PROJECT COMPLETION REPORT

BIBLIOMETRIC STUDY OF S&T PUBLICATIONS BY TRIBAL COMMUNITY OF ODISHA

Implemented By :

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JATNI, KHORDHA, ODISHA

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Every care has been taken to provide the authenticated information. However, the onus of authenticity of data rests with the PI of the project.

Knowledge is Power

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PREFACE :

Tribal population is found in almost all parts of India and Odisha claims to be the second largest leading tribal state in the country. About 68 million people of the state of India are members of Scheduled Tribes and one of the most studied tribal religions is that of Odisha(Census 2011).Of all the states of India, Odisha has the largest number of tribes , as many as 62.Tribals of Odisha are known as Adivasi,Vanabasis, and Girijanas. They are described as aboriginals of Odisha in anthropological literature. The Adivasi (aborigins), Vanabasis(forest dwellers), and Girijanas(mountain dwellers) represent an impressive 22.13% population of Odisha. There are many scientific contributions from the tribal community of Odisha. One systematic study has been carried out on the S & T contributions by this community. This study is highlighting the important issues, linked to their cultural life, which the tribal's are facing today. The extent of collaboration on tribal culture can't be easily determined by traditional methods of survey and observations so a bibliometric method offers a convenient and non reactive tool for studying collaboration in research. In this paper several types of collaboration on tribal culture have been identified and earlier research on collaboration has been reviewed. It provides the theoretical basis upon which super structure technology can be built. The study reveals on bibliometric documentation of relevant data about tribal culture adopted by peoples of tribal areas of Orissa including the parameters like language, tradition, custom etc. by scientific studies from journals, articles, publications, books etc.

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EXECUTIVE SUMMARY

Researchers need bibliometric data when responding to calls for applications for accreditation, competitive projects, etc. Likewise, the Institution uses the data for strategic purposes when reporting to the public administration, managing project applications, accrediting doctoral programmes, analyzing and assessing scientific output, setting research policies and disseminating its scientific activities. This is why the scholars are used to study Bibliometric Analysis, which enables bibliometric data to be managed and consulted and the impact of the publications and their authors to be measured. It stores the academic articles and lets users assess their quality based on national and international bibliometric indicators.

The bibliometric data are evaluated from the following:

- ❖ Evaluation of scientific publications.
- ❖ Application call procedures for the teaching staff.
- ❖ Dissemination of scientific publications (strategic).
- ❖ External reports.

As per 2011 Census, the Scheduled Tribe (ST) population of the State of Orissa is 9,590,756. Of this, 8,994,967 are in rural areas and 595,789 in urban areas. This constitutes 22.8 percent of the total population of the State and 9.7 per cent of the total tribal population of the country. The state holds 3rd and 11th rank among the States/UTs in terms of ST population and the proportion of ST population to total population of the State respectively. The highest number of Scheduled Tribes has been recorded in Mayurbhanj (1,479,576) and the lowest in Puri (6,129). The State has a total of sixty-two (62) Scheduled Tribes.

Derivation of tribal surnames

From the literatures study from the references as available in different authentic sources, the entire surnames are listed in the project.

Results and Findings

Data sharing of tribal - It is surprise that the total percentage of S&T share of tribal of Odisha is 05.27 only. The total tribal constitutes 22.1 percent of the total population of the State and 9.7 per cent of the total tribal population of the country. Hence, the S&T contribution of tribal of Odisha is not significant as compared to their population in the state.

The publication pattern of the tribal is to follow a positive pattern (growth) during the study period. The linear equation is also shown in Fig 2 as above. The calculated value of R^2 is 0.3492. It is showing slow trend during the years. Although the year 2015 is the most significant for S&T publications, publishing 125 articles by the tribal, but not remarkable changes in the total publications per year during 2014, 2016 and 2017. Tribal of Odisha has started their significant contribution from the year 2014 and continued as positive trend in S&T contribution in Odisha.

The tribal of Odisha has followed similar patterned which similar to earlier studies done by many researchers. Triple authorship is the most preferred pattern for all scientific publishers in primary sources. The tribal of Odisha are very much preferable for these patterns. There are also some unusual patterns followed in this study which observed in the category of 'Decuple & more'.

Author's Productivity Study **-** From the study it is noticed that there are 227 authors have published 935 S&T articles in different primary journals. The top 25 authors have published 469 articles sharing more than 50% of the total publications. The tribal author B. Majhi has published 79 S&T articles and occupied Rank 1 in the top productive list.

Quality of the Tribal S&T contribution **-** An average of 67.12% publications are appeared in the ranked sources (SCI Journals) during the years 2009-2018. Tribal of Odisha have shown the consistency in the quality S&T contribution during the years. Although the highest sharing of SCI publications has come in the year 2010 (78.43%) but the average quality contribution is seen in the year 2013 (Average SCI 2.50). The total SCI values (200.05) is reached to pick with an average IF of 2.33 in the year 2014. The highest SCI range is 21.875 (IF Value) in the year 2014 and 0.02 lowest in the year 2015. The lowest SCI range 0.044 is noticed during the years 2011, 2012, 2013, 2014, 2016, and 2017. The highest quality contribution is seen in the year 2015 (SCI 92). Although the quality of S&T contribution is showing a positive trend but not so significance during the period 2009-2018.

Tribal preferred institutions in Odisha

Based on number of S&T articles - NIT, Rourkela is the most preferred institutions where the tribal of Odisha have contributed a large number of S&T articles (125 S&T articles) compared to other institutions followed by OUAT, Bhubaneswar (69 S&T articles) and SOA, Bhubaneswar (62 S&T articles). On the other hand, the said ranking is shown different, if it is based on sharing of SCI sources from the total publications of the concerned institutions. ICMR-RMRC, Bhubaneswar (100%) is listing on the top of Table 8 followed by CSIR-IMMT, Bhubaneswar (92%) and IIT, Bhubaneswar (88.24). The top 20 ranked intuitions, based SCI sharing (%), are listed below:

Based on number of SCI Journals - It is also shown that NIT, Rourkela is also the most preferred institutions where the tribal of Odisha have contributed a large number of S&T articles in SCI quality journals (68 SCI Journals) compared to other institutions followed by OUAT, Bhubaneswar (48 SCI Journals) and CSIR-IMMT, Bhubaneswar (46 SCI Journals).

Based on Total IF Value - It is also noticed that CSIR-IMMT, Bhubaneswar is also the most preferred platform for the tribal of Odisha to publish most of the quality S&T articles (Total IF 145.98) followed by NIT, Rourkela (Total IF 143.284) and KIIT University, Bhubaneswar (Total IF 107.679).

Tribal preferred subject in Odisha

Based on number of S&T articles - It is confirmed that 'Computer Science' is the most preferred subject where the tribal of Odisha have contributed a large number of S&T articles (123 S&T articles) compared to other subjects followed by 'Medical Science' (80 S&T articles) and 'Agriculture Science' (78 S&T articles). On the other hand, the said ranking is shown differently, if it is based on sharing of SCI sources from the total publications of the concerned subject. 'Environment' (100%) is listing on the top of Table 12 followed by 'Biotechnology' (94.29%) and 'Metallurgy' (93.33).

Based on number of SCI Journals - It is also noticed that 'Computer Science' is also the most preferred subject where the tribal of Odisha have contributed a large number of S&T quality articles in SCI journals (55 SCI Journals) compared to other subject areas followed by 'Agriculture Science' (52 SCI Journals) and 'Medical Science' (50 SCI Journals).

Based on Total IF Value - It is also noticed that 'Minerals & Materials' is also the most preferred subject area for the tribal of Odisha to publish most of the quality S&T articles (Total IF 129.79) followed by 'Chemistry' (Total IF 110.559) and 'Biotechnology' (Total IF 100.07).

Tribal preferred source of publications

Based on SCI sources - It is noticed that the tribal of Odisha is used to preferred by contributing their articles in 'Veterinary World' (16 S&T articles) compared to other sources in 'IOP Conf. Series: Materials Science and Engineering' (15 S&T articles) and 'Indian Veterinary J.' (14 S&T articles).

Based on NSCI sources - It is seen that the tribal of Odisha is also used to preferred by contributing their articles in different NSCI sources and most preferred in 'Proceedings - AIP Conf.' (16 S&T articles) compared to other sources in 'Proceedings - ACM Intl. Conf.' (9 S&T articles) and 'Materials Today: Proceedings' (6 S&T articles).

Based on SCI ranking (IF value) - IF value of 'Advanced Energy Materials' is 21.875 occupying the top in the table and followed by 'Surgical Neurology Intl.' (IF 11.91) and 'ACS Catalysis' (IF 11.384). It is worth to inform here that tribal of Odisha are not behind to publish quality articles in high score SCI journals. 67.12% of their publications are covered under SCI tag.

Contribution through other institutions (Not in Odisha)

It is seen that there are 57 institutions located at outside of Odisha state contributed 110 S&T articles. Tripura University is at the top of list (14 S&T articles) followed by Dibrugarh University (09 S&T articles) and ICAR-NDRI, Karnal (06 S&T articles). The above output as shown above is due to the activities in national seminars, workshops or individual involvement with the institutions. There are 7 foreign institutions are involved to publish or promote 12 S&T articles of the tribal of Odisha. The above output as shown above is due to the activities in international seminars, workshops or individual involvement with the institutions.

The bibliometric studies are frequently used to assess research performance and to generate information that can be used by policy makers and experts. This study has proven to be useful tool in the assessment of research performance of faculty members. Taking into account the faculty members participation in scientific collaboration as expressed in co-publication the output and productivity have been calculated.

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Introduction

Chapter – I

Introduction

Researchers need bibliometric data when responding to calls for applications for accreditation, competitive projects, etc. Likewise, the Institution uses the data for strategic purposes when reporting to the public administration, managing project applications, accrediting doctoral programmes, analyzing and assessing scientific output, setting research policies and disseminating its scientific activities. To provide an adequate response to all the information needs, many tools used to manage them as the very unique solution is to download information from the databases and customize it to specific requests but it must be able to extract, interpret and represent the data in different ways. This is a laborious, costly task that can absorb up to 80% of the workload. This is why the scholars are used to study Bibliometric Analysis, which enables bibliometric data to be managed and consulted and the impact of the publications and their authors to be measured. It stores the academic articles and lets users assess their quality based on national and international bibliometric indicators.

The bibliometric data are evaluated from the following:

Evaluation of scientific publications: Assessment reports on scientific outputs at individual, research group, faculty, knowledge area or institutional level.

Application call procedures for the teaching staff: Researchers a support service for finding bibliometric data (impact factors, citations, etc.) included in the publications section on standardized curricula vitae to be submitted with applications for accreditation by the Quality Assurance Agencies.

Dissemination of scientific publications (strategic): Researchers guidance and/or reports on where to publish their articles. This strategy includes different issues concerning bibliometric data (the Q1 journals), number of issues per journal, the differences in publication and dissemination practices for each field of study, etc.

External reports: Several institutions at the central, state and local levels produce annual reports on the scientific productivity of public higher education institutions (number of articles and journal's impact factor).

The study which has undertaken is specific on S&T contribution by tribal of Odisha. About 68 million people of the state of India are members of Scheduled Tribes and one of the most studied tribal religions is that of Odisha (Census 2011). This study highlights about the tribes of Odisha and their contribution in the field of science & Technology nowadays. Many scientific studies are going on, on Tribal Community as on date. The extent of collaboration on tribal can't be easily determined by traditional methods of survey and observations. A lot of papers has been published regarding the contribution of the tribal people as well as about the tribal community of Odisha in science & technology, but all these documentations was in unorganized manner till date as all these publications are contributed by various authors in various languages on various issues with different domain. These scientific documentation on tribal community needs an organized well-defined data for future and further studies of researchers.

Tribal population has been found in almost all parts of India and Odisha claims to be the second largest leading tribal state in the country. The Adivasi (aborigins), Vanabasis (forest dwellers), and Girijanas (mountain dwellers) represents an impressive 22.13% population of Odisha comprising 62 major tribes and 233minor tribes. Odisha has 62 distinct tribal groups, making it the largest collection of tribal people in a single state in the country. Each of these tribal group have their own indigenous customs and they have their own system of culture, traditions, religious practices, inheritance of property, marriage system, healthcare practices and magico-religious practices. Earlier the tribal communities have been categorized as hunter-gatherer-nomads, hunter-gatherer and shifting cultivators, simple artisans, settled agriculturists, industrial and urban unskilled and semi-skilled workers, etc. But now tribal community have been showing their capabilities in every field especially in the field of Science & Technology (S&T). The overall literacy rate of the STs has increased from 22.31 per cent to 37.37 percent. The Work Participation Rate (WPR) of the ST population is also increasing day by day in field of S&T. Basically, the aim of this paper is to highlight the

contribution of tribal community in research publications in the field of science & Technology and to create a digitized platform based on bibliography study of S&T publications by the tribal community.

Tribal and it's categorization in Odisha

As per 2011 Census, the Scheduled Tribe (ST) population of the State of Orissa is 9,590,756. Of this, 8,994,967 are in rural areas and 595,789 in urban areas. This constitutes 22.8 percent of the total population of the State and 9.7 per cent of the total tribal population of the country. The state holds 3rd and 11th rank among the States/UTs in terms of ST population and the proportion of ST population to total population of the State respectively. The highest number of Scheduled Tribes has been recorded in Mayurbhanj (1,479,576) and the lowest in Puri (6,129). The State has a total of sixty-two (62) Scheduled Tribes.

Table 1 shows district wise distribution of ST population that Malkangiri district has the highest proportion and Puri has the lowest proportion as per 2001 Census. Since, there is not much changes in size distribution in Census 2011, it is worth to know the population distribution of ST in Odisha as per available data of 2001 Census.

Table 1: District wise distribution of ST population of Odisha

District	Population Size (in %)
Malkangiri	57.4%
Mayurbhanj	56.6%
Rayagada	55.8%
Nabarangapur	55%
Puri	0.3%

Out of sixty-two (62) STs, Khond is the most populous tribe with a population of 1,395,643 constituting 17.1 percent of the total ST population. Gond is the second largest tribe, having

a number of 782,104. having 9.6 per cent share in the total ST population. Six other tribes namely, Santal, Kolha, Munda, Saora, Shabar and Bhottada along with Khond and Gond constitute 64.2 per cent of the total ST population of the State. Bhumij, Bhuiya, Oraon, Paroja and Kisan having a population ranging from 248,144 to 321,592. [3,4,5] Together, they form 18.1 per cent. Five STs, namely, Bhumia, Binjhal, Koya etc. having population in the range of 103,537 to 196,846 constitute 9 per cent of total ST population. Remaining forty-four (44) tribes along with the generic tribes constitute the residual 8.8 per cent of total ST population of the State. Five tribes namely Chenchu, Mankidi, DesuaBhumij, Ghara, Tharua are very small groups having less than 500 population.

Table 2: Categorization of tribes and its population

Tribes Category (Out of 62)	Population size (in %)
Khond	17.1
Gond	9.6
Santal, Kolha, Munda, Saora, Shabar&Bhottada	46.2
Bhumij, Bhuiya, Oraon, Paroja&Kisan	18.1
Chenchu, Mankidi, DesuaBhumij, Ghara	0.2
Remaining 44 tribes	8.8

Table 3: District wise distribution of the individual ST

Individual ST	District
Khond	Kandhamal, Nayagarh, Boudh&Rayagada
Gond	Nabarangpur, Nuapada
Santal &Kolha	Mayurbhanj
Munda, Saora, Shabar&Bhottada	Sundargarh, Bargarh, Gajapati&Nabarangpur

District wise distribution of the individual ST Table 3. shows that Khond have the highest proportion (93.3 per cent) in Kandhamal district, followed by Nayagarh (76.9 per cent), Baudh (76.4 per cent), and Rayagada (71.1 per cent) districts. Gond have the highest concentration in Nabarangapur districts followed by Nuapada district whereas Santal and Kolha are primarily concentrated in Mayurbhanj district. Other four STs, Munda, Saora, Shabar and Bhottada are primarily concentrated in Sundargarh, Bargarh, Gajapati and Nabarangapur districts respectively. The overall sex ratio of the ST population in Orissa is 1003. It shows the preponderance of females and is higher than the national average (978) for all STs. At individual tribe level, except Santal, all the major tribes of the state have over all sex ratio higher than that of the national average.

Literacy Rate in Odisha

Odisha has a low literacy rate. According to 2011 census over all literacy rate of the country is 74.04 per cent whereas, for Orissa is 72.9 percent. The literacy rate of scheduled Tribes in Odisha is a cause for concern but nowadays the literacy rate among Scheduled Tribes, which was 37.37 percent in 2001, increased to 52.24per cent in 2011. The literacy rate was 72.9 percent in 2011, showing an overall improvement in the education level of the tribe's too. Male literacy has increased from 51.5per cent to 63.70 per cent during 2001-2011. The gap between the literacy rate of the total population and the ST population is 20.66 per cent. Female literacy continues to be an area of concern despite notable achievement during last decade. ST female literacy increased from 23.36 per cent to 41.20 percent during 2001-2011. ST female literacy is lower by approximately 22.8 percent point as compared to overall female literacy of the general population. Literacy rates have increased over the years due various programs targeted at it by the ministry as well as voluntary and nongovernmental organization, but there still exists a huge hiatus between the general and ST population literacy rates. It has been seen that in case of both general and tribal population the male literacy rate is higher in comparison to female literacy rate. ST male literacy rate has increased 12.20 % from 1991 to 2011 whereas ST female literacy has increased 17.84 % in the same period. Among the major tribes, Gond has the highest percentage of literates (47

%) followed by Saora, Santal, Munda, Shabar (35.4 per cent) etc. Gond has also registered the highest female literacy. Bhottada have the lowest percentage of female literates, preceded by Kolha and Khond.

