



## Citation Impact of Institutional Repositories in Selected Higher Learning Institutions in Tanzania

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### Abstract

Institutional Repositories (IRs) development in Tanzania has made publications readily available, accessible, and retrievable. IRs have increased the visibility of researchers and institutions and have contributed to the University ranking. Several Higher Learning Institutions (HLIs) in Tanzania have developed their IRs hosting institutional publications. This study assessed the citation impact of IR contents of selected Tanzanian HLIs. The study evaluated the citation impact of IR contents using publications indexed in the Scopus database. Four HLIs were purposively selected. The search within reference advanced feature for the Scopus database was conducted. The publications indexed in Scopus citing the selected IR contents from 2018 to 2022 were identified and extracted. Data analysis was carried out using Microsoft Excel and SPSS. The study findings indicated that the Tanzanian IR contents had a low citation impact. The study recommends that Tanzanian HLIs devise strategies for increasing IR content visibility. The strategies may include registering the IRs in online platforms and ensuring the Handle System is implemented to improve the accessibility of the IR content. Furthermore, the HLIs should create awareness of research visibility, enabling researchers to publish and increase their visibility.

**Keywords:** *Institutional Repository, Citation Impact, Research visibility, Open access, Tanzania*

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### Introduction

The advancement of Information Communication Technology (ICT) has changed how institutions collect, store, access, and disseminate scholarly outputs. ICTs have enabled the development, adoption, and use of Institutional Repositories (IRs) (Wheeler *et al.*, 2022). An Institutional Repository is a database that collects, organises, manages, and

disseminates electronic scholarly outputs of researchers, students, and staff of the relevant institution (Muneja & Ndenje-Sichalwe, 2017). Institutional repositories provide access to various scholarly content, including journal articles, conference papers, theses, dissertations, research reports, and related scholarly outputs. Open access repositories may include already published journal articles (post-prints), pre-published journal articles (pre-prints), theses and

dissertations, research reports, teaching materials, conference proceedings, or other relevant documents that institutions wish to provide access without barriers (Bailey, 2006; Bjork, 2004; Buhomoli & Muneja, 2020; Lynch, 2003). The Directory of Open Access Repositories (OpenDOAR) registers repositories that provide free, open access to scholarly outputs and resources. As of May 2023, OpenDOAR provided global statistics of 6,028 institutional repositories that provide free open access to scholarly content (OpenDoAR, 2023).

Europe and America were the first adopters of the IR initiatives, and then other continents adopted them later (Nunda & Elia, 2018; Wheeler *et al.*, 2022). The IR initiative was pioneered by some countries, such as Germany, Netherlands, and Norway. Africa was one of the continents that recently adopted the IR initiatives (Nunda & Elia, 2018). Tanzania has adopted IR initiatives, and as a result, several higher learning and research institutions have established Institutional Repositories (Mwalubanda, 2021; Nunda & Elia, 2018). According to Mwalubanda (2021), fourteen (14) institutions have established IRs in Tanzania. Kenya is leading in East Africa with forty-two (42) IRs, and Uganda has ten (10) IRs.

The movement towards adopting IR initiatives in Tanzania started in the early 2000s (Mwalubanda, 2021). The Tanzania Commission for Science and Technology (COSTECH) spearheaded the development and promotion of IRs in Tanzania. COSTECH supported institutions in adopting and promoting IRs through awareness creation, capacity building, technical support, advocacy, and IR policy development (Muneja & Ndenje-Sichalwe, 2017; Mwabukojo, 2020; Tanzania Commission for Science and Technology, 2018). The first repository in Tanzania was the University of Dar es Salaam IR. Other institutions joined the initiative by developing the IRs, such as Mzumbe University IR (MU IR), Sokoine University of

Agriculture IR (SUA IR), Muhimbili University of Health and Allied Sciences IR (MUHAS IR), and the University of Dodoma IR (UDOM IR) (Muneja, 2009; Nunda & Elia, 2018). The IR adoption and use in Tanzania have been motivated by several aspects, such as increasing institutional visibility, research outputs, and citation impacts (Buhomoli & Muneja, 2023; Mbughuni *et al.*, 2022; Nunda & Elia, 2018).

The increased number of IRs in Tanzania has led to the need to understand their impact, thus justifying their implementation, maintenance, and improvement. The IR impact refers to how the publications archived in the IRs are visible, used, accessed, and cited (Ndhlovu, 2021; Wheeler *et al.*, 2022). The IR impact is measured through various metrics such as visibility, accessibility, downloads, usage, and citations. This study has focused on measuring the impact of IRs through the citations of the IR content. Citation determines the quality of scholarly works and is the core aspect in which authors, institutions, and IRs can be evaluated (Caon *et al.*, 2020; Liskiewicz *et al.*, 2021; Wheeler *et al.*, 2022).

Despite the increasing number of IRs in Tanzania and their role in collecting, preserving, and disseminating scholarly works, their impact has yet to be well established. It is unclear whether the Tanzanian IR contents are visible, used, and cited by other scholars. Studies related to IRs in Tanzania have not addressed the impact of IRs. Nunda and Elia (2018) Samzug (2017) and Muneja (2016) focused on the adoption and implementation of IRs; Mbughuni (2022), Mnzava and Chirwa (2018) studied the contents and usage of IRs; Kakai *et al.* (2018), Kodua-Ntim and Fombad (2020) and Muneja and Ndenje-Sichalwe (2017) assessed the open access and copyright issues. Similar studies assessing the IR impact have been conducted in other countries; for instance, Ndhlovu (2021) evaluated the impact of IR contents in Zimbabwe, and Wheel *et al.* (2022) assessed the impact of institutional repositories in the USA, Austria, Columbia, and

Mexico. This implies that previous studies have not evaluated the impact of IRs in Tanzania. Therefore, this study addresses the gap by assessing the citation impact of IRs in Tanzania. This study aimed to assess the citation impact of Tanzania's IR contents.

