Online ISSN : 2249-460X
Print ISSN : 0975-587X

# Global Journal

## of Human-Social Sciences: B

## Geography, Geo-Sciences & Environmental



Services in Rural Areas

Distribution of Health and Education

Highlights

East African Universities

T. N. Godavaraman Case

Discovering Thoughts, Inventing Future

VOLUME 15 ISSUE 4 VERSION 1.0

© 2001-2015 by Global Journal of Human-Social Sciences, USA

Volume 15 Issue 55 was originally issued as B4

Global Journal of Human-Social Science: B
Geography, Geo-Sciences, Environmental Science & Disaster Management

Volume 15 Issue 55
Originally issued as B4

# Global Journal of Human-Social Science: B
## Geography, Geo-Sciences, Environmental Science & Disaster Management

Volume 15 Issue 4 (Ver. 1.0)

Open Association of Research Society

© Global Journal of Human Social Sciences. 2015.

All rights reserved.

This is a special issue published in version 1.0 of "Global Journal of Human Social Sciences." By Global Journals Inc.

All articles are open access articles distributed under "Global Journal of Human Social Sciences"

Reading License, which permits restricted use. Entire contents are copyright by of "Global Journal of Human Social Sciences" unless otherwise noted on specific articles.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without written permission.

The opinions and statements made in this book are those of the authors concerned. Ultraculture has not verified and neither confirms nor denies any of the foregoing and no warranty or fitness is implied.

Engage with the contents herein at your own risk.

The use of this journal, and the terms and conditions for our providing information, is governed by our Disclaimer, Terms and Conditions and Privacy Policy given on our website http://globaljournals.us/terms-and-condition/menu-id-1463/

By referring / using / reading / any type of association / referencing this journal, this signifies and you acknowledge that you have read them and that you accept and will be bound by the terms thereof.

All information, journals, this journal, activities undertaken, materials, services and our website, terms and conditions, privacy policy, and this journal is subject to change anytime without any prior notice.

**Incorporation No.: 0423089**
**License No.: 42125/022010/1186**
**Registration No.: 430374**
**Import-Export Code: 1109007027**
**Employer Identification Number (EIN):**
**USA Tax ID: 98-0673427**

# Global Journals Inc.

*(A Delaware USA Incorporation with "Good Standing"; **Reg. Number: 0423089**)*

*Sponsors: Open Association of Research Society*
*Open Scientific Standards*

## *Publisher's Headquarters office*

Global Journals Headquarters
301st Edgewater Place Suite, 100 Edgewater Dr.-Pl,
Wakefield MASSACHUSETTS, Pin: 01880,
United States of America
*USA Toll Free: +001-888-839-7392*
*USA Toll Free Fax: +001-888-839-7392*

## *Offset Typesetting*

Global Journals Incorporated
2nd, Lansdowne, Lansdowne Rd., Croydon-Surrey,
Pin: CR9 2ER, United Kingdom

## *Packaging & Continental Dispatching*

Global Journals
E-3130 Sudama Nagar, Near Gopur Square,
Indore, M.P., Pin:452009, India

## *Find a correspondence nodal officer near you*

To find nodal officer of your country, please email us at *local@globaljournals.org*

## *eContacts*

Press Inquiries: *press@globaljournals.org*
Investor Inquiries: *investors@globaljournals.org*
Technical Support: *technology@globaljournals.org*
Media & Releases: *media@globaljournals.org*

## *Pricing (Including by Air Parcel Charges):*

*For Authors:*
22 USD (B/W) & 50 USD (Color)
*Yearly Subscription (Personal & Institutional):*
200 USD (B/W) & 250 USD (Color)

# Integrated Editorial Board
## (Computer Science, Engineering, Medical, Management, Natural Science, Social Science)


**John A. Hamilton,"Drew" Jr.,**
Ph.D., Professor, Management
Computer Science and Software Engineering
Director, Information Assurance Laboratory
Auburn University

**Dr. Henry Hexmoor**
IEEE senior member since 2004
Ph.D. Computer Science, University at Buffalo
Department of Computer Science
Southern Illinois University at Carbondale

**Dr. Osman Balci, Professor**
Department of Computer Science
Virginia Tech, Virginia University
Ph.D.and M.S.Syracuse University, Syracuse, New York
M.S. and B.S. Bogazici University, Istanbul, Turkey

**Yogita Bajpai**
M.Sc. (Computer Science), FICCT
U.S.A.Email:
yogita@computerresearch.org

**Dr. T. David A. Forbes**
Associate Professor and Range Nutritionist
Ph.D. Edinburgh University - Animal Nutrition
M.S. Aberdeen University - Animal Nutrition
B.A. University of Dublin- Zoology

**Dr. Wenying Feng**
Professor, Department of Computing & Information Systems
Department of Mathematics
Trent University, Peterborough,
ON Canada K9J 7B8

**Dr. Thomas Wischgoll**
Computer Science and Engineering,
Wright State University, Dayton, Ohio
B.S., M.S., Ph.D.
(University of Kaiserslautern)

**Dr. Abdurrahman Arslanyilmaz**
Computer Science & Information Systems Department
Youngstown State University
Ph.D., Texas A&M University
University of Missouri, Columbia
Gazi University, Turkey

**Dr. Xiaohong He**
Professor of International Business
University of Quinnipiac
BS, Jilin Institute of Technology; MA, MS, PhD,. (University of Texas-Dallas)

**Burcin Becerik-Gerber**
University of Southern California
Ph.D. in Civil Engineering
DDes from Harvard University
M.S. from University of California, Berkeley
& Istanbul University

**Dr. Bart Lambrecht**
Director of Research in Accounting and FinanceProfessor of Finance
Lancaster University Management School
BA (Antwerp); MPhil, MA, PhD (Cambridge)

**Dr. Carlos García Pont**
Associate Professor of Marketing
IESE Business School, University of Navarra
Doctor of Philosophy (Management), Massachusetts Institute of Technology (MIT)
Master in Business Administration, IESE, University of Navarra
Degree in Industrial Engineering, Universitat Politècnica de Catalunya

**Dr. Fotini Labropulu**
Mathematics - Luther College
University of ReginaPh.D., M.Sc. in Mathematics
B.A. (Honors) in Mathematics
University of Windso

**Dr. Lynn Lim**
Reader in Business and Marketing
Roehampton University, London
BCom, PGDip, MBA (Distinction), PhD, FHEA

**Dr. Mihaly Mezei**
ASSOCIATE PROFESSOR
Department of Structural and Chemical Biology, Mount Sinai School of Medical Center
Ph.D., Etvs Lornd University
Postdoctoral Training,
New York University

**Dr. Söhnke M. Bartram**
Department of Accounting and FinanceLancaster University Management SchoolPh.D. (WHU Koblenz)
MBA/BBA (University of Saarbrücken)

**Dr. Miguel Angel Ariño**
Professor of Decision Sciences
IESE Business School
Barcelona, Spain (Universidad de Navarra)
CEIBS (China Europe International Business School).
Beijing, Shanghai and Shenzhen
Ph.D. in Mathematics
University of Barcelona
BA in Mathematics (Licenciatura)
University of Barcelona

**Philip G. Moscoso**
Technology and Operations Management
IESE Business School, University of Navarra
Ph.D in Industrial Engineering and Management, ETH Zurich
M.Sc. in Chemical Engineering, ETH Zurich

**Dr. Sanjay Dixit, M.D.**
Director, EP Laboratories, Philadelphia VA Medical Center
Cardiovascular Medicine - Cardiac Arrhythmia
Univ of Penn School of Medicine

**Dr. Han-Xiang Deng**
MD., Ph.D
Associate Professor and Research
Department Division of Neuromuscular Medicine
Davee Department of Neurology and Clinical NeuroscienceNorthwestern University
Feinberg School of Medicine

**Dr. Pina C. Sanelli**
Associate Professor of Public Health
Weill Cornell Medical College
Associate Attending Radiologist
NewYork-Presbyterian Hospital
MRI, MRA, CT, and CTA
Neuroradiology and Diagnostic Radiology
M.D., State University of New York at Buffalo,School of Medicine and Biomedical Sciences

**Dr. Roberto Sanchez**
Associate Professor
Department of Structural and Chemical Biology
Mount Sinai School of Medicine
Ph.D., The Rockefeller University

**Dr. Wen-Yih Sun**
Professor of Earth and Atmospheric SciencesPurdue University Director
National Center for Typhoon and Flooding Research, Taiwan
University Chair Professor
Department of Atmospheric Sciences, National Central University, Chung-Li, TaiwanUniversity Chair Professor
Institute of Environmental Engineering, National Chiao Tung University, Hsin-chu, Taiwan.Ph.D., MS The University of Chicago, Geophysical Sciences
BS National Taiwan University, Atmospheric Sciences
Associate Professor of Radiology

**Dr. Michael R. Rudnick**
M.D., FACP
Associate Professor of Medicine
Chief, Renal Electrolyte and Hypertension Division (PMC)
Penn Medicine, University of Pennsylvania
Presbyterian Medical Center, Philadelphia
Nephrology and Internal Medicine
Certified by the American Board of Internal Medicine

**Dr. Bassey Benjamin Esu**
B.Sc. Marketing; MBA Marketing; Ph.D Marketing
Lecturer, Department of Marketing, University of Calabar
Tourism Consultant, Cross River State Tourism Development Department
Co-ordinator , Sustainable Tourism Initiative, Calabar, Nigeria

**Dr. Aziz M. Barbar, Ph.D**.
IEEE Senior Member
Chairperson, Department of Computer Science
AUST - American University of Science & Technology
Alfred Naccash Avenue – Ashrafieh

## President Editor (HON.)

**Dr. George Perry, (Neuroscientist)**
Dean and Professor, College of Sciences
Denham Harman Research Award (American Aging Association)
ISI Highly Cited Researcher, Iberoamerican Molecular Biology Organization
AAAS Fellow, Correspondent Member of Spanish Royal Academy of Sciences
University of Texas at San Antonio
Postdoctoral Fellow (Department of Cell Biology)
Baylor College of Medicine
Houston, Texas, United States

## Chief Author (HON.)

**Dr. R.K. Dixit**
M.Sc., Ph.D., FICCT
Chief Author, India
Email: authorind@computerresearch.org

## Dean & Editor-in-Chief (HON.)

**Vivek Dubey(HON.)**
MS (Industrial Engineering),
MS (Mechanical Engineering)
University of Wisconsin, FICCT
Editor-in-Chief, USA
editorusa@computerresearch.org

**Sangita Dixit**
M.Sc., FICCT
Dean & Chancellor (Asia Pacific)
deanind@computerresearch.org

**Suyash Dixit**
(B.E., Computer Science Engineering), FICCTT
President, Web Administration and
Development , CEO at IOSRD
COO at GAOR & OSS

**Er. Suyog Dixit**
(M. Tech), BE (HONS. in CSE), FICCT
SAP Certified Consultant
CEO at IOSRD, GAOR & OSS
Technical Dean, Global Journals Inc. (US)
Website: www.suyogdixit.com
Email:suyog@suyogdixit.com

**Pritesh Rajvaidya**
(MS) Computer Science Department
California State University
BE (Computer Science), FICCT
Technical Dean, USA
Email: pritesh@computerresearch.org

**Luis Galárraga**
J!Research Project Leader
Saarbrücken, Germany

# Contents of the Issue


i. Copyright Notice
ii. Editorial Board Members
iii. Chief Author and Dean
iv. Contents of the Issue

1. Distribution of Health and Education Services in the Rural Areas: A Case Study of Aligarh District. *1-9*
2. A Gender Perspective of the Status of Water and Sanitation Landscape in East African Universities. *11-28*
3. What to do about Climate Change-Caused Flooding and the Associated Diseases in Rivers State of Nigeria. *29-34*
4. T. N. Godavaraman Thirumulpad V. Union of India & others: A Case Study. *35-45*
5. Length of Rainfall Season and its Implication over Enugu South - East Nigeria. *47-55*

v. Fellows
vi. Auxiliary Memberships
vii. Process of Submission of Research Paper
viii. Preferred Author Guidelines
ix. Index

Global Journal of human-social science: b
Geography, Geo-Sciences, Environmental Science & Disaster Management
Volume 15 Issue 4 Version 1.0 Year 2015
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-460x & Print ISSN: 0975-587X

# Distribution of Health and Education Services in the Rural Areas: A Case Study of Aligarh District

By Shabnam Khan
*Gorakhpur University, India*

*Abstract-* Providing health and education services in the rural areas is one of the biggest challenge that is faced by the government of India. With nearly 70 per cent population living in rural areas have less number of health and education services than their urban counterpart. Health care and education amenities are hardly available in the rural areas, and this is the core reason for migration of the rural people to urban areas. This paper focuses on the distribution of health and education services in the rural areas of Aligarh district taken primary and secondary data under consideration. Methodological principle adopted for the present study is cumulative frequency distribution, mean spacing, Gini's coefficient concentration ratio, and graphical representation of the cumulative frequency curve. Result shows that there is gap in the availability of health and education services in the rural areas in different population size group of settlements.

*Keywords:* *health services, education services, and rural areas.*

*GJHSS-B Classification :* *FOR Code: 040699p*



*Strictly as per the compliance and regulations of:*

© 2015. Shabnam Khan. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License http://creativecommons.org/licenses/by-nc/3.0/), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

# Distribution of Health and Education Services in the Rural Areas: A Case Study of Aligarh District

Shabnam Khan

*Abstract-* Providing health and education services in the rural areas is one of the biggest challenge that is faced by the government of India. With nearly 70 per cent population living in rural areas have less number of health and education services than their urban counterpart. Health care and education amenities are hardly available in the rural areas, and this is the core reason for migration of the rural people to urban areas. This paper focuses on the distribution of health and education services in the rural areas of Aligarh district taken primary and secondary data under consideration. Methodological principle adopted for the present study is cumulative frequency distribution, mean spacing, Gini's coefficient concentration ratio, and graphical representation of the cumulative frequency curve. Result shows that there is gap in the availability of health and education services in the rural areas in different population size group of settlements.

*Keywords: health services, education services, and rural areas.*

## I. Introduction

The issue of uneven distribution of health and education services in the rural areas of Uttar Pradesh, India is of great concern. As Aligarh district is an integral part of Uttar Pradesh, therefore it also experiences the same problem of uneven distribution of health and education services. Availability of health and education services is necessary for improving the standard of living of rural population. The main reason to focus especially to the rural areas is that these areas are devoid of these services compared to urban areas. There is uneven distribution of these services in rural and urban areas. Between urban and rural areas, urban areas have sufficient number of health and education services but rural areas are devoid of it. Therefore there is a need to focus on the availability of these services to the rural areas for the balanced development. Some of the work related to this study has been done by Dasgupta (2013), Kaur, Bajpai et al. (2008), Bhandari and Siddhartha (2007), Dholakia and Iyengar (2008) etc.

## II. Study Area

For the present study Aligarh district has been selected as the study area. It is one of the district of Uttar Pradesh, which is located in the north western part of Ganga Yamuna doab and forms a part of Agra division. It extends from 270 27' N to 280 11' N latitudes and 770 27' E to 780 38' E longitudes (fig. 1). As per census 2011 the district has a population of 3,673,849 persons, out of which 1,958,536 are male and 1,715,313 are female. The district has witnessed 2,127,592 and 864,649 as the rural and urban population respectively. Based on administrative convenience, the district has been divided into divisions i.e. tehsils namely Koil, Khair, Gabhana, Atrauli, and Iglas. These tehsils are further sub- divided into 12 development block namely Atrauli, Gangiri, Bijauli, Jawan Sikanderpur, Chandaus, Khair, Tappal, Dhanipur, Lodha, Akrabad, Iglas, and Gonda.

## III. Data Base and Methodology

The study is based on both primary as well as secondary sources of data. A secondary source of data has been collected through census records (2001), district statistical magazine (2001), etc. Primary survey has been done for the verification of secondary data through the field study.

Methodological principle adopted to analyse the distribution of health and education services are:

- numeral distribution,
- Cumulative frequency distribution of rural settlements having facility among the size class of rural settlements,
- Mean spacing of settlements having facility, which is calculated as:

$$D = 1.0746\sqrt{A/N}$$

Where, D = theoretical distance between points or settlements in hexagonal arrangement, or mean spacing in unit length.

A = area of given region
N = number of settlements in a given region
1.0746 = Spacing constant.

- Gini's coefficient of concentration of facilities among the size group of settlements

$$Gi = \frac{1}{10{,}000}\sum_{i=1}^{N}(xi.yi+1)-(xi+1.yi)$$

*Author: Post Doctoral fellow, Department of Geography Deen Dayal Upadhayay, Gorakhpur University, Gorakhpur, Uttar Pradesh (India). e-mail: shabnamkhan89@gmail.com*



© 2015 Global Journals Inc. (US)

Location of Aligarh District Z

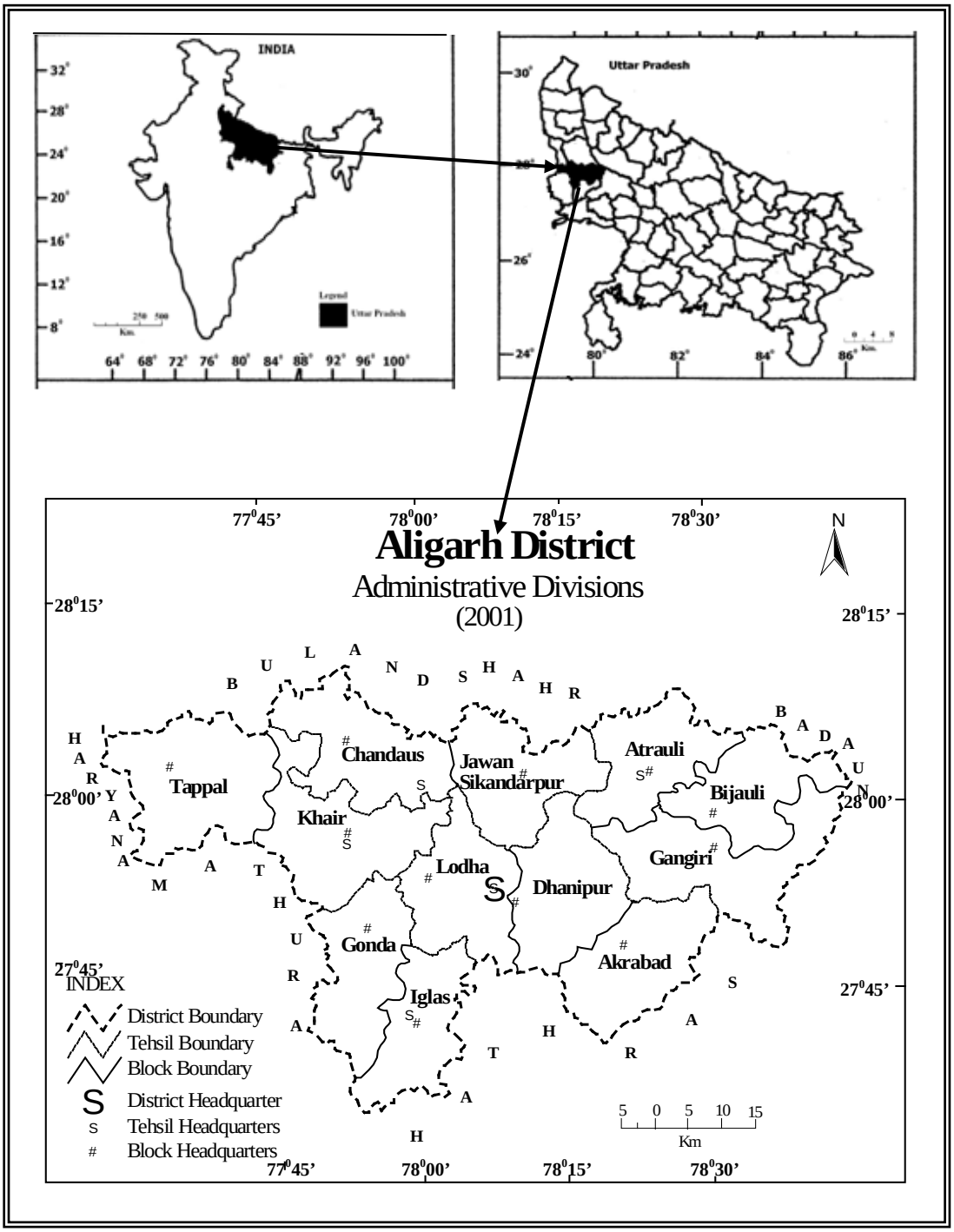



*Figure 1*

Where,

$x_i$ = the cumulative percentage distribution of attribute x.

$y_i$ = the cumulative percentage distribution of attribute y.

N = the number of observations

Gi = Gini's Coefficient Ratio (the relation between the area of triangle formed between the line of equal distribution and the y axis, and the area lying between the curve and the line of equal distribution).

Scale of Gi Ratio:

Gi = 0, is uniform distribution

Gi = 1.0, is highest concentration.

© 2015 Global Journals Inc. (US)

- examining the graphical representation of the cumulative frequency curve taking cumulative percentage of inhabited rural settlement and settlement located with facility.

## III. Result and Discussion

To analyse the distribution of health services in the district the existing establishment units providing health facilities i.e. hospital, dispensary, maternity and child welfare centre, health centre, primary health centre, primary health sub-centre, and nursing home has been taken under consideration.

*a) Distribution of Health Services*

i. *Hospital*

A hospital is an Institution, where sick or injured are given medical or surgical care. It includes allopathy, homeopathy, ayurveda, and unani hospital. In the district, there are 45 hospitals distributed in 45 inhabited rural settlements and each hospital serves an average population of 47,280 persons. Table 1 reveals that maximum concentration of rural settlements with hospital facility (42.23 per cent) has been found in the population size group of 5,000-9,999 followed by 33.33 per cent of rural settlements with the same facility in 2,000-4,999 population size group. No hospital has been found in the rural settlements having population less than 1,000 persons. Table 2 shows that mean spacing of settlements located with hospitals is 9.59 km. While Gi value 0.740 reveals its higher concentration at few bigger size of rural settlements while smaller size of settlements are lacking in this facility. The deviation of cumulative frequency curve of rural settlements having hospital facility from that of all rural settlements depicts the same result as above (fig.2).

ii. *Dispensary*

Dispensary is a place where patients are treated and medicines provided but with no in-patient facility. Immunizations, MCH Services and sometimes pathological tests are carried out here. They include allopathic, homeopathic, ayurvedic, and unani dispensary. In the district, there are 49 dispensaries located in 34 inhabited rural settlements. Not a single dispensary is located in the settlements under the size of population of less than 500 persons. Maximum numbers of dispensaries (35.29 per cent) are concentrated in the settlements having population size group of 2,000-4,999 and 5,000-9,999 persons. While minimum concentration (2.94 per cent) has been found in 500-999 population size group. Table 2 shows that on an average 43,420 persons are served by each dispensary. Mean spacing of settlements having dispensary is 11.03 km. While Gi value 0.681 indicates its higher concentration at few bigger sizes of settlements, is also revealed from the fig. 2.

iii. *Maternity and Child Welfare Centre*

It provides pre-natal and post-natal services for both mother and child. The services include regular check-up of pregnant women, giving folic tablets, counseling, delivery, immunization of children with check-up etc. There are 114 maternity and child welfare centre distributed in 114 inhabited rural settlements but none of them has been found in the rural settlements under the size group of population of less than 500 persons. 66.55 per cent of the rural settlements with maternity and child welfare centres have been found in 28.90 per cent of the rural settlements having population size group of more than 2,000 persons (table 1). Each unit serves an average population of 18,663 persons and settlements having maternity and child welfare centre are located at 6.02 km apart from each other (table 2). Gi value 0.511 reveals that distribution of this facility is neither concentrated nor uniformly distributed. Figure 2 depicts that, the frequency curve of settlements by their size group of population having maternity and child welfare centre does not corresponds to that of all settlements in the district.

iv. *Health Centre*

It is a clinic where medicine and medical supplies are dispensed. There are 29 health centres distributed among 28 inhabited rural settlements. No settlements with less than 500 populations and 1,000-1,499 population size group enjoys this facility. Maximum percentage of rural settlements having health centre (35.71 per cent) has been observed in the rural settlement with population size group of 2,000-4,999 and 5,000-9,999 followed by the population size group of 1,500-1,999 with 14.29 per cent of rural settlements with this facility. It serves at an average of 73,365 persons per unit in the district (table 2). Mean spacing of settlements having this facility is 12.15 km. While Gi value is 0.704 which shows its higher concentration at big size of rural settlements. Figure 2 depicts the lack of health centre facility more among small size group of settlements than bigger size.

*Table 1 :* Aligarh District: Percentage Distribution of Rural Settlements by their Size Group of population Located with Health Facilities (2001)

| Population size group (persons) | Rural Settlements | | per cent settlements by Health facility | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | No. | % | Hos. | Disp. | MCWC | HC | PHC | PHSC | NH |
| < 250 | 23 | 1.95 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 250-499 | 81 | 6.86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |



© 2015 Global Journals Inc. (US)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 500-999 | 312 | 26.44 | 0.00 | 2.94 | 6.14 | 3.57 | 0.00 | 8.06 | 0.00 |
| 1000-1499 | 247 | 20.93 | 4.44 | 8.83 | 12.28 | 0.00 | 10.00 | 9.68 | 12.50 |
| 1500-1999 | 176 | 14.92 | 11.11 | 5.88 | 14.03 | 14.29 | 20.00 | 11.29 | 12.50 |
| 2000-4999 | 290 | 24.58 | 33.33 | 35.29 | 44.74 | 35.71 | 45.00 | 45.16 | 12.50 |
| 5000-9999 | 46 | 3.90 | 42.23 | 35.29 | 19.3 | 35.71 | 20.00 | 22.58 | 50.00 |
| > 10,000 | 5 | 0.42 | 8.89 | 11.77 | 3.51 | 10.72 | 5.00 | 3.23 | 12.50 |
| Total percent | - | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Total number of settlements | 1180 | - | 45 | 34 | 114 | 28 | 20 | 62 | 8 |
| total number of Health facilities | - | - | 45 | 49 | 114 | 29 | 20 | 64 | 10 |

*Source: Computed from District Census Hand Book (Village Directory), 2001*

v. *Primary Health Centre*

A Primary Health Centre is the first contact point between a village community and the Government medical officer. In the district, there are 20 units of primary health centre distributed among 20 inhabited rural settlements (table 1). No settlement with less than 1,000 populations is having this facility. Around 70 per cent of the rural settlements having primary health centre facility has been found in the population size group of more than 2,000 persons in each. The health needs of about 106,380 people within a maximum travel distance of 14.38 km are served by the primary health centre (table 2). Gi value is 0.587 indicates that it is disproportionately distributed among the size group of settlements which is clearly observed from the fig. 2.

*Table 2 :* Aligarh District: Distribution of Health Facilities

| S.No. | Name of Facility | Mean Spacing(in km.) of Settlement having Facility | Average Population per Facility | Gi value of Settlement having Facility |
|---|---|---|---|---|
| 1. | Hospital | 9.59 | 47280 | 0.740 |
| 2. | Dispensary | 11.03 | 43420 | 0.681 |
| 3. | Maternity and child welfare centre | 6.02 | 18663 | 0.511 |
| 4. | Health centre | 12.15 | 73365 | 0.704 |
| 5. | Primary health centre | 14.38 | 106380 | 0.587 |
| 6. | Primary health sub centre | 8.17 | 33244 | 0.526 |
| 7. | Nursing home | 22.73 | 212759 | 0.708 |

*Source: Computed from District Census Hand Book (Village Directory), 2001*

vi. *Primary Health Sub-Centre*

A Primary Health Sub-centre is the first contact point between the primary health care system and the community. Total 64 units of primary health sub centres are distributed in 62 inhabited rural settlements. Nearly three fourth of rural settlements with primary health sub-centre are located in population size group of more than 2000 persons in each. No rural settlements with population less than 500 persons posses this facility. Each unit serves an average population of 33,244 persons and settlements having PHSC are located at a distance of 8.17 km apart from each other. Gi value is 0.526 which indicates that distribution of rural settlements with this facility is neither concentrated nor uniformly distributed in each size group of settlements that is clear from the deviation of frequency curve of settlements having this facility from that of all rural settlements (fig. 2).

vii. *Nursing Home*

A nursing home is a long –term care facility licensed by the state that offers 24hour room and board and health care services including basic and skilled nursing care, rehabilitation and a full range of other therapies, treatments and programs to old and sick people. The district has been found with only 10 nursing home distributed in 8 inhabited rural settlements and each nursing home serves an average population of 212,759 persons. No nursing home has been found in the settlements having population less than 1,000 persons. Half of the rural settlements having nursing home facility lie in the population size group of 5,000-9,999 persons (table 1). Mean spacing of settlements having this facility is 22.73 km. Gi value 0.708 indicates its higher concentration at few big sizes of settlements, is also revealed from the figure 2.



© 2015 Global Journals Inc. (US)

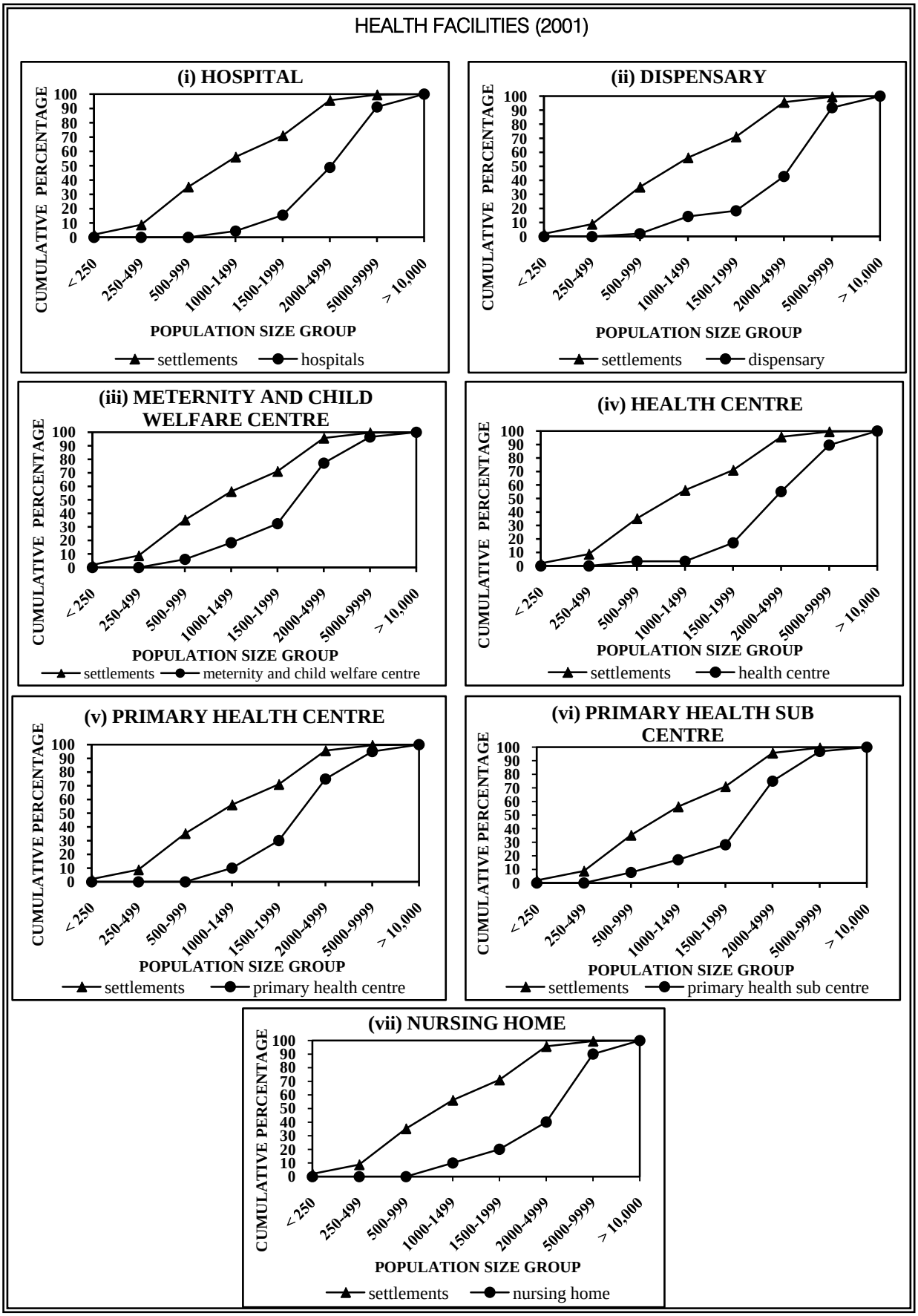



Figure 2



© 2015 Global Journals Inc. (US)

*b) Distribution of Education Services*

The existing establishment units providing educational facilities in the district includes primary school, middle school, secondary school, senior secondary school, college, and adult literacy centre.

i. *Primary school*

Primary school is the first stage of compulsory education known as primary or elementary education. The district has 1312 primary schools distributed in 1027 rural settlements, implies 87.03 per cent of villages have primary schools. Out of 1312 primary schools, 758 (57.77 %) are located in the settlements having population of more than 1500 persons. Maximum concentration of primary schools i.e. 28.14 per cent has been observed in 2000-4999 size group of population (table 3).

