

Textbook on
Skill
enhancement
course in
Library
and
Information Science

Undergraduate Programmes in CBCS

Birender Pal | Nikhil Hazarika

The book

This book covers the undergraduate syllabus of Skills Enhancement course in Library and Information Science of Dibrugarh University, Dibrugarh and Madhabdev University, Lakhimpur-Assam. The book can also be consulted for the undergraduate SEC courses in LIS of other universities too. It is written in very simple language with clear and simple explanation of the topic so that the undergraduate students can understand it very easily without much technical terminology. The students can learn many important skills of Library and Information Science. It will also encourage the students for choosing this subject for their higher studies. The book strictly adheres to the guidelines of UGC for the plagiarism as per the UGC regulation 2018



The authors



Dr. Birender Pal (M.L.I.Sc., PGDCA, PhD) is the Librarian of Kaliabor College, Assam and also served as Librarian of Dhakuakhana College, Lakhimpur, Assam. He is at present the team member for National Education Policy-2020 of Assam Government for the Group "Technology and Integration", Office Secretary of Assam Library Association (ALA).

Dr. Pal was also the coordinator of ICT cell of Assam College Librarians' Association and completed his PhD in the Dept. of Lib & Inf. Sc, Gauhati University



Dr. Nikhil Hazarika (M.L.I.Sc., PhD) is the Librarian (i/c) of Madhabdev University, Assam. He is at present the team member for National Education Policy-2020 of Assam Government for the Group "Technology and Integration" and completed his PhD in the Dept. of Lib & Inf. Sc, Gauhati University. Dr. Hazarika has presented and published different papers in seminars, conferences, journals, etc.

ISBN: 978 93 92038 13 6



2022

₹ 295/-



EBH Publishers (India)

an imprint of Eastern Book House®

136, M.L.N. Road, Panbazar, Guwahati-781001 (India)

National Education Policy 2020 and its Challenges



ASSAM COLLEGE TEACHERS' ASSOCIATION

Editors:
Dr. Apratim Nag
Dr. Banajit Sharma
Buddhadev Basumatary

National Education Policy 2020 and its Challenges: A collection of Research Papers and Articles, edited by Dr. Apratim Nag, Dr. Banajit Sharma and Buddhadev Basumatary and Published by Dr. Jayanta Barua, General Secretary, Assam College Teachers' Association, ACTA House, Solapar, Guwahati- 781008, Assam and Ganesh Books, Noonmati, Guwahati-20, Printed in India.

ISBN: 978-93-93864-19-2

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the publisher.

The views expressed in this book are those of authors and not necessary that of the organization. The publisher is not responsible for the views of the authors or the authenticity of the data, in any way whatsoever.

Editors :

Dr. Apratim Nag, Associate Professor, Dept. of Physics, Gurucharan College+, Silchar,

Dr. Banajit Sharma, Assistant Professor Dept. of Philosophy, Bongaigaon College, Bongaigaon

Buddhadev Basumatary, Assistant Professor, Dept. of Political Science, P.B. College, Gauripur

Published by : Dr. Jayanta Barua, General Secretary, Assam College Teachers' Association, ACTA House, Solapar, Guwahati- 781008, Assam and Ganesh Books, Noonmati, Guwahati-20

Month and Year of Publication : December, 2022

Copyright: Assam College Teachers' Association

Cover Design : Anjan Ch. Kalita

Price: Rs. 450/-

Type Setting : Geetanjali Printers, Bongaigaon

Printed at: Shri Ganesh Printers, Sankardev Market, Noonmati, Guwahati-20

Editori

Himanshu
Professor, C
Dr. Breez M
Associate P
Dr. Jayant
Associate P
Pranjal Gop
Professor, S

Editori

Mr. Bhas
Political
Tingkhong
Dr. Tamu
Physics, S
Dr. Binoy
College, G
Mr. Upen
Assamese
Mr. Sanj
English, R

National Education Policy 2020 and its Challenges; A collection of Research Papers and Articles, edited by Dr. Apratim Nag, Dr. Banajit Sharma and Buddhadev Basumatary and Published by Dr. Jayanta Barua, General Secretary, Assam College Teachers' Association, ACTA House, Solapar, Guwahati- 781008, Assam and Ganesh Books, Noonmati, Guwahati-20, Printed in India.

ISBN: 978-93-93864-19-2

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the publisher.

The views expressed in this book are those of authors and not necessary that of the organization. The publisher is not responsible for the views of the authors or the authenticity of the data, in any way whatsoever.

Editors :

Dr. Apratim Nag, Associate Professor, Dept. of Physics, Gurucharan College+, Silchar,

Dr. Banajit Sharma, Assistant Professor Dept. of Philosophy, Bongaigaon College, Bongaigaon

Buddhadev Basumatary, Assistant Professor, Dept. of Political Science, P.B. College, Gauripur

Published by : Dr. Jayanta Barua, General Secretary, Assam College Teachers' Association, ACTA House, Solapar, Guwahati- 781008, Assam and Ganesh Books, Noonmati, Guwahati-20

Month and Year of Publication : December, 2022

Copyright: Assam College Teachers' Association

Cover Design : Anjan Ch. Kalita

Price: Rs. 450/-

Type Setting : Geetanjali Printers, Bongaigaon

Printed at: Shri Ganesh Printers, Sankardev Market, Noonmati, Guwahati-20

Editori

Himanig
Professor, E
Dr. Breez M
Associate P
Dr. Jayanti
Associate P
Pranjal Gop
Professor, S

Editori

Mr. Bhesk
Political
Tingkhong
Dr. Tanuj
Physics, S
Dr. Binoy
College, G
Mr. Upen
Assamese
Mr. Sanj
English, R

CONTENTS

1.	NEP 2020: A Transformative Education Policy for Resurgent India.	Niranjan Roy	15
2.	New Education Policy Towards Integrating Ancient Indian Knowledge in Modern Education: A Holistic Approach.	Sanjib Bhattacharjee	25
3.	Liberal Arts Education and the NEP 2020	Chandan Kumar Sarma	38
4.	Effective Teaching Strategies vis-à-vis NEP 2020: Challenges and Opportunities before Teachers in Higher Educational Institutions	Chandan Kumar Bhattacharyya	54
5.	Integration of Information Technology with Education in National Education Policy 2020	Kumar Sunar	71
6.	Multiple Entry and Exit System in New Education Policy: An Evaluative Study	Parvin Sultana	80
7.	Changing Pedagogy - Prospects and Issues in Assam	Tarun Kumar Bahadur	96
8.	The Vision of faculty development in NEP 2020 for Higher Education	Imrul Hussain	111
9.	NEP 2020: A Move to Reintroduce India	Munni Deb Mazumder	118

National Education Policy 2020 and its Challenges

10. Challenges of Indian Higher Education System
A study in the light of National
Education Policy 2020
Karuna Phukan & Niranjan Das 128
11. Indian Knowledge System and NEP 2020
Aditi Das 143
12. Liberal Arts Education in NEP 2020: An Analysis
Protim Sharma 166
13. The Genesis Behind the Establishment of
National Research Foundation: NEP 2020
Rabi Kumar Jha 181
14. NEP and Commerce Education
Tapash Kashyap 188
15. Equitable and Inclusive Education: A Learning
Perspective of NEP 2020 of Assam
Phatik Chandra Kalita 193
16. Outlook on NEP 2020 and its Challenges
Towards Women Empowerment.
Dipsikha Das 204
17. NEP 2020 roadmap in enriching the
teaching-learning process with online
resources: a study based on
MOE-GOI ICT initiatives
Birender Pal 214
18. Inclusive Policy for SEDG: A study
in the light of NEP 2020
Akhtarul Islam 225
19. Reference of Motivated, Energized, Capable
Faculty in National Education Policy 2020
Bikash Bhargab Sarma 235

TRANS
POLICY

Introduction

in the ill

world in knowl

to all spheres

Vedas and Up

are rare exam

rest of the w

movement, fo

Saraswati urge

to rediscover

their lost pride

the old spiritu

splendour, dec

work, the flow

philosophy, lit

Prof. Niranjan Roy

for Studies in Hum

formerly Dean, M

and Director, Direc

He was also the

October, 2011 to A

NEP 2020 ROADMAP IN ENRICHING THE TEACHING-LEARNING PROCES WITH ONLINE RESOURCES: A STUDY BASED ON MOE-GOI ICT INITIATIVES

Birender Pal

1. Introduction :

Data, Information and knowledge are key to build any information society. Without any information we cannot make any decisions. ICT has been playing a great role in the education sector. The NEP 2020 in its documents has clearly mention the role of ICT in use of ICT tools to conduct the virtual class, use of ICT in enriching the libraries, use and creation of digital repositories, e-learning with MOE-GOI platforms, creation of digital infrastructures etc. The

Dr. Birender Pal is a Librarian in Kullu District Library, Himachal Pradesh. He has completed his M.Phil. and Ph.D. in Library Science. He has been awarded with several awards and honors. He is currently working as a Librarian in Kullu District Library. He is also a member of the Indian Library Association (ILA) and the Indian Association of Agricultural Librarians and Documentalists (IAALD). He is also the Office Secretary of Kullu District Library.

