

Green Home, A Concept Implicit and Needed in Nepalis Context

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Abstract—This study is concentrated on the problem of weather green home or green construction is needed for Nepal to enhance the green economy. The objective of the study was weather green home is needed or not with technology and services in Nepal, which is possible by promoting local-provincial and national level of government policy resulting to use locally available construction materials. It has also recommended the suggestions came from this research to related authorities for implementation. For verifying it substantial literatures reviewed had done as secondary data, the research gap between existed philosophy and proposed this research, data have been collected by adopting qualitative research methods as a primary data. In this research I claim, that green home demand is much more in Nepal and are being formulating the needed proper policy and guideline by concerned authorities. It is associated with Green materials used Passive solar design had Energy efficiency adopted by Waste management and well functionated by Water conservation. Some international Non-Government organization also contributing their experts and skills to the authorities to promote the green home. Some Metropolitan City and Municipalities are making guide lines and also it was found some municipalities have started to give some discount in taxes to the users and some guidelines are being formulation for green home through the green construction to achieve the green economy of Nepal.

Keywords—Green Home, Green Economy, Sustainable development and Green Construction

I. INTRODUCTION

Rapid urbanization due to rural migration is putting tremendous pressure on natural resources. As a result, lack of drinking water supply, negative impacts such as water pollution, environmental degradation, ground water depletion are common issues in major cities. Immediately several initiatives should be taken a community level as well as at the household level to address these issues. Green homes or sustainable housing is an approach that includes household systems that reduce pressure on natural resources and carbon emissions, thus resulting in human well-being, social equity and green economy. Besides energy efficient buildings, it also includes eco-friendly practices for water and waste management systems such as rainwater harvesting, water & wastewater recycling. Green homes are more than just green buildings—they reflect a sustainable lifestyle based on eco-friendly systems and behavior. Nepal's Climate Change Policy (2011) is advocating low carbon development and adaptation plans to address the need of climate resilient development [5].

Nepalese Cities are facing challenges in water scarcity, waste management and environmental pollution. Growing climate variability is also likely to exacerbate pressure on the urban services. To enhance sustainability and adapting climate change impacts. It is imperative to include eco-friendly practices and to curb the energy consumption in the housing sector both embodied in construction materials as well as operational. Therefore, Green Homes is being proposed to address the demand of the time.



Green Homes or Sustainable Housing is that which includes household systems reduce the pressure on natural resources which reduces the carbon emissions so that resulting better human life, establishes the social equity, and maintain the green economy. Also, it leads energy efficient buildings and includes eco-friendly practices for maintains the water and waste management systems such as rainwater harvesting, and waste/wastewater recycling. Therefore, green homes are more than the green buildings which reflects a sustainable lifestyle based on environment-friendly or earth-friendly systems. Particularly risk associated with the cost within an appropriate approach for structuring all factors as legal, financial, Political, technological, environmental and other factor which probability is more in construction projects [8].

Green Home in Nepal

A green home is a type of house designed to be sustainable. The concept is that the green homes focus on the efficient use of energy, water, and building materials including efficient use of natural resources. A green home may utilize sustainably sourced, environmentally friendly. It used the recycled building materials. It may include sustainable energy sources such as solar or from other alternative energy, and be

sited to take maximum advantage of natural features such as sunlight and tree cover to improve energy efficiency. National Shelter Policy (2012) also takes into account low carbon development in housing and promotes renewable as well as energy-efficient solutions [10]

Objectives of the study

The overall objective is to identify the acceptance of green home technologies and services to contribute eco-infrastructure and reducing poverty through creation of green jobs and moving towards a green economy in Nepal

Specific Objectives:

1. Make aware for suitable development policy environment to promote green home
2. To promote the local materials for green home
3. And to recommend to concerning authority came from the research

Limitation of the Study

Research area is taken as Kathmandu valley, Pokhara valley and Dharan Municipality

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II. LITERATURE REVIEW

The concern of this research is to design towards the development of critical construction processes in housing project management for developing affordable and sustainable housing scheme. it is well known in Malaysia the difficulty in ownership of housing especially for middle income category. Thus, this research is useful to help housing construction in determining which element that can help in reducing the price of new houses. Furthermore, green element if being introduce, may give significant effect in long run of life span and life cycle of the building. Researcher of this group will try to formulate the best solution in order to help middle income buyers for nation development [9].