Table 4 reveals that on an average, population of 1622 persons is served by each primary school. Rural settlements having primary schools are located at mean spacing of 2.01 km. Gi value (Gini's coefficient concentration ratio) of 0.086 shows nearly uniform distribution at each size group of settlements. Figure 3 reveals that the cumulative frequency curve of settlements having primary school is almost corresponding to the frequency curve of all inhabited rural settlements indicates its quite uniform distribution at each size group of settlements in the district.

*Table 3 :* Aligarh District: Percentage Distribution of Rural Settlements by their Size Group of Population Located with Educational Facilities (2001)

| Population size group (persons) | Rural Settlements | | per cent settlements by Educational facility | | | | | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | PS | MS | SS | SSS | Col. | ALC |
| < 250 | 23 | 1.95 | 0.49 | 0.56 | 0.00 | 0.00 | 0.00 | 0.00 |
| 250-499 | 81 | 6.86 | 3.80 | 2.24 | 1.06 | 2.13 | 0.00 | 6.67 |
| 500-999 | 312 | 26.44 | 24.44 | 9.52 | 6.38 | 6.38 | 20.00 | 13.33 |
| 1000-1499 | 247 | 20.93 | 21.81 | 12.61 | 9.57 | 6.38 | 20.00 | 33.33 |
| 1500-1999 | 176 | 14.92 | 16.36 | 17.93 | 9.57 | 6.38 | 0.00 | 6.67 |
| 2000-4999 | 290 | 24.58 | 28.14 | 45.66 | 54.26 | 46.81 | 20.00 | 20.00 |
| 5000-9999 | 46 | 3.90 | 4.48 | 10.08 | 15.96 | 27.66 | 40.00 | 20.00 |
| > 10,000 | 5 | 0.42 | 0.48 | 1.40 | 3.20 | 4.26 | 0.00 | 0.00 |
| Total percent | - | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Total number of settlements | 1180 | - | 1027 | 357 | 94 | 47 | 5 | 15 |
| Total number of Educational facility | - | - | 1312 | 401 | 97 | 49 | 5 | 16 |

*Source: Computed from District Census Hand Book (Village Directory), 2001*

ii. *Middle school*

As per the education system in Uttar Pradesh middle school provide educational facilities up to the class VIII$^{th}$ standard. There are 401 middle schools distributed in 357 inhabited rural settlements. Only 2 (0.56 %) middle schools are found in population size group of less than 250 persons. Maximum concentration of middle school i.e. 45.66 per cent has been observed in 2000-4999 size group of population. Table 3 reveals that 75.07 per cent of the rural settlements with middle school are having population more than 1500 persons in each, while it serves 43.82 per cent of all inhabited rural settlements with population more than 1500 persons in each. On an average, 5,319 people are served by each middle school and the settlements having middle school are located at mean spacing of 3.41 km. The Gi value of 0.372 indicates its quite disproportional concentration at bigger size of rural settlements. The deviation of cumulative frequency curve of settlement from that of all inhabited settlements reveals disproportional concentration of this facility at large size group of population (fig.3).

*Table 4 :* Aligarh District: Distribution of Education Facilities

| S.No. | Name of Facility | Mean Spacing(in km.) of Settlement having Facility | Average Population per Facility | Gi value of Settlement having Facility |
|---|---|---|---|---|
| 1. | Primary School | 2.01 | 1622 | 0.086 |
| 2. | Middle School | 3.41 | 5319 | 0.372 |
| 3. | Secondary School | 6.63 | 21934 | 0.519 |
| 4. | Senior Secondary School | 9.38 | 43420 | 0.576 |

© 2015 Global Journals Inc. (US)

| | | | | |
|---|---|---|---|---|
| 5. | College | 28.76 | 425518 | 0.387 |
| 6. | Adult Literacy Centre | 16.60 | 132975 | 0.180 |

*Source: Computed from District Census Hand Book (Village Directory), 2001*

iii. *Secondary School*

Secondary school is an educational institution imparting education upto X$^{th}$ standard. There are 97 secondary schools distributed in 94 inhabited rural settlements. Table 3 reveals that settlements with population less than 250 persons do not posses this facility and 73.42 per cent of secondary schools are located in 2000 and above size group of settlements of the district with an average population of 21,934 persons. Only single school has been recorded, in less than 500 population size group. Maximum numbers of secondary school has been noticed in 2,000-4,999 size group of population. Table 4 reveals that mean spacing of the settlements with this facility is 6.63 km. Gi value of 0.519 indicates that it is concentrated at big size of settlements. The deviations of frequency curve of settlements having secondary school from that of all rural settlements reveals lack of this facility in the small size group of settlements than the bigger size group of settlements (Fig.3).

iv. *Senior Secondary School*

Senior secondary school provides educational facility up to class XII$^{th.}$ There are 49 senior secondary schools located in 47 inhabited rural settlements in the district. On an average 43,420 persons are served by each senior secondary school. Population size group below 250 persons do not posses this facility. Table 3 reveals that 21.27 per cent of the rural settlements with senior secondary school are having population less than 2,000 persons in each, where as 78.73 per cent of the settlements with this facility are having population more than 2,000 persons in each. The above data clearly shows unequal distribution of this facility among different size group of rural settlements. Table 4 shows mean spacing of settlements with this facility is 9.38 km. Gi value of 0.576 reveals its higher concentration at bigger size of settlements. Figure 3 depicts the disproportional concentration of senior secondary school at big size of settlements than at small size of settlements.



© 2015 Global Journals Inc. (US)

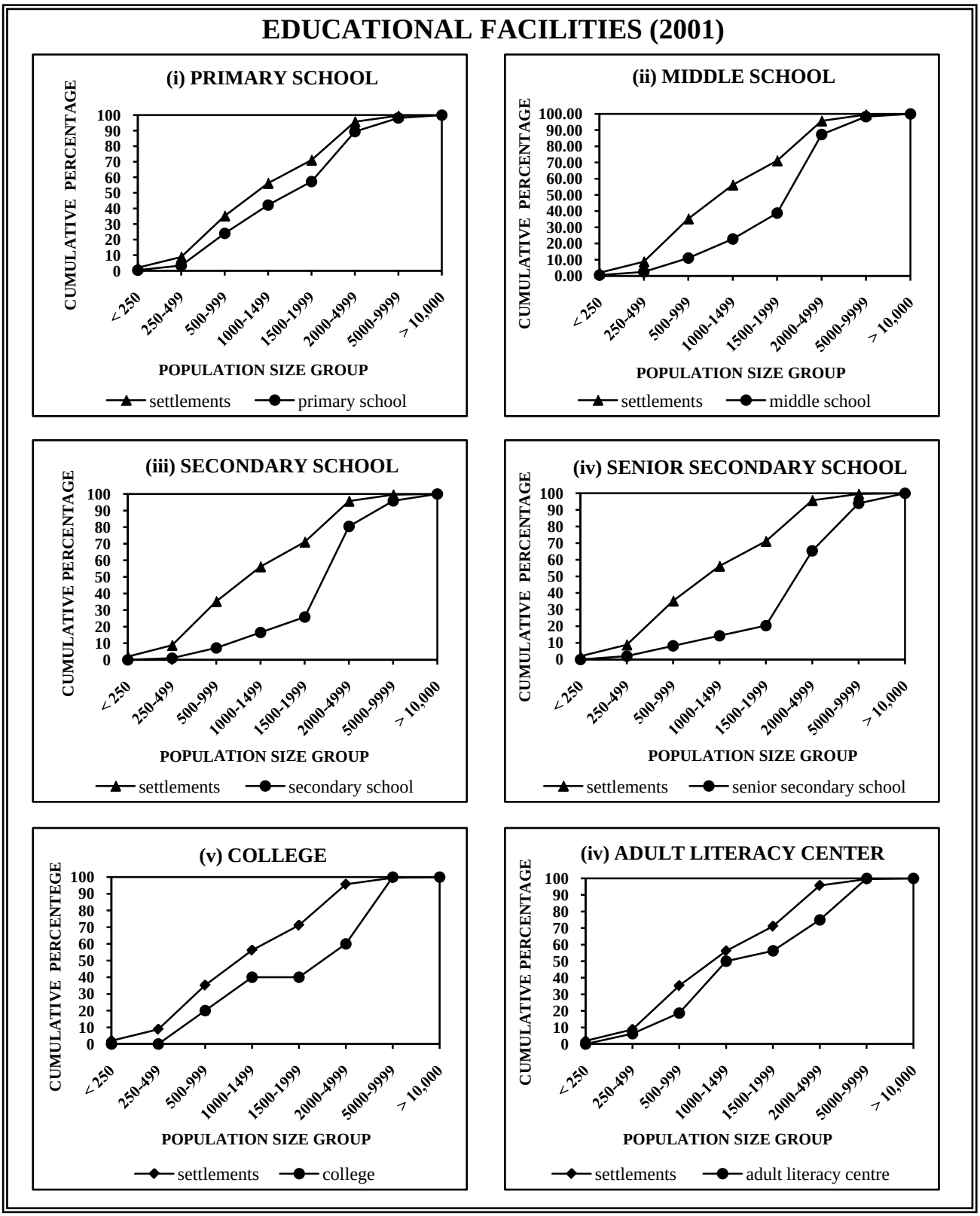



*Figure 3*

v. *College*

College is an educational institution that provides the graduate level educational facility. Total 5 colleges are located in 5 inhabited rural settlements. They are located at Dhansari village in Gangiri block, Nagla Madho in Khair block, ChaupurHauj in Atrauli block, Sangra in Jawan block and Tochhigarh in Iglas block. One of the interesting feature of its distribution is

© 2015 Global Journals Inc. (US)

that no college has been found in less than 500, 1500-1999, and above 10,000 population size group of the settlements. 2 colleges exist in 500-1499 population size group and rest 3 colleges exist in 2000-9999 population size group. On an average, population of 425,518 persons is served by each college in the district. Mean spacing of settlements with this facility is 28.76 km. Figure 3 depicts the disproportional concentration of colleges at big size of settlements while small size of settlements are lacking in this facility.

vi. *Adult Literacy Centre*

Out of the total rural settlements in the district, there are 16 Adult literacy centres located in 15 inhabited rural settlements. Table 3 depicts that population size group below 250 and above 10,000 does not possess this facility. All the 16 Adult literacy centres are distributed in the rural settlements having population size group ranging from 250-9999 persons. Each Adult literacy centre provides education facility to an average population of 132,975 persons. Mean spacing of settlements with this facility is 16.60 km.

## IV. Conclusion

The above study shows that there is large gap in the availability of education and health facilities in the rural areas in different population size group. Large numbers of these services are found in big settlements whereas small settlements depend on these big settlements to avail these services. Among health facilities, maternity and child welfare centre has low mean spacing whereas nursing home has highest mean spacing. Similarly among education facilities, primary school has lowest mean spacing whereas college has highest mean spacing. Cumulative frequency curve shows that curve of all the settlements having health facilities to that of all inhabited settlement curve among different population size group do not corresponds to each other therefore it may be concluded that health facilities are not uniformly distributed among different size group of population. In terms of education facilities only primary school is uniformly distributed among different population size group whereas all other education facilities are not uniformly distributed.

## References Références Referencias

1. Bajpai, N., Ravindra, Dholakia, H., & Sachs, J.D. (2008). Scaling up primary education services in Rural India: Public investment requirements and policy reform, case studies of Andhra Pradesh and Karnataka. CGSD Working paper No. 34, January 2008.
2. Bhandari, L., & Dutta, S. (2007). Health Infrastructure in Rural India. India Infrastructure Report 2007, pp.265-285.
3. Dasgupta, P., The shameful frailty of the Rural Healthcare System in India. *In sickness and in Health on Asia, India*, Feb. 2, 2013.
4. Dholakia, H., & Iyengar, S. (2008). Access of poor households to primary education in rural India. W.P. No. 2008-02-02, Indian Institute of Management, Ahmedabad, India, February 2008, pp.1-24.
5. Kaur, R., Rural Education in India. Retrieved from http://WWW.mapsofindia.com.



© 2015 Global Journals Inc. (US)

This page is intentionally left blank

© 2015 Global Journals Inc. (US)

Global Journal of human-social science: b
Geography, Geo-Sciences, Environmental Science & Disaster Management
Volume 15 Issue 4 Version 1.0 Year 2015
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-460x & Print ISSN: 0975-587X

# A Gender Perspective of the Status of Water and Sanitation Landscape in East African Universities

By Kebirungi, Harriet., Kabonesa, Consolata., Kimwaga, Richard Joseph., Majaliwa, Jackson-Gilbert Mwanjalolo. & Luboobi S. Livingstone.
*Kyambogo University, Uganda*

*Abstract-* Access and utilization of adequate water supply and sanitation facilities is high on the agenda of both International, national, and local communities including East African Universities (EAUs). Despite global demand for higher education characterized with increased male and female enrolment, the current levels of access and utilization to water supply and sanitation facilities remain largely inadequate and gendered in EAUs. Among the contributing factors is limited gender scholarship to question the causes of gender inequalities in access and utilization of water and sanitation facilities in universities including selected EAUs. This paper aims to explore the gender responsiveness of access and utilization of water and sanitation facilities and to ascertain the underlying gendered causes of the current status of water and sanitation facilities in EAUs. The paper adopted cross-sectional gender focused study design. A total of 701 respondents were interviewed at both Makerere and Dar es salaam Universities. Qualitative gender disaggregated data was collected using semi-structured and in-depth interviews, focus group discussions and follow up site visits for observations.

*Keywords: gender, water, sanitation, facilities, east african universities, makerere university, university of dar es salaam.*

*GJHSS-B Classification : FOR Code: 040699*




*Strictly as per the compliance and regulations of:*

© 2015. Kebirungi, Harriet., Kabonesa, Consolata., Kimwaga, Richard Joseph., Majaliwa, Jackson-Gilbert Mwanjalolo. & Luboobi S. Livingstone.. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License http://creativecommons.org/licenses/by-nc/3.0/), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

# A Gender Perspective of the Status of Water and Sanitation Landscape in East African Universities

Kebirungi, Harriet. [α], Kabonesa, Consolata. [σ], Kimwaga, Richard Joseph. [ρ], Majaliwa, Jackson-Gilbert Mwanjalolo. [ω] & Luboobi S. Livingstone. [¥]

*Abstract-* Access and utilization of adequate water supply and sanitation facilities is high on the agenda of both International, national, and local communities including East African Universities (EAUs). Despite global demand for higher education characterized with increased male and female enrolment, the current levels of access and utilization to water supply and sanitation facilities remain largely inadequate and gendered in EAUs. Among the contributing factors is limited gender scholarship to question the causes of gender inequalities in access and utilization of water and sanitation facilities in universities including selected EAUs. This paper aims to explore the gender responsiveness of access and utilization of water and sanitation facilities and to ascertain the underlying gendered causes of the current status of water and sanitation facilities in EAUs. The paper adopted cross-sectional gender focused study design. A total of 701 respondents were interviewed at both Makerere and Dar es salaam Universities. Qualitative gender disaggregated data was collected using semi-structured and in-depth interviews, focus group discussions and follow up site visits for observations. Water and sanitation facilities were geo-referenced and analysed using geo-statistics techniques and Euclidian distance in ArcGIS 10.1. Gender concerns were captured both in access and utilization modeling gender related criteria in the reclassification of the number of toilet per person. Strong evidence indicates that EAUs are gendered and exhibit severe deficiencies in water and sanitation facilities. Major contributing factors of the observed deficiencies in water and sanitation facilities were lack of gender focused research, rapid increment of student enrollment, lack of water and sanitation policies and prioritization, decline in government support associated with liberalization and expansion of universities among others. Based on these findings, there is need to improve and engender the current water and sanitation infrastructure, abstraction and storage (water harvesting) to accommodate the increasing number of students in EAUs. There is also need for gender focused research to be carried out to determine the most appropriate design and distribution of water and sanitation facilities to cater for the high numbers and diverse needs and interests of male and female students in EAUs.

*Keywords: gender, water, sanitation, facilities, east african universities, makerere university, university of dar es salaam.*

*Author α: Kyambogo University, Kampala Uganda.*
*e-mail: kebirungiv@yahoo.co.uk*
*Author σ ω ¥: Makerere University, Kampala Uganda.*
*Author ρ: University of Dar salaam, Dar es Salaam Tanzania.*

## I. Introduction

Increased global demand for higher education, inspired by Education for All (EFA), Millennium Development Goals (MDGs) with specific reference on access and gender has led to increased male and female enrolments (UNESCO 1998; Tiyambe and Adebayo 2004; and Mamdani 2007) in Universities including those in East African Universities (EAUs). For example, student enrolments increased from 2,712 in 1970 to 37,101 (44% females) in 2014 and from 14 in 1970 to 21,502 (36.5% females) in 2012 at Makerere University and at University of Dar es Salaam 2014 respectively. Half the number of these students lived in the same halls of residence designed in 1960s and 1970s.The number of students has exceeded the current university infrastructure, putting a strain on the limited and aged water and sanitation infrastructure most of which was designed in the 1950 and 1960s for very few male staff and students.

Due to persistent gender inequalities, the status of water and sanitation facilities in EAUs hides facts about male and female vulnerability and wellbeing. We need a critical feminist perspective to question the water and sanitation facilities in EAUs. International commitments on water and sanitation in education are useful in this inquiry. The approach presents high potential in understanding gender inequalities rooted in, and reproduced by, historic and structural male favored management to productive resources including water and sanitation resources in universities.

The global water deficit stands at 768 million people lacking access to improved drinking water and 2.5 billion people lacking access to improved sanitation services. The declaration on water and sanitation access and utilization as a human right (UN, 2010); Sustainable Development Goals (SDG) 6 with emphasis on secure water and sanitation for all for a sustainable world; the Millennium Development Goals (MDG) 7c's on the minimum requirement for water at protected community-level sources, such as tube wells, and for sanitation at household-level sanitation facility, such as household pit latrine (Cumming*et al.*, 2014) ; and its benchmark that focus on water and sanitation in some pre- university educational institutions like primary and



© 2015 Global Journals Inc. (US)

secondary schools in developing countries (Sommer, 2012; Crofts and Fisher, 2012; WHO/UNICEF, 2012) are all recognized in this paper.

This paper highlights gaps in the MDG (7c) on water and sanitation benchmark, which treats communities and households as homogenous; and marginalizes both the qualitative and quantitative gender perspectives of water and sanitation at global level. In addition, the gender aspects in other communities like EAUs who use other sources of water and sanitation facilities like piped water and flush toilets have not been captured in the global water and sanitation statistical deficit. It is also not clear whether the declaration on water and sanitation access and utilization as a human right (UN, 2010) has been realized in EAUs and yet these institutions are least well understood in relation to feminist thinking, about water and sanitation. Male and female students being the main stakeholders in EAUs have diverse needs and interests related to access and utilization of water and sanitation facilities. For example, it expected that female students require more water and sanitary facilities for bathing and washing especially during menstruation cycle than their male counterparts. Therefore it is mostly female students who are likely to be more affected by lack of or inadequate hygiene and sanitation facilities in public places such as universities.

Several university based studies have focused on student enrolments, quality and relevance of education; funding and technological innovations (Kasozi, 2004; Mamdani, 2007; Bhatia; & Dash, 2010). There is limited information on gender responsiveness of water and sanitation access and utilization in Universities. This paper aims to 1) explore the gender responsiveness of water and sanitation facilities' availability, acceptability and accessibility in EAUs and to 2) ascertain the underlying gendered causes of the current status of water and sanitation facilities.

## II. Theoretical Considerations

This study uses the theory of political sociology of water resources management (Mollinga, 2008) and the theory of water questions in feminism (Ahlers and Zwarteveen, 2009). The political sociology of water resources management theory stresses that water resources management is an in inherently political process which is based on the idea that water control is at the heart of water resource management and should be conceived as a process of politically contested resource use. According to Mollinga (2008), natural resources management (NRM) including water and sanitation resources has several components and dimensions that influence each other. Mollinga points out that NRM problem require an understanding of both natural resources systems and their interactions with human (management) systems which affect water provision, access and utilization. Water control has three dimensions: a technical/physical, an organizational/-managerial, and a social economic and regulatory. These generic categories refer to respectively, the manipulation of the physical flow and quality of water, the guiding of the human behavior that is part of water access and use, and the social economic, administrative and other structures in which water management is embedded and that constitute conditions and constraints for management and regulation.

The theory of water question in feminism highlights that water control perpetuates gender inequities (Ahlers and Zwarteveen, 2009). In the past, water resource management policies were driven by expanding supplies, or developing more sophisticated technologies to capture hitherto untapped sources of water, today's focus is primarily on institutional and legal reform. This raises the question of water allocation whose claim to how much water is provided which overshadows the previous dominant focus on distribution that is how to get a certain volume to a certain location at a particular time. Today's water questions involve complex distributional choices that are intrinsically political, yet it hides political choices of distribution through naturalizing, universalizing and objectifying abstractions (Ahlers 2005b; Boelens and Zwarteveen, 2005; Gleick*et al.*, 2002; Moore 1989; Zwarteveen 1998). This position is useful in articulating water and sanitation problems in EAPUs from a gender perspective by recognizing historical and current power dynamics in institutions which perpetuate gender inequality as a structuring force. To understand access and utilization of water and sanitation in EAUs, we position this study in a gender approach that recognizes the interaction of social, political and economic configurations as historical and dynamic. A gender analysis demands critical scrutiny of how particular conceptual constructs reify and reproduce boundaries and binaries that demand questioning, such as those between the natural and the social, institutions and human, which are important to this study.

Access and utilization of of resources including water and sanitation facilities is a right or opportunity to use, manage or control a particular resource (Nicholas et al., 1999). Resources may be economic (land or credit) political (participation in decision making in government or in local institutions like universities) and social (education and training). In general women require different levels of access and utilization of resources based on their productive, reproductive and community management roles (Moser, 1993), In the context of EAUs, both theories by Mollinga (2008) and Ahlers and Zwarteveen, (2009) question disputes and controversies rising from water resource management, access and utilization which result into gender inequalities. The main concern is that in water resources management, there are different individuals or groups



© 2015 Global Journals Inc. (US)

involved who have different interests. The focus lies in the fact that societal issues around water management are proliferating (Joy et al, 2008).

Therefore, both political sociology of water resources management and water question in feminism theories are important to the questioning of gender inequalities in access and utilization of water and sanitation facilities and their underlying causes in EAUs. Key variables of investigation and analysis will include: availability (adequacy of water and sanitation facilities); acceptability (gender specific facilities, offering technical safety and use of water and sanitation facilities in a way that ensures privacy and dignity for females and males); and accessibility (whether water and sanitation facilities are accessible to everybody, without any threat or insecurity and discrimination). These concepts are investigated against the duty bearer obligation to respect, protect and fulfill their role to ensure that students' right to appropriate water sanitation facilities is realized.

## III. Methods and Materials

The study was undertaken at two East Africa Universities namely; Makerere University, Uganda and University of Dare-salaam, Tanzania (Figure 1). Distance to toilet and number of toilet per person were modelled using spatial analyst in ArcGIS 10.1. For each University, toilet, water and storages facilities were visited and geo-referenced. For each toilet facility observations were made on the toilet type (seating or squatting) and status (availability, accessibility, acceptability, cleanliness).For water reservoir tanks in the toilet and those elevated on the buildings, the capacity of the water tanks was determined. Each facility was geo-referenced using Etrex 10 GPS with 2 m accuracy. The information was entered into ArcGIS version 10.1 to obtain toilet and water facility distribution maps for male and female students (Point maps). The normality of the data was crosschecked using geostatic wizard, and transformation performed to normalize the data. GIS layers were generated for each of the following parameters: toilet per student distribution, and water and storage facility distributions using krigging (interpolation) extended to the boundaries of each University. The toilet per person layer was reclassified using the Planning Guidelines for Minimum Numbers of Toilets at Public Places and Institutions in Disaster Situations adapted from The Sphere Project (2004) on toilet use for both short and long term as: 1 toilet to 30 female students and 1 toilet to 60 male students. Distance to toilet and water facilities maps were generated using the Euclidian distance function under spatial analyst tool in ArcGIS 10.1. These layers were reclassified using the standard plumbing code: residential, (0-10 m), exception (10-91m), public facilities (91-152m) and inappropriate for >152m. The amount of water required for a particular day was computed based on the toilet utilization and the standard required volume of water per person per utilization as 20-40 liters per user per day for conventional flushing toilets connected to a sewer. The water deficit per toilet was computed as a difference between the available water at each toilet and the required amount in a day.

A cross-sectional gender analytical design, using both qualitative and quantitative methods of research was adopted, to explore the gender responsiveness of access and utilization of water and sanitation facilities in EAUs.



© 2015 Global Journals Inc. (US)

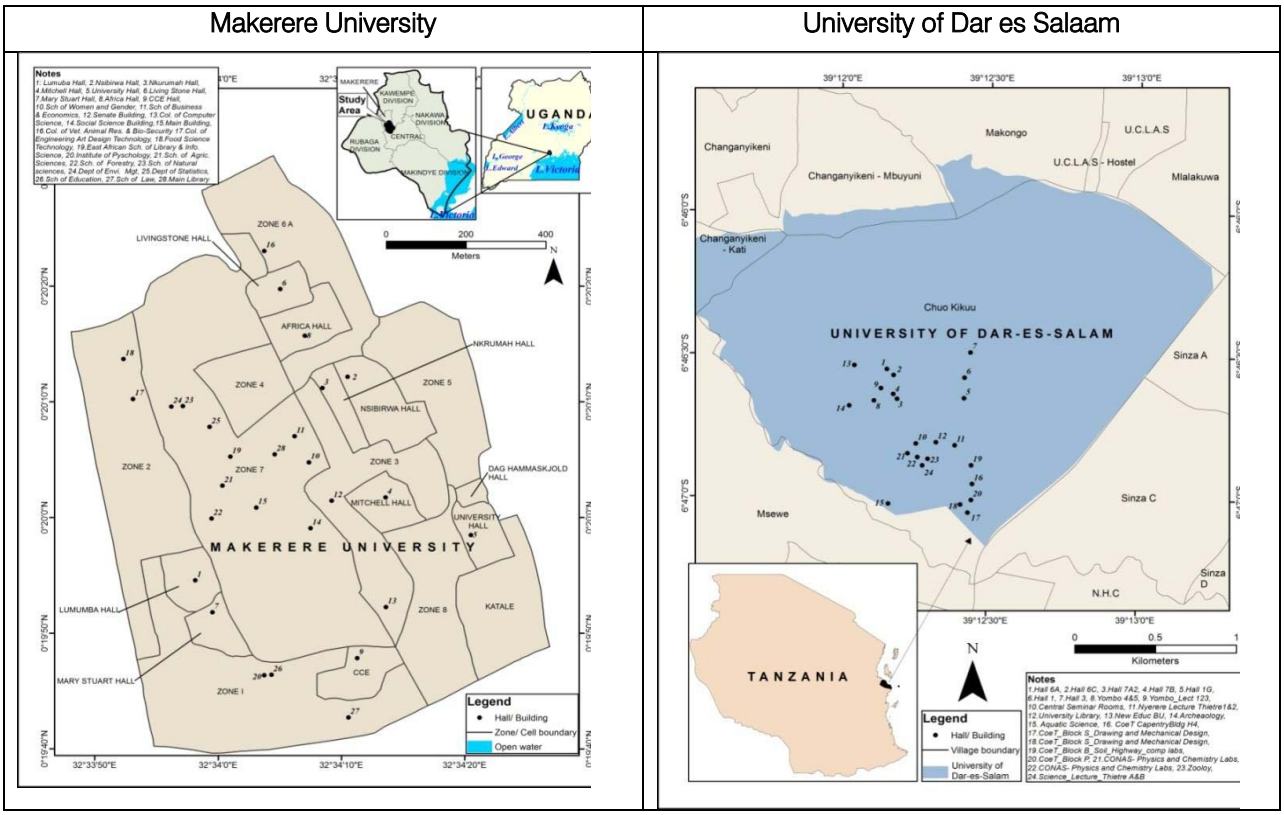



*Figure 1 : Location of the study area*

Both qualitative and quantitative data were collected to explore the current water and sanitation status through key informant interviews and semi-structured questionnaires administered to students at both universities.

Qualitative information was collected through key informant interviews. A total of twenty four (24) in-depth interviews were conducted, 12 interviews at each University with a sample of 16 (10 male and 6 female) from key respondents drawn from the university decision-making bodies and of 8 (4male and 4 female) key respondents drawn from student leaders at both universities. The objective of these key informant interviews was to allow for more in-depth investigation of gender issues related to the current status of water and sanitation and their gendered caused at both universities.

Qualitative information was collected through a questionnaire, administered to 1000 (one thousand) students was randomly selected at both universities with a proportionate distribution in the ratio of 50%. The 50% was again proportionately distributed with a ratio of 25 % male and female students respectively at both universities. This sample included resident and nonresident students. A total of seven hundred one (701) complete questionnaires were returned although the ratio of female to male student respondents was found to be disproportionately low as follows: 333 students [132 (36.6%) female and 201 (60.4%) male] for Makerere University and 368 students [158 (42.9%) female and 210 (57.1%) male] for University of Dar salaam.

Additional information was collected through focus group discussions (FGDs). A total of 8 (4 male and 4 female) FGDs was conducted with student leaders; 4 with custodians and 4 with cleaners at both universities. On average 8 student leaders (4 males and 4 females), 4 custodians (2 males and 2 females), 4 cleaners (2 males and 2 females) were invited for each of the focus group discussion. The objective of these discussions was to elicit information pertaining to gender issues, student's practices and behaviors in access and utilization of water and sanitation facilities in halls of residence and lecture theatres.

Follow-up site visits and observations were also conducted. An observation guide was generated with an intention to assess gender sensitivity and responsiveness of water and sanitation facilities in respect to water and sanitation availability, accessibility, acceptability, and adequacy, cleanliness of the facilities in lecture theatres and halls of residence; and student's behavior towards utilization of water and sanitation facilities.

Data collected from Key informants and observations were coded according to themes. Information obtained through questionnaires was entered in SPSS.



© 2015 Global Journals Inc. (US)

## IV. Results and Discussions

The objective of the study was to explore the gender responsiveness of the status of water and sanitation facilities' availability, acceptability and accessibility in EAUs.

*a) Gender and Locations with Available Water and Sanitation Facilities*

Distance to water and sanitation facilities is presented in Figure 2 and the area covered under each distance category is presented in Figure 3. At Makerere University, areas around lecture rooms and halls of residence are classified as residential. The pattern of exceptional, public facility condition rings is like an inversed R of 200 m width and about 1 km long. The inside of the above R and the boundaries of the University are classified as inappropriate (>152 m from the nearby water and sanitation facilities (NBWSF)) according to the Standard Plumbing codes. Areas under exceptional condition (10-91 m from NBWSF) (40.2%) dominant followed by public facility (30.9%) and inappropriate (28.1%). At University of Dar es Salaam, most of the northern part of the University has adequate water and sanitation facilities for both male and female students. Most parts of the southern parts are below the number of water and sanitation facilities required for females whereas most of the south eastern parts of are below the number required for females with Collage of Engineering and Technology (CoET) having adequate numbers of toilets for both male and female students. Residential conditions only cover less than 0.14% of Makerere University and 0.67% at University of Dar-esalaam. Residential area at Makerere University and University of as Dar es Salaam has uneven residential distribution of toilets.

With less 1% residential distributions, the female students are at a disadvantage because they require many toilets for their varied needs which make them use the toilets more frequently and for a longer times as explained by Lovell Banks (1991) [1].

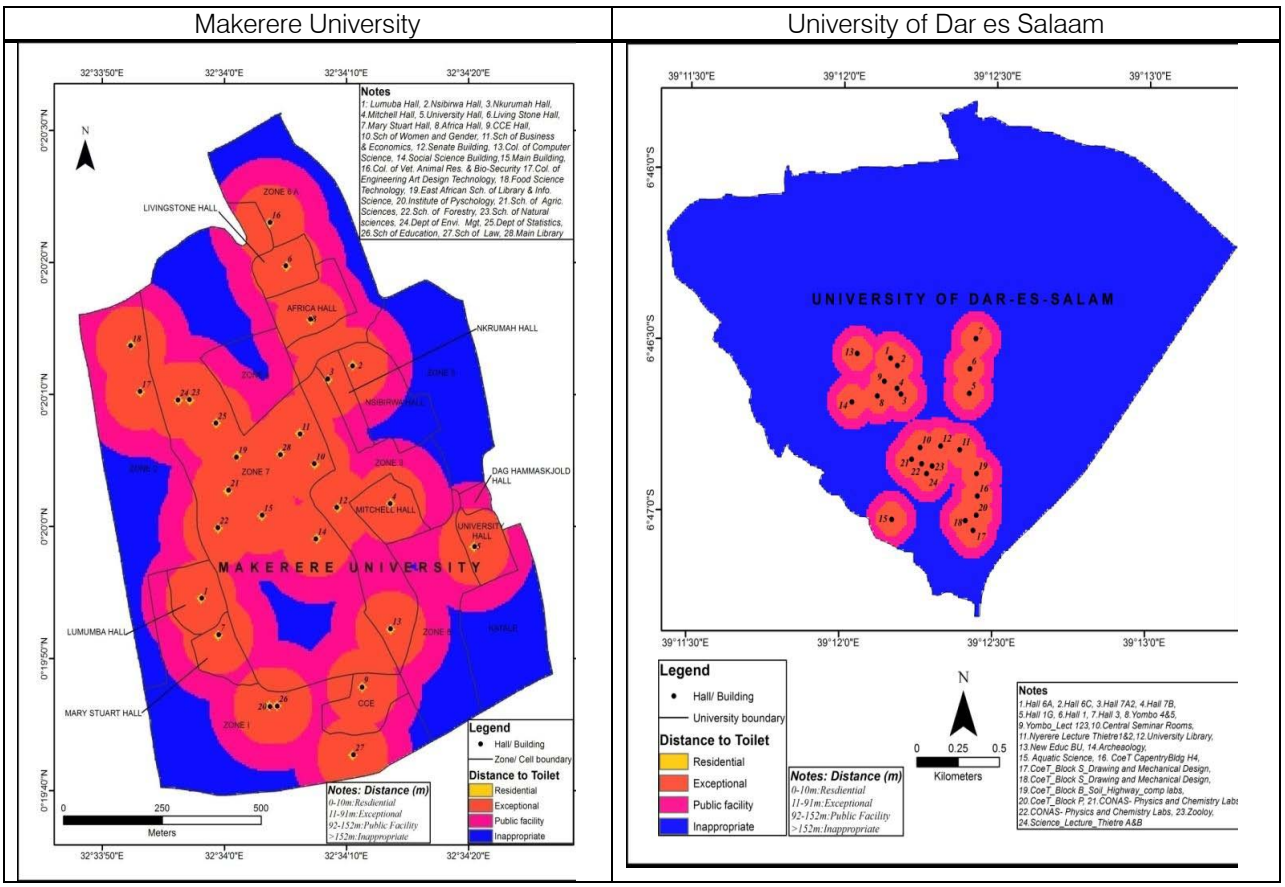



*Figure 2 :* Distance to toilets and water facilities at both EAUs

*…Other factors contributing to longer bathroom stays for women are menstrual periods; urinary tract infections, more common in women than in men, which require more frequent trips to the toilet; pregnancy, which reduces bladder capacity; and, finally, clothing (women have more clothes to manipulate than men do).*

*(ibid, pg 275)*



© 2015 Global Journals Inc. (US)

Lovell Banks further affirms that availability of toilets for females has been a long standing feminist critique of public facilities that tend to favour males than females cite as: (Taunya, 1991; Barcas, 2005; Greed,1996).

