A Bibliometric Study of the Publication Patterns of Institute for Agricultural Research Scientists in Nigeria

by
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Abstract
This study examines the publication patterns of agricultural research scientists of the Institute for Agricultural Research, Ahmadu Bello University, Zaria. Data collected were from database of the institute's publications and randomly selected peer reviewed journals, proceedings, seminars, theses, workshops and conferences of the Agricultural Library, Samaru. A total of 438 materials were sampled from the library database, 420 journals, 300 proceedings, 200 seminars, 650 project theses, 100 workshops and 120 conferences and analysed. The result showed a great distinction within and between subjects, status and publication productivity. The study also revealed that grants from government and private bodies' remain the major sustaining factor for information publication. It was recommended that grants be maintained to sustain the Institute to facilitate publicity of research results that are beneficial for agricultural development.

Introduction
There is no doubt that every research outfit need to show levels of productivity, this is an indication of its trends, contribution to development and of researchers' preferences for publication outputs. Results of such studies facilitates decision making and for future planning. This result will further enable policy makers to evaluate their decisions on awarding of grants to individuals and the institutions.

Scientific productivity has been linked to various factors, such as age and subject specialisation, others are economic indicators, such as government expenditure on civil research and development (Jacobs, 2001). Institute for Agricultural Research (IAR) was established to advance agricultural production (Anonymous, 1996). The institute is ranked highest on performance because of its mandate by the Federal Government of Nigeria which are on most cereals and legumes crops produced in Nigeria, the research institutes oversee researches and farming systems performed on almost two third land mass of Nigeria for arable and irrigated farms since the institute's inception in 1922 (Anonymous, 1996). Today it is saddled with most of the north western states of Nigeria which comprised, Kaduna, Kano, Katsina, Jigawa, Kebbi, Sokoto and Zamfara States. The study by Pouris (1989) in the ranking of academic institutions in South Africa, revealed that the criteria used ranged from opinion surveys measuring research productivity as proxied by publication counts in a sample of reputable journals. IAR on the other hand published reputable literary resources which depicts the breakthroughs and results obtained from within and outstations earlier and presently affiliated to it (Anonymous, 1996). The stations are Samaru (Headquarters), Mokwa, Yandev, Talata-Mafara, Kadawa and Kano (all outstations). The bibliometric productivity of the institute has been tremendous which disagreed with Lancaster (1982) who posited that many scientists in developing

countries prefer to publish in foreign journals rather than in their native journals for the sake of prestige and recognition.

The present study revealed that for any research scientist of the Institute, it is prestigious to have an article in either, Samaru Research Bulletin (SRB), Samaru Conference Paper (SCP) and Samaru Miscellaneous Paper (SMP). This agrees with Budd and Seavey (1996) who said that prestige and productivity go together.

Samaru Research Bulletin is jacketed reprints of papers by members of the institute in Journals and proceedings of learned societies on the mandates of IAR. Samaru Conference Papers are duplicated versions of papers given at conferences by IAR/FOA staff based on their IAR/FOA research with printed covers. Samaru Miscellaneous Papers are papers that are unlikely to find space in journals because of their local interest or length. These materials have been able to answer many external inquiries on northern Nigeria agricultural activities dating back to colonial era and covers wide subject areas as agricultural economics and rural sociology, agricultural engineering, agronomy, animal science, crop protection, plant science and soil science.

The study on bibliometric productivity of the Institute agrees with those reported elsewhere by Saracevic (1977) and Alabi (1989) who expressed similar sentiments that the rate of scientific activities has been tripling in most developing countries compared with the doubling tempo in the developed countries.

Problem Statement
Bibliometric studies afford investigators to study the quality and quantity of work done by scientists in the various fields. Over the years, little or nothing has been reported distinctively to Institute for Agricultural Research Samaru, Ahmadu Bello

University, Zaria. This informs the problem statement and reasons why this study was undertaken to present the institute publication pattern.