National Education Policy 2020 and its Challenges

has also given a due weightage to the content creation in local languages. Ministry of Education (MOE), Government of India (GOI) has very seriously implementing the different ICT initiatives as per the vision of NEP 2020. It has already identified fourteen platforms as the key ICT initiatives in the field of education. These platforms not only are creating the infrastructure for the digital platforms but also equal focus is on enriching the platforms with quality content. The focus is to disseminate all the ICT services to all citizens of the country in spite of any geographical location. Further, the focus of all the ICT initiatives is to deliver the content in an organized manner with one platform to connect the universities, different libraries, different departments, etc. The ICT initiatives of MOE-GOI had given a great support to the teaching and learning process during a period of pandemic situation.

2. Pandemic and the Learning

With the COVID-19 situation, the world has been severely affected in different sectors. In the field of education, the pandemic has forced the institutions to go online teaching and learning tools. There are many concerns that have been raised after facing the Pandemic situation or the Lockdown phase. These question may be: Shall we start our learning with the online platform? Are we ready to accept this online platform? Are we having sufficient digital gadgets like smartphones with high bandwidth internet connectivity for these platforms? Are we having sufficient connectivity from these platforms? There may be many answer to these questions. In another sense for few communities, online learning is the comfortable platform to learn. So, these initiatives and solutions need to focus on timely

National Education Policy 2020 and its Challenges

use of the technological needs of education. One thing is sure that in today's context, we cannot ignore the online platforms be it for school education, college, university or any other levels of education. There are lots of online teaching and learning tools which were already available before we face the Pandemic situations. But the Pandemic has given an opportunity to us to be much familiar with those teaching learning tools. There are many teaching learning tools which can be used by the teachers and students community. Besides this, there are lot of information searching platform which is available in the internet platform. Now two parallel resources should be equally made available to the learner for the success of online teaching and learning. These are-

- a. Teaching learning tools and
- b. E-resources platforms which will supplement the Teaching learning.

Some of famous online teaching Learning tools are the Google classroom, Video conferencing software like ZOOM, Google Meet, Web X, etc through which students can attend their live classes with face to face interaction in the virtual environment. Students should have some digital gadgets and proper internet connectivity for their presence in these platforms. Now the question is that only with Google classroom, Video conferencing software like ZOOM, Google Meet, Web X and by Smart phone and internet connectivity will be able to connect the Teaching and learning. But unless and until we connect the Teaching and the online resources, then the very purpose of Teaching-learning cannot be to be quality one. As similar in the Traditional learning environment where the precious class books are

National Education Policy 2020 and its Challenges

teachers are well supplement by the library documents like Books, Journals, Newspapers etc.

3. Online Learning and E-resources platforms
There are many online e-resource platforms which caters to the needs of the internet users. Many nations, organization, institutions, etc are working on this platform for developing different e-resource platforms for its users. Government of India has been funding a huge amount for developing different online learning or e-learning platforms for the different categories of learners. Some of initiative under the Ministry of Education (MOE), Govt of India (GOI) are-

1. SWAYAM: It is platform where different courses are provided for the learners from school level to the PG level. Now, a day's even formal courses are available in the online environment where the students will not only learn but also get due acknowledgement in the form of certification. For getting the more information on the form of platform, learners can visit the website <https://swayam.gov.in/>.

2. SWAYAM PRABHA: Learning without internet connectivity through the help of satellite channels like television networks of Dish TV, DD DISH, etc. Here the learners can attend the lectures of the quality teachers. There are 34 DTH channels which telecast the programme from school to the higher education level. An online programme is also build to assist the users in using the SWAYAM PRABHA channels <https://swayamprabha.gov.in/>

3. National Digital Library of India (NDLI): It connects the digital libraries of India into a single platform where learners can access e-books, e-articles, previous year question papers, etc. <https://www.vidyalaya.com/>

for voluntarily contribution towards higher educational institutes of India. This contribution can be in the form of Academic services/academic activities/ assets/materials/equipment <https://vidyanjali-he.education.gov.in/>. In addition to all the above platforms, UGC has maintained a webpage where the e-books published by UGC are hosted. Some of these publications are

- a. Consortium for Academic Research and Ethics(CARE)
- b. Guideline for development of Research and Development cell in Higher Education institutions
- c. Inclusion of Human Values and Professional Ethics in Higher Educational Institutions(Mulya Pravaah)
- d. Quality Mandate for HEI in India Curriculum and Credit Framework for Undergraduate Programmes
- e. Curriculum and Credit Framework for Undergraduate Programmes.
- f. Academic Integrity and Research Quality
- g. Operational guideline: STRIDE

All these publication along with the remaining publications can be found by following the mentioned link www.ugc.ac.in/ebook.aspx

Conclusion:

Today we are on the path of transformation of education system with NEP-2020. The policy has also indicated the use of ICT platforms and resources for education. We are also on the path of expanding 5G technology. So the terms like Artificial intelligence, internet of things (IOT), Simulation, Robotics are common terminology within the days to come. And it

our responsibility to accept the challenges otherwise no sooner the "Digital Divide" will likely to be experienced to the region where there is no access and use of the above digital educational platforms.

REFERENCES:

1. Department of Higher Education | Government of India, Ministry of Education. (n.d.). Retrieved December 12, 2022, from <https://www.education.gov.in/en/ind-initiatives>
2. Ministry of Education, Government of India (2020). Retrieved December 12, 2022, from https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
3. IndCat. (n.d.). Retrieved February 15, 2022, from <https://indcat.inflibnet.ac.in/index.php/search>
4. National Digital Library of India. (n.d.). Retrieved December 12, 2022, from <https://ndl.iitkgp.ac.in/>
5. N-LIST: National Library and Information Services Infrastructure for scholarly content. (n.d.). Retrieved December 12, 2022, from <https://nlist.inflibnet.ac.in/>
6. Pal, B, & Singh, S.K (2022). Uses of MoE-Gol Open Educational Platforms by the College Teachers of Assam: A Study Focusing on the Role of Library. <https://ir.inflibnet.ac.in:8443/ir/handle/1944/2375>
7. Swayam Central. (n.d.). Retrieved December 12, 2022, from <https://swayam.gov.in/>

Uses of MoE-GoI Open Educational Platforms by the College Teachers of Assam: A Study Focusing on the Role of Library

Birender Pal and Sanjay Kumar Singh

Today, the use of technology in education is the need of the hour for any higher educational institution. NEP-2020 has very clearly mentioned the roadmap for the adoption of technology in education. It has emphasized the use of open online learning platforms along with the different e-contents, information repositories, etc platforms. The OER developed under the MOE-GOI has its own credibility in terms of courses available across the higher educational institutions of our country. Various platforms like SWAYAM, NDLI, e-PG Pathshala, CEC-OER, virtual labs, etc are developed under the guidance of MOE-GOI. Even these platforms served as an alternative during the pandemic situations. Till the study was submitted, 244 numbers of colleges have already registered in N-LIST out of which 185 colleges were the present beneficiary. College libraries are providing maximum assistance to library users in using the N-LIST services. So, whether a similar approach is found to be practiced by the college libraries in the case of OER. Further whether the faculty members are using all the different open online education platforms of MOE-GOI. What challenges are faced by the college teachers of Assam in utilizing the OER? So, this paper basically deals with all these three questions mentioned above.

