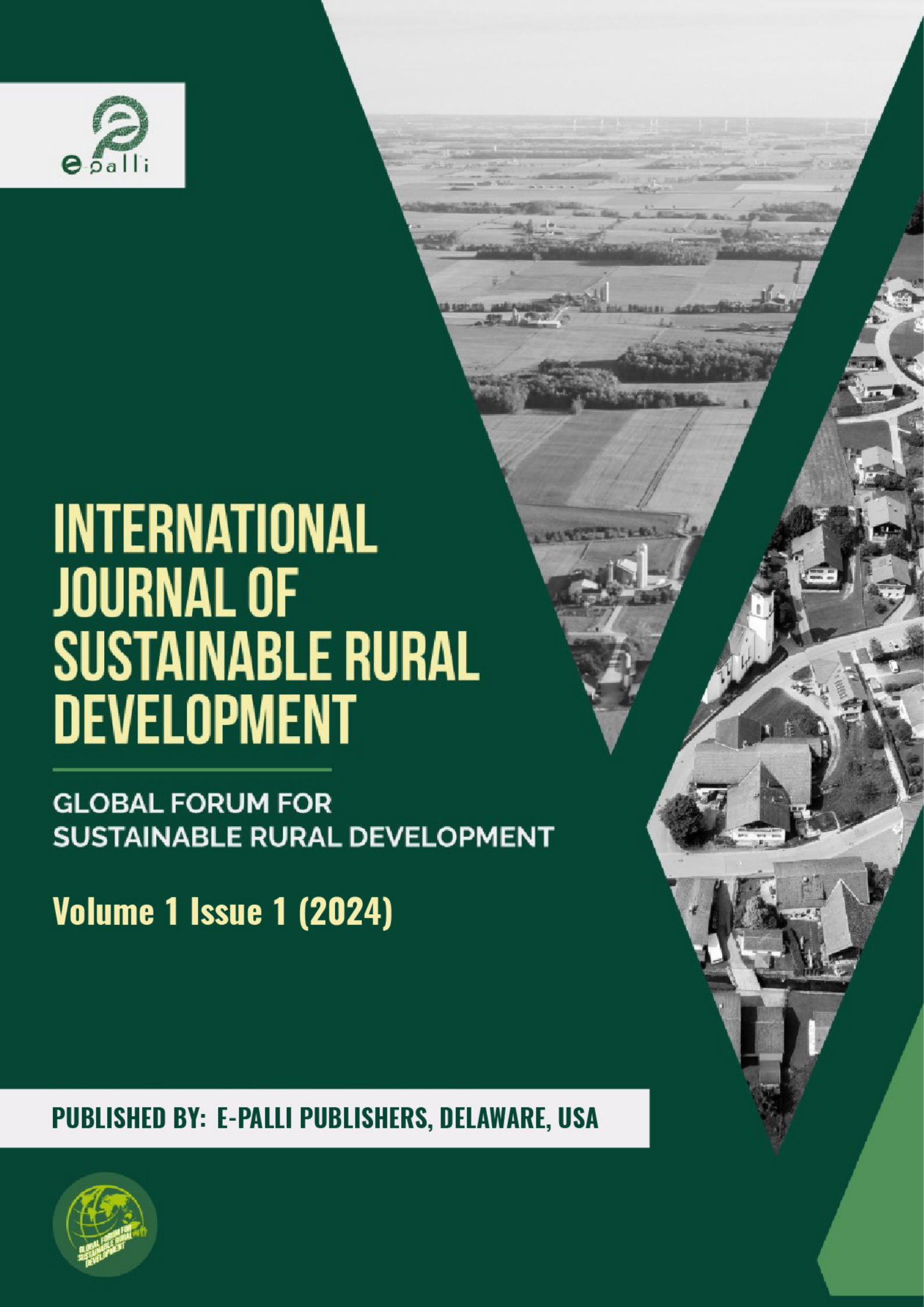

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Towards Sustainable Future: Exploring Green Building Initiatives and Strategies for Urban Development: A case study of Gulf Region

