GENERAL INTRODUCTION

1.1 Introduction

The Information and Communication Technology (ICT) and the emergence of Internet have had substantial and rigorous impacts on the knowledge and information sector and build a new aspect in the platform of information retrieval. The convergence of ICT has given rise to the evolution of several new jargons like paperless society, electronic resources, portal/gateway and global digital library. Now-a-days, the academic libraries are not only providing printed resources to their users rather they provide printed as well as electronic resources like e-journals, e-books and databases for fulfilling the day-to-day academic and research requirements of the library users as a result of which the user satisfaction level has been increasing.

In 21st century, libraries are moving from print to e-resources either subscribing individually or through consortia. There has been paradigm shift in the collection development policies for acquiring printed as well as e-resources (both offline and on-line resources). So therefore, there is need for drafting the new collection development policies for accommodating electronic resources in the library collection. There should be balance between the printed and e-resources for acquiring in the libraries as per the demand of the end users.

Now due to changing trends of electronic publishing, many online and offline resources are being published as these resources have great demand from the

libraries and users community. These revolutionary steps are providing scholarly resources including peer reviewed journals, databases, abstracts, proceedings etc. These efforts must be a boon to university library users which will definitely boost the level of higher education system in our country.

1.2 Background

The higher education of 21st century is passing through the phase of Information/Knowledge revolution. The formation of consortia or the process of buying e-resources by the different libraries of Assam together has become very important activities in the last few years. This study *"Usage of E-Resources in the University Libraries of Assam: A Comparative Study"* discusses the usefulness of e-resources available under library consortia in the university libraries of Assam.

Library Consortium is an Association of a group of libraries to achieve mutually the common objective and it is felt that the concept of e-journals consortia can keep pace with the demand of the library users without requiring additional fees to access the e-journal.

The changing scenario in library environment has arisen for the need and use of e-journals along with print version. Electronic journals has created new challenges before the library and information professionals to give full text access to scholarly publications both in print and electronic version to its end users. In this study, the researcher has tried to identify the various issues relating to the process of accessing e-journals, e-books & bibliographic databases of the scholarly peer reviewed journals which are being subscribed by the university libraries of Assam.

1.3 Emergence of Electronic Resources in Changing Environments

Knowledge resources are changing from printed to electronic format. As a result many libraries are currently experiencing a fast transition from print to electronic format while developing collection of an academic, Technical/ Special Libraries. The collection development method and practices of acquiring library resources have changed in order to cope with the electronic version publications.

The role of library and information professionals also needs to be changed to provide best services to the end users. The Internet has given rise to the development of electronic versions of printed library reading materials like books, journals, report, conference proceedings, monographs etc., which have brought changes in the collection development policies of academic libraries and the role of librarians is vital in the selection and procurement of relevant electronic resources judiciously within limited available finance.

The electronic resources can be access over Internet, which may be on the basis of ownership or access right for the journals subscribed. On-line access is available along with subscription with printed volumes. Electronic resources include e-journals, e-books, CD-ROM/ DVD Databases, On-Line Databases etc.

There has been a trend in academic libraries for adopting consortia model for accessing to electronic resources over Internet. The consortia approach for subscribing to e-journals and databases has been gaining momentum in India also and different models are being coming up and some are running successfully. These e-journals consortia are, UGC-INFONET Digital Library Consortium, AICTE-INDEST Consortium, DeLCON, FORSA Consortium, CSIR Consortium and IIM Consortium (Sinha & Gautam, 2015).

1.4 Concept of E- Resources

Electronic resources represent an increasingly important component of the collection building activities of libraries. "Electronic resources" refer to those materials that require computer access, whether through a personal computer, mainframe, or handheld mobile device. They may either be accessed remotely via the Internet or locally. Some of the most frequently encountered types are:

- E-journals;
- E-books;
- Full-text (aggregated) databases;
- Indexing and abstracting databases;
- Reference databases (biographies, dictionaries, directories, encyclopaedias, etc.);
- Numeric and statistical databases;
- E-images; and
- E-audio/visual resources (Johnson *et.al*.2012).

1.5 Different Forms of E-Resources

a. E-Journals

Electronic journals encompass information products as electronic journals, and links to e-journal collections like gateways as well as publishers such as JSTOR, Project Muse, and ScienceDirect. The users can search e-journal by title. They can browse e-journal titles alphabetically as well as by subject category. Sometimes a hierarchical Sometimes a hierarchical outline of subject categories or A to Z Index of

subjects is also available. Currently most of the modern libraries facilitate e-journal collections and databases.

b. E-Books

A good number of libraries and information centers provide links to collections of full-text books like Books 24x7, Early English Books Online, Net-Library. Libraries provide access to full-text electronic books with a focus on information technologies. For example there can be a collection of thousands of online full-text books and other materials across a variety of subject areas and a collection of online scholarly books in the field of specific single subject. In various S & T Libraries aggregated engineering and applied science handbooks, databases, and data can be accessed full text and also by utilizing specific proprietary tabular analysis tools.

c. Databases (reference works & indexes)

The databases include products such as periodical indexes and abstracts, directories, encyclopedias, dictionaries, other reference works. In general the databases provide search facilities to users by subject, type and title or keyword (s) with the Boolean logic feature.

d. E-News

Electronic news has already made its place in the form of news resources like LexisNexis and Factiva, and links to local, national, and international newspapers.

e. E-Images

Due to advent of electronic image facility, image databases are used specifically in subjects such as history, geography, medical sciences etc. The libraries develop in-house digital image collections and also provide access to selected external databases to their clientele.

f. E-Music and Sound Collections

Electronic music and sound collections are creating their niche which in multimedia libraries. Digital sound recording collections are facilitated by libraries.

g. Data/GIS

Numeric and geo-spatial data suitable for those interested in using either statistical or GIS software is provided.

h. Academic Commons

The intellectual output of a particular organization is also considered. Online access to university dissertations, working papers, proceedings, etc. is facilitated to the academic community. The access to such e- resources can be restricted to the organizational users only, depending on policies.

i. E-Reference

Electronic reference sources are the significant facet of e-resources. E-reference sources can be comprised of following types of resources:

- ❖ Dictionaries;
- ❖ Translators;
- ❖ Encyclopedia;
- ❖ Directories;
- ❖ Glossaries;
- ❖ Virtual Newspapers;
  - ▪ International Newspapers;
  - ▪ Local Newspapers; and
- ❖ Subject Guides

As the name suggests the subject-focused guides to digital and print resources. These types of resource help in day to day faculty needs and cater to wide

variety of user demands in the academic set-up (Bhattacharjee, Bhattacharjee & Sinha, 2012).

j. Web Search Tools

Internet search tools like search engines, Ask, Yahoo, Live Search, google including various feature such as Google Book Search, Google Earth, Google Images, Google Maps and Google Scholar; are inevitable as well as significant components of library. Meta search engines such as Mamma Meta search InfoMine, Dogpile, Grokker, and MetaGlossary do make impressive aspect. Directories/ reference sources such as Wikipedia, Bubl Link, PubMed , WWW Virtual Library, audio-visual tools such as YouTube, Radio-Locator, Singingfish blogs and web 2.0 tools such as Technorati, Flickr and guides/reviews such as search engine showdown as well as search engine watch are available.

k. The Web

The web is a useful source of online information but it is also an uncontrolled environment; anyone can post information to it for any purpose and at any time.

l. Subject or Information Gateways

Subject and information gateways are the free information and resources available on the web which have been carefully chosen and quality checked by experts in their field. The subject Gateways provide access to reliable and up-to-date web resources for all subjects, some examples are as following:

i. Intute: Intute is the best and most relevant resources covering all subjects, in one place. It provides trusted information, which has been evaluated by specialists for its quality and relevance.

ii. Google Scholar : User can search across many disciplines and sources for scholarly literature and relevant research. Resources include papers, theses, books, preprints, abstracts and technical reports.

1.6 Characteristic of E-Resources

Important features of e-resources are as follows:

i) The information exists in a digital format or computer processable format;

ii) Information resources are published by releasing them to a central database or in the form of CD Rom, DVD Rom etc;

iii) E-document can be available in text, static picture, sound, animation, motion picture and various tactile modes of communication;

iv) Processing, presentation, storage, display, communication is carried out through the use of digital technology;

v) E-documents are distributed by CD Rom, DVD Rom or communication link;

vi) Helps in easy document delivery. Users may established their own accounts, change services, pay through credit cards or by some other pre-arranged method and have requested material delivered directly to them by Fax, Email, etc. (Pandey, 2010).

1.6.1 Added Value Features to E-resources

❖ Search (within) and Searching across collections;

❖ Hyperlinks (internal /external);

❖ Multimedia;

❖ Interactivity/Exercises leading to Participation;

- ❖ Book marking and Information delivery;

- ❖ Annotating and Highlighting;

- ❖ Reference tools;

- ❖ Archives;

- ❖ Copying/pasting/e-mailing and Chat with Editors/ Authors;

- ❖ Capitalizes on pupil's enthusiasm for new media;

- ❖ Reduces the amount of photocopying for handouts;

- ❖ Borrow e-book versions of reference books;

- ❖ Technical processing costs are less; and

- ❖ De-selection more easily facilitated

1.7 Advantages for Subscribing E-Resources

A number of advantages the library and users may have while subscribing or accessing e-journals / digital resources/ e-resources according to are listed below:

- ❖ It allows remote access;

- ❖ E-Resources are having 24 x 7x 365 access;

- ❖ It can be used by many users simultaneously;

- ❖ Anytime and anywhere access;

- ❖ Available before print version is coming out;

- ❖ Many users can access it simultaneously;

- ❖ Provide timely access to the documents;

- ❖ It is interactive & allows interaction between authors/publishers & users.

- ❖ Support different searching capabilities;

- ❖ It can support multi-media applications;

- ❖ Require less physical space for storage;

- ❖ CD/DVDs take less space for storage of electronic documents;

- ❖ Eco-friendly in nature;

- ❖ Save printing and postage expenditure;

- ❖ It can easily merged with alerting service given by publishers;

- ❖ It provides improved access through full-text searching;

- ❖ It accommodates unique features such as links to related items.

- ❖ Problems of missing issues can be solved easily;

- ❖ Login / Password or IP based access check the illegal access;

- ❖ Can be protected in any natural calamity at one location;

- ❖ Easy to get translated into many languages;

- ❖ Do not require physical processing for access.

- ❖ It can solve the problems of missing issue of journals;

- ❖ It is available as soon as the print version is published over the Internet;

- ❖ Electronic publishing is cheaper than the print version;

- ❖ Journal articles can be searched by the combination of search strategies by titles, author, subject descriptors etc;

- ❖ It does not require physical processing.

- ❖ Economy in maintenance of archival files in the form of CD-ROM;

- ❖ Allow library users to give online feedback of the articles to the author through e-mail;

- ❖ Those articles which are not freely available can be had from the author concerned by sending e-mail to them;

- ❖ Length of articles needs not to be restricted as in case of print version of the journals;

- ❖ Content can be reproduced, forwarded and modified causes problems for

copyright protection and the preserving the authenticity of the content;

❖ Provision of hyperlinks to internal and with the other publishers; and

❖ Saving of shelf space of library allowing more accommodation of digital as well as print resources (Sinha & Gautam, 2015).

1.7.1 Advantages of E-resources in Terms of Technological Aspects

In terms of technological aspects, the advantages are as following:

❖ Space;

❖ Updating;

❖ Security, theft, automatic returns (no fines); and

❖ Remote and Concurrent and 24x7 access to textual aspects.

1.8 Subscription of E-Resources / E-Journals Pricing Models

The E-resources publishers are investing huge amount for the production of printed and e-resources and that is why publishers want due return on their investment. For subscription of e-resources, various pricing models are available According to Sinha & Gautam (2015), these are as follows:

➕ *Electronic Subscriptions bundled with print subscription:* In such cases, electronic access to journals is linked with their printed versions. Therefore, e-journals are offered either free with their print counterpart or a fixed amount may be charged on print subscription charges or some other similar model. For examples: Free with printed journals: AlP, APS, AMS, Elsevier, and Wiley International.