Introduction

The Higher education system in India has been transforming very fast in terms of using ICT applications and services. Open education platforms and Resources have balanced the maximum of the teaching-learning systems during the pandemic situation whether at the school level or higher educational level. Various e-learning and open educational resource platforms are developed under the Ministry of Education-Government of India (MOE-GOI). In school education, the importance of the DIKSHA e-learning portal cannot be ignored when it comes to online learning. Similarly, many other online resource platforms are also developed for the enrichment of learning at the school level such as e-Pathshala (<https://epathshala.nic.in>), OLABs (<http://www.olabs.edu.in/>), NISHITA platform for professional development of school teachers (<https://itpd.ncert.gov.in/>), etc. The higher education system is also no exception to it. Various online education and resource platforms are being developed under the special guidance of the Department of Higher education, MOE-GOI. At a nationalized level, the open education platform such as SWAYAM has been attracting many learners to not only gain knowledge but also to receive the proper assessment through its certifications. Open Resource platforms developed under the Ministry of Education, Government of India have been targeted to provide great relief to the learners in terms of accessing quality based learning materials.

2. NEP-2020, Open Education and Resources

The Ministry of education (earlier MHRD), Government of India has launched various ICT-based teaching learning platforms across different disciplines from the National Mission on Education through Information and Communication Technology (NMEICT). It has not only provided digital connectivity but also digital resources through its different programmes. National Education Policy-2020 in the Technology use and Integration has clearly prioritized the extensive use of teaching-learning platforms like SWAYAM/DIKSHA with qualitative content (Government of India, 2020). The policy has prioritized the implementation of the Blended mode of learning. The policy set the goal of creating the Content, digital repository, and its proper dissemination. It also gives a clear indication that for the practical infrastructure, the Virtual Labs platform needs to be extensively utilized for the learners. The NEP-2020 has opened a new opportunity for learners to complete their learning at any time and from any place. It has emphasized more flexibility and mobility of the students towards higher education in India. The Academic Bank of Credits (ABC) of the Ministry of education, Government of India has been launched with such objectives for the student's mobility across higher education in India (GOI. Ministry of Education, 2021). Further, Government of India has targeted to leave no stone unturned in making available the learning platforms and resources. With the technology integration, these tasks become much more vibrant by developing different learning and resource platforms at all levels of education.

3. ICT initiatives of Ministry of Education, Government of India (MOE-GOI)

The Ministry of Education, Government of India (MOE-GOI) has identified fourteen platforms for technology enabled learning through ICT initiatives (Ministry of Education, GOI, n.d.). These are:

- i. SWAYAM
- ii. SWAYAM-PRABHA
- iii. National Digital Library of India (NDLI)
- iv. e-PG Pathshala
- v. Shodhganga
- vi. e-ShodhSindhu
- vii. e-Yantra
- viii. FOSSEE Free/Libre and Open Source Software for Education
- ix. Spoken Tutorial
- x. Virtual Labs
- xi. University Enterprise Resource Planning (SAMARTH)
- xii. VIDWAN database
- xiii. IRINS: Indian Research Information Network System
- xiv. ShodhShudhhi (PDS) for Plagiarism detection

SWAYAM is the online education platform for teaching and learning through MOOCs. This platform also provides different qualitative learning materials prepared by the experts of the country. Similarly, SWAYAM –PRABHA is another platform for learning through satellite communication having at present 34 DTH channels. This platform is an audio-visual platform for learners. Other open resource platforms are NDLI, e-PG Pathshala, Virtual Labs, Shodhganga. CEC (Consortium for Educational Communication) has also developed the Open Educational Resource platform for various courses of different disciplines in the multimedia format.

A huge amount of time, money and labor is used from the top to the bottom level in carrying out the different activities of all these platforms. The teachers involved in teaching are highly expected to extensively use these platforms. Then only the doors will open for the students to learn and gain knowledge through all these platforms. So, a study is required to know the awareness, usage and difficulties in using the MOE-GOI open online education platforms.

4. Library's Role

The libraries of any academic institution are expected to be aware of not only the resources available at their library but also the invisible resources scattered in the web platforms. Different libraries are involved in creating awareness on different OER platforms. Today, the reference and information service of the library must be extended in terms of maximum utilization of OER platforms. In other words, the Library has to involve in awareness of different GOI online education platforms such as SWAYAM. Similarly, the library should be in a position to market the information of other GOI OER platforms.

5. OER

According to UNESCO “Open Educational Resources (OER) are learning, teaching and research materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license, that permit no-cost access, re-use, re-purpose, adaptation and redistribution by others”(UNESCO, n.d.).

6. Objectives of the study

Following are the objectives of the study:

- i. To know the status of the college teachers of Assam in utilizing the SWAYAM and ARPIT (Annual Refresher programme in teaching) platforms.
- ii. To identify the challenges faced by the college teachers of Assam in adopting the SWAYAM platform for their students
- iii. To know the status of college teachers of Assam in utilizing the NDLI, CEC -Open Educational Resource platform, e-PG Pathshala, SWAYAM-PRABHA and Virtual Labs platforms.

- iv. To identify the challenges faced by college teachers of Assam in using the OER platforms.
- v. To know the different initiatives taken by the libraries for the college teachers of Assam in using the OER.

7. Limitation of the study

Assam has four universities which have been providing affiliation to the colleges. These universities are Gauhati University, Dibrugarh University, Assam University and Bodoland University. The study is confined to the teachers of different government General Degree colleges affiliated to these four universities. The study has excluded all the law and engineering colleges of Assam.

8. Methodology

The methodology used for the study is the survey method. Data is collected using the Google form. All the communication is made directly with the college teachers of Assam either through respective email id or through respective WhatsApp number or even direct audio communication. To get the maximum accuracy, the researcher has avoided the use of mass interactive social networking tools such as WhatsApp groups, Facebook posts, etc.

9. Affiliated Colleges of Assam

Table 1: Status of different affiliated colleges of Assam

Name of the University	No of Colleges	Percentage	Total Nos of Affiliated colleges in Assam(includes all private and Government)
Assam University	38	11	337
Bodoland University	23	7	
Dibrugarh University	120	36	
Gauhati University	156	46	

Source: Government of Assam, Higher Education as accessed on 27/08/2022

(https://highereducation.assam.gov.in/sites/default/files/swf_utility_folder/departments/higheredu_medhassu_in_oid_3/do_u_want_2_know/337_stream_wise_colleges.pdf)

From the above Table11, it is found that maximum numbers of affiliated colleges are under Gauhati university followed by Dibrugarh university, Assam university and Bodoland university respectively.

10. Analysis of Resonances

10.1 Status on Response Received

Table 2: University and Designation wise Response received from the affiliated colleges

Name of the University	Responses of teachers received	Assistant Professor	Associate Professor	No of Colleges covered
Colleges under Assam University	27	23	4	6
Colleges under Bodoland University	15	14	01	7
Colleges under Dibrugarh University	96	83	13	44
Colleges under Gauhati University	145	123	22	54

A total of 283 responses have been received from the 111 provincialized colleges of Assam affiliated to the four different universities of Assam. The Table-2 depicts that 51.2 % (145 numbers) of the responses are from the affiliated colleges of Gauhati University, 34% (96 numbers) are from affiliated colleges of Dibrugarh University, 9.5% (27 numbers) are from affiliated colleges of Assam University and 5.3% (15 numbers) are from affiliated colleges of Bodoland university.