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ABSTRACT

This research discussed the green building rating scales in light of modern-day methods that would have been utilized for better performance. The different factors affiliated with green building systems were discussed in terms of how there are advantages and disadvantages involved in the procedures. The primary objective of the research is to determine the strategies that can be applicable for the sustainable development of green buildings. The methodology that had been applied for the research here was the literature review strategy that was meant to shed light on how this method was a perfect fit. The recent research articles and the case studies of the recent times were used for understanding the practical world cases. The literature review was generated based on the research articles of the recent times where the conflicting opinions of the scholars were evaluated. Furthermore, a case study was discussed in regard to how the green building plans were executed in the Gulf region. The findings of the research concluded a total 20-year Net benefit of $50 to $65

INTRODUCTION

Background

Green buildings have been discussed and reviewed by researchers over recent years, and there are certain standards that these individuals have maintained. There are some specific performance thresholds that the buildings have to meet in order to maintain a certified position (Mattoni *et al.*, 2018). In correlation with the various thresholds that have to be maintained, some academic definitions have prevailed. The Green Building Rating System is the prevalent tool that is used by the industry in order to maintain sustainability (Awadh, 2017). Hence, some agendas have been designed in order to carry out these procedures rather effectively.

The trend of going green has been pushed to the top of the agendas by the institutions that are working on construction-related activities. An entire committee of professional bodies, independent organizations and the members of the government have highlighted the green building rating systems in recent decades in order to define the green building standards (Lu *et al.*, 2019). It can be analyzed that an agreed-upon definition has not been proposed regarding green buildings, and this is probably because of the changing geographical surroundings, economic development, availability of resources and some other factors (Ding *et al.*, 2018). Hence, the green rating system is what has been focused upon in order to reach some agreed-upon grounds.

The green rating systems are found on rather substantial levels as the existing buildings are likely to find these under seven different categories. The various green rating systems are affected by the environmental conditions and the cultural values of the country (Hazem *et al.*, 2020). There is, however, a need for green building rating systems regarding how the improvements can be made. The sustainability performance is likely to be improved through the multi-certification model that helps accomplish the perfectly appropriate rating systems (Assefa *et al.*, 2022).

The health and productivity within commercial buildings are quite likely to be enhanced through sustainable building rating systems (McArthur & Powell, 2020). The questions are raised in regard to what sort of green building criteria need to be met, and the outcomes are usually connected with health and well-being, material efficiency, innovation, indoor environment and energy efficiency (Tang *et al.*, 2020). If all of the concerned areas are addressed from time to time and nothing is found to lack around these, then the green building rating systems can be found at rather improved positions.

METHODOLOGY

The approach that has been finalized for discussion in the entire scenario here is clearly related to the review of the literature. As the literature review is accepted to be a large building, the opinions of the various researchers within it are clearly considered as the building blocks that form the entire structure. These add value to the research when the agreements among the researchers are discussed along with the conflicting opinions of the various researchers. The multiple researchers for these kinds of scenarios have to be studied in terms of how the amendments and the improvements can be made from time to time on different issues (Snyder, 2019). The review of the literature, therefore, has to be conducted through a very careful selection. The literature review approach is about building the research on a topic that exists already. The literature found is treated as a building block that helps conduct the various research-relevant activities. Handling these rather accurately is what all of the academicians

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need to carry out smartly. Researchers agree already regarding how it has become more of a complex task, and it cannot be rather easily carried out. The production of knowledge around the business research field can be accepted to be rather accelerating in terms of a rather fast speed that can be conducted. At the same time, the remaining time would be fragmented (Snyder, 2019). These reviews on literature appear to be a part of various introduction sections as well as the discussion section of the research.

