CHAPTER II
LITERATURE REVIEW

2.1 General

This chapter presents literature review of studies on the significance and need of heritage conservation taken up by various investigators and mechanisms of wherewithal followed by the government and non-government agencies. These details are incorporated in sections 2.2 to 2.8 while conclusions are summarised in section 2.9.

2.2 Overview

A common staunch feeling across the society about heritage buildings is that they shall continue to have an indefinite life span. According to Feilden (2003), heritage buildings differ from modern buildings because they are anticipated to last forever. The author has described them as “buildings that for various reasons society has decided shall be preserved for as long as possible”. The same author added, “buildings that give us a sense of wonder and make us want to know more about people and culture that produce it” (Feilden, 2003). A more elaborate definition by Kamal and Harun (2007) states heritage buildings as the ones built in the past carrying high historical and architectural values requiring continuous care and protection to preserve their aesthetic, archaeological, architectural, economic, historical, political, social and spiritual characteristics. According to Kathpalia and Lambah (2002), “A heritage building is that structure which has survived the hazards of time and provides the tangible link between the past and present giving us a continuous cultural identity”. These expectations quite silently, but very seriously underline the need, significance and responsibility of preserving varied heritages to the maximum possible period in future.

The uniqueness and diversity of India’s heritage is reflected in its urban morphology, building typologies, social structure, religious beliefs, traditions, civic activities and varied natural resources. Accordingly, various State Governments, under relevant state legislations have identified 4000 historical monuments for protection. Yet, an equally strong number of historical structures and heritage areas are lying uncared in the country (Sanyal, 2009). Added to this, as mentioned in the
previous Chapter, rapid urbanisation in the country being witnessed in recent decades has been accelerating the pace of change in all walks of life including heritages. As a result, majority of Indian cities and towns are exposed to strong extraneous and fast growing forces that disturb the delicate balance among cultural, physical, social and ecological aspects of the land symbolising various categories of heritages (Anonymous, 2010a). This situation calls for alternative ways and means to develop mechanisms for the revival and revitalisation of all such built environs as well as intangible and natural heritages of the good olden times of this wonder land, India with great care and caution for posterity. For these reasons, Indian Constitution, under Article 51A (F) casts a duty upon every citizen to value and preserve the rich heritage of the composite culture (Sanyal, 2009).

2.3 Threats to Heritages

Statutory provisions for heritage conservation have been in existence in India much before the introduction of the concept of City Plans (Hali, 2006). Despite this legal backup, a large number of heritage buildings and precincts in India have become highly vulnerable facing severe threat both in urban and rural areas due to extensive economic pressures and have reached the stage of ‘endangered’ category. Ascribing little significance to the heritage character of a structure or environment, modern buildings are constructed in place of the old ones. As aptly commented by Jain (2007), in recent decades, the treasure of traditional urbanism has often been trampled upon in a zeal to develop the modern cities together with ‘property’ oriented approach. This kind of disheartening situation suggests the urgent need of strategic plans for a region to protect and preserve heritage resources through adoption of an integrated approach and its immediate implementation in truth and spirit is essential to keep the heritage resources lively, attractive, cherishable and everlasting.

2.4 Heritage Conservation

Heritage conservation is a continuous value based process involving a wide range of activities. The significance of building maintenance has been emphasised in almost all primary documents and legislations intended for the conservation of heritage buildings. This recognition was made as early as 1877 by William Morris, the founder of the Society for the Protection of Ancient Buildings (SPAB), an organisation
entrusted with caring and preserving United Kingdom’s heritage buildings. He considered regular maintenance as “the most practical and economic form of conserving heritage buildings”. The Burra Charter holds that maintenance should be given topmost priority where the fabric of heritage building is identified to have cultural significance and defines maintenance as “the continuous protective care of the fabric, contents and setting of a place and is to be distinguished from repair because repair involves restoration or re-construction and should be treated accordingly” (Anonymous, 1987).

Though Brereton (1991) did not argue against repair, he clearly pointed out, “the unnecessary replacement of historic fabric, no matter how carefully the work is done, will have an adverse effect on the appearance of a building and will seriously diminish its authenticity and reduce its value as a source of historical information”. Feilden and Jokilehto (1993) defined maintenance more broadly with no clear distinction between maintenance and repair. According to them, “maintenance, is a continuous process that includes all practical and technical measures that are needed to keep the site in condition at a standard that permits enjoyment of the cultural resource without damage”. While recognising the prominence of maintenance as a preservation process, Kerr (1996) defined maintenance, “the single most important conservation process and whether the building is architectural, mechanical or botanical, prevention is better than cure”. Maintenance is defined, “routine work necessary to keep the fabric of a building, the moving parts of machinery, grounds, gardens or any other artifact in good order” (BS: 7913-1998). Dann and Worthing (1999) argued that in the context of heritage buildings, there is a clear distinction between maintenance and repair. They pointed out that though repair may prolong a building’s life, it damages the building fabric with high cultural significance.

International Council of Monuments and Sites Australia Chapter states, “conservation may, according to circumstances, include the processes of retention or reintroduction of a use; retention of associations and meanings; maintenance, preservation, restoration, reconstruction, adaptation and interpretation; and will commonly include a combination of more than one of these” (Anonymous, 1999). Kamal and Harun (2007) opined that building conservation projects shall include four phases, viz., documentation, building investigation, building diagnosis and
conservation cum repair techniques before a building is exposed to any repair or refurbishment work. According to Anonymous (2007b), the conservation process could be divided into six important steps, namely, i) initiation, ii) assessment, iii) options, iv) project development, v) implementation and vi) operation.

Kerr (2000) again emphasised, “of all the processes of conserving heritage buildings, maintenance is the single most important process”. Wordsworth (2001) simply defined maintenance in the context of heritage building conservation as “an alternative to improvement rather than an adjunct”. Regular maintenance shall be considered as the most sustainable way of preserving heritage buildings (Dan and Cantell, 2007) and shall be regarded as the most pragmatic and philosophically appropriate conservation method (Forsyth, 2007). Thus, regular maintenance is critical to the survival of any building, be it a heritage or non-heritage building.

2.4.1 Heritage Conservation at International Level

United Nations Educational, Scientific and Cultural Organisation was established as a specialised agency of United Nations Organisation in 1945. Article I (2) (c) of the Constitution entrusts it with the task of maintaining, increasing and diffusing knowledge by assuring conservation and protection of world’s inheritance of books, works of art and monuments of history and science and recommending to the nations concerned the necessary international conventions. In 1972, under the auspices of this organisation, the international community of states have adopted the “Convention Concerning the Protection of World Cultural and Natural Heritage” establishing a system of collective protection on a permanent and scientific basis.

The approach of ‘urban conservation’ was elevated to ‘integrated urban conservation’, in which conservation is seen as an integral part of development planning. This concept was adopted for the first time in 1985 in “The Granada Convention for Protection of the Architectural Heritage of Europe”. This approach aims at achieving social, cultural and economic development thereby playing an important role within the wider context of urban planning. Integrated conservation significantly contributes to uphold the diversity and uniqueness of a city while highlighting the conservation values relevant to the lives of the people at large. Lichfield (1988), Fielden and Jokilehto (1998) and Cohen (2001) opined that urban
planning and conservation are rather complementary than contradictory and the former that does not take care of the latter is incomplete. “Often, it is argued that there can be no preservation without legislation and regulations. The restoration could preserve only a few sites, while legislation may preserve thousands. Legislation does not restore buildings but it stops the free run of bulldozers” (Jain, 2007).

In its further efforts, UNESCO has created National Committees of ICOMOS in every country and it currently has over 110 such Committees including the one in India. These committees bring together individual and institutional members and offer them a framework for discussion and exchange of information regarding various heritage issues. Each National Committee adopts its own rules of procedure and elaborates its own programme according to the goals and aims of ICOMOS. Indian chapter of this body works in close cooperation with INTACH, ASI and other scientific laboratories (Anonymous, 2012b).

Preservation of heritage sites in Malaysia has turned into a positive societal investment with the emergence of the National Heritage Act, 2005 (Yaacob, 2007). Idrus et al. (2010) noted that despite the enactment of heritage acts by the Malaysian government, heritage buildings still remain in poor condition with serious defects threatening their survival because of the insufficiency of legislation in addressing the issue of maintenance and management. The authors proposed a framework that will provide holistic guidance to and understanding of the maintenance management practices by the custodians of heritage buildings. Saradj (2011) suggested a conservation policy based on a scale of values for ranking heritage buildings in Iran for prioritisation and allocation of grants.

2.4.2 Heritage Conservation at National Level

As mentioned earlier, the Constitution of India directs the state and its citizens to protect and preserve the nation’s rich heritage. The GoI and its federal members promulgated several laws to conserve and protect heritages under their purview. Cultural heritages in the country, among the many, are protected through the following main laws.
1. The Indian Treasure Trove Act, 1878
2. The Ancient Monuments Preservation Act, 1904
3. Rajghat Samadhi Act, 1951
4. The Ancient Monuments and Archaeological Sites and Remains Act, 1958
5. The Ancient Monuments and Archaeological Sites and Remains Rules, 1959
6. The Antiquities and Art Treasures Act, 1972
8. Environment (Protection) Act, 1986

Foundations for heritage conservation in India were laid down way back in the pre-independence era at the time of inception of Town Planning Acts (Madras Town Planning Act 1920 of Tamilnadu and the Travancore Town Planning Act 1932 of Kerala) itself. The planning tools developed in 1960’s for the entire country are not sufficient to cater to the protection of rich and varied urban heritages of India.

Under this scenario, a national society named “Indian Heritage Society” (HIS) (formerly known as Indian Religious Society) was formed in 1993 with the motto of “Preserving Indian heritage for the next generation”. The society intends to create appropriate measures to protect, preserve and judiciously use Indian heritage. The organisation aims to create awareness about the danger of losing our art and architecture due to inadequate preservation methods. Towards these objectives, the organisation takes up preparation of conservation plans through Memorandum of Understanding (MoU) with the federal governments of various states in the country. The society also draws attention on the destructive approaches towards the national environment by ruthless and unplanned exploitation of natural resources of the land.

In fact, in practice, heritage conservation is often side lined unlucky. Urban Local Bodies are giving priority only to physical planning exercises such as improvement of facilities, utilities, transportation network and enforcement of land use regulations but following piecemeal approach towards heritages. Such step motherly attitude has been resulting in the deterioration, disintegration and loss of the very structures and their innate surroundings. While town and country planning conventionally aim at ‘Planning for the Future’, the objective of heritage conservation shall be to ensure ‘Future for the Past’ as promptly recognised by Hali (2006).
Given the situation, Chohan and Ki (2005) have opined that a comprehensive heritage conservation policy involving every member of the community and its integration with urban regeneration are making their way to a grand success indicating that overall vision and policy initiatives of the government help in achieving good success in heritage conservation. According to Hali (2006), heritage (buildings, precincts and nature) conservation has to be carried out on a continuous basis and comprehensive listing and grading are required to achieve the task of effective conservation. Ucer et al. (2006) considered cultural tourism as a tool for successful preservation and conservation of cultural and historical heritages. According to Das and Basu (2007), long-term protection of heritage depends upon the encouragement, sustainable development of local resources and promotion of appropriate tourism as a means of conserving them so that local and regional economies get benefitted.

2.4.3 Heritage Conservation at State Level

Various acts intended to see to the prosperity and welfare of different categories of monuments and heritages in the state are

1. Andhra Pradesh Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1960
2. Salar Jung Museum Act, 1961
3. Andhra Pradesh Urban areas (Development) Act, 1975
4. Andhra Pradesh Heritage Regulation Act, 1999

Government of Andhra Pradesh (GoAP) have for the first time in the state framed heritage regulations for Hyderabad Urban Development Authority (HUDA) area in December 1995 on the lines of Bombay Heritage Regulations (Chainani, 2007). Subsequently, in February 1997, HUDA have notified a list of 150 buildings and 9 precincts in Hyderabad as state heritage resources and sought for public opinion. Ultimately, in March 1998, HUDA accorded recognition to 137 buildings and to another 14 later in 2005. In August 1999, the state government have intended to bring-in heritage regulations to other major urban local bodies such as Kakatiya Urban Development Authority, Warangal (Warangal District); Putaparthi Urban Development Authority, Putaparthi (Anantapur District); Visakhapatnam Urban Development Authority, Visakhapatnam; Tirupathi Urban Development Authority,
Tirupathi (Chittoor District) and Vijayawada Urban Development Authority, Vijayawada (Krishna District); but the tempo was not sustained to realise the aim (Chainani, 2007).

2.4.4 Heritage Conservation at Regional Level

For the first time in 1986, Visakhapatnam Urban Development Authority (VUDA) constituted under the Andhra Pradesh Urban Areas (Development) Act 1975 took initiative and prepared Master Plan for VMR as a whole and Zonal Development Plans (ZDP) for Anakapalle, Bheemunipatnam, Vizianagaram and Visakhapatnam separately, which were sanctioned by the GoAP in G.O.Ms.No: 274 M.A, Dt: 23.05.89 (Anonymous, 1996a). So far, Bheemunipatnam ZDP listed out the historic Dutch built heritages that totaled to 21 and Vizianagaram ZDP listed a Fort along with its surroundings and proposed for their conservation. The Master Plan that was valid till 2001 was subsequently reworked and a Revised Master Plan for Visakhapatnam Metropolitan Region-2021 (RMPVMR-2021) was prepared afresh (Anonymous, 2007a).

2.4.5 Heritage Conservation at City Level

Greater Visakhapatnam Municipal Corporation (GVMC) have also prepared a ‘City Development Plan’ (CDP) that contained a gist of heritage resources, without taking note of RMPVMR-2021 that has provided all necessary details for the effective conservation and preservation of built heritage sites (Anonymous, 2005a). Some random examples of noted built heritages of the city were described in chapter five of this thesis. Further, the Corporation has not also specifically put up any effort so far to develop and conserve any of the heritage resources existing within its jurisdiction.

2.4.6 Other Heritage Acts of the Land

Much the same way as in the Granada Convention, administrative acts in India consider ‘heritage conservation’ as a subject matter of town planning (Hali, 2006). The guidelines prepared by the Institute of Town Planners India in 1996 for ‘Urban Development Plan Formulation and Implementation’ (UDPFI) suggested the local bodies to treat heritage structures, conservation sites and scenic value areas as ‘Special Areas’ while formulating town planning schemes or development plans. As a
sequent, many Regional, Zonal, Town Planning Schemes, Local Area Plans and Development Acts have provisions for identifying different heritages and ‘special areas’ to regulate activities around them. Some of the important acts of the kind in the country are

1. Victoria Memorial Act, 1903
2. Jallianwalla Bagh National Memorial Act, 1951
3. Orissa Ancient Monuments and Preservation Act, 1956
4. Uttar Pradesh Ancient and Historical Monuments and Archaeological Sites and Preservation Act, 1957
5. West Bengal Preservation of Historical Monuments and Objects and Excavation of Archaeological Sites Act, 1957
6. Assam Ancient Monuments and Archaeological Sites and Remains Act, 1959
7. Maharashtra Ancient Monuments and Archaeological Sites and Remains Act, 1961
8. Salar Jung Museums Act, 1961
10. Mysore Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1962
12. Punjab Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1964
17. Delhi Development Act, 1957
18. Delhi Urban Art Commission Act, 1973
19. **New Delhi Municipal Council (Pasting of Bills and Advertisement) Bye-laws, 1995**
20. **Delhi Municipal Corporation (Tax on Advertisements other than Advertisements published in Newspapers) Bye-laws, 1996**
21. **Urban Improvement Acts of various States**
22. **Municipal Acts of various States**
23. **Town and Country Planning Acts of various States**

Other ‘Para-legal’ measures can also be successfully adopted for effective heritage conservation through various participatory processes listed out by Jain (2007) as under.

1. Listing and identification,
2. Standards, norms and specifications,
3. Code of conduct and ethics (social, community, professional and religious),
4. Policy planning and designing guidelines,
5. Charter (e.g. The Athens Charter, 1937),
6. Zone partnership empowerment,
7. Community enterprise promotion and
8. Incentives such as Transferable Development Rights, Waive off of Building Bye-laws governing setbacks, rights, land use and Floor Area Ratio and flexibility through urban design and architectural controls.

**2.5 Conservation Planning**

According to Ortega (2002), heritage management planning should be given top priority to realise the sustainability of heritages successfully. Tunas (2004) analysed two Colonial spaces in the capital city of Jakarta in Indonesia and identified their potentialities in order to elaborate them in the general urban strategic planning. During the process, the author has considered i) value of monumentality, ii) value of recollection and remembrance and iii) value of contemporanity as criteria for arriving at the importance of a heritage and then assigned it a set of parameters, viz., economic status (historic, cultural and property values) and socio-cultural role (urban collective memory and urban mental mapping). Whymann (2009) explored the significance of visitor centres in terms of architectural importance and concluded that a fine balance
has to be maintained between the protection of historic and cultural values of a site and management of a large number of visitors and their needs.

As regards heritage planning in India, GoI is reliably framing to prepare CDPs focusing on heritages for the entire country after a comprehensive analysis of their existing status and future role. Incorporation of a heritage management plan for each identified ‘heritage resource’ in the CDP as an integral part will be very ideal.

In the case of Andhra Pradesh, Hyderabad Metropolitan Development Authority (HDMA) formulated its first Heritage Conservation Committee in 1999 to aid in management planning and has recently started instituting informative plaques on heritage buildings to demonstrate their value (Rajamani, 2010). This author suggested for the establishment of Urban Arts Commission as a management machinery to motivate architects and builders on the conservation needs. As mentioned in introduction, a good heritage management plan shall essentially include inventory of resources, their designation and conservation practices while taking care of fiscal aspects, manpower, publicity and role of locals.

2.5.1 Inventory of Heritages

Cities with rich heritages are being gradually threatened by unplanned urbanisation and tourism. Fortuitously, increasing awareness about heritages in recent decades has been leading various organisations to identify heritages as well as to delineate heritage zones based on a set of defined criteria.

Pauline and Roosmalen (2005) suggested to UNESCO’s World Heritage Centre to adopt a new set of criteria for the identification and documentation of modern colonial built heritage based on nine parameters, viz., circumstances, working practice, framework, local conditions, external influences, adjustment and adaptations, contemporary references, characteristics of architecture and guidelines for town planning. In order to facilitate survey of built heritages in the city of Arnprior in Canada, Ruddy (2006) adopted history, architecture and environment as three chief criteria. In a similar manner, Gupta (2007) stressed cultural significance, historic integrity and historic context as the three key concepts for the identification and documentation of built heritages in India. Much the same way, Das and Basu (2007)
had developed a methodology for identifying heritage zones through systematic mapping for environmental protection, tourist appreciation and local community benevolence. The Getty Conservation Institute of Los Angeles have classified architectural and photographical documentation emanating from heritage inventories into reconnaissance, preliminary and detailed outputs (Anonymous, 2007b). Onaka (2009) had considered significance of the monument, scale of the object and its complexity as tools useful in the documentation of architectural heritage sites for conservation projects.

Chitra and Sharmilee (2010) while dealing with regulatory provisions for heritage conservation in Chennai Metropolitan Area had added historical, architectural and cultural aspects as criteria to be followed for listing and screening of heritage buildings. While studying the existing methodologies and documentation techniques of the archaeological conservation projects in the Republic of Slovenia, Marko (2012) noticed that a system and methodology of surveys, modern documentation techniques and cultural landscape are fundamental to the evaluation, conservation and presentation of a cultural heritage. While preparing proposals for conservation, restoration and enhancement of heritage structures of Thimpu in Bhutan, Anonymous (2012c) presented inventory of important heritage structures and their classification based on physical condition; historical, social, religious and architectural importance; ownership and associated events.

United Nations Education Scientific and Cultural Organisation in its “Operational guidelines for the implementation of the World Heritage Convention” have set forth many themes under various criteria for arriving at the outstanding universal value of a cultural heritage for purposes of its listing as a world heritage (Anonymous, 2012d).

Heritage of Malaysia Trust classified architectural styles of built heritages in Malaysia into seven categories based on the influences of European, Chinese, Malay, and Indian sources (Chun et al., 2005). These categories are Indian Kingdoms (7th-14th Century), Malay Vernacular (pre-15th Century to the present), Straits Eclectic (15th-mid-20th Century), Chinese Baroque (19th-early 20th Century), Chaitya Indian Vernacular (15th-mid 20th Century), Colonial (17th-mid-20th Century) and Modern (1950s-1980s). Jeyaraj (2010) analysed Indo-Saracenic buildings of the British Colonial period in Chennai city in the light of architectural features imbibed from
Islamic, Hindu and Byzantine styles and highlighted them through pictorial depictions.

2.5.2 Designation of Heritages

Intergovernmental Committee for the Protection of the World Cultural and Natural Heritage of the World Heritage Centre of UNESCO in its Operational Guidelines for the Implementation of the World Heritage Convention (November 2011) vests the responsibility of ensuring, “the identification, nomination, protection, conservation, presentation, and transmission to future generations of the cultural and natural heritage found within their territory, and give help in these tasks to other States Parties that request it” with the individual States. Thus, there is no specific universal procedure for designating heritages and therefore each State acts on the matter on the merits identified by them for the purpose. However, various courses of action(s) taken in the said regard shall necessarily be reported to UNESCO in the case of all inheritances declared by it as World Heritages.

Townsend (2002) adopted four heritage designation categories with a particular grading and score (‘A’-100 to 70, ‘B’-69 to 45, ‘C’-44 to 26 and ‘D’-25 to 0) to classify the overall significance and eligibility of a property for designation under the Ontario Heritage Act 1975 based on four criteria, namely, architectural, historical, integrity and environmental in the case of Peterborough city, Canada.

Jain (2007) suggested that understanding of the existing laws derived from the spirit of Indian Constitution (various Central and State acts; regulations, bye-laws, rules, statutes and orders; and mandatory plans, statutory plans, zonal development and architectural controls) will be highly useful in the conservation of traditional urbanism and heritage. Ruddy (2006) recognized four categories of heritage, namely, Category-1, 2, 3 and 4 carrying a score of 79-100, 71-78, 59-70 and 0-58, respectively while designating buildings of Arnprior city in Canada.

Norfolk County Lakeshore Special Policy Area Secondary Plan, Norfolk County, Canada recommends inventory and designation as cultural heritage management strategies and cultural heritage conservation measures for the development of the Area (Anonymous, 2007c). Gupta (2007) dealt with the identification and
documentation of built heritage in India at length in a systematic manner, but did not include the subject of designation. While explaining different overall heritage grades in the City of Brampton, Canada Anonymous (2007e) briefed up the criteria and rating scale adopted for the purpose besides providing a scoring sheet. The grades were classified into Categories A, B, C and D based on the scores ranging from 70 to 100, 40-69, 26-39 and 0-25, respectively.

Heritage designation processes followed in the City of Hamilton, Canada were described by Anonymous (2008a) without the mention of any grading system. Different criteria and grades of each criterion employed for designating heritage properties in the City of Regina, Canada were well narrated by Anonymous (2008b).

A study of the documentation process for conservation of architectural heritage sites was taken up by Onaka (2009) along with examples from Egypt and Belgium. Pradhan (2009) undertook the massive task of presenting a comprehensive account of 199 lesser-known heritage monuments representing temples, buildings, tanks, wells, sites and archaeological remains of Bhubaneswar, Orissa, India, but did not classify them into any particular grade.

Chitra and Sharmilee (2010) had dealt with the processes of grading and designation of heritages in Chennai Metropolitan Area through Gazette notifications illustrating various legislative measures available for the purpose and the role of a technical body in aiding these processes. The heritage grades in India were classified into four categories, namely, I, IIA, IIB and III (Anonymous, 2011a).

2.5.3 Condition Assessment of Heritages

As is well known, degradation - usually referred to as weathering or wear and tear and deterioration - commonly termed as biological damage are two inherent natural phenomena that affect all living and non-living matter in this world with time being the only witness and built heritages are no exception to this. Consequently, a built heritage, or for that matter any other construction, is unceasingly subjected to several physical, chemical and biological influences of ambient soil and air (and water too, if the structures are in or near fresh or salt-water bodies) besides numerous human induced ills (Cataldo et al., 2005).
Some important soil features are texture, composition, stratification, porosity, temperature, faults, fractures, seismicity, aquifers (physical); acidic or alkaline character, red-ox potential, mineral or other chemical contents (chemical) and substratum dwellers (surface and sub-surface), viz., microbes, fungi, insects and pests (biological). Similarly, salient air attributes are temperature, solar radiation, humidity, wind, rainfall, aerosols (physical); acidic or alkaline nature, chemicals including salt(s) and gases (chemical) and microbes, fungal spores and seeds (biological).

Among human induced ills (anthropogenic); solid, liquid, gaseous effluents from different industries; solid waste dumps; vehicular traffic; sound, noise; construction activity; sewage; underground cables, ducts, drainages and diversion of water bodies are chief factors besides vandalism, encroachment, physical assault, etc.

The isolated and/or combined affect(s) of one or several of these factors on a building often gradually, or on occasions, abruptly manifest(s) into rarely single, but usually multiple defect(s) such as dampness, rain water seepage, watermarks, floor-raising, wall cracks, wall blisters, given out joints, metal rusting, paint peeling, corroded fastenings, white ant attacks, fungal infestation and moulds, plant growth, pest invasion, etc.; more so along with advancement of age of an erection and aging of its components. This resultant state of a structure (owing to degradation and/or deterioration) is termed as ‘building distress’ and its study as ‘Condition Assessment Survey’ (CAS) or ‘Dilapidation Survey’ (DIS) or ‘Historic Structure Assessment’ (HAS) (Arya and Agarwal, 2007).

Although repair and restoration are age-old practices in India and the ‘Agamas’ (texts describing the rules of construction) prescribe mending or replacement of broken architectural members (Mohandas, 2010), Eweda et al. (2010) noted that sufficient literature reflecting research output in the area of building condition assessment is generally lacking not only in India but also all around the world. However, considerable attempts have been made of late in this line around the globe.

Abbot et al. (2007) reiterated the importance of condition assessment besides elaborating the systems and processes involved in the task with examples and stated that “condition assessments have evolved into a technology that adds a new dimension to strategic management and maintenance of buildings and related infrastructure”. Arya and Agarwal (2007) suggested rapid or visual preliminary evaluation, detailed
investigation and soil profile studies as methodologies for ‘condition assessment of buildings for repair and seismic upgrading’ and besides bringing out a guide that aids the task. Piazza and Riggio (2008) observed that visual inspection coupled with non-destructive *in-situ* testing allows for the determination of mechanical properties as well as decay level of the timber. Santos (2010) had prepared a guide for the structural rehabilitation of heritage buildings in Netherlands based on structural assessment of the building among other aspects and stressed that deciphering of safety level, modeling, quantification of materials strength and quantification of acting forces are important components of the job. Anonymous (2011c) elaborated on the ‘State Historical Fund Annotated Scope of Work’ essential for developing a comprehensive assessment plan for the preservation, rehabilitation or restoration of historical properties in Colorado (USA) mainly based on visual assessment and photo documentation. Vatan (2011) carried out condition survey of 600 years old Murat Pasha Mosque in Turkey based mainly on visual assessment and building dimensions. Hu *et al.* (2012) discussed about the conservation and restoration of the Guang Sheng Si Pagoda, aged 900 years, in China based mainly on visual examination and extensive photo documentation.

In fact, assessment or monitoring is the act of measuring change in the state, number or presence of characteristics of something and the follow up process of preservation is cyclic rather than linear representing a single effort to be a brief moment during the life span of a building (LeBlanc, 2011). "*Material characteristics can change with age and use. Masonry decays with exposure; metals can fatigue; wood can become brittle, lose elasticity, and be attacked by insects and fungi and some more modern materials have inherent faults that were unknown at the time they were introduced*" (Kelley and Look, 2011). These defects get further compounded by the fact that most of the historical structures were built either before any ‘building codes’ were specified or the then prevailing ‘codes’ were quiet different from the ones in current application. Similarly, materials used and methods followed in these constructions were quiet different from the ones in practice at present. Hence, application of modern building codes and standards to heritage buildings is very difficult for making easy comparisons (Santos, 2010; Kelley and Look, 2011; Molongoski, 2012).
Thus, assessment of heritage buildings is a highly technical and complicated arena requiring assiduous knowledge of the materials, good techno-scientific skills and ample patience to bear with the associated drudgery involving complex tasks and prolonged travails demanding orderly documentation of information followed by systematic data collection.

Orderly documentation of information of a built heritage usually involves probing into the history of a building, preparation of detailed architectural drawings, photographic capture of various features and computer based digitization, wherever possible. In addition, a comprehensive knowledge of the state of different materials used in, elements fabricated thereof and structural integrity incorporated therein in a heritage structure are fundamental to assess and monitor its condition and to arrive at any appropriate and befitting conservation practice at any given point of time (Santos, 2010; Fitzgerald, 2010; Harun, 2011; Kelley and Look, 2011; Vatan, 2011).

Systematic data collection involves detailed examination of the entire building for structural fitness of all components in preserving the integrity and sustaining the longevity of a built heritage through inductive (qualitative) and deductive (analytic) approaches, of which the latter in turn involves visual examination (qualitative) and scientific probing (in-situ recording and ex-situ testing) (quantitative). Generally, it is customary to resort to the second approach as it yields full-fledged information from visual examination and dependable data from measurements made through scientific instruments and equipment (Arya and Agrawal, 2007; Ahluwalia, 2008; Piazza and Riggio, 2008; Santos, 2010; Kelly and Look, 2011; Vatan, 2011; Hu et al., 2012 and Molongoski, 2012).

The suitability of various instruments and equipment in condition assessment surveys can be found from literature. For example, Gorlacher (1987) found that Pylodin predicts mean outer density of wood with reasonable accuracy. Lokaj et al. (2007) while discussing about physical properties of solid wood in NDT emphasised that the density of wood correlates best with Pylodin measurements. The depth of Pylodin penetration is inversely proportional to wood density and serves as a reliable method in understanding the soundness of wooden members (Palaia, 2007; Palaia et al., 2011). Density is an indicator of several strength properties of timber such as
hardness, crushing strength, bending strength and shrinkage that increase along with an increase in this measure.

Similarly, two non-destructive instruments Schmidt Rebound Hammer and Ultrasonic Pulse Velocity were proved to be of real importance in condition assessment surveys (Bilgin et al., 2002; Arya and Agarwal, 2007; Hobbs and Tchoketch, 2007; Patil and Patil, 2008 and Shariati et al., 2011). Likewise, usefulness of mercury thermometer, infrared thermometer, hygrometer and moisture meter from among many such instruments in monitoring the condition of heritage buildings and places quite effectively was clearly spelled out by LeBlanc (2011).

In order to present the results of condition assessment surveys in a comprehensive and easily understandable manner, National Centre for Preservation Technology and Training (NCPTT, USA) have developed a ‘Detailed Building and Site Condition Assessment Format’ for use in intensive survey of properties damaged due to natural calamities or anthropogenic disasters (Anonymous, 2011b). The form contained nine major aspects, viz., inspection, property description, property location data, potential hazards, significance, site evaluation, exterior evaluation, interior evaluation and contents evaluation.

2.5.4 Finances for Heritage Conservation

Rajamani (2010) had suggested for the mobilisation of funds from JNNURM and other schemes to help in repairs and maintenance of heritage resources while dealing with various aspects related to heritage conservation in Hyderabad city, Andhra Pradesh, India.

2.5.5 Publicity on Heritage Conservation

Several public awareness measures as indicated in sub-section 1.10 of the first chapter were indicated by Agrawal (2002) to achieve encouraging participation of people from various walks of life to publicise the importance of heritages. Dasgupta et al. (2006), during a study on identification and documentation of built heritages in India has opined that dissemination of knowledge to the next generations by pilgrims is valuable in preserving Indian heritage.
2.5.6 Role of Locals in Heritage Conservation

Close involvement of people of a locality in various aspects related to the sustainability of heritages in their vicinity is crucial to see to the success of different inheritances and lays foundations for an effective system of collective protection. While highlighting the importance of integrating cultural heritage with tourism in Norway, Peter (2006) has opined that local festivals and school camps deliberately involve local residents in the revitalisation of tangible and intangible heritages. Poonacha (2007) observed that people are becoming more and more conscious about heritages and coming forward to share the responsibility of safeguarding them. Levi and Kocher (2009) felt that continued use of religious heritage sites by the local community should be encouraged as it provides meaning to the site and supports their preservation and maintenance.

2.5.7 Role of National and International Agencies in Heritage Conservation

Ministries of ‘Housing & Urban Poverty Alleviation and Culture’ and ‘Urban Development’ of GoI have jointly embarked upon the formulation of heritage toolkit for the protection of different categories of heritages in the country (Anonymous, 2006b). While acknowledging the importance of urban heritage, a programme to implement decentralisation and support urban development was launched by these ministries in the country during the last decade and the same was christened as Jawaharlal Nehru National Urban Renewal Mission (JNNURM). As a maiden effort, the mission requested the cities to integrate heritage aspects with planning while preparing CDPs (Singh, 2010).

As mentioned under section 1.10 of the first chapter, a number of international agencies, namely, ICOM, ICOMOS, ICCROM, IIC-HAW, WHC and SSIF promote all efforts to encourage heritage programmes and heritage conservation through several ways and means on a priority basis throughout the globe (Singh, 2010).

As a sequel of an international conference held in Jaipur, an UNESCO-led Indian Heritage Cities Network (IHCN) was founded in 2006 at New Delhi with due endorsement of the Ministry of Urban Development, GoI. The network now comprises of twenty-two Indian cities, seven French cities and regional partners, several universities, institutions and a number of NGO’s as members. Many more
Indian and European cities, regions and universities have already joined the network and yet others have expressed their interest in linkages (Ramanathan et al., 2007). The network further provides a platform for all its member cities and towns to cope up with the changes that risk the elimination of their diverse heritages through sharing of experience and expertise among themselves to achieve sustainable socio-economic and cultural development. The network supports the members through policy advice, capacity building, awareness generation, technical assistance and partnership facilitation (Anonymous, 2009a).

2.6 Benefits of Heritage Conservation

Preserving our collective past through historic structures is a noble cause that upholds the very character and pride of a nation. Fielden (2003) remarked that historical buildings indeed are valuable and should be appreciated for their cultural significance. The significance of these buildings is present in their aesthetic characteristics as well as historical, social, spiritual and symbolic values. As opined by Jayakumar (2011) heritage development offers the inalienable human right of cultural well being.

2.7 Desktop Case Studies

In order to gain an insight into various procedures and methodologies involved in undertaking condition assessment survey, three desktop case studies belonging to different historical periods were taken up. These structures bear relevance to the present context in terms either of their location in tropical region, affiliation to different historical periods, proximity to sea and built employing massive quantities of stone, wood and brick elements or a combination of two or more of these aspects.

2.7.1 Case Study-1: Restoration and Refurbishment of Old City Hall, Georgetown, Penang, Malaysia (Ahmad and Rahman, 2005)

i) Historical and Architectural Significance

Old City Hall of Georgetown in Penang, Malaysia was built in 1903 in an impressive neo-classical style. The building portrays a fine example of admirable British Colonial architecture. The Federal Government of Malaysia has listed the
same for its significant historical and architectural values as a national monument under their Antiquities Act 1976.

The Hall currently houses the Council Chamber and some offices of the Penang Municipal Council. A dilapidation survey of this Hall revealed several defects that need immediate rectification. The concept of ‘combined restoration and refurbishment’ was adopted as the conservation approach to authenticate the building, its fabric and the functional requirement as a modern office environment. The project was carried out in two stages. Stage one involved restoration of building structures, its elements, salt desalination and termite treatment, while stage two included refurbishment of interiors. The author discussed pertinent details involved in the conservation project as detailed below and refurbishment works related to the Council Chamber, main lobby, Councilors’ Offices, mezzanine floor, dining hall and toilets.

ii) Conservation Project

A condition assessment survey essentially involving the following works was systematically carried out to aid in the conservation of the Old City.

Reconnaissance Survey

A general investigation of the building interiors and exteriors was taken up to gauge the nature and extent of building problems further to the identification of remedial measures needed.

Pictorial Documentation

The building plan was categorised into grid zones and systematic pictorial documentation in digital format with particular emphasis on dilapidated zone was carried out.

Detailed Investigation

Dilapidated panels from the affected grid zones were removed while digitally capturing the condition of the building façade before, during and after the removal procedures.
a) Timber species, its scientific name and strength group were analysed by involving experts from Malaysian Timber Industry Board.

b) Original paint colours of the building and category of the paints used were identified.

c) Level of salt content and extent of dampness were analysed through laboratory tests while the composition of building materials and strength of new wall plaster were examined using X-Ray Fluorescence and Schmidt Hammer Rebound.

**Dilapidation Survey**

This survey resulted in identifying the following main defects.

a) Ceiling: Parts of old timber ceiling were found rotten due to water leakage and condensation from air-conditioning ducts. Certain portions of new ceilings sported unsightly watermarks and were also seen affected by termites.

b) Walls and columns: Some masonry walls and columns were found affected due to increased dampness that led to crumbling of plastering works on the columns. Plastering of walls and columns with cement was observed to have been done during previous repair works. The walls and columns depicted cracks, peeling of paints and organic growth. Newer walls built of boards and timber studs were seen attacked by termites.

c) Flooring: Floor finishes of mosaic, cement tiles and cement render remained in good condition.

d) Staircase: Main staircase leading to the first floor was in fair condition, but for the improper securing of rubber strips on the treads and use of balustrades of different designs.

e) Timber structures: Timber structures, especially floor and ceiling joists were found to be in different stages of damage due to infestation wood rot and attack of termites.
f) Rising damp: As the hall is only 50m away from the sea, the building was noticed to have experienced increased dampness on all plastered wall surfaces upto 2.3m above the ground in both the floors.

g) Salt contamination: Many walls of the building were seen affected by high levels of salt contamination and showed the presence of white deposits including that of Nitrate (NO₃) and Sulphate (SO₄) leading to crumbling of plaster over them.

h) Termite attack: The building was observed to be badly affected by termite attack.

i) Rainwater goods: Several rainwater down pipes including those inside the building were noted to be in a poor state.

iii) Refurbishment Works

A methodical system of recording the building condition before, during and after restoration and refurbishment was found practiced as regards the Old City hall as required by the Department of Museum and Antiquity of Malaysia. All walls, windows and doors of the building were fixed with yellow strings to form small grids of 1 x 2 m, coded systematically, then photographed, recorded in a standardised and systematic format and stored in a computer database for future referencing and final documentation.

iv) Conclusions Drawn by the Investigator

The case study revealed general poor condition of the building because of damage of wooden components by water leakages and termite attack while masonry work suffered from dampness, consequent material loss, salt contamination and organic growth. An extensive restoration work was proposed to rectify all these identified defects.
2.7.2 Case Study-2: Present Condition and Causes of Decay of Tomb of Jahangir at Shahdara, Lahore, Pakistan (Awan and Kazmi, 2008)

A detailed visual examination of the Tomb of Jahangir at Shahdara, Lahore in Pakistan was taken up by the authors in 2004 and important features are as follows.

i) Introduction

The Tomb of the Mughal Emperor, Jahangir, son of Akbar the Great is one the most significant historic buildings of the Mughal Period. According to his last wish, Jahangir was buried at Shahdara, Lahore in the garden of “Dilkusha” on the north-western bank of the River Ravi. Jahangir’s son, Emperor Shahjahan constructed his father’s tomb during 1627-1637.

Jahangir’s tomb is approached through a spacious Serai, called Akbari Serai existing in a rectangular enclosure. The interior court is surrounded on all sides by raised walkways and small rooms or cells. The tomb is a single storey square building, with octagonal minarets in the four corners, set in a luxuriant square garden of “Chaharbagh” concept.

Restoration works in the monument have been carried out regularly, with the last being restoration of the western facade of the building by the Department of Archaeology and Museums, Pakistan before this study. As the building is one of the masterpieces of the Mughal architecture, the authors carried out an investigation to find out the major causes of decay of the tomb.

ii) Causes Related to the Geographical Location

Decay causes such as solar radiation, temperature, humidity, rain, wind speed, floods and earthquakes related to the geographical condition of the building were examined.

Thermal Movement

Lahore experiences extreme climate with temperatures ranging from 0°C in winter to 48°C in summer. While exposed parts of the building are subjected to expansion and shrinkage depending upon the incident solar radiation, internal and shaded parts stable relatively. Thermal movements arising out of such situations were found to
have created stress on the building components and material leading to cracks and such other structural defects, particularly on the upper portion.

The roof decorated with different colored stones was also noticed to have developed cracks and the joints given away. Due to this, rainwater percolated into the interiors of the building and caused damage to the fresco paintings and mosaic tiles.

