

IJS GS


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## INTERNATIONAL JOURNAL OF SCIENCE FOR GLOBAL SUSTAINABILITY

### International Journal of Science for Global Sustainability (IJS GS): A Bibliometric Analysis: 2015-2019

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#### ABSTRACT

Bibliometric analysis method was used in this study. Observation and physical counting method was adopted to examine the bibliographic characteristics and development of the assembled issues/volumes which were available in the Federal University Gusau (FUGUS) library and confirmed by the past and present Editors-in-Chief of the Journal. The study covered 8 volumes of the IJS GS from the period 2015 to 2019. The bibliometric characteristics examined in this study are (i) Number of issues published per year, (ii) Distribution of articles published per volume, (iii) Authorship pattern (single & multiple), (iv) Authorship affiliation (Universities, Research/special organizations-NAFDAC, Private, MDAs etc, Polytechnics, and Colleges), (v) FUGUS authorship; (vi) Most cited source of information which for convenience sake were divided into six, namely; books (including chapter contributions), journals, proceedings (conferences, workshops, seminars, symposiums and technical/scientific reports), Thesis/Dissertations/Projects, (Internet resources and Others (Bulletin, Newsletter, Guides, newspapers, magazines, maps/atlas, unidentifiable sources etc). (vii) Most cited journal title and ranking of the journal titles. A benchmark of 5 reference listing was set to select a Journal title as most cited/referenced/listed. Findings include the journal's inconsistency in the number of issues published per year from 2015-2019; FUGUS staff authorship pattern shows that the department of Chemistry contributed more papers to the journal than other departments. It was also revealed that African Journal of Biotechnology was the most cited journal title and as such ranked first. The study recommended that urgent efforts should be made to make the journal more visible by hosting it on the FUGUS website as well getting it indexed.

**Keywords:** Bibliometric, Analysis, Citation, Research output, Productivity characteristics, Science journal

#### 1.0 INTRODUCTION

The term "Publish or perish" is a driving force for academic or scholarly publishing. Perhaps that is responsible for the growth and sustenance of journals by various academic institutions as avenue to publish their research reports or opinions so as not to "perish" but rather remain relevant in their respective fields and get promotions, be engaged as resource person or speaker in one's area of expertise as evident in your publications. This is aside advancing knowledge for societal development that result from their researches. Journals are the major tools for sharing and disseminating current information/knowledge among scholars both professional and academic communities and

across cultures, even more so now that the world has become a global village. According to Inazu (2012), Journals enable researchers across countries to identify and understand the unique happenings of a field in other countries. According to her, the internet has also provided opportunity for collaboration between and among authors from different institutions and countries. Online Journals are popular these days and has helped also in the visibility of both the authors and their works particularly, indexed journals.

The term "Bibliometric" according to Inazu (2012) was coined in 1969 by Pitchard.

Bibliometric analysis involves counting of these elements in relation to authors, subjects covered which helps in determining popularity of authors, subjects, titles, journals or sources of information, affiliations etc. Bibliometric study is championed by librarians and information scientists and is based on study of metadata elements like author, subject, title, citation among others related to scholarly publication within a field. According to Lemke (2020) when you want to quantitatively ascertain the impact of a scientific publication, usually, the number of times the article is quoted in other publications is counted. That is how many other authors cited or made reference to a particular article. This should also go for a journal title. It is a measure of research output quantity wise. According to Lemke, the idea behind this procedure started as in the 1920s; and that the compilation and subsequent publication of the first citation indexes in the 1960s significantly influenced it.

Knowledge of research output is very important as it would help determine the depth and current trend of research in a given field (Inazu 2012). Research output study can therefore, attract research funding to an individual or institution that is found to have high research output; it can

### **1.1 Brief History of the Journal**

International Journal of Science for Global Sustainability (IJS GS) is a university based journal published by the Faculty of Science, Federal University Gusau (FUGUS), Zamfara State, Nigeria. The university is one of the three universities established by the Federal Government of Nigeria in 2013 as a response to the need for equal access to university education for the citizens. The university started with three faculties namely; Science, Humanities and Education and Management and Social Sciences. Full academic activities took off in January, 2015. The faculty of science pioneered the establishment of academic Journal in the new university; hence, the first edition of the journal, titled, International Journal of Science

also help the acquisition librarians to acquire research publications/journal with high rating; furthermore, journal publishers and authors can use the outcome to assess themselves. New scholarly journals are being established every now and then by various individuals, groups, institutions, regions, and countries, some have local coverage while some others have international coverage meant to serve their defined research interests. International Journal of Science for Global Sustainability (IJS GS) is one of such journals. This study is on a single journal, this is offers opportunity for in-depth study. This is in agreement with the position of Zainab, Anyi and Anuar 2009 (in Manzava and Mussa, 2019) that studying single journal will help to characterize the journal by giving more insights about its quality, maturity and productivity.

