Bibliometric Analysis of the Trends of Publications on Poverty Research in Tanzania from 1961 to 2016

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Abstract
Poverty research is essential in understanding the evolution of poverty, poverty trends and dynamics, policy formulation, prioritising policy interventions and informed decision making. To date, a bibliometric analysis of poverty research in Tanzania does not exist in the literature. Therefore, this bibliometric study was conducted to assess the research trends on poverty in Tanzania between 1961 and 2016. Data were collected through Harzing's Publish or Perish tool, which uses Google scholar to retrieve data from the web. A total of 825 publications were retrieved, with an average of 14.7 publications per year. As the growth rate of publications increased, the corresponding doubling time decreased. Journal articles were the dominant (23.9%) type of publication. The degree of collaboration among researchers was low, with the majority (52.8%) of publications having one author. The citation analysis reveals that over a third (35.76%) of publications were not cited. Subject categories related to poverty that had a relatively higher number of publications were governance (10.2%), agriculture (9%) and community (8.6%). Generally, the study findings provide valuable information on the characteristics of poverty research in Tanzania, which can reference future research.

Keywords: Poverty, bibliometric, citation analysis, Tanzania

Introduction
The majority of the world's poor are found in Sub-Sahara African countries, including Tanzania. In Tanzania, poverty remains a persistent problem, mainly in rural areas where over 70 percent of the country's population depends heavily on rain-fed agriculture for livelihoods. For example, reports show that basic poverty has declined from 34.4 percent to 28.2 percent and extreme poverty from 11.7 percent to 9.7 percent between 2007 and 2012 (Arndt, Demery, McKay, & Tarp, 2015; World Bank, 2015, 2019). The severity of poverty was estimated at 26.4 percent in 2018 (World Bank, 2019). In 2018, about 14 million and 26 million Tanzanians lived below the national poverty line and international poverty line, respectively. This suggests that many poor people are very close to the poverty line, and there is a low level of inequality among the poor population groups. Although Tanzania has seen some remarkable economic growth since the early 2000s, there has been a slow response of poverty to the growing economy. The number of poor, particularly in rural areas, is still high (26 million people, which is about 49 percent of the population), and the welfare

disparity between the geographic regions is widening (World Bank, 2015, 2019). Consequently, poverty reduction has remained a country's significant development challenge for many years.

The government, development partners, and other key stakeholders have taken various measures to address poverty in Tanzania. These measures include the formulation and implementation of policies, strategies and programmes that aim at alleviating poverty and improving living standards. The country has been devising policy frameworks and strategies to increase economic growth and achieve poverty-reduction targets. Improving agricultural productivity has been central to poverty reduction efforts. Although these interventions have been implemented over the years, poverty is still pervasive, and there is an apparent mismatch between growth and poverty reduction.

Poverty reduction interventions ought to use research results for planning and implementation to succeed. Research is essential for understanding the evolution of poverty, poverty trends and dynamics, and policy formulation, prioritising policy interventions, and informed decision making. It is also necessary to explore linkages between poverty and economic growth and determine whether the growth has become pro-poor. Thus, poverty research is expected to contribute to more efficient poverty-reducing strategies. Poverty research is often fitted into various disciplines' theories and methodologies because of its multidisciplinary nature.

Assessment of research trends in a specific topic is essential to understanding the magnitude of research productivity regarding research activities and priority areas. Bibliometric techniques are often employed to measure research productivity concerning scientific disciplines' growth, structure, interrelationship, and productivity (Hood & Wilson, 2001). Bibliometrics use quantitative analysis and statistics to describe distribution patterns of publications within a given topic, field, institution and country. Important data sources for bibliometric studies include the Web of Science, Scopus, and Google Scholar databases. A program known as Publish or Perish (PoP) uses Google Scholar to retrieve publications, citation counts and associated metrics. PoP provides statistics such as the number of publications, citation counts and indices such as the h-index, g-index, Hc-index and HI-norm index (Harzing & van der Wal, 2009). The h-index simultaneously measures the number of publications and citations of a scholar ((Hirsch, 2010). Egghe (2006) developed the g-index, which gives more weight to highly cited publications. Sidiropoulos *et al.* (2007) developed the Hc-index by adding a weight-related to the age of each cited publication. Furthermore, the HI-norm index offers a better approximation of the author's impact on the number of citations (Braun, Glänzel, & Schubert, 2006).

This study analysed poverty research trends in Tanzania between 1961, when Tanzania got her independence, and 2016. The study focused on the growth of the scholarly literature on poverty, authorship collaborations, distribution of subject categories, citations trends of publications, and individual researchers' productivity. Understanding trends in poverty research in Tanzania could help to devise strategies for improving the volume and quality of research on this topic. The results would also help identify the research gaps that research on poverty could focus on in the future. To the best of our knowledge, no bibliometric studies have been carried out to measure poverty research trends in Tanzania.

Methods

A bibliometric analysis was conducted to assess the research trends on poverty in Tanzania between 1961 and 2016. This study used the Publish or Perish (PoP) software which retrieves data through Google Scholar. A significant advantage of Google Scholar is the broader coverage of indexed scholarly publications and those not indexed by various academic databases (Harzing,

2013). To ensure all retrieved publications address poverty issues in Tanzania, a search strategy with "poverty" and "Tanzania" as keywords were performed using the title field to refine the results. A publication title always captures its essence and reflects the content of the main text. In addition, most search engines, databases, and journal websites use the words found in the title to enable readers to retrieve publications. Search results were refined to ensure relevant publications were captured and duplicates were removed. A total of 825 publications were retrieved. The types of publications considered for this study were: journal articles, books, book chapters, technical reports, theses, and dissertations, working papers and articles in conference proceedings. The retrieved metrics were the total number of publications, number of authors for each publication and citation counts. It should be noted that this study employed online tools to collect data; thus, publications and citations that were not available online could not be retrieved. Nevertheless, the study gives a clear picture of trends of poverty research in Tanzania.

Results and discussions
The findings and discussions focus on the growth of poverty research literature, collaboration patterns, subject categories, citation trends, and year-wise distribution of publications.

Publication productivity
The study findings indicate that 825 scholarly publications addressed various aspects of poverty in Tanzania from 1961 to 2016. The oldest publication was published in 1974. Fifteen publications had no year of publication. It should be noted that data for this study were collected in August 2016; they might not present a complete picture for the year 2016. The findings (Table 1) show that most (23.9%) retrieved publications were in the form of journal articles, followed by technical reports (23%) and theses and dissertations (13.5%). The scenario was expected because most scholarly publications are often published in journals.

Table 1: Publications distribution by type, n=825

| Type	Number of publications	Percent
Journal articles	197	23.9
Articles in conference proceedings	98	11.9
Theses and dissertations	111	13.5
Book chapters	110	13.3
Books	44	5.3
Technical reports	190	23
Working papers	85	10.3

The Relative Growth Rate (RGR) is calculated as RGR = $(\ln N_2 - \ln N_1) / (t_2 - t_1)$, where N_2 and N_1 are the cumulative numbers of publications in the years t_2 and t_1. It is an increase in the number of publications per unit of time. The findings (Table 2) indicate that RGR had increased from 0.69 (1977) to 4.30 (2016) with some fluctuations between the years. The Doubling Time (Dt), which is the period required for publications to become double the existing quantity, is directly related to RGR and is calculated as Dt = 0.693/RGR (Mahapatra, 1994). The findings show a decreasing trend from 1.00 (1977) to 0.16 (2016) with slight fluctuations between the years. The study period recorded the mean RGR and Dt of 1.99 and 0.38, respectively, which means that as the publications

growth rate increased, the corresponding doubling time decreased. These findings suggest that the number of publications on poverty in Tanzania had increased over the years.