Objectives

- To explore authorship pattern, collaborative research pattern on the scientific contributors by tribal community.
- To identify the relative performance of the published work on the basis of published journal of reputation.
- To compare the research outputs in terms of the citations received, contributions towards the tribal community etc.
- To create and digitize all bibliography study of S&T publications by tribal community.
- Statistical analysis on the bibliographic analysis by tribal community.
- Validating the above documents and record for future aspects.

Conclusion

It is possible to study the contribution of tribal of Odisha in the field of S&T using different bibliometric parameters. But only major problem which was noticed during the study that surnames of tribal researchers are not common as it was anticipated earlier. No doubt, there are many such unique surnames which the tribal of Odisha have. But, there are some surnames which are common with SC and also in General categories. So the study was directed to decide tribe's surnames first before applying bibliometric parameters for data analysis. The details of study on this aspect is discussed in Chapter – II.

Chapter - II

Review of Literature

Chapter – II

Review of Literature

Tribal Surname and Contribution Study

Surnames of Tribal in Odisha

According to the Order, 1950 as amended by Modification Order, 1956, Amendment Act, 1976 and the Scheduled Castes and Scheduled Tribes Order (Amendment) Act 2002 No. of Ministry of Law & Justice republished by Law Department, Govt. of Orissa., the list of Scheduled Tribes surnames of tribal in Odisha[1] are listed below:

Bagata, Bhakta

Baiga

Banjara, Banjari

Bathudi, Bathuri

Bhottada, Dhotada, Bhotra, Bhatra, Bhattara, Bhotora, Bhatara

Bhuiya, Bhuyan

Bhumia

Bhumij, TeliBhumij, HaladipokhriaBhumij, HaladiPokhariaBhumija, Desi Bhumij, Desia, Bhumij, TamariaBhumij

Bhunjia

Binjhal, Binjhwar

Binjhia, Binjhoa

Birhor

BondoPoraja, Bonda Paroja, Banda Paroja

Chenchu

Dal

DesuaBhumij

Dharua, Dhuruba, Dhuruva

Didayi, DidaiParoja, Didai

Gadaba, Bodo Gadaba, GutobGadaba, KapuGadaba, OllaraGadaba, ParengaGadaba, Sano Gadaba

Gandia

Ghara

Gond, Gondo, Rajgond, Maria Gond, Dhur Gond

Ho

Holva

Jatapu

Juang

KandhaGauda

Kawar, Kanwar

Kharia, Kharian, Berga Kharia, Dhelki Kharia, Dudh Kharia, Erenga Kharia, Munda, Kharia, Oraon Kharia, Khandia, Pahari Kharia

Kharwar

Khond, Kond, Kandha, NanguliKandha, SithaKandha, Kondh, Kui, Buda Kondh, Bura, Kandha, DesiaKandha, DungariaKondh, KutiaKandha, KandhaGauda, MuliKondh, MaluaKondh, PengoKandha, Raja Kondh, Raj Kondh

Kisan, Nagesar, Nagesia

Kol

KolahLoharas, KolLoharas

Kolha

Koli, Malhar

Kondadora

Kora, Khaira, Khayara

Korua

Kotia

Koya, GumbaKoya, KoiturKoya, KamarKoya, MusaraKoya

Kulis

Lodha, Nodh, Nodha, Lodh

Madia

Mahali

Mankidi

Mankirdia, Mankria, Mankidi

Matya, Matia

Mirdhas, Kuda, Koda

Munda, Munda Lohara, Munda Mahalis, Nagabanshi Munda, Oriya Munda

Mundari

Omanatya, Omanatyo, Amanatya

Oraon, Dhangar, Uran

Parenga

Paroja, Parja, Bodo Paroja, Barong JhodiaParoja, ChheliaParoja, JhodiaParoja, Konda, Paroja, Paraja, PongaParoja, SodiaParoja, Sano Paroja, Solia Paroja.

Pentia

Rajuar

Santal

Saora, Savar, Saura, Sahara, ArsiSaora, Based Saora, Bhima Saora, BhimmaSaora, ChumuraSaora, JaraSavar, JaduSaora, JatiSaora, JuariSaora, KampuSaora, Kamp, Soura, KapoSaora, KindalSaora, KumbiKancherSaora, KalapithiaSaora, KiratSaora, LanjiaSaora, LambaLanjiaSaora, LuaraSaora, LuarSaora, LariaSavar, Malia Saora, MallaSaora, UriyaSaora, RaikaSaora, SuddaSaora, SardaSaora, TankalaSaora, PatroSaora, VesuSaora.

Shabar, Lodha.

Sounti

Tharua, Tharua Bindhani

Interpretation and Analysis

Studies on tribe's surname are not available much. Only the type of ST is there in the public documents. On the other hand, tribal concentration is not specific to any particular state. In Indian geographical states, they are living in the border areas. However, some scholars are studied the surname of tribal for their research purpose. It is essential to know the surname

of the tribal of Odisha to study their S&T contribution in the state. The interpretation is made with the available data.

Out of the 62 Scheduled Tribes, the State has declared 13 tribal communities as Primitive Tribal Groups. These thirteen communities are: 1.Bonda Paraja, 2. Chuktia Bhunjia, 3. Didayi, 4. Dongaria Kondha, 5. Juang, 6. Hill Kharia (also Knov/n as7. Mankiridia, 8. Birhor), 9.Kutia Kondh, 10. Lanjia Saora, 11. Lodha, 12. Paudi Bhuiyan and 13. Saora. Each of these tribal communities is rich in social institutions, socio-cultural profile and ethnic identity as revealed from their life styles.

BIRHOR: Birhors are mainly distributed in the districts of Sambalpur, Sundargarh, Balasore, Cuttack and Ganjam. The meaning of the term Birhor in their language is Bir (forest) and Hor (men) i.e. men of the forest.

BONDO: The Bondo are only found in Odisha State. They are the speakers ofthe 'Kemo language which belongs to the Austro-Asiatic language family. There are three subgroups: the Bondo highlanders, Lower Bondo and the Gadaba-Bondo group. The Bondo villages are found in hilltops and hill slopes, as well, and their economic life centres on cultivation, both shifting and settled.

CHUKTIA BHUNJIA: The ChuktiaBhunjici are members of the Bhunjia tribal groups, concentrated in the Sonabera plateau of Kalahandi (old) district, which is located at an altitude of approximately 3,000 feet above the sea level. High and undulating hill ranges, streams and dense forest distinguish the area.

DIDAYI: The Didayi is an ethnic group that occupies the area of the Konda Kamberu hill ranges and the Machhkund River. Their habitat constitutes riverine plains, undulating plateau and rugged mountainous terrain.

DONGRIA KANDHA: The DongriaKandha, members of the Kandha tribe of Odisha, are found in the Niyamgiri hill ranges ofthe Eastern Ghats and particularly in the Rayagada and Koraput

districts. DongriaKandhcts speak a language, called the kuvi, which is of Dravidian linguistic ancestry.

JUANG: The Juang are found only in Odisha State, concentrated in the districts of Keonjhar and Dhenkanal. The Gonasika, which is situated in Keonihar district, is the principal seat of the tribe. The Gonasika area constitutes sedentary landscape with hills, slopes, ridges, and valleys. The vegetative cover in the area ranges from barren to thin forest, within a sub-tropical monsoon climate.

KHARIA: The PaharUHill Kharia, members of Kharia tribe, are considered the most 'backward' insofar as their economic status is concerned. The Hill Kharias are the autochthonous inhabitants of the Similipal hill ranges of Mayurbhanj district.

KUTIA KANDHA: The KuliaKandha is a sub-section of the Kandha tribal group of Odisha and they are mainly concentrated in Belghar area of the Balliguda subdivision in Phulbani district. Their habitat is located in the northeastern fringe of the Eastern Ghats and contains hills, rivers and streams.

LODHA: the Lodhas are concentrated in two areas, namely Morada and Suliapada in the Sadar subdivision of Mayurbhanj district. They are originally a Mundari speaking tribe. Their economy is subsistence-oriented and depends upon the collection of minor forest produce, wage-earning and agricultural labour. The Lodha social organisation is characterized by patrilineal and totemistic clans, and most ofthe families are nuclear.

PAUDI BHUYAN : The Bhuyan is one of the major tribes of Odisha. They are found in the districts of Keonjhar, Sundargarh, Mayurbhanj and Sambalpur and are chiefly concentrated in the Bhuyanpirha of Keonjhar district and Bonai subdivision of Sundargarh district.

SAORA: The Saora is one of the major tribes of Odisha and they speak a language, Saora, which can be classified under the Austro-Asiatic language family. They are found in almost all districts of the State, but are chiefly concentrated in Gajapati and Rayagada districts.

Derivation of tribal surnames

Recent MP and MLA election (2019) from different reserved ST areas in Odisha state has been studied to collect authentic surnames. The surnames of the tribal are as follows:

Baka, Bhoi, Biswal, Dian, Dishari, Ekka, Gamango, Gond, Hembram, Jani, Kanhar, Khuntia, Laguri, Madhei, Madhi, Majhi, Marandi, Muduli, Munda, Murmu, Naik, Nayak, Oram, Padhi, Pangi, Pradhani, Randhari, Saraka, Soren, Tete and Tudu.

From the literatures study from the references as available in different authentic sources, the entire surnames are listed below:

Baka, Banda Paroja, Barong JhodiaParoja, BhimmaSaora, Bhoi, Biswal, Bodo Gadaba, Bodo Paroja, Buda Kondh, ChheliaParoja, ChumuraSaora, Dehury, DesiaKandha, Dian, Dishari, DongariaKondh, Ekka, Gadaba, Gamango, Gond, GumbaKoya, GutobGadaba, Hembram, JaduSaora, Jani, Janie, JaraSavar, JatiSaora, Jhankar, JharaniaKondh, JhodiaParoja, JuariSaora, KaiapithiaSaora, KamarKoya, KampaSoura, KampuSaora, Kandha, Kanhar, KapoSaora, KapuGadaba, Khond, Khuntia, KindalSaora, KiratSaora, Kisan, KoiturKoya, Kol, Kond, Konda, Konhar, Koya, Kui, KumbiSaora, KutiaKandha, Laguri, Lamba, LanjiaSaora, LariaSavar, Lodh, LuarSaora, Madhei, Madhi, Mahalodh, Majhi, Majhi, Malia Saora, Mallick, MaluaKondh, Marandi, Muduli, MuliKondh, Munda, Murmu, MusaraKoya, Nagesar, Nagesia, Naik, NanguliKandha, Nayak, OllaraGadaba, Oram, Padhi, Pangi, Paraja, ParengaGadaba, Parja, Paroja, PengoKandha, PongaParoja, Pradhani, Raj Khond, Raja Kondh, Randhari, Sabar, Sano Gadaba, Sano Paroja, Saora, Saraka, Shabar, SithaKandhaKondh, SodiaParoja, Solia Paroja, Soren, Tete, Tudu.

Tribal Contribution Study

Once the surnames of tribal listed, it is easy to carry out the study with the help of authorship of the articles by considering all bibliographical elements in the concerned databases.

B.M. Mukherjee[2] (2004) studied the contributions of anthropology in Central India and stated that In the State of Madhya Pradesh the beaurocratic structure is so strong that there is hardly any scope for human consideration. Politicians and administrators in most cases, cannot be expected to have patience for experiments or time for research. Two years back an UNESCO Sponsored Programme "Education For All" started at Bhopal and suddenly collapsed. The reason is not known to me. Another reason for the present status of applied anthropology in central India is that the publications of this region remain unknown and unobtainable. Partly responsible is the paucity of anthropological literature/text book due to the lack of library facilities and lack of knowledge in English language. This gives me an impression that the region has not been able to establish the discipline of applied anthropology inspite of the fact that Madhya Pradesh by virtue of its tribal concentration and problems deserves immediate attention of applied anthropologists.

Harapriya Das[3] (2009) studied Tribal Contributions to the Cultural History of Orissa and discussed that Orissa has been the homeland of sixty-two tribes. Their interaction with the common people has influenced their life style and culture. Of course, all these tribes may not have equal contribution in the field of culture, but some of them have made significant contribution. This paper attempts at a close study of the tribal contribution to Orissa and culture in various fields. In the survey of the tribal influence on Orissan culture, it is found from ancient period that the tribal have been regarded as an integral part of Orissan society and culture. In political, social and religious fields they have contributed a lot to enrich Orissan culture. Even today, the tribals are casting some influence on Orissan culture. With the advancement of time new vistas will be opened in the field of tribal influence in the Orissan society.

C.O. Lima and J. Bonetti[4] (2020) made study Bibliometric analysis of the scientific production on coastal communities' social vulnerability to climate change and to the impact of extreme events. Bibliometric analysis is a quantitative evaluation method for scientific research aiming at measuring knowledge expressed as scientific publications in a given field. This paper proposes to analyze the worldwide scientific production on social vulnerability of

coastal populations through six bibliometric indicators: typology, historical evolution, geographic distribution, main sources, relevant authors and publications and recurring keywords. The research theme was chosen given the continuous increase of studies related to climatic changes and their consequences to populations in coastal zones. In total, 191 indexed documents covering the period from 1991 to 2019 were selected from the Scopus database, after the examination of more than 900 entries, and analyzed through VOSViewer software and the Bibliometrix R package. The results obtained confirmed the exponential growth of scientific production on this subject. Most frequently impacts considered were coastal flooding and erosion triggered by extreme events and the majority of studies have been presented as academic articles published in scientific journals. Moreover, most documents identified were site-specific, based on secondary data and associated with authors from the USA and the UK, with an emerging production related to authors from developing economies in recent years. Among the 658 authors found, only nine have published three or more articles on the theme, with citations highly concentrated in only four publications. The analysis also revealed the evolution of preferred keywords over time and the lack of consensus in the use of terminology. Studies about coastal social vulnerability were initially mostly focused on the evaluation of risks and exposure to hazards, evolving over time such that the focus shifted to adaptation measures seeking to minimize impacts from climate change to coastal zones.

Otávio José de Oliveira, Fabio Francisco da Silva, Fernando Juliani, Luis César Ferreira Motta Barbosa and Thaís Vieira Nunhes[5] (2018) undertaken the study on Bibliometric Method for Mapping the State-of-the-Art and Identifying Research Gaps and Trends in Literature: An Essential Instrument to Support the Development of Scientific Projects. Bibliometric analysis is an indispensable statistic tool to map the state of the art in a given area of scientific knowledge and identify essential information for various purposes, such as prospecting research opportunities and substantiating scientific researches. Therefore, the objective of this chapter is to present a method of bibliometric analysis for mapping the state of the art and identifying gaps and trends of research. The method encompasses instruments to identify and analyze the scientific performance of articles, authors, institutions, countries, and journals based on the number of citations, to reveal the trends of the field studied

through the analysis of keywords, and to identify and cluster scientific gaps from most recent publications. This method enables to expand in a scientific way the boundaries of science by investigating and identifying relevant and avant-garde research topics. It is an essential element that provides researchers means to identify and support paths towards the development of scientific projects.

Research Gap and Analysis

The major jobs on tribe's surnames As discussed earlier with the help of available literature, it is noticed that the major job of the study is to select tribal authorships from the database and followed by their S&T contributions in the state concerned. The bibliometric study of the data will provide both quality and quantity in tribal S&T productivity.

Conclusion

After the derivation of surnames of tribal S&T authors, it is easy to apply different parameters of bibliometric study to evaluate their contribution in S&T. However, some surnames are not filtered out from the list and finding difficulties get input from the author directly or from their working institution. Since their size is not so dominant that it will affect the trends any way. This may be treated under the limitation of the study. This study helps to design the research methodology of the project. The undertaken literature review helped to design research methodology of the project study.

