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Review paper on low cost housing in India

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ABSTRACT

India is a developing country and at the same time the second most populated country of the world with a considerable portion of population craving for shelter to live in. we can reduce the burden of high cost by using various low cost materials and techniques. This paper will summarize all the low cost housing techniques and materials used across India.

INTRODUCTION

Low cost housing is meant to provide the housing services with least possible cost. It doesn`t mean that we compromise with strength and durability, rather each part is reviewed for most efficient construction material and construction technique from various possible options and choosing the right one.

It may be classified into four parts viz. rural housing, urban housing, mass housing and green building construction. In India large population lives in villages and is below the poverty line, so development in field of low cost housing in rural areas is necessary. For people living in footpaths of densely populated cities mass housing is required. For people with comparatively better standard of living,need green buildings for comfort, energy saving and economical construction.

As the population increases day by day need of construction also increases. India being a developing country can`t afford that much hence the only way is to reduce the cost of construction as much as possible. This paper provides the review of low cost construction techniques in India.

LITERATURE REVIEW

Lourie Baker [1999]

Lourie baker was a British born Indian architect. He firstly worked in the hilly village in UPand then in the Kerala. He is known as poor man's architectfor his art of obtaining the maximum benefits from the available resources.

He mostly worked in rural areas. He says ''ask every building part is it necessary'' If yes then find the most effect material and technique for the same, .if not then it shouldn't be constructed.

His famous techniques include use of mud, irregular building plans for irregular lands, planed development for vacant area, eliminating unnecessary parts of buildingapplying good techniques of both traditional scientific research maximum use of available resources etc. all these techniques were very effective in cost reduction .

He believes in the fact that each area has developed the efficient construction methodology as per their requirement by trial and error method from centuries. If we will put use of latest technology along with this methodology we will achieve much moreefficiency.

S. Chowdhury and S. Roy 2013.

They were the first to put forward the details about availability of the low cost housing materials and their use as a low cost material for construction.

They tabulated the availability of these materials is India states wise. The materials include bamboo, bagasse fiber, jute fibre, coir, fly ash, milk rice husk, straw and aerocon.

They suggested the use of corrugated bamboo roofing sheets which is eco friendly, light weight, strong and durable. They can be used as roofing, walling, door and window shutters and other components of building.

They also suggested to use of compressed earth blocks, non-erodible mud plaster developed by CBRI, straw as a thatch roofing after treating with copper sulphate solution and also after treating by methods designed by CBRI.

They also tabulated the performances of some important fibres produced in India and also tabulated the properties of building materials like thermal ,structural, thermal and water penetration resistance and cost.

Ali Haider Jasvi And D K Bera (2015)

They studied the economic aspect of the low cost housing techniques in India. They put forward the techniques and materials for low cost construction particularly for low income group people.

They discussed about the availability of different waste materials and their adoption factors as a construction materials like technical,social,economical,ecological and physical.

Some of the techniques they reviewed for technical and economical aspect were , filler slab, brick panel roofing, flat slab, soil stabilized blocks by cement and lime as stabilizers hollow concrete bricks ,rattrap bonds , thin joint constructions ,fly ash sand lime bricks ,aerated concrete blocks, GFRGpanelbuildingsystem,few formwork techniquesetc.

They also took review of natural and manmade materials use for low cost housing techniques which include bamboo fibre ,earth , straw fibre bagasse banana fibre,aerocon panels ferrocement, cement concrete hollow blocks precast RCC etc .

After studying all these techniques, they found that we are able to save the construction cost by 16 percent to 50 percent in different techniques.

Waste materials as a supplementary building material by Ambikesh Singh et.al 2017

The use of waste material as a constructive material is analyzed in their research paper. They classified these available materials into categories as natural supplementary material and industries waste supplementary materials. The natural supplementary materials include use of earth bagasse,straw bamboo and fibre with least methodologies.

The best way to use these materials and their availability in India is also discussed in the paper. India is the agricultural country so agricultural wastes are abundantlyavailable, so if we will be able to discharge these we can save cost as well as energy.

The industrial wastes include fly ash,PVC and rice husk ash. Their use in the construction industry is all discussed such as brickmanufacturing technology, PVC, wood, plywood and as an admixture with concrete.

So they mainly discussed the low cost housing techniques in rural India. These techniques can provide farmers an extra income to improve their financial condition.

Study of construction and demolition waste for reuse and recycleBy Mr. A R Kakegankar et.al (2018)

India generates 20 to 30 million tons of waste from construction industry which leads to environment pollution.