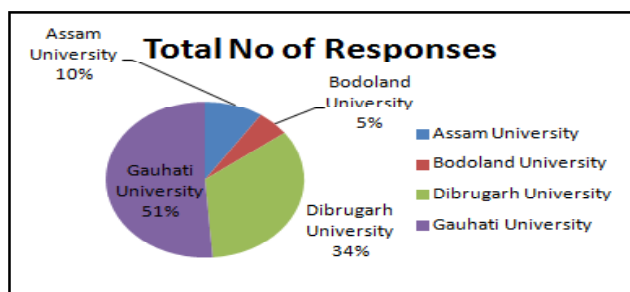


Figure 1: Graphical Representation of the University wise response received.

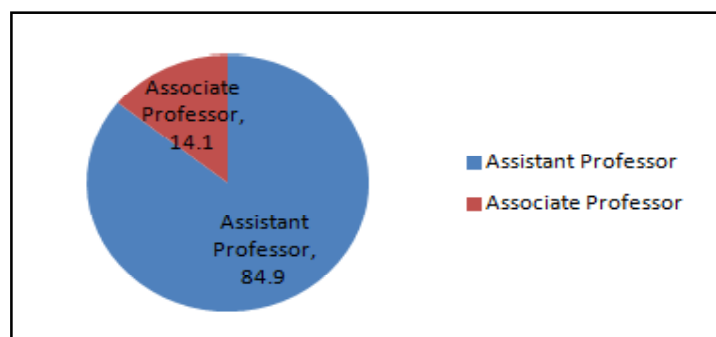


Figure 2: Graphical Representation of the Designation wise response received.

10.1.1 Age Group of the Respondents

Table 3: Responses received from different age groups

Age Group	No of Responses	Percentage
20-30 Years	25	8.8
30-40 Years	99	35
40-50 Years	104	36.8
Above 50 Years	55	19.4

The above Table - 3 depicts that maximum of the response received is from the age group of 40 to 50 years followed by 30 to 40 years.

10.2. Library Visits by College Teachers

Table 4: Status on Library visit by the selected college teachers of Assam

Description	No of Responses	Percentage
Daily	109	38.5
Weekly	118	41.7
Quarterly	27	9.5
Monthly	18	6.4
Others	11	3.9

***Others:** Need based, leisure time, rarely, 3 to 4 days in a week.

From the above Table44, it is found that the maximum number of the respondents visits their college library either on a daily basis or on a weekly basis. This indicates that the respondents are expected to be very much aware about the library resources and its services.

10.3. Teachers' preferences on Format of Document access from their Library

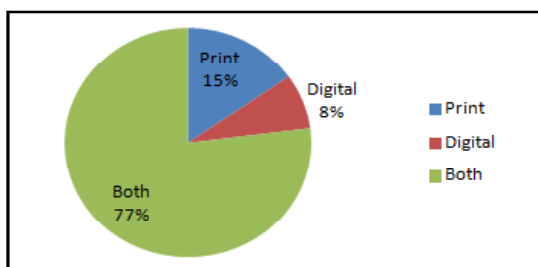


Figure 3: Graphical Representation of preference for use of library document in print or digital format

The above Figure - 3 reflect that maximum of the respondents prefer to access both the printed and digital document from their college library. It also shows that a limited percent of the respondents prefer to use either the printed format (15 percent) or the digital format (8%).

10.4 Status on usage of SWAYAM and ARPIT Platform

Table 5: Status on usage of SWAYAM and ARPIT platform by the selected college Teachers of Assam

Description	No of Responses	% of Responses	No of Responses	% of Responses
	SWAYAM Platform	ARPIT Platform		
Yes	132	46.6	50	17.7
No	137	48.4	210	74.2
Not Aware about the platform	5	1.8	17	6
Content do not matched with the Subject of the teachers	9	3.2	6	2.1

From the above Table- 5, it is found that 46.6% of the college teachers are aware and have used the SWAYAM platform. Further, 48.4% of the teachers are aware but still they are yet to use the SWAYAM platform. It is also found a few percentages i.e. 1.8% of the teachers are not aware about this online teaching and learning platform. Also, for 3.2% of the faculty members, the content of the SWAYAM platform is not matched with their respective subjects.

The above Table- 5 further reveal the usage of ARPIT platform for the professional development of the college teachers of Assam. It is found that a less percentage i.e. 17.7 % of the college teachers have used this platform till yet. The above Table also depicts that 74.2 % of the teachers are aware about this platform but they are still to use this platform. Furthermore, 6% of the teachers are not aware about this platform. For 2.1% of the teachers, the content delivered through ARPIT platform does not match the requirement of their respective subjects.

10.5 Challenges in adopting SWAYAM Platform

Table 6: Different challenges faced by the selected college teachers of Assam in using the SWAYAM platform

Challenges	No of Response	% of Responses
Lack of Provision of SWAYAM courses prescribed by the university	69	24.4
Lack of courses in regional language	47	16.6
Lack of Awareness	101	35.7
Prefer the Traditional Mode of teaching-learning	48	17
Others	18	6.3

***Others-** Not Required, Not used yet, Used other online platforms, the tenure of the course is too long, Interested to use for students, Students are not interested.

From the above Table- 6, it is found that maximum number of the faculty members, i.e. 35.7% are in the opinion that “lack of awareness” is one of the greater hindrances to the uses of SWAYAM platforms. Further, 24.4% of faculty members of the affiliated colleges further express that due to non-inclusion of SWAYAM courses in the college programmes by their parent university, it creates a hurdle in using this platform at the college level. 17% of the teachers still prefer to continue the teaching learning process through the traditional platform. 6.6% of the teachers have identified “lack of SWAYAM courses in regional languages” as a hindrance to use the platform. Further, 6.3% of the teachers have identified some “other challenges” in using the SWAYAM platform.

10.6 Usage of other OER platforms of GOI(CEC-OER, NDLI, e-PG Pathshala, SWAYAM-PRABHA, Virtual Labs)

Table 7: Status on usage of other Learning Platforms of MOE-GOI

Description	Responses Received (N=283)				Responses Received (N=54)
	CEC-OER	NDLI,	e-PG Pathshala	SWAYAM- PRABHA	Virtual Labs (only for Science Teachers)
Yes	121(42.8%)	181(64%)	129(45.6%)	86(30.4%)	29(53.7%)
No	121(42.8%)	91(32.2%)	141(49.8%)	146(51.6%)	20(37%)
Not Aware about the platform	35(12.4%)	8(2.8%)	6(2.1%)	39(13.8%)	2(3.7%)
Content do not matched with the Subject of the teachers	6(2.1%)	3(1.1%)	7(2.7%)	12(4.2%)	3(5.6%)

The above Table 7 depicts the status of usage of different online educational resource platforms by the selected college teachers of Assam. It is found that, 42.8% of the respondents are using the CEC OER (Consortium for Educational Communication) Open Educational Resource (OER) platform. Also, 42.8% of the respondents are aware about this platform but have not used the platform yet.

Maximum of the respondents, i.e. 64 percent are using the NDLI platform and 32.2 percent are although aware about the platform but have not used it yet.

45.6 percent of the respondents are using the e-PG Pathshala for teaching learning purposes. Further, maximum percentage of the respondents, i.e. 49.8 percent are although aware but have not used the e-PG Pathshala platform yet.

The usage of SWAYAM-PRABHA is found to be very less used by the respondents. It is found that 51.6 percent of the respondents have not used the platform yet. 30.4 percent of the respondents have used the platform till now.

The response of only Science faculty is considered for the usage of virtual labs platform and it is found that 53.7 percent of the respondents are using the platform and 37 percent are still to use it.

Further 12.4 % of the respondents are not aware about CEC OER, 2.8 % are not aware about NDLI, 2.1 % are not aware about e-PG Pathshala, 13.8 % are not aware about SWAYAM-PRABHA and 3.7 % are not aware about Virtual Labs platform.

Regarding the status on content delivered in the platform with the subjects of the respondents, it is found that 2.1 % respondents subject are not matched with the content delivered in CEC OER, 1.1 % not matched in NDLI, 2.7 % not matched in e-PG Pathshala, 4.2 % not matched in SWAYAM-PRABHA and 5.6 % not matched in Virtual Labs.

