International Journal of Grid and Distributed Computing
Vol. 13, No. 2, (2020), pp. 85-89

Sustainability through Adaptation of Spaces and Upcycling of Building Material

Chetna Raje[1]
[1]*Ph.D Research Scholar, Department of Resource Management, Sir Vithaldas Thackersay College of Home Science (Autonomous), SNDTWU, Juhu Campus, Mumbai – 400049. Email : craje@svt.sndt.ac.in*

Abstract

Architectural and design studies help define the cultural, behavioral and environmental issues that affect and may arise from the built environment. It is pertinent today to design habitable spaces with responsibility and emotional intellect so as to realize sustainability. The understanding of sustainable design is fundamental to all levels of educations. The primary growing global concern today is linked with waste management and climate change. The planners and designers of space therefore need to mitigate the impacts of negative footprints of development through not only scientific study for the modern solutions, but also by examining the historic data on built up spaces. Native habitats are an important base of contemporary architecture. The Indian sub-continent offers indigenous and rich montage of art and heritage spaces with diversity in materials and design elements. This has evolved from a long-established socio-cultural influence and offers lessons on sustainability. Similarly, the changing trends in designing today propagates reuse and reinvention of material like furniture, fixtures and articles that have lost their primary value original in due course of time and context. It is an agreeable effort to imbibe the culture of reusing architectural salvage for social benefits, especially in developing countries, where resources are scarce and unaffordable to a large population. This paper aims to explore concept of adaptation, and upscaling with artistic evolution of spaces keeping conservation as the core of the process and apply the best practices in the pedagogical domain.

Keywords: *Design, Crafts, Upcycling, Adaptive reuse.*

Introduction:

In a wide sense, ***sustainable*** means to keep in existence, to be capable of being continued with minimal negative effect on the environment. Because of the ecological roots of the term, it is mostly used to address environmental and climatic concerns. The climatology and energy experts opine that it is because of the world's huge consumption of energy, there is a need to re-use, re-place and re-cycle the present resources much more so as to decrease the rate of using up energy resources and to slow down global warming. The right practice of conservation can maximize the use of the existing materials and infrastructure and in return reduces waste caused by demolition and energy put into the production of new materials and construction. Many facets of historic buildings were developed with reference to aspects like climate and site situation, in purview of sustainability build. If correctly conserved, many old buildings can serve future generations for many years to come.

Sustainability practices:

ISSN: 2005-4262 IJGDC

The concepts of adaptive reuse, upcycling and reinventing for aesthetic evolution and conservation of the spaces are valued best practices to promote concerted efforts towards sustainability. This paper looks at how resources need to be recontextualized with upcycling and adaptive reuse as part of remedial practice for the suffering global ecologies, as well as the practical aspect of upscaling for professionals.

Adaptive reuse:

The story starts when the conservation movement was born in Britain in 1957. Even adaptive reuse was developed because it is one of kind intervention. Now it is most popular because it is, consider most sustainable and economical (Latham, 2000). "Adaptive reuse is often the only economic way in which old buildings can be saved, by adapting them to the requirements of the new tenants. This could sometimes involve radical intervention, especially in the internal organization of space"."(Fitch, 1982). It can be considered recycling of the building. The process helps property to regain life and become compatible with present surroundings through repair, conversion, extension and rehabilitation.The important parts, which convey historical, cultural and architectural values, are to be preserved. When a building is no longer used for its original function, it is wise to adapt a new use, which helps to sustain it in the new environment. New use can bring new energy and life to exhausted buildings (Latham, 2000).

Much of today's building activity takes place in sensitive historic environments and architects are often engaged in redesigning existing buildings. It is therefore essential for students of architecture to be aware of the philosophy of conservation of historic and vernacular buildings. A combination of academic teaching and practical projects constitute a hypothetical approach and implement an educational strategy which leads to students acquiring the skills for an interdisciplinary, holistic approach towards the rehabilitation of traditional settlements, and helps them recognize and assess their different values. Whenever a building is recycled, by opting for refurbishment rather than demolishing and rebuilding the structure then a large amount of energy is being saved by avoiding the need to extract raw materials and convert them into a replacement building. Smaller scale refurbishment, for example; when the existing structure and the external building envelope are retained, will clearly yield the greatest energy savings, but even the more drastic renovations, where larger scale refurbishment takes place involving the structural aspects and the refurbishing of the outer leaf will mostly use up considerably less energy resources than the choice to demolish and rebuild. (Highfield,2000)

Upscaling practices:

At the individual level, renowned designers, ordinary individuals, and even marginalized communities with limited knowledge have developed upcycled products (Sung, Cooper, & Kettley, 2014), creating interest and trends towards upcycling. The growing number of publications on upcycling in various subject areas also shows that the concept of upcycling has received more attention from numerous business practitioners, researchers, and craft professionals and hobbyists in recent years related books have been published since 1999.