➕ *Electronic Subscriptions with Campus Licenses:* In this model unlimited access to e-resources are provided throughout the campus;

➕ *Electronic Versions only:* In such pricing model, the publishers offer

electronic versions only with a token discount; Small Increase (ACS 105 %), Discount from print (AlP 80%, AMS 90%)

- *Pay per View:* In this subscription, the library has to pay on the basis of usage pattern of the full text journal articles. This is similar to print versions where articles of interest can be identified and requested on payment basis via a document delivery services given by the publishers;

- *Consortium Licensing with discount:* Now Consortium mode of subscription of e-resources is gaining popularity in India amongst academic and technical institutions for which publishers have started working out best pricing models suitable for different types of consortia may be at local, regional and national level;

- All titles of publishers with print optional;

- Deep Discount Pricing;

- Subject cluster;

- Usage based pricing ;

- Extra Free for software;

- Free completely -Differently funded;

- Extra for Value Added Services;

- License Membership Fees;

- Subscription to core titles and rest title as per pay per view;

- Pricing based on Full Text Access, Concurrent Users;

- A lot more for Little Extra payment of Subscription Amount

- Access to all titles of publishers for little surcharge;

- Multi-Year Agreement with fixed Annual Price Cap;

- User Happy -Wider Access;

- Publishers Happy Guaranteed revenue, greater visibility of titles; and

- Discount on multiple print copies

1.9 Concept of Library Consortia

Library consortia is a community (a supportive) of two or more libraries which have formally agreed to cooperative, synchronize, organize, collaborate or consolidate certain functions to achieve joint objectives. Online Dictionary for Library and Information Science (ODLIS) defines Library Consortia as "an association of independent Libraries and/or Library systems established by formal agreement, usually for the purpose of sharing". Membership may be restricted to a specific geographical region, type of Library (Public, Academic, and Special) or subject specialization" (Sinha & Gautam, 2015).

Over the decade this concept has emerged as a growing area among the librarians, scholars, and publishers. The *'consortia'* is the plural form of *'consortium'* but is often used in place of singular form. It is derived from the Latin word for *'fellowship'* - the meaning emphasizes coming together of separate groups for a purpose. Synonymously the term is used as alliance, coalition, collaboration, cooperation, partnership, etc. Consortium is a complicated organization.

It is 'an association' in the sense that is not commonly understood, i.e. a consortium is not a library association, although some associations of libraries may engage in consortia activities. Again, a consortium is not a regional or state system of public libraries (read as state central library), although such systems may negotiate access to electronic resources on behalf of their constituent institutions.

Simply, the consortia run to gamut from relatively *informal cooperatives* founded just to realize economies of scale in purchasing, to highly-organized,

centrally-staffed, centrally funded organization; intended to share the resources, and to engage in all manner of collaboration within the member libraries 10. It has no entity, if there is no common-interest and no member to participate and also the success or failure is very much depends on the members of particular consortium (Jiban, 2009).

According to the Oxford English Dictionary, consortium means a "temporary cooperation of a number of powers, companies, etc. for a common purpose. It is an association of similar type of organization/ institution who are engaged for producing and servicing the common things for providing services for a specific purpose of its users".

American Heritage Dictionary (3rd ed., 1993) considered the term - "a cooperative arrangement among groups or institutions. More straightforward description of 'library consortia' would be organizations of libraries formed to realize the benefits and opportunities of collaborative activity.

Arnold Hirshon, editor of the Library consortia management journal, defines library consortium more broadly. He posted this definition on the web discussion forum on library consortia [May 27, 1999] as "a generic term to indicate any group of libraries that are working together towards a common goal, whether to expand cooperation on traditional library services (such as collection development) or electronic information services. It is now used perhaps too broadly, and encompasses everything from formal legal entities to information groups that come together solely to achieve better pricing for purchasing electronic information".

The aim of consortia is to achieve what the members of the group cannot achieve individually, and its purpose is sharing of resources, money, and manpower, etc. It is regarded as an effective strategy to increase the buying power and risk-

sharing capacity of individual libraries over the short term. It is also an opportunity to maximize the opportunities for mutual collection development and resource sharing over the long term.

A consortium has the ability to share resources without sacrificing the individuality of each member library. As a result, the end-users can reap the benefits of more resources than would be available through one library, while staff can customize the system to meet their individual library's needs. It can be a single agency with multiple locations around the globe, all sharing one name, or the consortia members can retain their own name, but use the name of the consortia to identify that they are the part of a larger, often global, organization. It acts as coordinator for the electronic resource sharing at the national, regional and local levels (Jiban 2009).

The Consortium namely UGC-INFONET Digital Library Consortium, DeLCON and AICTE - INDEST subscribes to electronic resources covering all major subject discipline being taught in universities. It includes wide variety of materials e.g. e-journals, bibliographic databases, reviews published by scholarly societies, university presses, institutional and commercial publishers. The Consortium subscribes to 19 full-text e-resources and 10 bibliographic databases from 23 publishers and aggregators. The member institutions are provided differential access to these resources based on their needs and activity profile as per the recommendation of the National Steering Committee. The resources subscribed by the Consortium can broadly be divided into the following two categories:

i) Full-text Electronic Resources

ii) Bibliographic Databases

1.10 Need for E-Consortia in the University Libraries of Assam

Technological developments, electronic publishing of scholarly journals, pricing models of publishers for consortia gives new opportunities for libraries to provide instant access to information. Following factors justifies the need of consortia development for the management of electronic resources are as follows:

(a) **Overloaded Budgets:** Libraries are committing larger portions of their budgetary allocations for either procuring or assessing electronic resources while the allocation keeps on diminishing. The libraries with their diminishing or at best static financial allocations have to consider new ways to consolidate globally accessible electronic resources. Consortia are formed with an objective to enhance the purchasing power of the participating institutes in this critical situation of major financial crunch faced by the libraries and information centres. A consortium facilitates the member libraries to get the benefit of wider access to electronic resources at affordable cost and at the best terms of licenses.

(b) **Information explosion:** There has been the sudden onslaught of new materials and electronic versions of old materials resulting in the availability of information in numerous forms. This flood shows no signs of abating. Full-text electronic scholarly and popular books are becoming available in online form, and a deluge of such materials and providers over the next few years is expected. A consortium, with the collective strength of resources of various institutions available to it, is in a better position to address and resolve the problems of managing, organizing and archiving the electronic resources.