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5. Otávio José de Oliveira, Fabio Francisco da Silva, Fernando Juliani, Luis César Ferreira Motta Barbosa and Thaís Vieira Nunhes (2019) undertaken the study on Bibliometric Method for Mapping the State-of-the-Art and Identifying Research Gaps and Trends in Literature: An Essential Instrument to Support the Development of Scientific Projects. Scientometrics Recent Advances, ISBN: 978-1-78984-713-0, 11 December 2019

Chapter - III

Research Methodology

Chapter – III

Research Methodology

Bibliometric Data

Bibliometric data are analyzed in the following steps:

Data model:

In this section, we briefly define how the information contained in this database is structured and organized. Bibliometrics' main entities are:

Author
Article
Journal
Organization
Subject area
Indicator

The links between these entities are articulated through the following relationships:

Authorship (it links an author with his or her article)
Affiliation (it links an author with the organization)
Publication (it links an article with a journal)
Indicator value (it links an article, author, journal or subject area with an in- dicator)

Information about the authors

Bibliometrics includes the scientific output of the lecturers and researchers affiliated with the institutions and, for each one, provides a series of data, including start and end dates of the affiliation with the institutions, research centre, faculty or research group. The information stored for each author is as follows:

Table 4: Detail of the fields corresponding to the entity *Author*

Field	Definition
Citation name	Form of the name customarily used by the author
Given name	The author's first name
Surname	The author's surname
ORCID	ORCID identifier
Scopus author ID	The author's identifier in Scopus
Research ID	The author's identifier in WoS
Public profile	Indicates whether or not the author's detailed file will be viewable on the application
Affiliation	Indicates or not whether the author belongs (or has be- longed) to the UOC
> From	Indicates the date on which affiliation with the UOC began
> To	Indicates the date on which affiliation with the UOC ended

Bibliographic data from publications

The following bibliographic information is collected for each publication:

Table 5: Detail of the fields corresponding to the entity *Publication*

Field	Definition
Original title	The article's original title
English title	The title in English if the original title is in another language
AI Code	The article's unique code in the CRIS
WoS ID	The article's identifier in WoS
Scopus ID	The article's identifier in Scopus
DOI	The article's DOI identifier

Publication type	Type of publication
Publication status	The article's publication status
Language	The language in which the article is written
Journal	The journal in which the article is published
Volume	The journal's volume number
Issue	The journal's issue number
First page	The number of the article's first page
Last page	The number of the article's last page
Publication year	The year in which the article was published
Publication date	The date on which the article was published in date format
Collaboration	The article's field of institutional collaboration
Conference	Title of the conference
Open access	Indication of whether the article is published in open access
Authorship	The publication's authors, by order of appearance, the institution they belong to and, if they are affiliated with the UOC, details of the centre, faculty or research group to which they belong
Repository URL	Link to the full text of the article in the UOC's repository
Bibliographical reference (APA)	The article's bibliographical reference in APA format
Bibliographical reference (ISO)	The bibliographical reference in ISO-690 format

Information about bibliometric indicators:

Each article is assigned the applicable national and international bibliometric indicators, depending on the journal they are published in, the academic discipline or the citations received. Bibliometric indicators included in Bibliometrics:

International indicators: Journal Citation Reports, Journal Rank andLat index.
National indicators: MIAR, Carhus+ and DICE.
Citations: ISI WoS, Scopus, Google Scholar.

Bibliometric Indicators

Bibliometrics provides four levels of indicators to represent the data:

Productivity

The number of publications can be consulted by year of publication, author and type of publication. As regards consultations of publications by year of publication, the user can compare the publications between faculties, research centres, research groups, academic disciplines or field of study. The calculation is performed as follows: for the research groups, research centres or faculties, it counts the number of publications whose au- thorship is assigned to the UOC research group, research centre or faculty. For the knowledge areas, it counts the number of publications that have an author affiliated with the knowledge area.
One of the calculations offered by Bibliometrics in this section is the Author's productivity, and the information that the user can access is the following:

Table 6: Calculations of the indicator *Author's productivity*

Indicator	Calculation
PDI (research and teaching staff)	This counts the total number of UOC members who are active within each organization unit or knowledge area.

% PDI	The percentage of the PDI with respect to the total number of active UOC members.
Publications	The total number of publications whose authorship is assigned to the organization unit or knowledge area.
% Publications	The percentage of publications by the organization unit or knowledge area with respect to the total number of publications.
Productivity by PDI	The number of publications by the organization unit or knowl- edge area divided by the PDI of the organization unit or knowl- edge area.

Visibility

This enables the articles' quality to be analysed in terms of the journal they are published in, using international (WoS, Scopus) and/or national (MIAR, Carhus+, etc.) bibliometric indicators. It is true that sometimes an article's visibility has been meas- ured on the basis of whether or not it has been cited (the most cited articles are con- sidered more visible than those that have not been cited) [2], but we have applied this interpretation to the impact indicator.

As regards the possibility of comparing data, the tool offers the user the possibility of comparing only between Journal Citation Reports and Scimago Journal Rank, as they are the only two indicators that apply to all the knowledge areas in which research is performed.

Impact

This enables the citations received by publication in WoS, Scopus and Google Scholar to be analyzed. The user can consult the number of citations received by year of publication and, in addition, by way of summary, he or she can see how many publications are indexed, what is the % of publications cited and what is the total number of citations received (the results will vary depending on the search carried out by the user, depending on whether or not the

data have been filtered by an organization). Lastly, the user can also compare the citations received between research centres, faculties or research groups.

Table 7: Calculations of the indicator *Comparative citations*

Indicator	Calculation
Publications	For the UOC research groups, research centres or faculties, it counts the number of publications whose authorship is assigned to the UOC research group, research centre or faculty. For the knowledge areas, it counts the number of publications that have an author affiliated with the knowledge area.
Total citations	It adds the total number of citations received in each of the databases.
Total cited	It counts the number of publications that have at least one citation in each of the databases.
Not cited	It counts the number of publications that are not cited in any of the data- bases.
% Cited	The percentage of cited publications with respect to the total number of publications by the UOC research group, research centre or faculty.

Collaboration

This enables the level of co-authoring of publications to be analyzed in terms of the authors' affiliation (institution and country): international, national, inter-university or without collaboration. The user can compare the collaboration among the publications' authors between faculties, research centres, research groups, academic disciplines or field of study. The calculation is performed as follows:

The percentage of publications from each organization unit or knowledge area by level of collaboration (UOC, national, international), with respect to the to- tal number of publications.

For UOC research groups, research centres or faculties, it counts the number of papers whose authorship is assigned to the organization.
For knowledge areas, it counts the number of publications that have an author affiliated with the knowledge area.

For collaboration between institutions, the user can access data on the mean number of citations received at Scopus for publications co-authored with one member of the institution (number of citations/number of publications). The same thing happens with collaboration between countries, as the user can access data about the mean number of citations received at Scopus for papers co-authored with an institution in the coun- try (number of citations/number of publications).

In order to do statistical analysis based on the scientific contribution by tribal community of Odisha, the methodology has been adapted to collect data from different sources and then develop a web enabled database. Data has been collected from both primary and secondary sources such as Web-of Science, SCOPUS, Google Scholar, Indian Science Abstracts and online literatures available at IndianJournals.com etc. Around 17,756 bibliographical details of references were collected from 09 resources to throw some lights to S&T contribution of tribal of Odisha. After mapping with tribal authors from the total collections, there are 935 articles contributed on S&T by the tribal of Odisha. The total percentage of share is 05.27 only. The total tribal constitutes 22.1 percent of the total population of the State and 9.7 per cent of the total tribal population of the country. Hence, the S&T contribution of tribal of Odisha is not significant as compared to their population in the state. The above references are collected based on different Bibliometrics parameters. The parameters are listed below:

a. Publication Source (Title, Vol., Issue, Year, Pages, Language etc.)
b. Title of the article
c. Authors with their affiliations
d. Subject Keywords
e. Abstract
f. Cross References, if any

Chapter - IV

Data Collection & Analysis

Chapter – IV

Data Collection and Analysis

Data sharing of tribal from the total S&T publications of Odisha

There are 17,756 bibliographical details of articles or references collected from 09 resources to throw some lights to S&T contribution of tribal of Odisha. After mapping with tribal authors from the total collections, there are 935 articles contributed on S&T by the tribal of Odisha. The total percentage of share is 05.27 only. The total tribal constitutes 22.1 percent of the total population of the State and 9.7 per cent of the total tribal population of the country. Hence, the S&T contribution of tribal of Odisha is not significant as compared to their population in the state.

Table 8: Collection of data from different sources

Source	Total Articles	Contribution by Tribal	Share %
WOS	741	52	7.02
NRRI AR	89	6	6.74
SCOPUS	12030	802	6.67
NISER AR	90	6	6.67
CIFA AR	157	8	5.10
IIT AR	85	3	3.53
IJ.COM	1073	35	3.26
OUAT AR	518	11	2.12
ISA	2973	12	0.40
Total	**17756**	**935**	**5.27**

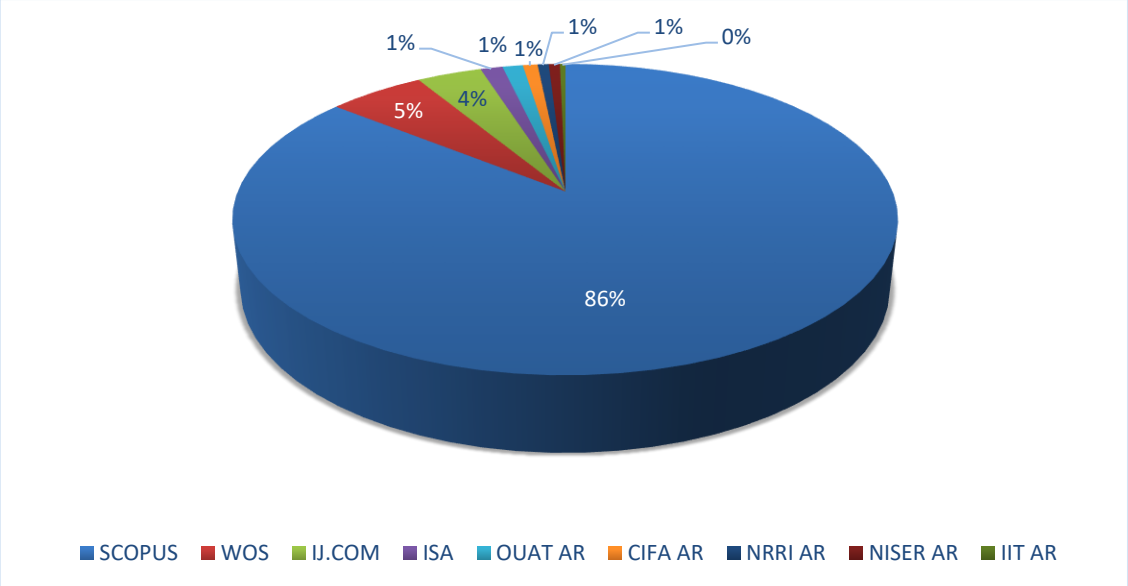
The maximum S&T articles of 802 are collected from SCOPUS. 85.78 % which representing 802 articles references are collected from SCOPUS to analyzing S&T contribution of tribal of

Odisha. SCOPUS is the major database on which the study is based to analyze S&T contribution of the tribal in the state.

Table 9: Sharing of S&T publications of tribal of Odisha in different sources

Source	No. of Articles	Share %
SCOPUS	802	85.78
WOS	52	5.56
IJ.COM	35	3.74
ISA	12	1.28
OUAT AR	11	1.18
CIFA AR	8	0.86
NRRI AR	6	0.64
NISER AR	6	0.64
IIT AR	3	0.32
Total	**935**	

Fig 1: Sharing of S&T publications by tribal of Odisha



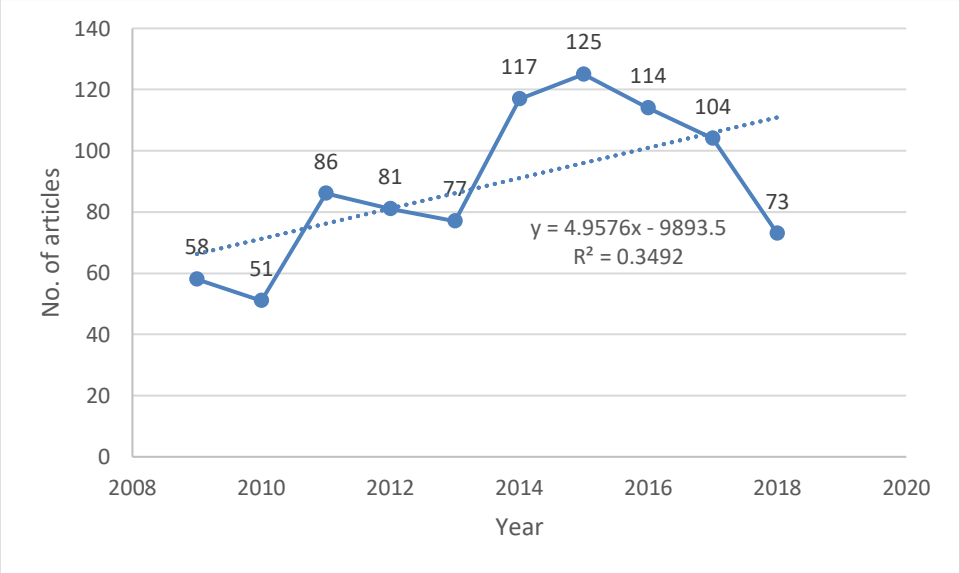
Year-wise S&T publications (Published by tribal of Odisha)

Table 10: Year-wise S&T contribution by the tribal of Odisha

Year	No. of Articles
Before 2008	9
2008	40
2009	58
2010	51
2011	86
2012	81
2013	77
2014	117
2015	125
2016	114
2017	104
2018	73
Total	**935**

Publication data for the year 2009 to 20018 (10 Years) is collected for the study. However, some data are shown against the year 2008 and also 'Before 2008'. It looks these 02 years data collection are not studied under the year-wise contribution. Although the year 2015 is the most significant for S&T publications, publishing 125 articles by the tribal, but not remarkable changes in the total publications per year during 2014, 2016 and 2017. Tribal of Odisha has started their significant contribution from the year 2014 and continued as positive trend in S&T contribution in Odisha.

Fig 2: Year-wise contribution (Significant study)



The publication pattern of the tribal is to follow a positive pattern (growth) during the study period. The linear equation is also shown in Fig 2 as above. The calculated value of R^2 is 0.3492. It is showing slow trend during the years.

Authorship Pattern followed by the tribal of Odisha

The tribal of Odisha has followed similar patterned which similar to earlier studies done by many researchers. Triple authorship is the most preferred pattern for all scientific publishers in primary sources. The upward trend is used to noticed from single authorship to triple authorship and downward trends from quadruple authorship onwards. However, there is a specific trend for the study observed in Triple, Quadruple and Quintuple authorship's pattern. The tribal of Odisha are very much preferable for these patterns. There are also some unusual patterns followed in this study which observed in the category of 'Decuple & more'. The trends of last ten categories are in the following authorship patterns:

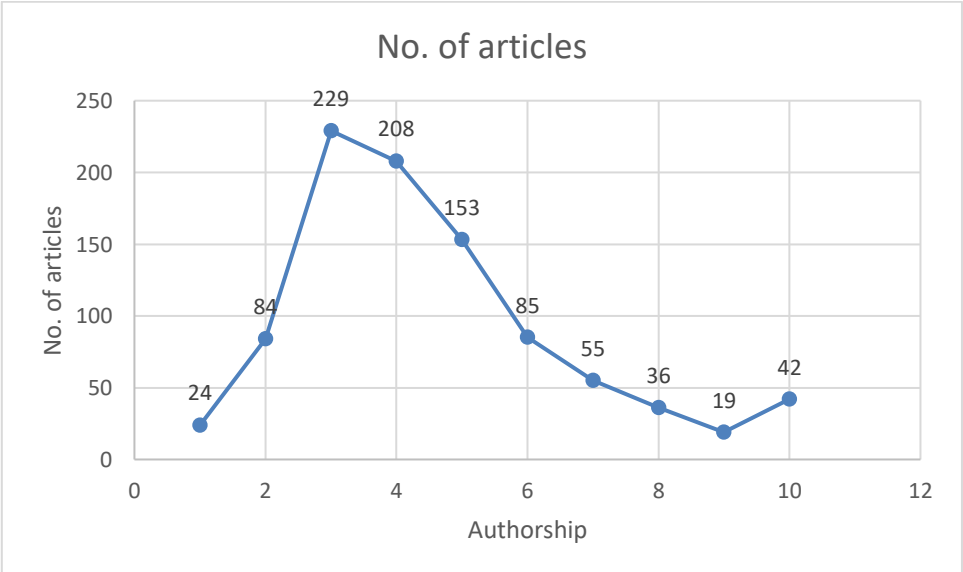
15, 15, 16, 16, 16, 18, 21, 31, 52 & 86 **'Authorship Patterns'**

Higher author patterns are observed in the area of 'Biological Sciences' in particular to 'Agriculture Science'.

Table 11: Authorship Pattern by the tribal of Odisha

Authorship Category	No. of articles
Single	24
Double	84
Triple	229
Quadruple	208
Quintuple	153
Sextuple	85
Septuple	55
Octuple	36
Nonuple	19
Decuple & more	42
Total	**935**

Fig 3: Authorship Pattern by the tribal of Odisha in S&T publication



The tribal of Odisha is followed a **'Pyramid Publication Pattern'** as shown in Fig 3.

Author's Productivity Study

From the study it is noticed that there are 227 authors have published 935 S&T articles in different primary journals. The table as shown below, the top 25 authors have published 469 articles sharing more than 50% of the total publications. The tribal author B. Majhi has published 79 S&T articles and occupied Rank 1 in the top productive list.

Table 12: Top 25 Productive Tribal Authors

Author's Name	No. of Articles	Rank
Majhi B	79	1
Mallick S.	47	2
Mallick P.	32	3
Naik B.	29	4
Kundu C.N.	24	5
Dehuri S.	18	6
Naik S.K.	18	7
Kundu S.	16	8
Mallik A.	16	9
Besra L.	15	10
Naik S.	15	11
Nath I	14	12
Nath R.K.	14	13
Bhuyan P.	13	14
Majhi D.	13	15
Mallick B.	13	16
Kundu A. K.	12	17
Kundu D.K.	11	18

Majhi S.K	11	19
Mallick P.K.	11	20
Bhoi B	10	21
Kundu M	10	22
Nath G.	10	23
Dehury B.	9	24
Dehury S.	9	25

The entire rank between the tribal authors are distributed as given in Table 13. Out of 227 authors, 106 authors have contributed 106 articles. The detail of the study is given at Annexure-I in the report.

