A Study of the application of the 'salvage' concept as a material usage in Architecture

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Master of Science in Architecture

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Introduction

Introduction

A. Topic explanation

The word 'Material' is a key term in Architecture. The word 'Salvage' is a significant term in materials. A deeper meaning of these terms involve in what we can do to contemporary architecture.

'Material' means that from which something can be made. 'Building materials' help to form architecture. Architect creates architecture from any kind of materials, because any living being can create or built their living quarters using available materials.

Utilization of available materials in building construction has been a basic concept since in the past. Development in technology has caused diverse impacts on Architecture, Economy and Environment. Waste can be introduced as one of the faces of it.

'Salvage' is saving and using waste materials. 'Saving' is avoiding wastage. The concept of 'salvage' could be applicable for scarce conditions appearing in the provision of natural resources. Waste is a burden for eco-system and could be turned out into valuable utilitarian benefits in the global economy. Considering 'salvage' materials as a requisite for architectural work, gets back to a significant history. However the concept of 'salvage' emerge in various cultures in varied forms. But nature of 'salvage' materials is important of its reusability.

In Sri Lanka as a developing country, selection and material allocation in the construction field is most cases are very critical. This study will lead to identify, how wastes are used as building materials n an architectural point of view and how it can be applicable to Sri Lanka.

B. Need of the study

Sri Lanka is a country with traditional values and beliefs prevailing among her people. Therefore waste materials they neglect and see as thrown out rubbish. There arises the question "who made rubbish". The answer will be too difficult as for as maintenance and protection of their possessions are concerned. From external cleanliness comes protection of the body and maintenance of accessories in life. If this is understood no new material will be quickly necessitated in place of used ones as old looking.

The architect will not like to see waste materials staked up in the surroundings. On the other hand creations for clientele is the essential nature of the scene. In one hand value of architecture is lost there by. The poorest needs more attention of the architect and governance should be there for his good service and expenditure of the poor client. Therefore salvage concept, which had not been paid much of an attention or help the creative ability of the architect to directly venture into it while safeguarding his academic output is a thing mainly to be considered by the public and the governance as a global necessity to prevent from prevailing poverty and environmental hazards.

In the history of living beings, they had architecture. But they are not architects. Their natural needs Leeds to create architecture. In Sri Lanka most of the slum & shanty dwellers, made their living spaces by using various discarded materials. They innovatively used discarded waste materials only to fulfill their purposes without any architectural sense or knowledge. But they nicely detailed and combined each material together very concerning about the available minimum resources. The architects can influence that, how the minimum resources and waste materials are utilize in a congested situation.

Utilization of waste material in technologically cannot be considered as an immediate possibility for the purpose. But it could be feasible enough to categorize certain aspects in architectural projects until an economic growth for processing technology is acquired in the field of salvage culture.

Salvage concept should be further studied with the assistance of developed nations in technology and possible aid programs. Until such time architects could use their potential knowledge to utilize certain possible aspects without going into expensive cost factors in selecting materials for their inventions.

Historically the attitude of using salvaged (agro) materials by Sri Lankan for dwelling purposes had been totally forgotten due to deceitful nature generated by foreign influence. In the past available building materials were stone, thatch, iluk, mana, cow dung etc. Present society ignores what had been very valuable to a healthy growth of a society because the trend is to use synthetic materials without architectural sense.

The concept of 'salvage' has varied appearances in past time in different cultures. In western culture, it was used as a trend and in the mean time it had been used as an aim of demolishing social attitudes too. Also they have paid their attention to make use of this salvage as building materials due to lack of resources. But in an Asian country like Sri Lanka, it appears as a habit of protecting antiques and to exhibit the proud. Here the nature of salvage materials is different rather than the waste materials in west. However houses of destitute people, who suffer from lack of resources, have been built using this kind of waste materials.

The need of this study is to recognize the importance of construction in relevant qualities of salvage materials, which could be used in contemporary architecture. It is the responsibility of the architectural scholars to study feasible methods using waste materials that could be assemble at their original state or other possible methods.

C. Intention and Scope of the study

It is necessary to develop a new contemporary architectural style to suite the current issues and to make the best use of waste material. The intuition of the architect and his abstract form of material selection is basically needed for his creation. As the country has already faced up with a grave situation and search of possible clues for her environmental hazards occurred due to scarcity of natural

resources diminished due to greedy economic reasons. Adventuring deeply into the subject, the dealer architect should be a promising environmentalist with a balance mind to create its true meaning as an economist and sociologist.

The main intension of the study is to recognize how effectively the architect could use salvage materials in his creative works qualititatively. The meaningful way of handling work should not be purposely bent on expensive new materials but to visualize thrown out waste as a new market potential substituting the idea. There are thrown out substitutes in constructional schemes, industrial production units and sometimes even in dump yards. Salvage as a true concept could be promoted meaningfully by utilizing the architects creative knowledge and inventive outlook.

Methodology

1. The study will begin by the role of materials played by architecture and contribution of material usage in it in relation to historical periods and modern civilizations, which had effect the global condition. The usage of materials in architecture is a complicated exercise incorporating equilibrium which should be there in the ambiance in terms of architectural expressions, cost effectiveness and environmentally sustainable.

2. Literature review on 'Salvage' culture as an architectural point of view and its philosophical background in different cultures. Considering the present global situation with the effect of salvage culture and its utilitarian value as a solution, the architect must be the supreme of it. Special interest should be paid by Sri Lankan situation of material usage in past and present.

3.The study will be discussed under locally and internationally.

i._Identifying types of usage of salvage materials in Sri Lanka and the expectation from it. Then the photographic study and participatory observation of usage discarded materials in low-income people, what they expect from architecture.

These studies will be discussed under the achievement of 3 considerations in material usage.

Sri Lanka

a. Antique expression - Lunuganga

b. Modern interpretation for informal expression - Steel house

c. As a method of cost reduction - Non architectural works

ii. Then identify the poverty driven program in Alabama, how they used 'salvage' materials as its true meaning. It is mainly discussed under the main stream of cost reduction with its architectural expression.

Alabama Rural Poor community

a. Brayant House

b. Yancy chapel

c. Children's Center

Past - "Architecture follows materials"
Today - "Materials follows Architecture"
- D.Airapetov

Chapter One

1 The Relationship between material usage and acceptance in Architecture

Introduction

" By the use of raw materials and starting from conditions more or less utilitarian, you have established certain relationship which have aroused my emotions. This is Architecture." (5)

Availability & choice of materials and construction techniques contributed in an architectural occasion extensively influence modification of form of buildings. From early days building techniques answered to physical problems of nature like wind, rain, cold, humidity, hot, radiation. In order to respond these factors, materials and construction altered as modifying factors in the process throughout.

Our ambiance changes momentarily because of immutable laws of nature uncontrolled by human activities. The latter originated biologically at the beginning of human civilization, man with intuition endeavoured to process, close-up spaces to respond the ever-changing attitude of ambiance. At the very inception homo-sapiens made their enclosures comfortable to themselves using available materials with a basic knowledge in technology inborn among them which had, had evolved with time. Early men were unaware of modification factors to cope against the changing ambiance. They were also ignorant of reforming what they have already acquired for living but were able to use available materials to make them better. As time evolved their ability was developed intuitively to modify materials and apply technology in constructing their dwellings. Since then modification techniques were gradually recognized and available materials were used in a better way of living.

1.1 Role of materials in architecture

Generally materials visible in architecture are to obtain structural stability, symbolic expression and protection from climatic conditions. Earlier different materials diversified methods were used for the purpose. And as a result new kind of architectural materials have been produced today. The materials have a tendency showing symbolic expression among different cultures from time immemorial. Not only cultural differences but also climatic conditions have been taken in to account and could be seen through historical evidence world over. Thus the modern world provides new materials through their scientific a technological skill.

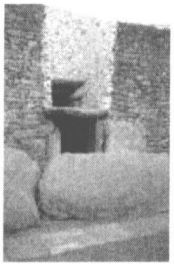


Figure 1:Megalithic stone structure at New Grange.
(Source: www.shee-eire.com)

Painting, sculpture, music, poetry etc., all have a medium of expression and are extended in different forms. Recognition of Architecture has a material as a medium to express their meanings. Early men were not knowledgeable about the true aspect of useful materials available in their surroundings. The non-eternal, impure and painful qualities regarding ignorance in man could not properly recognize material usage until reformation took place in the chapters of history.