(c) **Impossibility of self-sufficiency:** With the proliferation of information in myriad forms, it is difficult for any library to be fully sufficient to cater to the information needs of its user community. Financial constraints, space

curb, human resources inadequacy also stress upon the need for the libraries to opt for the consortia approach.

(d) **Willingness of publishers:** This approach has helped to get attractive discounted rates and most of publishers responded positively to the call of consortia and are enthusiastic to give the best possible offers. Another reason for the eagerness of publishers to enter the Indian market, which holds very high future potentials.

(e) **Diversity of user needs:** The technology has changed expectations of researchers, their patience, and their willingness to accept services that are available on demand. The Web-based electronic resources are an apt answer to the expectations of users. Library users want to have access to that material as quickly as possible, and many of them want information at their computer screens.

(f) **Quick Access:** The technology provides an unparalleled media for delivery of information with greater speed and economy. Academic and Research users can now hope to have access to their learned journals articles in electronic form as the electronic access is comparatively cheaper. Users are beginning to expect electronic delivery that is speedy and accessible at remote.

(g) **Improving quality standard of research:** The research productivity of all institutions is expected to improve with increased access to international e-databases and full-text resources, so libraries are willing to add electronic resources to their collection and opting for consortia approach.

(h) **Professionalism of Library Science:** This concept has tremendous influence on the consortia initiatives. The changing role of librarian as a conservator to a navigator/disseminator of information has enhanced the value of library consortia.

(i) **Future developments:** One of the important issues related to technology is

stability of the systems that they deploy to store, retrieve and deliver the electronic resources. Consortia help to have a watchful eye on coming latest technological changes in publishing industry and associated legislations which can affect the libraries directly or indirectly (Vasishta, Kaur & Dhingra 2012).

1.11 Benefits of E-Consortia

The present system of consortia has lot of merits over the earlier pattern of individual subscription to electronic resources. The main advantage of library consortia is resources enhancement and general cost savings. Few benefits according to are mentioned below:

(a) Consortia-based subscription to electronic resources provides access to wider number of electronic resources at substantially lower cost. When subscribed through a consortium the cost per library can be significantly lower than what each library would pay in an independent agreement. The consortium, with its collective strength of participating institutions, has attracted highly discounted rates of subscription with most favorable terms of agreement.

(b) The consortium usually offer better terms of licenses for use, archival access and preservation of subscribed electronic resources, which would not have been possible for any single institution.

(c) Since the subscribed resources would be accessible online in electronic format, the beneficiary institutions would have less pressure on space requirement for storing and managing print-based library resources. Moreover, all problems associated with print media such as their wear and tear, location, shelving, binding, organizing, etc. would not be an issue for electronic resources.

(d) Availability and monitoring of usage statistics, which helps libraries, in accomplishment of future strategy.

(e) Library consortia act as means to achieve electronic resources access to more users for a lesser price. For the library it is more-for-less bargain strategy.

(f) By developing common e-resources databases libraries can have access to otherwise un-subscribed electronic resources.

(g) A single interface and access point providing scope for electronic archive searching always provide an edge to the needy user.

(h) Pooling of expertise in the resolving of complicated tasks e.g. in the implementation of modern technological applications is an added benefit.

(i) The gateway portals provide customized solution not only to access the resource online but also access resources of other libraries participating in the consortium (Pandey, 2010).

1.12 Consortia Models

The types of consortia identified are generally based on various models evolved in India in Varity of forms depending upon participations affiliation and funding sources (Yernagula, 2010). These are described below:

i) Open Consortia

This type of consortia is very flexible and it is the wish of members of consortia can join and leave any they please. AICTE- INDEST Consortium is an example to this.

ii) Closed Group Consortia

It is within defined group. This kind of consortia emerges either by affiliation and collaboration among them like CSIR, DAE, IIM Consortium. And the formation

and operation of the consortia guidelines and its administration are fairly simple and easy.

 iii) Centrally Funded Model

In this model, consortium will solely depend on the parent body. A few examples are INFONET by UGC, ICMR, CSIR by DSIR.

iv) Shared-budget Model

"In this model the participating libraries take the lead and form the consortium. IIM and FORSA are examples of this model".

v) Publisher Initiatives

The Emerald Full-Text Library published by the Emerald Publishing Group (formerly MCB University Press) is recent example. Here, the consortium members will get deep discount price to the participating libraries

vi) National Consortium

The end of this model is , national level licensing of products. and in this regard are AICTE- INDEST, UGC Infonet.

1.13 Status of membership of consortia for University Libraries of Assam

The university libraries covers under the present study viz. Assam University, Tezpur University, Gauhati University, and Dibrugarh University have been included as members and beneficiary of following consortia.

    a. UGC-INFONET Digital Library Consortium;

    b. DeLCON Digital Library Consortium; and

    c. AICTE- INDEST Consortium

The facilities under above consortia differ from universities to universities. These are described below:

a) UGC-INFONET Digital Library Consortium

The UGC- INFONET Digital Library Consortium is major initiative of University Grants Commission (UGC) to bring qualitative change in academic libraries in India. It was formally launched in December, 2003 by Honorable Dr. A P J Abdul Kalam, the then President of India.

The Consortium provides current as well as archival access to more than 5,000 core and peer-reviewed journals and nine bibliographic databases in different disciplines from 23 publishers and aggregators. In terms of number of users, the UGC-INFONET Digital Library Consortium is the largest Consortium in India with a vision and plan to reach out to all universities and colleges affiliated to these universities, over a period of time.

b) DeLCON Digital Library Consortium

DBT e-Library Consortium (DeLCON) is a unique Electronic Journal Consortium which is operational since January 2009. Currently the Consortium includes 16 DBT Institutions including ICGEB, New Delhi and 18 North Eastern Region (NER) Institutions. The Biotechnology Industry Research Assistance Council (BIRAC), New Delhi is also part of DeLCON. Now, the total 'DeLCON Members' are 34. A total of 926 selective Journals and a Database (SCOPUS) are covered under DeLCON. These all are accessible by the DeLCON Consortium Members through the DeLCON Portal (http://delcon.gov.in).

c) AICTE- INDEST Consortium

The "Indian National Digital Library in Engineering Sciences and Technology (AICTE- INDEST) Consortium" was set up in 2003 by the Ministry of Human Resource Development (MHRD) on the recommendation of an Expert Group appointed by the Ministry. The IIT Delhi has been designated as the Consortium Headquarters to coordinate its activities. The Consortium was renamed as AICTE-INDEST Consortium in December 2005 with the AICTE playing a pivotal role in enrolling its approved engineering colleges and institutions as members of the Consortium for selected e-resources at much lower rates of subscription.