Purpose of Literature Review

The literature review method is one of the few methods that have received quite some general acceptance in recent years. The academic industries have widely accepted the literature review method, and more importantly the researchers have generated some excellent progress through these. The literature that has been found to be worked upon in recent years has clearly proven to be the kind of one that helps identify how the opinions of the various scholars over the recent turn of events have evolved (Snyder, 2019). The evolution of the various ideologies is what is mostly represented through these. The literature review that is mostly drafted comes along with different situations and aims, all the while shaping up how the scholars would generate the literature review.

Challenges Faced

Normally, the core objective of the literature review is to shorten and collaborate the knowledge that exists already. These are among the situations where the review of the literature is conducted by the authors who deal independently with the topic (Kraus *et al.*, 2020). This research, therefore, conducted a thorough examination of how the literature from the past can be reviewed. However, it has also been stated that these literature-based elements have turned out to be rather complicated and quite time-consuming in regards to how the relevant amount of information can be detected. The core idea of the information for these kinds of scenarios has to be affiliated with the various improvements that must be made by updating the information from time to time. The review of the literature for such sort of scenarios can be quite time-consuming and might also enhance the length of the studies but the results and outcomes are always favorable.

LITERATURE REVIEW

Sustainable Development Goals

The term sustainable development was previously defined as a kind of growth and development that is found to meet the current needs and demands without actually compromising the future generations' capability to address the needs of the time (Fonseca *et al.*, 2020). There are basically seventeen goals that are widely accepted and the core objective of these goals has always been to accomplish an environmental development that would last for a rather longer time. It can be expected from the advancement of the technology that it would clearly help the various countries achieve the sustainable development goals, keeping in account the environmental quality (Fonseca *et al.*, 2020).

The Sustainable development goals are illustrated ahead:

Figure 1: Sustainable Development Goals

There are 17 sustainable goals in total, and each of these has been accepted over recent years in regards to how much of significance these hold. The first and the most initial one among these is 'No Poverty', where poverty is meant to be targeted for minimization. The second one is 'Zero Hunger', which is quite similar to the previous one. The third one in the entire series is 'Good Health and Well-being', which focuses on health issues. The fourth one is 'Quality Education' in regards to how quality must be maintained in education sectors. The 'Gender Equality' is the fifth one that lays its emphasis on how racial discrimination must be reduced. The sixth one is 'Clean Water and Sanitation', where water purity has to be maintained. The 'Affordable and Clean Energy' is the seventh one in the series that is conducted at the administrative level (Fonseca *et al.*, 2020).

The 'Decent Work and Economic Growth' are the eighth one in the series, and the 'Industry, Innovation and

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Infrastructure' are the ninth one in this series and the two of these are somewhat similar. The tenth one in the series is 'Reduced Inequality', which emphasizes overall equality among citizens. The 'Sustainable Cities and Communities' are the eleventh in a series that focuses on infrastructure management. The 'Responsible Consumption and Production' is the twelfth goal. After this follows 'Climate Action', which is then followed by 'Life Below Water' in the fourteenth number. Quite similarly, 'Life on Land' follows after this one that emphasizes how improvements can be made. The 'Peace, Justice and Strong Institutions' are among the sixteenth ones in the series. Lastly, the Partnership for Goals is considered to be the finishing goal that brings an end to the entire list of sustainable development goals (Fonseca *et al.*, 2020).

Among these 17 sustainable development goals, the 11th goal on sustainable cities and communities is the one that would be accomplished in the entire scenario. As green buildings are installed in larger parts of the city, the cities and communities will improve and improve (Vinuesa *et al.*, 2020). Depending upon the number of green buildings that would be installed, it would have to be perceived rather carefully about how long the cities and the communities would find themselves to be sustainable. All regions where these kinds of green buildings are found would have to be examined in terms of how sustainability is likely to be affected in these regions (Biermann *et al.*, 2022). So, the architects and the project managers are recommended to emphasize the kind of products that would be used for the development of the green buildings.

Green Buildings

The green buildings for these kinds of scenarios are likely to reduce the environmental influence through the efficient and sustainable use of the resources over a longer life cycle. The focus during these kinds of scenarios has to be laid on the social, economic and environmental dimensions (Ravasio *et al.*, 2020). The execution of the green building offers social benefits, health benefits and economic benefits. However, there are some improvements required in the areas of technical abilities, economic benefits and government policies so that widespread adoption can be conducted (Liu *et al.*, 2022). As these buildings are looked upon through the perspective of environmental damage, it becomes quite visible that the cases of these buildings are likely to clash with the legal jurisprudence. The various outcomes for these kinds of scenarios have to be studied in terms of how all of the different buildings can be examined in regard to how their existence is likely to influence the surroundings. So the managers have to be assigned different responsibilities for these.

There has been a rather steady growth in regards to the green building research that has been conducted since the year 2000. This has happened so primarily because of the excessive increase that has been found in the year since 2011 (Li *et al.*, 2020). The advancement in green buildings has been conducted in terms of various practical ground investigations. Green Building Technologies have offered various kinds of benefits that are affiliated with environmental conditions, economic conditions and societal benefits. These clearly require further study to be carried out and a progressive development for the improvement of the sustainable future (Meena *et al.*, 2022). While these buildings have to be examined in regards to how the different improvements can be made in regards to these, it would have to be evaluated here in terms of how such sort of buildings can be used for sustainability purposes. It is sustainability that must not be compromised under any circumstances, and the sustainability must be examined in terms of how the essential features of environmental improvement must be carefully handled.

The community involved with studying these emissions needs to conduct measurements regarding how much of the emissions can be affordable. The unpolluted chemical emissions that are reduced through these green buildings definitely bring along some other side effects that need to be addressed one way or another. These facades and green buildings are likely to reduce the environmental influences by 1% on a yearly basis (Chàfer *et al.*, 2021). The carbon dioxide-based emission is likely to be reduced through these, but at the same time, the plants that depend on these for survival are likely to deteriorate (Du *et al.*, 2019). The abolishment of the plants, therefore, leads to a rather challenging position for humans as well in regards to how they receive less amount of oxygen once these issues are likely to arise.

Advantages of Green Buildings

Green buildings are likely to promote a rather sustainable form of living as these offer features such as reduction of water, reduction of carbon emissions and the reduction of energy. And simultaneously, these provide an improved space for the inhabitants, all the while offering them environmental benefits, economic benefits and social benefits (Sujatha & Sivarethinamohan, 2021). The materials affiliated with the green building offer health, beauty, comfort and environmental protection. Furthermore, it also holds the capability to use the waste items for other purposes; the improvement of the recently developed materials is also offered, and so are the standards of the industry found to be used widely (Sun, 2020). All of these benefits can be utilized if expert individuals handle the green buildings and their use.

The improvement that is expected in terms of the environmental assessments is more or less of the kind of one that helps in the formation and the development of the various outcomes. The damages that were likely to be caused to the environment are quite likely to be explored as these have to be studied in terms of how the different aspects must rather carefully be handled and treated through different sources. The wastage that could have been rather severely harmful is quite likely to be identified in regards to how it can be brought for a

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rather better use otherwise. The environmental factors have to be handled in an approach where the minimum amount of compromise is done and these are clearly found to happen in the cases of green buildings (Sujatha & Sivarethinamohan, 2021). Hence, these issues have clearly turned out to be among those that contribute to advantages in the entire scenario.

Disadvantages of Green Buildings

However, there are also some minor disadvantages involved in the entire process of these green buildings, but these are quite less as compared with the advantages. These green buildings can reduce the energy consumption in the buildings that are found to exist currently. Apart from these, these buildings are capable of enhancing the maintenance costs and due to those potential damages are likely to be caused to the building (Wesołowska & Laska, 2019). These green buildings are likely to neglect the personnel suitability that is found indoors, which eventually causes an ample amount of dissatisfaction among the people who reside there (Sun *et al.*, 2020). The green buildings for such sorts of scenarios have to be addressed in terms of how their disadvantages can be reduced and minimized.