As a result, sub sequential man came to understand the hidden secrets of nature and utilization of available materials in the formation of dwellings according to different climatic conditions. In the evolution of mankind, modification of their dwellings and recognition of useful materials channeled out technology in architecture. Today man has attended a peak position in the usage of synthetic materials, which opposes the natural condition of life.

1.2 Historical evolution of usage of materials

Building construction is an ancient human activity. It began with the purely functional need for a controlled environment to moderate the effects of climate. Constructed shelters were one means by which human beings were able to adapt themselves to a wide variety of climates and become a global species.

12000 BC hunters of the Stone Age, who moved about a wide area in search of food, built temporary shelters as circular stone rings. Later crude huts were made out of animals' skins, wood and clay found in their resources.

Figure 2: First stone structure- stone henge
(Source: Architects and Architecture)

Bronze age and urban cultures were developed in river valleys Nile, Tigris, Euphrates, Indus, Howan Ho and other places as well. Building industry developed and cities came up with remote technology developed among them, and resource were found for further development. Indigenous material usage was generated as a result of technology and science.

Egypt built cities with mud bricks, as timber was scarce. Only royal buildings were built with limited timber. New technology was born out of religious activities occurred during the 4th dina (2575 BC - 2465 BC) in Egypt unlike Mesopotamia and Indus valleys had deposits of several materials for Elite construction of state buildings.

Figure 3:Solid construction - Pyramids of Giza in Egypt.
(Source: Chronicle of the Pharaohs)

Since 1800 BC Greek culture was developed under the influence of Egyptian and Mediterranean cultures; stone temples were built since then. The constructions were largely built by marble and limestone.

Later the Roman builders who followed the Greek, however, exploited masonry to its full potential. From Etruscans of northern part of Italy, Roman derived building technology. Stone arch was created and developed by Etruscans who had a highly developed terra cotta and fired brick technology. Later in southern Italy brick arch and span opening in walls were developed. Mortar was made out of sand, Lime and water for the first time. Then Renaissance period recover Roman technologies including timber trusses.

In 1st Industrial Age large-scale production of iron was developed. Which was known as industrial revolution occurred during last half of the 18th century. The second industrial age which began in about 1880, mass production of materials and new building forms were developed. Steel was chosen as the principal building material. It was exhibited through Eiffel tower.

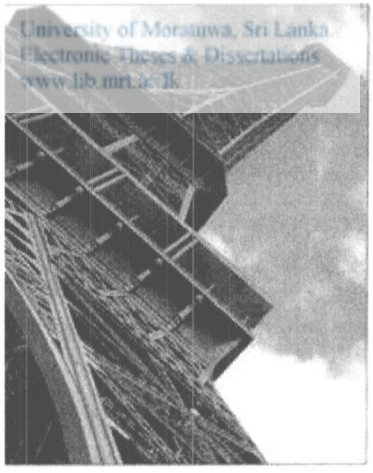


Figure 4: Large-scale iron structure - Eiffel tower in Paris.
(Source: 20th century architecture)

Building construction today is a significant part of industrial culture, a manifestation of its diversity and complexity and measure of its mastery of natural forces, which can produce a widely varied built environment to serve the diverse needs of society.

1.3 Factors of consideration in usage of Materials in Architecture

1.3.1 Architectural expression

According to interest of the society, their desires and wishes should be psychologically formulated to satisfy their needs in built form. Architectural designing should be basically integrated with important psychological, functional, economical, climatic, aesthetic factors and other personal requisites, which result in harmony at last. Built forms serve certain utilitarian functions. The major function being the aesthetic appearance factor coordinating utilitarian value which constitute the meaning embodied in the relevant built form. However it should not be regarded as a decorative organ of an addition, but as a comprehensive expression of its function, and also as the ultimate truth of its creation. At this stage, the truth of creation in a built form is analogous to the concept of comprehensive expression. It may be observed that truth covers up component user; activity pattern, context and higher purpose are recognized generators of expressions in architecture.

1.3.1.1 Generators of Architectural expression

"Architecture is an art; & art is a means of communicating truth about itself and its context. The subtler that this communicating is the more successful will that work of architecture be (the more complex is the work of system of truths communicated, the more the piece of architecture becomes expressive) often, the building itself, the brief, determines the truth should communicate & the hierarchy these truths should adopt. Historically these truths are seen to include the truth about the 'people' that use it, the 'activity pattern' that goes with it, 'context' it is in, and often a' higher purpose' it may have to perform". (23)

In any work of architecture the generators create particular circumstances. These circumstances are the demands and they facilitate with the built form. To fulfill the demand it requires specific architectural quality and expression, which manifest through the built form with display of materials. Above generators are true to nature when architecture is proved to be true. These generators are the initial factors, which support the base for evolution in any work of architecture.

a. User

Generators of expression are given to convey a contemplated message of a built form and vary according to user requirement and intact portion of the truth of its creation than the symbolic expression. Built form should represent the reality of the user life.

"Architecture must transmit some thing meaningful to senses and minds of those who interact with it, who read it."

(Sukle Abby-1980)

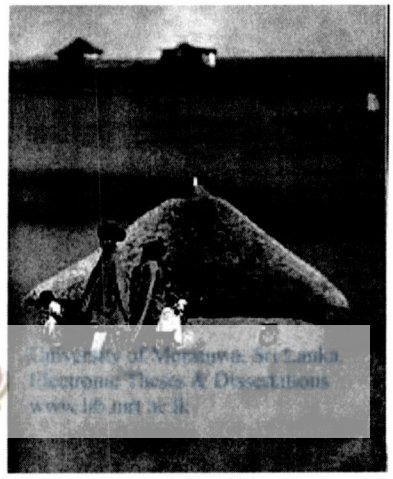


Figure 5: Traditional house in South Africa
(Source: South Africa)

Due to differences and in values and attitudes of people, their responses vary and it affects to the built form.

b. Activity pattern

"The architecture must be beautiful, but it should be more that. It must enclose space in which certain activities can take place comfortably and effectively."

Robert Sommer

This implies how much important is an activity pattern when creating spaces in architectural planning. All units of space in it should be characterized and

meaningful. Aesthetically appealing good works of built form enhance that. It could fit into user comfort at all times.

Figure 6: Central open area as a gathering space
(Source: Charls Corea)

c. Context

Context is the physical boundary of nature for man-made things. Our spaces should tally with the physical environment. Every built form should have its own context. A particular context shapes the built form climate topography, vegetation, water resource, and with other related objects.

Figure 7:To suit the hot climate arranged the built form.
Material expressed it built form.
Taos Pueblo, New Mexico
(Source: A sence of place, a sence of time)

d. Higher Purpose

Evolution of mankind and purpose of life subsequently have become a complex situation today. In the beginning man protected himself from the difficult physical environment and gradually created need for shelter and advanced his knowledge in purpose of living. As time evolved along the way with religious and political belief, Higher objectives were gradually developed his skills with abstract language, signs and symbols.

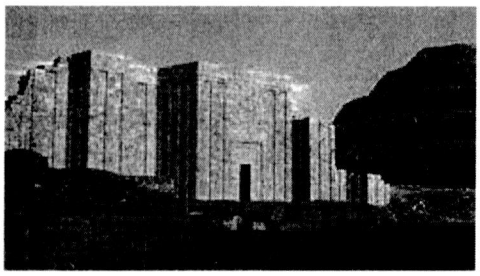


Figure 8: The temenos wall surrounding the Djoser's Step Pyramid complex can only be entered at one point.
That funerary monument was that of an area for the spirit, focused on the pyramid itself.
(Source: Chronicle of the Pharaohs)

1.3.3.2 Contribution of materials and modes of architectural expression

"To create any type of place, space must be enclosed. The availability of and choice of materials and construction techniques in an architectural situation will greatly influence and modify the form of buildings" (19)

a. Form

"Form is an abstract idea. Design is its material application"

- Louie Kahan

Form means the third arrangement of a built form. Built form can be distinguished as a composition of elemental forms in the existence space. Architectural forms have to be natured and matured of material employment and function. According to physical and social context of the environment the form of building is modified. Modification of variant form in architecture is known as 'Shape'.

b. Shape

"Shape is the principle identifying the characteristic quality of form and shape results from specific configuration of forms, surfaces and edges."(5)

Composition of the form implies the unity of different scales of propotions and enhances quality of the shape, which is identified as,

i. Building elements
ii. Texture
iii. Colour
iv. Ornamentation.

i. Building elements

Visual appearance of built form can display building elements; known as roof, entrance, fenestration walls, columns, and are composed according to correct scale, proportion, positioning, solid, void, light and shade.