As a relatively new Journal, IJS GS to the best knowledge of the researchers have not been studied bibliometrically, hence this study intends to fill that gap and add to knowledge by conducting a bibliometric analysis on the journal to investigate its productivity characteristics and development over its five years of existence! 2015-2019

for Global Sustainability (IJS GS) appeared in September 2015 (Vol. 1 Number 1). IJS GS is a peer reviewed journal with main theme of "Sustaining the World through Scientific Research". Hence, the scope of IJS GS cut across pure and applied sciences and other studies that are scientific in nature. The journal accepts regular research papers both from practical and simulations, Critical Review, Short Communications and Letters (IJS GS, 2015). The language of publication of the journal is English Language. Apart from 2018 when the Journal did not publish any issue, it has been consistent since inception; hence it is in its fifth volume with eight issues.

## 1.2 Objectives

This study sought to investigate the:

- i. Number of issues published by IJSGS per year
- ii. Distribution of articles in IJSGS per volume
- iii. Authorship pattern
- iv. Authorship affiliation
- v. FUGUS staff authorship pattern
- vi. Most cited source of information
- vii. Most cited Journal title and Rank

## 1.3 Literature Review

According to Iftikhar, Ali, Faisaluddin, Khayyat, De Gouvía De Sa and Rao, (2019) bibliometric analysis is a statistical evaluation of published scientific articles or book chapters and an effectual way to measure the influence of scientific publication among a scientific community. Various bibliometric studies have been carried out by scholars over these years and in various disciplines, like science, education, library and information science, medicine, agriculture among others both on online and physical journals. Studying online journal in databases is much easier than studying physical copies. Determining the popularity of researchers and or their works, have been the reason behind citation analysis. These works are broadcasted to the intended communities through publications of various formats. Some of this formats according to McBurney and Novak 2002 (in Kasa, Ibrahim and Momoh (2014) include books, journals, conference papers, bulletins, magazines, monographs and technical reports. The rest formats, they categorized as miscellaneous papers. Of these, journal seem to be the most popular as averred by some authors. For example, Javed and Shah (In Kasa Ibrahim and Momoh (2014) discovered that 49.52% of citations in their study pertains to journal while the rest sources shares the remaining percentage. Kasa Ibrahim and Momoh also reported that this is in line with the observation of Gideon (2002) that journal is of great importance in the dissemination of scholarly publishing. In the same vein, Larivere et al (in Inazu 2012) asserts

that journals are the most popular information resources of bibliometric studies. This could be as a result of high journal citations recorded in bibliometric analysis. Agreeing further, Tsafe and Yusuf (2016) found out the referred journals was the most used source of information by scholars to publish their work.

The prominence of journal over other forms of scholarly publications cannot be overemphasized. Production of Journals are faster and reaches wider readership, this keeps researchers, scholars and professionals abreast of the latest knowledge in their individual fields. Books are mostly “bye product” of various research reports on a particular field, that is to say that journal publication usually precedes textbooks. According to Ezema 2010 (in Rotich and Musakali (2014) Journal publishing is a critical determinant of scholarly output of a particular area in the global academic community. Wider readership is guaranteed by a journal’s visibility. High visibility helps to spread research findings as well as the author/researcher, institutional affiliation and by implication making them popular. The advent of e-publishing and e-databases, particularly online databases have helped in the visibility of journals. It also helps in the assessment of journals as well as authors/researchers. In line with this, Rotich and Musakali (2014) advised that African scholars can improve their visibility in the academic community through identifying with journals that are widely read, some of which are listed in directory and databases like, African Journal online (AJOL), Director of Open Access Journal (DOAJ) etc. there are also databases and publishers with global coverage like SCOPUS, Science Direct, Taylor and Francis, Thompson Reuther’s, SAGE etc.

Since learning and teaching and research is the main business of the academic environment, particularly the university, lecturers are saddled with the responsibility of conducting research so as to generate new knowledge they will teach

their students and pass on to the society for innovations. The principle of publish and perish put them on their toe and have contributed immensely to the increase in the number of journals. This increase avails the lectures the opportunity to broadcast their latest findings to the wider world either on individual basis or in collaboration with fellow faculties and peers both within and outside their immediate environment. Fagbola and Adejoro (in Kasa, Ibrahim and Momoh (2014) affirms that journals importance make it the most cited literature sources and also most preferred source of information. This is in line with the findings of Tsafe, Basaka and Chiya (2016) that majority of their respondent published in journals. Fagbola and Adejoro (in Kasa, Ibrahim and Momoh (2014) attributed their findings to currency of information, high rate of turnover of production, easy accessibility, frequency of production-faster than publishing a book and other primary sources of information. Corroborating further Abiolu (in Tsafe, Basaka and Chiya 2016) concluded that scholarly journals still remained the most preferred and certified avenue of sharing research results and ascertaining new ideas between and among academics.