Upcycling is an activity that utilizes the limited affordance of the discarded products to develop a new product (or material) of comparatively better value (McDonough & Braungart, 2013). Upcycling activities have proved to be effective in delaying waste disposal (Singh & Ordoñez, 2016), eliminating the need for new products, enhancing the aesthetic value (Sung & Cooper, 2015; Wilson, 2016), and consuming less energy in material circulation as compared to recycling (Nilakantan& Nutt, 2015). Particularly, in the case of developing and underdeveloped countries, upcycling is a suitable option to discard recovery (Slotegraaf, 2012), where the other waste management techniques, such as recycling, biodegradation, landfilling, incineration, etc., are not

ISSN: 2005-4262 IJGDC

efficient irrespective of latest technological interventions due to system and service level limitations (Guerrero, Maas, & Hogland, 2012; Hoornweg & Bhada -Tata, 2012). The benefits of upcycling are discussed on the basis of the three pillars of sustainability – economic, environmental and social sustenance. Environmental benefits included solid waste reduction (and prevention), space saving, raw materials use reduction, energy use reduction, and greenhouse gas emission reduction. Economic benefits include cost savings and new profit opportunities for manufacturers, entrepreneurs and consumers. Social benefits in developing countries are mostly poverty alleviation and, in developed countries are more relevant to psychological wellbeing and socio-cultural benefits based on individual upcycling. These benefits, however, are mostly generic and vivid rather than specific and quantified unless the papers deal with technical aspects of the upcycling process. (Kyungeun Sung 2015)

Tendering Upscaling through Curricular platform:

In context of the curricular integration, the Department of Resource Management at Sir Vithaldas Thackersey College of Home Science (Autonomous), SNDTWU, Mumbai, introduced a course for students at the final year level. The practice of using discard products to create products with novel applications started in 2014, when the students were given challenge to create products for the annual exhibition ' NIRMITI' by keeping green design as the base. The students then salvaged the discarded furniture, mannequins, crates, bottles and other paraphernalia. This initiative was the basis to introduce a new course in the restructured curriculum. A survey was initiated to review the actual acceptance and issues of the Upscaling practice along with introduction of this course.

Course - "Creative Upscaling of Dry Waste"

- Apply basic creative thinking to convert waste to utility object
- Recognize the importance of architectural salvage
- Develop entrepreneurship abilities through recycling products

Methodology:

A study was conducted with purposive sample of young Architects and Designers (25 to 35 yrs. age group) who had some experience of working on projects with Upscaling designs. The questionnaire was administered with a range of queries covering their work experience, their opinion on the practicality of such projects and the barriers in design implementation as well as economic factor. A five point Likert scale was introduced for validating the practical aspect like advantages and challenges of upscaling from the respondents.

- The size of sample taken was 55 and responses received were 42.
- Of the total respondents 31 were females and 11 were males.
- Years of work experience for Interior projects between 5 to 15 years
- Mean of responses for type of projects work on in percentage :
- Regular projects with new refurbishment – 80 %
- Upscaling style of Interior Projects – 15 %

Table No 1: The varied parameters were checked for advantages and challenges of Upscaling Design projects on 5 point Likert scale -

Points for consideration	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree

ISSN: 2005-4262 IJGDC

Upscaling salvages important resources like wood, glass, metal work	***30***	***9***	***3***	**-**	**-**
Allows reuse of vintage material in contemporary backdrop	***30***	***9***	***3***	**-**	**-**
Contribute positively environmental solutions	***28***	***10***	***2***	***2***	**-**
Economically viable to use upscaled products in designing	***24***	***10***	***3***	***5***	**-**
Upscaled products and design elements need lot of research	***28***	***12***	***2***	**-**	**-**
Resource Procurement is easy	14	15	-	10	3
Needs workshop space to create or fabricate products	18	15	-	7	2
Needs warehousing	18	17	-	5	2
Products and created interior spaces do not have a finesse	9	13	3	10	7
Convincing clients for use of upscaling concept is a challenge	***14***	***19***	***5***	***4***	**-**
Marketability of products is weak	***15***	***15***	***7***	***5***	**-**
Economic returns are not comparable to fresh products as the finished look of new products is always better	10	11	3	12	6
Do not wish to promote upscaling as an allied profession for designers	7	12	9	6	8
Upscaling is here to stay	12	15	5	6	2

Findings and Discussion:

The above data indicates a positive trend towards upscaling from the professional perspective. More than 75% respondents are agreeable on the ecological benefits, application of vintage material in contemporary designs and more importantly salvage of important resource like wood. The agreement is more towards economic viability of using upscaled products in space planning.