- Roof

  Roof is mainly controlled by the building and expresses different meaning to the built form. Therefore nature of materials controlled by architecture is very important giving expression to roof. Material nature of the roof consider quality of form as heavy or light, scale of structural proportion and stability.

  E.g. temporary quality - light material with roof

- Outer cover

  Entrance, fenestration, plinth and columns express quality of function. These elements decides solid and void ratio, light, shade, composition of built form enhance quality of materials applied.

  E.g. Temple- solid walls- materials like heavy stone blocks.

ii. Texture

In consideration of built form it skeleton structure and the skin surface (crust) expresses the character of the building. Material impact on the structure and surface narrate different episodes about aesthetic value in its texture and appearance factor as a whole.

iii. Colour

Colour is the symbolic feature of spaces. Mode and emotions of spaces enhance colour. Matter contributes colour in space and carries a magnitude of pigments necessarily may be used in art and architecture. Nature of material colour and pigmentation give out the true meaning of space. Colours are derived from solar spectrum, sensitivity reflected as warm and cool in natural pigments.

Today generally pay more attention to make it dramatically attractive by even applying flamboyant colours available in the market and some times it may camouflage the natural beauty of pigments in material applied.

iv. *Ornamentation*

Quality of the built form and its shape enhance from the ornamentation. Ornamentation with decorative elements is used particularly on special occasions and places design to highlight a building like in the need of a special dress.

Ornamentation in architecture is seen mostly in interiors and exterior places of large buildings.

E.g.: Antique usage in Temple architecture.

1.3.2 Cost of materials

More thought and effort should be invested in designing buildings. Cost of materials is mainly important for possible implementation as our present economy runs on throughput of materials. Excepting special occasions, handling of material in designing for architecture, cost factor should be cut down to a minimal level maintaining appearance as expected. Optimal attitude of using expensive commercial materials, which have boomeranged most pocessions of shelter. As a result squatter shelters and shanty dwellers could be seen in the metropolis among colossal buildings where beauty is lost. Therefore immediate necessity should be there to control expensive material wastage in designing to develop ugliness into beauty by helping the have-nots.

Building industry grows vigorously along with population expansion and very little resources were left over for the newborn. Present day building industry consumes more materials and wastage of energy that have hit back our economy. Demand for technical buildings and rich looking houses cover up vast areas of our democratic economy, which must be equitable in the three basic requirements.

Consumer demand for buildings become complicated due to a wider variety of material usage and there by cost of construction goes higher and higher. And results in an unbearable wastage.

Availability of building materials were not scarce in the past as it is to be seen and today inventive out look of the modern civilization is an outcome of post war development which have changed indigenous cultural background of the society.

Along with a rapid population growth, building expansion has arisen to a great extent and natural resources have become scarce. Therefore more energy and resources are needed to replace what have already been wasted and lost.

1.3.3 Sustainable Environment

The Australian architect Glenn Murutt quoted an Aboriginal saying,

"Touch this Earth Lightly"

This saying describes the relationship between the building and its environment. For example Nomads were having mobility in sheltering where ever they moved and very few materials were in their possession. Tents were woven out of animal fur, a limited amount of wooden poles, pegs and rope were carried along with them for the purpose and protected them selves from natural disasters.

Attitude of the modern space age is totally different and man becomes more and more adventurous in many ways, struggling to find out new avenues to live in and to control the environment in many ways. Today he extracts most of the natural resources and no returns of gratitude but with more waste and pollution. The advantageous out look on natural resources gradually diminish and it will be ever difficult to replace it with his scientific development. Extinguish means forever, and should not only be the mere way of life, but it should also be the way to protect nature as it should be. Waste in the present scale is completely un-presented. Post war society opposed the past history of civilization and generated environmental hazards, with waste materials and negligence through ignorance of a carefree life.

Therefore designing for architecture should be the main criteria to gear back Mother Nature and lost resources heaped up as waste materials. Accordingly designers can consider making the maximum use of discarded waste materials for their creations.

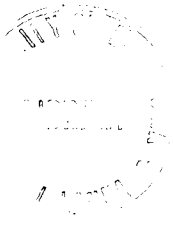
1.4 Problems behind the architecture and material usage

New innovative materials and technology have jugged a position of importance in the contemporary global architecture without concerning the human sensitivity of life. Materials were used radically and its failure may be the part of architects and builders to acquire and adequate knowledge and mastery of the extensive range of new materials and method of usage.

Scarcity of resources and a colossal growth of poverty have directly affected a healthy global position. Modern civilization tends to live more energetically and building materials have become synthetic in appearance to suit its condition too. Therefore the architects' main responsibility should be more considerate to amalgamate materials for the purpose of creation within the framework of nature.

Not withstanding the imperative need for materials studied in relation to the acquisition of a broader knowledge of materials, the very existence of a vast material market acts as a constraint to the security of the relevant familiarity by architects. The task have been made more difficult by the tendency on the part of architects to try out innovations and variations on conventional products that have been in long use. Thus, it is not an over estimation to classify this task as a lifetime one.

In the current global issue of poverty in life swiftly detached from nature. Mastery in architecture, there should be feasibility in the usage of materials and components effectively used in a friendly environmental monopoly.



Conclusion

Current situation of the global industrial setup day by day becomes hazardously complicated. Limitlessly different types of new materials are being produced through high-tech. Methods and means of economy and more and more energy is produced by wasting up all available natural resources for a new born to live. Poverty along with population expansion have become gravely unsolvable in the present world, sympathetically there should be governance on this hazardous situation in our society.

"In the long run a sustainable way of running our affairs needs to be found and the sooner we do this the less painful the future will be. What does sustainable mean in this context? In a simple way it means recycling our waste as an integral part of providing for our needs." (18)

The above quotation implies architects should think about the concept of 'salvage'.

"Ephemeral isolated,
abondoned to the weather,
it is often just salvaged bits and pieces."
- cabin fever

Chapter Two

2 The concept of 'usage of salvage materials' in Architecture and contemporary view

Introduction

"An environment includes something, it inspires, depending on the quality of the surroundings, on the possibilities realizable there in. If this materials and social environment shows an organic development, organic architecture can be realized in a natural way."(16)

The general attitude of present day society is to throw away their possessions after being used and the result will be environmental pollution. Besides itself, there is a rapid growth of ignorance in making the best use out of a hazardous situation. Thrown out discarded possessions could be reclaimed by technological processing as by-products in architecture, agriculture and industry. Now time has arisen in our society to salvage through roads of garbage as a new sport for no trophy.

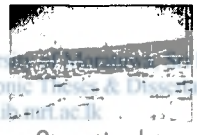


Figure 9: waste dump yard
(Source: Internet)

The construction industry lags far behind other industries in efficiency related to materials consumption, reuse and recycling. For example, a new automobile such as the BMW contains 70% recycled content, as a new building probably contains less than 1% reclaimed materials.

The total economy and environmental impact of the construction industry begins with raw material extraction form natural resources and continue manufacture, transportation, operation, maintenance, building reuse and demolishing. Each building product alone contains a vast quantity of energy, which could be extracted from raw materials used in it and create marketable products. Extraction of raw material from natural resources through mining and smelting is one of the most wasteful energy intensive polluting industries on earth if not used profitable both ways.

Reusing and Recycling of materials prevent pollution and degrade extraction of virgin raw materials from an already threatened ambiance, considering about combined energy required for transportation, labour, design, construction and demolition. There is a colossal wastage of valuable materials. Salvaging constructional wastage preserves, energy originally used to create materials and reduced the need for virgin materials.

"As a principle no materials would go directly from a single use to waste. Instead, when a certain use has weakened the material, it is put to another use, and another afterwards until it reached a start of waste that could nourish the ground."

- Dr. R. Dayarathna. 1995.185

Figure 10:The house made from discarded old boat in Copenhagen Denmark
(Source: 10)

2.1 'Salvage' concept in Architecture

"Saving and use of waste materials"

- Oxford Mini Dictionary

Historical evidence is there in the field of architecture to prove several materials have been considered to be noble. Since 19th century, new synthetic materials such as cement, plaster, iron, different metals, plastic, acrylic and other elements have been introduced to the field. Man's inventive knowledge further search for new horizons in the material world. In this situation man in the possession of his disposable items are recycled for a secondary purpose or totally glamorous and economical in outlook. His wisdom and inventive ability is there to linkup all complex

conditions pertaining to environmental hazards occurred due to his own ignorance.