Among the disadvantages that can be identified, it is the cost consumption that has been highlighted the most in the entire scenario. The expenses that are found in regard to energy consumption have been objected to by various parties. The legislative bodies have raised objections in regards to how these can cause damages to the maintenance and how economies of the state are quite likely to be harmed through these. It must, therefore, be rather carefully evaluated in terms of how the different issues must actually be resolved in terms of the cost consumption and how the administrative departments must take some immediate actions (Wesołowska & Laska, 2019). All of the different authorities who form the councils have to amend these issues by actually resolving the cases through sources that might generate ways through which positive sides would not be compromised.

The Proposals

Proposal One: Bringing 'Green Economy'

The concept of a 'Green Economy' is among the well-recommended ones that clearly indicates that various issues on the overall economic conditions of the state need to be addressed. The goal and the vision is a sustainable economic condition of the state where all of the essential factors that bring stability to the economy of the state would be handled. The balance of trade needs to be maintained in a way that the inflowing currency would be found to be higher as compared with the outgoing one. The foreign funds acquired from the International Monetary Fund (IMF) need to be utilized and allocated rather carefully so that potential losses do not occur. The different resources, therefore, would have to be addressed in terms of how exactly these contribute to the overall infrastructural management of the country (Adloff & Neckel, 2019). The role of different influential parties would also have to be analyzed here in regard to how the amendments can be made.

Among these, the modernization of society is one of the essential elements that have to be addressed, as this is not just about working on the infrastructural development of a particular region; rather, it emphasizes the growth and development of the general public in terms of education. The educational values need to be introduced here, and these help identify how the educational reforms can be made. Modern-time education needs to be examined in regard to how the underprivileged members of society can benefit from it (Adloff & Neckel, 2019). All such members, therefore, need to be provided with a quality education in order to reduce the illiteracy ratio of a targeted region. This is eventually presumed to bring a reduction in the poverty ratio of the state, all the while resolving the various issues of the people found in the different slum areas of the state.

Furthermore, sustainability also needs to be practised in the field of politics, where the policies generated by the government would have to be taken into consideration. There might be some among those policies where the general public and the average citizens of the state might not be in favour of some amendments that would be proposed. However, the government would have to conduct some seminars and workshops that would spread awareness concerning how sustainability needs to be maintained. The green building projects and their significance must be taught to normal citizens, and they would be instructed regarding how exactly the emissions caused by these can turn out to be beneficial (Adloff & Neckel, 2019). The government would have to arrange some foreign investments for these as these kinds of projects clearly demand huge investments that clearly carry along some promising returns.

Proposal Two: Smart Sustainable Cities

Some lengthy projects are also recommended, as these include small city projects that emphasise minimizing the damages that are likely to be caused by the emissions released by ordinary buildings. Hence, Smart Sustainable Cities need to be developed that would possess a vast amount of green building projects that would be operating accordingly. The environmental pollution that could have been caused otherwise is likely to be reduced through these as this would indicate how exactly the wastage can be prevented. The different forms of pollution-based emissions that are likely to occur on a rather regular basis would have to be considered by the project owners. They would have to keep this into account while installing the new plants (Bibri & Krogstie, 2019). These Cities need to be populated with an average amount of population that is educated enough to maintain cleanliness and other purity based issues.