1.14 Locale of the Study

1.14.1 Demographic Profile of Assam

Table: 1.1 Statistical Records of Assam

State Capital	Dispur
Area	78,438 sq. km. (of this 20% hilly)
Altitude	237 ft
Longitudes	92.93 East
Latitudes	26.20 North
Population	31,205,576 Numbers
Male	15,939,443 Numbers
Female	15,266,133 Numbers
Sex Ratio	958 females per 1000 males
Temperature	10ºC- 35 ºC
Rain	1,500 mm per year
Official Languages	Assamese, Bodo, Bengali (in South-part).
Literacy rate	73.18 % (as 2011 Census)
No. of Districts	27 nos. (Till March, 2015)

(*Source: Manorama Yearbook, 2015*)

1.14.2 Introduction to Assam

Assam has a unique landscape with sprawling tea gardens and unending stretches of paddy fields interspersed with groves of coconut, areca nuts, and banana trees. Its population is a confluence of streams of different races and tribes like the Austrics, the Aryans, Negroids, Indo-Burmese, Indo-Tibetans, and Mongoloid. They have enriched each other and have evolved to give a distinctive identity to the Assamese people.

1.14.4 Geography of Assam

Assam is located at the gateway of Northeast India; Assam is separated by Bangladesh from mainstream India. The state is bounded in the north by Arunachal Pradesh and Bhutan; in the east by Nagaland, Manipur, and Burma; in the south by Bangladesh, Tripura, Mizoram, and Bangladesh; and in the west by West Bengal. Assam can be broadly divided into three distinct physical units, the Brahmaputra Valley in the north, the Barak Valley in the narrow protruding south, and the state's hilly region separating the two valleys.

Assam consists of the most wide-ranging networks of higher educational institutions in the whole of North-Eastern region of India. Presence of institutions including the Indian Institute of Technology (Guwahati), National Institute of Technology (Silchar), **Central Universities (Tezpur University, Tezpur and Assam University, Silchar)**, **State Universities (Gauhati University, Guwahati and Dibrugarh University, Dibrugarh),** K.K. Handique State Open University (Guwahati), private universities (Donbosco University, Assam Down Town University and Kaziranga University), Assam Medical College (Dibrugarh), Silchar Medical College, Guwahati Medical College, Assam Agricultural University (Jorhat), Assam Engineering College (Guwahati), Jorhat Engineering College

(Jorhat), Architecture institutes, Management institutes, Hotel Management Institute, Law University and various affiliated/ provincialized or private colleges adds significant value to the educational system of Assam. The colleges of Assam (including medical, engineering and law colleges) are affiliated to Gauhati University, Dibrugarh University, Assam University and the Assam Agricultural University.
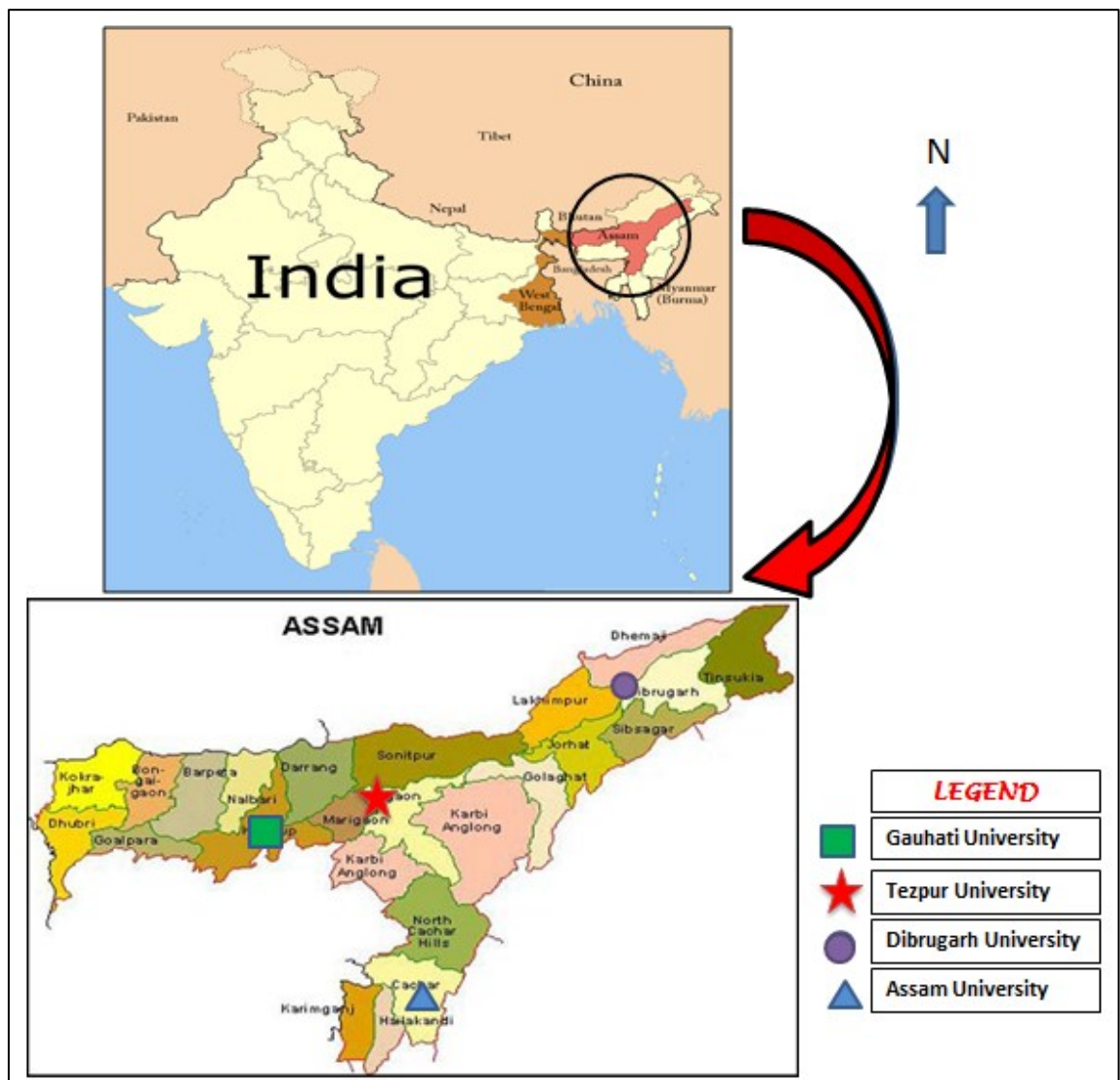