Table 13: Rank between the tribal authors

No. of Authors	No. of Articles	Rank
1	79	1
1	47	2
1	32	3
1	29	4
1	24	5
2	36	6
2	32	7
2	30	8
2	28	9
3	39	10
1	12	11
3	33	12
3	30	13

8	72	14
5	40	15
5	35	16
8	48	17
5	25	18
16	64	19
17	51	20
34	68	21
106	106	22
227		

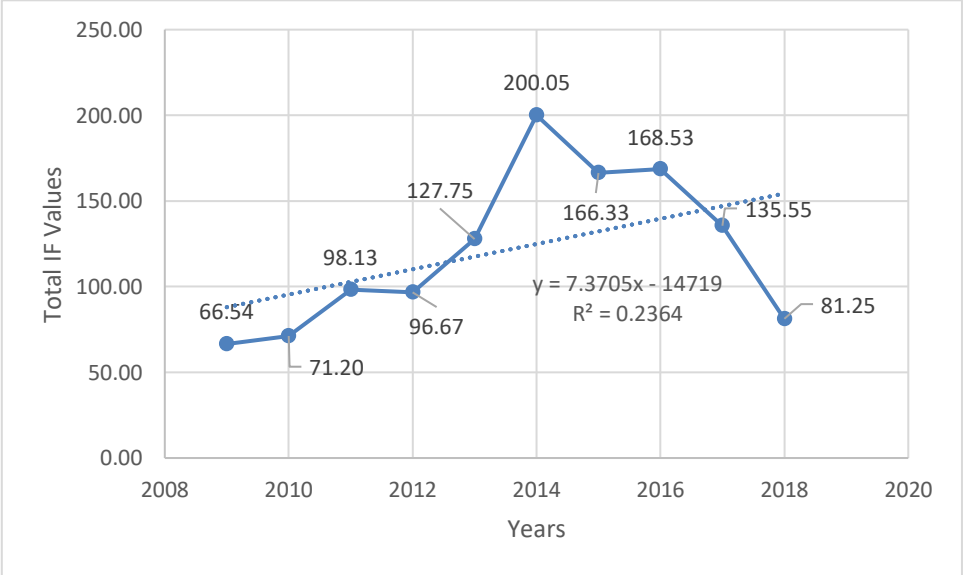
Quality of the Tribal S&T contribution

Table 14: Quality contribution by the tribal of Odisha

Year	Total	SCI	NSCI	SCI %	SCI Range	Total SCI	Average IF
2009	58	40	18	68.97	5.091 : 0.09	66.54	1.66
2010	51	40	11	**78.43**	5.091 : 0.204	71.20	1.78
2011	86	51	35	59.30	6.615 : 0.044	98.13	1.92
2012	81	51	30	62.96	7.36 : 0.044	96.67	1.90
2013	**77**	**51**	**26**	**66.23**	**7.082 : 0.044**	**127.75**	**2.50**
2014	**117**	**86**	**31**	**73.50**	**21.875 : 0.044**	**200.05**	**2.33**
2015	125	**92**	33	73.60	9.931 : 0.02	166.33	1.81
2016	114	82	32	71.93	11.91 : 0.044	168.53	2.06
2017	104	55	49	52.88	8.097 : 0.044	135.55	2.46
2018	73	49	24	67.12	6.86 : 0.172	81.25	1.66
	886	597	289	67.12			

Impactor Factor (IF) is one of the parameter to judge the quality contribution by the tribal of Odisha. An average of 67.12% publications are appeared in the ranked sources (SCI Journals) during the years 2009-2018. Tribal of Odisha have shown the consistency in the quality S&T contribution during the years. Although the highest sharing of SCI publications has come in the year 2010 (78.43%) but the average quality contribution is seen in the year 2013 (Average SCI 2.50). The total SCI values (200.05) is reached to pick with an average IF of 2.33 in the year 2014. The highest SCI range is 21.875 (IF Value) in the year 2014 and 0.02 lowest in the year 2015. The lowest SCI range 0.044 is noticed during the years 2011, 2012, 2013, 2014, 2016, and 2017. The highest quality contribution is seen in the year 2015 (SCI 92).

Fig 4: Quality of S&T contribution of tribal using IF values



Although the quality of S&T contribution is showing a positive trend but not so significance during the period 2009-2018 as shown in Fig 4.

Tribal preferred institutions in Odisha

There are a number of S&T institutions in Odisha. Many of the institutions are achieved its role to achieve national as well as international reputation. Tribal of Odisha have their

presence to strengthening the institutions through their quality contributions during the years 2009 to 2019. Their contribution may be projected as follows:

Based on number of S&T articles

Table 15: Ranking of institutions based on number of S&T articles

Institutions	No. of Article	SCI	NSCI	Total SCI
NIT, Rourkela	125	68	57	143.284
OUAT, Bhubaneswar	69	48	21	29.009
SOA University, Bhubaneswar	62	38	24	60.732
CSIR-IMMT, Bhubaneswar	50	46	4	145.98
KIIT University, Bhubaneswar	45	32	13	107.679
VSSUT, Burla	39	23	16	22.523
NOU, Baripada	37	30	7	48.35
NISER, Bhubaneswar	25	21	4	73.465
Ravenshaw University, Cuttack	20	17	3	58.402
Sambalpur University, Jyotivihar, Burla	20	14	6	23.194
SCB Medical College and Hospital, Cuttack	19	14	5	32.278
ICAR-NRRI, Cuttack	18	14	4	21.802
IIT, Bhubaneswar	17	15	2	52.613
Tripura University, Tripura	14	12	2	14.151
VIMSAR, Burla	14	10	4	24.529
AIIMS, Bhubaneswar	13	7	6	9.423
Utkal University, Bhubaneswar	12	7	5	11.094
F M University, Balasore	10	1	9	4.305
ICAR-CIFA, Bhubaneswar	10	6	4	2.287
Dibrugarh University, Dibrugarh	9	7	2	10.379

From the Table 15, it is shown that NIT, Rourkela is the most preferred institutions where the tribal of Odisha have contributed a large number of S&T articles (125 S&T articles) compared to other institutions followed by OUAT, Bhubaneswar (69 S&T articles) and SOA, Bhubaneswar (62 S&T articles). The top 20 ranked intuitions based on the total number of articles published are listed with its contributions as above. (See Annexure – II)

On the other hand, the said ranking is shown different, if it is based on sharing of SCI sources from the total publications of the concerned institutions. ICMR-RMRC, Bhubaneswar (100%) is listing on the top of Table 16 followed by CSIR-IMMT, Bhubaneswar (92%) and IIT, Bhubaneswar (88.24). The top 20 ranked intuitions, based SCI sharing (%), are listed below:

Table 16: Ranking of institutions based on SCI sharing (%)

Institutions	No. of Article	SCI	SCI%
ICMR-RMRC, Bhubaneswar	9	9	100.00
CSIR-IMMT, Bhubaneswar	50	46	92.00
IIT, Bhubaneswar	17	15	88.24
SOA, IMS & SUM Hospital, Bhubaneswar	8	7	87.50
Tripura University, Tripura	14	12	85.71
Ravenshaw University, Cuttack	20	17	85.00
NISER, Bhubaneswar	25	21	84.00
NOU, Baripada	37	30	81.08
ICAR-NRRI, Cuttack	18	14	77.78
Dibrugarh University, Dibrugarh	9	7	77.78
SCB Medical College and Hospital, Cuttack	19	14	73.68
VIMSAR, Burla	14	10	71.43
KIIT University, Bhubaneswar	45	32	71.11
Sambalpur University, Jyotivihar, Burla	20	14	70.00

OUAT, Bhubaneswar	69	48	69.57
SOA University, Bhubaneswar	62	38	61.29
VSSUT, Burla	39	23	58.97
Utkal University, Bhubaneswar	12	7	58.33
NIT, Rourkela	125	68	54.40
AIIMS, Bhubaneswar	13	7	53.85

Based on number of SCI Journals

Table 17: Ranking of institutions based on number of SCI journals

Institutions	No. of Article	SCI	NSCI	Total SCI
NIT, Rourkela	125	68	57	143.284
OUAT, Bhubaneswar	69	48	21	29.009
CSIR-IMMT, Bhubaneswar	50	46	4	145.98
SOA University, Bhubaneswar	62	38	24	60.732
KIIT University, Bhubaneswar	45	32	13	107.679
NOU, Baripada	37	30	7	48.35
VSSUT, Burla	39	23	16	22.523
NISER, Bhubaneswar	25	21	4	73.465
Ravenshaw University, Cuttack	20	17	3	58.402
IIT, Bhubaneswar	17	15	2	52.613
Sambalpur University, Jyotivihar, Burla	20	14	6	23.194
SCB Medical College and Hospital, Cuttack	19	14	5	32.278
ICAR-NRRI, Cuttack	18	14	4	21.802
Tripura University, Tripura	14	12	2	14.151
VIMSAR, Burla	14	10	4	24.529
ICMR-RMRC, Bhubaneswar	9	9		19.964

AIIMS, Bhubaneswar	13	7	6	9.423
Utkal University, Bhubaneswar	12	7	5	11.094
Dibrugarh University, Dibrugarh	9	7	2	10.379
SOA, IMS & SUM Hospital, Bhubaneswar	8	7	1	2.262

From the Table 17, it is shown that NIT, Rourkela is also the most preferred institutions where the tribal of Odisha have contributed a large number of S&T articles in SCI quality journals (68 SCI Journals) compared to other institutions followed by OUAT, Bhubaneswar (48 SCI Journals) and CSIR-IMMT, Bhubaneswar (46 SCI Journals). The top 20 ranked intuitions based on the total number of SCI journals are listed as above.

Based on Total IF Value

Table 18: Ranking of institutions based on total IF values

Institutions	No. of Article	SCI	NSCI	Total IF
CSIR-IMMT, Bhubaneswar	50	46	4	145.98
NIT, Rourkela	125	68	57	143.284
KIIT University, Bhubaneswar	45	32	13	107.679
NISER, Bhubaneswar	25	21	4	73.465
SOA University, Bhubaneswar	62	38	24	60.732
Ravenshaw University, Cuttack	20	17	3	58.402
IIT, Bhubaneswar	17	15	2	52.613
NOU, Baripada	37	30	7	48.35
SCB Medical College and Hospital, Cuttack	19	14	5	32.278
OUAT, Bhubaneswar	69	48	21	29.009
VIMSAR, Burla	14	10	4	24.529
ILS, Bhubaneswar	7	6	1	23.45
Sambalpur University, Jyotivihar, Burla	20	14	6	23.194

VSSUT, Burla	39	23	16	22.523
ICAR-NRRI, Cuttack	18	14	4	21.802
ICMR-RMRC, Bhubaneswar	9	9		19.964
Tripura University, Tripura	14	12	2	14.151
GIET, Gunupur	3	2	1	13.72
Dr. Abhin Chandra Homeo. Med. College and Hos., Bhubaneswar	3	3		12.286
Utkal University, Bhubaneswar	12	7	5	11.094

From the Table 18, it is also noticed that CSIR-IMMT, Bhubaneswar is also the most preferred platform for the tribal of Odisha to publish most of the quality S&T articles (Total IF 145.98) followed by NIT, Rourkela (Total IF 143.284) and KIIT University, Bhubaneswar (Total IF 107.679). The top 20 ranked intuitions based on the total IF values are listed as above.

For details of the institutions and its ranking as studied during the years 2009 to 2018 may be referred at Annexure - III.

Tribal preferred subject in Odisha

Based on number of S&T articles

Table 19: Ranking of subjects based on number of S&T articles

Subjects	Total Articles	SCI	NSCI	Total IF
Computer Science	123	55	68	66.501
Medical Science	80	50	30	89.942
Agriculture Science	78	52	26	64.834
Physics	63	45	18	69.635
Chemistry	50	44	6	110.559

Minerals and Materials	49	44	5	129.79
Pharmaceutical Science	44	37	7	63.125
Biotechnology	35	33	2	100.07
Veterinary Science	33	28	5	6.571
Electronics	30	7	23	7.539
Biological Science	19	15	4	44.141
Chemical Science	19	15	4	50.83
Mechanical Engineering	19	10	9	11.796
Electrical Engineering	18	7	11	21.518
Bioinformatics	16	12	4	29.488
Metallurgy	15	14	1	14.808
Basic Science	14	13	1	44.988
Dental Science	14	3	11	3.165
Life Science	14	13	1	57.843
Aquaculture	10	6	4	2.287

From the Table 19, it is confirmed that 'Computer Science' is the most preferred subject where the tribal of Odisha have contributed a large number of S&T articles (123 S&T articles) compared to other subjects followed by 'Medical Science' (80 S&T articles) and 'Agriculture Science' (78 S&T articles). The top 20 subject areas are ranked based on the total number of articles published as listed above.

On the other hand, the said ranking is shown differently, if it is based on sharing of SCI sources from the total publications of the concerned subject. 'Environment' (100%) is listing on the top of Table 20 followed by 'Biotechnology' (94.29%) and 'Metallurgy' (93.33). The top 20 ranked subjects, based SCI sharing (%), are listed below:

Table 20: Ranking of subjects based on SCI sharing (%)

Subjects	Total Articles	SCI	SCI%
Environment	7	7	100.00
Biotechnology	35	33	94.29
Metallurgy	15	14	93.33
Basic Science	14	13	92.86
Life Science	14	13	92.86
Minerals and Materials	49	44	89.80
Cancer	9	8	88.89
Chemistry	50	44	88.00
Veterinary Science	33	28	84.85
Pharmaceutical Science	44	37	84.09
Biological Science	19	15	78.95
Chemical Science	19	15	78.95
Bioinformatics	16	12	75.00
Physics	63	45	71.43
Agriculture Science	78	52	66.67
Medical Science	80	50	62.50
Mechanical Engineering	19	10	52.63
Computer Science	123	55	44.72
Electrical Engineering	18	7	38.89
Electronics	30	7	23.33

Based on number of SCI Journals

Table 21: Ranking of subjects based on number of SCI journals

Subjects	Total Articles	SCI	NSCI	Total IF
Computer Science	123	55	68	66.501
Agriculture Science	78	52	26	64.834
Medical Science	80	50	30	89.942
Physics	63	45	18	69.635
Chemistry	50	44	6	110.559
Minerals and Materials	49	44	5	129.79
Pharmaceutical Science	44	37	7	63.125
Biotechnology	35	33	2	100.07
Veterinary Science	33	28	5	6.571
Biological Science	19	15	4	44.141
Chemical Science	19	15	4	50.83
Metallurgy	15	14	1	14.808
Basic Science	14	13	1	44.988
Life Science	14	13	1	57.843
Bioinformatics	16	12	4	29.488
Mechanical Engineering	19	10	9	11.796
Cancer	9	8	1	32.69
Electronics	30	7	23	7.539
Electrical Engineering	18	7	11	21.518
Environment	7	7		21.976

From the Table 21, it is also noticed that 'Computer Science' is also the most preferred subject where the tribal of Odisha have contributed a large number of S&T quality articles in

SCI journals (55 SCI Journals) compared to other subject areas followed by 'Agriculture Science' (52 SCI Journals) and 'Medical Science' (50 SCI Journals). The top 20 subject areas are ranked based on the total number of SCI journals as above.

Based on Total IF Value

Table 22: Ranking of subjects based on total IF values

Subjects	Total Articles	SCI	NSCI	Total IF
Minerals and Materials	49	44	5	129.79
Chemistry	50	44	6	110.559
Biotechnology	35	33	2	100.07
Medical Science	80	50	30	89.942
Physics	63	45	18	69.635
Computer Science	123	55	68	66.501
Agriculture Science	78	52	26	64.834
Pharmaceutical Science	44	37	7	63.125
Life Science	14	13	1	57.843
Chemical Science	19	15	4	50.83
Basic Science	14	13	1	44.988
Biological Science	19	15	4	44.141
Cancer	9	8	1	32.69
Bioinformatics	16	12	4	29.488
Environment	7	7		21.976
Electrical Engineering	18	7	11	21.518
Management	9	4	5	15.171
Metallurgy	15	14	1	14.808
Homeopathy	3	3		12.286

Chemical Engineering	9	6	3	12.218

From the Table 22, it is also noticed that 'Minerals & Materials' is also the most preferred subject area for the tribal of Odisha to publish most of the quality S&T articles (Total IF 129.79) followed by 'Chemistry' (Total IF 110.559) and 'Biotechnology' (Total IF 100.07). The top 20 subject areas are ranked based on the total IF values as above.

For details of the subject areas and its ranking as studied during the years 2009 to 2018 may be referred at *Annexure - IV*.

Tribal preferred source of publications in Odisha

Based on SCI sources

Table 23: Ranking of sources based on number of SCI Journals

Title of the Source	SCI	IF Value
Veterinary World	16	0.313
IOP Conf. Series: Materials Science and Engineering	15	0.197
Indian Veterinary J.	14	0.044
Indian J. of Physics	11	0.967
Smart Innovation, Systems and Technologies	9	0.59
Indian J. of Animal Sciences	8	0.279
RSC Advances	8	2.936
Procedia Computer Science	7	0.79
Molecular BioSystems	6	2.759
Scientific Reports	6	4.122
J. of Chemical and Engineering Data	5	2.196
J. of Indian Academy of Forensic Medicine	5	0.28

J. of the Indian Chemical Society	5	0.204
Lecture Notes in Computer Science	5	0.369
Research J. of Pharmacology and Pharmacodynamics	5	2.439
Australian J. of Crop Science	4	1.635
Industrial and Engineering Chemistry Research	4	3.141
Intl. J. of Pharmacy and Pharmaceutical Sciences	4	0.66
Intl. J. of Signal and Imaging Systems Engineering	4	0.56
J. of Information Processing Systems	4	0.75

From the Table 23, it is noticed that the tribal of Odisha is used to preferred by contributing their articles in 'Veterinary World' (16 S&T articles) compared to other sources in 'IOP Conf. Series: Materials Science and Engineering' (15 S&T articles) and 'Indian Veterinary J.' (14 S&T articles). The top 20 sources are ranked based on the total number of articles published as listed above.