So, out of all the platforms, NDLI platform is the most used platform by the respondents.

10.7 Challenges in using other OER Platform

Table 8: Different challenges faced by the selected college teachers of Assam in using the GOI-OER

Challenges	No of Response	% of Responses
Lack of resources in regional languages	43	15.1
Lack of Internet connectivity	49	17.3
Difficulty in reading in Digital format	17	6
Lack of awareness.	56	19.8
Difficulty in accessing the OER.	7	2.5
All the Above challenges	50	17.7
Not find any challenges	55	19.4
Others	6	2.2

***Others**-Not unable to identify challenges as the respondent is not using, Lack of information on other platforms, Lack of facilities extended by college library.

The above Table 8 depicts the challenges of the selected college teachers of Assam in using all other OER platforms. It is found that: Maximum percentage of the faculty members, i.e. 19.8% are in the opinion that “lack of awareness” is one of the grater hindrances in using all the selected Open Educational Resource platform of MOE-GOI. Lack of Internet connectivity is also one of the focus reasons (challenges) in using all the OER which is responded by 17.3% respondents. Further, 15.1 % respondent’s belief that lack of availability of learning resources in the regional language is another great challenge in using all these resources, i.e. 15.1% respondents. 6% and 2.5% of the respondents have further identified the “Difficulty in reading in Digital format” and “Difficulty in accessing the OER” respectively as challenges for using OER. Overall, 17.7 % of the respondents are encountered with all the above mentioned challenges identified for the study. Further, 19.4% of the respondents are using the OER platforms smoothly without encountering any challenges. 2.2% of the respondents are facing some other challenges as mentioned (below the Table-8)

10.8 Initiatives of College Library for use of OER platforms

Table 9: Status of different initiatives taken by the library for the use of OER by the college teachers of Assam

Initiatives from library	No of Responses	Percentage of Responses
Link of OER in Library Webpage	29	10.2
Organizing Awareness Programme on OER	61	21.6
Organizing Seminar, workshops, Conferences on OER	42	14.8
Through the Library Display Board	17	6
Through the Social Networking sites	14	4.9
Maximum of the above initiatives	45	15.9
No any initiatives from Library	75	26.6

The above Table- 9 depicts the different initiatives taken by the college library in maximum usage of OER platforms by selected college teachers of Assam. It is found that:

21.6% of the respondents responded that their college library is organizing a different awareness programme on OER. Further, 14.8% responded that their library organizes different professional development programmes for the maximum use of OER. 10.2% of the respondents responded that their library provides links to OER in the library webpage. Further, 6% and 4.9% of the respondents responded that their library markets the information on OER through “library display board” and “Social networking sites” respectively. Overall, 15.9% of the respondents responded that their library takes maximum initiatives in making them aware about the different OER platforms and takes maximum of the above initiatives. A good number of respondents i.e. 26.6% have expressed that their library has still to take any initiatives in assisting them for the use of OER.

10.9 Digital document format preferred by the respondents in using OER

Table 10: Status of Respondents in preferring the digital document for the use of OER

Digital Format	No. of Respondents	Percentage of Respondents
Textual	65	23
Video	18	6.4
Audio	1	0.3
Image	Nil	Nil
All kinds of Digital Format	199	70.3

From the above Table 10, it is found that a maximum percent of the respondents (70.3%) prefer to use the OER in all types of digital document format such as text, audio, video, image, etc format. Further, a good number of the respondents (23%) prefer to use the OER in text format only. The study also found that a small number of the respondents prefer to use the OER either in video (6.4%) and audio format (0.3%).

11. Findings of the study

Following are the main findings of the study-

Objective 1

- i. Most of the college teachers of Assam are aware about the SWAYAM platform. Further, a large number of teachers are using the SWAYAM platform for online educational purposes. Also, a sufficient number of teachers are still to use this platform (From Table: 5).
- ii. The ARPIT platform delivered through SWAYAM is found to be utilized by a limited number of college teachers of Assam. This indicates that they prefer to pursue their professional development programme from other available platforms (From Table: 5).

Objective 2

- iii. Most of the college teachers of Assam believe that lack of proper awareness on SWAYAM courses hinders them in using this platform. Further, a good percentage of the college teachers of Assam expressed that lack of any clear guideline from its parent university in adopting the SWAYAM courses results in another great challenge for using the SWAYAM platform. A section of college teachers of Assam have expressed that they prefer to use the traditional method of teaching and learning rather than from the SWAYAM platform. An equal number of college teachers (approximately) also expressed that lack of availability of the courses in their regional language creates another challenge in using the SWAYAM platform (From Table: 6).

Objective 3 (From Table: 7).

- iv. CEC OER- A good number of the college teachers of Assam are using the CEC OER platforms. Further, the equal numbers of teachers are yet to utilize this platform. Also, a sufficient number of teachers are unable to use this platform due to the lack of proper awareness.
- v. NDLI: The selected college teachers of Assam are using the NDLI platform amongst all the selected OER platforms of GOI.
- vi. e-PGPathshala- The usage of this platform is found to be minimal as compared to the college teachers who are not using it.
- vii. SWAYAM-PRABHA- This platform is utilized by 30 percent (approximately) of the college teachers of Assam selected for the study. Further, a maximum of the college teachers are yet to utilize this platform. Also a good number of the college teachers are unable to use this platform due to lack of proper awareness.
- viii. Virtual Labs: Maximum of the selected science faculty members of the colleges of Assam is utilizing this experimentation platform. Further, a good number of faculties are still to experience this platform.
- ix. The content delivered through all these OER platforms is very important for the college teachers of Assam and is directly related with the subjects they deal with.

Objective 4

- x. Majority of the selected college teachers of Assam expressed that lack of proper awareness on OER platforms, internet connectivity, resources in regional languages, acceptability and accessibility of the resources in digital format results in a great challenge in using the Open educational resources(From Table: 8).

Objective 5

- xi. Maximum of the selected college teachers of Assam receive different assistance from their institute library in using the OER. Further, approximately 27% of the selected teachers are still to receive such assistance from their library (From Table: 9).

12. Suggestion

- i. A massive awareness is required in making the best use of SWAYAM and all the remaining OER platforms developed under the Ministry of education, Government of India. For this purpose, the college libraries may take an active role in making aware to the library users regarding the different OER platforms. Both the national and state library associations and the library network of India may come forward and may start a mission with an objective of creating awareness on different OER platforms. In this regard, the role

played by the ICT cell of Assam College Librarians' Association can be taken as a role model. During the Pandemic period 2020, the association has organized a series of awareness programme in the different colleges of Assam on use of e-resources specially the "ICT initiatives of Ministry of Education, Government of India".

- ii. The librarians of higher educational institutions may be entrusted with the responsibility of "Technical Coordinator" in creating awareness on OER of MOE-GOI.
- iii. Every college may establish a SWAYAM-PRABHA facilitation centre in their college so that the teachers and students can utilize this platform extensively.
- iv. All the four universities providing affiliation to the colleges of Assam may adopt the University Grants Commission (Credit Framework for Online Learning Courses through Study Webs of Active Learning for Young Aspiring Minds) Regulations, 2021 dated 25th March, 2021 for its affiliated colleges.
- v. The Ministry of Education, Government of India may also take initiative to develop the open online course materials in Assamese language.
- vi. The college teachers of Assam may guide their students to use all the available OER resources developed under the guidance of MOE, Government of India.
- vii. The facility of National Knowledge Network (NKN) for Internet connectivity may be extended to all the provincialized colleges of Assam.

13. Conclusion

The usage of OER resources developed under the guidance of MOE-GOI is rapidly increasing. To further promote and acknowledge these resources, various platforms are being developed such as Academic Bank of credits (<https://www.abc.gov.in/>), National Testing agency (<https://nta.ac.in/>), UGC e-resources Portal (<http://ugceresources.in/>)" etc so that the learners from any part of the country can take maximum benefit from these facilities. These OER resources developed have its own standard and features which differentiate it from the general internet free accessible resources. MOE-GOI is taking every step to popularize these resources from urban to the remote rural location of the country. The colleges of Assam which itself is a big network in terms of its human resources; infrastructure, etc are highly capable of handling these resources. Further, with the implementation of NEP-2020, the college teachers of Assam are highly expected to utilize these invisible resources and infrastructure so that the teaching learning system of higher education in the state of Assam may become more and more vibrant.