Table 2: Publications distribution by year

Year	Number of publications	Percent	Cumulative	lnN_1	lnN_2	RGR	Dt
1974	1	0.12	1		0.00	-	-
1977	1	0.12	2	0.00	0.69	0.69	1.00
1979	1	0.12	3	0.00	1.10	1.10	0.63
1982	2	0.24	5	0.69	1.61	0.92	0.76
1984	2	0.24	7	0.69	1.95	1.25	0.55
1985	1	0.12	8	0.00	2.08	2.08	0.33
1986	1	0.12	9	0.00	2.20	2.20	0.32
1988	1	0.12	10	0.00	2.30	2.30	0.30
1989	2	0.24	12	0.69	2.48	1.79	0.39
1990	6	0.73	18	1.79	2.89	1.10	0.63
1991	2	0.24	20	0.69	3.00	2.30	0.30
1992	2	0.24	22	0.69	3.09	2.40	0.29
1993	11	1.33	33	2.40	3.50	1.10	0.63
1994	15	1.82	48	2.71	3.87	1.16	0.60
1995	8	0.97	56	2.08	4.03	1.95	0.36
1996	15	1.82	71	2.71	4.26	1.55	0.45
1997	18	2.18	89	2.89	4.49	1.60	0.43
1998	18	2.18	107	2.89	4.67	1.78	0.39
1999	24	2.91	131	3.18	4.88	1.70	0.41
2000	26	3.15	157	3.26	5.06	1.80	0.39
2001	22	2.67	179	3.09	5.19	2.10	0.33
2002	46	5.58	225	3.83	5.42	1.59	0.44
2003	45	5.45	270	3.81	5.60	1.79	0.39
2004	47	5.70	317	3.85	5.76	1.91	0.36
2005	67	8.12	384	4.20	5.95	1.75	0.40
2006	55	6.67	439	4.01	6.08	2.08	0.33
2007	49	5.94	488	3.89	6.19	2.30	0.30
2008	46	5.58	534	3.83	6.28	2.45	0.28
2009	36	4.36	570	3.58	6.35	2.76	0.25
2010	39	4.73	609	3.66	6.41	2.75	0.25
2011	58	7.03	667	4.06	6.50	2.44	0.28
2012	32	3.88	699	3.47	6.55	3.08	0.22
2013	37	4.48	736	3.61	6.60	2.99	0.23
2014	32	3.88	768	3.47	6.64	3.18	0.22
2015	31	3.76	799	3.43	6.68	3.25	0.21
2016	11	1.33	810	2.40	6.70	4.30	0.16
No date	15	1.83					
Total	**825**	100				1.99	0.38

Research collaboration
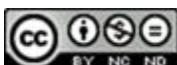
The authorship pattern (Table 3) shows that most (52.85%) publications had single authorship, followed by those produced jointly by two authors (24.48%). The degree of collaboration (C) among scholars in poverty research was 0.47. This is computed as the ratio of the total number of collaborative publications (Nm) to the total number of multi-authored publications plus the number of single-authored (Ns) publications (i.e. C= Nm/Nm + Ns) (Subramanyan, 1983). These findings indicate a low degree of teamwork in poverty research compared to previous studies in other fields (Bosquet & Combes, 2013; Serenko, Bontis, Booker, Sadeddin, & Hardie, 2010). These findings support that sole-authored works are common in the social sciences (Sudhier & Abhila, 2011). Collaboration in research is often recommended as it enables researchers to share skills and techniques; enhances transferring of knowledge; brings about the cross-fertilisation of ideas; provides intellectual companionship; plugs researchers into wider scientific networks; and enhances the visibility of research works (Huang & Lin, 2010). A low level of collaboration among scholars indicates inadequate teamwork within the research network.

Table 3: Research collaboration patterns

| Authorship	Number of publications	Percent
Single authors	436	52.8
Two authors	202	24.5
Three authors	102	12.4
Four authors	51	6.2
Five authors	26	3.2
Six or more authors	8	0.9
Total	**825**	**100.00**

Citation pattern

Citation analysis measures each publication's scientific influence, impact, and visibility by counting the number of times other scholars cited them. The citation status of publications on poverty research in Tanzania reveals that nearly two-thirds (64.24%) of the publications were cited at least once. Over a third (35.76%) of publications were not cited. A total of 530 publications were cited 5,874 times, with an average of 11 citations per publication. The overall average citation was as low as seven citations per publication (Table 4). It implies that many publications had made little impact, mainly because of their limited visibility and accessibility.