Based on NSCI sources

Table 24: Ranking of sources based on number of NSCI Journals

Title of the Source	NSCI
Proceedings - AIP Conf.	16
Proceedings - ACM Intl. Conf.	9
Materials Today: Proceedings	6
BMJ Case Reports	5
Communications in Computer and Information Science	5
J. of Contemporary Dental Practice	5
J. of Intl. Society of Preventive and Community Dentistry	4
Proceedings - Intl. Conf. on Control, Instrumentation, Communication and Computational Technologies, ICCICCT 2014	4

Proceedings - Intl. Conf. on Energy, Automation and Signal, ICEAS - 2011	4
Proceedings - World Congress on Nature and Biologically Inspired Computing, NABIC 2009	4
Advances in Intelligent Systems and Computing	3
Electronic J. of Geotechnical Engineering	3
Indian J. of Orthopedics Surgery	3
Intl. J. of Computational Vision and Robotics	3
J. of Oral and Maxillofacial Pathology	3
Proceedings - Intl. Conf. on Computing, Communications and Networking Technologies, ICCCNT 2017	3
Advanced Materials Research	2
Agriculture Engineering Today	2
Annals of Cardiac Anaesthesia	2
Archives of Phytopathology and Plant Protection	2

From the Table 24, it is seen that the tribal of Odisha is also used to preferred by contributing their articles in different NSCI sources and most preferred in 'Proceedings - AIP Conf.' (16 S&T articles) compared to other sources in 'Proceedings - ACM Intl. Conf.' (9 S&T articles) and 'Materials Today: Proceedings' (6 S&T articles). The top 20 NSCI sources are ranked based on the total number of articles published as listed above.

Based on SCI ranking (IF value)

Table 25: Ranking of sources based on SCI ranking (IF value)

Title of the Source	SCI	IF Value
Advanced Energy Materials	1	21.875
Surgical Neurology Intl.	1	11.91
ACS Catalysis	1	11.384

J. of Materials Chemistry A	1	9.931
ACS Applied Materials and Interfaces	2	8.097
Molecular Cancer	1	7.776
Intl. J. of Cancer	1	7.36
Carbon	1	7.082
Intl. J. of Research in Economics and Social Sciences	1	7.077
J. of Physics: Conf. Series	1	6.937
Intl. J. of Mechanical Engineering and Technology	3	6.86
Intl. J. of Pharmaceutical Sciences Review and Research	1	6.857
Cochrane Database of Systematic Reviews	1	6.754
Chemical Engineering J.	2	6.735
Intl. J. of Physical and Social Sciences	1	6.644
Genomics, Proteomics and Bioinformatics	1	6.615
Acta Biomaterialia	2	6.383
J. of Medicinal Chemistry	1	6.253
Intl. J. of Medical Pediatrics and Oncology	2	6.2
Seminars in Cell and Developmental Biology	1	6.138

IF value of 'Advanced Energy Materials' is 21.875 occupying the top in the table and followed by 'Surgical Neurology Intl.' (IF 11.91) and 'ACS Catalysis' (IF 11.384). It is worth to inform here that tribal of Odisha are not behind to publish quality articles in high score SCI journals. 67.12% (see Table 14) of their publications are covered under SCI tag.

For details of the rank list of different sources as studied during the years 2009 to 2018 may be referred at *Annexure - V*.

Contribution through other institutions (Not in Odisha)

Table 26: Contribution by tribal of Odisha through other institutions

Institutions (Not in Odisha)	No. of Article
Tripura University, Tripura	14
Dibrugarh University, Dibrugarh	9
ICAR-NDRI, Karnal	6
Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, WB	6
Ajou University, South Korea	5
Jaypee University of Information Technology, Waknaghat, HP	4
IIT, Kharagpur	3
Guru GhasidasVishwavidyalaya, Bilaspur	3
ICAR-Central Res. Inst. for Jute and Allied Fibres, WB	3
G. G. Vishwavidyalaya (Central University), Bilaspur	2
IIT, Delhi	2
Vignana Bharathi Inst. of Technology, Hyderabad	2
Goa Inst. of Management, Panaji	2
Inst. of Nutraceutical Res., Clemson University	2
NIT, Warangal	2
AIIMS, New Delhi	2
JIS College of Engineering, Kalyani	2
NIT, Himachal Pradesh	2
Assam Agricultural University, Silchar	1
BIT, Pilani	1

From Table 26, it is seen that there are 57 institutions located at outside of Odisha state contributed 110 S&T articles. Only top 20 institutions are listed as above. The entire list of intuitions are shown at Annexure - . Tripura University is at the top of list (14 S&T articles) followed by Dibrugarh University (09 S&T articles) and ICAR-NDRI, Karnal (06 S&T articles). The above output as shown above is due to the activities in national seminars, workshops or individual involvement with the institutions.

Table 27: Contribution by tribal of Odisha through foreign institutions

Foreign Institutions	Location	No. of Article
Ajou University, South Korea	South Korea	5
Inst. of Nutraceutical Res., Clemson University	Clemson, USA	2
University of Waterloo, Waterloo	Waterloo, Belgium	1
Weizmann Inst. of Science, Rehovot	Rehovot, Israel	1
University of Illinois, College of Medicine, Chicago	Chicago, USA	1
University of California, Berkeley	Berkeley, USA	1
Centre for Environmental Risk Assessment and Remediation, Australia	Australia	1

From Table 27, there are 7 foreign institutions are involved to publish or promote 12 S&T articles of the tribal of Odisha. The above output as shown above is due to the activities in international seminars, workshops or individual involvement with the institutions.

Chapter - V

Results & Findings

Chapter – V

Results and Findings

Data sharing of tribal

It is surprise that the total percentage of S&T share of tribal of Odisha is 05.27 only. The total tribal constitutes 22.1 percent of the total population of the State and 9.7 per cent of the total tribal population of the country. Hence, the S&T contribution of tribal of Odisha is not significant as compared to their population in the state.

The publication pattern of the tribal is to follow a positive pattern (growth) during the study period. The linear equation is also shown in Fig 2 as above. The calculated value of R^2 is 0.3492. It is showing slow trend during the years. Although the year 2015 is the most significant for S&T publications, publishing 125 articles by the tribal, but not remarkable changes in the total publications per year during 2014, 2016 and 2017. Tribal of Odisha has started their significant contribution from the year 2014 and continued as positive trend in S&T contribution in Odisha.

The tribal of Odisha has followed similar patterned which similar to earlier studies done by many researchers. Triple authorship is the most preferred pattern for all scientific publishers in primary sources. The tribal of Odisha are very much preferable for these patterns. There are also some unusual patterns followed in this study which observed in the category of 'Decuple & more'. The trends of last ten categories are in the following authorship patterns:

15, 15, 16, 16, 16, 18, 21, 31, 52 & 86 **'Authorship Patterns'**

Higher author patterns are observed in the area of 'Biological Sciences' in particular to 'Agriculture Science'.

Author's Productivity Study

From the study it is noticed that there are 227 authors have published 935 S&T articles in different primary journals. The top 25 authors have published 469 articles sharing more than

50% of the total publications. The tribal author B. Majhi has published 79 S&T articles and occupied Rank 1 in the top productive list.

Quality of the Tribal S&T contribution

An average of 67.12% publications are appeared in the ranked sources (SCI Journals) during the years 2009-2018. Tribal of Odisha have shown the consistency in the quality S&T contribution during the years. Although the highest sharing of SCI publications has come in the year 2010 (78.43%) but the average quality contribution is seen in the year 2013 (Average SCI 2.50). The total SCI values (200.05) is reached to pick with an average IF of 2.33 in the year 2014. The highest SCI range is 21.875 (IF Value) in the year 2014 and 0.02 lowest in the year 2015. The lowest SCI range 0.044 is noticed during the years 2011, 2012, 2013, 2014, 2016, and 2017. The highest quality contribution is seen in the year 2015 (SCI 92). Although the quality of S&T contribution is showing a positive trend but not so significance during the period 2009-2018.

Tribal preferred institutions in Odisha

Based on number of S&T articles

NIT, Rourkela is the most preferred institutions where the tribal of Odisha have contributed a large number of S&T articles (125 S&T articles) compared to other institutions followed by OUAT, Bhubaneswar (69 S&T articles) and SOA, Bhubaneswar (62 S&T articles). On the other hand, the said ranking is shown different, if it is based on sharing of SCI sources from the total publications of the concerned institutions. ICMR-RMRC, Bhubaneswar (100%) is listing on the top of Table 8 followed by CSIR-IMMT, Bhubaneswar (92%) and IIT, Bhubaneswar (88.24). The top 20 ranked intuitions, based SCI sharing (%), are listed below:

Based on number of SCI Journals

It is also shown that NIT, Rourkela is also the most preferred institutions where the tribal of Odisha have contributed a large number of S&T articles in SCI quality journals (68 SCI

Journals) compared to other institutions followed by OUAT, Bhubaneswar (48 SCI Journals) and CSIR-IMMT, Bhubaneswar (46 SCI Journals).

Based on Total IF Value

It is also noticed that CSIR-IMMT, Bhubaneswar is also the most preferred platform for the tribal of Odisha to publish most of the quality S&T articles (Total IF 145.98) followed by NIT, Rourkela (Total IF 143.284) and KIIT University, Bhubaneswar (Total IF 107.679).

Tribal preferred subject in Odisha

Based on number of S&T articles

It is confirmed that 'Computer Science' is the most preferred subject where the tribal of Odisha have contributed a large number of S&T articles (123 S&T articles) compared to other subjects followed by 'Medical Science' (80 S&T articles) and 'Agriculture Science' (78 S&T articles). On the other hand, the said ranking is shown differently, if it is based on sharing of SCI sources from the total publications of the concerned subject. 'Environment' (100%) is listing on the top of Table 12 followed by 'Biotechnology' (94.29%) and 'Metallurgy' (93.33).

Based on number of SCI Journals

It is also noticed that 'Computer Science' is also the most preferred subject where the tribal of Odisha have contributed a large number of S&T quality articles in SCI journals (55 SCI Journals) compared to other subject areas followed by 'Agriculture Science' (52 SCI Journals) and 'Medical Science' (50 SCI Journals).

Based on Total IF Value

It is also noticed that 'Minerals & Materials' is also the most preferred subject area for the tribal of Odisha to publish most of the quality S&T articles (Total IF 129.79) followed by 'Chemistry' (Total IF 110.559) and 'Biotechnology' (Total IF 100.07).

Tribal preferred source of publications

Based on SCI sources

It is noticed that the tribal of Odisha is used to preferred by contributing their articles in 'Veterinary World' (16 S&T articles) compared to other sources in 'IOP Conf. Series: Materials Science and Engineering' (15 S&T articles) and 'Indian Veterinary J.' (14 S&T articles).

Based on NSCI sources

It is seen that the tribal of Odisha is also used to preferred by contributing their articles in different NSCI sources and most preferred in 'Proceedings - AIP Conf.' (16 S&T articles) compared to other sources in 'Proceedings - ACM Intl. Conf.' (9 S&T articles) and 'Materials Today: Proceedings' (6 S&T articles).

Based on SCI ranking (IF value)

IF value of 'Advanced Energy Materials' is 21.875 occupying the top in the table and followed by 'Surgical Neurology Intl.' (IF 11.91) and 'ACS Catalysis' (IF 11.384). It is worth to inform here that tribal of Odisha are not behind to publish quality articles in high score SCI journals. 67.12% of their publications are covered under SCI tag.

Contribution through other institutions (Not in Odisha)

It is seen that there are 57 institutions located at outside of Odisha state contributed 110 S&T articles. Tripura University is at the top of list (14 S&T articles) followed by Dibrugarh University (09 S&T articles) and ICAR-NDRI, Karnal (06 S&T articles). The above output as shown above is due to the activities in national seminars, workshops or individual involvement with the institutions. There are 7 foreign institutions are involved to publish or promote 12 S&T articles of the tribal of Odisha. The above output as shown above is due to the activities in international seminars, workshops or individual involvement with the institutions.

Conclusion

Conclusion

The bibliometric studies are frequently used to assess research performance and to generate information that can be used by policy makers and experts. This study has proven to be useful tool in the assessment of research performance of faculty members. Taking into account the faculty members participation in scientific collaboration as expressed in co-publication the output and productivity have been calculated. In a quantitative approach ranking of Institutions, Tribal Authors, Subject Areas and Publication Sources based on different research performance have been compared. The present study illustrates with facts and figures on S&T contribution of Tribal of Odisha. The wider application of bibliometric techniques is leading to the development of a new and wore precise technique hopefully, the ongoing theorist work will point the way to more innovative techniques. Moreover, the present study mirrors the actual. This study will helpful to the policy makers to take any decision making process for the development of weaker section of the society.

Research Summary

Bibliometric Study of S&T Publications by Tribal Community of Odisha by Dr. Himansu Mohan Padhy. Sophitorium Institute of Technology & Lifeskills, Jatni, Bhubaneswar (Odisha).

This work provides a quantitative and qualitative analysis of S&T contribution by tribal of Odisha as reflected in the publications output reported in global secondary services. The study also brings out strong and weak areas of research, quantity and quality of output, and dynamics of research across institutions, geographical regions, subjects, sub-fields and core journals for S&T contribution of tribal in Odisha. The analysis uses data from WOS, SCOPUS, IJ.COM, Indian Science Abstracts and Annual Reports of major institutions of Odisha for the years 2009-18. The study also includes some of the unindexed Indian contributions.

The outcome of the study may be used to assess research performance and to generate information which used by policy makers and experts. This study has proven to be useful tool in the assessment of research performance of faculty members. Taking into account the faculty members participation in scientific collaboration as expressed in co-publication the output and productivity have been calculated.

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Annexures

Annexure – 1

Tribal Authors and their ranking based on number of S&T articles:

Author's Name	No.	Rank
Majhi B	79	1
Mallick S.	47	2
Mallick P.	32	3
Naik B.	29	4
Kundu C.N	24	5
Dehuri S.	18	6
Naik S.K.	18	7
Kundu S.	16	8
Mallik A.	16	9
Besra L	15	10
Naik S.	15	11
Nath I	14	12
Nath R.K.	14	13
Bhuyan P.	13	14
Majhi D.	13	15
Mallick B.	13	16
Kundu A. K.	12	17
Kundu D.K.	11	18
Majhi S.K	11	19
Mallick P.K.	11	20
Bhoi B	10	21
Kundu M	10	22
Nath G.	10	23
Dehury B.	9	24
Dehury S.	9	25
Mallick M.K.	9	26
Mallick R.K.	9	27
Marandi B.C.	9	28
Naik I.	9	29
Naik R.	9	30
Nath V.	9	31
Kole C	8	32
Munda S	8	33
Naik A.	8	34
Naik P.	8	35
Nath L.K.	8	36
Bhuyan S.K.	7	37
Dehuri P.K.	7	38
Hembram A	7	39
Majhi R.K.	7	40
Nath N.	7	41
Bhoi S.K.	6	42
Bhuyan R.K.	6	43

Hansda M.K.	6	44
Kundu S.S.	6	45
Majhi P	6	46
Mallick R.	6	47
Naik P.K.	6	48
Nath V.S.	6	49
Bhakta S.	5	50
Bhoi G.K.	5	51
Bhuyan L.	5	52
Kundu M.K.	5	53
Naik B.S.	5	54
Bhuyan G C.	4	55
Bhuyan M.K.	4	56
Bhuyan S.	4	57
Dehury S.K.	4	58
Majhi J.	4	59
Mallick D.	4	60
Mallick J.	4	61
Mallick S.K.	4	62
Murmu K.	4	63
Murmu M.	4	64
Murmu S	4	65
Naik K.K.	4	66
Naik M.	4	67
Nath J.	4	68

Nath R.	4	69
Nath S.	4	70
Bhuyan K.C.	3	71
Bhuyan P.K.	3	72
Bhuyan R.	3	73
Kole P.C.	3	74
Kundu P	3	75
Kundu, A. K.	3	76
Majhi A J	3	77
Majhi R.	3	78
Mallick A.K.	3	79
Mallik B.K.	3	80
Mallik R.K.	3	81
Marandi D	3	82
Naik G.	3	83
Naik G.K.	3	84
Naik K.N.	3	85
Naik M.R.	3	86
Nath P.	3	87
Bhakat S.	2	88
Bhoi A.	2	89
Bhoi S.	2	90
Bhunya P. K.	2	91
Bhuyan D.	2	92
Bhuyan H.K	2	93

Dehuri P.	2	94
Dehury N.	2	95
Dehury R.K.	2	96
Dehury S.N.	2	97
Kole C.R.	2	98
Kole P.	2	99
Kuila B	2	100
Kundu D.	2	101
Kundu, M.	2	102
Majhi P.K.	2	103
Malik S.	2	104
Mallick B.C.	2	105
Mallick B.N.	2	106
Mallick C.	2	107
Mallick H.	2	108
Mallick S.N.	2	109
Mallick S.P.	2	110
Mallick S.R.	2	111
Munda R.N.	2	112
Naik A.K.	2	113
Naik M.K.	2	114
Naik P.P.	2	115
Naik S.S.	2	116
Naik, S.	2	117
Nath D.	2	118
Nath L.	2	119
Toppo S.	2	120
Tudu B.	2	121
Baskey P.K.	1	122
Besra B.	1	123
Bhakta N.	1	124
Bhoi A. K.	1	125
Bhoi B.K.	1	126
Bhoi J.	1	127
Bhoi K.K.	1	128
Bhoi K.S.	1	129
Bhoi N.	1	130
Bhoi P.	1	131
Bhoi Y.P.	1	132
Bhuayan R.K.	1	133
Bhunya P.	1	134
Bhuyan B.K.	1	135
Bhuyan C.	1	136
Bhuyan M.	1	137
Bhuyan G C.	1	138
Bhuyan, L.	1	139
Bhuyna G.C.	1	140
Dehuri, M.	1	141
Dehury B.N.	1	142
Dehury G.	1	143