References

1. Government of India. (2020). National Education Policy 2020 Ministry of Human Resource Development Government of India.

2. Ministry of Education, GOI. (n.d.). ICT initiative of Ministry of Education, GOI-Technology enabled learning. Available at <https://www.education.gov.in/en/ict-initiatives> (Accessed on August 29, 2022)
3. Ministry of Education, GOI (2021). ABC | Academic Bank of Credits. Ministry of Education, Government of India. Available at <https://www.abc.gov.in/> (Accessed on August 29, 2022)
4. UNESCO. (n.d.). Open Educational Resources | UNESCO. Available at <https://www.unesco.org/en/communication-information/open-solutions/open-educational-resources> (Accessed on August 27, 2022)

Keywords: ICT Technology; LIS Education; National Education Policy 2020 (NEP); Education Policy; MLIS Programme

About Authors

Dr. Birender Pal

Librarian

Kaliabor College, Kaliabor, Nagaon, Assam

Email: birenderpal4@gmail.com

Prof. Sanjay Kumar Singh

Professor and Head

Department of Library & Information Science, Gauhati University, Guwahati

Email: sksgul@gauhati.ac.in

Research Data Repositories in Perspective of Climate Change: India to lead The World in Big Data Analytics with G-20 Summit

Birender Pal¹, Sanjay Kumar Singh², Prasanta Kumar Deka³

¹ Librarian, Kaliabor College, Nagaon, Assam

² Head, DLISc, Gauhati University, Guwahati, Assam

³ Librarian, K K Handiqui Library, Gauhati University, Guwahati, Assam

Abstract

Background: Climate change is one of the major environmental challenges that have been faced by every nation. Data is the key factor for any nation for its progress. Different data repositories are maintain by different disciplines, organizations or nations. Technology is a boon for dealing with different global problems. Data science if merge with technology can bring a major development in our society. The G20 in its 2023 vision has clearly mentioned about “One Earth One Family One Future” which further expressed its concern towards the global problem related to climate change faced by the nations. The G-20 presidency of India may bring a common platform for countries to store and exchange their data with one policy and technology.

Objectives: The study targets to identify different data repositories available in the world on the domain of climate change. The study also targets the data repositories of India. The study refers to identify the strength of G-20 countries on climate change domain data repositories with a proposal for creating a Unified global data repository on the domain.

Methods: The method for the study is based on the available data repositories under the Registry of Research data repositories related to climate change. The climate change repositories were identified by following four areas of universe of knowledge.

Results: The study found that there are 217 repositories of the 22 nations or unions on climate change domain. Further, the study also found that there are 62 data repositories identified which are created after the cooperation among nations or union. India individually is found to have 11 numbers of data repositories on the domain.

Implications: The findings of the study can be applied for mitigating the global challenge faced by the world in terms of climate change by implementing the domain of data science. The study may lead India to serve as a Global leader in mitigating the global problem of climate change through its G-20 Presidency.

Keywords: Climate Change, Data Repositories, G20, Research Data Repositories

1. Data analytics in Mitigating Climate change

Today, Data and Information are the primary needs of any knowledge society. A country's decision-making capability can be fully improvised by the processing of ground-level data. Different institutions or disciplines are creating or maintaining different information repositories or data repositories to support their missions and visions.

Climate change is one of the major environmental challenges that is faced by every nation. Every nation has its own data privacy rules and regulations. Climate issues are today not a local scenario but a global concern. It is a global challenge that needs to be seriously dealt with the cooperation of all the countries of the world. It has adversely affected food production, human health, weather, flora and fauna, the ecosystem in the high mountain areas, the water conservation system, etc. World Health Organization (2021) in the report on Climate Change has mentioned that taking the help of technology "Integrated monitoring systems allowing collection and analysis of data on environmental hazards, socio-economic factors and health outcomes are established" (WHO, 2021). Parth and others (2019) in a study have concluded that the power of information can mitigate the effects of climate change. In their study, they have mentioned that lack of micro-level data has adversely impacted climate change related to agriculture. The study has also recommended a policy for providing access to agricultural data to farmers using ICT tools (Parth et al., 2019).

2. Objective of the Study

The following are the main objectives of the study:

- ❖ To know the status of different climate change related data repositories available across the world.
- ❖ To explore the status of Indian data repositories related to climate change.
- ❖ To propose and prepare a roadmap for global unified data repositories with the G20 presidency of India

3. Methods

The method for the study is based on the available data repositories registered in the Registry of Research Data Repositories (re3data.org) related to climate issues. Both browsing and searching technique were applied to collect the data. Climate change repositories were identified considering the issue of climate change from four broad areas- Lithosphere, Atmosphere, Hydrosphere and Biosphere. Further, the repositories are finally considered after properly verifying the content area and the important keywords entered for each of the repositories. The study has followed four methods for collecting data:

- ❖ Data Repositories of Individual countries search with the keyword "Climate" which is followed by content analysis of the repository. The collected data is used in the Table:1 of the study.
- ❖ Data Repositories of Cooperative countries search with the keyword "Climate" which is followed by content analysis of the repository. The collected data is used in the Table:2 of the study.

- ❖ All the data repositories of India are available on the registry on climate change which is followed by content analysis of the repository (browsing and examining the subject content of each of the repositories). The collected data is used in Table 3 of the study.
- ❖ Browsing the data repositories of the five G-20 countries whose repositories are not discoverable (as individual registered countries) while searching through the keyword search word “Climate” (related to the concept of climate change as per the study). The collected data is used in Table 4 of the study.

4. Limitations of the study

For collecting the global data for the available climate change repository, the search is limited within the website of the Registry of Research data repository. Further, the word “International” used by the Registry of Research data repository to represent the international countries without any particular nomenclature of the nation is also used in the study for representing the name of a country/region.

5. Data repository in perspective of climate change

5.1 Global Scenario

As per the data extracted from the Registry of Research Data Repositories, there are 3148 data repositories which are registered in the registry (as of 27/08/2023). Using the search access term “climate”, 307 data repositories were found to be in the displayed result. Further, all the 51 repositories available for India were searched separately. Out of the 358 repositories examined individually, the repositories that are either no longer in existence or do not have any content related to climate change issue were not considered for this study. After browsing and exploring each of the 358 repositories, 279 repositories were considered to highlight the global scenario of the countries in maintaining the data repositories related to climate change.

Table 1: Status of data repositories of different individual countries and regions in the Climate Change domain.

Sl. No	Name of the Country/Region	Number of Repositories identified
1.	United States	96
2.	Germany	27
3.	Canada	25
4.	Australia	12
5.	United Kingdom	11
6.	*India	11
7.	France	8
8.	Netherland	4

RESEARCH DATA REPOSITORIES IN PERSPECTIVE OF CLIMATE CHANGE: INDIA TO LEAD THE WORLD IN
BIG DATA ANALYTICS WITH G-20 SUMMIT

9.	European Union	4
10.	Japan	3
11.	*International	3
12.	Norway	2
13.	South Africa	2
14.	Sweden	2
15.	Austria	1
16.	China	1
17.	Finland	1
18.	Italy	1
19.	Luxembourg	1
20.	Spain	1
21.	Switzerland	1

**International: The word international was used in Registry of Research Data Repositories without identification of any nomenclature of any particular country.*

**India: The data for India is collected by browsing all the 51 repositories available for India in Registry of Research Data Repositories*

From, the above Table 1, it is found that 217 data repositories are registered by the institutions, organizations or the discipline of twenty-one countries and unions related to environment and climate change discipline. The United States is found to have the highest number of data repositories registered related to the subject content of the climate change domain. The Table:1 also reflects that Germany (27) and Canada (25) have approximately equally registered data repositories. Similarly, Australia (12), the United Kingdom (11) and India (11) also have approximately equally registered data repositories. France is found to have registered eight numbers of data repositories. The Netherlands and the European Union have registered four data repositories. Japan and International have registered four repositories. South Africa and Sweden have registered two each. Further, there are seven countries (viz. Austria, China, Finland, Italy, Luxembourg, Spain, Switzerland) whose one data repository respectively are registered in the Registry of Research Data Repositories related to the domain of climate change.