The literature indicates various concepts that have been covered related to measuring the impacts of institutional repositories. They include measuring IR impact (Ndhlovu, 2021; Wheeler *et al.*, 2022); IR content document types (Arsyad *et al.*, 2018; Hyland, 2017; Mozersky *et al.*, 2021); documents citing IR contents (Demetres, Michelle, Delgado and Wright, 2020; Gil-Leiva *et al.*, 2022; Koulikov, 2010; Rethlefsen *et al.*, 2021); IR contents cited by documents indexed in reputable indexing databases (Ndhlovu, 2021; Wheeler *et al.*, 2022) and authors affiliations (Bachelet *et al.*, 2019; Hottenrott & Lawson, 2017; Ndhlovu, 2021; Wheeler *et al.*, 2022).

A study by Walsh and Thomson (2016) evaluated how IR contents in New Zealand were cited and concluded that theses and dissertations were the most cited IR contents. Arsyad *et al.* (2018) pointed out that the theses and dissertations are mostly cited because they occupy a large part of IR content. Moreover, Hyland (2017) postulated that theses and dissertations are materials containing comprehensive information on the topic rather than an article, which may be one of the objectives of the thesis or dissertation. Arsyad *et al.* (2018) and Hyland (2017) narrated that, despite theses and dissertations being mostly cited, the number of citations is minimal compared to their numbers in the specific repositories.

Studies (Gil-Leiva *et al.*, 2022; Gusenbauer, 2022; Koulikov, 2010; Rethlefsen *et al.*, 2021; Salisbury, 2009) indicate that journal articles occupy a large portion of the documents indexed in reputable indexing databases. Consequently, journal articles are the main documents indexed in reputable databases that cite institutional repository content. On the other hand, Demetres,

Delgado and Wright (2020) argued that although theses and dissertations are the main documents citing IR content, they are not seen as significant because they are not indexed in reputable databases. Furthermore, most reputable indexing databases do not index grey literature such as theses and dissertations (Demetres, Delgado, and Wright, 2020; Rethlefsen *et al.*, 2021). Therefore, citation impact assessment based on the documents indexed in reputable indexing databases would indicate minimal citations from theses and dissertations, which may affect the repositories' citation impact.

Citation impact is also based on the author's affiliation; it indicates the reach of the research output in the global research community. The author's affiliation shows the recognition and acknowledgement of the organisation or country that has supported the research (Do *et al.*, 2013). They are recorded in the published research output. Several factors may influence the author to indicate their affiliations. Such factors include access to infrastructures and networks, resource accessibility, financial gain, employment, and institution reputation (Bachelet *et al.*, 2019; Hottenrott & Lawson, 2017). A study by Do *et al.* (2013) stipulated that author affiliation facilitated tracing the cited documents' visibility. Hottenrott and Lawson (2017) narrated that author affiliations inform about the institution and country where the document has been cited.

## **Materials and methods**

The study employed a quantitative approach in identifying publications that have cited IR contents in the Scopus database. Scopus was used because it offers comprehensive coverage by indexing high-quality journals. Additionally, Scopus has robust analytical tools and metrics, and its contents have international coverage (Ndhlovu, 2021; Schotten *et al.*, 2017). The study employed the advanced search feature of the Scopus database. The Scopus advanced feature has an element that enables the search to be

conducted within the reference. The IRs of the Muhimbili University of Health and Allied Sciences (MUHAS IR), Mzumbe University (MU IR), Sokoine University of Agriculture (SUA IR), and the University of Dodoma (UDOM IR) were purposely selected for the study. The four IRs were purposively selected because they have the highest number of contents in the country. In addition, the IRs were selected because they are open-access repositories, and thus, they can easily be accessed and searched, and publications could be retrieved in full-text. To check the level of open access, the researcher checked the availability of full-text documents in the repositories. While the institutional repository of the University of Dar es Salaam (UDSM IR) could be a valuable resource, its IR contents were not accessible remotely during the study period. Therefore, it was excluded from the study. The selected repositories' Universal Resource Locator (URL) was used as a search term within the Scopus reference search tool. The study assumed all documents citing IR contents would include the URL in the reference section. Thus, the study used URLs in identifying documents citing Tanzanian IR content. Accordingly, if the cited documents used a Uniform Resource Identifier (URI) such as DOI, they would probably have been excluded from this study. However, it should be noted that the study could not use URI because it links to the publisher's site instead of the repository site on which the study focuses.

The documents citing the selected IR contents in Tanzania for the five years from 2018 to 2022 were identified. From the search results, researchers recorded the following: IR name, publication year, document type, author's country affiliation, and subject area. These details were recorded in both citing and cited documents. To identify the cited document's details, the citing document's references were inspected, and the relevant IR was consulted.

**Table 1**

Moreover, references that did not indicate details about the document were searched directly in the respective repositories using the document's title or the author's name. Data were analysed using descriptive analysis. Data were presented in tables and figures indicating the frequency and percentages.

## **Results**

This section presents the results organised according to the study objectives. The first section shows the results of publications indexed in Scopus citing Tanzanian IR contents, while the second section presents documents in Tanzanian IRs cited by publications indexed in Scopus.

