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Citation Pattern of the Nigerian Journal of Horticultural Science from 1990-2005

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Introduction

The essence of academic journal publishing is to report research findings and to contribute to the field of knowledge. Journals are the most current channel of dissemination of new ideas, knowledge and breakthroughs in scientific development. Academic journals play a significant role in academic scholarship (Xiao and Smith, 2006). The present study therefore is undertaken on one of the renowned subject specialized academic journals, with the aim of analyzing citations cited in the various articles published therein.

Citation analysis examines bibliographic data from journal articles, monographs, published bibliographies, theses and electronic indexes in order to understand researchers' specific information needs and explain trends in library use. Citations appearing in journals of particular disciplines provide an objective measure of the contributions of other knowledge systems to the development and progress of that particular discipline (Chandy and Williams, 1994). According to Gao , Yu, and Luo (2009) librarians have used several different quantitative methods to identify patrons' needs, including circulation and shelving data, the analysis of interlibrary loan requests, as well as citation analysis.

Edward (1999) asserts that citation analysis can be used to determine a core collection of journals critical to local users and representative of the research needs of the collection. Gooden (2001) opines that citation analysis has been used by librarians in various disciplines to eliminate costly, low used/unused journals, purchase needed materials and ascertain core journals needed for patron use, and to reveal the most active research in a particular field. Ching and Chennupati (2002) opines that citation analysis is a form of checklist approach, and basically compares a library's holdings to an authoritative list for the purpose of assessing the quality of all or part of the collection.

Furthermore, Gao et al, (2009) asserts that citation analysis has advantages over the other methods in a number of ways. Firstly, citing a publication may be the best indication of its importance since the citation implies that researchers read the publication and considered it important enough to include as a reference. Secondly, managing a citation study is relatively simple — it can be conducted by a single person. Thirdly, citation studies are reliable, valid, rapid, and economical and the data may be obtained unobtrusively. Fourthly, and perhaps most valuable for an academic librarian is the fact that a citation is a component of the most important product of the academic enterprise.

The Nigerian Journal of Horticultural Science was first published in May, 1990. It is published by the

Horticultural Society of Nigeria. The Journal is the primary source for inquiry on horticultural crop production and sustainability in sub-Saharan Africa; it is the key source of information that is consulted by researchers and scholars in horticultural research.

Literature Review

Zhang (2007) analyzed research behavior of US international relations scholars by selecting peer-reviewed journals' citations appearing in articles from the three leading international relations journals published from 2000 to 2005. His findings revealed that books and journals are the overwhelmingly dominant reference sources (86.6%), while the other formats are relatively less utilized in international relations research (13.5%). Kelsey and Diamond (2003) analyzed core journals in the interdisciplinary field of Forestry.

Similarly, Das and Sen (2001) analyzed 1049 citations appended to 34 research articles of *Journal of Biosciences*; 2000. It was found that out of the total citations, journal articles comprises 85.89% and monographs 10.1%. The report of Koley and Sen (2003) which covered 457 citations from 26 research articles published in the four issues of the quarterly Indian *Journal of Physiology and Allied Sciences*, also revealed that 76.81% related to journal articles, 18.59% to monographs, while others were conference papers and theses. Likewise the study of Javed and Shah (2008) revealed that 49.52 % citations pertained to journal articles and rest to other resource types. This shows that journals are heavily cited and preferred source of information. Journals are more cited than other literature sources because of the following: Currency of information, high rate of turnover of production, easy accessibility, frequency of production is faster than books and other primary sources.