Table2: Status of different data repositories on climate change domain created with the cooperation and leadership among the countries and region.

Sl. No	Name of the Country/Region	Number of Repositories considered
1	*European Union / Others	18
2	*United States / Others	11
3	*International / Others	10

ENRICHING ETDs AND THEIR REACH

4	*Germany and others	4
5	*France and others	4
6	*Australia and others	2
7	Canada /United States	2
8	International / Germany	2
9	China / International	1
10	Italy / International	1
11	Indonesia / Netherland	1
12	Spain / Germany	1
13	Switzerland / International	1
14	Belgium /Germany / United Kingdom/ France	1
15	Burkina Faso /Germany /Ghana	1
16	Russia Federation / Japan	1
17	Cyprus / European Union	1

**International: The word international is used in the Registry of Research Data Repositories without identification of any nomenclature of any particular country.*

**Here details of the cooperative countries are provided as mentioned in Table:2.*

***European Union (EU) / Others -EU and International=2**

-EU / International/Italy=1

-EU /International/Finland/Norway=1

-EU/International/Belgium/US/Germany/Switzerland=1

-EU/International/Belgium/US=1

-EU/International/France/US/Finland=1

-EU/ Norway=1

-EU/Austria/Norway=1

-EU/Germany=2

-EU/Germany/Belgium=1

-EU/Iceland/Germany/Switzerland/Italy/International=1

-EU/Slovenia=1

-EU/Sweden/Netherland=1

-EU/Netherland=1

-EU/Sween/Germany/Netherland/France/Switzerland/United Kingdom=1

-EU/France/Russia Federation/Italy/Greece/UK/Netherland/Germany=1

***United States (US) / Others**

-US/United Kingdom=1

- US/Norway=1
- US/Brazil/Australia/Netherland/India/International=1
- US/Brazil=1
- US/France=1
- US/France/International/European Union=1
- US/France/Japan=1
- US/Mexico=1
- US/Switzerland/Germany=1
- US/Germany/ European Union /Brazil/Japan/China/Korea/Australia/India=1
- US/ International=1
- *International / Others**
- International –Australia=1
- International -United States=2
- International - United States/Canada=1
- International-Canada=2
- International-France =2
- International-Kenya=1
- International-New Caledonia-Fiji-France-1
- *Germany and Others**
- Germany / United States / International=1
- Germany / International=3
- *France and Others**
- France / Sweden=1
- France / Unites States=1
- France / India=1
- France / Cameroon / India / Lao’s People /Democratic Republic/ Viet Nam=1
- *Australia and others**
- Australia / United States=1
- Australia / United Kingdom=2

The above Table 2 reflects the status of different data repositories which are created with the cooperation and leadership among the countries or with the Union. From, the above Table 2, it is found that there are 62 data repositories identified which are registered with the help of cooperation of the institutions, organizations or the disciplines of the different countries and union of the world related to climate change domain. It is also found that the European Union, United States, International, Germany and France provide the leadership to different countries of the world for creating different data repositories related to environment and climate change. Further, it is also found that Australia, Canada, the Netherland, Switzerland, and Belgium are also contributing to data repositories by participating or cooperating with the different nations in the different data repositories available in the Registry of Research Data Repositories related to the domain of climate change.

5.2 Indian Scenario of Data Repository from the Perspective of Climate Change

Different countries maintain different data repositories to collect, analyze, visualize and store the data related to climate change. In India, the National Information System for Climate and Environment Studies (NICES) maintains the national-level climate database (Information for Climate and Environmental Changes, n.d.). Similarly, the National Remote Sensing Centre (NRSC) is maintaining the satellite data (NRSC, n.d.). Meteorological and Oceanographic Satellite Data Archival Centre (MOSDAC)-a data center of Space Application Centre maintains the satellite data with regard from its collection to data visualization and dissemination (Meteorological & Oceanographic Satellite Data Archival Centre, n.d.). India- Water Resource Information System (WRIS) is the repository for maintaining data on water resources and allied themes (India-WRIS, n.d.). Environment Monitoring and Research Center of the Indian Meteorological Department (IMD) monitors ozone monitoring, precipitation chemistry, aerosol monitoring, black carbon monitoring, air quality forecasting and research (SAFAR) having different network stations within the country (India Meteorological Department, n.d.). Further, to mitigate climate change issues, IMD is contributing its data and information to the World Meteorological Organization. The India Environment Portal maintained by the Centre for Science and Environment (CSE) has built its repository using the open-source software Drupal. This repository maintains the environment related data such as water and air pollution; forest, land and agriculture, atmospheric data; energy, biodiversity, etc. (India Environment Portal, n.d.). India's ENVIS (Environmental Information System) programme maintains another data repository related to environmental science (Environmental Information System, n.d.). India is also a participating nation for the data repository of the World Agroforestry Centre - ICRAF Dataverse (World Agro Forestry, n.d.). Further, there are many other data repositories maintained by different organizations and institutes in India that cater to the need of their users.

Table 3: Status of different data repositories created or participated in by India relating to Climate Change (as search in Registry of research data repositories)

Sl. No	Name of the Repository	Last Updated	Access to Data Repository	As Individual country/ Cooperation with others
1.	India Environment Portal	2021-11-16	Open	Individual
2.	India Water Portal	2021-12-22	Open	Individual
3.	Open Government Data Portal of Tamil Nadu	2023-02-14	Open	Individual
4.	KRISHI	2022-03-24	Open	Individual
5.	National Data Repository	2019-05-15	Open	Individual
6.	NER Databank	2019-11-18	Open	Individual
7.	Biosearch	2021-08-25	Open	Individual

RESEARCH DATA REPOSITORIES IN PERSPECTIVE OF CLIMATE CHANGE: INDIA TO LEAD THE WORLD IN
BIG DATA ANALYTICS WITH G-20 SUMMIT

8.	India Biodiversity Portal	2021-11-16	Open	Individual
9.	World Data Centre for Geomagnetism, Mumbai	2018-12-19	Open	Individual
10.	Indian National Centre for Ocean Information Services	2023-05-26	restricted	Individual
11.	Indian Space Science Data Center	2021-10-06	restricted	Individual
12.	TropFlux	2022-02-07	Open	Cooperation
13.	M-TROPICS	2023-06-02	Open	Cooperation
14.	WorldClim	2022-01-18	Open	Cooperation
15.	International Ocean Discovery Program	2022-12-20	Open	Cooperation

The above Table 2 reflects the s

Table 3 indicates that out of the 51 repositories registered for India, there are eleven data repositories registered for India in the Registry of Research Data Repositories registry, which provide data on the domain of climate change. Further, the Table 3 also reflects that India is a participating nation for the four numbers of data repositories (i.e., two repositories each led by the United States and France).

6. G-20 and Presidency of India for Unified Global Data Repository- A Proposed Roadmap

National Interagency Fire Center open data site of the United States has tremendously helped the public by open access usage of the data sets dealing with wildfire (*Wildfire Open Data Is Driving Innovation and Improving Public Safety*, 2021). The open access availability of data has helped to mitigate a dangerous problem related to human safety. So, data sharing policy can bring a constructive development if used with proper ethics.

On June 30, 2008, India launched its National Action Plan on Climate Change where it has launched eight different missions on climate areas. Also, the year 2023 is of great importance for India as it is holding the G20 presidency (*Government of India, Ministry of External Affairs*, n.d). The G20 in its 2023 vision has mentioned “One Earth One Family One Future” which further expressed its concern towards the global problem related to climate change faced by the nations.