Dehury J.	1	144
Dehury J.	1	145
Hansda D.N.	1	146
Hansda S.	1	147
Hansda U.	1	148
Hansda M.K.	1	149
Khamari B.	1	150
Kole A.K.	1	151
Kundu B.	1	152
Kundu C.	1	153
Kundu C.K.	1	154
Kundu K.	1	155
Kundu M.C	1	156
Kundu P.K.	1	157
Kundu T.K.	1	158
Kundu A.K.	1	159
Kundu D.K.	1	160
Kundu, C.N.	1	161
Majhi Binodini	1	162
Majhi B.K.	1	163
Majhi Babita	1	164
Majhi Binodini	1	165
Majhi C.	1	166
Majhi K.	1	167
Majhi M.	1	168
Majhi N.S.	1	169
Majhi R K	1	170
Majhi Rashmi	1	171
Majhi S.	1	172
Majhi S.C.	1	173
Majhi S.M.	1	174
Majhi P.R.	1	175
Majhi, M.	1	176
Majhi, R.	1	177
Majhi, S.M.	1	178
Majhi, T.	1	179
Malik H.	1	180
Malik P.K.	1	181
Malik R.K.	1	182
Malik S.K.	1	183
Malik V.	1	184
Mallick G.S.	1	185
Mallick K.	1	186
Mallick M.A.	1	187
Mallick M.R.	1	188
Mallick M.R.	1	189
Mallick S.B.	1	190
Mallik M.	1	191
Marandi B.	1	192
Marndi C.	1	193

Murmu K.C.	1	194
Murmu M.K.	1	195
Murmu S.K.	1	196
Naik C.	1	197
Naik D.	1	198
Naik D.K.	1	199
Naik E.S.	1	200
Naik G.B.	1	201
Naik K.	1	202
Naik M.A.	1	203
Naik M.S.	1	204
Naik P.S.	1	205
Naik S.N.	1	206
Naik S.P.	1	207
Naik T.	1	208
Naik Z.	1	209
Naik, B.	1	210
Naik, P.	1	211
Nath A.	1	212
Nath A.G.	1	213
Nath B.	1	214
Nath B.K.	1	215
Nath G.B.	1	216
Nath J.K.	1	217
Nath M.	1	218
Nath P.C.	1	219
Nath S.K.	1	220
Nath S.S.	1	221
Nath V.G.	1	222
Nath I.,	1	223
Nath, S.P.	1	224
Tadu D.	1	225
Tudu, B.K.	1	226
Tudu Barsha	1	227
Total	**960**	

Annexure – II

Institutions and its ranking based number of S&T articles published:

Institutions	No. of Article	Rank
NIT, Rourkela	125	1
OUAT, Bhubaneswar	69	2
CSIR-IMMT, Bhubaneswar	50	3
SOA University, Bhubaneswar	62	4
KIIT University, Bhubaneswar	45	5
NOU, Baripada	37	6
VSSUT, Burla	39	7
NISER, Bhubaneswar	25	8
Ravenshaw University, Cuttack	20	9
IIT, Bhubaneswar	17	10
ICAR-NRRI, Cuttack	18	11
Sambalpur University, Jyotivihar, Burla	20	12
SCB Medical College and Hospital, Cuttack	19	13
Tripura University, Tripura	14	14
VIMSAR, Burla	14	15
ICMR-RMRC, Bhubaneswar	9	16
AIIMS, Bhubaneswar	13	17
Dibrugarh University, Dibrugarh	9	18
SOA, IMS & SUM Hospital, Bhubaneswar	8	19
Utkal University, Bhubaneswar	12	20
ICAR-CIFA, Bhubaneswar	10	21
IGIT, Sarang	6	22
ILS, Bhubaneswar	7	23

ICAR-NDRI, Karnal	6	24
ICAR-Central Tuber Crops Res. Inst., Thiruvananthapuram	6	25
ICAR-Directorate of Water Management, Bhubaneswar	7	26
IIIT, Bhubaneswar	4	27
Jaypee University of Information Technology, HP	4	28
LV Prasad Eye Inst., Bhubaneswar	4	29
Berhampur University, Berhampur	5	30
Bidhan Chandra Krishi Viswavidyalaya, WB	6	31
CET, Bhubaneswar	5	32
Dr. Abhin Chandra Homeo. Med. College and Hos., Bhubaneswar	3	33
DRIEMS, Tangi	3	34
IIT, Kharagpur	3	35
KIIT, KIMS, Bhubaneswar	3	36
Ajou University, South Korea	5	37
Allahabad Agriculture Inst., Prayagraj	2	38
Center for Medical Science, Albany	2	39
Central Ayur. Res. Inst. for Hepatobiliary Disorders, Bhubaneswar	2	40
Central Horticultural Experiment Station, Bhubaneswar	4	41
Department of Forest and Environment, Odisha	3	42
G. G. Vishwavidyalaya(Central University), Bilaspur	2	43
GIET, Gunupur	3	44
ICAR-Indian Inst. of Soil and Water Conservation, Koraput	2	45
IGH, Rourkela	2	46
IIT, Delhi	2	47
IOP, Bhubaneswar	2	48

Kanak Manjari Inst. of Pharmaceutical Sciences, Rourkela	3	49
National Res. Inst. of Ayurvedic, Bhubaneswar	2	50
NTPC, Angul	2	51
Vignana Bharathi Inst. of Technology, Hyderabad	2	52
Vikash Degree College, Bargarh	2	53
Assam Agricultural University, Silchar	1	54
Bhadrak Inst. of Engg. and Tech., Odisha	1	55
BIT, Pilani	1	56
Burdwan Raj College, Burdwan	1	57
Central Council for Res. in Ayurvedic Sci., New Delhi	1	58
Central Ground Water Board, SER, Bhubaneswar	1	59
Central Poultry Development Organisation, Bhubaneswar	1	60
Central Soil & Water Conserv. Res. and Training Inst., Sunabeda	1	61
Centre for Development Studies (CDS), Trivandrum	1	62
Centre for Environmental Risk Assessment and Remediation, AU	1	63
CSIR-CGCRI, Kolkata	1	64
CSIR-IICB, Kolkata	1	65
Dantiwada Agricultural University, Gujarat	1	66
EAST, Phulnakhara, Bhubaneshwar	1	67
F M University, Balasore	10	68
G.M. Autonomous College, Sambalpur	2	69
GITA, Bhubaneswar	1	70
Goa Inst. of Management, Panaji	2	71
Government College of Engineering, Kalahandi	1	72
GSI, Bhubaneswar	1	73

Guru GhasidasVishwavidyalaya, Bilaspur	3	74
ICAR-Central Coastal Agricultural Res. Inst., Goa	1	75
ICAR-Central Res. Inst. for Jute and Allied Fibres, WB	3	76
ICAR-Res. Complex for Eastern Region, Ranchi	1	77
ICMR-National Inst. of Malaria Res., Delhi	1	78
IISER, Bhopal	1	79
IIT, Kanpur	1	80
Inst. of Agriculture, Visva Bharati, Sriniketan	1	81
Inst. of Nutraceutical Res., Clemson University	2	82
Intermediate Science College, Balisankara, Sundergarh	1	83
ISI, Kolkata	1	84
Jadavpur University, Kolkata	1	85
JHPIEGO, Bhubaneswar	1	86
Kashipur Michael Madhusudan Mahavidyalaya, Purulia	1	87
KIITS, KIDS, Bhubaneswar	8	88
Krupajala Engineering College, Bhubaneswar	1	89
M.K. Das Group of Instrument Res., Sambalpur	1	90
Mahavir Inst. of Engg. and Technology, Bhubaneswar	2	91
Meghna Inst. of Dental Sciences, Nizamabad	1	92
National Bureau of Plant Genetic Resources, New Delh	1	93
National Res. Centre on Plant Biotechnology, New Delhi	1	94
Nayagarh Autonomous College, Nayagarh	1	95
NIPER, Mohali	1	96
NIT, Durgapur	1	97
NIT, Warangal	2	98

NRC on Litchi, Muzaffarpur	1	99
Pharmaceutical college Barpali, Bargarh	1	100
Regional Centre of Central Tuber Crops Res. Inst., Bhubaneswar	2	101
RG Kar Medical College, Kolkata	1	102
Roland Inst. of Pharmaceutical Sciences, Berhampur	2	103
Space Applications Centre (ISRO), Ahmedabad	1	104
Tata Steel Ltd., Joda	1	105
UGC-DAE CSR, Kolkata	1	106
University of Calcutta, Kolkata	1	107
University of California, Berkeley	1	108
University of Illinois, College of Medicine, Chicago	1	109
University of Kolkata, Kolkata	1	110
University of Waterloo, Waterloo	1	111
Vinoba Bhava University, Hazaribagh	1	112
Weizmann Inst. of Science, Rehovot	1	113
WIPRO Technologies, Hyderabad	1	114
AHRCC, Cuttack	1	115
AIIMS, New Delhi	2	116
BIDS, Bangalore	1	117
CARE Hospital, Bhubaneswar	1	118
Centurion University of Technology and Management, Odisha	1	119
CIPET, Bhubaneswar	2	120
College of Pharmaceutical Science, Berhampur	1	121
GanatantrikAdhikar Suraksha Sangathan, Odisha	1	122
Gayatri College of Pharmacy, Sambalpur	1	123

Government Dental College and Hospital, Mumbai	1	124
Govt. Junior College, Bhawanipatna	2	125
ICAR-IIVR, Varanasi	1	126
ICAR-RCER, Patna	1	127
IISc, Bangalore	2	128
Interscience Inst. of Management and Technology, Kantabada	1	129
Jagannath Inst. for Tech. and Management, Paralakhemundi	1	130
JIS College of Engineering, Kalyani	2	131
Kalinga Hospital, Bhubaneswar	1	132
King Khalid University, Saudi Arabia	3	133
KMC, Manipal	1	134
KPC Medical College, Kolkata	1	135
MKCG, Berhampur	2	136
MPS Farm, Jhargram	1	137
NIT, Himachal Pradesh	2	138
NMIET, Bhubaneswar	1	139
Pt. JLN Medical College, Raipur	3	140
Pulp and Paper Res. Inst., Jaykaypur	1	141
RCM, Bhubaneswar	2	142
S.E.C., Sundargarh	1	143
SCB Dental College, Cuttack	1	144
SOA, IDS, Bhubaneswar	4	145
St. Peter's University, Chennai	1	146
Sudargarh Engineering College, Sundargarh	2	147
Total	**886**	

Annexure – III

Institutions and its number of S&T articles, SCI, Non-SCI and Total IF values:

Institutions	No. of Article	SCI	NSCI	Total SCI
NIT, Rourkela	125	68	57	143.284
OUAT, Bhubaneswar	69	48	21	29.009
CSIR-IMMT, Bhubaneswar	50	46	4	145.98
SOA University, Bhubaneswar	62	38	24	60.732
KIIT University, Bhubaneswar	45	32	13	107.679
NOU, Baripada	37	30	7	48.35
VSSUT, Burla	39	23	16	22.523
NISER, Bhubaneswar	25	21	4	73.465
Ravenshaw University, Cuttack	20	17	3	58.402
IIT, Bhubaneswar	17	15	2	52.613
ICAR-NRRI, Cuttack	18	14	4	21.802
Sambalpur University, Jyotivihar, Burla	20	14	6	23.194
SCB Medical College and Hospital, Cuttack	19	14	5	32.278

Tripura University, Tripura	14	12	2	14.151
VIMSAR, Burla	14	10	4	24.529
ICMR-RMRC, Bhubaneswar	9	9		19.964
AIIMS, Bhubaneswar	13	7	6	9.423
Dibrugarh University, Dibrugarh	9	7	2	10.379
SOA, IMS & SUM Hospital, Bhubaneswar	8	7	1	2.262
Utkal University, Bhubaneswar	12	7	5	11.094
ICAR-CIFA, Bhubaneswar	10	6	4	2.287
IGIT, Sarang	6	6		1.575
ILS, Bhubaneswar	7	6	1	23.45
ICAR-NDRI, Karnal	6	5	1	1.412
ICAR-Central Tuber Crops Res. Inst., Thiruvananthapuram	6	4	2	6.38
ICAR-Directorate of Water Management, Bhubaneswar	7	4	3	9.935
IIIT, Bhubaneswar	4	4		6.398
Jaypee University of Information Technology, HP	4	4		8.634

LV Prasad Eye Inst., Bhubaneswar	4	4		6.463
Berhampur University, Berhampur	5	3	2	1.278
Bidhan Chandra Krishi Viswavidyalaya, WB	6	3	3	7.97
CET, Bhubaneswar	5	3	2	4.147
Dr. Abhin Chandra Homeo. Med. College and Hos., Bhubaneswar	3	3		12.286
DRIEMS, Tangi	3	3		2.901
IIT, Kharagpur	3	3		4.087
KIIT, KIMS, Bhubaneswar	3	3		3.278
Ajou University, South Korea	5	2	3	2.517
Allahabad Agriculture Inst., Prayagraj	2	2		2.306
Center for Medical Science, Albany	2	2		10.432
Central Ayur. Res. Inst. for Hepatobiliary Disorders, Bhubaneswar	2	2		4.878
Central Horticultural Experiment Station, Bhubaneswar	4	2	2	1.427
Department of Forest and Environment, Odisha	3	2	1	0.535
G. G. Vishwavidyalaya(Central University), Bilaspur	2	2		1.461

GIET, Gunupur	3	2	1	13.72
ICAR-Indian Inst. of Soil and Water Conservation, Koraput	2	2		1.928
IGH, Rourkela	2	2		6.42
IIT, Delhi	2	2		6.376
IOP, Bhubaneswar	2	2		4.842
Kanak Manjari Inst. of Pharmaceutical Sciences, Rourkela	3	2	1	1.548
National Res. Inst. of Ayurvedic, Bhubaneswar	2	2		4.878
NTPC, Angul	2	2		8.078
Vignana Bharathi Inst. of Technology, Hyderabad	2	2		0.344
Vikash Degree College, Bargarh	2	2		9.784
Assam Agricultural University, Silchar	1	1		1.885
Bhadrak Inst. of Engg. and Tech., Odisha	1	1		0.177
BIT, Pilani	1	1		1.715
Burdwan Raj College, Burdwan	1	1		2.687
Central Council for Res. in Ayurvedic Sci., New Delhi	1	1		2.439

Central Ground Water Board, SER, Bhubaneswar	1	1		1.804
Central Poultry Development Organisation, Bhubaneswar	1	1		0.313
Central Soil & Water Conserv. Res. and Training Inst., Sunabeda	1	1		0.707
Centre for Development Studies (CDS), Trivandrum	1	1		3.983
Centre for Environmental Risk Assessment and Remediation, AU	1	1		4.926
CSIR-CGCRI, Kolkata	1	1		0.728
CSIR-IICB, Kolkata	1	1		3.201
Dantiwada Agricultural University, Gujarat	1	1		0.135
EAST, Phulnakhara, Bhubaneshwar	1	1		0.56
F M University, Balasore	10	1	9	4.305
G.M. Autonomous College, Sambalpur	2	1	1	0.242
GITA, Bhubaneswar	1	1		0.365
Goa Inst. of Management, Panaji	2	1	1	0.56
Government College of Engineering, Kalahandi	1	1		0.175
GSI, Bhubaneswar	1	1		1.435

Guru Ghasidas Vishwavidyalaya, Bilaspur	3	1	2	3.849
ICAR-Central Coastal Agricultural Res. Inst., Goa	1	1		0.279
ICAR-Central Res. Inst. for Jute and Allied Fibres, WB	3	1	2	0.489
ICAR-Res. Complex for Eastern Region, Ranchi	1	1		0.565
ICMR-National Inst. of Malaria Res., Delhi	1	1		2.509
IISER, Bhopal	1	1		2.21
IIT, Kanpur	1	1		4.051
Inst. of Agriculture, Visva Bharati, Sriniketan	1	1		0.823
Inst. of Nutraceutical Res., Clemson University	2	1	1	4.106
Intermediate Science College, Balisankara, Sundergarh	1	1		0.59
ISI, Kolkata	1	1		2.936
Jadavpur University, Kolkata	1	1		0.987
JHPIEGO, Bhubaneswar	1	1		2.888
Kashipur Michael Madhusudan Mahavidyalaya, Purulia	1	1		3.864
KIITS, KIDS, Bhubaneswar	8	1	7	0.46