Figure: 1.1: Map of Assam

Table: 1.2 Numbers of Higher Educational Institutions in Assam

Type	Numbers
Central University	2
Deemed university	1
Private University	4
State University	2
Open University	1
Distance educational Institution	2
IIT	1
Medical Colleges	8
NIT	1
Institutes of National Importance	3

(*Source: Compiled from https://en.wikipedia.org/wiki/Education_in_Assam*)

The above table 1.2 shows that the different types of higher educational institutions of Assam along with the respective numbers. Thus, Assam has the most wide range networks of higher educational institutions in the whole of North-Eastern region of India.

Thus the present study "*Usage of E-resources in the University Libraries of Assam: A Comparative Study*" has been carried out among university library users to know the usage pattern of e-resources among the faculty members and research scholars of the central and state universities of Assam.

1.15 Brief Introduction about the Four University under the Study

1.15.1 Tezpur University, Tezpur

For the present study, two number of Central Universities (viz. Tezpur University (Tezpur) and Assam University (Silchar)) and two numbers of State universities (viz. Gauhati University (Guwahati) and Dibrugarh University (Dibrugarh)) have been taken into granted.

Tezpur University was established by an Act of Parliament in 1994. The objects of this Central University as envisaged in the statutes are that it shall strive to

offer employment oriented and interdisciplinary courses to meet the local and regional aspirations and the development needs of the state of Assam. The university campus has been situated at Napaam about 15 km east of Tezpur, the headquarters of the Sonitpur district of Assam. Napaam is a rural area surrounded people of diverse caste, religion and language. The Napaam campus consists of a plot of an area of 262 acres (1.06 km2) of land. The university has four schools of studies which are divided into 20 departments and three special academic centers. (http://www.tezu.ernet.in/)

Figure: 1.2 Tezpur University, Tezpur

The Central Library, Tezpur University was established in 1994 along with the establishment of the University. The library holds 61284 volumes of Books and subscribed 685 titles of current journals (print 183, online 502). The UGC-Infonet Consortia of INFLIBNET Center is providing access facility to 9081 (including 525 on perpetual basis) e-journals. Central Library also gets online access of 926 e-journals through DeLCON Consortium and 17 databases (14 from UGC-INFONET and 3 from others). The library also holds more than 1961 CDs scattering to different thought contents.

Library users can access book database, theses database, journal database, e-journals and other e-resources from any terminal within the University campus. Library also subscribed various e-resources for library users; which are IEEE Digital Library, ACM Digital Library, ASME Database, Science Direct, SciFinder, JCCC Database, Royal Society of Chemistry (6 Database), MathSciNet, ISID Database, Web of Science, Emerald, Cambridge Structural Database(CSD), FSTA, Indiastat, etc (http://www.tezu.ernet.in/Library/database.htm).

1.15.2 Assam University, Silchar

Figure: 1.3 Assam University, Silchar

Assam University came into existence through Assam (Central) University Act, 1989 which is established in 1994 under an Act of Parliament. It has been accredited by the National Assessment and Accreditation Council (NAAC), with a B grade with a CGPA of 2.90 in 2015. The main campus is situated in Dargakona, about 20 kms from Silchar, while a satellite campus of the university has been located at Diphu, in the Karbi Anglong district of Assam. The University has Sixteen Schools on major disciplines and 5 centre of studies in the main campus at Silchar. There are Thirty Five Departments under these Sixteen Schools with more than 330 faculties from

many disciplines are the strength of the university. There are more than 3000 students enrolled in various courses offered by this university. There are also 56 undergraduate affiliated colleges under this university. (http://www.aus.ac.in/)

The University Central Library was established in 1994. At present the Central Library has a collection of more than one lakh twenty thousand books. It also subscribes to more than 400 Indian and foreign journals. Facilities provided by the Library include reading/ lending services, reference service, reprint service, literature search, photocopying, and CD-ROM search. Besides these, access to internet is provided to students through 40 terminals. Online access to more than 2000 e-journals under UGC-Infonet, access to IFLIBNET Database service, access to DeLNET Database Services, emerald journal services, OPAC facility etc. are also provided. (www.aus.ac.in)

1.15.3 Gauhati University, Guwahati

Gauhati University is the first public university of North-East India, located in Guwahati, Assam, India. It was established on 26 January 1948. It is accredited by the National Assessment and Accreditation Council, with a B grade with a CGPA of 2.91. The university was established by an act of the State Legislature: the Gauhati University Act 1947 (Assam Act, XVI of 1947) of the government of Assam in 1948. The university is in Jalukbari in the Guwahati city area. There are 39 post graduate departments and 341 affiliated colleges under Gauhati University. (www.gauhati.ac.in/)

Figure: 1.4 Gauhati University, Guwahati

The central library of Gauhati University is known as Krishna Kanta Handiqui Library. In 1982, the University Library was renamed as K K Handiqui Library after the death of its first Vice Chancellor Professor K K Handiqui. The personal collection of 7593 volumes of books generously donated by Prof Handiqui consisting to Gauhati University is a precious and priceless possession of the library. The library holds 269369 books, 34495 volumes bound periodicals, 4276 nos report literature, 4500 nos manuscripts, 150000 pages digitized manuscripts, 852524 pages digitized theses, etc. (http://www.gauhati.ac.in/Krishna-Kanta-Handique-Library.php)

1.15.4 Dibrugarh University, Dibrugarh

The Central Library of Dibrugarh University, popularly known as Lakshminath Bezbaroa Library was established in the year 1965 along with the University and since then it has become an integral part of all accomplishments of

academic excellence and endeavour of the University. The Library was shifted to its present building, with an area of 33570 sq. ft., in 1985.