Table 4: Distribution of publications based on citations

Citedness of publications (No. of times)	Number of publications	Percent	No. of citations
0	295	35.76	0
1	66	8.00	66
2	171	20.73	342
3	71	8.61	213
4	34	4.12	136
5	19	2.30	95

6	12	1.45	72
7	23	2.79	161
8	9	1.09	72
9	6	0.73	54
10	13	1.58	130
11	7	0.85	77
12	5	0.61	60
13	4	0.48	52
14	3	0.36	42
15	10	1.21	150
16	2	0.24	32
17	6	0.73	102
18	6	0.73	108
19	2	0.24	38
21	3	0.36	63
22	1	0.12	22
23	1	0.12	23
24	1	0.12	24
25	2	0.24	50
26	1	0.12	26
28	3	0.36	84
29	2	0.24	58
30	3	0.36	90
31	1	0.12	31
32	3	0.36	96
33	2	0.24	66
36	2	0.24	72
38	2	0.24	76
39	2	0.24	78
40	2	0.24	80
41	1	0.12	41
44	1	0.12	44
45	2	0.24	90
48	2	0.24	96
49	1	0.12	49
50	1	0.12	50
51	1	0.12	51
56	2	0.24	112
58	2	0.24	116
60	1	0.12	60
61	1	0.12	61
64	1	0.12	64
73	1	0.12	73
74	1	0.12	74
75	2	0.24	150
76	1	0.12	76
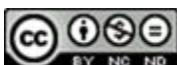
78	1	0.12	78
92	1	0.12	92
105	1	0.12	105
139	1	0.12	139
158	1	0.12	158
169	1	0.12	169
179	1	0.12	179
392	1	0.12	392
414	1	0.12	414
Total	**825**	**100.00**	**5,874**

The top 10 highly cited publications contributed nearly one third (1,827; 31.1%) of the total citation counts. The maximum number of citations was 414. The top-cited publication was "Livelihoods and rural poverty reduction in Tanzania", published in *World Development* in 2003 with 30.2 cites per year. It was followed by a World Bank publication titled "Voices of the poor: poverty and social capital in Tanzania", published in 1997 with 21.8 cites per year. The third most cited, which was also the most recent publication in this category, is titled "Agricultural growth, poverty, and nutrition in Tanzania", published in *Food Policy* in 2011. It had a citation rate of 18 cites per year (Table 5).

Table 5: Citation profile of significant publications

No	Publication	Citations	Cites per year
1	Ellis, F. and Mdoe, N., 2003. Livelihoods and rural poverty reduction in Tanzania. *World Development*, *31*(8), pp.1367-1384.	392	30.2
2	Narayan-Parker, D., 1997. *Voices of the poor: poverty and social capital in Tanzania* (Vol. 20). World Bank Publications.	414	21.8
3	Pauw, K. and Thurlow, J., 2011. Agricultural growth, poverty, and nutrition in Tanzania. *Food Policy*, *36*(6), pp.795-804.	92	18.4
4	Scott, N., Garforth, C., Jain, R., Mascarenhas, O. and McKemey, K., 2005. The economic impact of telecommunications on rural livelihoods and poverty reduction: a study of rural communities in India (Gujarat), Mozambique and Tanzania.	169	15.4
5	Wedgwood, R., 2007. Education and poverty reduction in Tanzania.*International Journal of Educational Development*, *27*(4), pp.383-396.	139	15.1
6	Jung, H.S. and Thorbecke, E., 2003. The impact of public education expenditure on human capital, growth, and poverty in Tanzania and Zambia: a general equilibrium approach. *Journal of Policy Modeling*, *25*(8), pp.701-725.	179	13.8
7	Kironde, J.L., 2006. The regulatory framework, unplanned development and urban poverty: Findings from Dar es Salaam, Tanzania. *Land Use Policy*,*23*(4), pp.460-472.	78	7.8