### ***Publications indexed in Scopus citing Tanzanian IR contents***

#### *Number of Documents indexed in Scopus citing Tanzanian IR contents*

The findings showed that the number of documents in Scopus citing Tanzanian IR contents for five years, from 2018 to 2022, was 97, translating to an average of 19.4 documents per year. Table 1 shows an increase in the number of documents citing Tanzanian IR contents year after year for five years. Further, the study found that for the period of five years (2018 to 2022), SUA IR was the highly cited IR (46) with an average of 9.2 citing documents per year, and UDOM IR was the least cited IR (8) with an average of 1.6 citing documents per year. This is explained by the fact that the two repositories have different ages; SUA IR was established in 2014, while UDOM IR was established in 2019.

Documents indexed in Scopus citing Tanzanian IR contents

INST.	UDOM IR		SUA IR		MUHAS IR		Mzumbe IR		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
2018	0	0%	1	1%	2	2%	2	2%	5	5.2%
2019	0	0%	3	3.1%	5	5.2%	3	3.1%	11	11.3%
2020	0	0%	5	5.2%	3	3.1%	6	6.2%	14	14.4%
2021	2	2.1%	15	15.5%	4	4.1%	5	5.2%	26	26.8%
2022	6	6.2%	22	22.7%	5	5.2%	8	8.2%	41	42.3%
<b>Total</b>	<b>8</b>	<b>8.2%</b>	<b>46</b>	<b>47.4%</b>	<b>19</b>	<b>19.6%</b>	<b>24</b>	<b>24.7%</b>	<b>97</b>	<b>100%</b>

*Type of documents indexed in Scopus citing Tanzanian IR contents*

The findings indicate that journal articles (94; 96.9%) were the major type of document citing

Tanzanian IR content, followed by conference papers (1) and book/book chapters (1). Table 2 presents the types of documents indexed in Scopus citing Tanzanian IR contents.

**Table 2**

Type of Documents indexed in Scopus citing Tanzanian IR contents

INST.	UDOM IR		SUA IR		MUHAS IR		Mzumbe IR		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Journal article	7	7.2%	46	47.4%	19	19.6%	22	22.7%	94	96.9%
Conference Paper	0	0%	0	0%	0	0%	1	1%	1	1%
Book/ Book Chapter	1	1%	0	0%	0	0%	1	1%	2	2.1%
<b>Total</b>	<b>8</b>	<b>8.2%</b>	<b>46</b>	<b>47.4%</b>	<b>19</b>	<b>19.6%</b>	<b>24</b>	<b>24.7%</b>	<b>97</b>	<b>100%</b>

*Author affiliations of documents indexed in Scopus citing Tanzanian IR contents*

The findings show that the Tanzanian IR contents were cited by authors originating from 36 countries. Results further indicate that SUA IR was cited in twenty-seven (27) countries, Mzumbe IR in seventeen (17) countries, MUHAS IR in thirteen (13) countries, and UDOM IR in five (5) countries. The number of countries' affiliations citing Tanzanian IR contents is high

because researchers from different countries collaboratively authored some of the identified documents. The findings further indicate that more citations were affiliated with countries outside the African continent.

*Year of Publication of the Documents citing Tanzanian IR contents*

Table 3 shows the year of publication of the documents indexed in Scopus that have cited Tanzanian IR contents. The Table shows an overall increasing trend of documents indexed in the Scopus citing Tanzanian IR contents. Results show that 2022 recorded the highest number of documents indexed in Scopus citing Tanzanian IR contents (41; 42.3%). Results have also shown

that the number of documents indexed in Scopus citing SUA IR contents was increasing year after year (2018; 1, 2019; 3, 2020; 5, 2021; 15, 2022; 22). Further, Table 3 shows the fluctuations in documents indexed in Scopus, citing the Tanzanian IR contents for Mzumbe IR and MUHAS IR. Detailed results for the year of publication are shown in Table 3.

**Table 3**

Year of Publication of the Documents citing Tanzanian IR contents

INST.	UDOM IR		SUA IR		MUHAS IR		Mzumbe IR		Total	
	Fre	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
2018	0	0%	1	1%	2	2.1%	2	2.1%	5	5.1%
2019	0	0%	3	3.1%	5	5.1%	3	3.1%	11	11.3%
2020	0	0%	5	5.1%	3	3.1%	6	6.2%	14	14.4%
2021	2	2.1%	15	15.5%	4	4.2%	5	5.1	26	26.8%
2022	6	6.1	22	22.7%	5	5.1%	8	8.2	41	42.3%
<b>Total</b>	<b>8</b>	<b>8.2%</b>	<b>46</b>	<b>47.4%</b>	<b>19</b>	<b>19.6%</b>	<b>24</b>	<b>24.7%</b>	<b>97</b>	<b>100</b>

*Subject type of the Scopus indexed documents citing Tanzanian IR contents*

Figure 1 shows the distribution of documents that cited Tanzanian IR contents by subject. Among the valid subjects, agriculture and health

had the highest frequency, each accounting for 29 (29.9%) and 27 (27.8%) of the documents, respectively, followed by business 11 (11.3%), engineering 7 (7.2%), education 7 (7.2%), information technology 6 (6.2%), and social sciences 10 (10.3%).