Objective of the study

The objective of this study is to distinguish within and between subjects' productivity, staff status and publication productivity, and prestige and productivity. In order to achieve this, the study considered and utilized the resource materials for the dissemination of agricultural information, this include Samaru Research Bulletin (SRB), Samaru Conference Paper (SCP) and Samaru Miscellaneous Paper (SMP). The specific objectives include

    (i)   To investigate the publication patterns in 7 departments/subject areas

    (ii)   To examine the citation patterns of the resources in publications of agriculture

Materials and Methods

Data were collected from database holding records of Samaru Miscellaneous Papers, Samaru Research Bulletin and Samaru Conference Papers from the Agricultural Library. The result was categorized into seven subjects and analysed statistically using simple descriptive statistics of percentages, mean and frequency distribution. Results obtained are also presented in tabular and graphical methods.

Table 1 shows the publication patterns in the 7 departments/area stratified and studied. From the result, it shows that productivity was highest in Crop protection than any with 115 materials representing 25.26%, and the least was Agricultural Engineering 18 (4.11%). Three attributes considered to possibly explain the reasons why Crop Protection, Soil Science and Agronomy tops the publication pattern were subject productivity level; effect of prestige and productivity and lastly, grants and publication productivity. Diagram 1 gives relationships between these variables.

Results and Discussions

Publication Patterns in study area

Table 1: Publication patterns in the study area

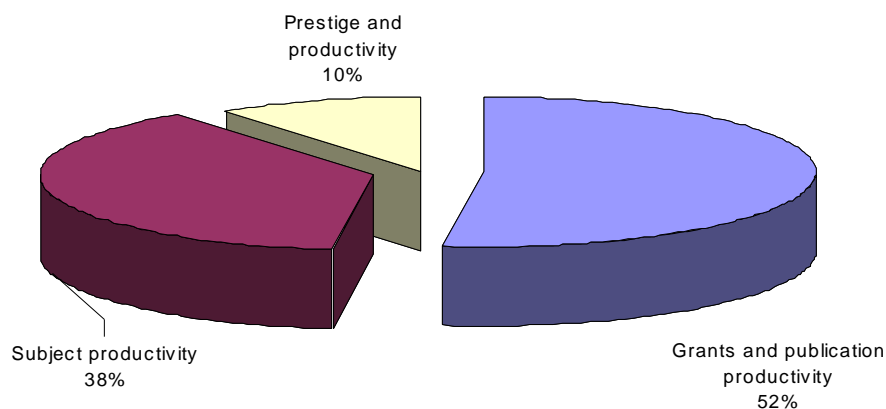| Department/Subject areas	Frequency (n = 438)	Percentage
Agricultural economics and rural sociology	58	13.24
Agricultural engineering	18	4.11
Agronomy	83	18.95
Animal science	29	6.62
Crop protection	115	25.26
Plant science	44	10.05
Soil science	91	20.78

Diagram 1: Percentage representation of the relationship between subject's productivity, grants and publication productivity, and prestige and productivity

Subject productivity level: The results revealed that a total of 166 materials or 38% of resources from the numerous fields of the seven subject areas showed an up thrust of publications indicating that each department is struggling to present a documented evidence of achievement in their fields as the academic subject performances. This implies that with favourable working conditions the tendency for productivity to be rated high is likely to be, and definitely be a reflection of subjects specialization.

Prestige and productivity level: Only 10% responses fell within this category, this was ascertained from a non-formal interview of some authors of resource utilized for the study. It was claimed that in instances where there exist a chair or senior colleagues, there could be the maintenance of reputations, and to do so, contributors, reviewers and the chair ensures hard work and whatever published meets a minimum standard that contribute meaningfully to knowledge. The prestige and productivity levels of the resource have been negatively influenced by the new criteria used for promotions and upgrading of staff that disseminate their findings through these resources. The resources are not considered any longer for promotions and upgrading. For instance, initially, only those who made remarkable achievements published their findings in these resources because of its wide acceptance, circulation and reputation. It remained prestigious because authors were acclaimed to be hardworking even though majority of them were holders of first degrees with few having masters and doctoral degrees. This made the compelling circumstances of prestige and productivity to downturn.