6	Collier, P., Radwan, S., Wangwe, S. and Wagner, A., 1986. Labour and poverty in rural Tanzania: Ujamaa and rural development in the United Republic of Tanzania.	158	5.6
8	Lugalla, J., 1995. *Crisis, Urbanization, and Urban Poverty in Tanzania: a study of urban poverty and survival politics*. University Press of Amer.	101	4.8
8	Hosier, R.H. and Kipondya, W., 1993. Urban household energy use in Tanzania: prices, substitutes and poverty. *Energy Policy*, *21*(5), pp.454-473.	105	4.5
Total		**1,827**	**137.4**

*Journals publishing research outputs on poverty in Tanzania*

Table 6 presents 14 journals that published at least three articles on poverty research in Tanzania. Of 197 journal articles, 59 (30%) were published in the 14 top-ranked journals. The top three journals are the *Tanzania Journal of Development Studies* (14 articles), *Tanzania Journal of Population Studies and Development* (5 articles), and *Uongozi* (5 articles). The findings suggest that research on poverty in Tanzania has been published in various journals within and outside the country.

Table 6: Journals publishing research on poverty in Tanzania

No	Journal	Number of articles	Country
1	Tanzania Journal of Development Studies	14	Tanzania
2	Tanzania Journal of Population Studies and Development	5	Tanzania
3	Uongozi	5	Tanzania
4	African Studies Review	4	United States
5	Tanzania Veterinary Journal	4	Tanzania
6	Tanzania Journal of Population	3	Tanzania
7	Journal of African Economies	3	United Kingdom
8	International Journal of Educational Development	3	United Kingdom
9	The Journal of Development Studies	3	United Kingdom
10	Food Policy	3	United States
11	World Development	3	United Kingdom
12	International Journal of Educational Development	3	United Kingdom
13	African Journal of Finance and Management	3	Tanzania
14	Utafiti	3	Tanzania
Total		**59**	

Subject coverage

The retrieved publications were grouped into 21 subject categories, as shown in Table 7. Some publications addressed more than one subject category. The findings indicate that research on poverty in Tanzania had addressed governance (10.2%), agriculture (9%), community/society
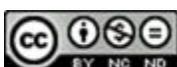
(8.6%), development/growth (8.2%), and economics (8.1%) issues. These might be the most critical issues in addressing the poverty problem in Tanzania. Technology, tourism, and witchcraft were the last subject categories having 1.3 percent each.

Table7: Subject categories on poverty research in Tanzania

No	Subject	Number of publications	Percent
1	Administration/governance	86	10.2
2	Agriculture	76	9.0
2	Community/society	72	8.6
3	Development/growth	69	8.2
4	Economics	68	8.1
5	Education	53	6.3
6	Environment	46	5.5
7	Evaluation (Poverty assessment)	44	5.2
8	Finance	42	5
9	Food security	38	4.5
10	Forestry	34	4
11	Gender	31	3.7
12	Health	30	3.6
13	Information/knowledge	3	0.4
14	Livelihood	27	3.2
15	Policies	25	3
16	Foreign aid	23	2.7
17	Population/demography	22	2.6
18	Resources i.e. water, minerals, wildlife, energy	20	2.4
19	Technology	11	1.3
20	Tourism	11	1.3
21	Witchcraft	11	1.3
Total		**842***	

*The total output is more than the actual output because some publications addressed more than one subject category.

Conclusion and recommendations

The study analysed the poverty research output in Tanzania between 1961 and 2016 using bibliometric techniques. The findings suggest that there has been progressive growth in poverty research in Tanzania. However, the degree of collaboration among scholars in poverty research was generally low. The citation analysis shows that many publications had made a low impact on scholarly communities. Key research issues were governance/administration, agriculture, and community/society. The findings indicated a low level of collaboration among researchers, which demonstrate inadequate teamwork and networking. Collaborative research on poverty should be highly encouraged mainly because of the multidisciplinary nature of this topic. This may be

emphasised by building research teams and funding collaborative research proposals, which may result in teamwork in research and publication.

Limitation and implications of the study
The main limitation of this study is its focus on publications and citations that were available online and those that had "poverty" and "Tanzania" as keywords in their titles. This means that publications and citations that were not available on the web were not retrieved.

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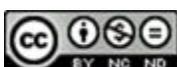
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