Some long-term strategies have to be developed while initiating these kinds of projects, where the financial planning of the projects has to be conducted before the

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projects actually begin. There is a certain amount of risk that is expected in the architecture of small city projects, so the project managers have to keep this in consideration, visualizing the calculated amount of risk that they can afford. The economic conditions of the state also need to be addressed in regard to how the fluctuation of the business cycle can cause complications. Likewise, there are also uncertainty factors that have to be taken into consideration, as there are always chances of disasters that are likely to strike unexpectedly (Bibri & Krogstie, 2019). All such kinds of elements, therefore, have to be forecasted with the assistance of historical records. After a detailed analysis of all the factors, the next step should be to proceed carefully with the project in the small city.

Further ahead, the technology needs to be involved in terms of how the construction of the green building projects must be conducted. The well-trained experts for these kinds of scenarios need to be involved who would be asked to construct the green buildings keeping in account all of the hazardous factors. The multiple hazards may include the safety measures that have to be provided to the construction workers. If modernized technology were involved, then the hazards would clearly come to be minimized (Bibri & Krogstie, 2019). The preventive measures that have to be addressed here would require supervision from the seniors who would manage the different conflicts that are likely to arise. Modern-time technology, therefore, would have to be utilized in terms of how maximum output can be acquired through the minimum input and resources.

Gap Identification

As the various research articles of the recent times are closely evaluated, it becomes rather visible that the modern time initiatives regarding the green buildings have not been emphasized upon. The improvements that can potentially be made would not be rather clearly worked upon as all of these have to be explored in terms with how modern technology can make improvements and propose a betterment. Further ahead, how these can assist for accomplishing the sustainable development goals was not found in the recent research articles which needs a rather thorough attention from the research scholars.

Problem Statement

The sole problem that appears in the entire scenario is regarding proposition of the sustainable strategies that have to be evaluated. There are plenty of initiatives proposed by the research scholars but not enough solutions regarding the execution of sustainable strategies. Hence, the concerned research has been carried out in order to bring improvements in terms with how improvements can be made. The proper use of technology and more importantly its efficient use is what needs to be highlighted in the entire scenario. The concerned research is headed to contribute significantly to the academic industry by addressing all of these concerns and filling out the research gaps.

RESULTS AND DISCUSSION

Case Study

When it comes to the most elevated rate of vitality utilization, the United Arab Emirates has the highest rate of vitality in the Gulf Cooperation Council zone. It has also been stated that the vitality utilization in terms of units has been found to be the highest for this particular state in the entire world. This happens so because of the low vitality cost, the severity of the natural conditions in connection with the desert atmosphere and the financial perfection as per the entire scenario. Based on this higher quantity of vitality utilization, the United Arab Emirates has been found to advance in terms of utilization of the criteria that are supportable. The dependence on the utilization of the criteria on development ventures has proven to be an element that devises less dependence on the vitality assets of carbon drive (Yas & Jaafer, 2020). The carbon impression was found to be decreased as an outcome of this, due to which the Emirati government was found to command the undertaking after the year 2010 in order to proceed with vitality-sparing criteria (Yas & Jaafer, 2020).

This, indeed, is an impression of the worldwide attention to the natural impact of CO_2 discharge that assumes a noteworthy job in environmental change. Additionally, green structures ought to be a piece of the national technique of any nation having issues in vitality generation, vitality assets, and deficiency in crude material stores. The GB configuration ought to contain the three mainstays of execution growth over conventional structures; these columns are financial, ecological, and social factors in its development, operational, and destruction stages impression is left before the entire world in terms of how the attention is granted to the influence of carbon dioxide release in terms with how the noteworthy job in environmental change is assumed. The various green structures come and play their part of being pieces of national technique for a nation that faces issues in regard to vitality generation. The green building configurations for these scenarios have to possess three mainstays that are affiliated with execution growth in connection with the conventional structures. These can be ecological, social, and financial factors found during the phase of operational, development and destruction stages (Yas & Jaafer, 2020). The core force that develops this mindfulness on the significance of manageability drift would be affiliated with the development of the business that can be found in correlation with ecological issues that arise. The atmospheric deviation and the enhancement of carbon dioxide discharges would be found with how much exhaustion for the vitality assets would be conducted (Yas & Jaafer, 2020).