From the interview conducted with the developer of YTL, it was found out that the company used Zero Energy Home Concept for the Bird Island Project. Green home in Malaysia is being built from green materials such as bamboo frames, sustainably-source silicone glass fabric and etc. Green technology is also being used to build the green homes. The Bird Island green homes have energy and water-efficient appliances. Grey water recycling system and solar thermal system are being installed in the green homes. Green home at Bird Island uses solar roof shingles to generate the energy used by the occupier of the house. This means that it uses renewable energy as its power source. There are a number of problems faced by the developers when developing green home in Malaysia. One of the problems faced by the developers is lack of green technology and green materials in Malaysia. Most of the materials need to be imported from foreign countries making the costs of construction for green home higher than conventional home.

Homeowners' reactions towards green home are the biggest problems developers faced when developing green home.

From the questionnaire survey, it is proven that the main problem of green home in Malaysia is the homeowners' low level of acceptability and reactions towards green home. Most of the homeowners in Malaysia are not aware of green home and they lacked understanding towards this new concept which had already set foot in our country since year 2007. This accounts for the low demand of green home in Malaysia. The homeowners lacked understanding about the concept, designs and the benefits of the green home being introduced to them. Moreover, they are not willing to purchase green home because the price is more expensive compared to conventional home. They are not aware that a green home can help them to save money in the long run [2]. Five popular and well-established green building assessment standards widely spread around the world were chosen for comparison. Previous comparative studies on green building assessment standards have neither compared the overall structure of the standards or have suggested possible ways to design a new standard based on the different credits available in each standard. The point of departure of this study was to make a detailed comparison of individual scope addressed in all categories of different standards, including its various schemes and evolution. This study will not only help to identify future trends in the green building industry but also to understand the specific scope of each assessment standard. Such comparison helps to identify the key areas of focus during green building design and certification planning. The tables illustrate the special scope shared by different standards, which are useful for multiple certification planning. The study identified that there is a moving trend in tenant participation and material selection I green building design and construction. Standards have evolved quickly addressing multiple building types and specific building related energy and occupant issues. As each standard has its own purpose and is committed to certain roles, their independence should not be disturbed. However, a common benchmark could be set for easy comparison and adaptability. Multiple certification of a facility will be more frequent, thus attracting more market attention, thereby leading to a greener society [4].

With India facing rapid urbanization, globalization and expanding economy, it is experiencing a rapid spurt in building construction across a range of city activities and socio-economic spectrum, increasing consumption of building materials such as glass, cement, metals and ceramics. Uncurbed consumption of these high embodied energy materials is a reason for environmental degradation. In today's era where energy crisis is a major problem, green buildings gives a brilliant and promising solution. These are designed to use minimum energy. All the systems for cooling, heating, ventilating is designed such that they require very less energy. The IGBC has adopted the LEED rating system for evaluating green building performance in India. The payback period for existing green buildings range from two to seven years, depending upon their certification level. The key challenges for the development of green buildings in India are mostly in the lines of awareness on the benefits of green buildings, green materials and technology. The CII-

IGBC and other professionals are working towards addressing these challenges to enable developers to operate with ease. Green building is a boon to the society where energy and water consumption can be reduced while still maintaining an increase in productivity for occupants, their health, safety and well-being. In today's era green buildings are essential as environmental balance is important for survival and further development of human beings, but first people have to be made aware not to see green buildings as an extra monetary burden. Green buildings are only way to a sustainable tomorrow [13].

Third-party inspections and testing of a building's energy efficiency appear critical to a project's success. Testing is required for LEED (Leadership in energy and environmental design) for Homes and the Standard but is not required by the Guidelines. In comparing the additional construction costs and programmatic costs such as registration, certification, and verification, the total cost of building a green home seems to be significantly higher for LEED for Homes certification than for certification by the NAHB Guidelines or Standard [12].

For more than a decade, governments have been incentivizing, and now requiring, private developers to construct energy efficient, sustainable projects. We examine the effectiveness of green single-family construction incentive programs. A cross-sectional comparison of municipalities with and without green private residential incentive programs indicates which government levels of policy issuance and which types of certification programs prove most successful, and when those impacts should be expected. Findings indicate that only municipalities experience success with construction-related policies, which may be tailored to their local market's construction demands. Business-related policies, however, prove effective at all levels of government implementation, with particular success at the state level. Lastly, event studies and multiyear window data indicates that green incentive policies elicit the greatest change 2 to 3 years after their implementation [3].

The number of green home projects has increased across Malaysia during recent years. Even there is no doubt on the necessity of green housing development and its benefits for the home owners, developers as well as government, but green housing market still is not attractive for majority of home buyers. Higher price compared with conventional homes and lacks of government incentives for green home buyers are the main causes of the current situation in the green home market. Introducing the new financial incentives for green home buyers not only can attract more potential home buyers to this market but also promote green housing development by increasing demand for this concept of homes. This research aims to investigate current financial incentives for green home buyers and to exposure the new financial incentives for green home buyers. The methodology for conducting the study involved literature review, data collection and analysis data. The process of data collection involved obtaining data from the respondents by conducting questionnaires survey. Collected data has been analyzed by SPSS version 19. As a result, the new financial incentives for green home buyers have been evaluated to

stimulate potential home buyers to purchase green homes instead of non-green conventional homes [6].

The purpose of this paper is to describe and assess one of the first comprehensive residential green-builder programs in the U.S. It compares trends of items used in residential construction during the past five years and reports why participating builders chose to incorporate specific items and their level of commitment to the program. This description provides a baseline of strategies to investigate the effect of this program in developing sustainable communities. The builder study population was derived from a database of registered "green" residences built during 1998-2002 in greater Austin, Texas (2,335 homes and 73 listed builders). Almost half the builders constructed just one "green" home, whereas

two builders built almost 75% of the green homes during the 5-year study period. Less than 1% of the homes received a perfect 5-star rating, whereas 87% were rated 1 or 2 stars. The frequency of implementing the 122 green features were compared over time and analyzed for correlation with cost and their associated star-value. Cost was the primary factor determining item use frequency. Participating builders generally concurred that the program was successful and beneficial to homeowners but that the additional work required for participation provided little financial reward for builders. While much can be done with low-cost interventions to reduce the negative environmental impacts of residential construction, builder participation may be enhanced by promotion of some of the higher cost features. In addition, public education about the long-term benefits of green homes is needed to increase homeowner participation, and encourage builders to incorporate more environmentally friendly features in the homes they construct [14].

As the benefits of green building continue to change the Architecture/Engineering/Construction industry and the number of green projects rises in the United States due to market changes, more construction firms are gaining experience with this new way of building and changing their expectations for new hires from degree-granting construction programs.

This paper documents a baseline study of contractor experiences, expectations, and perceptions associated with green building conducted in Fall 2006. The study was based on detailed survey results from 87 different companies recruiting from three major university construction programs in the eastern United States (Auburn, Purdue, and Virginia Tech). The survey collected data regarding current experience levels and capabilities of companies with regard to green construction, corporate expectations of new hires in terms of green construction knowledge and skills, and respondent expectations and perceptions about the future of the industry with regard to green projects. The findings of this study support the growing importance of green building as a component of the whole construction market and provide a benchmark against which to measure future changes in the industry over time [1].

This paper reports an empirical study that investigates the energy efficiency and resident behaviors in residential buildings after adopting energy-efficiency

technologies. This work innovatively integrates the energy simulation approach into multivariate regression modelling. The data are from a sample of more than 300 residential units which meet the green building standards. Findings identify 43% of the annual reduction in terms of energy consumption and energy expenditures for a typical American home with green building technologies. Findings also identify four energy consumption-related resident behaviors depending on which the actual energy efficiency performance of green building technology may differ.

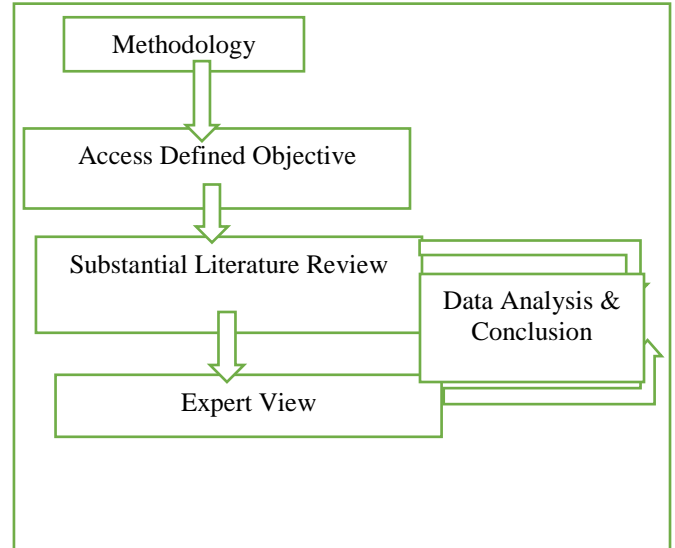
This work contributes to the body of knowledge by emphasizing the human-environment interactions in pursuing energy efficiency. It suggests that building scientists and mechanical engineers consider residents' routine behaviors during the early-stage design stages to maximize the technology's effectiveness and outcome. On the other hand, our work suggests homeowners regulate their energy-consumption-related habits to mitigate negative influences to technical systems' ideal performance [15].

The South Korean economy is now focusing on Green Growth as a key development strategy. In terms of structural conversion, Green Growth can be summarized as converting the nation's industrial structures into eco-friendly environments with reduced carbon dioxide production, while keeping its growth pace by employing innovative technologies. The construction industry, as with other industries, must be prepared for the Green Growth policy, which calls for a strategic approach and should result in significant benefits—not only for the environment but for the economy, as well. Accordingly, this study analyses the strategic value of 15 cutting edge green construction technologies and suggests the strategic plans (for both government and private enterprise) for the promotion of green construction. It also analyses recent international trends in green construction. Green Growth is summarized as the national growth strategy to enhance the quality of life as a whole by converting not only the lifestyle but the Korean national economic and industrial structures into the low carbon and eco-friendly environments. Green Growth industries, with low carbon as the momentum for new growth, base themselves in green technologies including renewable energy technologies, energy and resource efficient technologies, convergence technologies that reduce the environmental pollution. The construction industry, along with other industries, is in a position to play a key role and secure cooperation between government and industry to meet environmental and economic challenges with Green Growth. Accordingly, this study analyses recent trends of overseas green construction and presents responsive plans for both government and private enterprise for the implementation of green construction by selecting 15 construction sectors and analyzing their progress and green strategies in the Korean market [7].

III. METHODOLOGY

The methodology adopted in this research is qualitative and the problems are asked with the subject expert in this field from the research area.

Figure 1: Conceptual Methodology



In this research methodology the following process are being adopted:

- i. As per demand of the research objectives it has been reviewed the related literatures
- ii. As per the demand of research objectives required expert views have been taken from research area.
- iii. Based on collected data, we analysed the respected data
- iv. Based on collected data we conclude the research.
- v. Relevant recommendation has been done to authorised organization.

Targeted Groups

The following were the respondents from green home who are known about the related subject investment, the investors who are really investing their property and the house asset property valuing engineer who are listed engineer of different Metropolitan city in Nepal.