In their bibliometric study of a single journal, the Tanzania Journal of Agricultural Science (TAJAS), Mnzava and Chirwa (2019) reported that a total of 197 articles were published within the twenty years period they studied. The result further revealed unstable production of research articles since the inception of TAJAS in 1998. They reported that the years 1998-2002 95 (48%), 2003-2007 50 (25%) and 2013-2017 45 (23%) articles were published respectively while a remarkable decrease of 7(4%) articles were published in 2008-2012. In addition, Mnzava and Chirwa (2019) revealed that the publication frequency of the journal is not defined, although it was stated that the journal produces two volumes per year, but on the contrary the data collected shows a six years gap (2004, 2008, 2009, 2011 and 2012) and 2017 which was available but has no volumes. According to

them the frequency of publications attracts authors to choose such journal.

Mnzava and Chirwa (2019) found that collaboration in the degree of the articles published in the TAJAS was 0.91 which means that multi authored articles (179 articles out of 197) dominated the journal. They reported their findings in line with other researches which, despite variations in the extent of collaboration in various fields, concluded that science researchers agree to the critical role of collaboration in scientific research than humanists. (Real, 2012; Khaparde and Pawar, 2013). The studies conducted by (Abramo et al., 2014; Bordons and Gomez, 2000) revealed that authors from science fields collaborate at higher rates than social sciences and humanities fields authors. According to Mnzava and Chirwa (2019), notwithstanding that authorship pattern is not the perfect measure of the extent of collaboration in authorship, the general assumption is that multiple-authorship is evidence of an increase in collaboration. While Katz and Martin, 1997 (in Mnzava and Chirwa 2019) stated that implying co-authorship with collaboration is invariant, verifiable and relatively inexpensive and practical method for quantifying collaboration. However, Brocato 2001 (in Mnzava and Chirwa 2019) noted that the extent of collaboration may be attributable to factors like individual characteristics, psychological factors, environment and organizational factor. While, Edge et al. 2012 (in Mnzava and Chirwa 2019) holds that the behavior and attitude of researcher towards each other is the major factor driving collaborations and also to interact, motivate and support one another, as well making research output freely and openly available to all. Other parameters which have been successfully measured by bibliometric include years of distribution of journal articles as reported by the following scholars, Oluwakemi and Paul, 2012; Swain, 2013; Ellegaard and Wallin, 2015; Strydom and Els, 2016; Ani and Okwueze, 2017). Similarly, an analysis of research output of the academic in science and engineering by comparing the

results of different departments in science and engineering, Okafor (in Okafor (2015) discovered that academics of Zoology published more journal articles than other departments in sciences while petroleum/chemical engineering published highest in engineering faculty.

Omekwu (in Tsafe and Aliero 2008) conducted a study on author and journal citation pattern of and agricultural communication at the department of Agricultural Extension Services, University of Ibadan, Nigeria, and the study covered 37 thesis and it was discovered more citations of Nigerian authors than non-Nigerian authors. Antia-Obong, Casselden and Pickard (2019) carried out a bibliometric study on a journal titled, *Journal of Higher Education Management (JHEM)*, which according to them is the foremost journal for university administrators and have not been studied as a single journal. The purpose of their study was to examine the publication characteristics and developments of the journal over an eight (8) year period from 2007 to 2016. The results revealed total number of 83 articles and 1,821 citations within the period of study. Single authors had the highest number of papers with 54% of the total number of papers and degree of collaboration ranged between 0.14 – 0.67. They also discovered that the *Journal of Higher Education Management* was the most cited journal with a total of 27 citations. In addition, the results revealed that *JHEM* had a low self-citation with a total of 7 citations out of the total number of citations.