Table 4: Status of G-20 members participating in Registry of Research Data Repositories repository related to climate change

Sr.No	G-20 Members data repository related to issue of climate change in Registry of Research Data Repositories	Status of Repository in Registry of Research Data Repositories on climate change as Leading Nation
1.	Argentina	*Yes
2.	Australia	Yes
3.	Brazil	*Yes
4.	Canada	Yes

ENRICHING ETDs AND THEIR REACH

5.	China	Yes
6.	France	Yes
7.	Germany	Yes
8.	India	Yes
9.	Indonesia	#Yes
10.	Italy	Yes
11.	Japan	Yes
12.	Mexico	*Yes
13.	Republic of Korea	*Yes
14.	Russia	*Yes
15.	South Africa	Yes
16.	United Kingdom	Yes
17.	United States of America	Yes
18.	European Union	Yes
19.	Turkiye	No
20.	Saudi Arabia	No

* In Registry of Research Data Repositories, browsing of the repositories was done individual country wise on climate change.

Repository maintains with cooperation among countries

From the above Table 4 it is found that except two countries (i.e.10 per cent), 90 per cent of the G-20 members are having registered repositories in Registry of Research Data Repositories either individually or with the cooperation of different countries related to domain of climate change. This indicates that G-20 member countries are playing a leading role in maintaining different types of data related to the climate change domain.

6.1. Proposed Roadmap

With the support of G-20 members, a global unified data repository related to climate change is proposed. Following are the proposed steps for the unified data repository.

1. India may propose a model with its G-20 presidency for a global unified data repository with the participation and contribution of all the G-20 member countries.
2. Based on the different subject coverage of climate change, the proposed repository may cover all the aspects of the sphere i.e. Lithosphere, Atmosphere, Hydrosphere and Biosphere so that different areas of climate change will be reflected.
3. It is proposed that a common policy on data submission, its use and budgetary provisions may be proposed by India for all the G-20 member countries

4. Ministry of Environment, Forest and Climate Change, Government of India may be proposed to initiate all the general and technical works from India with cooperation from data or information management systems/centres available in India. Further, the experiences of the G-20 members who have a rich history and experience in managing the data repository can also be utilized. According to the data access from Registry of Research Data Repositories, the United States (1172), Germany (504), Canada (394), United Kingdom (321), France (128) Australia (103) have the highest number of data repositories covering different universe of knowledge as per the registry. It is also proposed that at the initial level, all these G-20 members may assist in framing the policies, technical infrastructure, etc.
5. It is also proposed that all the G-20 members may be requested to update their data repository before the start of the G-20 summit every year.
6. Further, the study proposes for equal storage of data to be stored in all the G-20 member countries.
7. It is also proposed that every year the country or region that will hold the G-20 presidency may lead the global unified data repository on climate change. This may involve the cooperation of the nations.

2. Findings

1. It is found that out of the 279 data repositories identified, 217 repositories are registered in the category of an individual country (Table 1).
2. It is also found that there are 62 data repositories identified (related to climate change) which were created or contributed with the cooperation of different nations or unions. (Table 2).
3. The study found there are 11 individual data repositories registered for India in the Registry of Research Data Repositories related to domain of climate change (Table 3). In addition to it, there are different data repositories (related to the data dealing with climate change) maintained by different organizations/institutions from India which are yet to be registered in the Registry of Research data repository.

3. Suggestions

The study has suggested a proposed roadmap for creating a unified global data repository under the G-20 presidency of India.

4. Conclusion

Data is the backbone of any global, regional, state or micro-level system. To deal with global issues, international cooperation is the key parameter. The theme of World Environment Day of 2022, i.e. “Only One Earth” clearly demands that all the countries of the world need to be united while dealing with environmental issues. Data science can further relate to the theme of World Environment Day by demanding that the countries share their data related to climate change not individually but with collaboration. The individual nations may have to understand the importance of data related to issues of climate change. Any kind of global unified data repository can only be possible if the cooperation of the international countries is

acquired. The proposed roadmap for a unified global data repository on climate change with G-20 members may create an example for the entire world. It will give a direction not only to frame policies on these issues but also adopt the technological advancement for managing the data sets.

Bibliography

World Agroforestry. (n.d.). | Transforming Lives and Landscapes with Trees. Retrieved August 27, 2023, from <https://www.worldagroforestry.org/country/India>

Meteorological & Oceanographic Satellite Data Archival Centre. (n.d.). Retrieved August 27, 2023, from <https://www.mosdac.gov.in/about-us>

India Environment Portal | News, reports, documents, blogs, data, analysis on environment & development | India, South Asia. (n.d.). Retrieved August 27, 2023, from <http://www.indiaenvironmentportal.org.in/content/about-us/>

Environmental Information System: About Us. (n.d.). Retrieved August 27, 2023, from <http://envis.nic.in/content/AboutUs.aspx>

Environmental Met. Services | India Meteorological Department. (n.d.). Retrieved August 27, 2023, from <https://mausam.imd.gov.in/responsive/servicesMetEnvironment.php>

GFZ German Research Centre For Geosciences, Humboldt-Universität Zu Berlin, Germany Karlsruhe Institute Of Technology (KIT), Purdue University Libraries, Bertelmann, R., Buys, M., Cousijn, H., Dierolf, U., Elger, K., Fenner, M., Ferguson, L. M., Fritze, F., Fuchs, C., Goebelbecker, H.-J., Gundlach, J., Kindling, M., Kloska, G., Klump, J., Kramer, C., ... van de Sandt, S. (2013). Registry of Research Data Repositories. <https://doi.org/10.17616/R3D>

Government of India, Ministry of External Affairs, (n.d). About G20. Retrieved September 2, 2023, from <https://www.g20.org/en/about-g20/>

India-WRIS. (n.d.). Retrieved August 27, 2023, from <https://indiawris.gov.in/wris/#/>

Information For Climate And Environmental Changes. (n.d.). Retrieved August 27, 2023, from <https://www.isro.gov.in/InfoClimateEnv.html>

WHO. (2021). Climate change (Compendium of WHO and Other UN Guidance on Health and Environment, pp. 94–106). World Health Organization. <https://www.jstor.org/stable/resrep35857.13>

Parth, K., Bibind, V., Naelle, V., Smiti, Y., & Institute, A. (2019). Climate Change and Agriculture: An Information Asymmetry Approach (Climate Change and National Security). Aspen Institute. <https://www.jstor.org/stable/resrep42655.4>

Wildfire Open Data is Driving Innovation and Improving Public Safety. (2021, November 10). <https://www.doi.gov/wildlandfire/wildfire-open-data-driving-innovation-and-improving-public-safety>



N-LIST services. So, whether a similar approach is found to be practiced by the college libraries in the case of OER. Further whether the faculty members are using all the different open online education platforms of MOE-GOI. What challenges are faced by the college teachers of Assam in utilizing the OER? So, this paper basically deals with all these three questions mentioned above.

Description: 13th International CALIBER-2022, BHU, Varanasi, UP, 17-19 November 2022

URI: <http://ir.inflibnet.ac.in/handle/1944/2375>

ISBN: 9789381232101

Appears in [CALIBER 2022: Varanasi, UP](#)

Collections:

Files in This Item:

File	Description	Size	Format
18.pdf	13th International CALIBER-2022, BHU, Varanasi, UP 17-19	156.88 kB	Adobe PDF

[View/Open](#)





based on the available data repositories under the Registry of Research data repositories related to climate change. The climate change repositories were identified by following four areas of universe of knowledge. Results: The study found that there are 217 repositories of the 22 nations or unions on climate change domain. Further, the study also found that there are 62 data repositories identified which are created after the cooperation among nations or union. India individually is found to have 11 numbers of data repositories on the domain. Implications: The findings of the study can be applied for mitigating the global challenge faced by the world in terms of climate change by implementing the domain of data science. The study may lead India to serve as a Global leader in mitigating the global problem of climate change through its G-20 Presidency.

Description: 26th International Symposium, ETD 2023, Gandhinagar, Gujarat, 26-28 October, 2023

URI: <http://ir.inflibnet.ac.in/handle/1944/2440>

ISBN: 9789381232125

Appears in [26th International Symposium ETD 2023](#)
Collections:

Files in This Item:

