3.1. Introduction

Literature review is an attempt to identify, locate and synthesize completed research reports, articles, books and other relevant materials. Review of related literature provides a clear understanding of what has been thought and done previously and what remains to be done on the topic of research. In this chapter, an attempt is made to review important studies on consortia of libraries with a view to justify the need and relevance of the present study. Studies are discussed under the following sub headings:

- Library Consortia: Types, Models, Licensing etc.
- Library Consortia for Specific Disciplines
- Library Consortia in Different Countries
- Library Consortia in India.

3.2. Library Consortia: Types, Models, Licensing etc.

Wade (1999) conducted a study on behalf of the Western Australian Group of University Librarians (WAGUL) among eleven small to medium-sized consortia of academic libraries in five countries. The aim of the study was to review the services offered, governance structure, funding arrangements and management. Based on this study the researcher was to offer advice on an appropriate model for WAGUL. The following library consortia were reviewed as part of the study; (1) Arizona University Libraries Consortium, US, (2) Cape Library Cooperative, South Africa, (3) Consortium of Academic Libraries in Manchester, UK, (4) CAVAL Limited, Australia, (5) The Council of Connecticut Academic Library Directors, US, (6) Council of Prairie and Pacific University Libraries, Canada, (7) Illinois Library Computer Systems Organization, US, (8) Missouri Research Consortium of
The study revealed that the reviewed consortia undertake a limited range of activities, which include reciprocal borrowing, interlibrary loan agreements, negotiating database licenses and seminars. Regarding the ownership of infrastructure and assets some consortia jointly own the assets and infrastructure, but some other owns their servers individually by member libraries. In order to meet the financial requirement most of the consortia collect a base fee from all participants and levy special fee for special services for outside members. It is also reported that none of the reviewed consortia has separate staff to manage the consortia, but staff of the member libraries volunteer to serve the consortia. The study suggested for a separate organizational structure and management hierarchy for the successful existence of the consortia.

Oza and others (2002) discussed the consortia in detail in order to present different models so as to enable the libraries to select the suitable model for their activities. The major types of consortia are: (1) Loosely knit Federations: Here local or regional level cooperation is expected and it is governed by its members, (2) Tightly knit Federations: In this type, there may have a sponsoring agency and participating agencies have common interest, (3) Multi-type Multi state Network: Here, statewide or multiple state consortia is formed and (4) Centrally supported consortia: This is the most popular type of consortia. Participating units will have high common interest and administered by a central unit. The authors also listed major issues of consortia approach and narrated experiments at global level.

Katsirikou (2003) conducted a study based on the concept of Knowledge Management applied in industry. The aim of the study was to suggest a working
model for library consortia. The investigator viewed that library consortia consisting of members of various strengths, power, age, collection, staff experience and specialization can operate using the concept of Knowledge Management in order to enhance their effectiveness and efficiency, as well as to share the expertise developed in the services of member libraries. Either at the organizational level or in the provision of services to users, the member of the library consortia could gain more benefit if they viewed themselves as a trans-organizational scheme of a knowledge-based community.

The proposed model for the knowledge management system of a consortium would be a communication system, derived by the supply chain management networks which consist of four major integrated parts. The first part is the knowledge resources such as publishers, database providers, websites, R&D organizations (industries, universities, research institutions etc.), digital media and information technology. This first part directs its content to the second part, which consists of the libraries’ content and e-knowledge database of every library as a unique integrated and distributed system. This new two-part information and knowledge system is diffused to the libraries’ members, who play the role of wholesalers and are the third part of the systems, as the fourth one are the users of libraries’ members. The crucial point here is the second part, which consists of an entirely integrated body regarding resources. Consortium members face so that the suppliers and the users are equally common. Otherwise, if the model would be one-library centered, the collaborating libraries would be considered as customers and would be included in the users.

Gorman and Cullen (2000) proposed an integrated approach for the library networks of Asia. Investigators presented their proposal based on the knowledge models suggested by Owen and Wiercx. The knowledge model for library networks involves three phases namely Networked Library Model, the
Cooperative Network Model and the Knowledge Environment Model. These models are developmental and evolutionary rather than fixed and static. These models are hierarchical, moving from simpler to more complex and from stand-alone to mutually integrated.

The development of the Networked Library Model consists of the following five components: (1) Storage facilities for conventional and electronic resources, (2) Integrated resource discovery system (catalogue), (3) Support system providing any type of assistance required, (4) Workstations allowing users to access catalogue, resources, support system, and (5) Administrative system. The model of the fully networked library is based on the assumption that individual libraries will create their own collections, create bibliographic data for internal and external resources, and provide their own document delivery services for end-users.

The Cooperative Network Model is conceptualized on Client-Server Metaphor, in which “Server libraries” offer services to other libraries, usually within a specific domain and those who receive these services are the “Client libraries”. The steps involved in the development of this model are; (1) shared cataloguing of resources, (2) shared collecting and storing of resources, (3) shared resource discovery system, (4) shared document delivery procedure, (5) shared license agreements and (6) shared user support procedures.

The Knowledge Environment Model is the highest level in the hierarchy. It recognizes that there is diversity in user expectations, and also diversity in user skills. Having considered this diversity, the Knowledge Environment Model seeks to offer both a sophisticated technological environment and also a more traditional set of services. In the evolution of these models, the Networked Library Model is considered as initial phase, the Cooperative Network Model as intermediate and the Knowledge Environment Model is viewed as advanced. Corresponding to
each stage there are five functions to be performed. They are (1) Acquisition, (2) Resource description, (3) Resource discovery, (4) User access and (5) User support. The study revealed that no network in the Asia region has achieved the advance stage of the Knowledge Environment Model.

The proliferation of library consortia and the changing face of the modern library require that automation systems should have flexible and extensive computing and data processing capabilities. Only systems designed for distributed processing environments are powerful enough to meet these requirements. Frasciello and Richardson (1999) conducted a study at Gaylord Information Systems, New York, as part of its implementation of new systems which suit multi layer computing required for modern library consortia. According to the investigators what made client/server systems so appealing to libraries was that the server did not have to be in the same building or even the same geographical location as the client. The new client/server library automation systems were considered state-of-the-art.

While designing a modern library consortium, fundamental issues like interoperability, security, manageability, seamless integration of various information sources etc. have to be addressed. The investigators explained from their experience that distributed processing by using Windows NT can address the above issues and they claimed that library consortia can test a vendor’s claim to scalable distributed processing by asking three questions: (1) Is the software dependent on the type of data being used? (2) Does the software support logical and physical separation/distribution? And (3) Does the software require a system shutdown to perform database or application updates? These three questions can be well answered by Windows NT automation system that is expanding the possibilities and carrying library automation into next century and makes the future of library consortia incredibly bright.
Rowse (2003) summarized the findings of a research program conducted by the Ingenta Institute, U.K, in 2002 on consortia licensing. According to this study, consortia deals can be divided into two basic types of packages. Firstly, there is the ‘Big deal’, also known as the all-you-can-eat model. Pioneered by Elsevier Science and Academic Press and now offered by many major academic publishers. The Big Deal may consist of hundreds of titles—often the publisher’s entire journal list—sold in a bundled package to a consortium of libraries on a one price, one-size-fits-all basis. Typically, pricing is based on historical subscription purchases and a publisher might supply a whole list for the price of the sum of the original print subscriptions of a library consortium, with an electronic premium added generally in the range of between 5 per cent and 15 per cent. Members of the consortium gain access to greatly expanded pool of content for relatively little additional cost.

In the second type of arrangement, member libraries get access to an expanded set of journal content, by gaining access to all the journals on a publisher’s list that other members of the consortium are already subscribing to. While not a ‘Whole list’ deal, the individual member library’s holdings are increased to total the sum of all other member’s subscription to that particular publisher’s content. Again, consortial pricing in this arrangement tends to be based on the sum of existing subscriptions, plus an electronic access premium.

These two licensing models have their own advantages and disadvantages. However libraries have not only benefited in overall reduction in cost-per-title, but consortia deals have often entailed improvements in usage terms. It is also probable that joint licensing will lead to other collaborative activities such as joint development of digital collections, the development of central catalogues, joint document delivery and inter-library loan system and shared storage. Libraries do not want to negotiate individually with publishers and vendors for access to
contents. They recognize that they now have a more powerful influence upon the market and thus collaboration may be equally important for other strategic and operational activities.

Ghosh and others (2006) conducted a study to review the state of libraries in India and summarized the strategic cooperative initiatives undertaken to improve user access to electronic information services. The methodology adopted were personal interviews, e-mail interactions and literature search. The investigators reviewed different models of consortia such as buying clubs, centralized consortium, decentralized consortium etc., and concluded that there is no single best model for a consortium. They particularly examined the consortia initiatives of the country and emphasized that Indian initiatives were mostly academic and special libraries predominate in cooperative approaches to collection development.

The investigators identified ten issues in order to improve the status quo and these factors should be tackled by Indian libraries to streamline their cooperative and consortial efforts. They are: (1) library policies and approaches need re-thinking, (2) commitment to cooperation, (3) adaptability, (4) consensus building, (5) types of agreement, (6) skills of planning, organization and administration, (7) egos and attitudes, (8) budgets and funding, (9) confirming relevance to core users and (10) technology.

Gorman and Cullen (2000) undertaken an investigation to study the cooperative models of Asian region to suggest a sustainable model for consortia especially for Asian region. The study identified rationale for cooperation, major barriers of cooperation, factors favouring cooperation and evolution of library cooperation. Based on the study the investigators put forth the following four models for consideration: (1) Bi-nodal partnership – this model is simply a pair of
libraries which have agreed to exchange information and materials. It is typically an exchange agreement in which the libraries agree on a value of the exchange rate, sometimes more advanced libraries agreeing on something like a two-for-one exchange agreement, (2) Multi-nodal partnership – this model is an extension of the bi-nodal model in which a number of libraries contribute to a common collection in some sense, and all draw from this common resource at an agreed rate, (3) Service partnership - in this model one library in a pair or a group makes available its facilities to produce a group output such as a cooperative OPAC. The output is made available to members of the group. All participating libraries contribute to the output, and one of them acts as a facilitating node or manager of the output, and (4) Out sourcing partnership – here an external organization (typically a bibliographic utility or aggregator) is engaged by the participating libraries to provide a common service. This is often viewed as a risky arrangement because the participating libraries enter into a contractual arrangement with a third party who is not “one of them”. The investigators concluded that multi-nodal partnership is the simplest type of consortium arrangement and would work well within a single country.

Stern (2003)⁹ in his study on consortial pricing models, expressed that differential pricing is best suited for library consortia. Differential pricing is based upon projected local use levels. The ability to determine a “fair” institutional price is based upon an estimate of use, as determined using criteria such as population size, institutional research level, use statistics, etc. Consortial pricing primarily provides efficiencies for members of the purchasing group. In addition to less expensive access to existing subscription titles, added-value material may also be obtained in a number of ways such as through less expensive access to a larger section of shared titles held by any member of the consortia, or through access to any titles from the publisher regardless of consortial subscription. The investigator viewed that the philosophy of cost model has been changed from “paper-based
with a surcharge for online access” to “online journal access with supplemental cost for paper subscriptions”.

Hurtt (2000)\textsuperscript{10} discussed the concept of consortia in publisher’s perspective. According to him the advantages of consortia to publishers include the ability to simplify the sales process, to help publishers increase their market penetration and communication with more libraries and increase the speed of sales. The author says that now libraries emphasis on “group purchasing” to derive lower pricing from both publishers and vendors and to spread access to electronic products to smaller and less well-funded libraries. He further discussed the advantages and disadvantages of working with consortia. Advantages of publishers in working with consortia are; (1) It helps to simplify the sales process: In developing a multi-consortium or national consortia approach, a publisher usually needs to have one contact for marketing, selling, negotiating a price and licensing. This works most efficiently when a publisher can work with consortia that have strong centralized administration. Those consortia that can sign license agreements on behalf of their members, and those that accept and pay from one invoice certainly cut down the time and paperwork needed when dealing with each library, (2) It increases their market penetration and communication with libraries, and to do so more quickly than the publisher can do on its own: Consortia, with their Web sites, newsletters (distributed via both mail and e-mail), regular meetings, and listservs are often able to communicate publisher information quickly to their members about new products, trials and price offers quickly and efficiently, and (3) It helps to achieve faster sales: Working through consortia can help publishers achieve a faster rate of adoption or sales, especially when the offer requires that the libraries subscribe to the product by a set deadline date. It is possible to sell an online product to an entire state or to a substantial percentage of the members of consortia within three months when conditions are right and everything in the process runs smoothly. By contrast, traditional mechanisms - such as direct mail, telemarketing or visits from
field sales representatives - could require one-to-three years to achieve similar results.

Disadvantages include: (1) consortia libraries delegate their selection decision to a committee. If the committee approves the product, then the publisher gets the sale. If a member of the committee votes against the product, the publisher stands to lose the entire sale (2) many libraries belong to more than one consortium and as such they are confused concerning through which consortium they want to purchase the product. He concluded with the remark that the chief advantage is that libraries will purchase a recently introduced product at a fair price and publishers end up with wider publicity and sales within shorter span of time.

Evans (2002)\textsuperscript{11} conducted a study on management issues of library consortia. The objective of the study was to identify the issues in forming library consortium. The investigator identified the following issues: (1) Institutional issues, (2) Legal, political and administrative issues, (3) Technological issues, (4) Physical issues, (5) Issues related to people and (6) Knowledge-based issues. In the second part of the paper, Evans (2002)\textsuperscript{12} conducted case studies in order to examine the current projects and initiatives in the light of the above issues. He presented four case studies indicating the reasons for the success or failure of these collaborative ventures.

The first case study was Tozzer Library, Harvard University’s anthropology/archaeology library. Tozzer is world’s largest libraries devoted solely to anthropology and archaeology. The investigator considered their project of preparing index to journals of anthropology was unsuccessful. The second case study was Theology libraries resource sharing (SCATLA - Southern California Technological Librarians Association). This is a local endeavour when compared to the previous case. It was created in 1980s by a group of theological libraries.
The investigator considered the project as successful. The third case study was Arroyo Seco Library Network (ASLN). It is a regional network under the Library of California (LOC). The goal of LOC was to facilitate resource sharing among all types of California libraries. The researcher viewed that ASLN was of recent origin and time would tell whether it would succeed or not. The fourth case was LINK+ Consortium of academic and public libraries in California and it was considered as successful. The investigator analyzed the reasons for the success or vice versa of these projects.

Shatberashvily and others (1988)\textsuperscript{13} while discussing the need and relevance of regional information system for science and technology have put forth the following principle directions to be followed in the development of the regional information system: (1) Creation of information systems providing broader access to external information resources, (2) Study of internal information resources and their transformation into information products, (3) Creation of local databases and creation of bibliographies covering regional information flows for studying the scientific potential of the region, (4) Establishment of an integral regional library system, (5) Establishment of a system center for information analysis and organization of information services for the administration of the region, (6) Organization of personnel training in the field of science and technology information and (7) Development of a system for overcoming language barriers.

Biradar and Sampath Kumar (2002)\textsuperscript{14} studied the library consortia of advanced countries and explained about the problems of library consortia and also mentioned basics of successful library consortia. They identified the following problems of library consortia: (1) Insufficient and improper trained manpower, (2) Lack of bibliographic tools (union catalogue), (3) Unreliable telecommunication services, (4) Lack of financial allocation to bear the cost of coordination, (5) Negative attitude to resource sharing, (6) Lack of national body to coordinate and
build up library consortia, (7) Absence of strong library association, (8) Difficulties in arriving at mutually agreeable collection responsibilities, and (9) Legal, political and administrative barriers.

Cholin and Karisiddappa (2002) expressed that Library consortium is one of the emerging tool kit for libraries to survive in the present circumstances. They discussed the major objectives and issues of consortia approach and suggested models for academic libraries. The developments in scientific publishing and the pricing policies of publications offer new challenges and opportunities for library and information centers. The strength of any library is directly dependent upon the timely and convenient access to wide variety of information. Consortia have become an important way of doing business and extending access to information.

Natarajan (2002) explained the present situation about the consortia and discussed the types of consortia with the characteristics. The author listed the following major benefits of consortia: (1) Provide more, better, faster and cheaper services for less money, (2) Able to change themselves and reengineer their services and operations in such a way that they meet user expectations better for less money, (3) Reduction of paper work – that is whenever there is an electronic edition of a journal, the library can stop handling the printed version, (4) Reduction in the staff strength – cost savings for library budget, (5) Education and training for the staff to perform new work processes, (6) Establishing cooperation with other libraries in building local hardware setups and interfaces that can handle large amounts of databases and electronic journals, (7) Greater buying power, (8) Collection improvement, (9) Sharing of technical expertise, (10) Increased access to sources, and (11) Ability to keep up-to-date with new technology. The author was of the view that it is only in the last four to five years that there has been marked growth in consortia whose primary purpose is to wield collective bargaining power in the purchase of online content, a trend in large part stimulated by
developments in technology that have led to the online dissemination of scholarly information. Publishers have offered site licenses for many years, but have only recently provided special consortial arrangements in which groups of libraries gain access to bundled collections of content. Consortial arrangements from current journal collections date back to the mid to late 1990s; a trend started by handful of large and medium-sized publishers in 1997 and 1998 which was followed by a second wave of medium sized and some smaller publishers in 1999 and 2000.

Hiremath (2001)\textsuperscript{17} studied different aspects of resource sharing in the digital age through electronic consortia. The discussion started with the need for consortia such as expectations of the patrons, cost of resources and need for technical expertise. The investigator argued that with the information revolution brought about by the development of the World Wide Web, libraries at every level have graduated from their traditional role as storehouses of information to vigorous disseminators of information. In order to discharge their duties, libraries have no option than to form consortia. As members of a consortium the buying power, risk-sharing capacity, collaborative technical expertise and unified lobbying potential of libraries are exponentially increased. The author also discussed different types of major consortia movements of countries like USA, UK, Germany, South Africa and China. The author identified the consortial challenges as changing role of librarians, uncertainty in cost, uncertainty in pricing and lack of trust for centralized negotiation.

The biggest advantage libraries can receive from consortia is that they will get more resources for fewer amounts than what they get if they purchase as a single client. Vijaya Kumar and Sreekumar\textsuperscript{18} listed the benefits that libraries can reap from consortia as: (1) Sharing of information with improved resource sharing, (2) Joint pricing negotiations, which gives ability to control expenses and reduce overall costs including information costs, (3) Contracts covering multiple countries.
and strategic alliance with institutions that have common interests for building a
larger political coalition and critical mass. They further listed the benefits of
purchasing e-journals through consortia as: (1) A single interface and access point,
(2) A wider range of electronic journals available, (3) E-journals organized by
subject, (4) Links to and from indexing and abstracting services, (5) Enhanced
search facilities and (6) Customizable institution interface.

Vinayak Bankapur and Sunil Mansur (2002)\textsuperscript{19} examined the emerging trend
of consortia, role and models of consortia and concluded that consortia approach is
a must for future libraries to meet the information requirement of the users.
Konnur and others (2002)\textsuperscript{20} treated library consortia as a tool for change
management.

Sonker and others (2002)\textsuperscript{21} and Jasmer Singh (1997)\textsuperscript{22} considered library
networks and library consortia as a useful tool for resource sharing and content
management. Library consortia can be used for extending their purchasing
capabilities to compensate reduced budget. Konnur and others (2002)\textsuperscript{23} studied
the evolution of the concept of library consortia from traditional library
cooperation to present status.

3.3. Library Consortia for Specific Disciplines

A consortium of power sector libraries is suggested to facilitate the resource
sharing and library cooperation among the libraries of power sector. Shankar
Singh (2002)\textsuperscript{24} while discussing the feasibility of library cooperation among the
libraries of power sector, put forth a proposal to form a consortia of power sector
libraries which can form a network of NTPC Libraries, BHEL Libraries, NHPC
Libraries, Libraries of State Electricity Board and private libraries of power sector.
He listed the objectives of this consortium, its functions, network architecture,
network management, technical requirements etc.
The Ministry of Human Resource Development (MHRD) has set-up a "consortia based subscription to Electronic resources for technical education system in India" and it is named as the Indian National Digital Library in Science and Technology (INDEST) Consortium. The INDEST Consortium has started its operation since 2002. Arora and Agrawal (2003) highlighted the constitution of INDEST Consortium, its objectives, policies and functions. The participating members of this consortium are IITs, IISc, NITs, RECs, IIMs and a few other institutions directly funded by the Ministry of Human Resource Development.

The electronic resources being subscribed through the INDEST consortium would greatly benefit the member institutions in terms of increase in the number of electronic resources accessible to each institution. The consortium is also expected to trigger a new culture of inter-institutional cooperation leading to remarkable increase in sharing of library resources amongst participating institutions. Some of the important benefits of this consortium are as follows:

1. Consortia based subscription to electronic resources provides access to wider number of electronic resources at substantially lower cost.
2. The Consortium, with its collective strength of participating institutions, has attracted highly discounted rates of subscription with most favourable terms of agreement. The rates offered to the consortium are lower by 50 per cent to 90 per cent depending upon the category of institutions. It may be interesting to note that full-text resources and databases proposed for subscription for various categories of institutions in the consortium would cost Rs. 164 crore as per their list price, while through consortium, the total cost comes to Rs.18.60crores, for all institutions being considered under the consortium, a total overall savings of Rs. 145.60 crore.
3. The research productivity of all the institutions is expected to improve with increased access to international databases and full-text resources.
(4) The consortium is expected to trigger remarkable increase in sharing of both print and electronic resources amongst participating libraries through J-GATE Custom Contents for Consortia (JCCC) proposed for subscription for all IITs and IISc, Bangalore with access to NITs and RECs.

(5) The consortium is proposed to be an open-ended proposition wherein other institutions can join and get the benefit of not only highly discounted subscription rates but also the favourable terms of licenses.

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

(7) Since the subscribed resources would be accessible online in electronic format, the beneficiary institutions would have less pressure on space requirements 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.

Electronic resources subscribed by the consortium include IEL online (IEEE), Science Direct (Elsevier), Ideal Library (Academic Press), Link Information (Springer Verlag), ABI/INFORM, ACM Digital Library (ACM), Applied Science & Technology Plus (Wilson/UMI), Web of Science (ISI), JCCC (Informatics India), JGATE (Informatics India), etc. The INDEST Consortium would benefit most of the engineering and technical institutions in India. The access to e-resources for the beneficiary institutions under the INDEST Consortium has increased from the present level of access to e-journals from 100 to 500 to more than 4000 journals in case of IITs and IISc, which is comparable to world-class institutions like MIT.

Ghosh and Jambhekar (2003) studied the possibilities of establishing Management and Engineering Libraries consortia of two Western Indian States –
Gujarat and Maharashtra. They gave an overview of the current status of Management and Engineering libraries of the region and examine the feasibility of forming an information sharing system. The authors also explained the theoretical and practical advantages and disadvantages of this form of collaborative approach between Management & Engineering Libraries.

Birdie and others (2003)27 argued that e-journals must be archived and preserved for future use for scholarly community. They focused on the issues related to the archiving of e-journals in Physics and Astronomy and explained the role of consortia in archiving e-journals. The authors also covered the origin, coverage and functions of two archives in Physics and Astrophysics – PROLA (Physics Review Online Archives) and ADS (Astrophysics Data System). They concluded that consortia of libraries can think in terms of creating their own archives so that awareness and skills of the library professionals required for archiving would be enhanced.

Digital Library of Information Science and Technology (DLIST) is a recently initiated project of the School of Information Resource and Library Science at the University of Arizona in collaboration with the Arizona Health Services Center. The primary objective of DLIST is to create a web-accessible, open and digital repository for Library and Information Science and Information Technology. It is an international scholarly communication consortium for library and information science. According to Coleman and Bracke (2003)28 DLIST is a repository of e-resources in domains of library and information science. Its collection and development scope is in information literacy and informatics. Academics, researchers and practitioners create a wealth of content that includes published papers, instructional materials, tutorials for software and databases, bibliographies, pathfinders, bibliometric databases, dissertations and reports. The authors also
explained the UK and US experiences in building institutional repositories and strategies for international consortia building for resource sharing using DLIST.

Rajgoli and others (2006)29 studied the concept of consortia as a model of approach in sharing and using the information resources available in LIS Centers. The investigators have taken FORSA consortium as a case study. They discussed its developments, services, salient features and future plans. The investigators have also conducted a study on the usage statistics of electronic journals subscribed by FORSA. The finding of the study indicated that downloads and use of core journals in Astronomy was more compared to those of non-astronomy journals. It was also seen from the study that in the beginning years of the consortium the patrons downloaded some articles from non-astronomy journals as well. This could be an indication of initial curiosity of the users, but in the following years the access of non-astronomy journals has considerably reduced.

The Indian National Agricultural Research System with its nationwide network of educational and research institutions established Agricultural Research Information System (ARIS) in 1995 to strengthen its research information base. Gajendra Singh and Kushal Pal (1998)30 explained the structure, components and features of the ARIS. ARIS envisages a network of ICAR’s Central Institutes, Project Directorates, National Research Centers, All India Coordinated Research Projects, Krishi Vigyan Kendras, State Agricultural Universities, Zonal Research Centers, numerous regional stations and research centers and a Central Agricultural University.

The two main components of the ARIS are the creation of infrastructure for providing electronic connectivity and creation of MIS and computerized/electronic databases of Indian research findings of NARS in various fields of agriculture and allied fields. The important modules of ARIS are (1) Agricultural Research
Personnel Information System (ARPIS), (2) Agricultural Research Financial Information System (ARFIS), (3) Agricultural Research Library Information System (ARLIS) and (4) Agricultural Research Management Information System (ARMIS).

Environmental information, education, awareness and training play a significant role in encouraging and enhancing people’s participation in activities aimed at conservation, protection and management of the environment, essential for achieving sustainable development. Harjit Singh (1999)\textsuperscript{31} discussed the Environmental Information System (ENVIS) to meet the above requirements. The ENVIS is a decentralized network information system consisting of a Focal Point in the Ministry of Environment & Forests, for coordinating the activities of a chain of 24 subject specific centers, known as ENVIS Centers, located in various prestigious institutions/organizations all over the country. The ENVIS center’s activities are related to collection, collation, storage, retrieval and dissemination of information in their respective subject areas.

3.4. Library Consortia Attempts in Different Countries

Academic libraries used to form consortia for the primary purpose of sharing printed materials. Recently, academic libraries are forming consortia to provide common access to electronic resources across the Internet. Potter (1997)\textsuperscript{32} highlighted five of these consortia attempts in the US. They are formed on a statewide basis. They are GALILEO in Georgia, The Lousiana Library Network, OhioLink, TexShare and VIVA in Virginia. The author described these five consortia in detail with information such as participating libraries, core programs, reason for formation, funding, involvement of large academic libraries, governance etc.

The basic functions of these consortia are: (1) sharing of physical resources: for this purpose, union catalogues have been assembled, local systems linked
together, inter library loan protocols established and courier services provided; (2) provide connections to the Internet and the WWW; and (3) provide access to electronic resources either by mounting them on a local server or providing access to resources on other platforms.

GALILEO is an acronym for Georgia Library Learning Online. The program originated and is operated by the University system of Georgia, which encompasses the 34 publicly supported colleges and Universities of the Georgia State. The services offered by the GALILEO include the expansion of the system wide data network called Peach Net, the completion of retrospective conversion and automation, a courier service for delivery of books, high speed tele-facsimile equipment and an attempt to facilitate walk-in borrowing at all libraries.

The Louisiana Library Network builds upon the success of LOUIS (Louisiana Online University Information System). LOUIS is a centralized library system operating out of Louisiana State University that supports the online catalogue and processing functions for 18 academic libraries in the state using NOTIS. Federal funds were sought and secured to use the LOUIS computer platform to provide electronic resources including the full text journals to academic, public and school libraries throughout the state.

OhioLink consisted originally of all state-supported universities plus two private universities and the Ohio State Library. Using a common vendor, each library operates its own integrated library system that in turn connects to a centralized system where an online union catalogue is maintained. This arrangement permits users to identify and request materials held in other libraries using current circulation information.
TexShare is a joint effort of the public ly supported Universities in Texas to provide common set of electronic resources and to expedite the physical sharing of resources.

The Virtual Library of Virginia (VIVA) provides a set of electronic resources and expedited inter-library loan to the 39 state-assisted Colleges and Universities in the Commonwealth of Virginia. To the user, VIVA is a site on the Internet that provides access to a variety of databases including full text as well as expediting the physical sharing of resources.

Dwyer (1999) reviewed the history and operations of the California State University System’s (CSU) Electronic Access to Information Committee (EAR) and CSU Software and Electronic Information Resources Office (SEIR). The objectives of the study were to examine the principles for the acquisition of electronic information resources, the criteria and recommendations for an initial core collection and cooperative efforts with other consortia. The advantages and disadvantages and future of this venture were also examined. The methodology adopted for this study was literature survey, scanning of the websites of the consortia under study, discussion with staff and experts in the field of consortia. The operations of EAR included survey and analyze the needs of member libraries, review and compare costs of various services, analyze the effectiveness of various products and develop benchmark testing. The principles adopted by the SEIR were collection development, pricing models, licensing options and archiving policies.

China Academic Library and Information System (CALIS) is the most important academic library consortium in China. It is a nationwide academic library consortium, funded primarily by the Chinese government and intended to serve multiple resource sharing functions among the participating libraries.
Activities include online searching, interlibrary loan, document delivery and coordinated purchasing and cataloguing by digitizing resources and developing an information service network. Dai and others (2000) explained the structure and management of CALIS. The CALIS is centrally funded and organized in a tiered structure. CALIS members are distributed in 27 provinces, cities and autonomous regions in China, making an entirely centralized management difficult. After surveying some of the major library consortia in the United States, Europe and Russia, CALIS adopted an organizational model characterized by a combination of both centralized and localized management- that is a Three-tiered structure, as mentioned below:

1. Five National Information Centers: under the guidance of the National Administrative Center, each national information center is responsible for building and maintaining an information system in one of the five general areas – Humanities, Social Science and Science; Engineering and Technology; Agriculture and Forestry; Medicine; and National Defense.

2. Eight regional information centers: academic libraries in China are divided into 8 groups based on their location and each group forms a regional library consortium. These regional centers not only participate in nationwide projects in coordination with the national centers and other regional centers, but they also are responsible for promoting cooperation among libraries in their particular regions.

3. Seventy Member Libraries: all these member libraries are connected to any one of the regional information centers. All the member libraries together serve 700,000 students.

The activities of CALIS include primary and secondary data searching, interlibrary borrowing and lending, document delivery, coordinated purchasing, online cataloguing, database creation such as union catalogues, Dissertation
abstracts and Conference proceedings etc. The future plans of CALIS are improvement of service systems including hardware and software and distribution of shared databases. CALIS will develop more electronic resource databases and be actively involved in the research and development of digital libraries expanding the scale and extent of resource sharing.

Hallowell and others (2001) narrated the process of transformation of Singapore’s public library system. The purpose of this transformation is to continuously expand the nation’s capacity to learn through a national network of libraries and information resource centers providing services and learning opportunities to support the advancement of Singapore. The Government has taken a series of deliberate actions during this process of transformation. These actions start with the formation of a Library Review Committee in 1992 followed by the constitution of statutory National Library Board (NLB), which takes care of the public library system in the country. They worked hard on changing the public’s image of the library from a book repository to a place for the people to learn, explore and discover; and to recast librarians as service-oriented “Cybrarians” rather than custodians of materials. These professionals would help make Singaporeans “knowledge navigators” through training in information search skills. The ultimate goal of the National Library Board is to create “any time, any place” e-library of the future that would complement the physical network of libraries in promoting social interaction and community bonding. As part of this movement, the National Library Board established a variety of libraries such as the National Reference Library, the Lifestyle Library, the Community Library, the Regional Library and Neighborhood or Community Children’s Libraries for catering to the varying information needs of the different segments of the society. This case study gave a chronological listing of milestones achieved during this highly challenging endeavor.
Library consortia in Philippines are usually based on the academic environment and the idea of library cooperation is not a new one in Philippines. However, library consortia in Philippines were lagged to evolve due to many reasons such as lack of resources with the academic libraries, financial positions of academic institutions, reluctance on the part of library professionals etc. Ladlad (2003)\textsuperscript{36} while mentioning the consortia movement in Philippines pointed out that special geographical consideration puts a negative impact on the development of consortia in Philippines. According to him, the country is a cluster of islands and hence transportation and accessibility is a major concern.

The major consortia of Philippines are:

1. The Mendiola Consortium which consists of four-member private colleges/universities and this consortium started functioning in 1978.
2. Inter-Institutional Consortium. Five member colleges/universities with four private tertiary institution members and one state university form this consortium and started functioning in 1970.
3. Ortigas Center Consortium with member libraries belonging to the business sector.
4. Academic Libraries Information Network in Mindanao with 37 members from the different regions of the island; and
5. The Academic Libraries Book Acquisition Service Cooperative (ALBASA). As the name implies this consortium is concerned with acquisition of new materials for all the members under cooperative environment.

Though there are a number of consortia in Philippines they are in their infancy with mere sharing of books and periodicals in their hard form.

Ojedokun (2003)\textsuperscript{37} reported major consortia movements in South Africa. He identified five well-established consortia and discusses their areas of cooperation. The Gauteng and Environs Library Consortium (GAELIC), started in 1996, is the largest academic library consortium in Southern Africa. This consortium is
managed by the Foundations of Tertiary Institutions of the Northern Metropolis (FOTIM) which itself is a consortium of seven universities and five technikons resolved to foster regional collaboration. The Free State Libraries and Information Consortium (FRELICO) is another consortium, which started in 1996 and comprises of three university libraries, a technikon, a public/legal deposit library and a technical library. The Cape Libraries Cooperatives (CALCO) was established in 1992 and consists of five institutions-universities and technikons. The Eastern Seaboard Association Libraries (ESAL) initiated in 1992, is a partnership of three universities and three technikons. And the South Eastern Academic Libraries System (SEALS) consists of seven universities and technikons. All the above consortia offer to member institutions opportunities for better cooperation, articulation and utilization of resources through a team approach between member libraries.

Darch and others (1999)\(^{38}\) carried out a study on the academic library consortia in South Africa. The objectives of the study were to analyze the impulses to cooperate and identify the obstacles that have emerged to stifle the impulses. They began their discussion with issues like language polarization, telecommunication infrastructure, etc. and finally arrived at the library sector in South Africa. According to the investigators, the major academic library consortia of South Africa are: (1) CALICO (Cape Library Cooperative), (2) ESAL (Eastern Seaboard Association of Libraries, (3) FRELICO (Free State Libraries and Information Consortium), (4) GAELIC (Gauteng and Environments Library Consortium) and (5) SEALS (South Eastern Academic Libraries System). The investigators identified two major challenges; (1) the problem of how to preserve and sustain what is valuable in the traditional print-based library while integrating it with a rapidly changing technology (2) the trend towards turning information into a commodity for sale through a generalized expansion of intellectual property rights and of the internet through commercialization. According to the researchers
the following are the two issues that are core to the development and progress of South African consortia: (1) the high bandwidth connectivity at a low tariff is an essential pre-condition of success and (2) need for an increased emphasis on large-scale information literacy training through consortial activity.