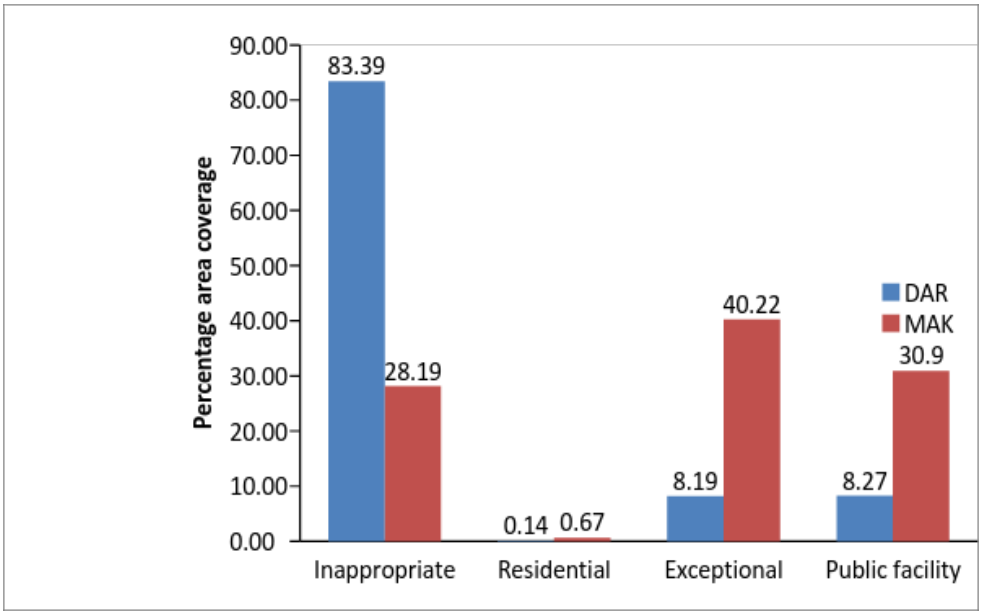



*Figure 3 :* Percentage of adequacy of toilet *distribution at both EAUs*

*b) Gender Relations in Acceptability to Water and Sanitation Facilities*

Figure 4 shows utilization of water and sanitation facilities at Makerere University and University of Dar es Salaam. Figure 5 depicts the area covered by each category of toilet per person. Generally at Makerere University there are water and sanitation inadequate conditions. Patches of favorable conditions for males and females are located to the western side, southern and northern zones of the university. Majority of the southern and eastern zones of the University was found to have inadequate water and sanitation facilities conditions. The zones of the University under inadequate conditions represent (66.85%), those adequate for males students represent 17.37% the rest is adequate for female students (15.78%). The rest of the university is inadequate at 84.22% meaning that although the university opened its gates to increased female students in the early 1990s not much has been done to make the environment comfortable for them.

Both universities have not paid much attention to the different interests on campus. Partly this is understandable because these structures were constructed before the female student numbers increased to the current numbers. Because the universities' do not consider the special interests of females therefore they promote a gender inequality that is questioned by feminists.



© 2015 Global Journals Inc. (US)

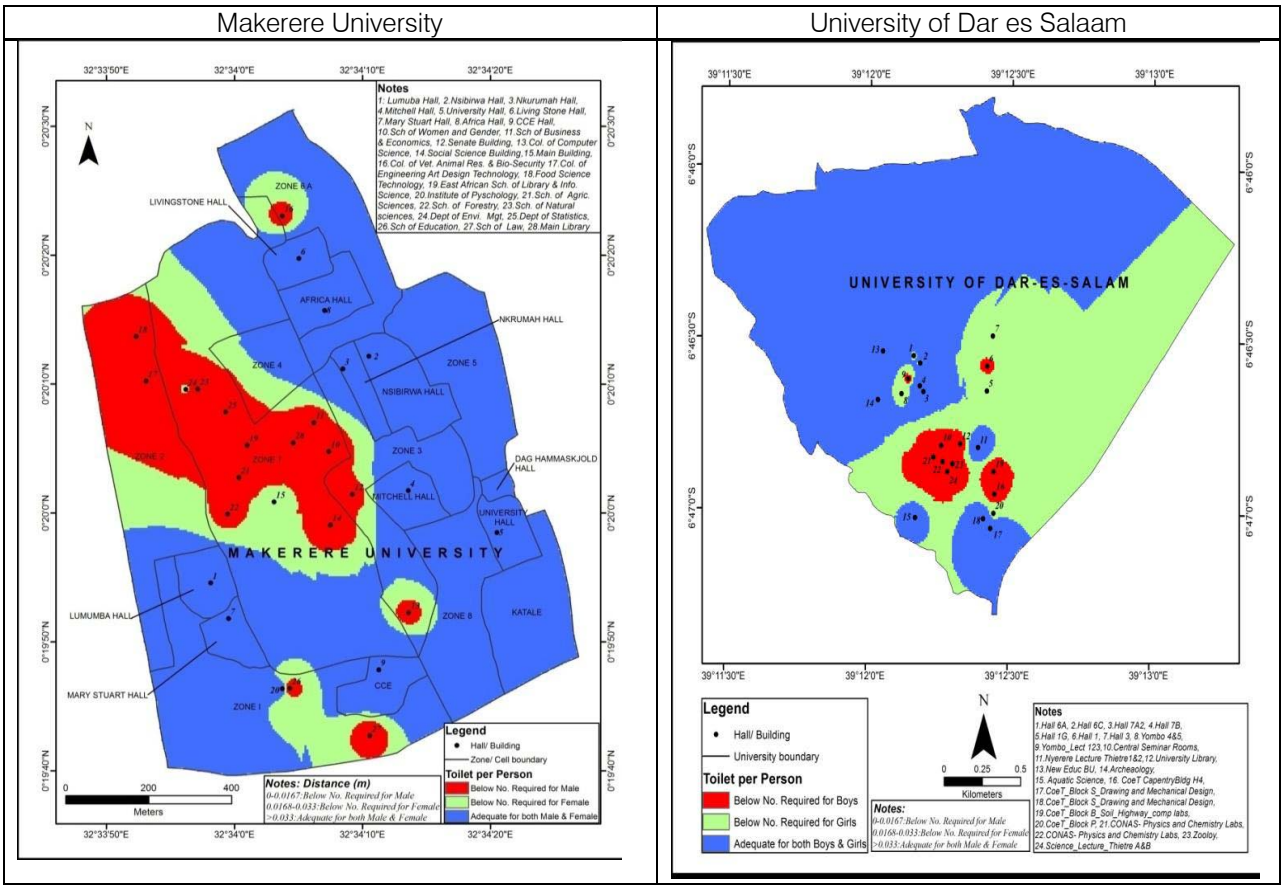



*Figure 4 :* Toilet per person at both East African Universities

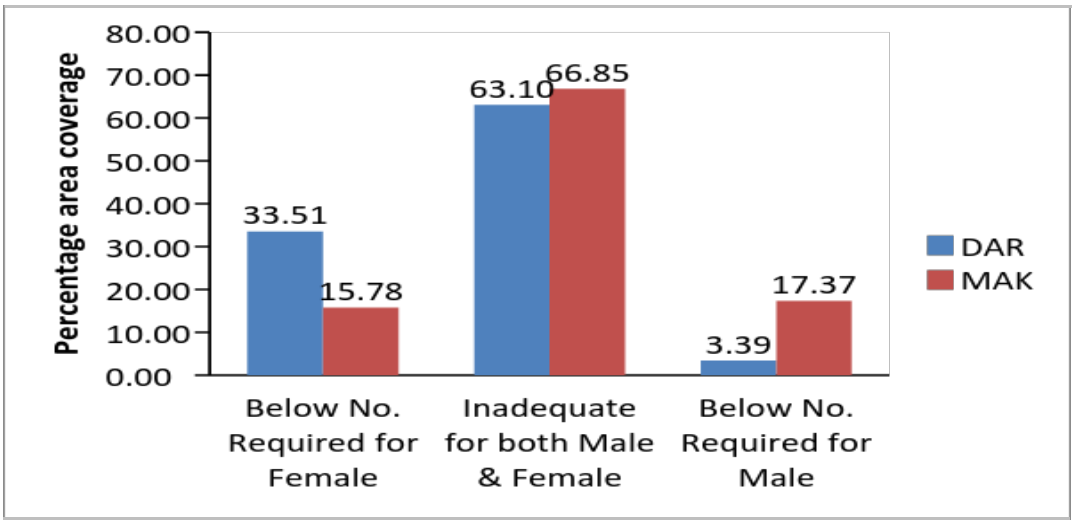



*Figure 5 :* Percentage area coverage for each category of toilet per person in EAUs

*c) Gender differences in Accessibility of Water and Sanitation Facilities*

Figure 6 shows water deficiency and Figure 7 depicts area covered by water deficiency. At Makerere University, the entire university is highly deficient in water (97%), and about 2% is moderately deficient, and less than 1% is not deficient. Areas with adequate quantities of water and sanitary facilities are Africa (female hall) and Nsibirwa male hall of residence with a student population of 510. At Nsibirwa, toilets have been modified from seating toilets and increased to squatting toilets with more water tanks installed. On the other hand, Africa (female) with a population of 498 promotes gender equality on campus. However if this residence is compared with Mary Stuart (female hall) with a high raise with 9 floors for female students with a population of 556 and it being located in a zone that is from slightly to moderately deficient in water supply points to the



© 2015 Global Journals Inc. (US)

political nature of water provisioning across the university. High deficient levels are also evident at entire University of Dar es Salaam, However areas of slight water deficiency at University of Dar salaam are around College of Engineering and Technology (COET) and the new buildings housing at the Faculty of Education, Aquatic Sciences and Archeology.

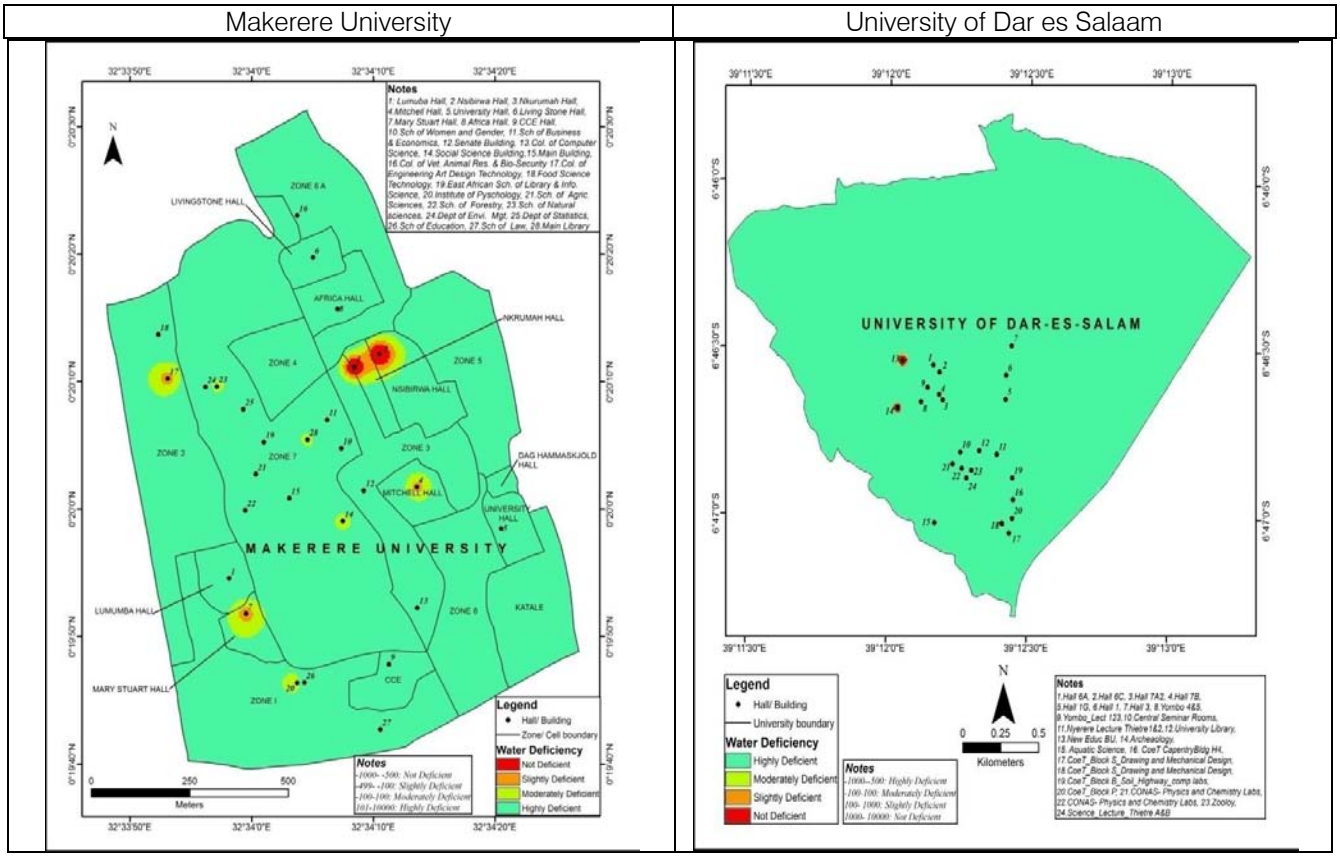



*Figure 6 :* Water Deficiency in both EAUs

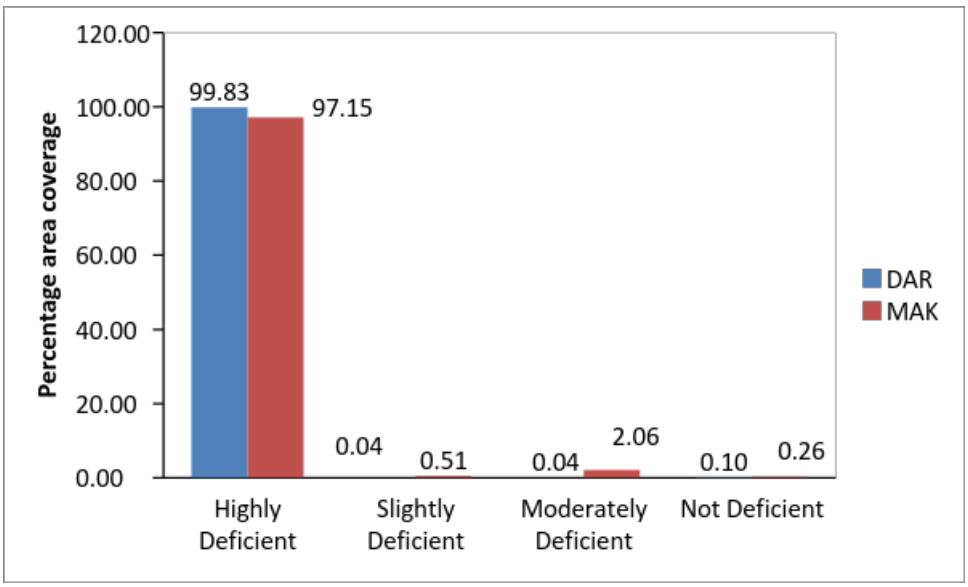



*Figure 7 :* Percentage area coverage under each water deficiency categories at both EAUs

In the context of the studied East African universities, deficiency in water and sanitation would imply violation of student's right to water and sanitation. This may have serious multiple and overlapping health, economic, and social impacts that disproportionately impact female students via impacts on behaviors like



© 2015 Global Journals Inc. (US)

academic performance and indignity (Coburn et al. 2015).

According to the United Nations Human Rights (2010), women and girls don't need toilets and bathrooms just for defecation. They also have a much greater need for privacy and dignity when menstruating. Inaccessible toilets and bathrooms make them more vulnerable to rape and other forms of gender-based violence (Sommer, 2010; United Nations, 2010). In East African Universities, inadequate access and utilization of water and sanitary facilities by students would also mean that there has been laxity by university managers who are mandated to manage water supplies to incorporate the principle of human rights to water and sanitation in university planning processes (Hunter, 2010; Heller, 2015; and UN Committee on Economic, Social and Cultural Rights (2003). This also exemplified by the least priority of water and sanitation issues in their strategic plans and other key policy documents, and less more gender aspects.

*d) Causes of Gender Inequalities in Water and Sanitation Facilities in EAUs*

The study explored the gender responsiveness of access and utilization of water and sanitation facilities in EAUS so as to understand the underlying causes of the current situation. The underlying causes were attributed to:- lack of prioritization of gender needs and interests of water and sanitation facilities ; gender neutral culture of infrastructural maintenance; non existence of gender specific water and sanitation policies and legal frameworks in higher education; gender neutral expansion of higher education institutions; naturalizing and universalizing of higher education; gender inequalities and political choices of distribution of financial resources in higher education; lack of gender disaggregated data or information on water and sanitation in universities; increased demand for higher education and lack of gender responsive sanitary materials and student practices.

i. *Non Prioritization of Gender Needs and Interests of Water and Sanitation Facilities in Universities*

The two universities prioritized physical infrastructure like space shortages in terms of teaching rooms, working spaces, seminar/practical rooms, laboratories, staff offices as well as staff and student accommodation and cleanliness and beautification of the surroundings (University of Dar es Salaam Five-Year Rolling Strategic Plan 2010/2011–2014/2015, Makerere Strategic Plan 2008/09- 2018/19). Although Bartram and Cairncross (2010) highlight water supply and sanitation as development priorities, the ambitions of the two University's strategic plans hardly prioritized water and sanitation infrastructure to address the needs and interests of male and female students increased numbers. This raises the water question in feminism of water and sanitary facilities allocation, claim to how much water and sanitary facilities are provided and distributional dimensions on how to get a certain volume to a certain location at a particular time. In other words, the University's strategic plans hide political choices of male and female who are the main users of water and sanitation facilities in EAUs (Mollinga, 2008; and Ahlers and Zwarteveen, 2009).

Focus group discussions (FGDs) conducted with male and female students pointed out a number of challenges in addressing water and sanitation as priorities. Students reported the diversity among university student population with varied needs and aspirations to life goals. They reported that male and female students develop strong aspirations to life goals towards completion of their studies as their main priority. However, it was noted that majority of student whom are females developed additional needs for water and sanitation than their male counterparts. They reported another set of both male and female students who want to be associated or identified with the universities as a priority regardless of aspirations to life goals. This group of students did not complain of any deficiencies in the university operations. To them they perceived water and sanitation as secondary needs. The study further points out other male and female students who were unaware that water and sanitation are basic needs or human rights which must treated as priorities and claimed from the university authorities who are charged with obligations to provide favorable water and sanitation facilities. While other students perceived toilet issues neither as dirt, private and shameful and not important topics for discussion in public nor cannot be demanded publicly. Lack of prioritization of gender concerns and maintenance of infrastructure poses all kinds possible ill-health to female students. Based on the above analysis in the EAUs, there was lack of prioritization of gender concerns and male and female students have not conceived water and sanitation as gender and basic needs or human rights as requiring political contestation with ultimate goal of improving their health wellbeing

An interaction with a key informant at Makerere University made reference to the mission, vision and core values as university main priorities.

> *We prioritize teaching and learning as our core functions. There are many urgent, yet competing priorities in the university like expansion of study centers, research, increase student enrollments and building institutional partnerships. Water and sanitation facilities which do not attract revenue to the university nor do they add scores on university ranking. These are mere fixed utilities, private and dirt not critical priorities in university budget frameworks.*
>
> *(Male Key informant, Makerere University)*

This statement confirms our earlier statement that water and sanitation issues were not priority issues to university management. This position of university



© 2015 Global Journals Inc. (US)

management propagates and reproduces gender inequalities at the studied universities.

ii. *Gender neutral culture of Water and Sanitation Infrastructural Maintenance*

There were water and sanitation infrastructure systems e.g. water stand standpipe, water reservoir tanks, toilets systems among others that were no longer used because they were no longer repaired or maintained and they were too old because of lack of maintenance in their earlier stages of deterioration. For example students at University of Dar es Salaam collect water from outdoor tanks provided by water vendors outsourced by the university to supply water using water tracks. This finding is supported by Sanders and Fitts (2011) who indicated that water supply facilities were affected by systems which were not maintained and therefore falls into disuse. Surprisingly, new facilities at the two universities are built, but are left with no funds for water and sanitation operation and maintenance. This creates a "use-it-or-lose-it environment," resulting in future over expenditure when they breakdown (Key informants Makerere University and University of Dar es Salaam Feb. 2015). This again confirms universities' lack of gender prioritization in water and sanitation interventions in EAUs.

An observation was made on status of water and sanitation facilities in halls of residence and lecture theatres at the two universities. Majority of these facilities in the two universities were not adequately functioning due to insufficient water supply. The facilities were characterized with blockages, bust pipes, leakages as a result of aged pipes and overload of water and sanitation wastes causing flow backs. Although Samwel and Gabizon's (2009) recommend indoor toilet facilities for proximity purposes with female friendly facilities, both indoor (halls of residence) and outdoor (lecture theatres) toilets displayed inadequate sanitation with floors covered with waste water, making the environment not favourable, unhygienic and a threat to especially female students' health. This unfovarable status led to less utilization due to the stench coming from dirty toilets. Similar findings were reported in the United Kingdom and Sweden by (Barnes and Maddocks and Lundblad et al. 2002). The findings also support those of Jasper et al. (2012) in their study of developed and developing nations and their findings revealed inadequacies in water and sanitation provisioning in schools. The toilets that were conveniently used in this study were located at Malimu Julius Nyerere and CoET lecture theatres at University of Dar es Salaam and Africa and Nsibirwa halls of residence at Makerere University.

The impact of inadequate water and sanitary facilities was also characterized with long queues as stated:

> *Toilets and bathrooms in university of Dar es Salaam were made for very few students. A room in the hall of residence that was designed to accommodate two students is currently being occupied by eight to twelve students. A proportional increase in toilets and bathrooms has not been made to meet diverse water and sanitation needs of male and female students. In the morning and evening we queue for toilets and bath facilities. We sometimes miss or go un bathed or postponed toilet use especially when students are scheduled for early morning lectures. For us female students when we are in our menstruation periods, our desire is to have adequate privacy. However, we do not enjoy our privacy because bathing facilities are shared due to inadequacy. Students with heavy menstruation period flows that require frequent changing of sanitary towels do not attend lectures due to non functional of water and sanitary facilities*
>
> *(FGD, University of Dar es Salaam).*

A number of feminists have argued that females should be provided with not only adequate toilets but the surrounding environment should be welcoming and allowing females to enjoy privacy while using these facilities as opposed to dirty male spaces (Taunya Lovell Banks, 1991, Barcan, Ruth (2005)[1] Greed (1996)[2]).

> *The construction and built-environment professions which have decision making powers over toilet provision. It is argued that the underrepresentation of women within these groups inevitably affects members' a spatial (cultural and social) attitudes towards toilet provision, and the results are manifest in the nature of the gender-biased nature of the spatial end product (namely lack of provision*)
>
> *(see Greed (1996, pg. 573-574)*

Upadhyay *et al.* (2007) highlights that avoidance of toilet use may contribute to a high risk associated continence-related issues like urinary tract infections. This assertion is supported with the finding of this study that students' common illnesses were urinary tract infections (UTIs) due to postponement of releasing fecal and urine, typhoid due to consumption of contaminated water, malaria as a result of water logging and stagnated pools of water in toilets and bathrooms.

Both the male and female students also reported vandalism and theft of their water and sanitation facilities in the halls of residence and lecture theatres. These acts of vandalism take a number of forms including theft of valuable metal pipes, fittings and manhole covers leading to an increase in the utility's

[1] Dirty Spaces: Communication and Contamination in Men's Public Toilets. Journal of International Women's Studies, 6(2), 7-23. Available at: http://vc.bridgew.edu/jiws/vol6/iss2/2

[2] C H Greed (1996) Planning for women and other disenabled groups, with reference to the provision of public toilets in Britain. Environment and Planning A 1996, volume 28, pages 573-588. http://www.environment-and-planning.com/abstract.cgi?id=a280573



© 2015 Global Journals Inc. (US)

maintenance costs. The extent of vandalism and theft experienced in studied universities have a direct and significant impact on the performance of a utility, and where the service is negatively affected, this will ultimately impact on the well-being of university communities especially on male and female students who are the main users of water and sanitary facilities on campus. The status of water and sanitation facilities in EAUs is also exacerbated by disputes and controversies, compounded by gender neutral culture of infrastructural maintenance. This status perpetuates gender inequalities in water allocation, distribution and utilization in EAUs.

iii. *Nonexistent of Gender Specific Water and Sanitation Policies and Legal Frameworks in Higher Education*

Gender specific policies and frameworks for sustainable sanitation and water management are a crucial pre-condition for the implementation of any sanitation and water management measure, as they are the basis for their success and sustainability (GWP 2008). Uganda and Tanzania had national water policies developed and were being implemented. The policies lay a foundation for sustainable development and management of water resources in the changing roles of government from service provider to that of coordination, policy and guidelines formulation and regulation (United Republic of Tanzania, (2002) and The Republic of Uganda, (1999). Analysis of National water policies in Uganda and Tanzania were conducted. Roles and responsibilities of different stakeholders and those of educational institutions to provide water and sanitation facilities to their communities were clearly spelt out. This means that the studied universities are responsible for customizing these policies and implementing them on behave of governments. However, responsible ministries and organizations were not disseminating the policies to the intended users including universities. The study also found out that universities had not formulated their own water and sanitation policies and regulations. An interaction with key informants and students at both universities concurred that they had no knowledge of existence of water and sanitation policies and regulations nor were they aware of the importance of those policies and regulations towards improvement of water and sanitation systems and services in the universities.

This means that students who are the main users of water and sanitation are included in decisions making regarding planning, construction, operation, maintenance and management of university based water and sanitation interventions. This may reproduce gender inequalities and further create boundaries and binaries of femininity and masculinity (Knights 2015).

A lack of a sound institutional framework on water and sanitation was found to be another root cause of many failures of water and sanitation provision at the studied universities. Absence of university water policies and regulations impended clear planning, management and coordination of water and sanitation interventions at University based user units. Major outcome due to absence of water and sanitation facilities is declining water and sanitation facilities and services leading to poor cost recovery and ultimately failed investments that do not meet either current or future demand (World Bank, 2014).

A study conducted globally by Montgomery and Elimelech (2007) discussed that in many developing countries, difficulty in enforcing standard creates a situation where water and sanitation does not receive due attention. A study in Romania showed that the government lacked experienced staff, inappropriate institutional framework, unclear role and responsibilities, inefficient management. Another study conducted in Buenos Aires by Hardoy and Schusterman (2000) mentioned that the failure to extend water and sanitation services was due to the lack of appropriate social policies and the lack of proven models.

iv. *Gender Neutral Expansion of Higher Educational Institutions*

The extensive widening of access to primary and secondary education has been attributed to a rapid increase in the number of people at the traditional ages for attending higher education institutions, and a higher proportion of secondary school graduates progressing to thread their way to higher education. Until independence, Makerere University was the only HEI in East Africa. To date Tanzania has 10 public and 18 private universities while in Uganda, there are currently 8 public and 30 private Universities. Expansion of higher education institutions in Africa face social economic challenges that begun from the 1980s and the subsequent structural adjustment reforms undertaken by many African governments led to the gross underfunding of higher education, which had been mainly supported by public funds (Moody's 2012; Arestis & Sawyer, 2004; Teferra and Altbach, 2004). In Uganda and Tanzania, the costs for operation and maintenance of higher education infrastructure face fiscal problems with water and sanitation infrastructure receiving almost no attention. Fiscal challenges problems are also experienced by wealthy industrialized nations, although the magnitude of fiscal problems is greater in Africa than anywhere else in the world (Moody's 2014; Teferra & Altbach 2004).

*e) Gender Opportunities and Constraints of Utilization of Water and Sanitations Facilities*

i. *Naturalizing and universalizing Higher Education*

Tanzania and Uganda are among the countries who signed the commitment to implement Education for All (EFA) and The Millennium Development (MDG) goals. The purpose of EFA is defined as meeting the basic learning needs by 2015 for every person (Child,



© 2015 Global Journals Inc. (US)

youth and adults) to benefit from educational opportunities. EFA Goal 2 on access and Goal 5 on Gender remains a strong agenda in education sector implementation in countries of Tanzania and Uganda (ESSAPR 2012-2013, SEDP II 2010). The Millennium Development Goals (MDGs) is meant to be achieved by 2015. The Goals respond to the world's main development challenges. The MDGs were drawn from the actions and targets contained in the Millennium Declaration that was adopted during the UN Millennium Summit in September 2000. MGD Goals 2, 3, 6 and 7 on universal primary education, promotion of gender equality and other diseases and ensuring environment sustainability. EFA and MDGs respectively remain part and parcel of countries national development plans (ESSAPR 2012-2013, SEDP II 2010). Increased demand for higher education is also emphasized in 1998 by UNESCO Declarations during the World Conference on Higher Education. Article 26(1) of the Universal Declaration of Human Rights reaffirms "*Everyone has the right to education . . . higher education shall be equally accessible to all on the basis of merit.*" Increasing the participation and role of women in higher education was also emphasized (Altbach *et al*. 2009).

In response to fulfill the commitments of EFA and MDGs, Tanzania and Uganda Governments established the Universal Primary Education (UPE) policy in 1995 and 1997 respectively. To cope up with increased pupil enrolments governments have established new schools, provided grant aiding of community schools, licensing and registration of private schools.

Tanzania and Uganda governments have used interventions such as liberalization and Public Private Partnership to ensure equitable access to higher institutions of learning. These interventions include; sponsor, support and admit students to tertiary institutions; implementation of the student loan scheme; affirmative action of awarding of 1.5 for and 1.1/2 points for Uganda and Tanzania respectively to all female candidates to assist them gain tertiary admission; implementation of the district quota system for admission of students to public universities; provision of scholarships; License private universities and institutions; and expansion of Higher Learning Institutions.

Despite massification of education in Tanzania and Uganda, there has not been new water and sanitation infrastructure developed to meet increased number of students at universities. The little infrastructural improvement has majorly focused on expansion of teaching and learning and administration with limited consideration to expand water and sanitation infrastructures especially in halls of residence and lecture theatres. A discussion with key informants at the two universities revealed that configurations and modifications of toilets were made on old buildings which are already strained with old water and sanitation systems. An observation during assessment of water and sanitation at the two universities indicate that new infrastructural developments and modifications of water and sanitary facilities were not addressing the varied needs and interests of student with special needs.

ii. *Gender Inequalities and Political Choices of Distribution of Financial Resources in Higher Education*

Financing and cost recovery are key issues for sustainable water and sanitation schemes (Osumanu, 2010). The impact of better and gender responsive university financial systems on improving the provision for water and sanitation at universities may have direct implication on improving the health wellbeing of male and female students or indirect for example on improving male and female student performance due to reduced water and sanitation related illnesses especially among female students who use more water than their male counterparts.

The study found out that capital and operating budgets at the two universities were reported to be insufficient due to the declaiming role of governments to fund higher institutions of learning. These findings support those of (Moody's 2012; sawyer 2004; Teferra and Altbach 2004) who indicated that the myriad of social economic challenges that plagued Africa, beginning from the 1980s and the subsequent structural adjustment reforms undertaken by many African Governments led to the gross underfunding of higher education, which had been mainly supported by public funds. Another study done by Telmo (2002) mentioned that in Mali the lack of 34 financial means by government was identified to be the main obstacle to the improvement of water supply and sanitation. Several authors (Moody's 2014; Teferra & Altbach, 2004) also report that similar fiscal problems are also experienced by wealthy industrialized nations, although the magnitude of fiscal problems is greater in Africa than anywhere else in the world. This situation is also coupled with pressure from the International Monetary Fund (IMF) and the World Bank to restructure its economy.