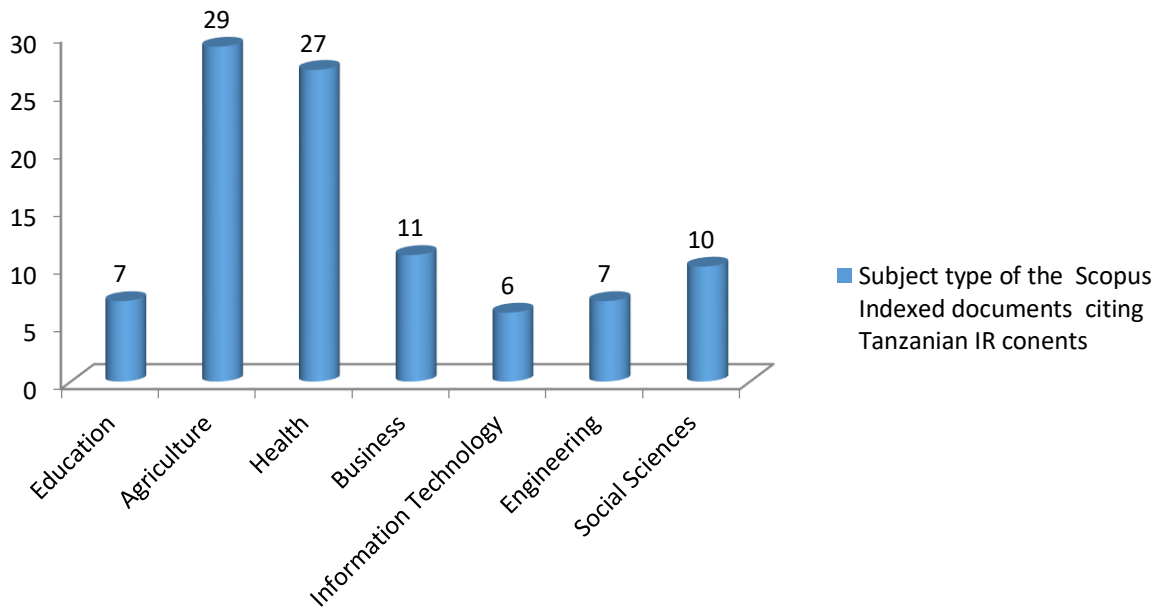


Figure 1. Subject type of the Scopus indexed documents citing Tanzanian IR contents

**Publications in Tanzanian IRs cited by publications indexed in Scopus**

*Number of documents in Tanzanian IRs cited by Publications indexed in Scopus*

The findings show that the number of documents contained in Tanzanian IRs cited by publications indexed in Scopus for the five years (2018 to 2022) is 95 documents (See Figure 1). These findings are two (2) documents less than those citing Tanzanian IR contents (97 documents). The results further show that the three institutions

(UDOM, MUHAS, and MU) had several citing documents equal to the number of cited documents (See Figure 2 and Table 1). This implies that each document in the three IRs was cited once. However, for SUA, some documents were cited more than once by the documents indexed in Scopus. Consequently, the number of the citing documents differed from the number of cited documents. This situation could result from the document’s age, quality, and size of the scholarly community.

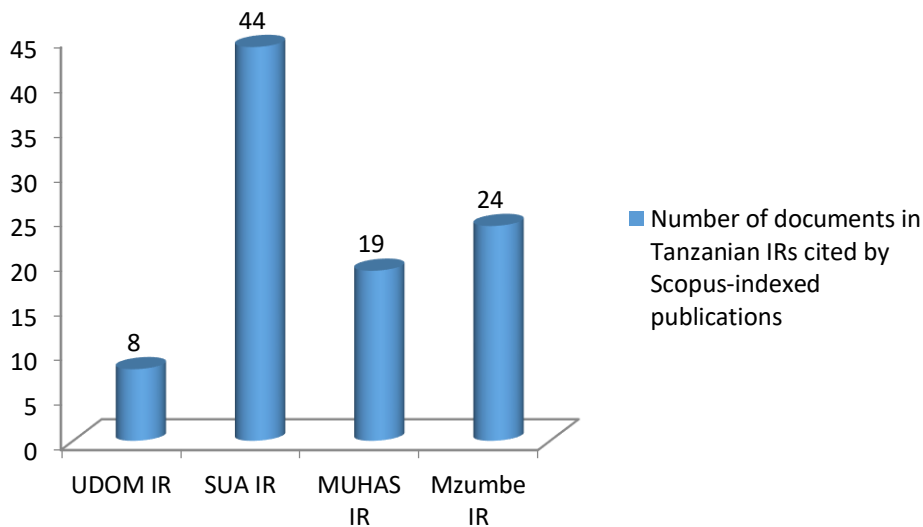


Figure 2. Number of documents in Tanzanian IRs cited by Scopus-indexed publications

*Type of documents in Tanzanian IRs cited by publications indexed in Scopus*

The findings show that the theses and dissertations (74; 74.2%) were the most cited documents in Tanzanian IR contents. They were followed by journal articles (18; 18.5%), conference papers (3; 3.1%), book /book chapters (2; 2.1%), and reports (2; 2.1%). On the other hand, journal articles were second ranked in terms of citations; no institutions had more than

38% citations from journal articles. Moreover, Sokoine University of Agriculture was the only institution with its reports and book/book chapters being cited in the Scopus database. Other institutions, except for Mzumbe University, had journal articles, theses and dissertations, and conference proceedings cited. Table 4 shows the results of the types of Tanzanian IR documents cited by publications indexed in Scopus.