Thanuskodi 2010 (in Inazu 2012) did a bibliometric study on the journal of *Social Science* from 2003-2007 and found out that a total of 273 articles were published by authors from various parts of the world. The finding further showed that journal articles were the most cited in the journal of social science. But on the contrary, Obokoh (in Tsafe and Aliero 2008) who examined the characteristics of bibliographic citations in first degree research projects on education, University of Port Harcourt between 1981 and 1983 revealed that

majority of the students used (monographs) books because they believe that it is easier and more appropriate to use books than journals. It was also revealed that the authorship pattern favoured two authors. Similarly, Hussain and Fatima 2011 (in Inazu 2012) studied the bibliographic features of Chinese Librarianship from 2006 -2010. It found out that during the four years the journal published 62 articles from authors around the world. Single authors have 55.23% being the highest. Academic institutions contributed most to the journal articles. A total of 1006 citations were made by the 62 papers. On the sources of information cited 450 journals, 250 books and 200 online search and websites were reported respectively.

The study of Usman and Dansale (in Usman, Yahaya and Kabir 2017) was on the usability traits of thesis and dissertation as sources of information among agricultural students, the main purpose of the study is to find out the main reason why students use them. The study showed that thesis and dissertation usage as source of information are not yet popular among the academia. It revealed that usage of thesis and dissertation by post graduate students who might publish article from their study is very low at 12.9% compared to undergraduates' 87.1% usage even though they may not publish their project as journal article. None usage of the post graduate students of thesis and dissertation in their articles could be as a result of lack of confidence on the quality of the work or sheer ignorance of the importance of the findings contained in the thesis and dissertations which makes them to forget them during literature search for their new paper. However, Usman, Yahaya and Kabir (2017) blame this low usage of thesis and dissertation as why there is little citation of grey literature in journals. In the same vein, Lisee, Lariviere and Archambault 2008 (in Usman, Yahaya and Kabir 2017) studied the Thompson's citation index for conference proceedings; the main purpose is because for a long time their importance has measured scientifically. The study revealed a slight growth from 8% to 10% references on cited proceedings

in engineering documents from 1980 to 2005, this is an increase from 0.32 in the 1980s to 0.38 in 2005 was observed as the average proceeding citation per article in 25 years. From this report it was proven that conference proceeding have a relatively low impact of about 2% of the total citations, representing only 1.7% of citations made in the natural sciences and engineering and 2.5% in social sciences and humanities. Again like thesis and dissertation, conference proceeding according to Usman, Yahaya and Kabir (2017) the study reveals that it is yet to be fully perceived as information source to be used to create and share knowledge. Agreeable, this affects the supposed importance of conference proceedings as information resource.

## 2.0 METHODOLOGY

Bibliometric analysis method was used in this study. The study covered eight volumes of the IJS GS from the period 2015 to 2019. Observation and physical counting method was used to study the assembled issues/volumes which were available in the FUGUS library. Number of issues published per year was determined by assembling them together and confirming from the Editor-in-chief as to the number available in the library which was eight.

## 3.0 RESULTS AND DISCUSSION

**Table 1.0: number of issues published by IJS GS per year**

S/N	Years	Number of Issues
1	2015	1
2	2016	3
3	2017	2
4	2019	2
	<b>Total</b>	<b>8</b>

The above table shows the distribution of the Journal issues in the five years under study. The Journal first appeared in 2015, few months after full academic activities of the new university. The table shows that only 1 issue was published in that year as the maiden edition, vol. 1(1) September, 2015. In 2016, 3 issues were published in March, June and December. While in 2017, 2 issues were published. However, the

Number of articles published per volume, Authorship pattern (single & multiple) and Authorship affiliation (Universities, Research/special organizations-NAFDAC, PTFD, NDLEA, MDAs etc, Polytechnics, and Colleges) were all determined by counting the articles one by one in each volume. The study determined FUGUS authorship by going through the articles one after the other. The most cited source of information was ascertained by going through the reference lists provided at the end of each article. For convenience sake, sources of information were divided into six, namely; books (including chapter contributions), journals, proceedings (conferences, workshops, seminars, symposiums and technical/scientific reports), Thesis/Dissertations/Projects, Internet resources and Others (Bulletin, Newsletter, Guides, newspapers, magazines, maps/atlasses, unidentifiable sources etc). As a result of the large number of Journals listed, a benchmark of 5 reference listing was set for a Journal title to be selected for most cited journal and also ranking of the journal titles. Thereafter, the whole data collected were presented and analysed using tables, percentages and cumulative total.