Key informants at the two universities concurred with the above scholars and revealed that the costs for operation and maintenance of higher education infrastructure face fiscal problems. The informants further reported that universities were constrained with teaching and learning financial demands with small budgets to address water and sanitation emergencies at universities.

iii. *Lack of Gender Disaggregated Data or Information on Water and Sanitation in universities*

The importance of accurate and reliable statistical data for proper planning and development of water and sanitation in universities cannot be

© 2015 Global Journals Inc. (US)

overemphasized. The objective of statistical data is to build a reliable and accurate water and sanitation profile in universities, which is used to negotiate with government and development partners. It also guides the planning and design of intervention programmes. Key informants and survey with students at both universities were in tandem that University duty bearers responsible for the provision of water and sanitation have not engaged in data collection, analysis to define water and sanitation needs for male and female students as priorities.

According to NETSSAF (2008), the purpose of the baseline data collection within the planning procedure is to collect background information that is essential to determine the requirements for an adequate water and sanitation in an institution, both from a technical point of view, and from the user's perspective. Water and sanitation baselines need to be conducted through a comprehensive, participatory evaluation of the current level of services and the perceptions of the users towards sanitation and water within an institution. The objective of this approach is not only to facilitate participatory decision making in the planning process, but also to improve further designs to meet male and female student user needs and to address the water and sanitation operation and maintenance challenges of day-to-day service delivery.

This challenge is due to lack of an institutional water and sanitation monitoring framework. The lack of gender focused has led to very little effort to upgrade or monitor water and sanitation infrastructure. Yet water and sanitation prioritization and monitoring indicators would be useful on focusing on the hardware or software (systems) to deliver water and sanitation, quantity of water and sanitation of a given quality accessible by users (Moriarty *et al.*, 2011), or the safety of a facility that is easily accessible and sustainably operated at the user unit level (Potter *et al.*, 2011).

iv. *Increased Demand for Higher Education*

A study done by Gleick (1998) mentioned that water availability was affected by anthropogenic factor which was the population growth. For example a research done by Vairavamoorthy et al. (2007) showed that the availability water sources throughout the world were becoming depleted and this was aggravated by the rate at which populations were increasing, especially in developing countries.

The major implication for the growth of a young population lead to an increase in demand for social services like University education and water and sanitation facilities, which are not keeping pace with the growth. The unlimited population growth has ultimately outstrips the ability of the economy and institutions of higher education to meet the demand for water resource availability as is the case at Makerere University and university of Dar es Salaam. The findings support those of Panayotou (2000) and Madulu (2004) who highlighted serious concerns as to the effect of population growth on local resources such as water and sanitation. The lack of these services threatens not only the health and the environment of University communities but also that of people living in formal urban areas (McGranahan, (2007).

The situation has been exacerbated by the growth of housing infrastructure of towns and cities in Kampala and Dar es Salaam who have been connected to the old water supply and sewerage systems. An observation was made in the studied universities that although there were direct connections to water or sewage service, majority of these facilities were not adequately functioning due to system overload (Asoka *et al.*, 2013).

In an attempt to address the water and sanitation challenge, the universities have taken decisions to ration water. For example, at the University of Dar es Salaam approximately 10.000 liters of water is pumped in the morning at 5:30 and 7:00 in the morning and evening in lecture theaters and halls of residence leaving most of entire day and night without water (KI, UDSM). Higher population densities, combined with unequal access to adequate piped water, sanitation and refuse collection, mean that a large proportion of less affluent urban populations are at risk from faecal contamination and other environmental hazards.

v. *Absence of Gender Responsive Sanitary Materials and Student's Practices*

This section discusses anal sanitary materials used after defecation, sanitary for menstruation and students practices.

a. *Anal Cleansing Materials and Hand Washing Practices*

Anal cleansing is an essential part of overall personal hygiene. Not cleaning after defecation can lead to irritation of the surrounding skin, cystitis (mainly for girls and women), it is also an embarrassment because of odor. In the perspective of human rights to water and sanitation, University male and female students need to be availed with anal cleansing facilities and materials, taught and motivated to follow hygienic anal cleansing practices. However, findings from this study reveal that majority students (70.90%) males (81.90%) and (90%) female at University of Dar es Salaam and (77.7%) male and (82.9%) female at Makerere University were not provided with toilet paper for anal cleansing after defecation. Students in FGD at University of Dar es Salaam reported that it is a Tanzania custom for a male or female to use water with or without soap for cleansing the anal area after defecation. This assertion supports an observation made that toilet paper and soap are not being provided in all student toilets. Instead, buckets, and mugs were available in toilets or in the toilet area for collecting water for anal cleaning after defecation. The



© 2015 Global Journals Inc. (US)

fact that the University is highly water deficient which violets the custom of students at University of Dar es Salaam majority of whom are Muslims. Majority students at both universities used newspaper or any hard paper material as toilet paper, stone, stockings, handkerchiefs, stockings, underpants which eventually caused toilet blockages to sewerage systems. Both male and female students carried their own toilet paper while others defecated without cleaning because they could not afford buying toilet paper. Students at the two universities had reservations on the practice of carrying own toilets paper as stated:

> *When a student is seen with toilet paper, physiologically his or her friends think that he/she will soon be going to the toilet. We also fear that carrying toilet paper in our book bags or pockets has health implications associated with fungal infections.*

*(Female FGD, University of Dar es Salaam &Makerere University)*

Although this argument seems convincing, the scope of the study did not carry out a deep analysis to prove the assertion. However, given the unsanitary conditions in the university toilets, a further study need to be conducted to investigate whether toilet paper in toilets is more prone to be contaminated with diseases compared to that carried by students in their bags or pockets.

Literature exists on anal cleansing practices Pre University institutions. However, the scope of this scholarship has not been extended to Higher Institutions of learning including UDSM and Mak. The universities themselves have not conducted awareness creation on student's use of sanitary facilities and practices are ignored as stated by a key informant:

> "*I believe that everyone is a grown up person and think that there is no need for training grownups how to use the toilet and how to clean their bottom. Toilet manners are taught at home because culture begins at home. In my culture, talking about toilet issues is taboo. Teaching a grown up person on how to use the toilet and how to clean his/her bottom is taboo plus. As an old educated man, people might think that I have run out of ideas"*
>
> *(Key Informant University of Dar es Salaam)*

Some studies also highlight that anal cleansing is often ignored in presentations on hygiene and sanitation. The reason for this is that, in almost all cultures, dealing with or touching human feces is surrounded by many taboos. Because of these taboos, it sometimes seems easier to "just forget" about the subject (http://www.wsp.org/Hygiene-Sanitation-Water-Toolkit/BasicPrinciples/AnalCleansing.html (accessed 11/06/2014)

An assumption that UDMS and Mak students as grownups with adequate knowledge on the use of toilets without considering their cultural, social and economic backgrounds, does not promote health and cut down the costs of ill health treatments and repairs of University sanitary facilities. The presence of policy with an all inclusive frame work on proper water and sanitation practices of toileting and hand washing with soap after anal cleansing and convenient materials for disposal would yield health benefits. Cultures promoting say the use of soil, ash or sand to clean the hands after defecation in the absence of water and soap are prone to contracting and transmitting diseases like diarrhea and helminth infections because hands carry microbes and other pathogens if not properly washed (GWP 2008).

*b. Sanitation for Menstruation Management*

Sanitary bins to dispose of female used sanitary towels though few to match with the number of female student users were available in all toilets at both universities. The challenge was that whenever sanitary bins filled up, female students resorted to throwing them on the floor or placing them on the water cistern. This practice was observed at both universities in halls of residence and lecture theatres. Such situation led to littering of the place which attracted flies. A few female students reported continuous menstrual periods by mere look at used sanitary towels as state by a female student:

> "*Whenever I see used sanitary towels littered on the toilet floor, I straight away start menstruating regardless of my menstrual cycle. I menstruate throughout the University semester period. This has not only been affected my economic status due to money I spend on buying sanitary towels, but it has also limited my social interaction with fellow students because I feel like smelling blood all the time. Psychologically I feel that my reproductive health function has been affected and maybe I never have children when I get married. Sometimes I feel like dropping out of University but my parents will not understand my problem"*

*(Female student at University of Dar es Salaam, Nyombo lecture 4&5)*

The locations of sanitary bins was also said to be a challenge. Through observation, sanitary bins were placed outside the toilet, close to the hand wash basins. Students reported that they felt uncomfortable carrying used sanitary towels from the toilet to an open area where everyone else waiting in the queue to use the toilet would see them dropping them in the bin. Due to this fear, students instead resorted to leaving them on the toilet floor, place them on toilet water cistern or drop them in toilet causing blockages. The cleaners were being tasked to place them in the right facility. Furthermore, Universities did not have incinerators instead outsourced companies for safely disposal.



© 2015 Global Journals Inc. (US)

According to records at University of Dar es Salaam, the companies' collection was limited to once a week

## V. Conclusions and Recommendations

The selected East African Universities exhibit severe water and sanitation deficiencies. This status has perpetuated gender inequalities in availability, acceptability and accessibility of water and sanitation facilities. The link between natural resource management and their interactions with management systems which affect water provision, access and utilization has not been understood by EAUs as political process based on water control. The questions in feminism of water and sanitary facilities allocation claim to how much water and sanitary facilities are provided and distributional dimensions on how to get a certain volume to a certain location at a particular time are hidden and limit political choices of male and female who are the main users of water and sanitation facilities in EAUs.

Major contributing factors of the observed deficiencies in water and sanitation facilities were lack of gender needs and interests prioritization of water and sanitation; gender neutral culture of infrastructural maintenance; non existence of gender specific water and sanitation policies and legal frameworks in higher education; gender neutral expansion of higher education institutions; naturalizing and universalizing of higher education; gender inequalities and political choices of distribution of financial resources in higher education; lack of gender disaggregated data or information on water and sanitation in universities; increased demand for higher education and lack of gender responsive sanitary materials and student practices.

There is need to improve the current water and sanitation infrastructure, abstraction and storage (water harvesting) to accommodate the increasing number of students, need to formulate, gender mainstreaming water and sanitation policies into national frameworks, students behavior change, sensitization campaigns, need for a study to be carried out to determine the most appropriate design and distribution of water and sanitation facilities to cater for the high numbers of students. There is also need to assess student's perceptions and adaptive measures to the current water and sanitation status in East African Universities.

## VI. Acknowledgement

This research project has been made possible with financial support from Makerere Sida-Bilateral Research Programme. Special gratitude goes to all the respondents from University of Dar es Salaam and Makerere University and to Nsiimire Peter for maps generation.

## References Références Referencias

1. Adeleye, S. and Olumayokun, M.O. (2014). Problems of water supply and sanitation in Kpakungu area of Minna (Nigeria), ISSN 2283-7949 Glocalism: *Journal of Culture, Politics and Innovation (JCPI), 2014, 1-2.*
2. Ahlers, R. (2005b). *Fixing Water to Increase its Mobility: The Neoliberal Transformation of a Mexican Irrigation District. PhD Diss. Cornell University*.
3. Ahlers, R. and Zwarteveen, M. (2009). 'The water question in feminism: water control and gender inequities in a neo-liberal era'. *Gender, Place & Culture, 16: 4, 409 - 426.*
4. Altbach, P G. (2012). "Franchising—The MacDonalization of Higher Education" *International Higher Education*, *Winter 2012, pp7-8.*
5. Altbach, PG, Reisberg,L., and Rumbley. LE (2009) Internationalization within the Higher Education Context, *Sage Publications.*
6. Asoka, G W., Bunyasi, and M. M. Thuo, A.D.M. (2013). Effects of Population Growth on Urban Infrastructure and Services: A Case of Eastleigh Neighborhood Nairobi, Kenya. *Kenyatta University Institutional Repository.* http://aripd.org/journals/jaa/-Vol_1_No_1_June_2013/4.pdf http://ir-library.ku.ac.-ke/handle/123456789/12252
7. Arestis,P., and Sawyer, M. (2004). "Macroeconomic policies of the Economic and Monetary Union: theoretical underpinnings and challenges," Chapters, in: Neo-Liberal Economic Policy. *Chapter 7 Edward Elgar*.
8. Barcan, R. (2005). Dirty Spaces: Communication and Contamination in Men's Public Toilets. *Journal of International Women's Studies*, 6(2), 7-23.
9. Barnes, P. M. and Maddocks, A. (2002) "Standards in school toilets--a questionnaire survey" *Journal of Public Health Med (JPH), 24(2): 85-87.*
10. Bartram, J. and Cairncross, S. (2010). Hygiene, Sanitation, and Water: Forgotten Foundations of Health. *PLoS Medicine 7: 11. doi: 10.1371/journal.pmed.1000367.*
11. Bhatia, K., and Dash, MK. (2010) National Knowledge Commission–A Step towards India's Higher Education Reforms on India's Higher Education. *International Research Journal of Finance and Economics (IRJFE), 53, 46-58.*
12. Bloom, D, Canning, D., and Chan, K. (2006) Higher Education and Economic Development in Africa. *World Bank, Washington DC.*
13. Boelens, R. (2008). The Rules of the Game and the Game of the Rules. Normalization and Resistance in Andean Water Control *PhD thesis. Wageningen University, the Netherlands.*
14. Boelens, R., and Zwarteveen, M. (2005). Anomalous Water Rights and the Politics of Normalization: Collective Water Control and Privatization Policies in



© 2015 Global Journals Inc. (US)

the Andean Region. In Liquid Relations Contested Water rights and Legal Complexity, (ed). Roth, D., Boelens, R., & Zwarteveen, M. *97–123. London: Rutgers University Press*.

15. Corburn, J, and Hildebrand,C.( 2015) Slum Sanitation and the Social Determinants of Women's Health in Nairobi, Kenya. Journal of Environmental and Public Health Volume 2015 (2015), Article ID 209505, 6 pages http://dx.doi.org/10.1155/-2015/209505
16. Crofts, T., and Fisher, J., (2012). Menstrual Hygiene in Ugandan Schools: An Investigation of Low-cost Sanitary Pads. *Journal of Water, Sanitation and Hygiene for Development (JWSHD), 2 (1), pp. 50 - 58*.
17. Cumming .O, Elliott. M, O. and Bartram, A J. (2014). Does Global Progress on Sanitation Really lag behind Water? An Analysis of Global Progress on Community- and Household-Level Access to Safe Water and Sanitation *PLoS ONE 9(12): e114699. doi:10.1371/journal.pone.0114699*
18. Gleick, P H. (1998) Water In Crisis: Paths To Sustainable Water Use: *Ecological Applications, 8(3), 1998, pp. 571–579 .The Ecological Society of America.* (http://countrymeters.info/en/Uganda, http://countrymeters.info/en/Tanzania: accessed 09.06.2015).
19. Gleick, P., Wolf G., Elizabeth. L C, and Reyes, R. (2002) The New Economy of Water. The Risks and Benefits of Globalization and Privatization of Fresh Water. *Oakland, CA: Pacific Institute for Studies in Development, Environment and Security.*
20. Greed, CH. (1996).Planning and Toilet Provision: an cistern's view of planning, *Planning Practice and Research, Vol. 11, No. 1, 99± 106, 199*
21. GWP. (2008). In Action Report, Global Water Partnership, *Drottninggatan 33.*
22. Hardoy, A., and Schusterman, R. (2000). New Models for the Privatization of Water and Sanitation for the Urban Poor. *Environment and Urbanization, Vol. 12, No. 2, p. 63-75*
23. Heller, L., (2015. The crisis in water supply: how different it can look through the lens of the human right to water? Cad. Saúde Pública, Rio de Janeiro, 31(3):447-449. [Retrieved from http://dx.doi.org/10.-1590/0102-311XPE010315]
24. Hunter, PR., MacDonald AM., and Carter RC (2010) Water Supply and Health. PLoS Med 7(11): e1000361. doi:10.1371/journal.pmed.1000361
25. Kasozi, ABK. (2004). University Education in Uganda: Opportunities for Reform. *Fountain Publishers, Kampala.*
26. Knights., D. (2015). Binaries need to shatter for bodies to matter: Do disembodied masculinities undermine organizational ethics? SAGE Journals, vol. 22 no. 2, 200-216: doi: 10.1177/1350508-414558724
27. Jasper, C.; TamLe,T., and Bartram, J. (2012) Water and Sanitation in Schools: A Systematic Review of the Health and Educational Outcomes, Int J Environ Res Public Health. 9(8): 2772–2787. doi: 10.3390/ijerph9082772
28. Joy, K.J., Paranjape, S.; Gujja, B.; Goud, V. and Vispute, S. (Eds). 2008. *Water conflicts in India: A million Revolts in the Making? Delhi: Routledge*.
29. Lopez-Quintero, C., and Freeman. P,. (2009). "Hand Washing among School Children in Bogota, Colombia" *American Journal of Public Health (AJPH), 99(1): 94-101.*
30. Lundblad, B., and Hellstrom, A. L. (2005). "Perceptions of school toilets as a cause for irregular toilet habits among schoolchildren aged 6 to 16 years" *Journal of School Health (JSH),_75(4): 125-128.*
31. Madulu, N. (2004). Assessment of Linkages between Population Dynamics and Environmental Change in Tanzania. http://www.tanzaniagateway.-org/docs/linkagebetweenpopulationandenvironment change.pdf [2015, March. 26]
32. Makerere University. (2013-2014). Fact Book, *Kampala.*
33. Makerere University. (2008/2009 - 2018/2019) Strategic Plan, *Kampala.*
34. Mamdani., M. (2007). Scholars in the Marketplace: The Dilemmas of Neo-Liberal Reform at Makerere University, 1989-2005. *Fountain Publisher, Kampala.*
35. McGranahan., G. (2007). The Rising Tide: Assessing the Risks of Climate Change and Human Settlements in Low Elevation Coastal Zones. *Environment and Urbanization, April 2007* vol. 19 *no. 1 17-37*
36. Mnisi, R. (2011). *An Assessment of the Water and Sanitation Problems in New Forest, Bushbuckridge Local Municipality, South Africa: Masters in the Disaster Management in the Disaster Management Training and Education Center for Africa at the University of The Free State.*
37. Mollinga, PP. (2008). Water, Politics and Development: Framing a Political Sociology of Water Resources Management. *Water Alternatives 1(1): 7-23.*
38. Montgomery, MA., Desai, MM., and Elimelech, M. (2010). Comparing the Effectiveness of Shared versus Private Latrines in Preventing Trachoma in Rural Tanzania. *American Journal of Tropical Medicine and Hygiene (AJTMH), 82: 4 693–695. doi: 10.4269/ajtmh.2010.09-0540*
39. Montgomery, MA., Desai, MM., and Elimelech, M. (2007) .Water and Sanitation in Developing Countries: Including Health in the Equation. *Environ 2007 Jan 1; 41(1):17-24.*
40. Moody's, Analytics. (2012). Cautiously Optimistic Outlook for Europe in 2013. *Press Release. New York, December 12, 2012.*



© 2015 Global Journals Inc. (US)

41. Moody's Analytics. (2014). Risk Practioner Survey Show Regulation, Stress Testing Drive Bank Spending. *Press Release, New York, December 10, 2014*.
42. Moore, M. (1989). The Fruits and Fallacies of Neoliberalism: The Case of Irrigation Policy. *World Development, 17, no. 11: 1733–50.*
43. Moriarty., P. (2011). Ladders for Assessing and Costing Water Service Delivery, IRC. *International Water and Sanitation Centre, Second Edition, November 2011.*
44. NETSSAF. (2008). Participatory Planning Approach: A Guideline for Sustainable Sanitation Planning. A Project supported by the European Union under the 6th Framework Programme, Thematic Priority: Global Change and Ecosystems. *Hamburg University of Technology - Institute of Wastewater Management and Water Protection, Germany*.
45. Osumanu, I K. (2010) Community Involvement in Urban Water and Sanitation Provision: The Missing Link in Partnerships for Improved Service Delivery in Ghana. *Journal of African Studies and Development (JASD), Vol. 2(8), pp. 208-215.*
46. Panayotou,T. (2000). Population and Environment. [Online]. Retrieved From: http://www.hks.harvard.-edu/var/ezp_site/storage/fckeditor/file/pdfs/centers programs/centers/cid/publications/faculty/wp/054.pdf [2015, July. 18].
47. Picolotti, J. M., Gilli, L., Juliá, M., & Mendyvil, A. (2003). The right to Water in Argentina. Prepared for Rights and Humanity. *CEDHA*. http://www.right-towater.-info/wp-content/uploads/Right-to-Water.pdf
48. Potter, A., Maarten van de Reep MVD., Burr, P., Dubé, A. & Krukkert,I. (2011). Assessing hygiene cost-effectiveness IRC International Water and Sanitation Centre. Wash Cost, Working Paper 6.
49. Taunya. Banks, (1991) *Toilets as a Feminist Issue: A True Story*, 6 Berkeley Women's L.J. 263 http://scholarship.law.berkeley.edu/bglj/vol6/iss2/3
50. Teferra, D. (1997). "Brain Drain of African Scholars and the Role of Stuying in the USA". *International Higher Education*, *No.7, Winter (March), 1997*.
51. Teferra, D. (2003). "Scientific Communication and Research in African Universities: Challenges and Opportunities in the Twenty-First Century" In Teferra, D. & Altbach, P G ( ed) (2003). *African Higher Education: An International Reference.*
52. Teferra, D., and Altbach, PG. (ed). (2004). African Higher Education: An International Reference Handbook. *Bloomington: Indian University Press*.
53. Telmo, A. (2002). A water Supply and Sanitation study of the Village of Gouansolo in Mali, West Africa. [Online]. Retrieved From: http://www.cee.-mtu.edu/peacecorps/studentfiles/telmo.pdf [2015, July. 12].
54. The Republic of Uganda. (2013). The Education and Sports Sector Annual Performance Report FY 2012/13. *Ministry of Education and Sports. Kampala*.
55. The Republic of Uganda. (1999). The National Water Policy. *Ministry of Water and Environment - Directorate of Water Development, Kampala*.
56. The Sphere Project. (2004). Humanitarian Charter and Minimum Standards in Disaster Response, Oxfam Publishing. ISBN 92-9139-097-6 http://www.-sphereproject.org
57. The United Republic of Tanzania (2010). Proposed Secondary Education Development Program II (SEDP II) 2010 – 2014. *Environmental and Social Management Framework (ESMF), Dar es Salaam.*
58. The United Republic of Tanzania. (2002). The National Water Policy. Ministry of *Water* and Livestock Development.
59. Samwel, M., and Gabizon, S. (2009). "Improving School Sanitation in a Sustainable way for a better Health of School Children in the EECCA and in the new EU Member States." *Desalination 248(1-3): 384-391*.
60. Sanders, H., and Fitts, J. 2011 Assessing the Sustainability of Rural Water Supply Programs: A Case Study of Pawaga, Tanzania, *Masters Project, Duke University Libraries.*
61. Sicherman, C. (2005). Becoming an African University: Makerere University, 1922 – 2000. *Fountain Publishers Kampala*.
62. Sommer, M. (2010). "Where the Education System and Women's Bodies Collide: The Social and Health Impact of Girls' Experiences of Menstruation and Schooling in Tanzania." *Journal of Adolescence 33(4): 521-529.*
63. Taunya, Banks. (1991) *Toilets as a Feminist Issue: A True Story*, 6 Berkeley Women's L.J. 263 http://scholarship.law.berkeley.edu/bglj/vol6/iss2/3
64. Tiyambe, P.,and Adebayo, Z., O. (2004). African Universities in the Twenty-first Century. Volume I: Liberalization and Internationalization. CODESRIA, 2004; 350 p., 2-86978-125-3, Dakar [Retrieved from http://www.codesria.org/spip.php?article917 30/08/2010].
65. UN Committee on Economic, Social and Cultural Rights (2003), General Comment No. 15 on right to water (E/C.12/2002/11). Retrieved on 03/04/2010 http://www.unhchr.ch/tbs/doc.nsf/0/a5458d1d1bbd-713fc1256cc400389e94/$FILE/G0340229.pdf
66. UNESCO. (1998). Higher Education in the Twenty-first Century Vision and Action*, World Conference on Higher Education, Paris. unesco.org/images/0011/-001163/116345e [Retrieved on 09/11/2010]*
67. United Nations. (2010). Resolution on the Human Right to Water and Sanitation. *(A/64/L.63/Rev.1), 26 July, 2010*. http://doc.un.org/DocBox/docbox.-nsf/GetAll?OpenAgent&DS=A/64/L.63/Rev.1




© 2015 Global Journals Inc. (US)

68. University of Dar es Salaam. (2010/2011 - 2014-2015). Five Year Rolling Strategic Plan. Dar es Salaam.
69. Upadhyay, V., Mathai, J., & Reed, PW. (2008). "Primary School Children: Access to Toilets." Acta Paediatrica, International Journal of Pediatrics (IJP), 97(11): 1546-1549. DOI: 10.1111/j. 1651-2227.2008.00969.x
70. Vairavamoorthy, K., Yan. J., Malgale. H M., and Gorantiwar. SD., (2007) IRA-WDS: A GIS-based risk analysis tool for water distribution systems. *Environmental Modelling & Software* Volume 22, Issue 7, July 2007, Pages 951–965.
71. WHO (2003), Right to Water, Health and Human Rights, Publication Series No. 3. A thorough introduction to the topic. http://www.righttowater.-info/wp-content/uploads/Right-to-Water.pdf.
72. WHO and UNICEF. (2012) Progress on drinking water and sanitation: Joint Monitoring Programme update. *ISBN*: 978 92 806 4632 0 [Retrieved from http://www.who.int/water_sanitation_health/publications/2012/jmp_report/en/ 20/06/2013]
73. World Bank. (2014). Water Supply and Sanitation: Sector Results Profile [Retrieved from http://www.worldbank.org/en/results/2013/04/12/water-sanitation-results-profile 07/06/2015]
74. Zwarteveen, M. (1998) Identifying Gender Aspects of New Irrigation Management Policies. *Agriculture and Human Values 15: 301–12.*



© 2015 Global Journals Inc. (US)

Global Journal of human-social science: b
Geography, Geo-Sciences, Environmental Science & Disaster Management
Volume 15 Issue 4 Version 1.0 Year 2015
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-460x | Print ISSN: 0975-587X | DOI: 10.17406/GJHSSBVOL15IS4PG29

# What to do about Climate Change-Caused Flooding and the Associated Diseases in Rivers State of Nigeria

By Dr. Christian Chigozi Oriji
*University of Port Harcourt, Nigeria*

*Abstract-* The prime focus of the study is to explain what to do about climate change-caused flooding and the associated diseases in Rivers State of Nigeria. In doing so, this work gives an overview of climate change-caused flooding and effects of flooding on people in flooded areas, as well as explains flooding associated diseases in Rivers State. Besides this, it further proffers legislative, short-term and long-term measures that will help reduce if not eliminate flooding and its associated diseases in Rivers State of today, and indeed of the future.

*Keywords:* *climate change-caused flooding, associated diseases, rivers state, Nigeria.*

*GJHSS-B Classification :* *FOR Code: 050101*




*Strictly as per the compliance and regulations of:*




© 2015. Dr. Christian Chigozi Oriji. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License http://creativecommons.org/licenses/by-nc/3.0/), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

# What to do about Climate Change-Caused Flooding and the Associated Diseases in Rivers State of Nigeria

Dr. Christian Chigozi Oriji

*Abstract-* **The prime focus of the study is to explain what to do about climate change-caused flooding and the associated diseases in Rivers State of Nigeria. In doing so, this work gives an overview of climate change-caused flooding and effects of flooding on people in flooded areas, as well as explains flooding associated diseases in Rivers State. Besides this, it further proffers legislative, short-term and long-term measures that will help reduce if not eliminate flooding and its associated diseases in Rivers State of today, and indeed of the future.**

*Keywords: climate change-caused flooding, associated diseases, rivers state, Nigeria.*

## I. Introduction

Flooding has become a major threat in that many countries the world over are struggling with loss of lives and properties, as well as associated diseases that emanate from it. Aside the pockets of flooding in the 1970s, 1980s and 1990s in Nigeria, flooding has become a huge issue after the 2012 overflow of Cameroon dam into most of the states in the country. In view of these circumstances, many people in flood-affected states lost their lives and properties due to poor responses from private organizations and government agencies in Nigeria. Indeed, this precarious situation was not different in Rivers State. Those in flood-affected communities complained of loss of lives of their beloved ones, alongside decimated crops arising from uncontrolled flooding. In addition, some complained of flood- associated diseases, lack of accommodation and inadequate food, in spite of the State Government's responses to curb same in these communities. The complaints by people in flood-affected areas have further persisted besides the 2012 flooding, in that today, there are no short-term and long-term policies for practical solutions to curb current flood-associated diseases in Rivers State. It is based on this premise that the study was spurred to investigate, alongside proffer solutions for *climate change-caused flooding and the associated diseases in Rivers State, Nigeria*.

## II. Climate Change-Caused Flooding: an Overview

The man on the street of Nigeria sees climate change as change in weather conditions (Oriji and Oriji, 2013). This seems true but beyond it, Inter-governmental Panel on Climate (IPCC) (2007) sees climate change as change due to varieties of natural causes and emissions resulting from scientific and technological innovations. In addition to this fact, the negative effect of climate change is enormous on human beings, more so, when it is associated with flooding. In this regard, climate change has in recent times, caused startling issues of global warming, sea level rise, ozone depletion, deforestation, air pollution, loss of biodiversity, dreadful flooding and so on, that have in turn affected the existence in human environment (Oriji and Oriji, 2013). This seems true because change in climate has become a major cause of flooding, the world over. Furthermore, a flood is caused by,

> A combination of heavy rainfall causing river/oceans to overflow their banks, and can happen at any time of the year, not just in the winter. Floods generally develop over a period of days, when there is too much rainwater to fit in the rivers and water spreads over the land next to it ('the flood plain')(http://www.water.environment-agency.gov.-uk/-fun,2013).

Equally important is that the change in climate may cause sea to over flow into the coastal areas, especially when the natural change is a combination of heavy storms, under ground water rise and low atmospheric pressure. This seems the situation in most states in Nigeria, especially Rivers State where those in the coastal area live on plain land below the sea level, for which climate change-caused flooding at the dam (especially Cameroon dam) and the oceans as well as rivers, led to effects that have devastated them today. See Figures 1, 2, 3 and 4 for the devastating effects of flooding on the people of Rivers State of Nigeria. Also see Figure 5 for map indicating the 2012 flood affected Local Government Areas of Rivers State.

*Author: Department of Sociology, Faculty of Social Sciences, University of Port Harcourt, Choba, Port Harcourt, Rivers State, Nigeria.*
*e-mail: christianoriji@uniport.edu.ng*



© 2015 Global Journals Inc. (US)



*Source:http//www.google.com.ng/search?q=images+of+flooding+in+rivers+st 2013.*

*Figure 1 :* The Devastating Effects of Flooding on People's Houses in Rivers State.



*Source: http//www.google.com.ng/search?q=images+of+flooding+in+rivers+st 2013.*

*Figure 2 :* The Devastating Effects of Flooding on People's Access Road in Rivers State.



© 2015 Global Journals Inc. (US)



*Source:http//www.google.com.ng/search?q=images+of+flooding+in+rivers+st 2013.*

*Figure 3 :* The Devastating Effects of Flooding on People's Farm Produce in Rivers State.

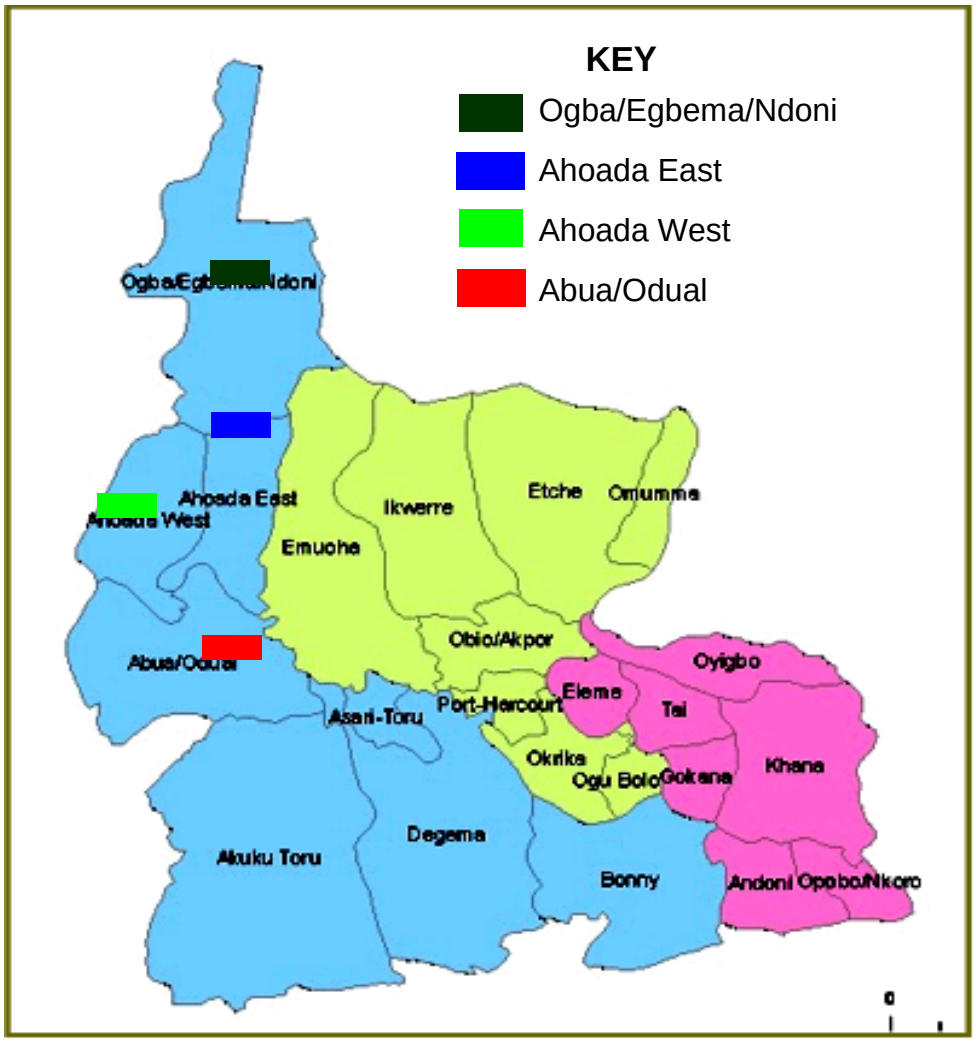


*Source:http//www.google.com.ng/search?q=images+of+flooding+in+rivers+st 2013.*

*Figure 4 :* The Devastating Effects of Flooding on People's Lifestyle (see an incident of a child defecating at a residence) in Rivers State, which may lead to contamination and diseases.