**Table 4**

Type of documents in Tanzanian IRs cited by Documents indexed in Scopus

INST.	UDOM IR		SUA IR		MUHAS IR		Mzumbe IR		Total	
	Freq.	%	Fre	%	Freq.	%	Freq.	%	Fre	%
Journal article	3	37.5%	11	23.9%	4	21%	0	0%	18	18.5%
Conference Paper	1	12.5%	1	2.8%	1	5.7%	0	0%	3	3.1%
Book/ Book Chapter	0	0%	2	4.3%	0	0%	0	0%	2	2.1%
Thesis and Dissertation	4	50%	30	65.2%	14	73.7%	24	100%	72	74.2%
Reports	0	0%	2	4.3%	0	0%	0	0%	2	2.1%
<b>Total</b>	<b>8</b>		<b>46</b>		<b>19</b>		<b>24</b>		<b>95</b>	<b>100%</b>

*Year of Publication of the Tanzanian IR contents cited in Scopus Database*

Table 5 shows the years of publications of the Tanzanian IR contents cited in the Scopus Database. Results show that the most cited Tanzanian IR contents were published between 2013 and 2017 (62; 63.9%). SUA IR had the highest number of cited documents across all year ranges except for 2008-2017, which had seven documents. Within each institution, there were variations in the number of cited documents

across different year ranges. For instance, SUA IR had a higher number of documents cited in the year range of 2013-2017 compared to other ranges. MUHAS IR had a relatively equal distribution of cited documents across the year ranges. Mzumbe IR had more documents cited from the 2013-2017 range (23 documents). While UDOM recorded four documents for the year ranges 2013-2017 and 2018 -2022. More details are indicated in Table 5.



**Table 5**

Year of Publication of the Tanzanian IR contents cited in Scopus Database

INST.	UDOM IR		SUA IR		MUHAS IR		Mzumbe IR		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
2018-2022	4	4.1%	7	7.2%	0	0%	1	1%	12	12.4%
2013-2017	4	4.1%	28	28.9%	7	7.2%	23	23.7%	62	63.9%
2008-2012	0	0%	7	7.2%	10	10.3%	0	0%	17	17.5%
Below 2008	0	0%	4	4.1%	2	2.1%	0	0%	6	6.2%
<b>Total</b>	<b>8</b>	<b>8.2%</b>	<b>46</b>	<b>47.4%</b>	<b>19</b>	<b>19.6%</b>	<b>24</b>	<b>24.7%</b>	<b>97</b>	<b>100</b>

*Subject type of the Tanzanian IR contents cited by documents indexed in Scopus*

Figure 3 shows that agriculture and health were the most frequently cited subject fields, each accounting for 30.9% (30 out of 97) of the citations. This suggests that research in these areas is particularly relevant and impactful, and

as a result, was cited more frequently in the Scopus database. The figure shows that only 5.2% (5 out of 97) of the citations were in education. The figure shows further that the social sciences accounted for 20.6% (20 out of 97) of the citations. Other details are shown in Figure 3.

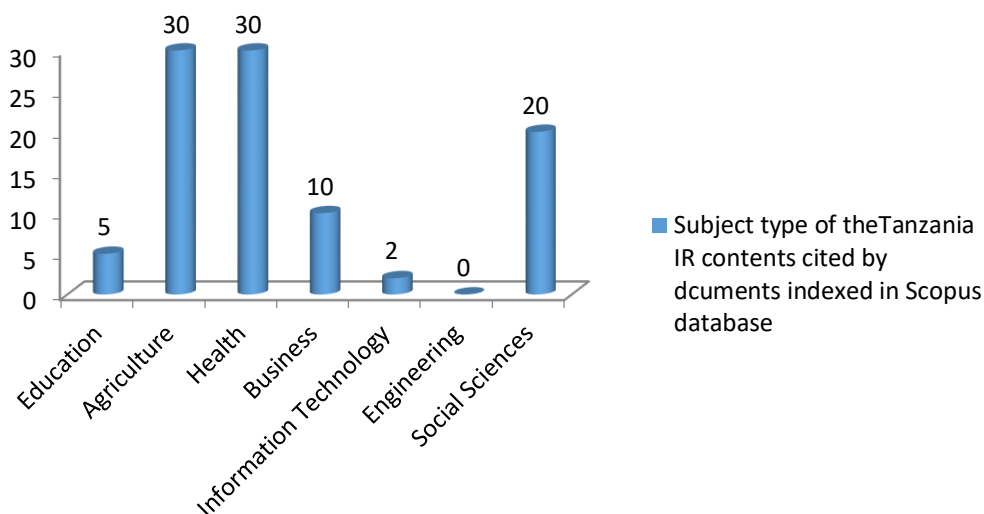


Figure 3. Subject type of the Tanzanian IR contents cited by documents indexed in Scopus

## Discussion

### Publications indexed in Scopus citing Tanzanian IR contents

*Number of Documents indexed in Scopus citing Tanzanian IR contents*

The findings showed an increase in the number of documents citing Tanzanian IR contents for

five years, with an average of 19.4 documents per year. This could result from the age of the archived IR contents; as time passes, their age increases and more documents cite them. This can also be attributed to the rise in the size of the research community, as the size of the research community may also affect the citation of the

document. Aksnes et al. (2019), Caon et al. (2020), and Mammola et al. (2021) reported that the age of the document, the size of the research community, and the quality of the documents are among the factors influencing the citation of the document. The strategies for increasing visibility implemented by the respective institutions and COSTECH could also be another reason for the increase in citations.

#### *Type of documents indexed in Scopus citing Tanzanian IR contents*

The findings indicated that journal articles were the major type of document citing Tanzanian IR contents. This could be supported by the fact that Scopus indexes mainly journal articles and related literature and does not index grey literature such as theses and dissertations. Although journal articles take a significant number of contents in the Scopus database, the recorded number of conference papers and book/book chapters was insignificant compared to the efforts made by various stakeholders in developing and promoting IRs.

#### *Author affiliations of Documents indexed in Scopus citing Tanzanian IR contents*

The findings show that the Tanzanian IR contents were cited by authors originating from 36 countries. The results further indicate that more citations were affiliated with countries outside the African continent. This implies that countries outside the African continent utilised the publications in Tanzania IRs more than those within the continent. It further indicates that despite the overall number of documents indexed in the Scopus database citing Tanzanian IR contents being low, the IR contents attract researchers from different countries. This implies that research output produced by Tanzanian researchers is utilised worldwide. These findings contradict a previous study by Ndhlovu (2021), which reported that scholars outside Africa were less interested in African research outputs than African scholars. The current results imply that research output from the African continent is being utilised and suitable for the global research community.