So applying the recycling techniques on construction and demolition waste to reuse it in construction will help in reducing cost of materials and also reduce pollution. Shortage problem of raw materials can also be eliminated.

This paper mainly pays attention towards the recycling of aggregates from construction and demolition waste tastes were carried out upon the samples from different construction sites in Pune. After thorough washing and drying, sieve analysis and impact test were carried out on the sample to check where it can be used as a new construction material.

The use of recycled aggregates is more prefect for construction of roads , floorings , mass concreting in foundation etc where fresh aggregates will only increase the cost of construction as here we don't need that much high quality materials especially aggregates .

Recycling becomes more important in the developing country like India due to low economy and higher demand of construction.

Sustainable construction; Analysis of its costs and financial benefits by V.Sumateja Reddy

A sustainable construction refers to the practice in which the existing construction materials or methodology is renovated to provide benefits like cost saving, lesser use of materials,optimum use of available resources etc.The term is generally referred to as green building.

to achieve sustainable constructions social ,economical and environmental aspect is studied to rate the construction the benefits of green buildings

1. It reduces the energy consumption hence saving both cost and energy.
2. Decreases use of the natural resources hence prevents environmental degradation.
3. Reduces the maintenance cost of buildings.
4. Lower emission of green house gases.
5. Buildings constructed with this practice are more user friendly hence improves productivity.

Hence we can conclude with that by using green building construction practices we can get maximum benefits with least use of resources which will not only reduce building cost but will

also help others who live in congested areas to get better houses in lower cost.

Another important benefit of this is to save resources for next generations who otherwise will have to face a tough time especially in the country like India which is highly populated.

Use of plastic waste as a construction material by M A Kamaruddin et. Al. (2017)

As per the studies 280 million tones of plastic were produced in the year 2012. The reasons being the attractive qualities of plastic goods likewater resistant or retainer, light weight and low cost. But unfortunately we are not able to recover it when it becomes waste which leads to degradation of our land and water bodied. Researchers have proved that we can improve the quality of concrete by using plastic wastes as aggregates which will reduce the cost of construction. The other uses of plastic waste include flexible pavement construction, building construction using plastic bottles etc.Plastics are recycled and reused in different ways across world but still this field needs more improvement.

Hence if we will be able to systemize use of plastic waste in construction industry, we will not only get rid of plastic waste disposal but also will reduce cost of construction.

Precast construction by Shreyankamurari

India is facing urbanization and migration from the villages. Because of this India is facing housing shortage especially in cities. Cast-In-Site or cast at construction site is a good but slow process and also it requires a lot of labour work. Precast Concrete Construction (PCC) is the perfect technique which could be used for mass Housing as well as for removing the shortage of housing. Precast Construction method has shown some spectacular results in the mass Housing and major projects. It is effective in terms of time, labour requirement, superior quality, better performance & finish, material requirement, less wastage, eliminate shuttering, desired shape & accurate finish etc. They have researched about the appropriate and most efficient way for the layout and the methodology in construction industry. The key element amongst all of them is still the design and the layout of project. Overall the problem of housing could be only overcome if we are good enough in promoting the precast construction work.

Marble slurry by Wisal Shah

Marble is used in very abundance in India for construction industry. But Marble slurry is very harmful to the environment aspects and it has reached so high that large lands have been degraded by its disposal. And The best solution is to minimise the waste at generation and disposal stage. In a survey it was found that around 90% of the marble is found in the India so it very necessary to ensure that how should we minimise the waste. Wisal shah and Nafees Mohammad performed several testing on the physical and chemical characteristics of the cement formed using the marble slurry and compared It with the cement without marble slurry. And the results were spectacular the cement produced using the marble slurry showed even better results is some aspects. So now according to the DEPARTMENT

OF MINES (GOVT OF INDIA) any company producing cement must be using marble slurry or any other solid waste on terms to minimise the waste. There are several other products you could develop from the marble slurry like bricks, tiles, cement, concrete etc.Hence if we will use this waste In construction we will be able to reduce the cost to some extent.

CONCLUSION

Now it is clear that good building is not that on which large money is utilized but that one in which money is efficiently used. About 30% of money can be saved if we use the techniques and materials right as stated in the paper. Houses can also be provided to low income group people. So it is clear that if we follow the techniques of low cost housing we can get more benefits then if constructed by traditional methods at the same cost and also prevent environmental pollution.

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