IV. DATA COLLECTION, DISCUSSION AND ANALYSIS

For being green home following characters need to verify to partially or fully for green home or green construction. **Green materials** are those materials which are available locally and renewable. For examples the materials are clay, sand and stone are green materials as they are found underfoot. Plant materials such as leaves, grasses, straw, wood and bamboo are also materials that have been used by humans since they started building. **Passive solar design** denotes to the use of the sun's energy for the heating and cooling of water, cloths including living spaces. In this method, the building itself or some element of it takes advantage of natural energy characteristics in materials and air created by exposure to the sun. **Energy efficiency** refers using less energy to provide the same service. For example, a compact fluorescent bulb is more efficient than a traditional incandescent bulb as it uses much less electrical energy to produce the same amount of light. **Waste management** is the precise name for the collection, transportation, disposal or recycling and

monitoring of waste. This term is assigned to the material, waste material that is produced through human being activity. This material is managed to avoid its adverse effect over human health and environment. **Water conservation** includes all the policies, strategies and activities to sustainably manage the natural resource of fresh water, to protect the hydrosphere, and to meet the current and future human demand. Population, household size and growth and affluence all affect how much water is used. Green building is one of measures been put forward to mitigate significant impacts of the building stock on the environment, society and economy. However, there is lack of a systematic review of this large number of studies that is critical for the future endeavour. The last decades have witnessed rapid growing number of studies on green building. This paper reports a critical review of the existing body of knowledge of researches related to green building. The common research themes and methodology were identified. These common themes are the definition and scope of green building; quantification of benefits of green buildings compared to conventional buildings; and various approaches to achieve green buildings. It is found that the existing studies played predominately focus on the environmental aspect of green building. Other dimensions of sustainability of green building, especially the social sustainability is largely overlooked [16].

The Pokhara Metropolitan authority has envisioned a plan of action for transforming Pokhara into a city of green homes within couple of years. For this, it has already decided to provide attractive facilities and substantial discounts to those who build green homes, the Metropolitan City authority informed (survey,2020).

“Authority of Dharan Sub-Metropolitan City decided to waive 50 percent of the charges while approving the maps and designs for green homes. In addition, the designs for green homes will be approved promptly,”

“Authority of Lalitpur Metropolitan City said to subsidize some facilities of the charges while approving the maps and designs for green homes. In addition, the designs for green homes will be approved promptly”(survey,2020).

As risk resilient urban development and environmentally friendly resilient planning are the key important plan those 20 years strategic development master plan for Kathmandu valley master plan (2015–2035) highlights and should incorporate values of open green space as core for resilience cities. The current and future urbanization trend of city including environment, socio-political and economic situations are the key concern in Kathmandu metropolitan city to address these concerns the green open space also plays a significant role [11].

An expert from UN, HABITAT Nepal authority said, "on sustainable housing, said that adoption of green homes concept is the need of the hour to minimize adverse impact on the environment. He further said that green homes are environment friendly because they are sustainable. It would save energy, water and contribute to creating a healthy environment"(survey,2020).

V CONCLUSION

This research is concluded based on literature review and the primary data collection from the respected authority and expert. The objective of the study was weather people like or not like with green home with technology and services which promote to green construction enhances green economy in Nepal, which is possible by promoting local-provincial and national level of government policy resulting to use locally available construction materials. It has also recommended the suggestions came from this research to related authorities for implementation.

Enough literatures have been reviewed for verify the research gape between existed philosophy and proposed this research, data have been collected by adopting qualitative research methods. From the research it can claim that green home wanted in every part of Nepal. Green home associated with Green materials used Passive solar design had Energy efficiency adopted by Waste management and well functionated by Water conservation. Some international Non-Government organization also facilitating to Nepal governments to promote the green home. Some Metropolitan City and Municipalities are making guide lines and also it was found some municipalities have started to give some discount in taxes to the users and some guidelines are being formulation for green home through the green construction to achieve the green economy of Nepal.

RECOMMENDATION

Local, Provincial and Federal government need to formulate Policy as demand, More specific policies and detail guidelines related to sustainable housing as a whole, Provision for eco-friendly housing in National Building Codes, At municipal level, both adaptation and mitigation measures into municipal planning and service delivery to promote sustainable housing is required for academicians, professionals, investors and users too.

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