Haycock (2004) analyzed 4542 citations from forty-three education dissertations completed at the University of Minnesota from 2000 to 2002. His research results were used to guide journal selection, retention, and cancellation decisions and to provide a basis for conversations with the faculty. Omekwu and Atinmo (1998) examined the author and journal citation patterns of Agricultural communication theses at the University of Ibadan. The result of the bibliographical reference of 37 theses studied showed a very significant difference in the citation of Nigerian and non-Nigerian authors, (with non-Nigerian authors cited more than Nigerian authors.) Dulle, F.W, Lwehabura, M. J. F, Matovelo, D.S, and Mulimila, R.T, (2004) analyzed citation pattern of Agricultural scientists in Tanzania, The study involved the analysis of 295 MSc theses and 21 PhD theses submitted at Sokoine University of Agriculture between 1989-1999, and 309 conference proceeding articles published during the same period. The result of the publications analysed, revealed that journals were more highly consulted(44.3% of the total citations), compared to other sources of literature (books-25.1%; proceedings-10.3%; theses- 4.2;% report-5.7% and other sources-10.4%).

Gao, et al. (2009) also analysed 56 PhD theses submitted in 2005 at Wuhan University in China. The authors analyzed 10,222 citations in theses in Library and Information Science, Biology, Photogrammetry and Remote Sensing, and Stomatology and reviewed and compared the characteristics of the literature cited in the four disciplines. Their results revealed an overwhelming emphasis on citations from the journal literature. Edwards (1999) analyzed 5874 citations of doctoral dissertations and masters thesis written at the University of Akron in the area of Polymer Science and Polymer Engineering from 1990 to 1996 to determine the characteristics of the materials being cited by graduate students.

Gooden (2001) studied 30 dissertations and generated a total of 3,704 citations. It was found that Journal articles were cited more frequently than monographs: 85.8% of the citations were journal articles and 8.4% of the citations were monographs.

Methodology

The Nigerian Journal of Horticultural Science was selected as the source of citation data for this study. National Horticultural Research Institute (NIHORT) gave birth to Horticultural Society of Nigeria which was established in 1977, the quality of papers that were presented at each annual conference led to launching of this journal. What informed the choice of this journal was to enhance provision of information for Horticultural scientists; to improve the dissemination of information and to serve as a guide for the collection development of the information resource centre. Articles published in the journals were analysed from 1990-2005 (volumes 1-10). Data collected from the articles included: author affiliations, number of citations, number of author(s), and the total of each cited work. The cited work in

each article were categorised into: journals, books and monographs, conference proceedings, bulletins, reports, thesis and dissertations, newsletters. Descriptive statistics were used in data analysis.

Result and Discussion

Table 1: Research contributions by Universities in different volumes of the Journals (1990–2005)

AUTHORS'AFFLIATION/GEOGRAPHICAL SPREAD	Volume										Total	%	Ranking
	1	2	3	4	5	6	7	8	9	10			
Ahmadu Bello University / N	5	18	3	17	14	7	2	2	2	2	72	30.0	1 st
University of Ibadan /SW	-	-	5	-	-	8	8	6	6	2	35	14.58	2 nd
University of Benin, Benin, Edo State /SE	5	5	8	0	6	-	3	-	5	2	34	14.17	3 rd
University of Nigeria, Nsukka /SE	2	8	3	2	1	0	1	4	2	1	24	10.0	4 th
University of Agriculture, Abeokuta /SW	-	-	2	-	5	1	2	2	4	6	22	9.17	5 th
Ogun State University Ago Iwoye /SW	3	1	-	5	2	-	-	-	-	-	11	4.58	6 th
University of Ilorin / SW	1	-	-	2	-	-	-	2	2	-	7	2.92	7 th
Abubakar Tafawa Balewa University /N	-	-	2	-	-	-	-	-	4	-	6	2.5	8 th
University of Agriculture, Makurdi /N	-	-	-	-	-	-	-	2	4	-	6	2.5	9 th
River State University of Science & Technology, Port Harcourt /SE	-	-	1	-	3	-	-	-	-	-	4	1.67	10 th
Usman Danfodiyo University, Sokoto /N	-	-	-	-	-	-	-	-	2	1	3	1.25	11 th
Obafemi Awolowo University, Ile Ife / SW	-	-	-	-	-	1	2	-	-	-	3	1.25	11 th
University of Science & Technology, Port Harcourt /SE	2	-	-	-	-	-	-	-	-	-	2	0.83	12 th
University of Ado-Ekiti /SW	-	-	-	-	-	-	-	-	1	-	1	0.42	13 th
Ladoke Akintola University of Technology, Ogbomosho /SW	-	-	-	-	-	-	-	-	1	-	1	0.42	13 th
Babcock University, Illisan Remo /SW	-	-	-	-	-	-	-	-	-	1	1	0.42	13 th
Bayero University, Kano / N	-	-	-	-	-	-	-	-	-	1	1	0.42	13 th
University of Uyo / SE	-	-	-	-	-	-	-	1	-	-	1	0.42	13 th