© 2015 Global Journals Inc. (US)




*Source:http://www.google.com.ng/?gws_rd=cr#bav=on.2,or.r_qf.&fp=b90981c401ff03dc&q=image+of+ map+of+rivers+state/2012.*

*Figure 5 :* Map indicating the 2012 Flood Affected Local Government Areas of Rivers State.

## III. Effects of Flooding on People in Flooded Areas of Rivers State

It is obvious that flooding has devastating effects on people, more so, during the wet season in Nigeria. In view of this, Ordinioha (2006) explains that rising sea levels can lead to the following outcomes:

a) Displacement of coastal communities

b) Disturbance of agricultural activities

c) Coastal erosion, beach loss and related decline in tourism

d) Intrusion of sea water into freshwater aquifers.

In this regard, the 2012 flooding adversely affected 33 out of the 36 States of Nigeria, for which lives and properties as well as agricultural produce were also lost. Of these,

> More than 7.1 million persons have been affected one way or the other … the affected states were categorized into A, B and C on the basis of the supposed intensity of the impact of the flood. Bayelsa and Delta States were put in category A, while Rivers State was put in category B (Allen and Dube, 2012).

In order to quell the adverse effects of flooding in flood risk areas, Rivers State Government, led by Rt. Honourable Chibuike Amaechi created the Emergency Response Management Committee headed by Engineer Tele Ikuru (the deputy governor of the state then), with the mandate to resettle, feed and provide socio-health needs to the victims within time and space. In spite of the efforts of the deputy governor of Rivers State to help flood affected-victims on camps, Allen and Dube (2012) expound that,

> Some died as a result of the government's poor handling of the relief process. The camps did not

© 2015 Global Journals Inc. (US)

meet the needs of the flood victims. Feeding in Rivers State's camps was grossly inadequate. Flood victims were given small rations of food to cook, even when they were not by any means treated like refugees, though in the real sense they were climate-change refugees. The food provided barely met nutritional health needs of victims, especially the sick and children.

## IV. 2012 Flooding and the Associated Diseases in Rivers State

Flooding is associated with water borne diseases, especially if it comes with large flow of water with debris into homes of people. Consequently, people in flooded areas are usually infected with fever, cholera, dysentery, diarrhoea and other diseases, due to their contact with contaminated drinking-water and waste water facilities, as well as vector-borne diseases arising from flooding. In addition, floods can potentially increase the transmission of the following communicable diseases:

- Water-borne diseases, such as typhoid fever, cholera, leptospirosis and hepatitis A;
- Vector-borne diseases, such as malaria, dengue and dengue haemorrhagic fever, yellow fever, and West Nile Fever ( http://who.int/hac/techguidance/-ems/flood -cds/en/index.html/2013). Besides this, there are specific cases of cities and countries where ef fects of flooding are associated with diseases:
  - Flooding on the Dominican Republic in 2004 led to malaria outbreak;
  - Periodic flooding linked to El Nino-Southern Oscillation (ENSO) is associated with malaria epidemics in the dry coastal Region of Northern Peru and with the resurgence of dengue in the past 10 years throughout the American continent;
  - West Nile Fever has resurged in Europe subsequent on heavy rains and flooding with outbreaks in Romania in 1996 - 97, in the Czech Republic in 1997 and Italy in 1998 (http://who/int/hac/-techguidance/ems/flood-cds/en/index.html, 2013)

Also in Nigeria, the 2012 flooding did witness large scale outbreak of diseases such as cholera and other infectious diseases that could lead to massive deaths on the camps; and even so, there were cases of malaria, diarrhoea and pneumonia in addition to various skin infections in the case of Rivers State (Allen and Dube, 2012). Indeed today, due to Nigerian's weak climate policy, people who were affected by the 2012 flooding in Rivers State are currently suffering from housing, socio-economic and health challenges; and thus they require the way-out of same for healthy future in the state.

*a) What to do about Climate Change-Caused Flooding and its Associated Diseases in Rivers State*

i. *Legislative Measures*

- Federal Government should strengthen the existing climate/flooding laws, as they affect states' laws in Nigeria.
- Federal Government in conjunction with the Rivers State Government should enforce the climate/flooding laws, in so much so that those involved in man-made flooding are prosecuted in the court of law and sentenced to jail, either without option of fine or with option of fine.

ii. *Short-term Measures*

- Rivers State Government should provide relief materials to victims immediately there is a flood incident. This should be done through town/community leaders rather than government officials.
- Rivers State Government and private organizations should inform, educate and communicate with the flood victims on the dangers of water-borne diseases, vector- borne diseases, and the effects of drinking flood water on them. Besides, they should also inform, educate and communicate with the section of the population in flood prone areas on the need for proper hand washing when they engage in daily activities which include cooking, eating, fishing, crop farming, and even defecating in the flood-risk vicinity.
- Rivers State Government should respond quickly to flood disaster areas whenever there is flooding, in order to save lives and property. In doing so, government should provide good camps and equip them with drugs, food and relief materials, as well as mobile toilets in order to also support the flood victims. Also, the government should ensure that the town/community leaders manage the relief materials sent by her, as she also ensures that professionals (doctors, public and community health personnel) take charge of professional roles on camps. In addition, the government should engage the medical sociologists and psychologists in the management of socio-psychological dispositions of flood victims on camps.
- Rivers State Government should ensure that flood victims are well managed and rehabilitated back to their homes by giving them loans as well as helping rebuild their houses.

iii. *Long-term Measures*

- There should be specific laws on flooding and its victims.
- There should be a specific policy on construction of more dams in flood prone areas, as well as reconstruction of the existing ones.



© 2015 Global Journals Inc. (US)

- There should be deliberate policy on the protection and management of river banks as well as dredging of the rivers or creeks, in order to halt sea level rise above the plain land. *Ipso facto*, there should be deliberate safe reconstruction of flood prone areas overtime if the aforementioned policy is to be achieved.
- Rivers State Government should do the geographical mapping of flood prone areas; and thus should establish long-lasting architectural camps with hospital and school facilities in them. Indeed, these should be managed by professionals and protected by law enforcement agencies for better sustainability of the camps.
- Rivers State Government should liaise with National Emergency Management Agency (NEMA), in order to inform, educate and communicate the people about early warning against floods. Also, Federal Government should ensure that her personnel in National Emergency Management Agency (NEMA) in conjunction with State Emergency Management Agency (SEMA) visit the flood-risk areas incessantly, for early detection of flooding, and possible evacuation of victims to camps in the event of same.

## V. Conclusion

In the light of the findings of the study, it is crystal clear that flooding poses a major challenge to Rivers State. In fact, sequel to the flood situation in the state, lives and property were lost. Based on these circumstances, the study with all intents and purposes suggests way-out of flooding and the associated diseases by proffering legislative, short-term and long-term measures that are reliable to check it in the study area. Thus, in sustaining these measures now and in the future, the study in addition opens windows of research on the relationship between flooding and low farm produce; as well the relationship between lack of resources to manage flooding and incessant loss of property in flood risk areas of Rivers State.

## References Références Referencias


1. Allen, F. & Dube, L. (2012). Natural disasters, state response and human rights: reflections on the impact of 2012 flooding on the Niger Delta. *Niger Delta Research Digest Journal of the Center for Niger Delta Studies.* Vol. 6: 130 -133.
2. Http://www.google.com.ng/search?=images+of+flooding+in+rivers+st/2013
3. Http://www.water.environmentagency.gov.uk/fun/-2013
4. Http://www.who.int/hac/techguidance/ems/flood-cds/en/index.html/2013
5. Http://www.google.com.ng/?gws_rd=cr#bav=on.2,or.r_qf.&fp=b90981c401ff03dc&q=image+of+map+of+rivers+state/2012
6. IPCC (2007). *Climate change: the physical science basis, summary for policy makers.* United Kingdom. Cambridge University Press: 4 -26.
7. Oriji, C.C. & Oriji, M.M. (2013). Effects of Climate change on human environment: the need of environmental education for sustainable development of Nigeria. *Nigerian South –South Journal of Social Studies and Civic Education: An Affiliate of the Nigerian Journal of Social Studies and Civic Education*. Vol.8 (7): 222 & 223.




© 2015 Global Journals Inc. (US)

Global Journal of human-social science: b
Geography, Geo-Sciences, Environmental Science & Disaster Management
Volume 15 Issue 4 Version 1.0 Year 2015
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-460x & Print ISSN: 0975-587X

# T. N. Godavaraman Thirumulpad V. Union of India & others: A Case Study

By Astha Pandey
*Amity University, India*

*Introduction-* Contribution/role of T.N. Godavaraman Thirumulpad in protection and conservation of environment especially with respect to forests in India has beenprodigious. Popularly known as the "Green Man" he assured through various methods like filing of varied PILs and interceding in numerous projects, that legitimate harmony could be accomplished between consumption of resources and conservation of the same, exclusively conservation of forests.

Environmental law being a field of national importance has attracted a great deal of participation from different NGOs, private organization, apex court and most importantly the common man without whose contribution and support ideal environmental conditions cannot be attained. The Supreme Court of India has always acted as a catalyst to back/support the growth and development of the environment through ensuring the protection of all components of environment by generating new jurisprudences like that of "absolute liability doctrine" and adding international concepts of sustainable development, precautionary principle and polluter pay principle.

*GJHSS-B Classification : FOR Code: 050299*




*Strictly as per the compliance and regulations of:*

© 2015. Astha Pandey. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License http://creativecommons.org/licenses/by-nc/3.0/), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

# T. N. Godavaraman Thirumulpad V. Union of India & others: A Case Study

Astha Pandey

## I. Introduction

Contribution/ role of T.N. Godavaraman Thirumulpad in protection and conservation of environment especially with respect to forests in India has beenprodigious. Popularly known as the "Green Man" he assured through various methods like filing of varied PILs and interceding in numerous projects, that legitimate harmony could be accomplished between consumption of resources and conservation of the same, exclusively conservation of forests.

Environmental law being a field of national importance has attracted a great deal of participation from different NGOs, private organization, apex court and most importantly the common man without whose contribution and support ideal environmental conditions cannot be attained. The Supreme Court of India has always acted as a catalyst to back/support the growth and development of the environment through ensuring the protection of all components of environment by generating new jurisprudences like that of "absolute liability doctrine" and adding international concepts of sustainable development, precautionary principle and polluter pay principle.[1]

With the advent of the case of T.N. Godavaraman Thirumulpad v. Union of India [WP (Civil) No. 202 of 1995]the apex court moved many steps ahead leaving behind its conventional character of interpreter of law, and taking over the roles of policy maker, law maker and administrator. In other words, this case also known as "forest case" in India which is an instance of judicial over-stepping of its own constitutional mandate as subsequent to the admission of this case the Supreme Court took over the supervision and control of day to day governance of the forests of India.[2]

*Author: B.A.LL.B (H), 9th Semester, Amity Law School, Amity University, Noida, U.P., India. e-mail: astha91@gmail.com*

The problem regarding deterioration of the environment and majorly damage to the forests which are rich in natural resources started with the increasing needs of the people arising due to rapid growth of industrialization, migration of people from rural to urban areas, need for more land for cultivation, housing and other purposes because of over population, etc. Huge chunks of forest lands were being cleared and used for non-forest or commercial purposes like that of mining, illegal felling of timber leading to deforestation etc. Forests which are supposed to be the most valuable assets as sustainability of a nation and its people depends on it for they provide us with eminent natural resources were being exploited to a great extend and that too without the adoption of compensatory measures. Thus, leaving no or very little scope for replenishment of such resources, which is an act of high risk because without such resources the future of the country would be shrouded in the dark clouds of insecurity and scarcity of essential resources.

Noticing such sad state of affairs of the environment especially of the forests, T.N. Godavaraman being an aware and responsible citizen of India could not resist but resort to revolt against such illegal practices by knocking the doors of the Indian Judicial System in seek of some help by the Supreme Court to curb such practices which were causing harm to the forests and environment. He sought to the apex court by filling a PIL (Public Interest Litigation) expecting support of the court and a legal remedy to mitigate the loss being caused to the forests and the natural environment by excessive non forest activities on forest lands.

It is of immense importance to mention here that even after the presence of the provisions of Constitution of India which states that everybody including the central and the state governments is accountable for and has a duty towards protection and conservation of the natural resources, how are such illegal activities of deforestation and depletion of environment and its natural resources taking place on such a large scale right under the nose of the central and state governments. Article 48A mentions that state will venture to secure and enhance the environment and also has a duty to protect the forest and wild life of our nation. Article 51A bestows on all the citizens of India the obligation to conserve and uplift the natural environment comprising of rivers, lakes, forests, wild life and to have benevolence towards all living beings.[3]

[1] M. Sakthivel, "Case Comment: T.N. Godavarman Thirumulpad v. Union of India, MANU /SC/0028 /2014" *available at*: http://rostrumlegal.com/blog/case-comment-t-n-godavarman-thiru-mulpad-v-union-of-india-manu-sc-0028-2014-by-m-sakthivel/ (Visited on August 18, 2015).

[2] Armin Rosencranz and SharachchandraLélé, 'Supreme Court and India's Forest', Vol.43 No. 5, Economic and Political Weekly,2nd Feb 2008, Pgs 11-14, *available at:* http://www.environmentportal.in/files/-epw1.pdf (Visited on August 20, 2015).



© 2015 Global Journals Inc. (US)

## II. T.N. Godavaraman Thirumulpad V. UOI & others WP (Civil) No. 202 of 1995: A Study

In the year 1995 T.N. Godavaraman Thirumulpad filed a writ petition with the Hon'ble Supreme Court of India with an intention or main motive of protecting a part of the Nilgiris forest from the clutches of illegal felling of timber leading to large scale deforestation. This was initiated by the 'Green Man' because while Mr. Godavaraman was travelling through a place called Gudalur he saw enormous areas of forest land wherein trees were being cut in huge numbers and the logs of such timber were being mutilated/stacked for the purpose of selling in the market. A part of this particular forest cover was once owned by family of Mr. Godavaraman, Nilambur Kovilakam. This act of cutting down of trees was a gross violation of varied rules and legislations. Moreover, those responsible for cutting down such trees were only giving a trivial amount as compensation against felling of such valuable trees. For instance, they only paid Rs1000 to the state for 50 logs of rosewood. [4] Becoming aware of this situation, he fulfilled his fundamental duty of protecting and conservation of the forests and its natural resources by filling a PIL with the apex court to protect such forests.

While hearing of the case the court conducted an in depth examination of various environment legislations, like that of the Forest Conservation Act, 1980, Environment (Protection) Act, 1986, etc and also reviewed the role of central and different state governments. In the first major order passed by the Hon'ble Supreme Court which was passed after hearing learned Attorney General for Union of India, learned counsel appearing for the states, parties, and learned Amicus Curiae Shri H.H. Salve, the court held that there was a fallacy in understanding the scope of the Forest Conservation Act, 1980 and the meaning of 'forest'. Therefore in its 1996 order the court freshly interpreted the word 'forest' stating that initially due to the vagueness of the definition of forests few states conveniently defined forest as the areas of "reserved forests" i.e. those areas of forest cover that were the richest in natural resources and came under the category of reserved forests, receiving the maximum amount of legal and environmental security. [5] Whereas, after passing of the 1996 order the apex court elucidated the term 'forest' by its dictionary meaning as land covering all statutorily recognized forest irrespective of whether they come in the category of reserved, protected or other under section 2(i) of the Forest Conservation Act, 1980. Further the court specified that 'forest land' would also include areas considered as forests in government records regardless of ownership, along with those as per the dictionary meaning. Thus, due to this new and broader definition, the word forest was now being defined and provisions of section 2 of the Forest Conservation Act regarding conservation and securing the forests would apply to all forests irrespective of the ownership and classification. [6]

### *a) Order of the Apex Court Passed in the Year 1996*

The first order of 1996 was divided in parts, wherein the first part being General Order which is applicable to all in general, second was specifically applicable to the state of Jammu and Kashmir, third to the state of Himachal Pradesh and Hilly regions of Uttar Pradesh and West Bengal, and the fourth part exclusively meant for the state of Tamil Nadu.

#### i. *General Guidelines*

The 1996 judgment of this case is considered to be a landmark judgment in the history of this case of "continuing mandamus." In its first part of the order of 1996 the courtimposed a complete ban on tree felling all across the nation. Except those which was approved by the Central Government. The court reiterated that in order to carry out any non forest activity in any area that comes within the purview of forest according to section 2 of the Forest Conservation Act then such activity would be ceased if prior approval of the central government is not obtained. Henceforth, various saw mills, including plywood and veneer mills and mining industries were shut down on the strict orders of the court. In order to maintain ecological balance in the region of wet ever green forests of Tirap and Changlang in the state of Arunachal Pradesh, all saw mills, veneer mills, plywood mills within a distance of 100 kms from the boundary of Assam were shut down in response to the order of the court. [7]

The Supreme Court stated that according to the provisions of Forest Conservation Act, 1980, approval of central government was mandatory to carry out non forest activities which include mining and saw mills. Therefore, the court ceased operation of non forest activities which were operating without attaining the approval of Central Government. Enforced complete ban on cutting down of trees in all of the seven states of

[3] T. N. Godavaraman Thirumulpad v UOI & Ors, AIR2005SC4256, (2006)1SCC 1, *available at:*www.ielrc.org/content/-e0508.pdf, (visited on 1st September 2015).

[4] Interview with T N Godavaraman Thirumulpad, 'Down To Earth', August 31st 2002, *available at:*http://www.doccentre.net/docsweb/-adivasis_&_forests/interview.pdf, (viewed on 1st September 2015).

[5] Armin Rosencranz, Edward Boenig, and Brinda Dutta, The Godavaraman Case: The Indian Supreme Court's Breach of Constitutional Boundaries in Managing India's Forests, *available at:*http://elr.info/sites/default/files/articles/37.10032.pdf (visited on August 30th 2015).

[6] T.N. GodavaramanThirumulkpad v UOI & Ors, (1997) 2 SCC 267, [12th December 1996, WP (Civil) No. 171/96], *available at:*http://www.scconline.com (visited on 4th September 2015).

[7] T.N. GodavaramanThirumulkpad v UOI & Ors, (1997) 2 SCC 267, [12th December 1996, WP (Civil) No. 171/96], *available at:*http://www.scconline.com (Visited on 4th September 2015).

© 2015 Global Journals Inc. (US)

the North-East region of the country that are rich in forest reserves. It also imposed a ban on transportation or movement of timber anywhere outside the North-East states.[8]The court further gave instructions to each state government for forming an Expert Committee within one month for following purposes:

- Identify areas which are forest irrespective of any classification or ownership.
- Recognize the areas which were initially a part of forest but now are cleared lands due to illegal activities like deforestation.
- Figure out the areas comprising of plantations and segregate those belonging to the government from those of private individuals.

Then the state government is supposed to file a report within 2 months with respect to following things:

- Number of saw mills, veneer mills and plywood mills carrying out functions within a state.
- Authenticity and validity of licenses of such mills.
- Accessibility/ closeness in terms of distance of such mills from nearby forests.
- Source of obtaining timber by such mills.
- The court also directed each state to appoint an Expert Committee within one month to determine the following:
- Viable scope of the forests of the state as being saw mills or timber based industries.
- Number of such existing mills that can be maintained within the state without any threat or unwanted problems in relation to the forests and the environment.
- Most suitable distance of such saw mills present within the state from the forests of that state.
- The Expert Committee so formed would comprise of a Principal Chief Conservator of Forest and another Senior Officer to supervise and inspect whether the order of the apex court is being complied with or not and to file status report within one month of its formation.[9]

ii. *Guidelines Laid Down for the State of Jammu & Kashmir*

The court ordered that the following things must be adhered by the state of Jammu and Kashmir:

- There will be absolutely no cutting down of trees in any kind of forest be it public or private except those private plantations where trees have been either planted by private individuals or by the social forestry department of this state and such cutting down should strictly be in compliance with the law i.e. chopping down of trees in these areas can only be done if prior authorized approval has been granted by the central government.
- In the areas that come within the purview of 'forest' the state government or its forest corporation may clear the trees which are already chopped off and can cut out any standing timber that is either diseased or has dried off, except in the areas covered under the J&K Wildlife Protection Act, 1978 and those banned under any other law applicable.
- An Expert committee to be incorporated by the government of this state with an objective of establishing qualitative and quantitative benchmarks with respect to the removal of trees that have already been chopped off, or cutting down of infected or arid standing timber. This committee would be constituted of an IAS Officer posted in this state, a representative of J&K government, two renowned private specialists and the Managing Director of J&K Forest Corporation who will also act as the member secretary of the committee.
- Slaughtering or removal of any trees or forest land for the execution of any project must be in conformity with the Jammu & Kashmir Forest Conservation Act,1990 and such removal to be exclusively executed by the state's Forest Department and not any private corporation. Moreover, this regulation would also be applicable to the doused regions of the 'Thein' Dam as well.
- The entire amount of timber procured form the areas mentioned above is to be consumed solely to fulfill the timber and fuel wood demands of the local individuals, government and other regional institutions.
- Strict prohibition on the displacement or transportation of timber from the state, save for the purpose of railway or defence. Further this movement would only be permitted after authorized certification has been received by the managing director of the state corporationstating that such timber has been obtained by State Forest Corporation. Subsequently, such motion will be done through either the corporation or the Forest Department of J& K.
- File an affidavit by the state mentioning about the data regarding the portion of timber owned by the private persons which has been bought by them from forest department of the state.
- None of the saw mill, veneer or plywood mill will function up to the range of 8 kilometers from the

[8] Armin Rosencranz and SharachchandraLélé, 'Supreme Court and India's Forest', Vol.43 No. 5, Economic and Political Weekly,2nd Feb 2008, Pgs 11-14, *available at:* http://www.environmentportal.in/files/-epw1.pdf (Visited on 9th September, 2015).

[9] T.N. Godavaraman Thirumulkpad v UOI & Ors, (1997) 2 SCC 267, [12th December 1996, WP (Civil) No. 171/96], *available at:*http://www.scconline.com (Visited on 11th September 2015).



© 2015 Global Journals Inc. (US)

periphery/borderline of forest region and if any such mill[10] already exists in the aforesaid area then the same shall immediately cease to operate and would be relocated.[11]

iii. *Guidelines for the State of Himachal Pradesh and Hilly Areas of Uttar Pradesh & West Bengal*

The Supreme Court directed the following to be strictly followed by such states:

- Prohibition on cutting down of trees within any area declared as forest whether public or private except for those private plantations which are not considered as forest or those regions Himachal Pradesh where authorized permission has been granted for legitimate personal use.
- State government to remove all already felled trees or those which have been dried or infected from regions apart from those mentioned under section 18 and 35 of the Wildlife Protection Act, 1972.
- An Expert Committee to be formed by the State government consisting of a Representative of Ministry of Environment and forest, Another Person Representing the State Government, Two Prestigious Private Experts and Managing Director of the State Forest Corporation (will act as the Member Secretary). Role of this committee is to establish qualitative and quantitative rules with respect to removal of such trees.
- Clearing of trees from forest in implementation of projects must be in accordance with the Forest Conservation Act, 1980 or any other law applicable and such felling of trees should only be done by State Forest Corporation and not by any private corporation.[12]

iv. *Guidelines for the State of Tamil Nadu*

The Apex Court in its 1996 judgment gave following guidelines exclusively to be complied by the state of Tamil Nadu:

*a.* Strict ban on deforestation or removal of trees from all regions that are covered under the purview of forest, except where

- Such trees are deliberately grown or planted rather than out bursting on their own, or
- When removal of trees is justified with a reason and is done in a region which was initially not considered as forest.

- Duty of the State Government to form a specialized committee for the purpose of figuring out/identifying all regions that can be covered and termed as forests.
- Growing and cutting down of trees will be permitted if done in accordance with the applicable laws and Government scheme wherein such an activity is carried out by the tribal people who form a part of Social Forestry Programme related to the Patta Lands and not forests.
- With respect to the Plantations of Coffee, Tea, Cardamom, etc following instructions have been laid down by the Hon'ble Court:
  - Cutting down of shady trees in these plantation regions:
  - Would be restricted to those trees that have been grown deliberately or planted intentionally and have not grown automatically.
  - Will only be applicable to the recognized species mentioned in the TANTEA Report.
  - All such activities must be in conformity with the propositions of TANTEA and
  - Must be carried out in surveillance and control of the Statutory Committee formed by the State Government.
  - Report of TANTEA would determine the state government's decision of cutting down Fuel trees that are grown out of the forests. While the trees of eucalyptus and wattle can be chopped off for personal utilization if such utilization is permissible by the statutory authority.
  - The court further instructed the state government to identify the regions of plantation which are a part of forest and are not operative in such plantation. Absolute ban on cutting down of trees in such areas.[13]
  - Prohibiting expansion of any such plantation in order to evade encroachment by plantations on the forests.
- A one-time measure of clearing/removing the trees that had already been chopped off before passing of the interim order by this court on 11 December, 1995 is permitted provided such trees had not been removed from Janmam Land.
- Strict compliance with the ban imposed on cutting down of trees from Janmam Land.
- This order of 1996 is final, binding and is to be operated, implemented and complied with, regardless of any different order passed by any other court or tribunal.
- Altogether, any adverse effect on saw mills or other wood based industries like closing down of such

[10] T. N. Godavaraman Thirumulkpad v UOI & Ors, (1997) 2 SCC 267, [12th December 1996, WP (Civil) No. 171/96], *available at:*http://www.scconline.com (Visited on 11th September 2015).
[11] T. N. Godavaraman Thirumulkpad v UOI & Ors, (1997) 2 SCC 267, [12th December 1996, WP (Civil) No. 171/96], *available at:*http://www.scconline.com (Visited on 11th September 2015).
[12] *Ibid*
[13] T.N. Godavaraman Thirumulkpad v UOI & Ors, (1997) 2 SCC 267, [12th December 1996, WP (Civil) No. 171/96], *available at:*http://www.scconline.com (Visited on 15th September 2015).



© 2015 Global Journals Inc. (US)

mills due to the implementation and compliance with this order of the Supreme Court will not lead to removal of workers of these industries. Moreover, they would be paid their full due allowances.[14]

*b) Pretext of the Court*

The court deemed fit to interfere with the functioning and implementation of various regulations under different environmental statutes and with the working of authorized bodies like Ministry of Environment and Forests, etc, because the condition of the forests was highly devastating at that point of time specially in the region of North East where large scale legal as well as illegal deforestation was taking place and the concerned government was behaving in a very insensitive and a careless manner, not taking any required action as per the circumstances. Therefore, the most important resource for survival was highly endangered, leading the court to step forward to protect and conserve such resource i.e. forests.

The court was of the view that both the central and the state governments were not acting in a desired manner as many instances were taking place that made this situation quite clear, one such being in the state of Maharashtra where the senior bureaucrats deliberately did not comply with the court's order of imposing a strict ban on granting licenses to saw mills, leading to committing of the act of contempt. Subsequently, the apex court had to resort to the application of its power of 'contempt' in order to change the attitude of such governments towards the protection and conservation of environment and forests and most importantly to get the orders passed by it implemented in an appropriate manner.

To its extreme shock/ surprise in retaliation of order passed by the court, the government of Meghalaya instead of taking steps to support and implement the court's order requested that all unregistered forests under the ownership of communities, clans and individuals be given the status of "plantation forests" so that such forests could be ostracized from the purview of the term 'forest.'[15] This implied two things, first that the rights of private individuals of utilizing their privately owned lands is not hampered and secondly, it is also a possibility that there was a wrongful intention of ensuring undue advantages to those who are involved in using the forests for non forest purposes as they will be able to execute their heinous activities on such lands if they are excluded from the scope of forests.

*c) Meddling (Exceeding) Operational Parameters by the Apex Court*

The fundamental functions of the Indian Judiciary bestowed on it by the Constitution of India comprise of interpreting/construing various laws/ legislations, bridging the gap and bringing harmony between the laws and the provisions of the constitution. Further as the Judicial System of the country is also a kind of supervisory/ adjudicatory body it has also been granted few exceptional discretionary/ unrestricted powers like that of 'Judicial Review' to enable the court to revise or review any thing that needs to be set right.

After granting so much power to the judiciary it was necessary to segregate the working of the legislature, executive and the judiciary to avoid unnecessary interference in each other's work. Thus, the constitution laid down the Doctrine of "Separation of Powers" and the importance of constitution and its provisions has been made very clear in the landmark judgment of Keshvananda Bharti v. Union of India. The only basic rule related to the governance in India is that everything or anything done within the country must be accordance with the constitution.

The constitution lays down provisions with respect to all the rights and duties, etc of the citizens. In fact the constitution also guarantees the Right to Healthy and Congenial Environment under Article 21 i.e. Right to Life. As clean environment being an integral and essential factor for sustenance of life therefore conservation, securing and maintenance of environment and its resources is the fundamental duty of the State as well as Central Governments which they did not fulfill and evaded their responsibilities and duties. Hence, the court had to step in between to overcome lacunas and drawbacks of the governments.[16]

First of all, the court engaged in 'micro-management' activities that were out of its operational scope like that of banning timber transportation, relocating saw mills, etc. Then, it formed a quasi-executive body i.e. Central Empowered Committee (CEC) under Section 3(3) of the Environment (Protection) Act, 1986 to keep a check on 'compensatory afforestation', other environmental happenings and to redress the grievances of people with respect to any non compliance with the order of the court. This committee exclusively reports to the court thus defeating the purpose of separation of powers. Finally, this court taking the defense of this case being an "extraordinary case" expanded its power manifold stating that it wanted to assure that no unwanted alteration can be made in the implementation of its order so that the environment and forests are completely

[14] *Ibid*

[15] Armin Rosencranz and SharachchandraLélé, 'Supreme Court and India's Forest', Vol.43 No. 5, Economic and Political Weekly, 2nd Feb 2008, Pgs 11-14, *available at:* http://www.environmentportal.in/files/-epw1.pdf (Visited on 18th September, 2015).

[16] Armin Rosencranz and SharachchandraLélé, 'Supreme Court and India's Forest', Vol.43 No. 5, Economic and Political Weekly, 2nd Feb 2008, Pgs 11-14, *available at:* http://www.environmentportal.in/files/-epw1.pdf (Visited on 18th September, 2015).



© 2015 Global Journals Inc. (US)

secured from the illegal activities of the exploiters. Moreover this case is going on for almost 20 years now and the court has held this case to be a case of "continuing mandamus" wherein there is continuous intervention of the court in all the activities related to the environment specially forests. Here it can be said that the apex court breached its constitutional mandate as the term "continuous mandamus" is nowhere mentioned in the constitution.[17]

*d) Order of the Supreme Court Dated 26/09/2005*

In its order passed in 2005 the Supreme Court dealt with following important points discussed in this case:

i. First of all the court stated that there is a great need or requirement for preservation, protection and conservation of Forests from the utilization of such natural resources i.e. forests for non forest purposes as it tends to cause harmful ecological effects.

ii. The court also discussed the issue of payment of some compensatory amount before using any forest land for non forest purposes. In this case the court made it mandatory for all states to make the payment of Net Present Value (NPV) of the amount of land which has to be used for undertaking of any non forest activity.

iii. The court also laid down the importance of enacting the Environmental (Protection) Act, 1986. It stated that the risk of threat to life on earth was due to the deteriorating environmental condition which was result of increasing pollution, los of biodiversity, etc.

iv. It was discussed in this case that necessary steps are essentially to be taken by central government towards compensatory afforestation in order to reinstate the green cover that has been lost due to the excessive deforestation. Therefore, large amount of funds are being submitted to the State Government by such user agencies by which afforestation is done by the government.

v. The MoEF submitted a scheme To ensure compensatory afforestation.

vi. CEC analyzed the scheme submitted by MoEF and made following recommendations:

a. According to the Forest (Conservation) Act, 1980 payment of NPV must also be made along with the amount for compensatory afforestation.

b. All the regulations with respect to the Compensatory afforestation and funds collected towards it will be laid down by the MoEF in consultation with the Central Government.

c. Money paid by the user agencies for safeguarding the biodiversity of a region of diverted forest area that falls within the purview of wildlife area mentioned under sections 18, 26A or 35 of Wildlife (Protection) Act, 1972, then such fund would also be submitted in the 'Compensatory Afforestation Fund' and would only be utilized for the motive of safeguarding/securing biodiversity.

d. Out of the total amount received in the fund the amount left after necessary expenditure will be kept with the state government and in case any amount that is pending to be paid by user agency to the state then that amount also shall be submitted by the state government to the fund and later on such government can recover the amount from the user agency.

e. Funds to be utilized for the purpose of natural regeneration, conservation of forest and its resources, etc.

f. All public or private sector units that require forest resources for production must contribute considerably towards compensatory afforestation.

g. All/Any plantations must utilize local/indigenous species rather than exotic species.

h. Compensatory Afforestation to be managed and controlled by an independent system to enable rightful and organized utilization of funds.[18]

The court in its order of 2005 marked the acceptance of the scheme of CEC by MoEF and presumed that it has been accepted by other states as well as no objection was raised in response to such scheme.