**Rain and Moisture**

Average annual rainfall in Lahore is 510mm. The facade of Jahangir’s tomb was built of red sandstone, which is porous. Cavernous decay of this material has resulted in marble inlay corrosion or their complete loss. Scaling and contour scaling on stone surfaces has also taken place due to repeated wetting and drying cycles. At some places, salt crystallization leading to powdering and fragmentation of stones was also observed.

**Natural Disasters**

Jahangir’s tomb is situated just 500m away from the river Ravi, which during floods acts as a source of serious threat to the monument. Due to stagnation of floodwaters in the building, especially during 1988, lower portion of the north-west minaret had bulged outward, veneering mostly disintegrated and shaft/ walls had developed major cracks. Although, Lahore is not a part of any serious seismic zone, shocks of earth shaking have led to the development of cracks in the corners of the walls and areas adjoining the openings and arches.

**iii) Causes Related to Nature of the Ground**

The river Ravi flowing close to the tomb is transmitting salinity to the masonry of the main structure through capillary action. Shallow aquifer and slushy soil below the buildings are contributing to permanent dampness of the building. These salts together with dampness have dissolved the lime mortar and caused serious disintegration of the masonry joints. The dampness had also resulted in the growth of lichens, fungi and bacteria thereby blackening the stone surfaces and disfiguring them. Excessively concentrated load upon the foundation has been also affecting the integrity of the structure as seen from the slight downward curve of the central portion. This
structural movement has further manifested as major cracks on the floor, sidewalls and vaulted roof.

iv) Causes Related to Materials and Techniques Used in Original Construction

Stones were found to have been not laid along their bed in Jahangir’s tomb and a large number of iron dowels were used for joining the stone slab veneering as well as for the reinforcement of masonry. Because of rusting and expansion of iron dowels, stones were splitting/shattering and stone veneering at places had disappeared.

v) Man-made Causes

The by-products of industrial activity, urbanisation and population pressure are the man-made causes of decay as mentioned below.

Willful Destruction

The monument had suffered a lot in the hands of the Sikh rulers, who stripped off most of the ornamentation and marble railing of the roof to décor the Golden Temple at Amritsar. Further, the monument was used as a residence by the Sikh rulers and the fire places made by them in the hall of the mausoleum had damaged its ornamentation. During the British period, the monument was subjected to more decay due to its use as a coal depot.

Neglect

The boundary wall of Jahangir’s tomb has been badly affected due to neglect and ignorance. The absence of pointing and grouting has resulted in the instability of the structure. The north and south pavilions of the garden are in an advanced stage of decay. Pavilion masonry had disintegrated and almost all the decoration had peeled off. The eastern pavilion had virtually collapsed.

Wild growth of plants and weeds was allowed in the ground and even on the walls. Sparrows and pigeons had made their nests in the building and their excreta has been promoting decay and disfiguring the beauty of building.
Atmospheric Pollution

The surfaces of stones, especially of “sang-e-badal” and marble got roughened and pitted due to air pollutants released regularly from a large industrial area in the neighborhood and automobile emissions from the Grand Trunk road nearby. Lime mortar and lime plaster were also affected by pollution with change of calcium carbonate into water-soluble calcium sulphate. The structure had become weak due to leaching off of lime mortar from acidic rains. Suspended particulates such as dust, fumes and soot had also disfigured the surface of the stone, especially the fresco work of the rooms surrounding the main chamber.

Vibration

Mechanical vibrations transmitted through the subsoil by heavy road and rail traffic had caused loss of strength of the foundation as well as the super structure, particularly the vaulted roof of the main building and the north-west minaret.

Wear and Tear by Visitors

Due to inadequate number of guards, visitors, particularly of un-authorised category damage the monuments by writing on the walls, climbing on to different elements of the building, by playing cricket, etc.

Poor Conservation Techniques

Repairs were often done inexpertly or by using unsuitable materials that reacted unfavorably with the original material and caused further damage. Altering original design and detailing coupled with unplanned conservation activities had led to the poor condition of the monument.

Restoration work carried out with poor workmanship had resulted in the damage of originality of the monument. Face lifting of the building was also carried out without structural bonding. Cement touching not compatible with lime mortar was done at a number of places.

vi) Biological and Microbiological Causes

Due to extensive dampness, the growth of micro-organisms was very common on the surface of the stone facade. Lichens and fungi have blackened the whole surface,
particularly of the dado panels. Enzymatic activity of the micro-organisms had also resulted in loosening, staining, cracking and falling of building materials. The surfaces of the white marble have developed green, red and brown spots due to algal growth.

vii) Conclusions and Recommendations

An examination and analysis of the Jahangir’s tomb revealed that the building (in 2004) was in acute need of works related to structural stability rather than a face-lift. Therefore, further efforts should concentrate on regular maintenance of the building and its precincts. Regular pointing and grouting are necessary to strengthen the structure. The structural problem of the north-west minaret needs an expert’s investigation before the initiation of any remedial measures.

The prime cause of deterioration of the building was found to be salinity that has been seriously and continuously affecting the masonry work. This is not only creating structural problems, but also damaging the decoration details of the mosaic works and fresco. Hence, specific control measures are needed to check this impact to prolong the life of the monument. Encroachments along boundary walls also need serious legal action to restore the surrounding benign environment of the monument.

2.7.3 Case Study-3: McCollum Hall, Structural Condition Assessment (Anonymous, 2009b)

i) Introduction

McCollum Hall is a historic building constructed in 1938 at the northeastern corner of Martin Luther King, Jr. Boulevard and Cranford Avenue, Fort Myers, Florida. The building consists of a single-storey structure to its west and a two-storey portion to its east. The single-storey building and lower level of the two-storey building were used (originally) as a business occupancy and the second storey as a dance hall.

The structural system of McCollum Hall consists of multi-dimensional brick and block load bearing walls, brick and timber columns, wood stud bearing walls, wooden beams, joists, bridging, sheathing and tongue-and-groove decking reflecting early modern architectural style.
A condition assessment survey based on detailed visual examination was undertaken adopting the following methodology to understand, evaluate and recommend guidelines needed for its rehabilitation.

ii) Survey

Study of Previous Reports

Previous preliminary condition surveys and national registers (for historical places), registration form etc. were examined as supporting documents to the report.

Architectural Drawings

Architectural and engineering drawings of the building were studied and analysed.

Discussions

Discussions with the staff of the hall were held to obtain information regarding structural additions and omissions within the building during the past.

Site Visits

Visual investigations were carried out in the hall and its condition documented. Condition of the exterior envelop, the interior and exterior load bearing walls, columns, beams, joists, bridging, wood floor sheathing/ decking, wood roof sheathing/ roofing, slab-on-grade surface condition and windows, doors, louver was assessed.

iii) Evaluation

"McCollum Hall is in an overall “Poor” structural condition. Some components are rated “Fair” and even “Good” while most of the components appear to be in poor condition. The structure is about 71 years old and has experienced numerous years of moisture penetration; in addition subterranean termites and insects are causing significant decay to wood framing."

iv) Suggestion by the Investigating Agency

Based on visual investigations the service provider recommended, “Improving the general structural condition of historic McCollum Hall require significant
replacement of wood structural elements including load bearing walls, beams, joists and rafters."

2.8 Formulation of Management Plans

Manpower, mainly of two hierarchal levels is essentially required to take care of various heritages in a place on a regular basis and consists of managers at the top order and caretakers at the lower level besides administrators and techno-scientific personnel responsible for heritage management planning and execution. The managers shall be fully aware of the complete value of a heritage in its all perspectives and are to be delegated with the general management of all affairs concerned with a heritage including philosophy; human resource management; communication; regular maintenance; environment upkeep; material safety; outreach to students, tourists, public; etc. The caretakers shall respect the importance and necessity of heritages together with their concepts and contents and are to be assigned the duties of good upkeep, safety of different structural elements and security of the precincts. Towards this, suitability qualified persons shall be recruited and be given ample training. The importance of qualifications and training to youth for inducting them into the field of heritage upkeep and sustainability was outlined by Agrawal (2002).

As pointed out by Tiwari (2002), effective urban planning implementation strategies should include protection of natural environment and conservation areas of cultural heritage. The legal aspects related to heritages are widely deliberated (Kathpalia and Lambah, 2002; Anonymous, 2004a; 2007a, d; 2010a, c; 2011a; 2012e, f; Thakur, 2007; Kapadia, 2009 and Agustiananda, 2012) whereas the management planning tools remain more or less restrictedly dealt with (Anonymous, 2004b; 2006c, d; 2007c, d; 2010b, c; 2011a, b and Nayak, 2009) both among local governing bodies and research circles as pointed in the above paragraph.

As a part of planning team, Chitra and Sharmilee (2010) suggested for the creation of a heritage conservation committee while Anonymous (2011b) establishes the need for setting up a heritage cell in Datia, Madhya Pradesh that focuses on the existing models of heritage conservation and suggests for the incorporation of heritage cells in various other urban local bodies across India with appropriate modifications.
Cultural properties that are deemed to be of sufficient heritage value after due identification shall be recorded in a heritage register as it forms the basis of a successful heritage management system. Rivett and Busgeeth (2002) proposed a heritage register for the South African heritage resource agency to record list of all declared heritage sites and include location; geographical coordinates; title deed details; listing particulars; zoning area; historical, cultural and aesthetic significance and photographs. Similarly, heritage register maintained by the Department of Environment and Heritage Protection of Queensland in Australia records information on the identity, location, address, construction period, classification, category, type, style, theme, designer’ name, builder’ name, fabric and construction method (Anonymous, 2010b).

2.9 Conclusions

Through the overall review of literature, it is observed that the society, at large, desires to sustain different kinds of heritages indefinitely to satiate many of their feelings while deriving inspiration for marching ahead in several facets of life. The literature further reveals that fortunately there is no dearth of these resources in India and for that matter elsewhere in the world. The constitution of India as well as the country’s preamble inculcates a sense of responsibility to the citizens towards protection of heritages. However, due to several reasons explained in the preceding review, majority of heritages in the country, particularly those existing outside the metropolises and a few other cities; are prevailing under ‘Damocles’ swords’. Therefore, it is understood that conservation of heritages in places big and small needs to be ensured through an understanding of the latest approaches, legal mechanisms and management methods at various provincial levels. These approaches chiefly involved inventory, designation, condition assessment and management besides legal framework, of which the first four aspects were addressed during this study deriving guidelines and directions from this chapter.

In the case of inventory, several researchers considered cultural history, architectural character and environmental features as the three prime parameters that qualify a historical structure as a heritage. Hence, the same were adopted during the present study for carrying out inventory of heritages present in Visakhapatnam Metropolitan Region.
In order to categorise different built listed in the inventory into different heritage typologies, twenty relevant nomenclatures from among the many themes adopted by UNESCO for assigning outstanding universal value to cultural heritages, were adopted namely, Commemorative architecture, Cultural associations, Developing knowledge, Developing technologies, Domestic habitat, Educational institutions, Equipping historical buildings, Gardens, Military architecture, Palaces, Parks, Public buildings, Public-cum-recreational buildings, Recreational architecture, Religious architecture, Religious-cum-commemorative architecture, Residences, Symbolic associations, Trade and Transport systems.

The architectural styles of heritage buildings were mainly influenced by the background, culture, aesthetics and richness of the rulers who erected them. Hence, architectural styles can be conveniently categorised by considering different regimes of rules.

Further the literature review has revealed that there is no specific universal procedure for designating heritages and that each State acts on the matter based on merits identified by it. Also, majority of investigators appeared biased in awarding weightages according to their subject choice or other preference that cannot be justified as every heritage is important as an entire (single) entity rather than any single aspect or facet of it (the heritage). Hence, departing from all other earlier systems; an unbiased, logically justifiable and rationally appropriate rating system leading to designation of various heritages into one of the three heritage grades (I, IIA, IIB and III) identified by the GoI was developed during the present study.

From the review of studies on condition assessment of heritage buildings, it is deciphered that documentation of all structural details of the built at the first place is fundamental to pave an easy way for actual assessment work. As made out from literature, understanding the state of different materials used in, elements fabricated thereof and structural integrity incorporated therein in a property are necessary to prepare an appropriate and befitting condition assessment survey document. These objectives were found to be achieved mainly through visual examination followed by in-situ non-destructive testing that are further supplemented by ex-situ destructive testing in exceptional instances, if warranted.
It is found from the desktop case studies undertaken in this chapter coupled with the literature review on the subject that pictorial documentation is carried out through photography and architectural drawings through computer programmes. The affects of thermal movement, rain and moisture, natural disasters, salinity, manmade causes such as willful destruction, neglect, atmospheric pollution, vibration, wear and tear by visitors, conservation techniques and biological and microbiological agencies were assessed through visual examination. Detailed scientific investigations were conducted through the use of various portable instruments such as mercury thermometer, infrared thermometer, hygrometer, moisture meter, Pylodin, rebound hammer and pulse velocity gadget and laboratory equipment such as strength testing machine. The species of timber used in various building elements were identified on the spot with the aid of ‘identification key’ using field lenses.

In order to comprehend the results of conditional assessment of built heritages, a report form was developed to suit to the current requirement considering a similar format developed for the purpose by the National Centre for Preservation Technology and Training (NCPTT, USA) as a prototype.

From the literature review on management plans, it is identified that a mosaic of manpower representing of an array of relevant fields as well as a potential management plan encompassing a range of effective strategies are found essential to realise the cherished common goal of upholding built heritages at the pinnacle of their grandeur. The review also clearly pointed out that a management plan shall be critically distinguished from the legal framework and shall consist of administrators, planners, techno-scientific personnel and local representatives besides being backed up by suitable working machinery to take care of all records and documentation.