Forestry Research Institute of Nigeria, Jericho , Ibadan, Oyo State /SW	-	-	-	-	-	-	-	-	-	1	1	1.6
Total	8	-	1	-	13	9	9	1	2	18	62	100

Table 2 shows the number of contributions of authors from Research Institutes. The National Horticultural Research Institutes (NIHORT) has the highest number of contributors among the Research Institutes 45 (72.6%), followed by Cocoa Research Institutes of Nigeria 8 (13%) The difference between the first and second Institutes by percentage is 59.6%. This is expected because the mandate of NIHORT is to conduct research into horticultural crops and it is the only research Institute south of the Sahara with this mandate. In addition, the Research Institutes, though have their headquarter stations as indicated; they also have sub-stations in the different parts of the country but no analysis on regional basis was done.

Table 3: Contributions by Colleges of Agriculture and Education in different volumes of the Journals (1990–2005)

AUTHORS' AFFILIATION/GEOGRAPHICAL SPREAD	VOL.1	VOL.2	VOL.3	VOL.4	VOL.5	VOL.6	VOL.7	VOL.8	VOL.9	VOL.10	TOTAL	%
Federal College of Forestry, Jericho, Ibadan /SW	-	-	-	-	-	-	-	-	2	2	2	20
River State College of Education, Port Harcourt /SE	-	-	-	-	-	-	1	-	1	2	2	20
Federal College of Education, Osiele Abeokuta /SW	-	-	-	-	-	2	-	-	-	2	2	20
Osun State College of Education, Ila orangun /SW	-	-	-	-	-	-	-	1	-	1	1	10
Plateau State College of Agriculture /SW	-	1	-	-	-	-	-	-	-	1	1	10
Federal College of Technology, Yola /N	-	1	-	-	-	-	-	-	-	1	1	10
Sheu Shagari College of Education, Sokoto /N	-	-	-	-	-	-	-	-	1	1	1	10
Total	-	2	-	-	-	-	2	1	1	5	10	100

Table 3 reveals the amount of contributions made by authors in Colleges of Agriculture and Education. Their contribution is quite small when it is compared to the contributions from authors in the universities and Research Institutes. Colleges of education (5) from South- western contributed 60% while two Colleges of education from the North (2) contributed 40 %,which could mean that emphasis on research in these institutions is minimal as they are set up to develop manpower for teaching.

Table 4: Contributions by Foreign authors in different volumes of the Journals (1990–2005)

AUTHORS' AFFILIATION	VOL.1	VOL.2	VOL.3	VOL.4	VOL.5	VOL.6	VOL.7	VOL.8	VOL.9	VOL.10	TOTAL	%
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University of Bonn, Auf dem Hugel 6D 53123 Bonn, Germany	-	-	-	-	-	-	-	-	-	2	2	33.3
University of Readings, Earleygate, Reading RG6 2AU.Uk	-	-	-	-	-	-	-	1	-	-	1	16.6
University of Peradeniya, Sri Lanka , Gannoruwa,	-	-	-	-	-	-	1	-	-	-	1	16.6
University of Helsinki, Finland	-	-	-	-	-	-	1	-	-	-	1	16.6
Lithuciannia Institute of Horticulture, Lt-4335 Babta, Kaunas district Lithuania	-	-	-	-	-	-	1	-	-	-	1	16.6
Total	-	-	-	-	-	-	3	1	0	2	6	100

Table 4 gives an overview of foreign authors' contribution. University of Bonn. Auf den Hugel, Germany had the highest number of authors 33.3%. From the analysis, foreign authors did not contribute to the journal from volume 1-5. The first event recorded was in volume 6. It is also interesting to note that volume 10 had the highest number of foreign authors. From the affiliation of the authors none of the foreign author is from African countries, this implies that other African countries have not been able to access the journal as an avenue to disseminate information on horticultural crops, though the journal is listed on AJOL (African Journal online). This implies that the editor needs to ensure registration of the journal with acclaimed international abstracts and bibliographies for a wider spread of information on horticultural crops research in sub-Saharan Africa.