Apart from natural disasters, environmental pollution has become the number one barrier against providing shelter in the metropolitan globe where available space has been lost. Total eradication of the question of garbage disposal may be turn back with science and technology, either by recycling or turning into new by products in the fields of agriculture and industry.

In the context a new production process to recycle waste materials locally and globally at large may be important when compared with population expansion housing and agriculture being the basic necessity concerned. The reuse and recycling of waste materials has become an essential input in the evolution of contemporary vernacular industrialised society.

Since the 2nd world war, salvage theme mostly read in the architectural field. Availability of post war surplus materials were reflected in architecture and characteristically found important as improvised. Thus Re-vitalisation was very important and conservation of past buildings and elements were the main features appeared. With the occurrence of energy crisis in 1972, people were compelled to conserve energy and scarcity of certain essential resources.

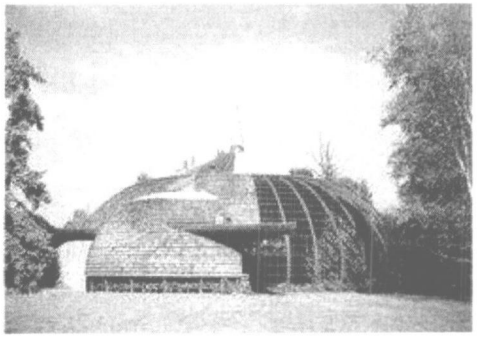


Figure 11:Bruce Goffs Ruth Ford house made out of post war surplus materials.
Skylight made by using plastic domes salvage from military aircraft.
(Source: 15)

Due to scarcity of essential resources, usage of materials stepped up in a different path and salvage concept has directly connected with reuse of materials required for new architectural concepts.

2.1.1 Philosophy behind the concept of 'Salvage' culture

"The fundamental lesson about new society: that man's relationship with things are increasingly temporary"(24)

The above caption means that every thing is ephemeral. Man will never be satisfied with what is available around him. But search for new avenues and therefore make it better to satisfy a burning desire. Through burning desire comes creative ability, which in return discard what is already being used. Relatively it is changeable at all times.

" Spread of disposability through the society also implies decreased duration in 'man-thing' relationship"(24)

" First advancing technology tends to lower the costs of manufacture much more rapidly than the costs of repair work"(24)

" The rise of disposability- the spread of the thrown away culture"(24)

" The extension of thrown away culture, the creation of more and more temporary structures, the spread of modularism are proceeding apace, and they all conspire toward the same psychological end: the ephemeralization of man's links with the things that surround him"(24)

The western world has mostly made it visible with their economic development, which can value new aspirations and aspects irrespective of what is already being in possession. Therefore 'the thrown away culture' had a rapid growth there. Even at the raw material stage they sometimes discard after first use and large areas of salvage heaps could be seen. Hindrance of valuable space and environmental pollution made the way to make the best use of salvage heaps to turnout new architectural products which could be seen in the building industry there.

Due to cultural changes of some groups in western world, their attitudes, norms, beliefs and behavioural patterns were changed rapidly. Therefore their living condition totally changed except their living quarters, cloths, music etc. This culture

is known as hippy culture. Alvin Toffler the philosopher, who characterised them as "new race of Nomads". Also salvage culture could be recognized in their living conditions made out of reused waste materials and its symbolic expression.

But in the east it looks totally different, where the attitude is to repair what had been used for sometimes without going in for new things although permanence is the reality. Old generation in the east protect their belongings in traditional and ancestral grounds for the young. The difference of thought in the west is to that of the east is ephemeral. The spiritual attitude of eastern culture could be identified as an important issue among family set-up because of their possessions been carefully protected from wastage as a 'nest egg' ready for the future.

Protection of available resources in the east and recycling of waste materials in the west has no difference on economic point of view. Therefore salvage concept is there in both sectors as a valuable advantage due to rapid development in science and technology. The eastern spiritual attitude looks gradually changing in many ways, where customs and manners being lost. Contextually differences could be seen in salvage materials too. In the west technologically produced and discarded items could be recognized as salvage materials but in the east it is agricultural wastage.

2.1.2 Salvage effects on Architecture

"In the work of the Ad-hocist designers, the problem of quality addresses more than that of quantity." (2)

'Ad-hoc' means a specific purpose. Metaphorical post modernism as defined by Janks, one of the most positive approaches was what he called Ad-hocism. The prairie Architecture of Bruce Goff had long been famous for his creative use of available local materials and sensitivity to the needs of individual clients.

In late sixties and seventies Ralph Erskine and Loucien Kroll developed the same kind of approach in designing buildings for tenants and University students and were both architectural and social.

Figure 12: Drop city, Colorado- A junkyard geodesic dome.
House made out of discarded materials
(Roofs of scrapped cars and vans)
(Source: 10)

In sixties and seventies, problem of quality of housing ad-hocist designers paid effort to solve architectural problems by innovating imaginative skill in the promotion of cheap and unconventional building methods. The ad-hoc methods influence by third world shantytown dwellers forced to rely on their own resources and were able to offer prototypes for a more democratic and sensitive environment. Post-modern ad-hocism was questionable at that time; it would be less appropriate that world poverty had greatly increased.

Figure 13:The American Mike Reynolds built his own house of bottles, old wood, and discarded automobile tires in Taos, New Mexico. (Source: 10)

2.1.3 "Salvage" attitudes in Architecture

Figure 14: Squatter dwelling, Clarence Schmidt built his own house, it is kind of a log cabin, tarred, and decorated with fragments of glass refuse old windows and doorframes, old wood. (Source: 10)

When deem to make building with waste materials, usually the images are third world squatter settlements. Because we think that waste materials strike one as low quality and should be discarded. But obviously squatter settlers are sympathetically poor and cannot afford to buy processed virgin materials to make shelters. The generate skills to use discarded scraps collected from heaps of garbage disposal in their surroundings. The idea in possibility of extracting new elements from discarded things as salvage material have been inspired by architects from squatter dwellings. But past experience in architecture innovatively have enough examples to use waste materials in the field of construction.

Attitude of most countries allow their waste to be polluted in and around their dwellings. For example some streets in USA it seems to be stacks of date expired thrown out quality goods. Along with their technological development and making the best use out of their ambience for a better growth of population, the present trend is to recycle and reuse all waste materials as second hand requisites in development. Second hand produce of reuse and recycle waste materials in an accomplishment of collective industrialism in this poor and hazardous environmental situation. Such a condition will be more advantages to any under developed area in the globe. The Japanese technological development synchronized both usages of virgin and waste materials simultaneously since the Second World War. In Engineering and Technological standards, Japan has the highest output. In the west and Far East, interest is to turn out industrial and agricultural by products into salvage materials.

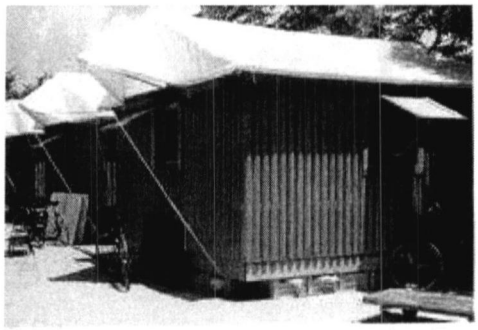


Figure 15: Japanese house- made out of recycled paper.

Vernacular housing based on reused or recycled waste materials, generally considered being marginal housing, which has no long history. For that reason in most cases waste materials have not been used as a high level of development in processing salvage as an advantage for the society.

Another problem involved in houses built with discarded materials now is the comfort level obtained looks relatively very low. Therefore an intensive technological and scientific survey is vigorously needed to develop the present level of comfort in houses built with salvaged materials. Insulation is a major issue in constructional schemes where thermal expansion is possible due to usage of large quantities of metal and plastic components.

Houses made out of waste material are light in construction and yields resistance to natural disasters. Japanese constructional schemes have developed new light materials with more resistance to natural hazards such as earthquakes. In Japan intensive work have been carried out by designing new structural elements and components in their constructional schemes.

Development in the system of building construction based on re-use of waste materials is more significantly appropriate in developing countries, where both the housing and the environmental problems are virtually out of control.