The challenge of upscaling as a professional engagement is due to low marketability of products which is stemming from peoples perception that upcycled products have close associations with bad finishing, reduced durability and low cost effectiveness. (Sung, K., 2015). Another important barrier to progress of upscaling practice is that convincing the clients is not an easy proposition. Majority of people perceive upscaled product as handed down.

There is a stark disparity in opinion amongst the professionals on queries related to space requirement, procurement of material and promoting Upscaling as an allied career for design professionals.

Conclusion:

New age restaurants , pub lounges, boutiques are designed by extensive scavenging of the valuable discards from various premises, also termed as *architectural salvage.* Advent of Heritage hotels exemplifies the philosophy of adaption to fit the present demand of sustenance as well as preservation of history with its unique splendor. The magnificence of historic monuments retained through intelligent use of spaces and generation of steady monetary resources for

subsistence. Specialist enterprises have been floated which propagate the concept of upcycling / upscaling in refurbishment of spaces. To a large extent, the process of salvage can be converted into a fairly manageable enterprise and livelihood.

Institutional curriculum is a vital platform to publicize the upcycling practice. It is an agreeable effort to imbibe the culture of reusing architectural salvage for social benefits, especially in developing countries, where resources are limits and unaffordable to a large population. It is vital to apply the best practices in the pedagogical domain, looking at possible implications of the principles of 'upcycling' and value adding through design as a means for educating global citizens.

References:

1. Barco B. (2002). *Historic Cities Moving towards Modernity*. *World Heritage papers*. World Heritage Shared Legacy, Common Responsibility Associated Workshops11-12 November 2002. Urbino, Pesaro – Italy
2. Chokshi, S., (2013). *The journey of sustainability-the Indian vernacular and beyond.* Green Building Workshop, NME-ICT, IIT Bombay.
3. Correia, Carlos & Rocha (2014). *Vernacular Heritage and Earthen Architecture: Contributions for Sustainable Development.* London :Taylor & Francis Group.
4. Dilawari V. (2010). *Historic Housing and Urban Regeneration :Mumbai* Conference Paper; UNESCO- September 2010.
5. Eds D. Watt, B. Colston (2002). *Conservation of Historic Buildings and their Contents*
6. Björkvall, Anders & Archer, Arlene (2016). *Ecologies of 'upcycling' as design for learning in Higher Education* . Conference proceeding ; Designs for Learning, Copenhagen, Denmark, May 18-20, 2016
7. Highfield, David (2000). *Refurbishing and Upgrading of Buildings*. E & F Spoon, London
8. Khan, Amaltas; Tandon, Puneet (2018). *Design from Discard: A Method to Reduce Uncertainty in Upcycling Practice*. Design and Technology Education, v23 n2
9. Guerrero, L. A., Maas, G., &Hogland, W. (2013). *Solid waste management challenges for cities in developing countries.* Waste Management, 33(1), 220–232.
10. McDonough, W., & Braungart, M. (2013). *The Upcycle: Beyond Sustainability - Designing for Abundance.* New York, NY, USA: North Point Press.
11. Singh, J., & Ordoñez, I. (2016). *Resource recovery from post-consumer waste: important lessons for the upcoming circular economy.* Journal of Cleaner Production, 134, 342–353.
12. Slotegraaf, R. J. (2012). *Keep the door open: Innovating toward a more sustainable future.* Journal of Product Innovation Management, 29(3), 349–351.
13. Sung, K. (2015). *A review on upcycling: Current body of literature, knowledge gaps and a way forward.* International Conference on Environmental, Cultural, Economic and Social Sustainability, 17(4), 28–40.
14. Sung, K., & Cooper, T. (2015). *Sarah Turner – Eco-artist and designer through craft-based upcycling.* Craft Research, 6(1), 113–12
15. https://cpwd.gov.in/Publication/ConservationHertbuildings.pdf

ISSN: 2005-4262 IJGDC