Journal did not make any publication in 2018. From the table, 2 issues were released in the year 2019. This shows that a total of 8 issues were published by FUGUS International Journal of Science for Global Sustainability (IJS GS) within the period from 2015 – 2019. The finding shows inconsistency in the number of volumes per year. 2015 has 1 issue; this is understandable as it is the maiden edition of the journal. 2016 has

3, 2017 has 2 and there was no publication at all in 2018 while 2019 also has 2 issues. This finding is similar with that of Mnzava and Chirwa (2019) who also studied a single journal which revealed that the publication frequency of the journal (TAJAS) is not defined, although it was stated that the journal produces two volumes per year, but on the contrary the data collected shows a six years gap (2004, 2008,

2009, 2011 and 2012) and 2017 which was available but has no volumes. According to them the frequency of publications attracts authors to choose such journal. And this has been reported to be the problem of most African based journals. Enough feasibility study should be made before establishing a journal title so as to maintain the serial characteristics of a journal and retain patrons.

**Table 2: The Distribution of Articles in IJS GS Per Volume**

S/N	Description	No. Article
1	2015 September, Vol. 1(1)	16 (13)%
2	2016 March, Vol. 2 (1)	16(13%)
3.	2016 June, Vol. 2 (2)	14(11%)
4.	2016 Sept. Vol. 2(3)	17 (14%)
5.	2017 June, Vol. 4(1)	18 (15%)
6.	2017 Dec. 2017 Vol. 4(2)	17 (14%)
7.	2019 Sept. Vol. 5(1)	13(10%)
8.	2019 Dec. Vol. 5(2)	13 (10%)
	<b>Total</b>	<b>124</b>

Table 3 above depicts that a total number of 124 articles were published in International Journal of Science for Global Sustainability (IJS GS) for the eight issues published in the five year period under study. The highest number of articles 18 (15%) was published in Vol. 4(1) of June, 2017. It Journal started with 16 (13%) and dropped to 14 (11%) after two years. However, it reached an all-time high 18(15%) in its fifth issue, vol. 4 (1) June, 2017 and the last two issues dropped to 13 (10%), vol. 5 (1) and vol. 5 (2) respectively.

The present study confirmed that of Mnzava and Chirwa (2019) in another single journal study, where they reported that a total of 197 articles were published within the twenty years period they studied. However, while IJS GS published 124 articles in 5 years, TAJAS published 197 in twenty years, an indication that IJS GS has more production than TAJAS. The result further revealed unstable production of research articles since the inception of TAJAS in 1998 which is in line in with the findings of the present study.

**Table 3: Percentage Rating of Authorship Pattern In IJS GS**

S/N	Description	Single Author	Multiple Author	Total
1.	2015 September, Vol. 1(1)	1 (1%)	70 (99%)	71
2.	March 2016, Vol. 2 (1)	0(0%)	72 (100%)	72
3.	2016 June, Vol. 2 (2)	0(0%)	56 (100%)	56
4.	2016 Sept. Vol. 2(3)	2 (4%)	51 (96%)	53
5.	2017 June, Vol. 4(1)	1 (2%)	57 (98%)	58
6.	2017 Dec. Vol. 4(2)	1 (2%)	57 (98%)	58
7.	2019 Sept. Vol. 5(1)	0 (0%)	42 (100%)	42
8.	2019 Dec. Vol. 5(2)	0 (0%)	71 (100%)	71
	<b>Total</b>	<b>5 (9%)</b>	<b>476 (91%)</b>	<b>481</b>

Result from the above table revealed that there is total number of 481 authors who contributed to the journal within the period under study. The authorship pattern analysis showed that there are more multiple authors than single authors. Multiple authors have 476 (91%) while single author contributors are just 5 (9%). This is in agreement with findings of Mnzava and Chirwa (2019) who found out that collaboration in TAJAS shows that multi authored articles (179 articles out of 197) dominated the journal. The result further showed that while multiple author contribution cut across the 8 issues published, single contribution was in 4 issues. This is an indication that scholars and researchers value collaboration because it enhances research output when varying positive contributions are made in producing the result. Collaboration also

makes the work easy as different components of the study would be shared among the contributing. This position is in line with that of Mnzava and Chirwa (2019) who reported their findings in line with other researches which, despite variations in the extent of collaboration in various fields, agreed that science researchers agree to the critical role of collaboration in scientific research than humanists. Multiple authors is an evident of collaboration leaving the extent of participation of individual author in the partnership for further verification. Similar research interests, sharing financial burden of publishing especially in high impact factor and foreign journals giving the high exchange rates friendship and mentorship could be some of the reason for collaborations