Table 5: Types of materials cited (1990–2005), their proportion and ranking by authors of articles in the journal

Types of materials cited	VOL.1	VOL.2	VOL.3	VOL.4	VOL.5	VOL.6	VOL.7	VOL.8	VOL.9	VOL.10	Total	%	Ranking
Journal articles	73	74	68	37	108	58	74	134	132	116	874	46.86	1 st
Books & Monographs	29	52	63	36	40	68	40	74	70	68	540	28.95	2 nd
Conference proceedings	14	24	20	18	26	5	13	37	36	26	219	11.74	3 rd
Bulletins	4	8	9	8	12	15	7	18	14	6	101	5.42	4 th
Reports	1	6	10	2	9	10	1	7	4	7	57	3.06	5 th
Thesis & Dissertations	-	9	7	-	5	6	8	1	8	5	49	2.63	6 th
Newsletters	-	-	4	1	5	2	1	1	7	4	25	1.34	7 th
Total	121	173	181	102	205	164	144	272	271	232	1,865	100.0	

Table 5 reveals the result that authors/researchers in the Nigerian Journal of Horticultural Science cited more journals than books between 1990 and 2005. Eight hundred and seventy four (874, 46.86%) journals were cited while books and monographs followed with five hundred and forty citations (28.95%) Conference proceedings were two hundred and nineteen (11.74%) while Newsletters was the least (1.34%). This result corresponds with Sam (2008) who examined articles published in the Ghana Library Journal over a seven-year period from 2000 to 2006, his result revealed that the majority of items cited were journals (44.5%) followed by books (32.5%) and reports (9.4%), similarly, the result of Dulle (2004) et al indicates that agricultural scientists consult journals for their research than any research communications, likewise Gooden(2001) found out in his citation analysis of 30 dissertations that journal articles (85.8%)were cited more frequently than monographs(8.4%). However, on the contrary, Zhang (2007) opines that researchers consult books than journals.

Table: 6 Pattern of Authorship

Number of authors	VOL.1	VOL.2	VOL.3	VOL.4	VOL.5	VOL.6	VOL.7	VOL.8	VOL.9	VOL.10	Total	Ranking
Single	5	4	8	1	4	3	1	7	5	3	41	2 nd
Two	7	7	6	5	9	9	4	7	9	5	67	1 st
Three	1	4	2	1	3	4	4	2	4	6	31	3 rd
Four	-	2	-	2	3	1	1	1	-	2	12	4 th
Five	-	-	-	1	-	-	1	-	-	-	2	5 th
Six	-	-	-	-	-	-	-	-	1	-	1	6 th
Total no of articles	13	17	16	10	19	17	11	17	19	16		

Table 6 indicates the pattern of authorship (Single and multi-authors) among researchers. Collaboration has been found to affect the feasibility and productivity of scientists (Subramnyam, 1983). The degree of collaboration varied from year to year. This observation has further exposed the low level of collaboration among scientists hence a recommendation for multi- disciplinary approach to research is advocated.

Conclusion and Recommendation

The citation pattern of a core journal for horticultural crops research was analysed. The result underscores the significance of journals as an important information source. Scientists primarily cite journals articles than books, although agricultural scientist likewise utilize electronic resources, magazines, newspapers to meet their information need but reference to electronic database, digital materials and the world wide web are fewer than the traditional print resources. This may be due to some factors such as lack of awareness, limited access to relevant agricultural databases and poor electronic power supply. The library and information resources centres should keep abreast the types of documents to acquire and provide a wealth of information for agricultural scientists, to enhance their research work.

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