2.2 Principles of "salvage" in architecture.

2.2.1 Revival of 'Salvage' Buildings

This is the adaptive process of modifying a building to function and accommodate the changing needs of its user. Preserving function of a building may be acceptable under circumstances relating to extraordinary historical events, but not for the vast majority of existing structures. Adaptive reuse deals with directional change of the building structure and function. This factor is a 'slows nutrient loss' which contributing diversity, complexity and continuity of a particular place.

Figure 16: Reuse old building for new function.
(Source: Re/architecture)

2.2.2 Conservative disassembly of salvage building materials

Buildings are monumental in construction and are not particularly timeless. Their destruction and removal is usually the result of both obsolescent and bottom line driven development. Whenever the value of property greatly exceeds the value of its building stock and probability of demolition increases.

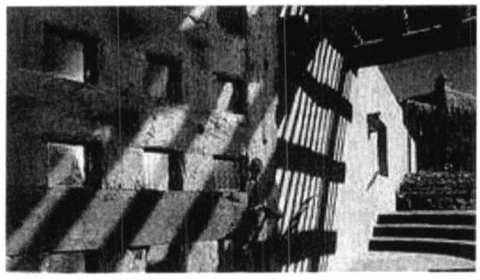


Figure 17: Reused Mexican jail door for house, as a main gate.
(Source: Lake /Flato)

When architecture is demolished, the spatial continuum may be broken down, but material continuum is no more needed. Demolition of a building might be rescued to its simpler elements.

Elements those cannot be broken down into other substances are mostly found in architectural embellishments and other constructional secondary components such as metals, doors, windows, roof beams & floor tiles, old decks, clean bricks and stones, hard ware & soft ware plumbing materials, wiring, structural steel and trusses, old timber from bridges and industrial buildings, tin, lighting fixtures, old bath room fittings, glass panels, many plastic components, some textiles and broken concrete.

2.2.3 Reusing salvage waste materials.

Wastage of natural resources single evolution of technological development is a new phenomenon, which have been accepted as quite normal, yet until two centuries ago there was no waste and it was biodegradable. In the third global society, wastage had become a staggering movement.

Discarded materials and components derived from available resources could be summarized into three major categories.

1. Reused materials:

Salvage materials that can be reused through minimal reprocess.

- Glass and plastic bottles, vehicle components, tyres, plastic cans, road signs, steel and machine components, containers, tin cans from cold drinks, rail sleepers, barrels, railway coaches.

Figure 18: Garden wall made by discarded bottles. (Source: 10)

Figure 19: Michael Reynolds Earth ship made from rammed earth tires. (Source: The Everyday & Architecture)

2. Recycled - Content materials:

Highly processed composites usually containing a post consumer recycled feedstock held together with strong binders.

- Recycled by melting down scrap metals, glass, and plastic
- Direct recycling of basic materials such as earth or timber
- Recycling through biodegradation or compacting of organic matter

3. By products - based materials:

These could be employed as minimally processed agricultural and industrial by products.

- Baled straw is an agricultural by product
- Steel wool

The salvage principal is hidden not only in Architecture but also in art as well. One good example is Picasso and his futuristic vision of using out-mooder scraps as valuable materials in his creations. The abstract artist found discarded material, as a challenge in modern art and Victor Moors Junk Castle is an outstanding example of reused materials. Salvage materials are inherently durable and adaptable as symbols of beauty in decadence over pre-mature destruction of buildings. That incorporates

salvage materials; sometimes exhibit formal characteristics based on quality, availability and dimension of materials them selves.

Figure 20: Victor Moores junk castle-made out of car doors, chunks of metal from old combine machines, old bedsteads, and road signs. (Source: 10)

Rather than merely making use of waste producing materials, just as it is best of products could be specifically designed, taking in to consideration a further use as a building component, so that it could be reused in a more appropriate manner at the end of their initial production. This kind of material usage had been identified as organic architecture directly deals with Ad-hoc architecture.

2.3 Usage of salvage materials in Sri Lanka

2.3.1 Historical perspective of usage of salvaged materials in Sri Lanka

"The traditional house that has existed in Sri Lanka for more than 2000 years was an out come of a strong philosophy of Buddhist life- i.e. the simplicity and the impermanent nature of life. The house was part and parcel of nature; the materials were borrowed from the nature and returned to the nature. The traditional concept was to live in and around the open areas of the house and not within the enclosed compartments of the house and it was the most suitable solution for Sri Lankan climatic conditions."

-Prof. N. de Silva (SLIAJ)

In the legacy of Sri Lankan culture and historical events reveal, that her inhabitants consumed a limited amount of materials for constructional purposes. The sustainable materials they used were clay, lash, fiber, creepers, rough timber, cane, including bamboo, etc; invariably rough out from the ambience. Their roofs were covered with cadjan, palm, bamboo leaves straws, grass (illuk); walls were wattle and smeared with clay or mud. They were basically agronomical. Therefore their dwellings were salvageable in purpose. Their pastoral agronomical life in different parts of the island compelled them to make their dwellings in different forms due to climatic and available materials around. Molehill clay, cow dung, sand, coconut husks etc, were basically used as 'agro salvage materials' for the purpose and the growth of a diversified agronomical culture had taken place.

Traditional Sri Lankan architecture could be discussed in 3 ways.

1. Traditional houses
2. Granaries
3. Religious places.

Figure 21: Traditional granary-made from 'agro salvage' materials like straws, thatch, mud with cow dung.

Traditional house is simple and make shift. But religious places were made out of permanent materials.

Late in pace of time Sri Lankan traditions were constantly influenced by foreign invasions, excepting ancient kingdoms. Present day cultural growth in Sri Lanka is an admixture of foreign influence. Thus, non Sri Lankan attitude of existence degraded the indigenous culture promoting shelter as a permanent entity. The general notion of Buddhist way of life have not been accepted as permanent and mundane in the world of enlightened one and bear no witness or evidence to prove a spiritual elevation in present day Sri Lankan culture.

2.3.2 Sri Lankan point of view in current situation of using building materials

Sri Lanka as a third world country basically faces the problem of poverty and housing as a typical question within it. Although conceptual designs were executed as an answer it is properly because high cost of materials.

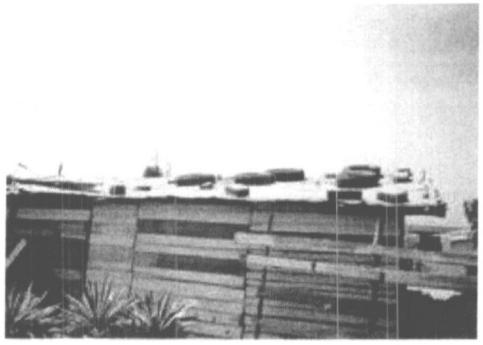


Figure 22: Shanty house. Used discarded materials

Sri Lankan socio and agro-economical structure is based on Buddhist culture existed for more than 2000 years and her people used to live in the simplest form as a venerable way of existence. In the early days they did not believe to attain mundane perfection, but were made to inspire the four noble truths and eight noble paths to diminish material existence propounded by the enlighten one. So their three basic requirements were adjusted in the simplest possible manner to suite what was aspired. Although it had been the essential nature for them, later it became an admixture of foreign influence, specially seen in their dwellings and social attitudes. As a degenerated culture in many ways she cannot get over or away from what have already rooted and developed in her present socio economic structure. But in one hand time has arisen to inspire valuable and helpful ideas to promote salvage culture as a growing economy. Even today Sri Lankan psychology is to keep waste materials safely and architects can certainly find out ways and means to promote economy with better housing units for have-nots at large.

Most affluent Sri Lanken families are prestigious in collecting antiques for their newly built luxury houses. The present trend is to make them valuable under protection without been discarded as outdated scrap materials. Salvage culture is particularly essential for the poor origins and cost reduction in reusing methods in

production should be the lowest possibility. In any item a higher cost factor cannot be borne by have-nots and architects inventive outlook is basically needed there.

"The search for solitude, the need to throw off the trappings of worldly life, has produced some of the world's most romantic buildings"
-cabin fever

Chapter Three

3. Contemporary usage of 'salvage' materials to make different faces in Architecture

Introduction

An architect has a main role to play in balancing the aesthetic appearance, cost and environment friendliness according to the relevant socio-cultural requirement of the society with materials and the technology available. In modern day salvage is a new avenue for architects.

Architectural practice in Sri Lanka has different interpretations on usage of the concept of salvage. Hence in this chapter illustrate the practice of architecture in terms of aesthetic expression, cost and environment friendliness dealt with the concept of salvage in different faces.

This basis for the usage of salvage concept is mainly characterized locally and internationally.

Locally it is classified as different faces.

1. Antique expression - Lunuganga
2. Modern interpretation for informal expression - Steel house
3. As a method of cost reduction - Non-architectural works

Internationally the usage of salvage concept is basically classified under the main category of method of cost reduction and simultaneously how they achieve the architectural expression within tight situations.

1. Brayant House
2. Yancy Chapel
3. The Children's center

3.1 Local example

3.1.1 Antique expression

Lunuganga:

"A antique and modernist quality of Bawas architecture is his redeploying of components, salvaged ancient artifacts, columns, a windows or a jar, in newly circumscribed contexts." (6)

This is a house facing Dedduwa Lake in the southern province of Sri Lanka and it belongs to Bawas brother, who is a landscape architect. Although Bawas living pattern is rather westernized, they greatly appreciate Sri Lankan traditional culture highlighted and intermixed with Dutch origin. His visual out look has characterized a prominent feature in conventional architecture rarely could be observed among others and identifies his personality as a prominent architect.

Figure 23: South facade
The front door used as an antique for the house and its roof give the prestige outlook.
(Source: 6)

Geoffrey Bawa altered its original outlook by adding up new design elements using various types of traditional building components. He has the curtsy to infer valuable traditional architectural elements and to use them as a new concept in its particular appearance. He has mostly thought of a 'salvage' culture in the promotion of traditional inspiration regarding tropical architecture in Sri Lanka. It is obvious there lays the idea of salvage culture in his mastery of contemporary architecture. Mastery in contemporary architecture of Sri Lanka should be the criteria behind salvage culture already reflected in Bawas concept. Now it is incorporated to safeguard Sri Lankan traditional architecture by taking up as a number one environmental hazard.

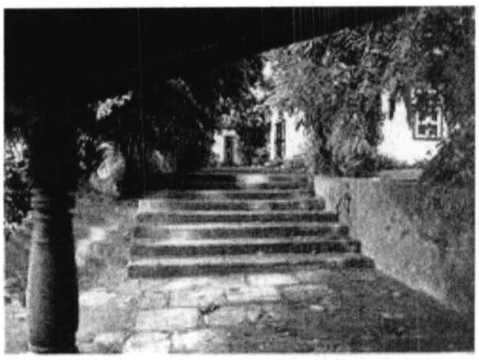


Figure 24: Used heavy timber salvage columns for entrance portico.
Its colour and texture remind, as it is to get expression of true colours of nature.
(Source: 6)

The romantic attitude of an architect is to capture quality of visible nature, which consists of things produce, and his sense conduct them in luminous, moving or fixed and exist for the sake of experience and fulfillment. Bawas addition includes this idea in his architecture concept that salvage culture is a possibility of using antique.

Figure 25: Salvage timber columns and other interior artifacts used as antiques.
These ornamentations have shaped the form and space. (6)

Materials in new designs, antiques which belong to the distant past do not look new because of time eaten material damage which could be repaired as it were in its original stage. Generally everything is subjected to decay and deteriorate unless otherwise protection and proper care be needed throughout existence.

Figure 26: Space of the blue pavilion- used salvage column and window.
(Source: 6)

Especially in architecture the term salvage sounds profitable as far as materials and components like made and used timber of different sizes, columns, doors, windows and embellishments could be effectively used in new design concept and cut down cost factor. Creative ability hides there not only in novelty but also in decadence elsewhere. Conceptually Bawas adventure in search of a neglected and extremely useful past became a throughput adaptation in designing for salvage culture.

Using old door sashes, timber beams and columns, all were retreated as new ones in his design concept for Lunuganga house, present attitude of conventional architecture is to totally demolish old buildings neglecting its value and make for expansion novelty they believe seen elsewhere. A good artist should have a good pair of penetrable eyes and Bawas vision lies there. By all means, it is a difficult task to organize a particular origin meant for a particular purpose in another concept without degrading its design value, which Bawa have done. As a whole detailing of its three-dimentional appearance have been tangled very carefully.

Figure 27: Hen house

Hen house looks a pavilion and reminds a traditional out look like at Tampita Vihara and "Vee-bissa" (Granary). Here the architect had again highlighted a traditional outlook in form and its usage can be counted as salvage culture.

Figure 28:Salvage building used as antique elements

Salvaged elements used as structural components like timber columns, king and Queen posts, half round tiles and other timber frames all look traditional in appearance. Heaviness in appearance of prestigious old buildings could be seen in his work. The bounding quality of architecture with natural environment is a sustainable way of looking at eco-system. Most of the timber components used in Lunuganga look salvaged and new unseasoned materials have not been used. To timber is scarcely available and all classes are very dear. But there cost is very high because of its antique quality.

3.1.2 New interpretation of informal living style

Steel House

"I'm interested in doing building which are neither modern nor traditional but which have a spontaneous response to the client, to the site and its context and available materials"

-Archt: V. Basnayake

Figure 29: Front view of the house
Skin of the front facade covered by the salvage door sashes

Some way or other the term "Available Materials" implies, the idea of salvage culture. The user of this house is a woman. She likes in solitude with nature. Architect of the house has made provision for her psychology of living. Using salvage materials he has organized spatial qualities expressing simplicity and uncertainty of life to suite his clients inspiration.

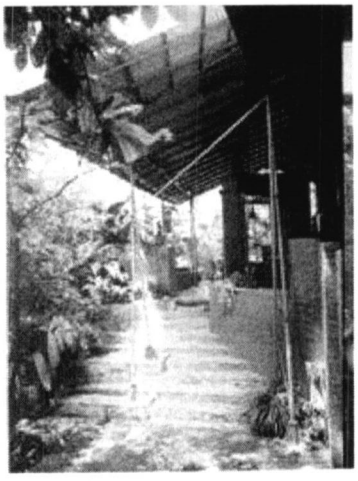


Figure 30: Thin scaffold poles supports the simple roof

User general character is portrait in its roof structure as the main element. The thin metal roof looks cushy and is the mirror image of simplicity in life. Scaffolding poles holds the entire weight of her building, at different spaces.

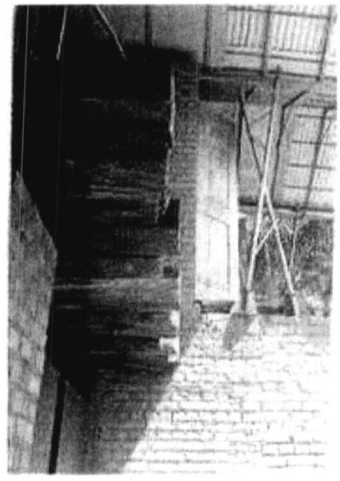


Figure 31:The textural value of this house is belongs to the nature because of characteristics of its salvage elements and materials.

Its textural quality is rustically expressed and looks unfinished. This textural value of the work has been obtained by application of salvaged components such as second hand bricks of a good quality, old railway sleepers, old doors, window sashes and frames.

Figure 32: Colour of salvage materials enhance the natural quality of space

Mode of expression in architecture is application of pigmentary colours derived from the each palette. Brick red and browns are the prominent colours applied within thick vegetation around it. All components and their colours relatively resemble in atmosphere and old salvaged in appearance.

The ad-hoc quality is commonly visible in our tradition. Archt: V. Basnayake and his client both have agreed to inspire the informal quality of living conditions found in shanty and squatter dwellings. This ad-hoc quality expresses form and space of a squatter dwelling. By all means poorest layer of our culture cannot be neglected from which source the architect gets possible inspiration development in living conditions.

3.1.3 As a method of low cost construction

Non-Architectural works

Miserably poor people buildup their huts mostly with salvage materials. They obtain these materials at a cheaper rate or freely from their neighborhoods and combine them in a possible way they could afford to construct a small hut. In their innocent world there comes inspiration to architecture. They believe that they could build homes with minimum requisites with ignorance of aesthetic expressions in spaces. Under no circumstance the architectural field could make it appealing to the developed eye. This is a catastrophe in existence unsolved.

