplinary approach towards addressing such complexities holistically (Asadikia et al., 2022; Fonseca et al., 2020; Nilsson et al., 2018; Payumo et al., 2021). An integrated vision of interdisciplinary development and growth encompasses diverse fields of knowledge and has driven progress towards global agendas as outlined by the UN (Sianes et al., 2022). This is further evident in our results as SDG17, which is related to a global partnership for sustainable development, was covered by 5.8% of all studies. Such an emphasis indicates a primary focus in future research efforts that will require collaboration across sectors, countries, and national and international agencies, including knowledge sharing and transfer (Addo-Atuah et al., 2020). The current literature considers these interrelationships as resulting in synergistic gains, as meeting the targets of one SDG positively correlates with progress towards the other SDGs (Fonseca et al., 2020). However, to maximize efficiency in their approach, institutions, including higher education, are encouraged to optimize their focus on the SDGs through various strategies that can be marshalled to meet their individual aims (Barbier & Burgess, 2017; Breuer et al., 2019).

Another important factor to note is the proportion of studies targeting more than one SDG. Along with maximizing on the synergistic interrelationships between the SDGs, this strategy encourages adopting a multidisciplinary approach and addressing multiple SDGs in a coherent manner within research studies. Increasing awareness regarding the SDGs enables investigators to be more cognizant of the potential goals and targets their project could be reasonably expanded to cover, hence develop a strategic framework to achieve the SDGs.

The results of this study corroborate and recognize that the work led by capacity building, community outreach, research funding, and institutional development makes an impact on institutional mandate reflective of national development priorities. Utilizing the SDGs as a metric of impact provides an evidence base and acknowledges their applicability as a legitimating framework. As a universally recognized set of global objectives, the SDGs have significant utility as a reliable and credible source for measuring impact across the board. Along with enabling higher education to evaluate progress over time, such an approach offers a framework for comparative analysis across the sector (and their cognate areas).

Higher education is a critical factor in the knowledge generation process that contributes to meeting the transformation agenda underpinning the SDGs. Augmented by the importance of multi-sectoral approaches with interdisciplinary studies, there is a potential with a global imperative to undertake multi-country and multi-context studies, including at the sub-national

level, that aligns with the intellectual provenance and mandates of various research bodies. This entails integration of a wide range of perspectives, experiences, and knowledge systems that foster collaboration, knowledge exchange, and capacity building across regions. Such efforts contribute to more effective and contextually appropriate approaches for achieving the SDGs at both a local and global scale. Academic institutions in particular play key roles in fostering awareness, acting as knowledge brokers between and among student cohorts and professional bodies who, in turn, work with industries to sustain actionable dialogue and effectively implement the SDGs (Kickbusch & Hanefeld, 2017). Importantly, university students, including those from healthcare, have little knowledge of concepts, indicators, documents, and models regarding the SDGs, suggesting that these aspects do not feature in current curricula in preparing health professionals (Omisore et al., 2017; Smaniotto et al., 2020). This sheds light on the importance of raising awareness and placing emphasis on the importance of the SDGs at the educational level, particularly building on research and an evidence base that is suggested above. Academic institutions are well positioned to cater to both target audiences of students and faculty alike to maximize their impact and progress (Amorós Molina et al., 2023).

This paper has presented results on grants awarded in 2022 and 2023, and while they illuminate aspects that are more generally noted in the scholarly literature, there is a need to study the trends in SDG focus in higher education in low-middle income countries. As a corollary, it is important to determine the actual impact of the current research output on achieving the SDGs, capacity built to address complex development agendas and inform relevant and responsive curriculum development to prepare the next generation of learners who will become leaders. This paper has highlighted an academic institution's contribution to knowledge and participation in research on a global platform and emphasized the importance of developing an SDG monitoring and evaluation framework. The findings show awarded research grants broadly align with the intent of the SDGs and offer insights for future lines of research and implications for curriculum development as well as provide baseline data to assess trends and growth of academic research output.

Conclusion

Our review reports an academic institution's research contributions in accordance with the SDGs. We evaluate current research trends and identify future areas of focus which may provide maximum benefit to meet institutional mandates. We highlight the importance of developing an SDG monitoring and evaluation framework for universities and present an actionable solution for institutions to track their progress towards achieving the SDGs with a particular focus on SDGs aligned to institutional mandates, allowing maximum efficiency and impact. By examining how funded research aligns with and distributes across the SDGs, and by identifying thematic strengths and gaps within the research portfolio, our study demonstrates the value of SDG mapping as a strategic tool for academic institutions.

It is evident that higher education, particularly in the Global South, has an important role in addressing national development goals that align with the SDGs and has the potential, as demonstrated in this paper, to establish robust partnerships (SDG17) across the globe to address interrelated planetary needs. HEIs are engaged in capacity building and creating leadership potential through their teaching and learning programmes on the one hand, and creating the knowledge base with the relevant evidence to address development needs. This paper, through

a mapping exercise of funded research, illuminates strategic directions for higher education and informs relevant teaching and learning programmes to meet local and global development needs in the Anthropocene Age.

Acknowledgements

Dr. Salim Virani's disclosures include: Research Support: US Department of Veterans Affairs, NIH, and UK NIHR; Research endowments: Nizar E. Noor Mohammed Mewawalla, Tahir and Jooma Family, and Asharia Family. The rest of the authors of this paper have no conflicts of interest or relevant funding sources to report. There has been no use of artificial intelligence in this paper. This study meets ethical standards of publication and has undergone Ethical Review Committee processing and exemption. CRediT contributions of authors: **Inam**: Validation, Data Collection, Data Analysis, Writing – Original Draft; **Virani**: Conceptualization, Methodology, Supervision, Writing – Review and Editing; **D'Cruze**: Writing – Review and Editing; **Robi**: Writing – Review and Editing; **Gatiti**: Conceptualization, Writing – Review and Editing; **Khamis**: Conceptualization, Methodology, Supervision, Data Analysis, Writing – Original Draft.

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