Another important step was constitution of CAMPA under section 3 (3) of the Environmental (Protection) Act. The Compensatory Afforestation Fund Management and Planning Authority (CAMPA) was constituted for the management of funds collected for compensatory afforestation. This executive body, CAMPA has six members and one Chairperson. Following are its powers and functions:

1. Appointment of staff on contract.
2. Managing the day to day financial process.
3. Delegating administrative and financial powers
4. Investment strategies with respect to fund raised, etc.

- Main goals set out by the court are that of protection and conservation of forests and their productivity, maintaining sustainable biodiversity, enhancing surrounding environmental conditions, etc.
- Mr. Salve, Aicus Curiae of the court suggested that TEV i.e. Total Economic Value provides for an

[17] Armin Rosencranz and SharachchandraLélé, 'Supreme Court and India's Forest', Vol.43 No. 5, Economic and Political Weekly, 2nd Feb 2008, Pgs 11-14, *available at:* http://www.environmentportal.in/files/-epw1.pdf (Visited on 18th September, 2015).

[18] T.N. Godavaraman Thirumulpad v. UOI & Ors, AIR 2005 SC 4256 (2006) 1 SCC 1, decided on 26.09.2006, *available at:*www.ielrc.org/-content/e0508.pdf (Visited on 21st September 2015).



© 2015 Global Journals Inc. (US)

account of both tangible as well as intangible benefits/ values that the forests provide through its natural resources. Combination of use and non use values build up TEV.

- The court in its order of 2005 explained CAMPA and its working in a very detailed manner and made following conclusions:

- Apart from schools and hospitals any other kind of project has to pay NPV before commencement. But the final decision depends upon the Expert Committee.
- Payment to CAMPA is valid and constitutional.
- Amount received must be utilized towards protection, conservation and upliftment of forests, environment and its resources and towards attaining ecological benefits.
- Funds to meet short term as well as long term goals.
- NPV should be in line with the Economic Principles.[19]

- The court further issued few directions to be followed:

- An Expert Committee to be formed comprising of three experts to lay down the parameters on the basis of which forest lands can be segregated on the basis of their value, to constitute diverse methodology for different geographical zone in order to figure out funds required for different areas of forests, to decide who is supposed to pay for compensatory affrestation, which projects can be exempted from contributing towards NPV.
- User agency shall be required to provide undertakings if required by expert body.
- Special Purpose Vehicle to be established after seeking due permission from the court.
- Report of Expert Committee to be sent.
- The clauses of CAMPA can be modified if required from time to time.[20]

*e) Order Passed by Hon'ble Court in January 2014*

This order passed by the Supreme Court covers the most important or the key point of the case of T.N. Godavaraman i.e. appointment of a "regulator" by the Central Government to carry out the functions and responsibilities like that of 'Environmental Impact Assessment', imposing penalties on polluters, etc, provided under section 3 (3) of the Environment (Protection) Act, 1986.[21]

In its order of 2014 of T.N. Godavaraman case the court explicitly cited the case of Lafarge Umiam Mining Private Ltd v. Union of India (2011) 7 SCC 338 in relation to the court agreeing not to intervene with the working and decisions of MoEF and for providing clearance for the mining activities/ project of the Lafarge Umiam Mining PvtLtd. But subsequently the court in its order dated 6/07/2011 also laid few guidelines to be followed in/ applicable to all future cases. Following guidelines or policies were to be followed compulsorily:

i. Appointment of a "National Regulator" by the Central Government under section 3(3) of the Act of Environment Protection, 1986 for the purpose of approving projects, establishing favourable environmental condition requirements, levying panalties on defaulters/ polluters. When such appointment was not made then the court in the year 2013 requested the learned Solicitor General Mr. Mohan Parasaran to inform the court as to when the direction of the court would be fulfilled/ complied with.

ii. When the matter was listed again on 18/11/2013 then the learned Solicitor General submitted that the court was actually to pay attention of National Forest Policy, 1988 that is related to/ has connection with the forests under section 2 of the Forest Conservation Act, 1980. He further states that the duty of a regulator has been bestowed upon the Central Government and it is the duty of Forest Advisory Committee to analyze and approve proposals after receiving prior approval under section 2 of Forest (Conservation) Act, 1980 from the Central Government as this committee is formulated under section 3 of this act, therefore these statutory duties/ responsibilities cannot be given to any other authority apart from Central Government.

iii. Next submission made by Mr. Parasaran was that Central Government has been bestowed with all powers under section 3 of Environment (Protection) Act like that of taking qualitative as well as quantitative measures for securing and maintaining the environmental standards. The Environment Impact Assessment (EIA) issued on 14/06/2006 by Central Government makes it clear that in order to commence any project an environmental clearance from the central government or state level EIA Authority in some cases is mandatorily required.

[19] T.N. Godavaraman Thirumulpad v. UOI & Ors, AIR 2005 SC 4256 (2006) 1 SCC 1, decided on 26.09.2006, *available at*:www.ielrc.org/-content/e0508.pdf (Visited on 21st September 2015).
[20] Ibid.

[21] M. Sakthivel, "Case Comment: T.N. Godavarman Thirumulpad v. Union of India, MANU /SC/0028 /2014" *available at*: http://rostrumlegal.com/blog/case-comment-t-n-godavarman-thirumulpad-v-union-of-india-manu-sc-0028-2014-by-m-sakthivel/ (Visited on 26th September, 2015).



© 2015 Global Journals Inc. (US)

Thus, when approval has to be granted by the central government then there is no need for appointment of a national regulator.

iv. Hence this is important to note that Mr. Parasaran considered the guidelines issued by the court as mere "suggestions" and that is why central government did not appoint a regulator under section 3(3) of the EPA thinking it to be just a suggestion and not an order.[22]

v. While on the other hand Amicus Curiae of the court Mr. Harish Salve repeatedly states that the order of the court is in the nature of mandamus i.e. Command of the court and the when the court held that a regulator should be appointed under section 3(3) of EPA then such direction implies that there is a "power coupled with duty" and Central Government has a mandatory duty/responsibility to appoint a "national regulator"

vi. Mr. Salve also mentions that the Lafarge order was passed in 2011 and no objections were raised at that time which means that it could be presumed that UOI understood the guidelines and is ready to follow them. Therefore suddenly after 2 years the central government cannot decline to abide by the order.

vii. The main issue raised in T.N. Godavaraman case's order of 2014 is to come to a decision whether the order of 2011 in the Lafarge Mining case was an order/ command of the court that had to be compulsorily complied with or a suggestion wherein the court issued guidelines and directed a "national regulator" to be appointed under section 3(3) of EPA, 1986.

viii. It was further brought to notice that no proper body exists for the proper working and implementation of National Forest Policy, 1988 read with Forest (Conservation) Act, 1980 (FCA). Therefore the central government has the power as well as the duty to appoint a regulator for proper/ effective applicability of the National Forest Policy, 1988.

ix. The court also laid down the difference between a regulator and a court in its 2014 order.

x. The Department of Management Studies, IIT, Delhi for MoEF, Executive and Government of India prepared a report on "Scope, Structure and Process of National Environment Assessment and Monitoring Authority (NEAMA) that delivers information regarding the issues faced in implementation of EIA 2006 Notification so that measures to improve it can be adopted by the concerned authorities.

xi. The court held in its order of 2014 that there is a need to appoint a "regulator" under section 3 (3) of EPAfor the purpose of providing environment clearances and to act in a fair, independent and judicious manner. Further the court believed that the submissions of Mr. Prasaran were not valid and justified. Therefore giving direction to UOI for appointing a "regulator under section 3(3) of EPA, 1986.[23]

Thus, it was quite evident from the order of 2014 which is a very important order of the WP (Civil) No. 202 of 1995 that the central government in order to grant hustle free clearances to mega projects wanted to avoid the appointment of the regulator when it was given the power and conferred with the duty to appoint a regulator at both state and central level for enabling proper implementation of National Forest Policy, 1988 and in turn protect and conserve the forests and their natural resources.[24]

## III. Implications of the Case of T.N. Godavaraman V. UOI & ors.

There are various positive as well as negative aspects that have been brought to light through the case of T.N. Godavaraman Thirumulpad v. Union of India

### a) *Positive Aspects*

There are several advantages that came into picture due to this case and due to the active role played by the judiciary. Following are the broad/major positive aspects that are the outcome/result of this case:

i. Curbing of distortion/flaws in the application/proper implementation of the Forest Conservation Act and ensuring its proper and smooth operation.

ii. Complete ban/ arrest of all illegal activities such as mass deforestation for using forest land for non forest purposes, cutting down and transporting large chunks of timber and other valuable resources.

iii. Formulating various New Government Bodies and New Administrators/ Superintendents of Forest

[22] M. Sakthivel, "Case Comment: T.N. Godavarman Thirumulpad v. Union of India, MANU /SC/0028 /2014" *available at*: http://rostrumlegal.com/blog/case-comment-t-n-godavarman-thirumulpad-v-union-of-india-manu-sc-0028-2014-by-m-sakthivel/ (Visited on 28th September 2015).

[23] T. N. Godavaraman Thirumulpad v. UOI & Ors, I.A. Nos. 1868, 2091, 2225-2227, 2380, 2568 and 2937 in WP (Civil) No. 202 of 1995, *available at*:http://supremecourtofindia.nic.in/outtoday/WC2021995.pdf, (Visited on 27th September 2015)

[24] M. Sakthivel, "Case Comment: T.N. GodavarmanThirumulpad v. Union of India, MANU /SC/0028 /2014" *available at*: http://rostrumlegal.com/blog/case-comment-t-n-godavarman-thirumulpad-v-union-of-india-manu-sc-0028-2014-by-m-sakthivel/ (Visited on 28th September 2015).



© 2015 Global Journals Inc. (US)

Policies [25] like the CECi. e. Central Empowered Committee which was created by the court to overcome the lacunas of the Ministry of Environment and Forest (MoEF) when the MoEF failed to resolve issues related to providing suitable reliefs against the measures taken by the government and other bodies while acting in accordance with the orders passed by the court. Another body called CAMPA i.e. Compensatory Afforestation Management and Planning Agency formed by the MoEF in order to regulate, redistribute and organize/manage the funds collected under the NPV or Net Present Value which was introduced by the Supreme Court in October 2002 according to which the states have to mandatorily pay the net present value of the forest land which has been deflected for the purpose of mining and other projects being undertaken by the public and private companies. This led to rise of sufficient funds for the purpose of compensatory afforestation.

iv. Many states became aware and conscious with respect to the non forest activities being carried out on forest lands. For instance the state of Bihar conducted an analysis so as to figure out the total number of saw mills that could be harmoniously sustained by the state's forests without causing any harm to the natural resources and the forest cover and then accommodated their licensing schemes and policies in accordance with that data.

v. Due to continuous intervention, supervision and control exercised by the apex court with the advent of the case of T. N. Godavaraman, the level of transparency [26] enhanced tremendously leading to avoidance of any type of goof up by other authorized environmental protection bodies in relation to the activities and procedures relating to the environmental activities/ those activities related to the forests like conversion of forest regions for non forest purposes, etc

vi. The close involvement of the apex court in this case portrays the concern of judiciary regarding the welfare of people, environment, resources and also puts forth an inspirational image of "Judicial Activism".

*b) Negative Aspects*

There are numerous negative effects of this case, the most evident ones being the following:

i. Havoc and complete destruction of the Timber Industries operating in the North-Eastern States and Lack of Judicial insight/ Prudence i.e. the seven north-eastern states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura commonly known as the seven sisters comprise of most of the part of Indian Forest cover, approx one fourth of the forest land of India and more than 50% of the Timber trade of the country. Due to the strict ban imposed on cutting down of trees, transportation of timber and other non forest activities like mining, etc a huge economic loss was inflicted on these states and timber industries as majority of the industries were shut down and the amount of timber imports increased tremendously. Moreover, instead of giving the state governments of these areas a chance to assign zones for such activities and relocation of such industries, the court without analyzing the intensity of economic loss imposed a complete ban on such activities, leading to serious economic loss to such state governments and industries operating therein.[27]

ii. The ban on cutting down of trees has led to diverse social and ecological impacts along with causing economic adverse impacts to the government. Since the ban was only with respect to the cutting down and transportation of Timber, the slaughtering of trees for obtaining charcoal and firewood has increased considerably. Hence causing harm to the most important resource i.e. the forests.[28]

iii. Another drawback of this case and ban imposed by the court is Breakdown of Working Plans and Establishment of Black Market for Timber because the court stated in its order of 1996 that unless the state governments introduces few working plans approved by MoEF and the Central Government for the issue of mass deforestation and converting forest lands for utilizing them for non forest purposes the court would not remove the ban from cutting down the trees. Since the State Governments have been very sluggish and stagnant in evolving and enforcing such plans there has been a considerable rise in forest management and there have been several evidences or large scale illegal activities with respect to felling and transportation of Timber, like for instance, it has been noticed that more than 60% of Timber in Assam is illegal. Thus,

[25] Armin Rosencranz, Edward Boenig, and BrindaDutta, The Godavaraman Case: The Indian Supreme Court's Breach of Constitutional Boundaries in Managing India's Forests, *available at:*http://elr.info/sites/default/files/articles/37.10032.pdf (visited on 6th October 2015).

[26] Armin Rosencranz and SharachchandraLélé, 'Supreme Court and India's Forest', Vol.43 No. 5, Economic and Political Weekly, 2nd Feb 2008, Pgs 11-14, *available at:* http://www.environmentportal.-in/files/epw1.pdf (Visited on 7th October 2015).

[27] Armin Rosencranz, Edward Boenig, and BrindaDutta, The Godavaraman Case: The Indian Supreme Court's Breach of Constitutional Boundaries in Managing India's Forests, *available at:*http://elr.info/sites/default/files/articles/37.10032.pdf (visited on 8th October 2015).

[28] Armin Rosencranz and SharachchandraLélé, 'Supreme Court and India's Forest', Vol.43 No. 5, Economic and Political Weekly, 2nd Feb 2008, Pgs 11-14, *available at:* http://www.environmentportal.in/-files/epw1.pdf (Visited on 8th October 2015).



© 2015 Global Journals Inc. (US)

leading to the formation of a huge Black Market for Timber Trade.

iv. Too much intervention by the court in the Duties and Functions of the Ministry of Environment and Forests (MoEF) by formulating the national as well as local guidelines for management of forests has lead to overlapping of actions and responsibilities of both the court and MoEF. Court has put a great deal of pressure on the MoEF to implement proper policies and regulations for tackling the problem of encroachment in the forests and exploitation of its resources, therefore even with insufficient funds and no proper resources the MoEF has to take steps to solve the issue of encroachment as demanded by court's order which has lead to causing great harm and huge loss to the poor people especially in the rural areas as such people who depended on forests for their source of livelihood no longer have a right on such forests. Many innocent people also suffered along with the illegal encroachers because everybody was removed in the process of eviction. Tribal people who are illiterate and did not have proper documents to prove that they were not encroachers also became victims of the mass eviction activity. Also no prior warning or notice was issued before evicting/ removing the people. People were deprived of their homes and livelihood suddenly and by using cruel and harsh means like elephants were used to crush the houses in the state of Assam. All this was a result of too much interference and casting unnecessary pressure by the court on the MoEF and other authorized bodies.[29]

v. The Amicus Curia, Harish Salve in this case informed that despite of court's order many states were letting the encroachers carry out their illegal activities in forest areas, therefore MoEF ordered for mass evictions from such regions leading to huge rebellion and revolts by the dwellers of those areas and development of hatred in the hearts of the tribals (who were to a great extent influenced by Naxalites) for the court/ judiciary.

vi. Monopolization or concentration of all the powers with the centre. Even small plans or working plans of petty relevance had to be first get approval from the Central Government and were under direct supervision and control of the court. Further there was continuous conflict between the MoEF and the court with respect to the prodigious investigating powers the court had given to CEC and regarding the creation of advisory committee which is the only body responsible for implementation of orders of the court. [30] MoEF believed that it had been handicapped by the overpowering attitude of the court.

vii. Reputation of the apex court and the entire Indian Judicial System is being hampered due to such long pendency of this case.

viii. "Judicial Over-Reach" or over stepping its constitutional mandate by the apex court has resulted in aggrieving the government and also sabotaging the work of the executive as well as legislature to some extent because it took extreme steps of banning even those activities that were not harmful like shutting down of saw mills in the name of non forest activities that also included simple tasks of basket weaving, etc. Moreover the court also intervened with the job of the legislature and lead to the through which it redefined the boundaries of forests by freshly defining the term 'forest.'

Therefore with this attitude of crossing the boundaries of Separation of Powers provision of the constitution and continuous interference by way of bringing in a new principle of "continuous mandamus" in the roles, duties and actions of other authorities through the case of T.N. Godavaraman, the apex court has lead to lot of negative consequences as well as negative publicity for itself.

## IV. Critical Analysis of T.N. Godavaraman Case

The case of T.N. Godavaraman is an epitome of "continuous mandamus" and a remarkable example of judicial activism as well as judicial overpowering wherein at some points it also depicts the adverse aspects of irrational/unreasonable judicial dominance and lacunas in speedy disposal of cases by the Indian Judiciary. This case majorly focuses on the role played by the Supreme Court of India and how is it overpowering rest of the courts and other relevant authorities. A case of "continuing mandamus" means a case in which the court instead of passing the final judgment has kept the case open for several years and is continuously giving new orders, imposing new bans, or passing any new directions with a motive/an intention to supervise the implementation and adherence of its various orders.

In this case of continuous mandamus the court has exceeded all its limits of delaying the decision in a particular case as the case is going on in the apex court for almost 20 years now and the court still not ready to wind up this case. Instead, at every hearing issues some

[29] Armin Rosencranz, Edward Boenig, and BrindaDutta, The Godavaraman Case: The Indian Supreme Court's Breach of Constitutional Boundaries in Managing India's Forests, *available at:*http://elr.info/sites/default/files/articles/37.10032.pdf (visited on 10th October 2015).

[30] Armin Rosencranz and SharachchandraLélé, 'Supreme Court and India's Forest', Vol.43 No. 5, Economic and Political Weekly, 2nd Feb 2008, Pgs 11-14, *available at:* http://www.environmentportal.in/-files/epw1.pdf (Visited on 10th October 2015).



© 2015 Global Journals Inc. (US)

new directions and is continuously trying to maintain a strong close control on all types of non forest activities taking place anywhere in or near the forests and also showcasing its undefeatable dominance over other lower courts, authorities and tribunals. Moreover, the court surpassed the boundaries of the doctrine of separation of powers and acted in sheer arbitrary manner interfering from the root level up to the highest level. Therefore, this case portrays both positive (protector of the environment) as well as negative (overstepping its mandate and interfering with the role of other authorities) aspects of the Indian Judicial System.

While the outcomes of the case of T.N. Godavaraman saw a major downfall and shutting down of the majority of timber, other wood based and mining industries due to the stringent ban imposed by the Apex Court on cutting down and transportation of timber. On the other side of it, this case witnessed a spectacular instance of an awareness, when a citizen, Mr. Godavaraman, filed a writ petition enabling the judicial system to step in and secure the trees in the forests from mass destruction i.e. deforestation. Ultimately this case has to a great extent, acted as a catalyst and a huge support system in protection and conservation of forests and its valuable natural resources and ensuring sustainable utilization of such resources so that no harm is inflicted upon the present and the future generations.

The most important contribution of this case towards the environment, is that proper and smooth operation of various legislations enacted to carry out environmental activities.

## V. Acknowledgement

This legal writing is a result of the study by the author. Any material used from different sources has been thoroughly acknowledged. After the successful completion of my work, I would like to thank a number of people.

I thank Ms. Sumiti Ahujawho undertook the role of Supervisor, Mentor and Guide, proved to be a constant driving force and support during the entire span of legal writing. It is due to her valuable guidance that I have been able to successfully complete this legal writing.

Further I would also like to thank the computer lab and library staff for providing their unparalleled infrastructural support.

It would never have been possible to complete this study without an untiring and unconditional support of my family and friends.

This legal writing bears testimony to the active encouragement and guidance of a host of friends and well-wishers.

B.A.LL.B (H)

9th Semester.

## Bibliography

*Primary Sources*

*Statutes*

- The Constitution of India, 1950.
- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Rights), Act 2006.
- The Environment (Protection) Act, 1986.
- The Forest (Conservation) Act, 1980.
- The Wildlife (Protection) Act 1972.
- The Jammu and Kashmir Wildlife (Protection) Act, 1978.

*Secondary Sources*

*Articles*

1. Rosencranz Armin and LéléSharachchandra, *"Supreme Court and India's Forest"*, Economic and Political Weekly, (Vol.43 No. 5) Available at:http://-www.environmentportal.in/files/epw1.pdf. (Visited on August 20, 2015).
2. *T.N. Godavaraman Thirumulpad v UOI & Ors*, AIR2005SC4256, (2006)1SCC 1, Available at: http://www.ielrc.org/content/e0508.pdf. (Visited on 1st September 2015).
3. *'Down To Earth'*, August 31st 2002, Interview with T N Godavaraman Thirumulpad. Available at: http://-www.doccentre.net/docsweb/adivasis_&_forests/interview.pdf. (Visited on: 1st September 2015).
4. Rosencranz Armin, Boenig Edward, and Dutta Brinda, *"The Godavaraman Case: The Indian Supreme Court's Breach of Constitutional Boundaries in Managing India's Forests".* Available at*:* http://elr.info/sites/default/files/articles/37.10032.-pdf. (Visited on: 8th October 2015).
5. *T. N. Godavaraman Thirumulpad v. UOI & Ors*, I.A. Nos. 1868, 2091, 2225-2227, 2380, 2568 and 2937 in WP (Civil) No. 202 of 1995. Available at: http://supremecourtofindia.nic.in/outtoday/WC2021-995.pdf. (Visited on: 27th September 2015).
6. Rosencranz Armin, Boenig Edward, and Dutta Brinda, *"The Godavaraman Case: The Indian Supreme Court's Breach of Constitutional Boundaries in Managing India's Forests"*. Available at:http://elr.info/sites/default/files/articles/37.10032.-pdf. (Visited on: 10th October 2015).

*Websites*

- www.scconline.com
- www.indiankanoon.org
- www.manupatra.co.in



© 2015 Global Journals Inc. (US)

This page is intentionally left blank

© 2015 Global Journals Inc. (US)

Global Journal of human-social science: b
Geography, Geo-Sciences, Environmental Science & Disaster Management
Volume 15 Issue 4 Version 1.0 Year 2015
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-460x & Print ISSN: 0975-587X

# Length of Rainfall Season and its Implication over Enugu South - East Nigeria

By Alexander Budnuka Chinago
*Rivers State College of Arts and Science, Nigeria*

*Abstract-* The study length of Rainfall (RF) season in Enugu, South East, Nigeria from 1916 – 2012 examines the trend in RF pattern over Enugu. Data for this work were extracted from the Nigerian Meteorological Agency (NIMET) Oshodi, Lagos archive for analysis. The results show that the date of Onset of RF over the years has extended or delayed slightly from 12th March (71) day of the year in 1916 to about 15 in 2012. In analysing RF cessation, it was observed that RF cessation has reduced or shifted forward from 21st October to 10th October. The study further observed that the duration of RF over Enugu has reduced. The duration in 1916 was 256 days, in 2012 duration accounted for just 223 rainy days during the period, representing a decrease of about 30 days as shown by the trend line for RF duration. It was also discovered that the RF distribution of Enugu skewed positively an indication that total RF is reducing slowly. The RF season or duration over Enugu covers 7 months. This work discovered that, onset of RF has extended, while cessation date reduced, and duration of RF has also reduced pointing to high RF intensity, this can trigger flooding and soil erosion, therefore, the work suggests that every environmental related policies need to consult RF data and take account the benefits and demerits associated with it.

*Keywords:* *climate change and fluctuation, rainfall parameters, wet and dry season, Enugu.*

*GJHSS-B Classification :* *FOR Code: 059999*




*Strictly as per the compliance and regulations of:*

© 2015. Alexander Budnuka Chinago. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License http://creativecommons.org/licenses/by-nc/3.0/), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

# Length of Rainfall Season and its Implication over Enugu South - East Nigeria

Alexander Budnuka Chinago

*Abstract-* The study length of Rainfall (RF) season in Enugu, South East, Nigeria from 1916 – 2012 examines the trend in RF pattern over Enugu. Data for this work were extracted from the Nigerian Meteorological Agency (NIMET) Oshodi, Lagos archive for analysis. The results show that the date of Onset of RF over the years has extended or delayed slightly from 12th March (71) day of the year in 1916 to about 15 in 2012. In analysing RF cessation, it was observed that RF cessation has reduced or shifted forward from 21st October to 10th October. The study further observed that the duration of RF over Enugu has reduced. The duration in 1916 was 256 days, in 2012 duration accounted for just 223 rainy days during the period, representing a decrease of about 30 days as shown by the trend line for RF duration. It was also discovered that the RF distribution of Enugu skewed positively an indication that total RF is reducing slowly. The RF season or duration over Enugu covers 7 months. This work discovered that, onset of RF has extended, while cessation date reduced, and duration of RF has also reduced pointing to high RF intensity, this can trigger flooding and soil erosion, therefore, the work suggests that every environmental related policies need to consult RF data and take account the benefits and demerits associated with it.

*Keywords: climate change and fluctuation, rainfall parameters, wet and dry season, Enugu.*

## I. Introduction

The study of RF is multidimensional in nature, because RF as an element of climate has a lot of impact on the environment and human within the environment. Therefore, any study of RF in the tropic must clearly state the aspect under consideration. The elements of climate are temperature, precipitation, sunshine duration, wind, cloud cover, humidity and pressure. The fluctuation of these elements can affect the climate of an area for good or for bad.

The examination of these variables in a single paper or study is difficult; therefore researchers tend to study single or fewer variables, knowing that variation in one will also affect the others and indeed the climate.

Rainfall is a form of atmospheric precipitation that is composed of large drops of liquid water; it consists of water droplets ranging from 1 - 5mmin diameter (Alexander, 2012). The types of rain produce reflect the circumstances in which it is formed (Mayhew, 2004).

Rainfall is one element that influences, the tropical ways of life, it dictates the agricultural calendar, impact on hydrologic circle, social life and even food distribution and transportation. It is very pertinent for economic growth and development in Enugu and Nigeria at large (Enete and Ebenebe, 2009). The amount of rainfall that is normally received determines which types of agriculture that can be carried out and which crops can be cultivated in a region. The seasonal distribution of rainfall regulates the agricultural calendar in the tropics (Alexander, 2012; Alexander et al, 2015; and Ajayi and Ojeleye). The relationship that exists between Rainfall and the tropical occupation of agriculture, especially in Enugu State of Nigeria that employ over 80% of the work force, this makes it important to study RF which determines agricultural calendar in the tropics. Odjugo (2010) argues that climate change has caused a shift in the normal timing and length of wet and dry seasons, shift in the seasonal variability of weather and climate; and increase in the seasonal fluctuation of the water bodies. Rainfall variability refers to variations in the mean state and other rainfall statistics on all spatial and temporal scales beyond that of individual precipitation events.

The earth's atmosphere consists of a mixture of various gases surrounding the earth to the height of many kilometres. However, the man's surface environment is a shallow but highly complex zone in which atmospheric conditions exerts control upon the land surface, while at the same time the surface of the land exert an influence upon the properties of the immediately adjacent atmosphere (Ukpong, 2009; Hardy, 2004; Bradshaw and Weaver, 1995).The earth's climate is dynamic and naturally varies on seasonal, decadal, centennial, and longer timescale. Each "up and down" fluctuation can lead to conditions which are warmer or colder, wetter or drier, more stormy or quiescent (NOAA, 2007).

The importance of RF on a given area depend on how it affects the peoples live and what the researchers seeks to achieve. The study could be for just an academic exercise, but most of the studies emanate as a solution to identified problems.

Most of the available work on RF are on trends, for instance, Abaje et al, 2010; If abiyi and Ojoye, 2013; Abaje et al, 2012; Imo and Ekpenyong, 2011, all discussed trend. Rainfall trend gives a picture of rainfall pattern annually. It is important in the study of hydrologic cycle and water resources; however, it is not very important for agriculture and understanding seasonal distribution of RF. It does not also explain the facts on

*Author: Department of Social Sciences "Geography Unit" Rivers State College of Arts and Science, Rumuola, Port Harcourt, Nigeria chinago. e-mail: alexerim@yahoo.com*



© 2015 Global Journals Inc. (US)

drought and flooding. It is actually an illusion to the true distribution of rainfall. (Alexander, 2015; Ayoade, 2003)

Other scholars such as (Srivastava, 1975 and Akinyemi et al, 2013) worked on seasonality of rainfall. Seasonal rainfall is vital in the field of agriculture and even monitoring of drought and flood incidences, however, most of the work did not use the results for predictions. It is also observed that the seasonal rainfall on its own cannot explain much and therefore will be usefully limited. It is like a sort of fluctuation or monthly variations.

The present study tends to investigate the length of RF over Enugu, using parameters such as Onset, Cessation and Duration for analysis. Attempt shall also be made using Pearson coefficient of skewness to determine the dispersion of RF during the study period over the study area. The few works carried out on the length of RF were targeted on planting season and harvest (Agriculture), this work goes beyond agriculture as it proposes application in the field of construction, water resource, etc.

## II. The Study Area

Enugu is one of the oldest cities in Nigeria. It was the capital of the defunct Eastern Region and East Central State of Nigeria. Presently the city of Enugu is the capital of a State bearing its name 'ENUGU STATE'. Enugu has two local government areas. It is the home of the Akanulbiam International Airport, Enugu State University of science and technology, Enugu State Institute of Management, home of Enugu Rangers Football Club (http://www.enugustate.gov.ng, 7-8-15).

Enugu is located on longitude 7°30'53.5"E - 7°34'40.54"E and latitude 6°24'14.62"N - 6°24'26.94"N, and on altitude of 152 meter above sea level.

Enugu has tropical wet climate. This implies that it has double maxima of RF pattern. It has a moderate temperature, with a mean temperature of 27°c, and a range of 4°c - 5°c. It has aRF of about 1500mm – 2100mm. Wet season lasted for about 7 – 8 months with a break or dry spell around August, the so called August break also known as dry spell.

Enugu falls within the farraginous soil within the interior zone of the late rite zone of Nigeria. Her major crops include Palm trees, Cassava, Maize, Bean seed, etc. Other economic activities includes, trading, mining, and transportation. The city of Enugu came into prominence as a result of coal discovery within and around it. The mineral resources within Enugu are Coal, Lead, and Zinc.

The population of Enugu stands at 722,664 in 2006 with a population density of 6,400 persons per square kilometre (NPC, 2006; http://en.wikipedia.-org/wiki/Enugu). Figure 1a shows the map of the study area within Nigeria, and Figure1b shows the area of study.



*Figure 1a :* Map of Nigeria showing Enugu State




*Figure 1b :* Map of Enugu State



© 2015 Global Journals Inc. (US)

## III. Material and Methods

Rainfall data for this work were extracted from the Nigerian Meteorological Agency (NIMET) Oshodi, Lagos from 1916 – 2012 (97 years) for analysis. The onset, end, and duration of RF were calculated using Walter's formula (Walter, 1967). The results of each of the 98 years were calculated.

$$\text{Onset/End of RF} = \text{NDM } (51 - \text{PAR})/\text{ARM} \quad (1)$$

Where NDM is the number of days of the when the constant 51 is reached or exceeded. 51 is the minimum RF accepted as the start of RF. Whereas PAR is previous accumulated RF before the 51mm target is reached or exceeded. ARM means the amount of RF recorded within the month that the 51mm target was reached.

$$\text{Duration of RF} = \text{End} - \text{Onset} \quad (2)$$

For Pearson coefficient of skewness Microsoft excel approach was adopted, the same was adopted in calculating seasonality index of RF.

$$\text{Seasonal percentage} = \text{SATRF/TRF} \times 100 \quad (3)$$

Where SATRF is the seasonal amount of RF, and TRF is the total RF for the period.

## IV. Result and Discussions

*a) Onset, Cessation, and Duration of Rainfall*

Analysis of onset of RF shows a great deal of fluctuation over the study period. However, the mean ($\bar{x}$) onset date is the 77$^{th}$ day of the year, which is March 18$^{th}$. Generally the study shows a delay in onset of RF over the study period. This implies that RF has shifted from the earliest date to a later date. Table1a shows the onset distribution of RF over the study period (1916 – 2012). The fluctuation shows the different dates of onset and the trend line points to the trend or pattern over the years. The line shows a slight increase in onset dates. This gradual shift can hardly be noticed by local people and farmers and thus may affect agricultural yield. The best RF onset period target would be 77± a week. The implication is that RF could start a week to or after the 77$^{th}$ day of the year.