#### *Year of Publication of the Documents citing Tanzanian IR contents*

A more focused examination of the data reveals that the number of documents citing the IR contents of Sokoine University of Agriculture (SUA) had been consistently rising yearly. This steady growth points towards the growing visibility and impact of SUA's research output within the scholarly community. In their study of European universities, Melo and Sanches, (2022) observed a similar increasing trend in citations of institutional repository contents. In contrast, Kodua-Ntim (2021) reported fluctuations in the number of citations for Ghana institutional repositories, suggesting varying levels of awareness and utilization of repositories across different regions. On the other hand, these fluctuations concur with the results fluctuations noted for the number of documents citing the IR contents of Mzumbe University and the Muhimbili University of Health and Allied Sciences (MUHAS). The increasing trend in citations of Tanzanian IR contents signifies the growing recognition of the country's scholarly output, highlighting the relevance of research conducted in Tanzania. This trend can contribute to raising the profile of Tanzanian institutions and researchers globally. Moreover, the consistent growth in citations of SUA IR contents underscores the institution's research impact and scholarly influence. It suggests that SUA's research output is increasingly acknowledged and referenced by the wider academic community, which can enhance collaborations, attract funding opportunities, and foster academic partnerships. Supporting the findings of Gadd *et al.*, (2018), publications available in institutional repositories received more citations than non-open access articles.

#### *Subject type of the Scopus indexed documents citing Tanzanian IR contents*

Tanzanian IR contents are cited in a wide range of subject fields, particularly on agriculture and health. This could indicate that research in these fields in Tanzania is gaining attention and recognition from the global research community. On the other hand, these findings highlight the importance of investing in research and

innovation in key areas such as agriculture and health. Results are inconsistent with findings by Kodua-Ntim (2021) who noted higher citations on agriculture and health in Ghana IR contents. Additionally, the high citation frequency in business, engineering, education, information technology, and social sciences indicates that Tanzanian research covers diverse fields not limited to agriculture and health. This implies that Tanzania's broad research capacity across different disciplines could be harnessed to address the country's multidisciplinary challenges.

### **Publications in Tanzanian IRs cited by publications indexed in Scopus**

#### *Number of documents in Tanzanian IRs cited by Publications indexed in Scopus*

The findings show that the number of documents contained in Tanzanian IRs cited by documents indexed in Scopus was less than those citing Tanzanian IR contents by two. The results differ from the ones reported by Ndhlovu (2021), who found that the number of documents in Scopus citing Zimbabwe IR contents was the same as the Zimbabwe IR contents cited by documents indexed in Scopus. The findings further show that the three institutions (UDOM, MUHAS, and MU) had several citing documents equal to the number of cited documents (See Figure 2 and Table 1). This indicates that each document was cited once by the citing document for the three institutions. However, for SUA, some documents were cited more than once by the publications indexed in Scopus. Consequently, the number of the citing documents differed from the number of cited documents. This situation could result from the document's age, quality, and size of the scholarly community.

#### *Type of documents in Tanzanian IRs cited by Publications indexed in Scopus*

The findings show that SUA IR emerged as the repository with the most cited documents across all year ranges, except for 2008-2012 and 2008-

2017. The scenario is consistent with the view that specific institutional repositories may have a more robust research presence and attract more citations (Lovett et al., 2017). The variations observed in the number of cited documents across different year ranges suggest that this was a period of increased research activity or influential publications published during the period. The findings align with the study by Bornmann and Mutz (2015) that emphasised the influence of specific periods on citation patterns. Mzumbe IR stood out with more documents cited from the 2013-2017 range. The findings suggest a concentration of impactful research within that particular timeframe for the Mzumbe IR. Similarly, Bornmann et al. (2008), Bornmann and Mutz (2015), and Fortunato et al., (2018) pointed out the existence of peak years and citation bursts within specific repositories.

#### *Subject type of the Tanzanian IR contents cited by documents indexed in Scopus*

Research conducted in the areas of agriculture and health in Tanzania holds significant relevance and impact, as evidenced by the higher citation frequency in the Scopus database. The findings highlight the importance of investing in research and innovation in key areas such as agriculture and health, as they attract attention and recognition from the global research community. They suggest that Tanzanian researchers are making valuable contributions in addressing critical issues related to agriculture and health, which are essential both within the country and globally. The findings echo Nazim and Ashar's study results (2019), who noted higher citations for India's agriculture and health subjects. On the other hand, the findings signify that Tanzania had a broad research capacity across different disciplines, which could be harnessed to address the country's multidisciplinary challenges. The results underscore the potential for interdisciplinary collaboration and knowledge exchange in Tanzania, allowing researchers from various

fields to contribute to addressing complex societal issues. Additionally, the presence of social sciences in the notable citations highlights Tanzanian research's diversity and interdisciplinary nature.