Alemna and Antwi (2002)\textsuperscript{39} undertook a study in order to suggest guidelines for the successful consortia building among university libraries in Africa. To collect inputs for the study, the investigators reviewed the important consortia of South Africa. They are: (1) South African Bibliographic and Information Network (SABINET). It is responsible for the compilation of the SAcat, the catalogue of books, journals and other materials held in South African libraries. SAcat currently contains approximately 2.5 million bibliographic references with more than seven million holdings, (2) Gauteng and Environs Library Consortium (GAELIC). It is a major project of the umbrella consortium FOTIM (Foundation of Tertiary Institutions in the Northern Metropolis). All GAELIC member libraries would use a common library software called INNOPAC and a common software for document transfer called ARIEL, (3) Cape Library Cooperative (CALICO), (4) Cataloguing Network in Pietermaritzburg (CATNIP) and (5) South Eastern Academic Library System (SEALS). Based on the review of the above mentioned consortia, the investigator suggested that all the participating libraries in the consortia should be bound by rules and regulations and made to sign an agreement to join the consortia. There should be a central coordination point for the project. In this regard, one of the better resourced university libraries would be the coordinating center. The governing structure must have the responsibility and authority to make and review policy, to review activities and issue directives for management of the consortia. Tools used for the creation of consortia must be carefully chosen. These include creation of local databases, union list of serials, etc. It should obtain political support also so that it can impress on government the need to support information infrastructure of the country.
Kasimu (2002) while explaining the problems of public library system in Kenya, highlighted the following reasons for the crisis faced by the public library system; (1) ever shrinking budgetary allocation (2) exorbitant prices of primary sources of information (3) ever increasing and varying information needs of the users and (4) unprecedented advancement of technology. The public library system in Kenya is largely run by the Kenya National Library Services and the main function of it is to create a knowledgeable society through supporting government literacy programmes, so wiping out ignorance in Kenya. At the end of the article the author suggests resource sharing and library cooperation among the network of public libraries of Kenya as a solution for the existing problem.

Jalloh (2000) conducted a study to propose a plan for the establishment of a library consortium for Swaziland. The objectives of the investigation were to assess the extend of library resource limitations in Swaziland, to affirm and conform the perceived need for resource sharing, to study existing cooperative activities, to appraise the attitudes and opinions of librarians, to establish present obstacles for library cooperation in the country, and finally to propose a model for effective utilization of library and information services resources in Swaziland. The methodology adopted for the study were literature study, interviews and discussions with heads and senior staff of major library and information services as well as potential shareholders and partners in Swaziland. WebPages of the established consortia in South Africa were also browsed for collecting data. Findings of the study were discussed under the subheadings; professional commitment, technical contacts, government support, infrastructure, funding, staffing, levels of automation, stock levels and quality and usage of libraries. Based on the findings of the study, the investigator proposed a framework for the proposed library consortium in Swaziland. This framework contains policy endorsement section, structure of the proposed consortium, provisions for funding,
objectives of the consortium, details of membership and brief note on the justification of framing a library consortium for Swaziland.

Martey (2004) had undertaken a study on the pilot project of Ghana Interlibrary Lending and Document Delivery Network (GILLDDNET), in order to suggest a detailed design and work plan for Ghana’s proposed library consortium. GILLDDNET was a pilot project which was in operation from 1996 to 2002. He examined the different aspects of the proposed consortium in the light of the pilot project such as objectives, cost sharing, digitization activities, common software to be used, resource sharing tools etc. The author expressed that the Ghanaian academic librarians have resolved to carry out the following activities to expedite the formation of new proposed consortium: (1) write a good proposal for external and internal funding, (2) continue to tap the expertise of INASP in so far as training, negotiations for the subscription of electronic resources, licensing and bandwidth issues are concerned, (3) show commitment to the cause of the consortium by performing assigned tasks promptly, (4) prepare all academic librarians psychologically to accept the consortium as a tool for reducing costs and efficient service delivery, (5) establish beneficial linkages with institutions outside the country,(6) encourage the formation of consortia in the sub region with a view of forming a West African consortium ultimately and (7) create digital and subscribe to electronic resources that can be shared.

Nfila and Darko-Ampem (2002) conducted a study on the developments of academic library consortia from 1960 to 2000. They begin their discussion by tracing the origin of the concept of the term library consortia. They pointed out the reasons for forming the consortia as: (1) To share and improve resources, (2) To reduce the cost and (3) To share expertise among libraries. The investigators discussed the important consortia initiatives of different countries, types of consortia and highlighted the formation of the International Association of Library
Consortia in 1997. According to them the current trend is of sharing integrated library systems and computer databases, collection development, purchasing of electronic journals and staff development. The highest achievement is the provision of resources to patrons they did not have them before as well as increased levels of services and conveniences of patrons. As the group of libraries in the consortium shares the expenditure, cost savings come through reduced cost per unit. Academic libraries are fast shifting from sharing bibliographic information to sharing technology for bibliographic control and this trend is bound to continue.

3.5. Library Consortia in India

Biswas and Dasgupta (2003) discussed briefly the concept and significance of resource sharing in Indian context and suggested that resource sharing is inevitable among libraries. They mentioned the concept and the areas and modalities for cooperation through consortia in the networked information environment. They also covered growth as well as merits and demerits of library consortia and the future prospect of consortia in Indian Scenario.

In India, Library network and cooperation started with the initiative of NISSAT in forming CALIBNET in 1986 and DELNET in 1988. The UGC set up INFLIBNET in 1988. Many libraries in India have set up consortia among themselves for resource sharing. For example, Physics and Astronomy libraries joined to form their own consortia. At the national level, INFLIBNET has taken initiative for a change in developing adequate infrastructure in libraries to be a part of networked environment.

Bavakutty and Abdul Azeez (2006) conducted a study of the major activities of library consortia in India like FORSA, CSIR Consortium, UGC-INFONET consortium, INDEST, IIM Consortium etc. The study also thrown light
on concerns over archival of electronic journals such as unprecedented pace of technological development, hardware and software updates, copyright issues, mergers, cessation and stoppages of publishing industry. The study revealed that none of the Indian consortia except IIM consortium have seriously considered archival aspects of e-journals.