Grants and Publication Productivity: The rating of the institute as a famous agricultural institute in northern Nigeria, also made it possible for the institute to benefit from support through research grants and other forms of funding. This is positively connected to the 228 materials or 52% of materials published because the institute dully sponsored them. Also, having sponsored the researches, the Institute had property and copy rights to publish the results of the findings. It is therefore pertinent that funding of the institute from private and government agencies should be maintained as measure against barriers that could infringe publicity of research results.

Table 2: Citation Patterns of SRB, SCP and SMP

Areas of presentation	Resources Materials use					
	SRB		SCP		SMP	
	Response	%	Response	%	Response	%
Peer reviewed journals	204	48.6	60	14.3	400	95.2
Proceedings	103	34.3	70	23.3	250	83.3
Seminar	40	20.0	80	40.0	180	90.0
Theses	408	62.8	50	7.8	420	64.6
Workshops	80	80.0	10	10.0	90	90.0
Conferences	98	81.7	30	25.0	109	90.8

Key:
SRP = Samaru research paper; SCP = Samaru Conference papers; SMP = Samaru Miscellaneous paper

The result obtained in this study examining the citation patterns of resources in publication of agriculture derived from sampling randomly 650 resources in the library comprising undergraduate project (200), postgraduate thesis (200) and doctoral dissertation (250), 420 journals comprising national journals (210) and international journal (210), 300 proceedings were crosschecked, 200 seminars, for workshops only 100 were sampled and finally 120 conferences respectively. The result revealed that there is difference between the numbers of papers published in the seven subject areas of the three profile based materials and their use in literary works. The result showed that Samaru Research Bulletin reflects 408 times in undergraduate projects, postgraduate theses and doctoral dissertations, this was followed by in peer reviewed journals and the least was in seminars with only 40

references. This may be attributable to the fact that results reported and those undertaken by students has a direct relationship.

The results for Samaru conference paper (SCP) revealed a variation too seemingly close, it reflect most in seminars (80), followed by in proceedings (70), in peer reviewed journals (60), conferences (30) and workshops (10). For Samaru miscellaneous papers, it result revealed that it was widely consulted and referenced. It appeared 400 times in peer reviewed journals, 250 in proceedings, 180 was reference in seminars, 420 times in theses, 90 in workshops and 109 times in conferences, respectively. The citations are very encouraging and show reliability and dependability of these resources to agricultural research, teaching and learning.
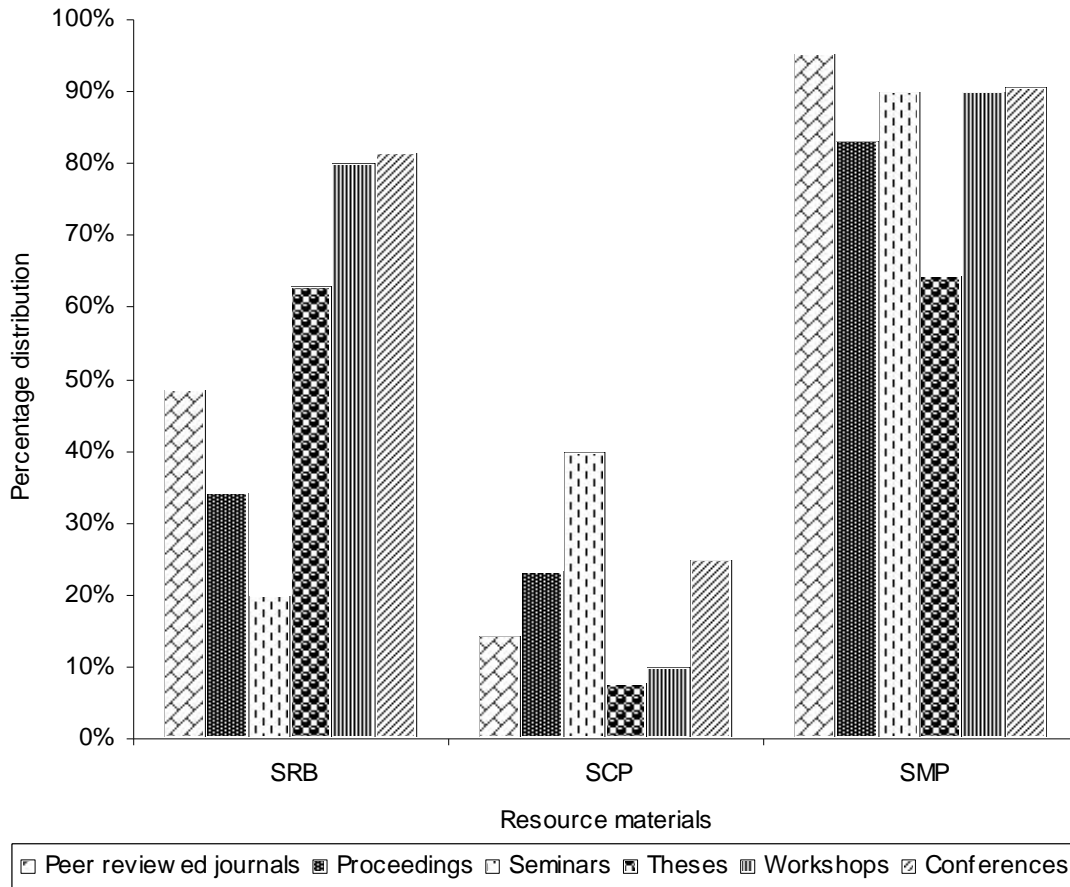