## Conclusion

The findings highlight that the global research community utilises the Tanzanian IR content. However, the citation impact of the IR contents was low. The results have the potential to influence practice and further research. The

## References

- Aksnes, D. W., Langfeldt, L., & Wouters, P. (2019). Citations, Citation Indicators, and Research Quality: An Overview of Basic Concepts and Theories. *SAGE Open*, 9(1). <https://doi.org/10.1177/2158244019829575>
- Angelo, A., Walsh, L., & Thomson, C. (2016). *Citing the Institutional Repository*. [https://ir.canterbury.ac.nz/bitstream/handle/10092/12663/SCOPUS IR Staff Forum Poster%0A160901.pdf?sequence=1](https://ir.canterbury.ac.nz/bitstream/handle/10092/12663/SCOPUS_IR_Staff_Forum_Poster%0A160901.pdf?sequence=1)
- Arsyad, S., Zaim, M., & Susyla, D. (2018). Review and Citation style in Research article introductions: A comparative study between National and International English-Medium Journals in Medical Sciences. *Discourse and Interaction*, 28-51.
- Bachelet, V. C., Uribe, F. A., Díaz, R. A., Vergara, A. F., Bravo-Córdova, F., Carrasco, V. A., Lizana, F. J., Meza-Ducaud, N., & Navarrete, M. S. (2019). Author misrepresentation of institutional affiliations: protocol for an exploratory case study. *BMJ Open*, 9(2), e023983. <https://doi.org/10.1136/BMJOPEN-2018-023983>
- Bailey, C. W. (2006). What is open access. Open access: key strategic, technical and economic aspects. *Oxford: Chandos Publishing*, 13-26.

findings have implications for resource allocation, collaboration, and future research efforts to foster the growth and impact of Tanzanian research across different subject fields. Possible recommendations of the study findings include: HLIs devise strategies to increase their IR content's visibility. HLIs should create awareness of research visibility, enabling their researchers to publish and increase research visibility. Further studies should investigate the citation impact of Tanzanian IR content using other indexing databases such as Google Scholar, Web of Science, and DOAJ.

- Bjork, B. C. (2004). Open access to scientific publications - an analysis of the barriers to change? *Information Research*, 9(2).
- Bornmann, L., & Mutz, R. (2015). Growth rates of modern science: A bibliometric analysis based on the number of publications and cited references. *Journal of the Association for Information Science and Technology*, 66(11), 2215-2222. <https://doi.org/10.1002/asi.23329>
- Bornmann, L., Mutz, R., & Daniel, H. D. (2008). Are there better indices for evaluation purposes than the h index? A comparison of nine different variants of the h index using data from biomedicine. *Journal of the American Society for Information Science and Technology*, 59(5), 830-837. <https://doi.org/10.1002/ASI.20806>
- Buholmoli, O. S., & Muneja, P. S. (2020). Awareness of open data among researchers in selected public Universities in Tanzania. *University of Dar Es Salaam Library Journal*, 15(1), 173-185.
- Buholmoli, O. S., & Muneja, P. S. (2023). Factors that determine open data readiness among scholars : experience from selected universities in Tanzania. *Information Delivery Journal*. <https://doi.org/10.1108/IDD-10-2021-0111>
- Caon, M., Trapp, J., & Baldock, C. (2020). Citations are a good way to determine the

- quality of research. *Physical and Engineering Sciences in Medicine*, 43(4), 1145–1148. <https://doi.org/10.1007/S13246-020-00941-9>
- Demetres, Michelle R., Delgado, D., & Wright, D. N. (2020). The impact of institutional repositories: a systematic review. *Journal Medical Library Association*, 108(2), 177–184.
- Do, H. H. N., Chandrasekaran, M. K., Cho, P. S., & Kan, M. Y. (2013). Extracting and matching authors and affiliations in scholarly documents. *Proceedings of the ACM/IEEE Joint Conference on Digital Libraries*, 219–228. <https://doi.org/10.1145/2467696.2467703>
- Fortunato, S., Bergstrom, C. T., Börner, K., Evans, J. A., Helbing, D., Milojević, S., Petersen, A. M., Radicchi, F., Sinatra, R., Uzzi, B., Vespignani, A., Waltman, L., Wang, D., & Barabási, A. L. (2018). Science of science. *Science*, 359(6379). <https://doi.org/10.1126/science.aao0185>
- Gadd, E., Fry, J., & Creaser, C. (2018). The influence of journal publisher characteristics on open access policy trends. *Scientometrics*, 115(3), 1371–1393. <https://doi.org/10.1007/s11192-018-2716-8>
- Gil-Leiva, I., Díaz Ortuño, P., & Fernandes Corrêa, R. (2022). Automatic indexing of scientific articles on Library and. *Revista Española de Documentación Científica*, 45(4), e338. <https://doi.org/10.3989/redc.2022.4.1917>
- Gusenbauer, M. (2022). Search where you will find most: Comparing the disciplinary coverage of 56 bibliographic databases. In *Scientometrics* (Vol. 127, Issue 5). Springer International Publishing. <https://doi.org/10.1007/s11192-022-04289-7>
- Hottenrott, H., & Lawson, C. (2017). A first look at multiple institutional affiliations: a study of authors in Germany, Japan and the UK. *Scientometrics* 2017 111:1, 111(1), 285–295. <https://doi.org/10.1007/S11192-017-2257-6>
- Hyland, K. (2017). Metadiscourse: What is it and where is it going? *Journal of Pragmatics*, 113, 16–29. <https://doi.org/10.1016/J.PRAGMA.2017.03.007>
- Kakai, M., Musoke, M. G. N., & Okello-Obura, C. (2018). Open access institutional repositories in universities in East Africa. *Information and Learning Science*, 119(11), 667–681. <https://doi.org/10.1108/ILS-07-2018-0066/FULL/HTML>
- Kodua-Ntim, K. (2021). University Academics' Usage of Open Access Institutional Repositories. *Journal of Library Resource Sharing*, 30(3–5), 101–116. <https://doi.org/10.1080/1072303x.2022.2103227>
- Kodua-Ntim, K., & Fombad, M. C. (2020). Strategies for the use of open access institutional repositories at universities in Ghana. *Library Management*, 41(6–7), 515–530. <https://doi.org/10.1108/LM-02-2020-0023/FULL/HTML>
- Koulikov, M. (2010). Indexing and full-text coverage of law review articles in nonlegal databases: An initial study. *Law Library Journal*, 102(1), 39–57.
- Liskiewicz, T., Liskiewicz, G., & Paczesny, J. (2021). Factors affecting the citations of papers in tribology journals. *Scientometrics*, 126(4), 3321–3336. <https://doi.org/10.1007/S11192-021-03870-W>
- Lovett, J. A., Rathemacher, A. J., Boukari, D., & Lang, C. (2017). Institutional Repositories and Academic Social Networks: Competition or Complement? A Study of Open Access Policy Compliance vs. ResearchGate Participation. *Journal of Librarianship and Scholarly Communication*, 5(1), 0–35. <https://doi.org/10.7710/2162-3309.2183>
- Lynch, C. (2003). Check out the new library. *Ubiquity*, 23(4).
- Mammola, S., Fontaneto, D., Martínez, A., & Chichorro, F. (2021). Impact of the reference