Krupajala Engineering College, Bhubaneswar	1	1		0.56
M.K. Das Group of Instrument Res., Sambalpur	1	1		5.76
Mahavir Inst. of Engg. and Technology, Bhubaneswar	2	1	1	1.601
Meghna Inst. of Dental Sciences, Nizamabad	1	1		1.085
National Bureau of Plant Genetic Resources, New Delh	1	1		1.782
National Res. Centre on Plant Biotechnology, New Delhi	1	1		2.821
Nayagarh Autonomous College, Nayagarh	1	1		0.104
NIPER, Mohali	1	1		6.253
NIT, Durgapur	1	1		1.322
NIT, Warangal	2	1	1	3.768
NRC on Litchi, Muzaffarpur	1	1		0.096
Pharmaceutical college Barpali, Bargarh	1	1		0.66
Regional Centre of Central Tuber Crops Res. Inst., Bhubaneswar	2	1	1	0.823
RG Kar Medical College	1	1		0.71
Roland Inst. of Pharmaceutical Sciences, Berhampur	2	1	1	2.442

Space Applications Centre (ISRO), Ahmedabad	1	1		4.039
Tata Steel Ltd., Joda	1	1		1.205
UGC-DAE CSR, Kolkata	1	1		1.453
University of Calcutta, Kolkata	1	1		1.236
University of California, Berkeley	1	1		1.1
University of Illinois, College of Midicine, Chicago	1	1		0.204
University of Kolkata, Kolkata	1	1		2.28
University of Waterloo, Waterloo	1	1		3.991
Vinoba Bhave University, Hazaribagh	1	1		4.122
Weizmann Inst. of Science, Rehovot	1	1		3.789
WIPRO Technologies, Hyderabad	1	1		0.79
AHRCC, Cuttack	1		1	
AIIMS, New Delhi	2		2	
BIDS, Bangalore	1		1	
CARE Hospital, Bhubaneswar	1		1	

Centurion University of Technology and Management, Odisha	1		1	
CIPET, Bhubaneswar	2		2	
College of Pharmaceutical Science, Berhampur	1		1	
GanatantrikAdhikar Suraksha Sangathan, Odisha	1		1	
Gayatri College of Pharmacy, Sambalpur	1		1	
Government Dental College and Hospital, Mumbai	1		1	
Govt. Junior College, Bhawanipatna	2		2	
ICAR-IIVR, Varanasi	1		1	
ICAR-RCER, Patna	1		1	
IISc, Bangalore	2		2	
Interscience Inst. of Management and Technology, Kantabada	1		1	
Jagannath Inst. for Tech. and Management, Paralakhemundi	1		1	
JIS College of Engineering, Kalyani	2		2	
Kalinga Hospital, Bhubaneswar	1		1	
King Khalid University, Saudi Arabia	3		3	

KMC, Manipal	1		1	
KPC Medical College, Kolkata	1		1	
MKCG, Berhampur	2		2	
MPS Farm, Jhargram	1		1	
NIT, Himachal Pradesh	2		2	
NMIET, Bhubaneswar	1		1	
Pt. JLN Medical College, Raipur	3		3	
Pulp and Paper Res. Inst., Jaykaypu	1		1	
RCM, Bhubaneswar	2		2	
S.E.C., Sundargarh	1		1	
SCB Dental College, Cuttack	1		1	
SOA, IDS, Bhubaneswar	4		4	
St. Peter's University, Chennai	1		1	
Sudargarh Engineering College, Sundargarh	2		2	
Total	**886**	**598**	**288**	**1068.728**

Annexure – IV

Tribal preferred subject, number of articles, SCI and Non-SCI:

Subjects	Total Articles	SCI	NSCI	Total IF
Computer Science	123	55	68	66.501
Agriculture Science	78	52	26	64.834
Medical Science	80	50	30	89.942
Physics	63	45	18	69.635
Chemistry	50	44	6	110.559
Minerals and Materials	49	44	5	129.79
Pharmaceutical Science	44	37	7	63.125
Biotechnology	35	33	2	100.07
Veterinary Science	33	28	5	6.571
Biological Science	19	15	4	44.141
Chemical Science	19	15	4	50.83
Metallurgy	15	14	1	14.808
Basic Science	14	13	1	44.988
Life Science	14	13	1	57.843
Bioinformatics	16	12	4	29.488
Mechanical Engineering	19	10	9	11.796
Cancer	9	8	1	32.69
Electrical Engineering	18	7	11	21.518
Electronics	30	7	23	7.539
Environment	7	7		21.976
Aquaculture	10	6	4	2.287
Chemical Engineering	9	6	3	12.218

Civil Engineering	8	6	2	6.17
Ayurveda	5	5		12.195
Dairy Science	6	5	1	1.412
Geology	8	5	3	11.317
Water Management	8	5	3	10.248
Botany	7	4	3	7.248
Information Technology	6	4	2	7.231
Management	9	4	5	15.171
Physical Science	5	4	1	10.321
Dental Science	14	3	11	3.165
Energy	5	3	2	8.208
Homeopathy	3	3		12.286
Horticulture	5	3	2	2.25
Biomedical	2	2		6.021
Instrumentation	2	2		5.864
Marine Science	4	2	2	1.15
Nano-technology	4	2	2	7.42
Polymer	3	2	1	2.717
Social Science	2	2		6.748
System Engineering	5	2	3	2.517
Chemical Biology	1	1		3.201
Communication Science	7	1	6	4.305
Geography	2	1	1	7.077
Material Science	1	1		1.1
Mathematics	1	1		0.128

Pharmacology	1	1		0.701
Poultry	1	1		0.313
Rural Technology	1	1		2.379
Jute	1		1	
Microbiology	2		2	
Neural Networks	2		2	
Paper technology	1		1	
	886	**598**	**288**	**1068.728**

Annexure – V

Publication Sources, Number of articles in SCI, Number of Non-SCI and Total IF values:

Source	SCI	NSCI	IF Value
Advanced Energy Materials	1		21.875
Surgical Neurology Intl.	1		11.91
ACS Catalysis	1		11.384
J. of Materials Chemistry A	1		9.931
ACS Applied Materials and Interfaces	2		8.097
Molecular Cancer	1		7.776
Intl. J. of Cancer	1		7.36
Carbon	1		7.082
Intl. J. of Research in Economics and Social Sciences	1		7.077
J. of Physics: Conf. Series	1		6.937
Intl. J. of Mechanical Engineering and Technology	3		6.86
Intl. J. of Pharmaceutical Sciences Review and Research	1		6.857
Cochrane Database of Systematic Reviews	1		6.754

Chemical Engineering J.	2		6.735
Intl. J. of Physical and Social Sciences	1		6.644
Genomics, Proteomics and Bioinformatics	1		6.615
Acta Biomaterialia	2		6.383
J. of Medicinal Chemistry	1		6.253
Intl. J. of Medical Pediatrics and Oncology	2		6.2
Seminars in Cell and Developmental Biology	1		6.138
Free Radical Biology and Medicine	2		6.02
Intl. J. of Engineering and Management Research	1		5.76
Frontiers in Immunology	1		5.511
J. of Urology	2		5.381
J. of Nanobiotechnology	1		5.294
RNA Biology	2		5.216
Oncotarget	1		5.168
Carbohydrate Polymers	1		5.158

Electrochimica Acta	1		5.116
J. of Colloid and Interface Science	2		5.091
Carcinogenesis	1		5.072
Nanomedicine	1		5.005
Soil Biology and Biochemistry	1		4.926
European J. of Medicinal Chemistry	1		4.816
J. of Materials Chemistry B	1		4.776
Oncogenesis	1		4.722
Inorganic Chemistry	2		4.7
ChemCatChem	2		4.674
Catalysis Today	2		4.667
Future Generation Computer Systems	1		4.639
Science of the Total Environment	1		4.61
Molecular Cancer Research	1		4.597
J. of Physical Chemistry C	3		4.484

DNA Repair	1		4.461
Applied Surface Science	3		4.439
J. of Molecular Catalysis A: Chemical	1		4.397
Intl. J. of Nanomedicine	1		4.37
J. of King Saud University - Computer and Information Sciences	1		4.305
Intl. J. of Hydrogen Energy	3		4.229
Scientific Reports	6		4.122
Principles and Practices of Plant Genomics	1		4.106
Dalton Transactions	3		4.099
Organometallics	1		4.051
Agricultural and Forest Meteorology	1		4.039
Energy Policy	2		4.039
Colloids and Surfaces B: Biointerfaces	3		3.997
J. of Network and Computer Applications	1		3.991
Ecological Indicators	1		3.983

Intl. J. of Biological Macromolecules	2		3.909
Phys. Chem. Chem. Phys.	1		3.906
Physical Chemistry Chemical Physics	2		3.906
Intl. J. of Heat and Mass Transfer	1		3.891
Analyst	1		3.864
Intl. J. of Pharmaceutics	1		3.862
Industrial Crops and Products	1		3.849
Swarm and Evolutionary Computation (Elsevier)	1		3.818
ACS Medicinal Chemistry Letters	1		3.794
J. of the European Ceramic Society	1		3.794
Langmuir	1		3.789
Expert Systems with Applications	3		3.768
Physica Status Solidi (B) Basic Research	1		3.721
Plant Science	1		3.712
Frontiers in Plant Science	1		3.678

Neuroradiology J.	1		3.653
Microporous and Mesoporous Materials	1		3.649
Toxicology and Applied Pharmacology	2		3.616
mSphere	1		3.575
Applied Physics Letters	2		3.495
Catalysis Communications	1		3.463
J. of Physics G: Nuclear and Particle Physics	1		3.456
J. of Drug Targeting	1		3.408
British J. of Ophthalmology	1		3.384
Experimental Cell Research	1		3.309
World J. of Gastroenterology	1		3.3
Chemico-Biological Interactions	2		3.296
BMC Cancer	1		3.288
Infection and Immunity	1		3.256
Neurocomputing	2		3.241

New J. of Chemistry	3		3.201
European J. of Agronomy	1		3.192
ChemNanoMat	1		3.173
J. of Physical Chemistry B	2		3.146
Phys. Chem. B	1		3.146
Oncology Research	3		3.143
Industrial and Engineering Chemistry Research	4		3.141
Intl. J. of Research in IT and Management	1		3.14
J. of Bimolecular Structure & Dynamics	1		3.107
Energy and Fuels	1		3.024
ChemMedChem	1		3.009
Intl. J. of Surgery Case Reports	1		2.996
Plant Cell Reports	1		2.989
RSC Advances	8		2.936
Microbes and Infection	1		2.924

Nanoscience and Nanotechnology Letters	2		2.917
Amino Acids	1		2.906
Surface and Coatings Technology	4		2.906
J. of Photochemistry and Photobiology A: Chemistry	1		2.891
Cancer Epidemiology	1		2.888
Regional Environmental Change	1		2.872
J. of Asian Earth Sciences	1		2.866
Malaria J.	1		2.845
AoB PLANTS	1		2.821
Cancer Chemotherapy and Pharmacology	1		2.808
IEEE Transactions on Knowledge and Data Engineering	1		2.775
PLoS ONE	3		2.766
Molecular BioSystems	6		2.759
Andrology	2		2.734
Materials Letters	2		2.687

Plasma Chemistry and Plasma Processing	1		2.658
Pediatric Blood and Cancer	1		2.646
Mechanics of Advanced Materials and Structures	1		2.645
J. of Physics Condensed Matter	1		2.617
BioMed Research Intl.	1		2.583
General and Comparative Endocrinology	1		2.564
Biochemical and Biophysical Research Communications	1		2.559
Channels	2		2.538
Acta Tropica	2		2.509
Advanced Catalytic Materials	1		2.509
Optics and Laser Technology	1		2.503
BMC Genetics	1		2.469
Bioorganic and Medicinal Chemistry Letters	3		2.442
Research J. of Pharmacology and Pharmacodynamics	5		2.439
Numerical Heat Transfer, Part B: Fundamentals	1		2.409

J. of Orthopaedic Trauma	1		2.381
Intl. J. of Computational Science and Engineering	1		2.38
J. of the Science of Food and Agriculture	1		2.379
J. of Physics D: Applied Physics	2		2.373
Intl. J. of Concrete Structures and Materials	1		2.36
Polymer Intl.	1		2.352
MedChemComm	1		2.342
Entropy	1		2.305
Semiconductor Science and Technology	1		2.28
Intl. J. of Earth Sciences and Engineering	1		2.276
Archives of Gynecology and Obstetrics	1		2.236
Materials Chemistry and Physics	1		2.21
J. of Thermal Analysis and Calorimetry	1		2.209
J. of Chemical and Engineering Data	5		2.196
J. of Applied Physics	1		2.176

Neurology India	2		2.166
Mathematical and Computer Modelling	2		2.15
Physica A: Statistical Mechanics and its Applications	3		2.132
PeerJ	1		2.118
Mineral Processing and Extractive Metallurgy Review	1		2.117
AEU - Intl. J. of Electronics and Communications	2		2.115
Biological Control	1		2.112
BMC Complementary and Alternative Medicine	1		2.109
Simulation Modelling Practice and Theory	1		2.092
J. of Hydraulic Engineering	1		2.08
Signal Processing: Image Communication	1		2.073
Polyhedron	1		2.067
J. of Molecular Structure	1		2.011
Materials Research Society Symposium Proceedings	1		2
J. of Medicinal Food	1		1.954

Pattern Recognition Letters	1		1.952
Intl. J. of Drug Development and Research	1		1.95
J. of Organometallic Chemistry	1		1.946
Pharmaceutical Development and Technology	1		1.945
Thin Solid Films	1		1.939
Cell Biology Intl.	1		1.936
Intl. J. of Laboratory Hematology	2		1.919
Agronomy J.	1		1.897
J. of Molecular Graphics and Modelling	3		1.885
Drug Development and Industrial Pharmacy	1		1.883
J. of Porous Materials	1		1.858
Physical Review C - Nuclear Physics	1		1.85
J. of Food Science and Technology	1		1.849
Metallurgical and Materials Transactions B: Process Metallurgy and Materials Processing Science	1		1.834
Environmental Monitoring and Assessment	1		1.804

Applied Biochemistry and Biotechnology	1		1.797
FEBS Open Bio	1		1.782
Trees - Structure and Function	1		1.782
J. of Cluster Science	1		1.715
Experimental Agriculture	1		1.68
Research on Chemical Intermediates	2		1.674
Pharmacognosy Reviews	1		1.67
Polymer - Plastics Technology and Engineering	1		1.655
Australian J. of Crop Science	4		1.635
Otorhinolaryngology Clinics	1		1.62
Cluster Computing	1		1.601
J. of Stroke and Cerebrovascular Diseases	1		1.598
J. of Electronic Materials	1		1.566
Intl. J. of Chemical Sciences	3		1.554
Solid State Communications	1		1.549

J. of Green Engineering	1		1.541
Multimedia Tools and Applications	1		1.541
Homeopathy	1		1.524
Farmacia	1		1.507
European J. of Plant Pathology	1		1.466
J. of Dispersion Science and Technology	2		1.454
Physica B: Condensed Matter	3		1.453
Acta Physiologiae Plantarum	1		1.438
Environmental Earth Sciences	1		1.435
Radiation Physics and Chemistry	1		1.435
Medicina (Lithuania)	1		1.429
Biologia Plantarum	2		1.424
Annals of Microbiology	1		1.407
J. of Environmental Engineering (United States)	1		1.396
Physiological and Molecular Plant Pathology	1		1.395

Intl. J. of Modern Physics E	1		1.386
Biocybernetics and Biomedical Engineering	1		1.374
Iranian J. of Pharmaceutical Research	1		1.372
Intl. J. of Electrochemical Science	1		1.369
European J. of Drug Metabolism and Pharmacokinetics	1		1.362
Microelectronics J.	1		1.322
Surface and Interface Analysis	1		1.263
J. of Natural Science, Biology and Medicine	1		1.25
Annals of Biology	2		1.24
Asia-Pacific J. of Chemical Engineering	1		1.238
Microelectronics Reliability	1		1.236
Electronics Letters	1		1.232
Korean J. of Parasitology	1		1.207
Ironmaking and Steelmaking	3		1.205
Agroforestry Systems	1		1.201

Research on Crops	1		1.2
Pramana - J. of Physics	2		1.185
Mediterranean J. of Hematology and Infectious Diseases	1		1.183
ZAAC - J. of Inorganic and General Chemistry	1		1.179
Intl. J. of Green Energy	1		1.171
Wilderness and Environmental Medicine	1		1.161
Laser Physics	1		1.158
Indian J. of Medical Microbiology	2		1.157
Materials Research Express	2		1.151
Physiology and Molecular Biology of Plants	1		1.151
Indian Pediatrics	1		1.145
Nuclear Instruments and Methods in Phy.s Res., Section B: Beam Interactions with Materials and Atoms	2		1.142
Soft Materials	1		1.132
Advances in Civil Engineering Materials	1		1.104
Nano	1		1.1

Advances in Applied Ceramics	1		1.092
Arabian J. for Science and Engineering	2		1.092
J. of Obstetrics and Gynaecology Research	2		1.091
J. of Applied Fluid Mechanics	1		1.09
J. of Dental Education	1		1.085
J. of Natural Fibers	1		1.076
Acta Pharmaceutica	1		1.071
Advances in Cement Research	1		1.063
J. of Macromolecular Science, Part A: Pure and Applied Chemistry	4		1.057
Composite Interfaces	1		1.048
Diagnostic Cytopathology	1		1.014
Marine Biodiversity Records	1		0.99
Sensors and Transducers	1		0.987
Indian J. of Orthopaedics	1		0.98
Intl. Braz J Urol	1		0.976

Indian J. of Physics	11		0.967
Indian J. of Ophthalmology	3		0.961
Kinetics and Catalysis	1		0.926
Bulletin of Materials Science	2		0.925
Materials Science- Poland	2		0.916
Intl. J. of Pharma and Bio Sciences	2		0.888
Current Science	2		0.883
Zeitschrift fur Naturforschung - Section C J. of Biosciences	1		0.882
J. of Equine Veterinary Science	1		0.88
Light Metals	2		0.84
IETE J. of Research	1		0.829
Intl. J. of Thermophysics	1		0.829
J. of Phytopathology	2		0.823
Procedia Computer Science	7		0.79
Intl. J. of Modern Physics B	2		0.769