Diagram 2: Citation analysis of Samaru Research Bulleting (SRB), Samaru Conference Paper (SCP) and Samaru Miscellaneous Paper (SMP)

Diagram 2 show the percentage distribution of references made of SRB, SCP and SMP in different resources materials sampled randomly in the Agricultural Library, IAR/ABU., Samaru.

Conclusion and Recommendations
In conclusion, the study notes that resources on Crop protection had the highest productivity level; it tops the seven subject areas of the study.

There were significant differences in subject productivity levels, prestige and productivity levels, and grants and productivity levels which were indices used to assess productivity.
Citation analysis drawn from six information sources revealed that all SRB, SCP and SMP were dependable and reliable agricultural research materials as they all feature in different proportions.

Recommendations
Based on the research findings from the study, the following recommendations are proffered:
(1) The Institute should constitute a Publication and Research Presentation Committee whose responsibility would be to ensure that there is constant publications and tentative research results presentations of all her funded and sponsored agricultural projects.
(2) Since funding has not serve as yard stick for productivity as revealed by the study, it is therefore recommended that research with effective improvement to agriculture should be recognized through awards and appreciations to deserving scientists, field assistants/technicians and all contributors to the research break through.
(3) It is also recommended that similar studies should be undertaken on other publications from IAR, i.e. Noma, Samaru newsletter, Samaru Soil survey, etc to facilitate planning and administration for agricultural improvement, food security, sustainability and sufficiency.

References
Alabi, G A. (1989) "The citation pattern of Nigerian scientists." *International Library Review,* 21: 129-137.

Anonymous (1996). Anonymous (1996). "This is the Institute for Agricultural Research (IAR), Third Edition. T.O.Fadiji, T.T. Gefu and O.B. Adeniji (eds.). Publication and Information Unit, IAR, Samaru - Zaria.

Budd, J.M. and Seavey, C.A. (1996) "Productivity of U.S. Library and Information Science Faculty : the Hayes study revisited." *Library Quarterly,* 66: 1-20

Jacobs, Daisy (2001) "A bibliometric study of the publication patterns of scientists in South Africa 1992-96, with particular reference to status and funding." *Information Research*, 6(3) Available at: http://InformationR.net/6-2/paper104.html. Accessed 27 March, 2009.

Lancaster, F.W. (1982) "Publication patterns in Brazil." *Science and Culture,* 34: 627-634.

Pouris, A. (1989) "Evaluating academic science institutions in South Africa." *Journal of the American Society for Library and Information science*, 40: 269-272

Saracevic, T. (1977) "Quantitative indicators of scientific and technical communication (unpublished)". Case Western Reserve University. Cleaveland, Ohio.