**Table 4: Percentage Rating of Authorship Affiliation in IJSGS**

S/ N	Description	Universities	Research/Special Organizations	Polytechnics	Colleges	Total
1.	2015 September, Vol. 1(1)	63 (89%)	4 (6%)	3 (4%)	1 (1%)	71
2.	2016, Vol. 2 (1)	54 (75%)	12 (17%)	0 (0%)	6 (8%)	72
3.	2016 June, Vol. 2 (2)	52 (93%)	1 (2%)	0 (0%)	3 (5%)	56
4.	2016 Sept. Vol. 2(3)	50 (94%)	1 (2%)	2 (4%)	0 (0%)	53
5.	2017 June, Vol. 4(1)	51 (88%)	0 (0%)	2 (3%)	5 (9%)	58
6.	2017 Dec. Vol. 4(2)	52 (90%)	0 (0%)	0 (0%)	6 (10%)	58
7.	2019 Sept. Vol. 5(1)	36 (85%)	2(5%)	2(5%)	2(5%)	42
8.	2019 Dec. Vol. 5(2)	60 (85%)	0 (0%)	3 (4%)	8 (11%)	71
	<b>Total</b>	<b>418 (87%)</b>	<b>20 (4.1%)</b>	<b>12 (2.4%)</b>	<b>31 (6.4%)</b>	<b>481</b>

Result from the above table on authorship affiliation indicates that a total number of 481 authors contributed to IJSGS 8 issues, from inception in September, 2015 to December, 2019. University with 418 (87%) authors contributed more than other affiliates. This is followed by Colleges with 31 (6.4%) while Polytechnics had the least overall contribution of 12 (2.4%). On per volume result, the maiden edition, 2015 September, Vol.1 (1) has the highest contribution from university based authors with 63 (89%) followed by the last issue under study, 2019 December, Vol. 5 (2). And the highest contribution from non-university is 12 (17%) from Research/Special Organizations,

while the least contribution of 1(2%) was recorded for Research/Special Organizations in 2016 June, Vol. 2 (2) and 2016 Sept. Vol. 2(3) and Colleges 1(2%) in 2015 September, Vol. 1(1) respectively. This finding is further attestation to the leading role of the university in research among other institutions except for research universities. Universities are established to provide high level manpower for the society as well as solve societal problems through research and development. Interestingly, from the reviewed literature, there are no studies on authorship or institutional affiliation upon which this finding would be compared.

**Table 5: Percentage Rating Of Fugus Authorship Pattern in IJSGS**

S/ N	Description	Biochem.	Bio Sci.	Chemistry	Geology	Mathematic s	Physics	Pub. Admi	Total
1.	2015 Vol. 1(1)	0 (0%)	1(4%)	12 (46%)	5 (19.2%)	4 (15.3%)	4 (15.3%)	0 (0%)	26
2.	2016 March, Vol. 2 (1)	0 (0%)	0 (0%)	2 (67%)	0 (0%)	1(33%)	0 (0%)	0 (0%)	3
3.	2016 June, Vol. 2 (2)	0 (0%)	2 (40%)	2 (40%)	1 (20%)	0 (0%)	0 (0%)	0 (0%)	5
4.	2016 Sept. Vol. 2(3)	0 (0%)	0 (0%)	2 (14%)	2 (14%)	7 (50%)	2 (14%)	1(7%)	14
5.	2017 June, Vol. 4(1)	0 (0%)	2 (40%)	1 (20%)	2 (40%)	0 (0%)	0 (0%)	0 (0%)	5
6.	2017 Dec. Vol. 4(2)	0 (0%)	4 (27%)	4 (27%)	3 (20%)	1(7%)	1(7%)	0(0%)	15
7.	2019 Sept. Vol. 5(1)	0 (0%)	6(67%)	1(11%)	2(22%)	0 (0%)	0 (0%)	0 (0%)	9
8.	2019 Dec. Vol. 5(2)	8 (67%)	0(0%)	0(0%)	3(25%)	0 (0%)	1(8%)	0 (0%)	12
	<b>Total</b>	<b>8(10%)</b>	<b>15 (20%)</b>	<b>21(28%)</b>	<b>18(24%)</b>	<b>13(18%)</b>	<b>8(10%)</b>	<b>1(15%)</b>	<b>74</b>

Table 5 above shows authorship pattern of Federal University Gusau (FUGUS)–(the University Journal host). The result here shows that FUGUS staff contributed only 74 (15.3%) out of the 481 authors that contributed to the Journal. Vol. 1(1) of September, 2015 recorded the highest number of FUGUS staff (26) contribution to the journal. Perhaps their zeal to feature and support their maiden issue prompted this high number. Subsequent volumes did not reach the point. Generally, this is not an impressive result and could be as a result of low visibility and none indexing of the journal by prominent databases, like science index, SCOPUS etc. This will not boost their popularity, they may have decided to be publishing in indexed and high impact factor journals. The result also shows a dominance of Science based departments which is not surprising as they of course are the owners of the

journal. The result further revealed that authors from the department of Chemistry contributed more than others with total of 21(28%), closely followed by Department of Geology 18(24%). While departments of Biochemistry and Physics contributed 8 papers each within the five year period under study. However, the Department of Public Administration from the Faculty of Management and Social Sciences had one contribution. Other departments in the university should also try and identify problems or gaps in the sciences or in their own field they can study and publish in each other's journals. This is an encouragement for interdisciplinary collaboration. Okafor 2010 (in Okafor (2015) discovered that academics of Zoology published more journal articles than other departments in sciences while petroleum/chemical engineering published highest in engineering faculty