Open Physics	1		0.755
J. of Information Processing Systems	4		0.75
Surface Review and Letters	1		0.734
Ferroelectrics	1		0.728
J. of Environmental Biology	1		0.727
J. of Horticultural Science and Biotechnology	1		0.715
Plant Genetic Resources: Characterisation and Utilisation	1		0.712
Lung India	1		0.71
Irrigation and Drainage	1		0.707
Research J. of Pharmaceutical, Biological and Chemical Sciences	3		0.701
J. of Chemical Crystallography	1		0.699
J. of Cytology	1		0.68
Digest J. of Nanomaterials and Biostructures	3		0.673
Intl. J. of Pharmacy and Pharmaceutical Sciences	4		0.66
Intl. J. of PharmTech Research	2		0.66

Quimica Nova	1		0.646
Molecular Crystals and Liquid Crystals	2		0.633
Smart Innovation, Systems and Technologies	9		0.59
Indian J. of Pure and Applied Physics	1		0.582
Mitochondrial DNA Part A: DNA Mapping, Sequencing, and Analysis	1		0.575
Metallurgical Research and Technology	1		0.574
Intl. J. on Artificial Intelligence Tools	1		0.565
J. of Plant Nutrition	2		0.565
J. of Agrometeorology	1		0.563
Intl. J. of Signal and Imaging Systems Engineering	4		0.56
Pharmacognosy J.	1		0.56
Int. J. Fish. Aquat. Stud.	1		0.549
Letters in Organic Chemistry	1		0.539
Intl. J. of Industrial Engineering Computations	1		0.537
J. of Scientific and Industrial Research	1		0.534

Acta PoloniaePharmaceutica - Drug Research	1		0.531
Indian J. of Pathology and Microbiology	2		0.529
Plant OMICS	1		0.51
Procedia Engineering	1		0.49
Cereal Research Communications	2		0.489
Turkish J. of Veterinary and Animal Sciences	1		0.489
Mitochondrial DNA Part B Resources	1		0.486
Indian J. of Hematology and Blood Transfusion	2		0.474
Hemoglobin	2		0.462
Key Engineering Materials	2		0.45
Tropical J. of Pharmaceutical Research	1		0.444
Indian J. of Medical and Paediatric Oncology	1		0.425
Indian J. of Genetic and Plant Breeding	1		0.409
Indian J. of Genetics and Plant Breeding	1		0.409
Russian J. of Herpetology	1		0.407

Latin American J. of Pharmacy	3		0.401
Intl. J. of Civil Engineering	1		0.379
Lecture Notes in Computer Science	5		0.369
Lecture Notes in Engineering and Computer Science	1		0.369
Frontiers of Optoelectronics	1		0.365
Advanced Materials Letters	1		0.357
J.Pl.Dis. Sci.	1		0.34
Veterinary World	16		0.313
Water and Energy Intl.	1		0.313
J. of Neurosciences in Rural Practice	2		0.31
Animal Nutrition and Feed Technology	1		0.295
J. of Planar Chromatography - Modern TLC	1		0.291
J. of Indian Academy of Forensic Medicine	5		0.28
Indian J. of Animal Sciences	8		0.279
Indian J. of Fisheries	2		0.275

KovoveMaterialy	1		0.273
Bulgarian Chemical Communications	1		0.242
Legume Research	1		0.232
Indian J. of Agricultural Sciences	2		0.231
Intl. J. of Emerging Electric Power Systems	2		0.22
Physics Procedia	4		0.219
J. of the Indian Chemical Society	5		0.204
Indian J. Anim. Res.	1		0.201
Indian J. of Anim. Res.	1		0.201
IOP Conf. Series: Materials Science and Engineering	15		0.197
Intl. J. of Communication Networks and Distributed Systems	1		0.177
Turkish J. of Physics	1		0.175
Intl. J. of Engineering and Technology	3		0.172
Polymers from Renewable Resources	1		0.17
Advances in life Science	1		0.168

Indian J. of Science and Technology	2		0.16
Pakistan J. of Biological Sciences	1		0.16
Intl. Agricultural Engineering J.	1		0.135
Intl. J. of Power and Energy Conversion	2		0.13
Indian J. of Environmental Protection	3		0.128
Intl. J. of Reasoning-based Intelligent Systems	1		0.126
TMS Annual Meeting	2		0.123
Intl. J. of Control Theory and Applications	2		0.104
Rupkatha J. on Interdisciplinary Studies in Humanities	1		0.104
J. of Pure and Applied Microbiology	1		0.1
Indian J. of Horticulture	1		0.096
Pharmacologyonline	1		0.09
Indian Veterinary J.	14		0.044
MEDICO-LEGAL UPDATE	1		0.02
ACS Omega		1	

Acta Horticulturae		1	
Advanced Materials Research		2	
Advances in Applied Research		1	
Advances in Intelligent Systems and Computing		3	
African J. of Agricultural Research		1	
African Review of Physics		1	
Agriculture Engineering Today		2	
Air, Soil and Water Research		1	
Annals of Cardiac Anaesthesia		2	
Applied Biological Research		1	
Applied Soft Computing J.		1	
Archives of Phytopathology and Plant Protection		2	
Asian J. of Chemistry		1	
Asian J. of Pharmaceutical and Clinical Research		1	
Asian Pacific J. of Tropical Biomedicine		2	

BMJ Case Reports		5	
Ceramics and Composites Processing Methods		1	
Channels (Austin).		1	
Chem. Asian J.		1	
Chemistry		1	
Communications in Computer and Information Science		5	
Compute 2011 - 4th Annual ACM Bangalore Conf.		1	
Conference Proceedings - India Intl. Conf. on Power Electronics, IICPE		1	
Contemporary Clinical Dentistry		2	
CrystEngComm.		1	
CuihuaXuebao/Chinese J. of Catalysis		1	
Current Trends in Biotechnology and Pharmacy		2	
Drug discoveries & therapeutics		1	
Ecology, Environment and Conservation		2	
Economic and Political Weekly		1	

Egyptian Informatics J.		1	
Electronic J. of Geotechnical Engineering		3	
Environment and Ecology		1	
Exploratory Animal and Medical Research		2	
FAO Report		2	
Global Trends in Intelligent Computing Research and Development		1	
Handbook of Neurotoxicity		1	
Handbook of Research on Computational Intelligence Applications in Bioinformatics		1	
Handbook of Research on Information Security in Biomedical Signal Processing		1	
IET Networks		1	
Indian J. of Agronomy		2	
Indian J. of Anaesthesia		1	
Indian J. of Forensic and Community Medicine		1	
Indian J. of Forensic Medicine and Pathology		1	
Indian J. of Mednodent and Allied Sciences		1	

Indian J. of Orthopedics Surgery		3	
Indian J. of Plant Genetic Resources		2	
Indian J. of Plant Physiology		2	
Indian J. of Practical Pediatrics		1	
Indian J. of Psychological Medicine		1	
Indian J. of Rheumatology		1	
Indian J. of Soil Conservation		2	
Indian J. of Urology		2	
Indian J. of Veterinary Medicine		1	
Indian J. of Veterinary Sciences and Biochemistry		1	
Indian J. of Weed Science		1	
Informatica (Slovenia)		2	
Int. J. Agricult. Biol. Engineer		1	
Int. J. Scientific Res. & Engineering Studies		1	
INTAS Polivet		1	

Intl. J. of Advancements in Computing Technology		1	
Intl. J. of Applied Chemistry		1	
Intl. J. of Biometrics		1	
Intl. J. of Computational Vision and Robotics		3	
Intl. J. of Fruit Science		1	
Intl. J. of Green Nanotechnology: Biomedicine		1	
Intl. J. of Green Pharmacy		2	
Intl. J. of Information and Communication Technology		2	
Intl. J. of Modelling, Identification and Control		1	
Intl. J. of Nano and Biomaterials		2	
Intl. J. of Plastics Technology		1	
Intl. J. of Preventive Medicine		1	
Intl. J. of Renewable Energy Research		2	
Intl. J. of Research in Social Sciences		1	
Intl. J. of Vegetable Science		1	

Intl. Res. J. Nat. Appl. Sci.		1	
IPPTA: Quarterly J. of Indian Pulp and Paper Technical Association		1	
J. of Advanced Pharmaceutical Technology and Research		1	
J. OF ANIMAL RESEARCH		1	
J. of Association of Physicians of India		1	
J. of Chemical and Pharmaceutical Research		1	
J. of Circuits, Systems and Computers		1	
J. of Clinical and Experimental Hepatology		1	
J. of Computational Mathematics and Optimization		1	
J. of Conservative Dentistry		1	
J. of Contemporary Dental Practice		5	
J. of Crop Science and Biotechnology		1	
J. of Ecology, Environment and Conservation		1	
J. of Environmental Chemical Engineering		1	
J. of Food, Agriculture and Environment		2	

J. of Indian Society of Periodontology		1	
J. of Intl. Society of Preventive and Community Dentistry		4	
J. of Mid-Life Health		1	
J. of Ophthalmic and Vision Research		1	
J. of Oral and Maxillofacial Pathology		3	
J. of Pediatric Neurosciences		2	
J. of Pharmaceutical Analysis		2	
J. of plant protection and environment		1	
J. of Surface Science and Technology		1	
J. of the Korean Chemical Society		2	
J. of Veterinary Behavior: Clinical Applications and Research		1	
Materials Today: Proceedings		6	
Molecular Stress Physiology of Plants		1	
Nature-Inspired Computing: Concepts, Methodologies, Tools, and Applications		2	
Potato J.		1	

Proceedibgs - Genetic and Evolutionary Computation Conf., GECCO'11 - Companion Publication		1	
Proceedings - IEEE Symposium Series on Computational Intelligence, SSCI 2013		1	
Proceedings - Conf. on Information, Communications and Signal Processing - ICICS 2011		1	
Proceedings - Intl. Conf. on High Performance Computing and Applications, ICHPCA 2014		1	
Proceedings - Intl. Conf. on Industrial and Information Systems 2009, Conf. Proceedings - ICIIS 2009		1	
Proceedings - Intl. Conf. on Industrial and Information Systems 2009, Conf. Proceedings - ICIIS 2010		1	
Proceedings - Intl. Conf. on Industrial and Information Systems 2009, Conf. Proceedings - ICIIS 2011		1	
Proceedings - National Academy of Sciences India Section A - Physical Sciences		1	
Proceedings - ACM Intl. Conf.		9	
Proceedings - AIP Conf.		16	
Proceedings - Asia Pacific Conf. on Postgraduate Research in Microelectronics and Electronics		1	
Proceedings - ASME 2014 Gas Turbine India Conf., GTINDIA 2014		1	
Proceedings - ICETEEEM 2012, Intl. Conf. on Emerging Trends in Electrical Engg. & Energy Management		2	
Proceedings - IEEE Conf. on Information and Communication Technologies, ICT 2013		1	
Proceedings - IEEE Congress on Evolutionary Computation, CEC 2009		1	

Proceedings - IEEE India Conf.: Emerging Trends and Innovation in Technology, INDICON 2014		2	
Proceedings - IEEE Intl. Advance Computing Conf., IACC 2009		1	
Proceedings - IEEE Intl. Conf. on Circuit, Power and Computing Technologies, ICCPCT 2016		2	
Proceedings - IEEE Intl. Conf. on Computer Science and Information Technology, ICCSIT 2009		1	
Proceedings - IEEE Intl. Conf. on Computer Science and Information Technology, ICCSIT 2010		1	
Proceedings - IEEE Intl. Conf. on Fuzzy Systems		2	
Proceedings - IEEE Intl. Conf. on Power, Control, Signals and Instrumentation Engineering, ICPCSI 2017		1	
Proceedings - IEEE Intl. Conf. on Research in Computational Intelligence and Communication Networks, ICRCICN 2017		1	
Proceedings - IEEE Intl. Conf. on Signal Processing, Informatics, Communication and Energy Systems, SPICES 2015		1	
Proceedings - IEEE Intl. Multi Conf. on Automation, Computing, Control, Commun. & Compressed Sensing, iMac4s 2013		1	
Proceedings - IEEE Student Conf. on Research and Development, 2012		1	
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Proceedings - IEEE Symposium Series on Computational Intelligence, SSCI 2013		1	
Proceedings - IEEE Uttar Pradesh Section Intl. Conf. on Electrical, Computer and Electronics Engineering, UPCON 2016		2	
Proceedings - IET Conf. Publications		1	

Proceedings - Intl. Conf. on Advanced Computer Control, ICACC 2009	1	
Proceedings - Intl. Conf. on Advanced Computer Science Applications and Technologies, ACSAT 2012	1	
Proceedings - Intl. Conf. on Advanced Computing and Communication Systems, ICACCS 2017	1	
Proceedings - Intl. Conf. on Advances in Engineering, Science and Management, ICAESM-2012	1	
Proceedings - Intl. Conf. on Communication and Signal Processing, ICCSP 2013	1	
Proceedings - Intl. Conf. on Communication Systems and Network Technologies, CSNT 2012	1	
Proceedings - Intl. Conf. on Communication Systems and Networks, COMSNETS 2018	1	
Proceedings - Intl. Conf. on Computer Applications in Electrical Engineering - Recent Advances, CERA 2017	1	
Proceedings - Intl. Conf. on Computer Communication and Informatics, ICCCI 2012	1	
Proceedings - Intl. Conf. on Computing and Network Communications, CoCoNet 2015	1	
Proceedings - Intl. Conf. on Computing Communication and Networking Technologies, ICCCNT 2014	2	
Proceedings - Intl. Conf. on Computing, Communication and Security, ICCCS 2015	1	
Proceedings - Intl. Conf. on Computing, Communications and Networking Technologies, ICCCNT 2017	3	
Proceedings - Intl. Conf. on Contemporary Computing, IC3 2014	1	
Proceedings - Intl. Conf. on Control, Instrumentation, Communication and Computational Technologies, ICCICCT 2014	4	

Proceedings - Intl. Conf. on Distributed Smart Cameras, ICDSC 2012	1	
Proceedings - Intl. Conf. on Electrical, Electronics, Signals, Communication and Optimization, EESCO 2015	1	
Proceedings - Intl. Conf. on Electrical, Electronics, Signals, Communication and Optimization, EESCO 2016	1	
Proceedings - Intl. Conf. on Electronics and Communication Systems, ICECS 2015	1	
Proceedings - Intl. Conf. on Energy Efficient Technologies for Sustainability, ICEETS 2016	1	
Proceedings - Intl. Conf. on Energy, Automation and Signal, ICEAS - 2011	4	
Proceedings - Intl. Conf. on Energy, Communication, Data Analytics and Soft Computing, ICECDS 2017	1	
Proceedings - Intl. Conf. on Green Computing and Internet of Things, ICGCIoT 2015	1	
Proceedings - Intl. Conf. on Highway Pavements and Airfield Technology 2017	1	
Proceedings - Intl. Conf. on Image Processing, ICIP	1	
Proceedings - Intl. Conf. on Industrial Electronics, Control and Robotics, IECR 2010	1	
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Proceedings - Intl. Conf. on Methods and Models in Computer Science, ICM2CS-2010	1	
Proceedings - Intl. Conf. on Nanoscience, Technology and Societal Implications, NSTSI11	2	
Proceedings - Intl. Conf. on Networks and Soft Computing, ICNSC 2014 - Proceedings	1	

Proceedings - Intl. Conf. on Recent Advances in Space Technology Services and Climate Change - 2010, RSTS and CC-2010	2	
Proceedings - Intl. Conf. on Recent Trends in Information Technology, ICRTIT 2011	1	
Proceedings - Intl. Conf. on Signal Processing and Integrated Networks, SPIN 2017	1	
Proceedings - Intl. Conf. on Signal Processing, Communication, Power and Embedded System, SCOPES 2016	1	
Proceedings - Intl. Conf. on Signal Processing, Communication, Power and Embedded System, SCOPES 2017	1	
Proceedings - Intl. Conf. on the Developments in Renewable Energy Technology, ICDRET 2009	1	
Proceedings - National Conf. on Communications, NCC 2017	1	
Proceedings - National Conf. on Computing and Communication Systems, NCCCS 2012 - Proceeding	1	
Proceedings - National Conf. on Emerging Trends and Applications in Computer Science, NCETACS-2012	1	
Proceedings - Nirma University Intl. Conf. on Engineering, NUiCONE 2013	1	
Proceedings - Proceedings: 2011 Intl. Conf. on Image Information Processing - ICIIP 2011	1	
Proceedings - Students Conf. on Engineering and Systems, SCES 2013	1	
Proceedings - USNC-URSI Radio Science Meeting (Joint with AP-S Symposium), USNC-URSI 2017	1	
Proceedings - WASE Intl. Conf. on Information Engineering, ICIE 2009	1	
Proceedings - World Congress on Information and Communication Technologies, WICT 2012	1	

Proceedings - World Congress on Nature and Biologically Inspired Computing, NABIC 2009		4	
Results in Pharma Sciences		1	
RevistaBrasileira de Hematologia e Hemoterapia		1	
SIDDHANT- A J. od Decision Making		2	
Sustainable Potato Production and the Impact of Climate Change		1	
The Bioscan		2	
The Ecoscan (communicated).		1	
Trauma		1	
World Academy of Science, Engineering and Technology		1	