It is significant to note that in the case of print subscription, the libraries will have the print copies of the journals subscribed in their collection, even if the libraries stop the subscription. But, in the case of electronic journals the things are entirely different. As long as we continue subscription we are permitted to access the archives. Once we discontinue subscription we won't have access to archives including the period for which we had subscription. However, some publishers like Springer arrange complimentary “limited perpetual” access to the subscribed content for one or two years and after expiry of complimentary access further access can be assured by paying a maintenance fee.

Publishers of e-journals also have software-controlled mechanism for checking sequential downloading of the articles of a particular issue. Hence there is no scope for downloading an entire issue and storage of the same on a secondary storage media. In the case of discontinuing an electronic subscription, the library will have absolutely no issues of journals for the use of their patrons.

The other issues of electronic archiving include shorter life span of electronic media. The scientific journals are in existence for a long time in print medium and they are well preserved in libraries. Now the format is changed from print to digital. At present most of the e-journals are published in PDF format. As the technology advances, the present medium and format may change within a short span of time. In order to withstand the changes in the format it is suggested that the archives may be in open formats like XML. Archival initiatives may also
consider unprecedented pace of technological developments in hardware and software. Today’s software and hardware may be outdated tomorrow. Issues like interoperability and standards must be considered in this context. We must also take security measures against unauthorised access either through password authentication or by IP authentication.

Copyright issue is another concern for Archives. Generally copyright of a journal article rests with the publisher of the journal. When we subscribe to an e-journal, we are only “licensed to access” that journal during a particular period. We may or may not have rights to access that journal in future. So, at the time of setting up of the Archives, issues of copyright have to be settled with the publishers.

Many of these problems are sorted out by the National Archival Centres established in most of the developed countries. But in India we have not yet established a national centre for this purpose. Also the publishers or the aggregators can set up Archives for long-term access to e-journals, or consortia of libraries can also think in terms of setting up their own archives. However, IIM Consortium has put forwarded a proposal to set up an archival centre along with their consortium.

Vishnu and Saji Nair (2005) studied the scope of library consortia in sharing e-resources in India. In developing countries like India, libraries are facing a continuous reduction in the subscription to scholarly journals and databases due to ever increasing cost of foreign journals, devaluation of rupees against major currencies and budget cut. Owing to the failure in accessing primary sources of information, India’s contribution to scholarly information at international level has slid to 15th position in 2000 from 8th in 1973. This pathetic situation can be overcome to certain extent by establishing consortia for sharing electronic
information resources. The authors also explained about major Indian consortia like UGC-INFONET, INDEST and Health Science Library & Information Network (HELINET).

Kushwah and others (2003)\(^\text{47}\) gave a brief account of some of the major consortia initiatives taken during the last couple of years. According to them, Forum for Resource Sharing in Astronomy and Astrophysics (FORSA) was established in 1981 and consists of Indian Institute of Astrophysics (IIA), Inter-University Center for Astronomy and Astrophysics (IUCAA), National Center for Radio Astrophysics (NCRA), Physical Research Laboratory (PRL), Raman Research Institute (RRI), Tata Institute of Fundamental Research (TIFR), Nizamiah Observatory (NO) and Uttar Pradesh State Observatory (UPSO). FORSA is subscribing to common database and full text journals on behalf of all member libraries for their use.

Another worth mentioning initiative is the Council of Scientific and Industrial Research (CSIR) Consortia. It has 40 laboratories spread over the length and breadth of the country. The major objective of CSIR Consortia is to strengthen CSIR library resources by pooling, sharing and providing electronic access to scholars and scientists of CSIR labs and to promote the culture of electronic access.

Apart from UGC-INFLIBNET initiative, yet another important attempt in this direction is the INDEST (Indian National Digital Library in Engineering, Science and Technology) Consortium, set up by the Ministry of Human Resource Development in collaboration with the All India Council for Technical Education. This consortium comprises of IISc, Bangalore, IITs, NITs, IIMs, RECs and few other institutions. This consortium being an open-ended proposition, welcomes all other institutions to join it on their own for sharing maximum benefits it offers in terms
of highly discounted subscription rates and better terms of agreement with the publishers.

Pandian and Karisiddappa (2003)\textsuperscript{48} looked at the technology requirements for modern library consortia and issues related to that both at the information providers and member libraries end. They presented a model library consortium that is technology enabled and ideal for Indian context.

Bavakutty and Haneefa (2003)\textsuperscript{49} proposed a library consortium for the universities of Kerala. They discussed the need for forming library consortium, requirements of library consortium and benefits of library consortium.

Tadasad (2003)\textsuperscript{50} presented a view to stimulate discussion within the Indian library and academic community about adopting a model of library consortia to improve library and information service. The success of consortia, like other cooperative efforts, depends on the proper mix of enthusiasm, innovative thinking and caution. As university libraries in India have no or little experience on consortia, these have to go in a humble way. For university library consortia to achieve considerable success, they must effectively act as a team, not as individuals to achieve common goals. He presented a visionary model to be adopted by the Indian universities to form effective consortia.

3.6. Conclusion

In this chapter the investigator has made a sincere attempt to review the literature pertinent to library consortia. It can be seen that 23 studies are related to library consortia models, types, etc. There are 8 studies connected to library consortia for specific disciplines, 12 studies are related to library consortia in different countries and 7 studies are on library consortia initiatives in India. It is
found that majority of the studies were conducted in foreign countries and less number of studies were conducted in India. Only two studies were conducted in Kerala. Critical analysis of the available literature has helped the investigator to finalize the objectives of the present study and arrive at certain assumptions, which are defined in the form of hypotheses. These objectives and hypotheses are discussed in the next chapter. During the review of related literature, the investigator did not come across any significant study on engineering college libraries in particular and he could not identify any attempt to assess the present status of engineering college libraries in Kerala.
References