**Table 6: Percentage Rating of Source of Information**

S/N	Description	Books	Journals	Proceedings/Reports	Thesis/Diss /Projects	Intern et	Others	Total
1.	2015 September, Vol. 1(1)	38 (17%)	142 (63%)	12 (5%)	4 (2%)	20 (9%)	11 (4%)	227
2.	2016 March, Vol. 2 (1)	24(11%)	118(54%)	26 (12)	11(5%)	10(5%)	29(13%)	218
3.	2016 June, Vol. 2 (2)	60(16%)	227(61%)	27(7%)	13(4%)	25(7%)	18(5%)	369
4.	2016 Sept. Vol. 2(3)	58(12%)	335(72%)	17(4%)	5(1%)	24(5%)	26(6%)	465
5.	2017 June, Vol. 4(1)	47(15%)	216(70%)	6(2%)	13(4)	5(2%)	23(7%)	310
6.	2017 Dec. Vol. 4(2)	55(16%)	219(65%)	25(7%)	6(2%)	9(3%)	23(7%)	337
7.	2019 Sept. Vol. 5(1)	38(14%)	166(61%)	19(7%)	5(2%)	25(9%)	18(7%)	271
8.	2019 Dec. Vol. 5(2)	32(10%)	218(67%)	24(7%)	9(3%)	24(7%)	18(6%)	325
	<b>Total</b>	<b>352 (14%)</b>	<b>1641 (65%)</b>	<b>156 (6%)</b>	<b>66 (3%)</b>	<b>142 (6%)</b>	<b>166 (6%)</b>	<b>2523</b>

Findings here show that a total number of 2,523 citations/references were made in the journal in the 8 issues over the period of five years, 2015-2019. This is a huge figure compared to the findings of Antia-Obong, Casselden and Pickard (2019) that studied a journal's eight (8) year period from 2007 to 2016 and revealed a total number of 1,821 citations. The findings further reveals that journals were the most cited sources of information 1,641 (65%) used by the contributing authors in the period under study. This is followed by books 352 (14%), Others 166(6%), Proceedings 156 (6%) and the least referenced source is thesis/dissertation and projects with 66 (3%). This is in line with the findings of Tsafe, Basaka and Chiya (2016) that majority of their respondents published in journals. Similarly, Hussain and Fatima 2011 (in Inazu 2012) and Javed and Shah (In Kasa Ibrahim and Momoh (2014) all discovered that journals were the most cited source of information in their studies. This finding attests to journal continuous lead as the most preferred out let of scholarly and research publications. This could be as a result of journals ability to bring research results of related or seemingly related studies together in one compact document which it does much faster than its closest ally, the book. However, contrary to the above agreement, the study of Obokoh (in Tsafe and Aliero 2008) revealed that majority of the students used (monographs) books because they

believe that it is easier and more appropriate to use books than journals. This is understandable, because at their level (undergraduate) they are not expected to engage in very serious and extensive research. The study of Usman and Dansale (in Usman, Yahaya and Kabir 2017) showed that thesis and dissertation usage as source of information are not yet popular among the academia. This supports the finding of this study where thesis and dissertation came last as preferred source of information. Low citation of thesis and dissertation could be as a result of lack of confidence on the quality of the work or sheer ignorance of the importance of the findings contained in the thesis and dissertations. In the same vein, Lisee, Lariviere and Archambault (in Usman, Yahaya and Kabir 2017) studied the Thompson's citation index for conference proceedings, their findings proves that conference proceeding have a relatively low impact of about 2% of the total citations, representing only 1.7% of citations made in the natural sciences and engineering and 2.5% in social sciences and humanities. Again like thesis and dissertation, conference proceeding according to Usman, Yahaya and Kabir (2017) is yet to be fully perceived as information source to be used to create and share knowledge. Agreeable, this affects the supposed importance of conference proceedings as information resource.