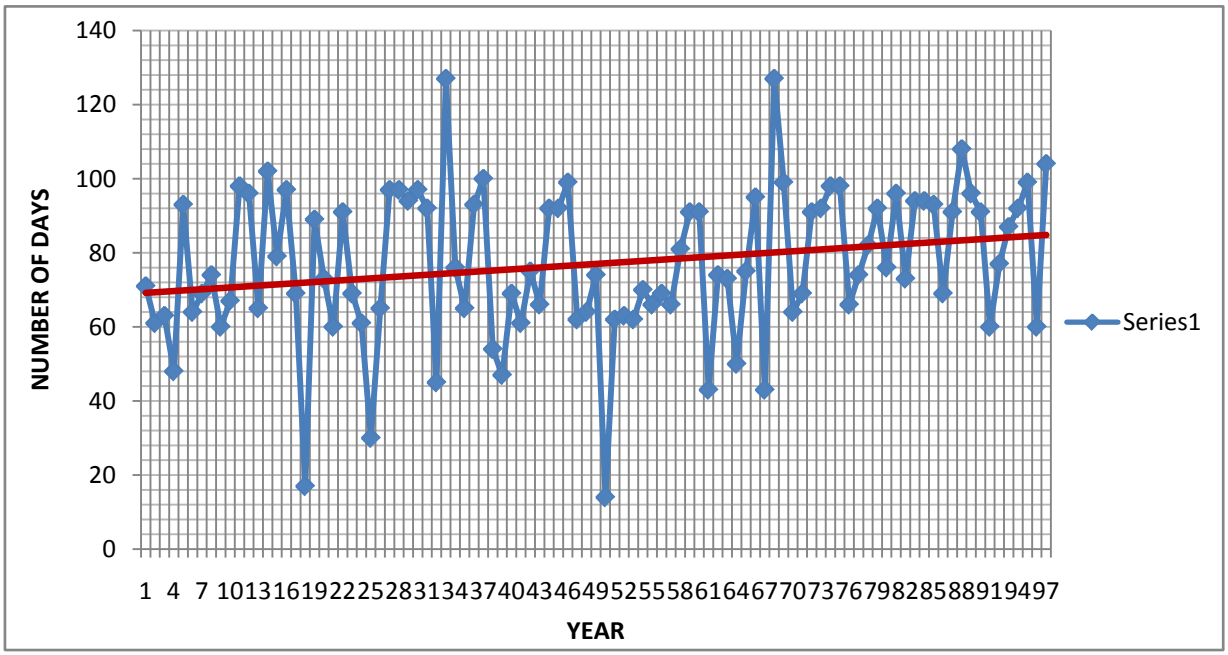



*Figure 1a :* The Variation of Enugu Rainfall Onset date and Trend over the Study Period (1916 – 2012)

Note the line started below the 80$^{th}$ day and ended above the 80$^{th}$ day, which is an indication of delayed RF onset date.

A further analysis using 10 years running mean to observe the trend and pattern shows that RF onset date is shifting to a later date.Figure1b explain the trend using 10 years running mean.

The earliest RF onset dates during the Period of study were the 14$^{th}$ day of the year (14$^{th}$ January) in 1965, 17$^{th}$ day of the year (17$^{th}$ January) in 1933 and the 30$^{th}$ day of the year (30$^{th}$ January) in 1940.While the latest RF onset date includes the 127$^{th}$ day of the year (6$^{th}$ and 7$^{th}$ May) in 1948 and 1983, and the 108$^{th}$ day of the year (19$^{th}$ April) in 2003.

© 2015 Global Journals Inc. (US)

Late Onset date implies a delay in planting date. The traditional date for planting is gradually shifting; by implication farmers that stick to the local date of planting may likely have poor harvest.

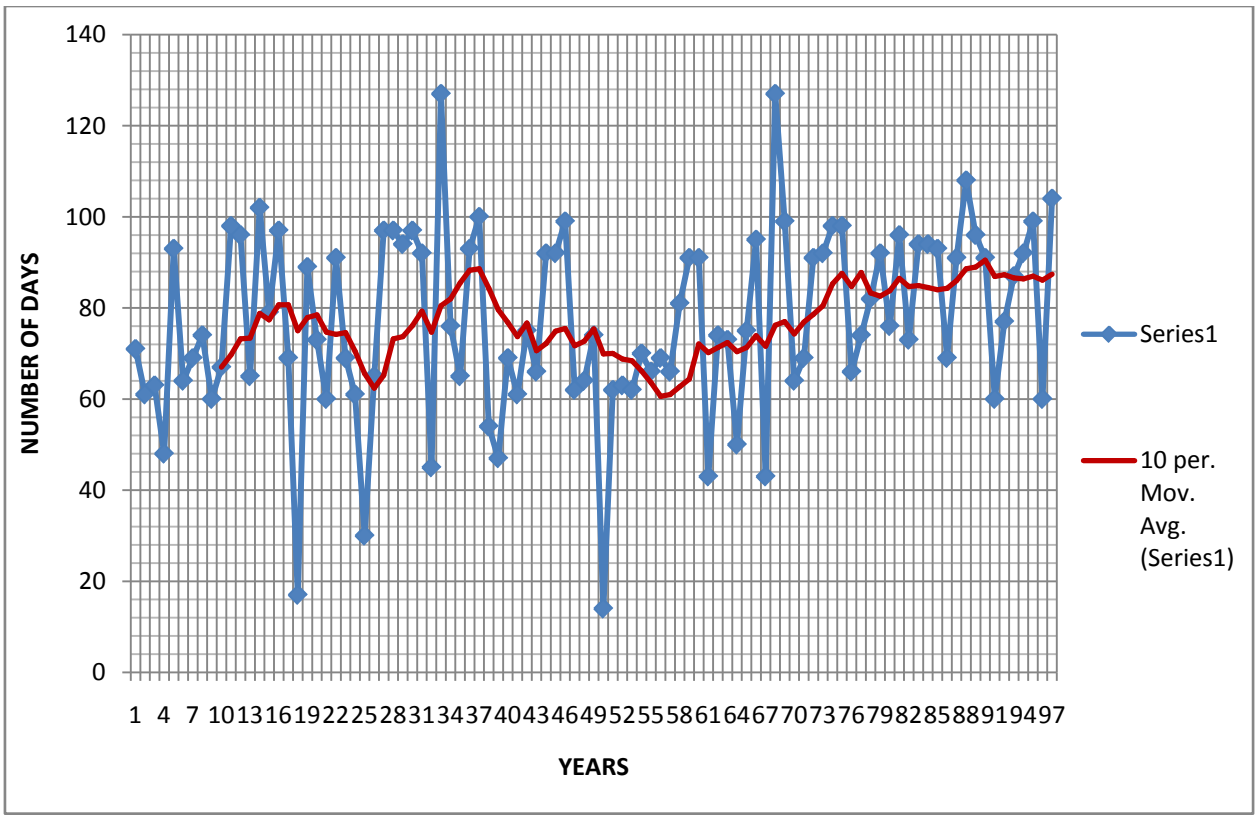



*Figure 1b :* The Distribution of Enugu RF onset date and 10 years Running Mean

Note- from table1b only few dates before 1988 crosses the 80th day of the year, however, from 1988 onward exceeded the 80th day of the year. This is an indication that onset date is increasing.

Increase in onset means a delayed in the date of RF onset which will directly planting of crops.

Similarly, it was observed that cessation or the end of the RF has slightly shifted forward. That is the end of RF occurs earlier. The latest cessation date, over the study period among others were, the 356th day of the year, 21st December in 1936, the 349th day of the year, which is 15th December in 1947 and 331st day of the year (27th November) 1975 and 1986 respectively. On the other hand the earliest RF cessation date includes the 246th day of the year, which is 3rd September, and the 274th day of the year, 1st October which occurred in 1925, 1937, 1967and 1979.

The mean ($\bar{x}$) RF cessation date for the study period is the 290th day of the year. Figure2a and Figure2b show the trend and distribution pattern of Enugu RF cessation dates during the study period.



© 2015 Global Journals Inc. (US)

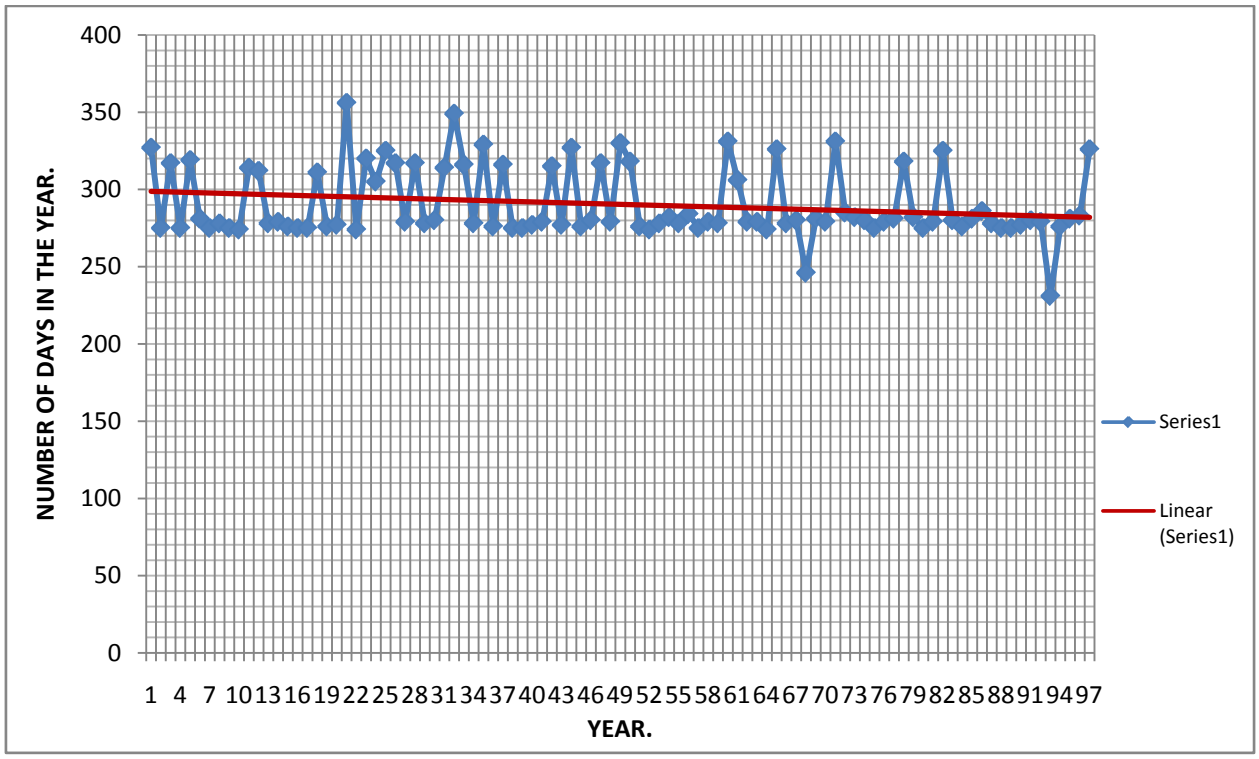



*Figure 2a :* The Distribution of Enugu RF Cessation date and Trend line indicating a shift over the years

The red line is a linear series pointing to the general trend or direction of shift of RF cessation over Enugu during the study period. The trend line started very close to the 300th day of the year in 1916,and shifted gently with 10 days by 1951(36 years) later. The shift gradually reduced to 20 days in 2012 after about 62 years. The shift or dispersion is very slow that even in a graph it seems to be ignored or very difficult to notice, but a reduction of about 3 weeks is a serious concern in climatology. This implies that Enugu RF cessation date will occur 3 weeks earlier on the $\bar{x}$.

The 10 years running $\bar{x}$ analysis shown in figure2b support the aforementioned result.

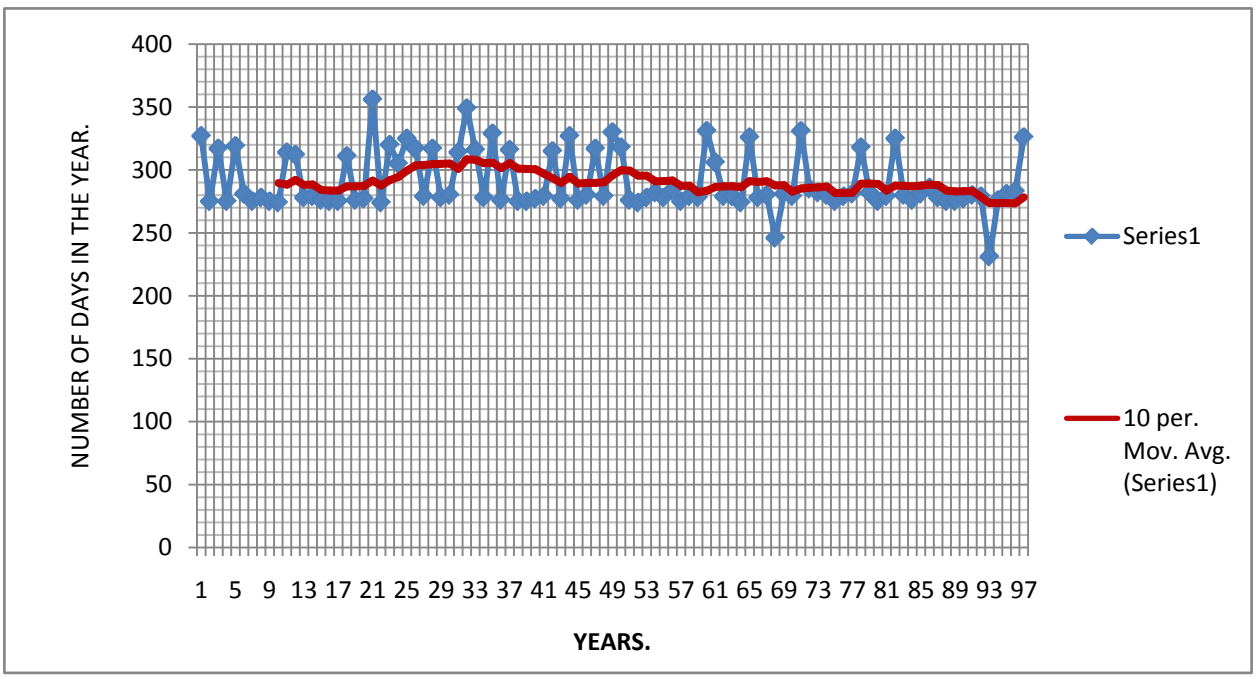



*Figure 2b :* The Distribution of Enugu RF cessation date and 10 years Running Mean



© 2015 Global Journals Inc. (US)

More of the cessation date falls below the moving $\bar{x}$ line. The cessation date reduces from the 300th day of the year to nearly 270th day in 2012.

The RF condition of Enugu shows that policy makers, farmers, and developers need to consider the Onset of RF and End in their plans. For instance, in road construction, especially the local roads, work should start about a week after the end of RF. There is the need for water to be conserve which can be used after RF cessation or during the dry months.

The analysis base on RF duration generally revealed a drop in days (i.e. Number of days). This implies that RF duration has decreased or shortened over the study period. Figure 3a shows RF duration fluctuations over the study period in Enugu and the trend line showing the direction of shift (i.e. the direction the trend is tilting to). Note, this does not account for the total RF in Enugu, whether it was reducing or increasing, rather, it shows that the rainy period is reducing or decreasing over the years. This shows a gradual but steady decrease in duration of RF over the study period.

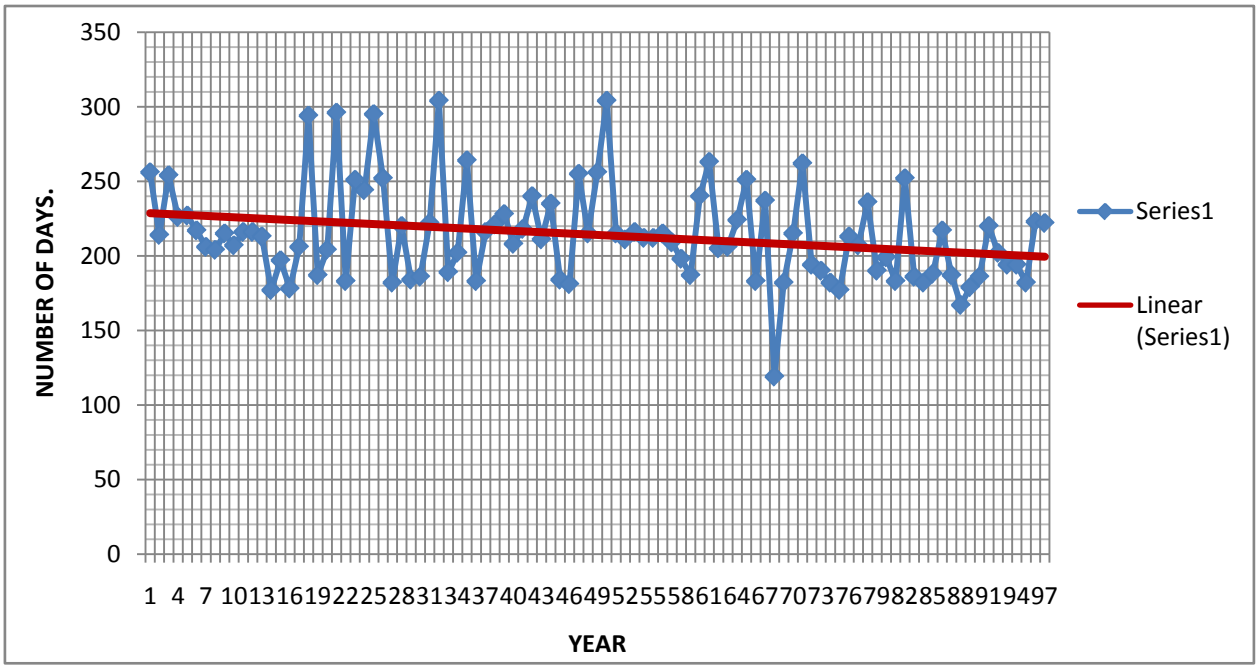



*Figure 3a :* The Distribution of Enugu RF Duration date and Trend line indicating a shift over the years

The 10 years moving $\bar{x}$ also shows that RF duration days is decreasing over time. The duration of RF is the difference between cessation date and onset date. A shift in one will affect the others, especially when the shift is in the opposite direction as shown in this study.

The study also shows that RF has shifted in all ramifications over the period of study in Enugu; this will affect water use, agriculture, constructions, and even outdoor activities.



© 2015 Global Journals Inc. (US)

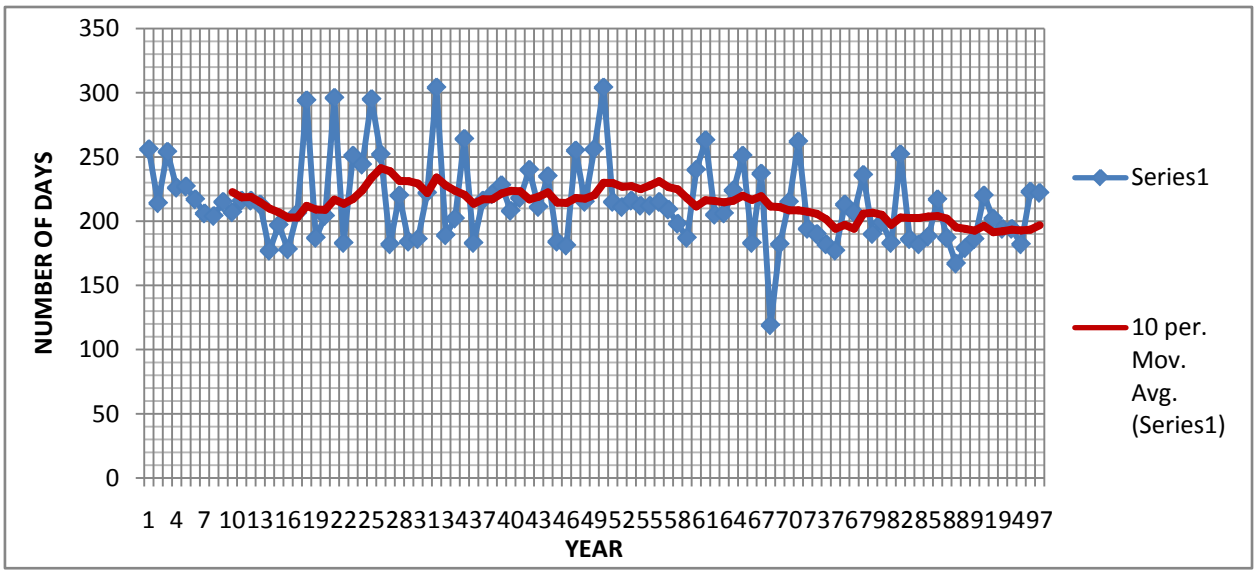



*Figure 3b :* The Distribution of Enugu RF Duration date and 10 years Running Mean

The comparative study of the three RF parameters shown in Figure 4, suggests that there is a shift or fluctuation in the parameter distribution during the study period, the trend lines show a divergence, an indication of variation from the normal state. The lines are closer toward the right or later years, showing a reduction in the RF duration period, as against wider lines on the left or earliest years.

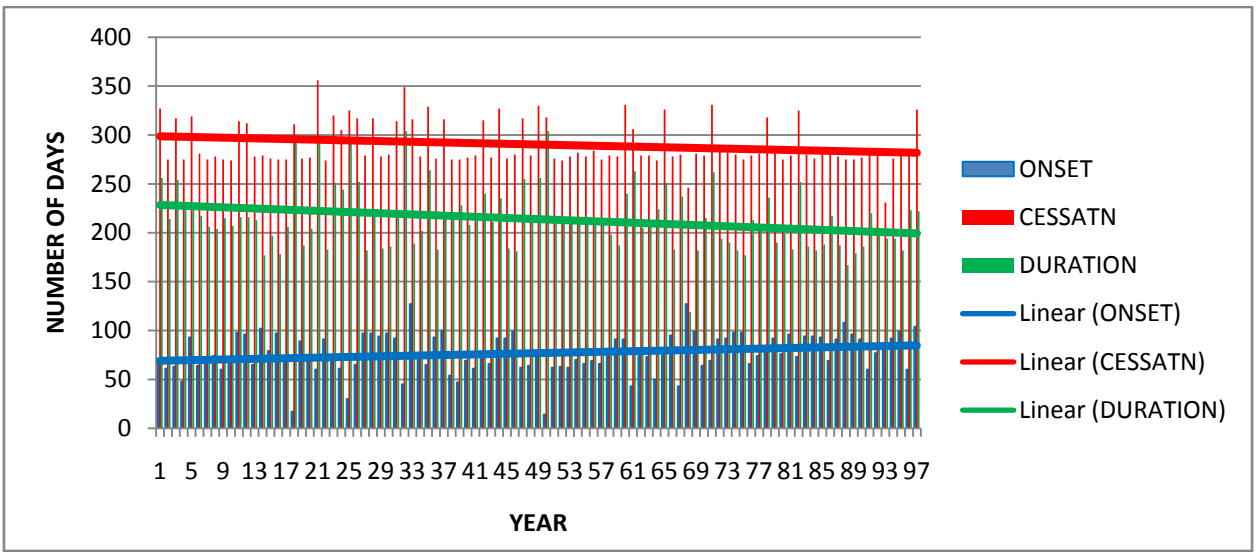



*Figure 4 :* Comparative Analysis of Enugu RF Parameters

The analyses so far show that Onset of RF is late, the Cessation or End is early, these are responsible for the reduction in RF Duration over the study area and period. The climate of Enugu is gradually shifting, because alteration of the existing RF pattern will also affect other climatic variables.

The rainy season contributed a total of 157692.79mm of RF out of the total of 172076.3mm recorded during the 97 years of study, representing 91.64%. The rainy season includes, April, May, June, July, August, September, and October. Logically March could have been included as part of rainy reason, since RF onset began in March. For convenience the study included October which is the end with the assumption that RF started half way in the month and ended half way of the month. When rationally we divided the year into half, the rainy season also accounted for 83.34% of the total RF.

This study reveals that the present RF duration in Enugu is about 59% of the year, which implies that RF or rainy season will last for about seven (7) months. Mean RF duration of Enugu is 212 days.



© 2015 Global Journals Inc. (US)

Harper (1977) stated that when a distribution skewed to the left it is positive, but when skewed to the right that it is a negative skew. The result of Pearson coefficient of skewness using Microsoft Excel is 0.220276 approximately 0.22. This implies that Enugu's RF distribution skewed to the left very slightly, which is an indication that RF occurrences and amounts are declining over the years in the study area. This is expected since the duration RF has reduced.

## V. Conclusion and Recommendations

The study observed that RF parameter varies within months and years; however, set pattern has been established. That the date of RF onset has increased over the study period, which implies that RF onset, will be late or start late. It was also observed that RF cessation has shifted in the opposite direction with onset. The implication is that RF tends to stop or end earlier. Which means that crops that matured very late may hamper productivity?

In analysing the duration of RF distribution, it was observed that the duration has reduced. This simply means that the RF period has reduced. It was also revealed that RF distribution skewed leftward an indication that RF distribution is also decreasing over the years. These revelations calls for urgent reorganization of climate related sectors, especially Agriculture, Water Resources Management and Road Construction. The shift is very slow as shown in the relevant figures. The shift presently has not been identified as a problem or blessing, that is beyond the scope of this paper.

The paper suggests that the shift observed in this work should be reviewed or reinvestigated with the aim to knowing if such shifts in RF parameters are for humans' advantage or warning to climatic havoc in Enugu, indeed the entire country. Besides, RF parameters data should be consulted before any serious environmental related decisions are made. There is a need to embark on a forecast of RF parameters over Enugu and in fact the whole Nigeria, because 4 – 6 month forecast is not always very useful in climatology, especially in Agro climatology.

Farmers have to work with RF parameter data to optimize yield; Road construction contractor should also be mindful of this vital tool before going to the field. Finally, the climatological data should be made available and free for researchers, the States, Corporate bodies and NGOs should assist researchers, especially those working on Weather and Climate, because life and human welfares are involved.

## References Références Referencias


1. Abaje, I, B., S.I. Ishaya and S.U. Usman (2010) An Analysis of Rainfall Trends in Kafanchan, Kaduna State, Nigeria. Research jour. Of Environt., and Earth Sci., 2(2):89 – 96.
2. Abaje, I.B., O.F. Ati and E.O. Iguisi (2012) Recent Trends and Fluctuations of Annual Rainfall in the Sudano-Sahelian Ecological Zone of Nigeria: Risk and opportunities. Jour. Of Sustainable Society. 1(2):44 – 51.
3. Ajayi, P.O.S (2003) *Comprehensive Geography for Senior Secondary School.* A. Johnson Publishers Limited, Lagos, Nigeria.
4. Akinyemi, O., O.A. Ayeni, O. Faweyeand A.G. Ibraheem (2012) Statistical study of Annual and Monthly Rainfall Pattern in Ekiti State, Nigeria. Int. J. Pure Appl. Sci. Technol., 15(2): 1-7.
5. Alexander, B.C (2012) Climate Change – A case study of Port Harcourt city Rainfall Pattern. Jour. Soc. Sci. Develop., 1(3): 54 – 60.
6. Alexander, B.C (2015) Climatological Review of Enugu Rainfall FROM 1916 – 2012. Paper presented at NDSS Geographers Conference, 3rd August, 2015.
7. Ayoade, J.O (2003) *Introduction to Climatology for the Tropics.* Revised Edition. Spectrum Publishers, Ibadan, Nigeria.
8. Bradshaw, M and R. Weaver (1995) *Foundations of Physical Geography.* Wm. C. Brown Publishers.
9. Enete, I.C and I. N. Ebenebe (2009) Analysis of Rainfall distribution over Enugu during the little dry season (1990 – 2005), J. Geog. And Regional Planning, 2(7) :182 – 189.
10. Hardy, I.H. (2004) *Climatology.* The Royal Academy Press, London.
11. Harper, W.M. (1977) Statistics. The M and E Handbook Series. 3rd Edition, The Chaucer Press, Great Britain.
12. http://www.enugustate.gov.ng. Retrieved on 7th August, 2015.
13. http://enwikipedia.org/wiki/Enugu. Retrieved on 7th August, 2015.
14. Ifabiyi, I.P. and S. Ogoye (2013) Rainfall Trends in Sudano-Saheian Ecological Zone of Nigeria. Earth Sci. Resc., 2(2): 186 – 194. Doi:10.5539/esr.-v2n2p194. URI.http://dx.doi.org/10.5539/esr.v2n2-p194.
15. Imo, E.J and N. Ekpenyong (2011) Extreme Climate variability in North – Western Nigeria: An Analysis of Rainfall Trends and Patterns. Jour. Geogr. Gly., 3(1): 40 – 51. Doi.10.5539/ jgg.vn1p51.
16. Mayhew, C. (2004) *Dictionary of Geography.* University of Oxford Press, London.
17. NOAA (2007) Observing climate variability and changes. Available at http://www.oar.noaa.-gov/climate/tobserving.html. Retrieved on 8th August, 2015.
18. NPC (2010) Nigerian Population Commission 2010 Projection.
19. Odjugo, P.A.O. (2005) "An Analysis of Rainfall pattern in Nigeria". Global J. Env't. Sci., 4(2): 139 – 145.




© 2015 Global Journals Inc. (US)

20. Srivastava, M.K. (1975) "Regional Varistion in the Seasonality of Precipitation in Bangladesh". 42(A) 1. Available in http://www.new.dii.ernet.in/data1/-upload/i-nsa/INSA-1/20005bea-68.pdf
21. Ukpong, I.E. (2009) Perspectives on Environmental Management. Environmental Systems Club Inc. Uyo, Nigeria.
22. Walter, M. (1967)" The length of the Rainy Season in Nigeria". Nigeria Geog. J., 10: 123-128.



© 2015 Global Journals Inc. (US)

# Global Journals Inc. (US) Guidelines Handbook 2015

www.GlobalJournals.org

# FELLOWS

## FELLOW OF ASSOCIATION OF RESEARCH SOCIETY IN HUMAN SCIENCE (FARSHS)

Global Journals Incorporate (USA) is accredited by Open Association of Research Society (OARS), U.S.A and in turn, awards "FARSHS" title to individuals. The 'FARSHS' title is accorded to a selected professional after the approval of the Editor-in-Chief/Editorial Board Members/Dean.



- The "FARSHS" is a dignified title which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., FARSS or William Walldroff, M.S., FARSHS.

FARSHS accrediting is an honor. It authenticates your research activities. After recognition as FARSHS, you can add 'FARSHS' title with your name as you use this recognition as additional suffix to your status. This will definitely enhance and add more value and repute to your name. You may use it on your professional Counseling Materials such as CV, Resume, and Visiting Card etc.

*The following benefits can be availed by you only for next three years from the date of certification:*

FARSHS designated members are entitled to avail a 40% discount while publishing their research papers (of a single author) with Global Journals Incorporation (USA), if the same is accepted by Editorial Board/Peer Reviewers. If you are a main author or co-author in case of multiple authors, you will be entitled to avail discount of 10%.

Once FARSHS title is accorded, the Fellow is authorized to organize symposium/seminar/conference on behalf of Global Journal Incorporation (USA). The Fellow can also participate in conference/seminar/symposium organized by another institution as representative of Global Journal. In both the cases, it is mandatory for him to discuss with us and obtain our consent.





You may join as member of the Editorial Board of Global Journals Incorporation (USA) after successful completion of three years as Fellow and as Peer Reviewer. In addition, it is also desirable that you should organize seminar/symposium/conference at least once.

We shall provide you intimation regarding launching of e-version of journal of your stream time to time.This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

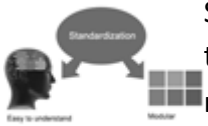



© Copyright by Global Journals Inc.(US) | Guidelines Handbook

The FARSHS can go through standards of OARS. You can also play vital role if you have any suggestions so that proper amendment can take place to improve the same for the benefit of entire research community.

As FARSHS, you will be given a renowned, secure and free professional email address with 100 GB of space e.g. johnhall@globaljournals.org. This will include Webmail, Spam Assassin, Email Forwarders,Auto-Responders, Email Delivery Route tracing, etc.






The FARSHS will be eligible for a free application of standardization of their researches. Standardization of research will be subject to acceptability within stipulated norms as the next step after publishing in a journal. We shall depute a team of specialized research professionals who will render their services for elevating your researches to next higher level, which is worldwide open standardization.

The FARSHS member can apply for grading and certification of standards of the educational and Institutional Degrees to Open Association of Research, Society U.S.A. Once you are designated as FARSHS, you may send us a scanned copy of all of your credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria. After certification of all your credentials by OARS, they will be published on your Fellow Profile link on website https://associationofresearch.org which will be helpful to upgrade the dignity.




The FARSHS members can avail the benefits of free research podcasting in Global Research Radio with their research documents. After publishing the work, (including published elsewhere worldwide with proper authorization) you can upload your research paper with your recorded voice or you can utilize chargeable services of our professional RJs to record your paper in their voice on request.