- list features on the number of citations. *Scientometrics*, 126(1), 785-799. <https://doi.org/10.1007/S11192-020-03759-0>
- Mbughuni, A. S., Mtega, W. P., & Malekani, A. W. (2022). Exploring academic staff engagement in depositing locally produced research content in open access institutional repositories in Tanzania. *IFLA Journal*, 48(4), 523-537. <https://doi.org/10.1177/03400352211069157>
- Mnzava, E. E., & Chirwa, M. N. (2018). Usage of Sokoine University of Agriculture Institutional Repository among academic staff at the College of Veterinary Medicine and Biomedical Science in Tanzania. *Global Knowledge, Memory and Communication*, 67(8-9), 510-522. <https://doi.org/10.1108/GKMC-04-2018-0033/FULL/HTML>
- Mozersky, J., McIntosh, T., Walsh, H. A., Parsons, M. V., Goodman, M., & DuBois, J. M. (2021). Barriers and facilitators to qualitative data sharing in the United States: A survey of qualitative researchers. *PLOS ONE*, 16(12), e0261719. <https://doi.org/10.1371/JOURNAL.PONE.0261719>
- Muneja, P. S., & Ndenje-Sichalwe, E. (2017). Institutional Repository Initiatives in Tanzania: Opportunities and Challenges. *University of Dar Es Salaam Library Journal*, 11(2), 74-92.
- Muneja, Paul S. (2009). Creating an institutional repository at the University of Dar es Salaam: some experiences Paul. In *First International Conference on African Digital Libraries and Archives (ICADLA-1) Creating*, 1-11.
- Mwabukojo, E. (2020). Technology Transfer Strategy: A Neglected Approach in Tanzania. *Munich Personal RePEc Archive*, 100619, 59. <https://mpra.ub.uni-muenchen.de/100619/>
- Mwalubanda, J. (2021). The development of institutional repositories in East Africa countries: A comparative analysis of Tanzania, Kenya, and Uganda. *IASSIST Quarterly*, 45(3-4), 1-12. <https://doi.org/10.29173/iq1012>
- Nazim, M., & Ashar, M. (2019). Do Open Access Journals Have Greater Citation Impact? A Study of Journals in Health and Medical Sciences in India. *Journal of Health and Medical Sciences*, 15(3), 149-164. <https://doi.org/https://doi.org/10.1080/15424065>
- Ndhlovu, P. (2021). Measuring the Impact of Institutional Repositories in selected Zimbabwean State Universities. *Southern Africa Journal of Communication and Information Science*, pp(July), 1-20. <https://www.researchgate.net/publication/353314252>
- Nunda, I. M., & Elia, E. F. (2018). Institutional repositories adoption and use in selected Tanzanian higher learning institutions Israel Malweta Nunda and Emmanuel Frank Elia. ... *Journal of Education and Development Using ICT*, 15(1), 150-164. <https://www.learntechlib.org/p/209740/>
- OpenDoAR. (2023). *OpenDOAR Statistics - Sherpa Services*. [https://doi.org/https://v2.sherpa.ac.uk/view/repository\\_visualisations/1.html](https://doi.org/https://v2.sherpa.ac.uk/view/repository_visualisations/1.html)
- Rethlefsen, M. L., Kirtley, S., Waffenschmidt, S., Ayala, A. P., Moher, D., Page, M. J., Koffel, J. B., & Group, P. (2021). PRISMA-S: an extension to the PRISMA Statement for Reporting Literature Searches in Systematic Reviews. *BMC*, 1-19.
- Salisbury, L. (2009). Web of Science and Scopus: A comparative review of content and searching capabilities. *The Charleston Advisor/Advisor Reviews*, 5-19. <http://www.bio.unipd.it/seminari/SCOPUSversusWoS.pdf>
- Samzugui, A. (2017). The Role of Institutional Repositories in Promoting Grey Literature in Academic Libraries in Tanzania. *University of Dar Es Salaam Library Journal*, 121(2), 149-200.
- Schotten, M., el Aisati, M., Meester, W. J. N.,

Steinginga, S., & Ross, C. A. (2017). A Brief History of Scopus: The World's Largest Abstract and Citation Database of Scientific Literature. *Research Analytics*, 31-58. <https://doi.org/10.1201/9781315155890-3>

Tanzania Commission for Science and Technology. (2018). *Rolling Strategic Plan: 2016/17 - 2020/2021*.

Wheeler, J., Pham, N. M., Arlitsch, K., & Shanks, J. D. (2022). Impact factions: assessing the citation impact of different types of open access repositories. *Scientometrics*, 127(8), 4977-5003.

<https://doi.org/10.1007/s11192-022-04467-7>