**Table 7: Percentage Rating of Most Cited Journal Titles and Ranking**

S/N	Name of Journal	Number of Citation	Ranking
1.	African Journal of Biotechnology	29 (9%)	1 <sup>st</sup>
2.	Food Chemistry	26(8%)	2 <sup>nd</sup>
3.	Renewable Sustainable Energy Review	25(8%)	3 <sup>rd</sup>
4.	Journal of Ethnopharmacology	21(7%)	4 <sup>th</sup>
5.	Geophysics	17(5.2%)	5 <sup>th</sup>
6.	International Journal of Solar Energy	16(5%)	-
7.	Fuel	16(5%)	-
8.	Nigerian Journal of Parasitology	15(5%)	-
9.	International Journal of the Physical Science	12(4%)	-
10.	Journal of Natural Products	12(4%)	-
11.	Geology and Mining	12(4%)	-
12.	International Journal of Heat and Mass Transfer	11(3.4%)	-
13.	Journal of American Oil Chemist Society	10(3.1%)	-
14.	International Journal of Pure and Applied Mathematics	9(3%)	-
15.	Mycoses	9(3%)	-
16.	PlantaMedica	8(2.4%)	-
17.	Biomass and Bioenergy	8(2.4%)	-
18.	International Journal of Computational Maths	7(2.1%)	-
19.	Inorganic Chemistry	7(2.1%)	-
20.	Bayero Journal of Pure and Applied Science	6(1.8%)	-
21.	Water Resources Research	6(1.8%)	-
22.	Pakistan Journal Nutrition	6(1.8%)	-
23.	Energy Conversion and Management	6(1.8%)	-
24.	Phytochemistry	6(1.8%)	-
25.	Environmental Pollution	6(1.8%)	-
26.	International Journal Pharmaceutical Science	6(1.8%)	-
27.	International Research Journal of Pharmacy and Pharmacology	5(2%)	-
28.	African Journal of Traditional complementary and Alternative Medicine	5(2%)	-
	<b>Total</b>	<b>322</b>	-

This table shows the result of the most cited Journal titles and there ranking in the IJS GS from 2015-2020 (eight issues). From the study a total of 322 (13%) of the whole citations (2523) were the total number most cited journals were listed. Twenty eight journals met the 5 listings benchmark. Findings further showed that African Journal of Biotechnology with 29(9%) referencing across the eight issues is the most cited journal title in the International Journal of Science for Global Sustainability (IJS GS) thereby ranked first (1<sup>st</sup>). Perhaps this is an indication of the popularity of Biotechnology among scholars and the society who are fast

embracing biotechnology products. It is followed by Food Chemistry and Renewable Sustainable Energy Review with 26(8%) and 25(8%) respectively, taking the 2<sup>nd</sup> and 3<sup>rd</sup> positions respectively. The first five position ranked here could be an indication of the most treated subject areas in the journal as per studied period. However, some titles have equal citations like International Journal of Solar Energy and Fuel, 16(5%) each, International Journal of the Physical Science, Journal of Natural Products and Geology and Mining, 12(4%) reference listing. The last two journals, International Research Journal of Pharmacy and

Pharmacology and African Journal of Traditional Complementary and Alternative Medicine stood at the benchmark 5(2%) which

#### 4.0 CONCLUSION

The study was a bibliometric analysis of a single physical Journal, the International Journal of Science for Global Sustainability (IJSGS) of the Faculty of Science, Federal University Gusau (FUGUS), Nigeria. The study described the output of the journal as it relates to the number of issues it published per year and it was revealed that the journal had not been consistent in the number of issues published from 2015-2019. The study described the distribution of articles per volume where it was found that a total number of 124 articles were published by the journal in the 8 issues it has in five years. It was further shown from the study, that

#### 5.0 RECOMMENDATIONS

1, The Publishers of International Journal of Science for Global Sustainability (IJSGS) should endeavour to stabilize and be consistent with the production of the journal, so as not to make scholars form a negative opinion about it.

2. As a matter of necessity, efforts should be made by the journal publishers to make it more visible by hosting it on the University website, getting it listed and indexed by reputable databases, like African Journals Online (AJOL), DOAJ, SCOPUS, EBSCOHOST etc. This will help give the journal wider publicity as well as enhances assessment of the authors.

3. FUGUS staff should also be encouraged to publish with the Journal.

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is the benchmark set for selection of most cited journal titles.

authorship pattern of the journal favoured multiple authors and that the university affiliation has more articles than the other institutional affiliation studied. FUGUS staff authorship pattern revealed that authors from the department of Chemistry contributed more papers to the journal than other departments in the university. The findings of the study further indicated that Journal was the most cited source of information used by the contributors, while it was discovered that 28 journal titles were the most cited of which African Journal of Biotechnology ranked first.

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