The FARSHS member also entitled to get the benefits of free research podcasting of their research documents through video clips. We can also streamline your conference videos and display your slides/ online slides and online research video clips at reasonable charges, on request.

© Copyright by Global Journals Inc.(US)| Guidelines Handbook



The FARSHS is eligible to earn from sales proceeds of his/her researches/reference/review Books or literature, while publishing with Global Journals. The FARSHS can decide whether he/she would like to publish his/her research in a closed manner. In this case, whenever readers purchase that individual research paper for reading, maximum 60% of its profit earned as royalty by Global Journals, will be credited to his/her bank account. The entire entitled amount will be credited to his/her bank account exceeding limit of minimum fixed balance. There is no minimum time limit for collection. The FARSS member can decide its price and we can help in making the right decision.

The FARSHS member is eligible to join as a paid peer reviewer at Global Journals Incorporation (USA) and can get remuneration of 15% of author fees, taken from the author of a respective paper. After reviewing 5 or more papers you can request to transfer the amount to your bank account.



## MEMBER OF ASSOCIATION OF RESEARCH SOCIETY IN HUMAN SCIENCE (MARSHS)

The ' MARSHS ' title is accorded to a selected professional after the approval of the Editor-in-Chief / Editorial Board Members/Dean.



The "MARSHS" is a dignified ornament which is accorded to a person's name viz. Dr John E. Hall, Ph.D., MARSHS or William Walldroff, M.S., MARSHS.

MARSHS accrediting is an honor. It authenticates your research activities. Afterbecoming MARSHS, you can add 'MARSHS' title with your name as you use this recognition as additional suffix to your status. This will definitely enhance and add more value and repute to your name. You may use it on your professional Counseling Materials such as CV, Resume, Visiting Card and Name Plate etc.

*The following benefitscan be availed by you only for next three years from the date of certification.*




MARSHS designated members are entitled to avail a 25% discount while publishing their research papers (of a single author) in Global Journals Inc., if the same is accepted by our Editorial Board and Peer Reviewers. If you are a main author or co-author of a group of authors, you will get discount of 10%.

As MARSHS, you willbegiven a renowned, secure and free professional email address with 30 GB of space e.g. johnhall@globaljournals.org. This will include Webmail, Spam Assassin, Email Forwarders,Auto-Responders, Email Delivery Route tracing, etc.



© Copyright by Global Journals Inc.(US) | Guidelines Handbook




We shall provide you intimation regarding launching of e-version of journal of your stream time to time.This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

The MARSHS member can apply for approval, grading and certification of standards of their educational and Institutional Degrees to Open Association of Research, Society U.S.A.






Once you are designated as MARSHS, you may send us a scanned copy of all of your credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria.

It is mandatory to read all terms and conditions carefully.

© Copyright by Global Journals Inc.(US)| Guidelines Handbook

# AUXILIARY MEMBERSHIPS

## Institutional Fellow of Open Association of Research Society (USA) - OARS (USA)

Global Journals Incorporation (USA) is accredited by Open Association of Research Society, U.S.A (OARS) and in turn, affiliates research institutions as "Institutional Fellow of Open Association of Research Society" (IFOARS).



The "FARSC" is a dignified title which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., FARSC or William Walldroff, M.S., FARSC.

The IFOARS institution is entitled to form a Board comprised of one Chairperson and three to five board members preferably from different streams. The Board will be recognized as "Institutional Board of Open Association of Research Society"-(IBOARS).

*The Institute will be entitled to following benefits:*

The IBOARS can initially review research papers of their institute and recommend them to publish with respective journal of Global Journals. It can also review the papers of other institutions after obtaining our consent. The second review will be done by peer reviewer of Global Journals Incorporation (USA) The Board is at liberty to appoint a peer reviewer with the approval of chairperson after consulting us.

The author fees of such paper may be waived off up to 40%.

The Global Journals Incorporation (USA) at its discretion can also refer double blind peer reviewed paper at their end to the board for the verification and to get recommendation for final stage of acceptance of publication.





The IBOARS can organize symposium/seminar/conference in their country on behalf of Global Journals Incorporation (USA)-OARS (USA). The terms and conditions can be discussed separately.

The Board can also play vital role by exploring and giving valuable suggestions regarding the Standards of "Open Association of Research Society, U.S.A (OARS)" so that proper amendment can take place for the benefit of entire research community. We shall provide details of particular standard only on receipt of request from the Board.




The board members can also join us as Individual Fellow with 40% discount on total fees applicable to Individual Fellow. They will be entitled to avail all the benefits as declared. Please visit Individual Fellow-sub menu of GlobalJournals.org to have more relevant details.

© Copyright by Global Journals Inc.(US) | Guidelines Handbook

We shall provide you intimation regarding launching of e-version of journal of your stream time to time. This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.




After nomination of your institution as "Institutional Fellow" and constantly functioning successfully for one year, we can consider giving recognition to your institute to function as Regional/Zonal office on our behalf.
The board can also take up the additional allied activities for betterment after our consultation.

**The following entitlements are applicable to individual Fellows:**




Open Association of Research Society, U.S.A (OARS) By-laws states that an individual Fellow may use the designations as applicable, or the corresponding initials. The Credentials of individual Fellow and Associate designations signify that the individual has gained knowledge of the fundamental concepts. One is magnanimous and proficient in an expertise course covering the professional code of conduct, and follows recognized standards of practice.

Open Association of Research Society (US)/ Global Journals Incorporation (USA), as described in Corporate Statements, are educational, research publishing and professional membership organizations. Achieving our individual Fellow or Associate status is based mainly on meeting stated educational research requirements.



Disbursement of 40% Royalty earned through Global Journals : Researcher = 50%, Peer Reviewer = 37.50%, Institution = 12.50% E.g. Out of 40%, the 20% benefit should be passed on to researcher, 15 % benefit towards remuneration should be given to a reviewer and remaining 5% is to be retained by the institution.

We shall provide print version of 12 issues of any three journals [as per your requirement] out of our 38 journals worth $ 2376 USD.

**Other:**

**The individual Fellow and Associate designations accredited by Open Association of Research Society (US) credentials signify guarantees following achievements:**

- The professional accredited with Fellow honor, is entitled to various benefits viz. name, fame, honor, regular flow of income, secured bright future, social status etc.

© Copyright by Global Journals Inc.(US)| Guidelines Handbook

- In addition to above, if one is single author, then entitled to 40% discount on publishing research paper and can get 10%discount if one is co-author or main author among group of authors.
- The Fellow can organize symposium/seminar/conference on behalf of Global Journals Incorporation (USA) and he/she can also attend the same organized by other institutes on behalf of Global Journals.
- The Fellow can become member of Editorial Board Member after completing 3yrs.
- The Fellow can earn 60% of sales proceeds from the sale of reference/review books/literature/publishing of research paper.
- Fellow can also join as paid peer reviewer and earn 15% remuneration of author charges and can also get an opportunity to join as member of the Editorial Board of Global Journals Incorporation (USA)
- • This individual has learned the basic methods of applying those concepts and techniques to common challenging situations. This individual has further demonstrated an in–depth understanding of the application of suitable techniques to a particular area of research practice.

**Note :**

"

- In future, if the board feels the necessity to change any board member, the same can be done with the consent of the chairperson along with anyone board member without our approval.
- In case, the chairperson needs to be replaced then consent of 2/3rd board members are required and they are also required to jointly pass the resolution copy of which should be sent to us. In such case, it will be compulsory to obtain our approval before replacement.
- In case of "Difference of Opinion [if any]" among the Board members, our decision will be final and binding to everyone.

"

# Process of submission of Research Paper

The Area or field of specialization may or may not be of any category as mentioned in 'Scope of Journal' menu of the GlobalJournals.org website. There are 37 Research Journal categorized with Six parental Journals GJCST, GJMR, GJRE, GJMBR, GJSFR, GJHSS. For Authors should prefer the mentioned categories. There are three widely used systems UDC, DDC and LCC. The details are available as 'Knowledge Abstract' at Home page. The major advantage of this coding is that, the research work will be exposed to and shared with all over the world as we are being abstracted and indexed worldwide.

The paper should be in proper format. The format can be downloaded from first page of 'Author Guideline' Menu. The Author is expected to follow the general rules as mentioned in this menu. The paper should be written in MS-Word Format (*.DOC,*.DOCX).

The Author can submit the paper either online or offline. The authors should prefer online submission.Online Submission: There are three ways to submit your paper:

**(A) (I) First, register yourself using top right corner of Home page then Login. If you are already registered, then login using your username and password.**

**(II) Choose corresponding Journal.**

**(III) Click 'Submit Manuscript'. Fill required information and Upload the paper.**

**(B) If you are using Internet Explorer, then Direct Submission through Homepage is also available.**

**(C) If these two are not conveninet , and then email the paper directly to dean@globaljournals.org.**

Offline Submission: Author can send the typed form of paper by Post. However, online submission should be preferred.

© Copyright by Global Journals Inc.(US)| Guidelines Handbook

# Preferred Author Guidelines

**MANUSCRIPT STYLE INSTRUCTION (Must be strictly followed)**

Page Size: 8.27" X 11'"

- Left Margin: 0.65
- Right Margin: 0.65
- Top Margin: 0.75
- Bottom Margin: 0.75
- Font type of all text should be Swis 721 Lt BT.
- Paper Title should be of Font Size 24 with one Column section.
- Author Name in Font Size of 11 with one column as of Title.
- Abstract Font size of 9 Bold, "Abstract" word in Italic Bold.
- Main Text: Font size 10 with justified two columns section
- Two Column with Equal Column with of 3.38 and Gaping of .2
- First Character must be three lines Drop capped.
- Paragraph before Spacing of 1 pt and After of 0 pt.
- Line Spacing of 1 pt
- Large Images must be in One Column
- Numbering of First Main Headings (Heading 1) must be in Roman Letters, Capital Letter, and Font Size of 10.
- Numbering of Second Main Headings (Heading 2) must be in Alphabets, Italic, and Font Size of 10.

**You can use your own standard format also.**
**Author Guidelines:**

1. General,

2. Ethical Guidelines,

3. Submission of Manuscripts,

4. Manuscript's Category,

5. Structure and Format of Manuscript,

6. After Acceptance.

**1. GENERAL**

Before submitting your research paper, one is advised to go through the details as mentioned in following heads. It will be beneficial, while peer reviewer justify your paper for publication.

**Scope**

The Global Journals Inc. (US) welcome the submission of original paper, review paper, survey article relevant to the all the streams of Philosophy and knowledge. The Global Journals Inc. (US) is parental platform for Global Journal of Computer Science and Technology, Researches in Engineering, Medical Research, Science Frontier Research, Human Social Science, Management, and Business organization. The choice of specific field can be done otherwise as following in Abstracting and Indexing Page on this Website. As the all Global

Journals Inc. (US) are being abstracted and indexed (in process) by most of the reputed organizations. Topics of only narrow interest will not be accepted unless they have wider potential or consequences.

**2. ETHICAL GUIDELINES**

Authors should follow the ethical guidelines as mentioned below for publication of research paper and research activities.

Papers are accepted on strict understanding that the material in whole or in part has not been, nor is being, considered for publication elsewhere. If the paper once accepted by Global Journals Inc. (US) and Editorial Board, will become the copyright of the Global Journals Inc. (US).

**Authorship: The authors and coauthors should have active contribution to conception design, analysis and interpretation of findings. They should critically review the contents and drafting of the paper. All should approve the final version of the paper before submission**

The Global Journals Inc. (US) follows the definition of authorship set up by the Global Academy of Research and Development. According to the Global Academy of R&D authorship, criteria must be based on:

1) Substantial contributions to conception and acquisition of data, analysis and interpretation of the findings.

2) Drafting the paper and revising it critically regarding important academic content.

3) Final approval of the version of the paper to be published.

All authors should have been credited according to their appropriate contribution in research activity and preparing paper. Contributors who do not match the criteria as authors may be mentioned under Acknowledgement.

Acknowledgements: Contributors to the research other than authors credited should be mentioned under acknowledgement. The specifications of the source of funding for the research if appropriate can be included. Suppliers of resources may be mentioned along with address.

**Appeal of Decision: The Editorial Board's decision on publication of the paper is final and cannot be appealed elsewhere.**

**Permissions: It is the author's responsibility to have prior permission if all or parts of earlier published illustrations are used in this paper.**

Please mention proper reference and appropriate acknowledgements wherever expected.

If all or parts of previously published illustrations are used, permission must be taken from the copyright holder concerned. It is the author's responsibility to take these in writing.

Approval for reproduction/modification of any information (including figures and tables) published elsewhere must be obtained by the authors/copyright holders before submission of the manuscript. Contributors (Authors) are responsible for any copyright fee involved.

**3. SUBMISSION OF MANUSCRIPTS**

Manuscripts should be uploaded via this online submission page. The online submission is most efficient method for submission of papers, as it enables rapid distribution of manuscripts and consequently speeds up the review procedure. It also enables authors to know the status of their own manuscripts by emailing us. Complete instructions for submitting a paper is available below.

Manuscript submission is a systematic procedure and little preparation is required beyond having all parts of your manuscript in a given format and a computer with an Internet connection and a Web browser. Full help and instructions are provided on-screen. As an author, you will be prompted for login and manuscript details as Field of Paper and then to upload your manuscript file(s) according to the instructions.



To avoid postal delays, all transaction is preferred by e-mail. A finished manuscript submission is confirmed by e-mail immediately and your paper enters the editorial process with no postal delays. When a conclusion is made about the publication of your paper by our Editorial Board, revisions can be submitted online with the same procedure, with an occasion to view and respond to all comments.

Complete support for both authors and co-author is provided.

**4. MANUSCRIPT'S CATEGORY**

Based on potential and nature, the manuscript can be categorized under the following heads:

Original research paper: Such papers are reports of high-level significant original research work.

Review papers: These are concise, significant but helpful and decisive topics for young researchers.

Research articles: These are handled with small investigation and applications

Research letters: The letters are small and concise comments on previously published matters.

**5.STRUCTURE AND FORMAT OF MANUSCRIPT**

The recommended size of original research paper is less than seven thousand words, review papers fewer than seven thousands words also.Preparation of research paper or how to write research paper, are major hurdle, while writing manuscript. The research articles and research letters should be fewer than three thousand words, the structure original research paper; sometime review paper should be as follows:

**Papers**: These are reports of significant research (typically less than 7000 words equivalent, including tables, figures, references), and comprise:

(a)Title should be relevant and commensurate with the theme of the paper.

(b) A brief Summary, "Abstract" (less than 150 words) containing the major results and conclusions.

(c) Up to ten keywords, that precisely identifies the paper's subject, purpose, and focus.

(d) An Introduction, giving necessary background excluding subheadings; objectives must be clearly declared.

(e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition; sources of information must be given and numerical methods must be specified by reference, unless non-standard.

(f) Results should be presented concisely, by well-designed tables and/or figures; the same data may not be used in both; suitable statistical data should be given. All data must be obtained with attention to numerical detail in the planning stage. As reproduced design has been recognized to be important to experiments for a considerable time, the Editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned un-refereed;

(g) Discussion should cover the implications and consequences, not just recapitulating the results; conclusions should be summarizing.

(h) Brief Acknowledgements.

(i) References in the proper form.

Authors should very cautiously consider the preparation of papers to ensure that they communicate efficiently. Papers are much more likely to be accepted, if they are cautiously designed and laid out, contain few or no errors, are summarizing, and be conventional to the approach and instructions. They will in addition, be published with much less delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and to make suggestions to improve briefness.

It is vital, that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

**Format**

*Language: The language of publication is UK English. Authors, for whom English is a second language, must have their manuscript efficiently edited by an English-speaking person before submission to make sure that, the English is of high excellence. It is preferable, that manuscripts should be professionally edited.*

Standard Usage, Abbreviations, and Units: Spelling and hyphenation should be conventional to The Concise Oxford English Dictionary. Statistics and measurements should at all times be given in figures, e.g. 16 min, except for when the number begins a sentence. When the number does not refer to a unit of measurement it should be spelt in full unless, it is 160 or greater.

Abbreviations supposed to be used carefully. The abbreviated name or expression is supposed to be cited in full at first usage, followed by the conventional abbreviation in parentheses.

Metric SI units are supposed to generally be used excluding where they conflict with current practice or are confusing. For illustration, 1.4 l rather than 1.4 × 10-3 m3, or 4 mm somewhat than 4 × 10-3 m. Chemical formula and solutions must identify the form used, e.g. anhydrous or hydrated, and the concentration must be in clearly defined units. Common species names should be followed by underlines at the first mention. For following use the generic name should be constricted to a single letter, if it is clear.

**Structure**

All manuscripts submitted to Global Journals Inc. (US), ought to include:

Title: The title page must carry an instructive title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) wherever the work was carried out. The full postal address in addition with the e-mail address of related author must be given. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining and indexing.

*Abstract, used in Original Papers and Reviews:*

Optimizing Abstract for Search Engines

Many researchers searching for information online will use search engines such as Google, Yahoo or similar. By optimizing your paper for search engines, you will amplify the chance of someone finding it. This in turn will make it more likely to be viewed and/or cited in a further work. Global Journals Inc. (US) have compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Key Words

A major linchpin in research work for the writing research paper is the keyword search, which one will employ to find both library and Internet resources.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy and planning a list of possible keywords and phrases to try.

Search engines for most searches, use Boolean searching, which is somewhat different from Internet searches. The Boolean search uses "operators," words (and, or, not, and near) that enable you to expand or narrow your affords. Tips for research paper while preparing research paper are very helpful guideline of research paper.

Choice of key words is first tool of tips to write research paper. Research paper writing is an art.A few tips for deciding as strategically as possible about keyword search:

- One should start brainstorming lists of possible keywords before even begin searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in research paper?" Then consider synonyms for the important words.
- It may take the discovery of only one relevant paper to let steer in the right keyword direction because in most databases, the keywords under which a research paper is abstracted are listed with the paper.
- One should avoid outdated words.

Keywords are the key that opens a door to research work sources. Keyword searching is an art in which researcher's skills are bound to improve with experience and time.

Numerical Methods: Numerical methods used should be clear and, where appropriate, supported by references.

*Acknowledgements: Please make these as concise as possible.*

References

References follow the Harvard scheme of referencing. References in the text should cite the authors' names followed by the time of their publication, unless there are three or more authors when simply the first author's name is quoted followed by et al. unpublished work has to only be cited where necessary, and only in the text. Copies of references in press in other journals have to be supplied with submitted typescripts. It is necessary that all citations and references be carefully checked before submission, as mistakes or omissions will cause delays.

References to information on the World Wide Web can be given, but only if the information is available without charge to readers on an official site. Wikipedia and Similar websites are not allowed where anyone can change the information. Authors will be asked to make available electronic copies of the cited information for inclusion on the Global Journals Inc. (US) homepage at the judgment of the Editorial Board.

The Editorial Board and Global Journals Inc. (US) recommend that, citation of online-published papers and other material should be done via a DOI (digital object identifier). If an author cites anything, which does not have a DOI, they run the risk of the cited material not being noticeable.

The Editorial Board and Global Journals Inc. (US) recommend the use of a tool such as Reference Manager for reference management and formatting.

Tables, Figures and Figure Legends

*Tables: Tables should be few in number, cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g. Table 4, a self-explanatory caption and be on a separate sheet. Vertical lines should not be used.*

*Figures: Figures are supposed to be submitted as separate files. Always take in a citation in the text for each figure using Arabic numbers, e.g. Fig. 4. Artwork must be submitted online in electronic form by e-mailing them.*

Preparation of Electronic Figures for Publication

Even though low quality images are sufficient for review purposes, print publication requires high quality images to prevent the final product being blurred or fuzzy. Submit (or e-mail) EPS (line art) or TIFF (halftone/photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Do not use pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings) in relation to the imitation size. Please give the data for figures in black and white or submit a Color Work Agreement Form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution (at final image size) ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs) : >350 dpi; figures containing both halftone and line images: >650 dpi.

Color Charges: It is the rule of the Global Journals Inc. (US) for authors to pay the full cost for the reproduction of their color artwork. Hence, please note that, if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a color work agreement form before your paper can be published.

*Figure Legends: Self-explanatory legends of all figures should be incorporated separately under the heading 'Legends to Figures'. In the full-text online edition of the journal, figure legends may possibly be truncated in abbreviated links to the full screen version. Therefore, the first 100 characters of any legend should notify the reader, about the key aspects of the figure.*

**6. AFTER ACCEPTANCE**

Upon approval of a paper for publication, the manuscript will be forwarded to the dean, who is responsible for the publication of the Global Journals Inc. (US).

**6.1 Proof Corrections**

The corresponding author will receive an e-mail alert containing a link to a website or will be attached. A working e-mail address must therefore be provided for the related author.

Acrobat Reader will be required in order to read this file. This software can be downloaded

(Free of charge) from the following website:

www.adobe.com/products/acrobat/readstep2.html. This will facilitate the file to be opened, read on screen, and printed out in order for any corrections to be added. Further instructions will be sent with the proof.

Proofs must be returned to the dean at dean@globaljournals.org within three days of receipt.

As changes to proofs are costly, we inquire that you only correct typesetting errors. All illustrations are retained by the publisher. Please note that the authors are responsible for all statements made in their work, including changes made by the copy editor.

**6.2 Early View of Global Journals Inc. (US) (Publication Prior to Print)**

The Global Journals Inc. (US) are enclosed by our publishing's Early View service. Early View articles are complete full-text articles sent in advance of their publication. Early View articles are absolute and final. They have been completely reviewed, revised and edited for publication, and the authors' final corrections have been incorporated. Because they are in final form, no changes can be made after sending them. The nature of Early View articles means that they do not yet have volume, issue or page numbers, so Early View articles cannot be cited in the conventional way.

**6.3 Author Services**

Online production tracking is available for your article through Author Services. Author Services enables authors to track their article - once it has been accepted - through the production process to publication online and in print. Authors can check the status of their articles online and choose to receive automated e-mails at key stages of production. The authors will receive an e-mail with a unique link that enables them to register and have their article automatically added to the system. Please ensure that a complete e-mail address is provided when submitting the manuscript.

**6.4 Author Material Archive Policy**

Please note that if not specifically requested, publisher will dispose off hardcopy & electronic information submitted, after the two months of publication. If you require the return of any information submitted, please inform the Editorial Board or dean as soon as possible.

**6.5 Offprint and Extra Copies**

A PDF offprint of the online-published article will be provided free of charge to the related author, and may be distributed according to the Publisher's terms and conditions. Additional paper offprint may be ordered by emailing us at: editor@globaljournals.org .



Before start writing a good quality Computer Science Research Paper, let us first understand what is Computer Science Research Paper? So, Computer Science Research Paper is the paper which is written by professionals or scientists who are associated to Computer Science and Information Technology, or doing research study in these areas. If you are novel to this field then you can consult about this field from your supervisor or guide.

## TECHNIQUES FOR WRITING A GOOD QUALITY RESEARCH PAPER:

**1. Choosing the topic:** In most cases, the topic is searched by the interest of author but it can be also suggested by the guides. You can have several topics and then you can judge that in which topic or subject you are finding yourself most comfortable. This can be done by asking several questions to yourself, like Will I be able to carry our search in this area? Will I find all necessary recourses to accomplish the search? Will I be able to find all information in this field area? If the answer of these types of questions will be "Yes" then you can choose that topic. In most of the cases, you may have to conduct the surveys and have to visit several places because this field is related to Computer Science and Information Technology. Also, you may have to do a lot of work to find all rise and falls regarding the various data of that subject. Sometimes, detailed information plays a vital role, instead of short information.

**2. Evaluators are human:** First thing to remember that evaluators are also human being. They are not only meant for rejecting a paper. They are here to evaluate your paper. So, present your Best.

**3. Think Like Evaluators:** If you are in a confusion or getting demotivated that your paper will be accepted by evaluators or not, then think and try to evaluate your paper like an Evaluator. Try to understand that what an evaluator wants in your research paper and automatically you will have your answer.

**4. Make blueprints of paper:** The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

**5. Ask your Guides:** If you are having any difficulty in your research, then do not hesitate to share your difficulty to your guide (if you have any). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work then ask the supervisor to help you with the alternative. He might also provide you the list of essential readings.

**6. Use of computer is recommended:** As you are doing research in the field of Computer Science, then this point is quite obvious.

**7. Use right software:** Always use good quality software packages. If you are not capable to judge good software then you can lose quality of your paper unknowingly. There are various software programs available to help you, which you can get through Internet.

**8. Use the Internet for help:** An excellent start for your paper can be by using the Google. It is an excellent search engine, where you can have your doubts resolved. You may also read some answers for the frequent question how to write my research paper or find model research paper. From the internet library you can download books. If you have all required books make important reading selecting and analyzing the specified information. Then put together research paper sketch out.

**9. Use and get big pictures:** Always use encyclopedias, Wikipedia to get pictures so that you can go into the depth.

**10. Bookmarks are useful:** When you read any book or magazine, you generally use bookmarks, right! It is a good habit, which helps to not to lose your continuity. You should always use bookmarks while searching on Internet also, which will make your search easier.

**11. Revise what you wrote:** When you write anything, always read it, summarize it and then finalize it.

**12. Make all efforts:** Make all efforts to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in introduction, that what is the need of a particular research paper. Polish your work by good skill of writing and always give an evaluator, what he wants.

**13. Have backups:** When you are going to do any important thing like making research paper, you should always have backup copies of it either in your computer or in paper. This will help you to not to lose any of your important.

**14. Produce good diagrams of your own:** Always try to include good charts or diagrams in your paper to improve quality. Using several and unnecessary diagrams will degrade the quality of your paper by creating "hotchpotch." So always, try to make and include those diagrams, which are made by your own to improve readability and understandability of your paper.

**15. Use of direct quotes:** When you do research relevant to literature, history or current affairs then use of quotes become essential but if study is relevant to science then use of quotes is not preferable.

**16. Use proper verb tense:** Use proper verb tenses in your paper. Use past tense, to present those events that happened. Use present tense to indicate events that are going on. Use future tense to indicate future happening events. Use of improper and wrong tenses will confuse the evaluator. Avoid the sentences that are incomplete.

**17. Never use online paper:** If you are getting any paper on Internet, then never use it as your research paper because it might be possible that evaluator has already seen it or maybe it is outdated version.

**18. Pick a good study spot:** To do your research studies always try to pick a spot, which is quiet. Every spot is not for studies. Spot that suits you choose it and proceed further.

**19. Know what you know:** Always try to know, what you know by making objectives. Else, you will be confused and cannot achieve your target.

**20. Use good quality grammar:** Always use a good quality grammar and use words that will throw positive impact on evaluator. Use of good quality grammar does not mean to use tough words, that for each word the evaluator has to go through dictionary. Do not start sentence with a conjunction. Do not fragment sentences. Eliminate one-word sentences. Ignore passive voice. Do not ever use a big word when a diminutive one would suffice. Verbs have to be in agreement with their subjects. Prepositions are not expressions to finish sentences with. It is incorrect to ever divide an infinitive. Avoid clichés like the disease. Also, always shun irritating alliteration. Use language that is simple and straight forward. put together a neat summary.

**21. Arrangement of information:** Each section of the main body should start with an opening sentence and there should be a changeover at the end of the section. Give only valid and powerful arguments to your topic. You may also maintain your arguments with records.

**22. Never start in last minute:** Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

**23. Multitasking in research is not good:** Doing several things at the same time proves bad habit in case of research activity. Research is an area, where everything has a particular time slot. Divide your research work in parts and do particular part in particular time slot.

**24. Never copy others' work:** Never copy others' work and give it your name because if evaluator has seen it anywhere you will be in trouble.

**25. Take proper rest and food:** No matter how many hours you spend for your research activity, if you are not taking care of your health then all your efforts will be in vain. For a quality research, study is must, and this can be done by taking proper rest and food.

**26. Go for seminars:** Attend seminars if the topic is relevant to your research area. Utilize all your resources.



© Copyright by Global Journals Inc.(US)| Guidelines Handbook

**27. Refresh your mind after intervals:** Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

**28. Make colleagues:** Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

**29. Think technically:** Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

**30. Think and then print:** When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

**31. Adding unnecessary information:** Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

**32. Never oversimplify everything:** To add material in your research paper, never go for oversimplification. This will definitely irritate the evaluator. Be more or less specific. Also too, by no means, ever use rhythmic redundancies. Contractions aren't essential and shouldn't be there used. Comparisons are as terrible as clichés. Give up ampersands and abbreviations, and so on. Remove commas, that are, not necessary. Parenthetical words however should be together with this in commas. Understatement is all the time the complete best way to put onward earth-shaking thoughts. Give a detailed literary review.

**33. Report concluded results:** Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

**34. After conclusion:** Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

## Informal Guidelines of Research Paper Writing

**Key points to remember:**

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

**Final Points:**

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

Writing a research paper is not an easy job no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record keeping are the only means to make straightforward the progression.

**General style:**

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear

· Adhere to recommended page limits

Mistakes to evade

- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

In every sections of your document

· Use standard writing style including articles ("a", "the," etc.)

· Keep on paying attention on the research topic of the paper

· Use paragraphs to split each significant point (excluding for the abstract)

· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

· Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives

· Shun use of extra pictures - include only those figures essential to presenting results

**Title Page:**

Choose a revealing title. It should be short. It should not have non-standard acronyms or abbreviations. It should not exceed two printed lines. It should include the name(s) and address (es) of all authors.



© Copyright by Global Journals Inc.(US)| Guidelines Handbook

**Abstract:**

The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript--must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing references at this point.

An abstract is a brief distinct paragraph summary of finished work or work in development. In a minute or less a reviewer can be taught the foundation behind the study, common approach to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Yet, use comprehensive sentences and do not let go readability for briefness. You can maintain it succinct by phrasing sentences so that they provide more than lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study, with the subsequent elements in any summary. Try to maintain the initial two items to no more than one ruling each.

- Reason of the study - theory, overall issue, purpose
- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
- As a outline of job done, it is always written in past tense
- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
- Center on shortening results - bound background information to a verdict or two, if completely necessary
- What you account in an conceptual must be regular with what you reported in the manuscript
- Exact spelling, clearness of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else

**Introduction:**

The **Introduction** should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
- Sort out your thoughts; manufacture one key point with every section. If you make the four points listed above, you will need a least of four paragraphs.

- Present surroundings information only as desirable in order hold up a situation. The reviewer does not desire to read the whole thing you know about a topic.
- Shape the theory/purpose specifically - do not take a broad view.
- As always, give awareness to spelling, simplicity and correctness of sentences and phrases.

**Procedures (Methods and Materials):**

This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt for the least amount of information that would permit another capable scientist to spare your outcome but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section. When a technique is used that has been well described in another object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text all particular resources and broad procedures, so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step by step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

What to keep away from

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

**Results:**

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.



© Copyright by Global Journals Inc.(US)| Guidelines Handbook

Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
- If you desire, you may place your figures and tables properly within the text of your results part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

**Discussion:**

The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a argument should be. Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly described. Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved with prospect, and let it drop at that.

- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

- When you refer to information, differentiate data generated by your own studies from available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

Please carefully note down following rules and regulation before submitting your Research Paper to Global Journals Inc. (US):

**Segment Draft and Final Research Paper:** You have to strictly follow the template of research paper. If it is not done your paper may get rejected.

- The **major constraint** is that you must independently make all content, tables, graphs, and facts that are offered in the paper. You must write each part of the paper wholly on your own. The Peer-reviewers need to identify your own perceptive of the concepts in your own terms. NEVER extract straight from any foundation, and never rephrase someone else's analysis.

- Do not give permission to anyone else to "PROOFREAD" your manuscript.

- Methods to avoid Plagiarism is applied by us on every paper, if found guilty, you will be blacklisted by all of our collaborated research groups, your institution will be informed for this and strict legal actions will be taken immediately.)
- To guard yourself and others from possible illegal use please do not permit anyone right to use to your paper and files.



© Copyright by Global Journals Inc.(US)| Guidelines Handbook

## Criterion for Grading a Research Paper (Compilation) by Global Journals Inc. (US)

**Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals Inc. (US).**

| Topics | Grades | | |
|---|---|---|---|
| | **A-B** | **C-D** | **E-F** |
| ***Abstract*** | Clear and concise with appropriate content, Correct format. 200 words or below | Unclear summary and no specific data, Incorrect form<br><br>Above 200 words | No specific data with ambiguous information<br><br>Above 250 words |
| ***Introduction*** | Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited | Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter | Out of place depth and content, hazy format |
| ***Methods and Procedures*** | Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads | Difficult to comprehend with embarrassed text, too much explanation but completed | Incorrect and unorganized structure with hazy meaning |
| ***Result*** | Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake | Complete and embarrassed text, difficult to comprehend | Irregular format with wrong facts and figures |
| ***Discussion*** | Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited | Wordy, unclear conclusion, spurious | Conclusion is not cited, unorganized, difficult to comprehend |
| ***References*** | Complete and correct format, well organized | Beside the point, Incomplete | Wrong format and structuring |

# INDEX


## *A*

Amenities · 1

## *C*

Custodians · 27

## *D*

Dwellers · 89

## *E*

Emanate · 57
Eminent · 70
Epitome · 87

## *G*

Grievances · 77

## *I*

Intrinsically · 23

## *M*

Mandate · 63, 69, 79, 87, 89

## *P*

Perpetuates · 23, 41

## *R*

Reify · 23



save our planet



# Global Journal of Human Social Science

Visit us on the Web at www.GlobalJournals.org | www.SocialScienceResearch.org
or email us at helpdesk@globaljournals.org



ISSN 975587

© Global Journals