Figure: 1.4 Dibrugarh University, Dibrugarh

The library started computerization in 1996 with CDS/ISIS, and introduced SOUL Software for automation in the year 2002 and upgraded to SOUL 2.0 in the year 2010. At present, the library has a total collection of 2,25,832 volumes including books, thesis, back volumes and journals and other reference materials to render services to 9832 active members directly. Besides providing access to UGCInfonet Digital Library Consortium and DELCON, the library independently procures e-books, e-journals, etc from, Elsevier, ScienceDirect, Scopus platforms.

1.16 Statement of the Problem

The Universities of Assam have realized the need of its users and made efforts for joining national library networks and e-consortia like UGC-INFONET, DeLCON and AICTE- INDEST Consortium mainly due to the radical changes in the functioning of the libraries. Now almost all universities have been accessing to

scholarly electronic resources including full-text and bibliographic databases in all subject disciplines made available to academic community in India. The MHRD through UGC-INFONET,AICTE- INDEST & DeLCON digital library consortium has been spending lots of rupees for subscribing the e-resources like e-journals ,e-books and on-line databases for the library users. So, it is very relevant and essential to know how far the faculty members and research scholars of the university libraries of Assam are making use of the e-resources which are made available under the UGC-INFONET Digital Library Consortium, DeLCON and AICTE- INDEST Consortium.

The purpose of this study is to examine the use of e-resources available under UGC-INFONET Digital Library Consortium, DeLCON and AICTE- INDEST Consortium by the faculty members and research scholars of Assam in current environment. More specifically this study was also designed to explore the following questions:

- Are they aware of UGC-INFONET, DeLCON and AICTE- INDEST Consortium?
- How does faculty members and research scholars use scholarly electronic resources including full-text and bibliographic databases?
- Which publisher they follow for getting the material?
- Does their university provide UGC-INFONET, DeLCON and AICTE-INDEST orientation program?
- How do they manage to get the material of their interest from the internet?
- Do these library services are provided effectively and efficiently to the users?
- Do they face any difficulty to access UGC-INFONET, DeLCON and AICTE-INDEST Consortium service?

Motivated by these problems an attempt has been made to conduct a study on the assigned topic "Usage of E-Resources in the University Libraries of Assam: A Comparative Study".

1.17 Significance of the Study

The significance of the study is argued on the basis of the following points:

- To study the usage pattern of scholarly electronic resources and bibliographic databases by the faculty members and research scholars of the universities of Assam;

- To study the quality of e-resources provided by the UGC INFONET, DeLCON and AICTE- INDEST Consortium;

- This study highlight the effectiveness of sources provided by these university libraries;

- To study the awareness of UGC INFONET , DeLCON and AICTE- INDEST Consortium used by faculty members and research scholars of the universities of Assam, India;

- This study also attempts to highlight the condition of the computer lab/internet facility available to provide UGC-INFONET , DeLCON and AICTE- INDEST services in those universities;

- Moreover, it also attempts to highlight the various needs or problems face by those faculty members and research scholars.

1.18 Objectives of the Study

The main objectives of the study are as follows:

➢ To examine the e-resource usage pattern among the university library users of Assam;

➢ To examine the preference of e-resources by the university library users of Assam;

➢ To examine the usefulness of e-resources available under library consortia and the preference of e-journal publishers among the university library users of Assam; and

➢ To find out the problems, prospects and measures for improving the usage of e-resources available under library consortia in the university libraries of Assam.

1.19 Hypotheses Framed

Hypothesis: 1.

$H0_1$: There is no significant difference between different categories of users in case of awareness of library consortia.

$H1_1$: There is a significant difference between different categories of users in case of awareness of library consortia.

Hypothesis: 2.

$H0_2$: There is no significant difference between library users who are belong to various universities while speaking about awareness of library consortia.

$H1_2$: There is a significant difference between library users who are belong to various universities while speaking about awareness of library consortia.

Hypothesis: 3.

$H0_3$: There is no significant difference between users belong to different stream in case of awareness of library consortia.

H1$_3$: There is a significant difference between users belong to different stream in case of awareness of library consortia.

Hypothesis: 4.

H0$_4$: There is no significant difference between different categories of users with level of satisfaction while accessing e-resource from UGC-INFONET.

H1$_4$: There is a significant difference between different categories of users with level of satisfaction while accessing e-resource from UGC-INFONET.

Hypothesis: 5.

H0$_5$: There is no significant difference between different categories of users with level of satisfaction while accessing e-resource from AICTE- INDEST consortia.

H1$_5$: There is a significant difference between different categories of users with level of satisfaction while accessing e-resource from AICTE- INDEST consortia.

Hypothesis: 6.

H0$_6$: There is no significant difference between different categories of users with level of satisfaction while accessing e-resource from DeLCON consortia.

H1$_6$: There is a significant difference between different categories of users with level of satisfaction while accessing e-resource from DeLCON consortia.

1.20 Scope of the study

The present study has been designed for library user's communities of university libraries of Assam having "UGC-INFONET", "DeLCON" and "AICTE- INDEST Consortium" and which also includes research scholars, faculty members and librarian. The area selected for the study is Assam state of Northeast India which consists of four universities, viz. Assam University, Tezpur University, Gauhati University, and Dibrugarh University.The consortia-based subscription to e-resources is a viable solution for increasing the access to electronic resources across institutions at a lower rate of subscription. Major benefits of Library Consortium are as follows:

- The Consortium acts as a single-window service for a large number of universities with their diverse research and academic interest;

- Users have immediate access to material previously not subscribed to, at no incremental cost for accessing back files;

- It improves the existing library services and reduce the subscription cost;

- The Consortium is being offered with better terms of agreement for use, archival access and preservation of subscribed electronic resources, which would not have been possible for any single institutions.