Regarding pollution and a recurring growth of poverty in the world, this catastrophe is not answerable by any civilization, whether developed or not because it is a global issue cannot be solved by any particular sector as far as equilibrium in immutable laws of nature are concerned. It is such that no nations can make good of another nation or have done anything good to any other as far as divisions of nature are concerned. The divisions of nature are specialized in general, ideal and indefinable and have happened through out human civilization. No one have ever thought, how it could be nice to construct a hut with discarded polythene and timber already seen as poverty driven among fewer colossal buildings, totally neglected and unseen. All poverty driven construction is done with tin sheets, Tar barrels, Polythene, Scrap wood, thrown out concrete blocks, brick pieces and etc. Also they have utilized corroded transportation vehicles and sometimes even containers. Investigations made on such sectors reveals of an unsolvable economic condition totally neglected for a long period along with population expansion without means of any economic development.

Figure 33: Shanty house
Discarded polyethylene sheet, old timber logs, cardboard pieces, textiles, palm leaves, old advertising boards used as salvage materials.

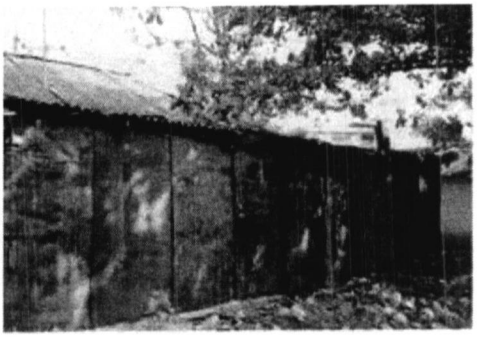


Figure 34: Wall
Made out of straighten barrels.

Figure 35: Culvert concrete cylinder converted in to the living quarter.

Figure 36: Retaining wall
River edge retaining wall made from discarded tires filled with garbage.

Figure 37: Container converted into a garage.

Figure 38: House
Made from discarded tin sheets.

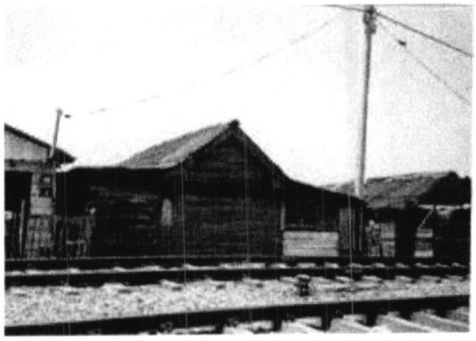


Figure 39: Shanty house
Tin sheets, discarded timber planks and logs, old tin with timber-framed window used as salvage materials.

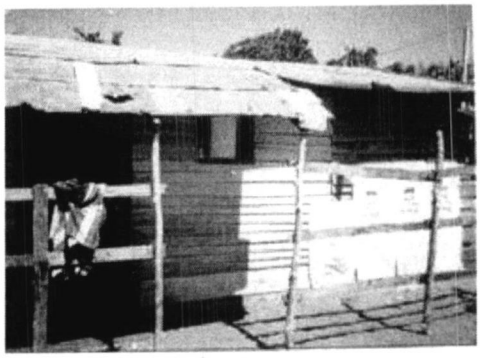


Figure 40: Shanty house
Roof - Tar sheets, walls - discarded timber planks with polyethylene

3.2 International Examples

3.2.1 Brayant House (Haybale house) - Straw house

The Remote Rural studio designers are the team of architectural students. They design and build housing for low-income people, and community service programs, deserving clients and businesses.

Figure 41: A Lot of salvage materials have been used for make better environment for the poor

Houses built from plentiful waste materials become a necessity for designers who worked with minimal funds. To achieve a cost target of $15,000 for a floor area of 850 square feet, they used low-tech solutions and abundant agricultural by products.

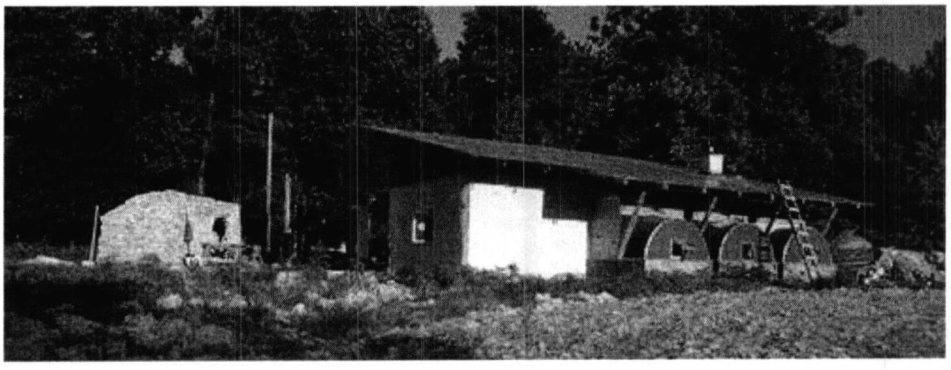


Figure 42:Walls were made from stacked hay bales with mud plaster- agricultural waste

The client is a fisherman whose family consists of four members including his disabled wife. The house has 24" thick walls made out of stacked hay bales stuccoed over providing inexpensive insulation. Stacked up straw bales looked like bricks for both load and non-load bearing walls. Straw stacks were smeared with mud mortar

and loose straw compacted this wall system has more thermal efficiency, breath ability seismic resilience, fire resistance and recyclability. Usage of waste agricultural fiber became more widespread in construction. As salvage material is a natural quality product for the poorer sector. The informal living condition is tally with this kind of rustic quality salvage materials.

Figure 43:The skeletal roof structure enhance more lighting and openness to their social life

Front windows of this house provide natural cooling during warmer months and a wood-burning store in the center of the house heat the entire structure during winter. The house has widened doorframes and a wheelchair for the disable member in the family to more and more comfortability throughout the house. There is a large front porch keeps the tone of southern culture. Addition to this, a lightened verandah gives a lightweight quality to it.

Figure 44: view of the smoke house made from salvage materials

Their living makes thorough fishing; students built him a smoke house out of curbstones and broken pieces of coloured bottles. Glass bottles were placed throughout the store to provide light. Roof was covered with overlapping road signs. The structural cost of the house was $43,000 and only $17 thousand for its make. This is a house, which had captured the spiritual quality of rural living. Texture,

colour, and all other elements including life interact it's own squatter character as a new meaning.

The smoke house have cost only $1 per square foot of work using 100% reused salvaged materials including broken pieces of concrete, shard curved beams from concert hut, and old road signs from a transportation depot.

Using salvage material for construction of house for have-nots of the society, could be elevated to a higher living standard within framework of their characters, activity patterns and other functional aspects. In the process designers may have to be careful in handling, not to harm the beauty of their simple living style. Designers will have to composed salvage materials not exceeding the limits for their budget and harmonizing it with the ambiance.

3.2.2 Yancy Chapel

Yancy chapel stands at Osorrison farm in the Hale county of Alabama. Architectural students designed it with an efficient cost factor to achieve a friendly environmental framework to preserve architectural beauty.

Figure 45: Using 100% of salvaged materials they merged it into a spiritual nature

Spiritual qualities have been achieved as a religious place. Walls of the chapel were built out of recycled tires filled with excavated dirt packed down and stuccoed over. Tires were donated by a tire dealer who was charged for disposing. All materials used were beautifully manipulated giving out the required spiritual appearance.

Roof being the main characteristic quality of the chapel is expressive in its spiritual form with light, space and simplicity. Salvaged materials such as reused steel 'I' beams, timber trusses from an old barn and tin were use to complete its general appearance.

Floor is sensitive to us when our feet touch it and create experience through our sense perceptions. Rock constitute the chapel floor was taken from a nearby riverbed. Its surface roughness gives out a cool atmosphere to the rural community.

Figure 46:entrance to the Chaple.

Chapel is setup at the side of an overlooking seascape blends with the beautiful surrounding woods. In this creation, rustic quality of salvaged materials could be seen at a glance.

3.2.3 The Children's center

This is another challenge in addressing social programs composed with minimal resources. Four female students are the designers or this children center. The building being used by the family resource center, hale country department of human resources, the district count, district attorney, the Greensboro police dept and hale country sheriff's department. It is used to interview and counsel children's center.

Designers have created a friendly atmosphere specifically for abused children to be interviewed and observed by psychiatrists, social workers, doctors and enforcement officials. The center has a great sensitivity creating a sheltered and informal environment for mentally, physically, sexually abused children.