1.21 Limitation of the Study

The present study was delimited to the following aspects:

- The study has been delimited to the four universities of Assam, India;

- The study has been further delimited to the faculty members and research scholars of the two state and two central universities of Assam; and

- Further, the study is delimited to the common twelve departments of all four universities under study which include Science, Technology & Management (STM); and Linguistic, Humanities & Social Science (LH&SS).

1.22 Definition of the Operational Term/ Key Terms

➢ *E-Resources*: The concept Electronic resources are regarded as the mines of information that are explored through modern ICT devices, refined and redesigned and more often stored in the cyber space in the most concrete and compact form and can be accessed simultaneously from infinite points by a great number of audience. The phrase "electronic resources", has broadly been defined as, information accessed by a computer, may be useful as

bibliographic guides to potential sources but, as of yet, they infrequently appear as cited references in their own right (Graham, 2003, pp. 18-24).

➢ *Electronic book* - A book provided in a digital format for checkout or use via an Internet browser, a computer, or another electronic device like an E-Book Reader.

➢ *Full-Text Database-* A full-text database is a database that is comprised of several books, articles, journals, magazines, newspapers and other textual documents but does not include graphical documents such as drawings, diagrams or pictures. Each of the referenced documents can be viewed, printed or downloaded online. It is also searchable by using keywords, phrases or both.

➢ *Bibliographic database:* A bibliographic database is a database of bibliographic records, an organized digital collection of references to published literature, including journal and newspaper articles, conference proceedings, reports, government and legal publications, patents, books, etc.

➢ *E-Journals:* "A publication whose primary means of delivery to subscribers is through a computer file." Today, most often this means being published on the web but it also could mean being published on CDROM or DVD or as text file distributed by e-mail.

➢ *Consortia:* A Consortium could be described as a group of organizations who come together to fulfill a combined objective that usefully requires co-operation and the sharing of resources. And need to have a clear mutual goal in order to ensure their success. The aim should be to deliver "more than the sum of the individual parts". A library Consortium formation can be local, regional, state, national and inter institutional level.

➢ *Library Consortia:* Library consortia concepts came first time from academic libraries formed consortia for the primary purpose of sharing printed materials. Recently, academic libraries are having consortia to provide

common access to electronic resources across the Internet, and they are forming these consortia on a statewide basis Library This task is very difficult for a single library. However, by forming a consortium among libraries, it becomes possible to purchase information in stabilized and reasonable prices.

➢ *UGC-INFONET Digital Library Consortia:* The UGC-INFONET Digital Library Consortium is major initiative of University Grants Commission (UGC) to bring qualitative change in academic libraries in India. It was formally launched in December, 2003 by Honourable Dr. A P J Abdul Kalam, the then President of India, soon after providing the Internet connectivity to the universities in the year 2003 under the UGC-INFONET programme.

➢ *DeLCON (DBT – Electronic Library Consortia):* DBT e-Library Consortium (DeLCON) is a unique Electronic Journal Consortium exclusively for the Department of Bio-Technology which is operational since January 2009. The Consortium operates through its Headquarter set-up at the National Brain Research Centre, Gurgaon, Haryana and Department of Biotechnology (DBT), Government of India provides funds required for subscription to electronic resources for Universities/Institutions.

➢ *AICTE- INDEST Consortia:* The Ministry of Human Resource Development (MHRD) has set-up the Indian National Digital Library in Engineering Sciences and Technology (AICTE- INDEST) Consortium on the recommendation made by the Expert Group appointed by the Ministry.

➢ **University:** "University" means an institution of learning of the highest level, comprising a college of liberal arts, a program of graduate studies, and

several professional schools, and authorized to confer both undergraduate and graduate degrees.

➢ *University Library*: A university library is a library attached to a university. It exists to cater to the needs and requirements of students and teachers and to support the teaching and research programmes of the university. At present the nature and mode of university level education is such that a student or scholar is put into a situation so as to find a solution to problems, do some creative thing or conduct a study on a project. This necessitates the existence of a sound collection of information, in what so ever form, that in turn is called a university library.

➢ *INFLIBNET:* Information and Library Network (INFLIBNET) Centre is an autonomous Inter-University Centre of the University Grants Commission (UGC) of India. It is a major National Programme initiated by the UGC in March 1991 with its Head Quarters at Gujarat University Campus, Ahmedabad. INFLIBNET is involved in modernizing university libraries in India and connecting them as well as information centers in the country through a nation-wide high speed data network using the state-of-art technologies for the optimum utilization of information. (http://www.inflibnet.ac.in/about/)

➢ *Usage Pattern*: The act or the manner of using a journal or book or information. Usage here refers to the use of print and electronic journals by the research scholars.

➢ *Gateway:* A node on a network that serves as an entrance to another network. In enterprises, the gateway is the computer that routes the traffic from a workstation to the outside network that is serving the Web pages. In homes,

the gateway is the ISP that connects the user to the internet.

1.23 Planning & Organisation of Chapter

The study is mainly organized into two main parts, namely: Theoretical Background and Analysis of Data

Chapter-I: General Introduction

It provides information on the Assam state, academic institutions of Assam, background of the study, significance, objectives, scope, limitation, planning of captures and definition of operational terms for the study in detail.

Chapter-II: Review of Literature

Here, it provides information about national level, international level and printed and non-printed types of review of earlier studies.

Chapter-III: Research Methodology

Third chapter describes research methodology and research design adopted for the collection and analysis of the data. It also describes sampling procedure, tools of data collection and research adopted for this study.

Chapter-IV: Information Seeking Behaviour: A Conceptual Framework

Forth chapter describes the Conceptual framework of e-resources which are available in the university libraries of Assam.

Chapter-V: Data Analysis and Interpretation

Fifth chapter deals with the data analysis and interpretation of the data related to personal information, usage pattern of e-resources among the users in the university libraries of Assam. It contains interpretation of data by statistics that includes statistical data and figures.

Chapter-VI: Major Findings and Discussion

Sixth chapter comprises of major findings of the study. It also discusses about the discussion about the earlier study with the finding of the study.

Chapter-VII: Suggestions, Recommendations & Conclusion

Seventh chapter provides suggestions, recommendations and conclusion. It also includes areas of further research.

At last bibliography is included with APA (6th ed.) style.