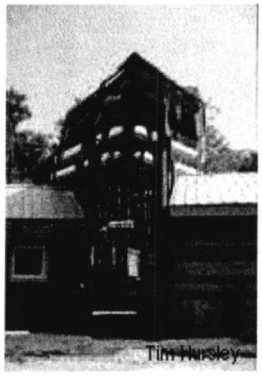


Figure 47: Entrance to the children's center

This rural children's center consists of an interview and observation room, meeting and educational room, office work and storage space, single storied barn like structures were built as spaces and sitting out spaces.

Figure 48: informal living style enhance from its salvage materials.

Walkway is curved by a voluminous roof canopy made out of corrugated metal and polycarbonate sheeting. The design features enhance the sensitivity of a friendly atmosphere. Angular poles cylinders resembling trees and tires swing large sand boxes are the basic components of this building. Roof beams were made out milled Cypress timber and laminated timber planks. All steel members were roof is partly covered with minimum and partly with toughened glass paneled lapped.

To make a strong sense of the place there is an adventurous combination of materials with vernacular archetype.

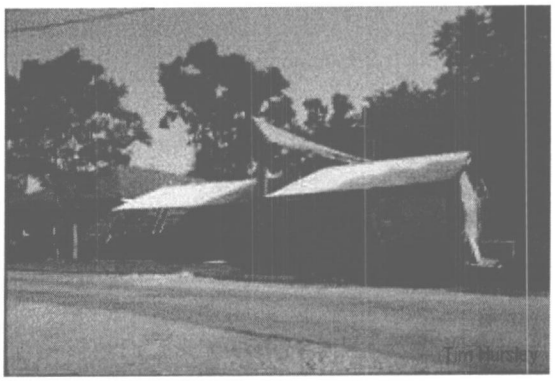


Figure 49:Light weight roof structures enhance the quality of informal living.

Ad-hoc quality of this children's center is a mirror image of their informal living quality enhance by salvaged materials readily available, this is an exercise 'strive' hard at decent architecture for an improvised rural constituency with bare minimum of recourses.

Discussion

This work is not a scientific endure linked up with processing technology of waste materials. But as a social endure to develop a relationship with a community hunting for low-cost building materials.

Incorporating local and regional opportunities salvage culture may be the answer for wastage. The 3 examples taken up in this part may prove a truthful adventure in search of new horizons in a prevailing hazardous situation to be thriven out.

Available waste materials are very valuable in community development programs and architectural spatial qualities were to seen in the process. Ad-hoc qualities can be met with these poor communities. No conventional expensive materials are there in the poor list. Properly assembled designing of salvage material will certainly create luxury in their living conditions.

Conclusion

Conclusion

Resources are Mother Nature's gift for living beings. Therefore in the past their gifted rights were vanished like what is exactly being happening today and consumed a very little with gratitude to her in return. Gradually mans greed for a current economy made him to live not with nature but by destructive means. Today there is no visible avenue to get rid these crimes other than the salvage culture. Salvage culture is not a new thing at all. It has been derived from the past as a solution to his present crimes. In the past it was 'Ad-hoc' architecture. That Ad-hocism is one of the styles of architecture. This has been in different cultural backgrounds and advantages in many ways.

Present day Sri Lankan use antique materials as an ancestral habit. Value of antique materials has gone up in their value. Poor people are left over there unaided even with possibilities of buying cheaper materials for their leaky huts. Consultation charges on architecture cannot be met by the poor to make a pleasant living like others. Therefore attitude of the architectural field should be the massage of an equitable share in dwelling facilities. So far salvage concept have not been implemented in Sri Lanka as a cost reduction in construction work. In consequence the prevailing challenge should be understood by the creative sector and be more familiar with the situation to use salvage materials in their designs with a possible cost reduction for all. Discarded materials and architectural components in good condition for immediate use could be repaired and reused if designers pay more attention to cut down the prevailing cost factor.

In Sri Lanka the usage of salvage materials cannot be considered as waste materials. There is a growing demand for second hand items found and sold by junk dealers at exorbitant prices and poorest sector cannot afford to buy their needs readily. There discarded materials that can be used as urgently required for hazardous situation will not be available at junkyards or at 2nd hand markets. Therefore the particular purpose is total lost. Control over reusable materials since construction is strictly being imposed on discarded materials could be categorized and handled for required purposes through authoritarian technology. Developed areas in the world over count salvage as recycling and no second hand usage been encounter. In Sri Lanka wastage follows discarded follows junk for a second or third hand market where it makes value again. Thereby recycling will be lost.

As Sri Lanka is a tropical country materials should be used according to the climate. Therefore synthetic materials, which are not suitable for climatic conditions, have been used with a very high cost factor irresistible. Therefore architecture in Sri Lanka cannot be monitored by western standards with very expensive cost factors. The duty of an architect should be to find out possible means of materials in designing to suit the climate.

In consideration of the present situation Sri Lanka is not technologically developed enough to use salvage materials as a byproduct of industrial wastage and it is therefore been used at times as an antique expression in architecture. It is clearly be understood to use salvage materials in the direction of poverty driven low cost housing schemes as well. International examples where their architects have used

salvaged materials within the framework of cost effectiveness in a friendly environment. In Sri Lanka there is technological advancement in certain aspects to cope up with salvage culture, yet have not been considered as a potential answer to meet with poverty and environmental pollution.

Cope of any architectural project should be of immense value if material wastage stopped to a higher degree. Dump yards, industrial and architectural units, residential areas are the second hand sources where required materials could be found. Classification of such materials are steel, plastics and acrylics, glass, broken pieces of used cement and concrete, sanded waste plaster, used cut timber, partly damaged building components. Then cow dung, thatch, illuk, coconut waste, rubber waste, could be acquired from agricultural sector. In the rural sector a higher proportion of natural waste materials could be obtained. As contextual differences vary materials should be classified on feasible terms. In Sri Lanka a proper study and research program should be carried out in searching of available waste resources, improve technology in processing, recycling and reuse of salvage materials.

Detailing of complex newest waste material may be mixed up proportionately often with available natural materials. The examples given in this paper; regarding salvage culture is coherent in nature. So far there have not been any clue to deviate the synthetic origin, applied in contemporary architecture with natural materials. Tires and mud walls, Aluminum number plates fixed with timber frames, scrap metal frames bolted to timber chunks are a few of the architectural things could see in salvage culture. Such materials have embodied energy, reusability durability and can be used as both structural and non-structural elements.

In the present context Sri Lankan has a market only for salvage buildings, components, because of their antique value. Accordingly deconstruction requires careful disassembly of buildings in the reverse order of construction. Deconstruction may be handled systematically to obtain successful results in undamaged materials that could be classified with cost factors relevant to its critical path analysis. Factors such as labour, scheduling and cost, tipping fees for construction and demolition, land filling, hazardous characteristics of demolition, waste markets, material grading systems, time an economic constraints, contractual agreements and public policy are the main events found in this path analysis. These conditions affect the potential out look in deconstruction industry for waste reduction, resource conservation, job creation in Sri Lanka as a developing country. Also it is essential to have a potential waste material market for other industrial and agricultural waste in order to use them as building materials. Latter will be needful in many ways.

"The final aim of this study should drag architectural knowledge to a higher level of experience acquired through an adventurous search prevailing hazardous specially in Sri Lanka". But more researches have to be carried out on the question of salvage culture in relevance to application of building materials in contemporary architecture as a rational concept to formulate a theory in the usage of salvage culture. More research should be carried out to find out materials required for construction. It should also cover-up architectural and technical details pertaining to incorporated material use for designing.

The study covers up only as a preliminary step in salvage materials in Sri Lanka and how it will be a useful resource for our future generation. The study covers a limited area of salvage culture in Sri Lanka and other countries. However there are many more directional channels to identify the true possibility an aspect of a rapid growth of salvaged produced materials for other purposes in the developed world. Further studies should be carried out in more details about the types of salvage materials in Sri Lanka and the architectural detailing. It may be more helpful to architects and students.

The kind of application of salvaged materials in architecture rendering helps to keep spatial quality and it's detailing in high position while maintaining a very reasonable cost factor in construction. Before the advent of an industrialized society materials were used as an available sources and today as it has ran short demand grows for industrialized synthetic materials._Salvage objects excite the imagination and their expressive reuse captures a bit of the richness that only the past makes known.

"An environment that cannot be changed invites its own destruction. We prefer a world that can be modified progressively against a background of valued remains, a world in which one can leave a personal mark alongside the marks of history."
- Kevin Lynch

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