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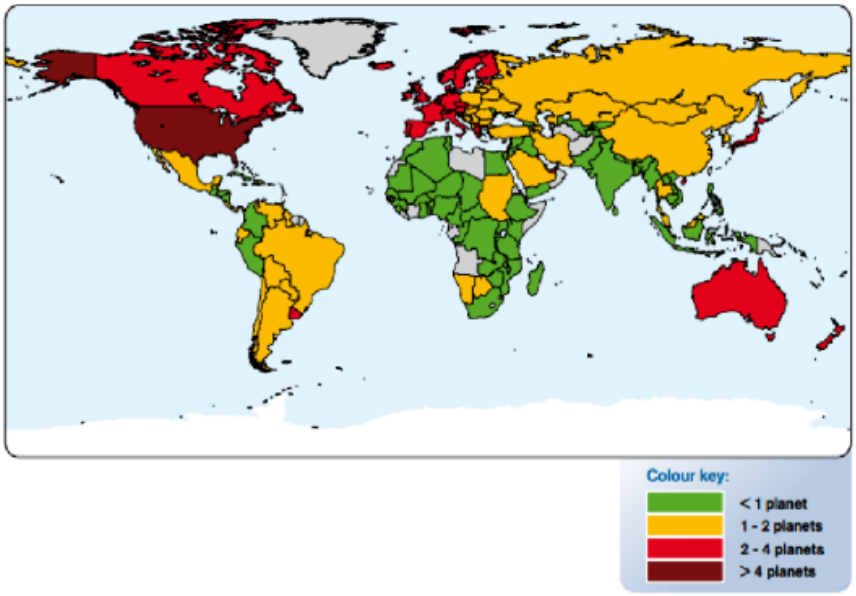

Figure 2: UAE's Ecological Footprint Worldwide

The figure above represents the UAE's ecological footprint in terms of how sustainability is found to be maintained in terms of the investments that the government made. The societies that are likely to benefit from these are what is clearly illustrated above and a representation of how the improvements are made is carried out through these.

Table 1: Green Buildings Financial Benefits

Category	**20 years Net Present Value Summery of findings per square foot (US$)**
Energy Savings	$5.80
Emissions Savings	$1.20
Water Savings	$0.50
Operations and Maintenance Savings	$8.50
Productivity and Health Benefits	$36.90 to $55.30
Subtotal	$52.90 to $71.30
Average Extra Cost of Building Green	(-$3.00 to-$5.00)
Total 20-year Net Benefit	$50.00 to $65.00

The table above represents the financial benefits that are acquired through green building projects as these are affiliated with the different categories of savings. The energy savings are found at $5.80, the emission savings are reported at $1.50, and the water savings are reported at $0.50. The operations and maintenance savings are found at $8.50.

The green building rating tools are also quite likely to come along with costs, as represented in the illustration below:

Figure 3: Relative Breakdown Costs

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There are different costs found within the total budget, and these are clearly affiliated with the high-performance construction as this comes along with quite some costs. The documentation costs are then found to be slightly less, and lastly the application and registration cost is way less.

The identified studies have contributed to a proper comprehension of the sustainable development goals and the green buildings by determining the strong link that needs to be developed between strategy and execution. How a strategy can be formed and how an improvement can be made for the execution purposes is what needs to be carefully evaluated in the entire process.

CONCLUSION

Summarizing up, the discussions were carried out in terms of how green buildings have been found to be quite beneficial and what sort of projects are found to be involved with these. The various green building projects that had been worked on were all shed light upon. The advantages along the disadvantages of green building systems have to be monitored rather carefully as these are among those elements where the position of these green buildings in terms of the environmental law can become visible. A case study on the Gulf region was further discussed and shed light upon for a better understanding of the outcomes. The initial case study shed light upon how the ecological footprints within terms of sustainability can be maintained. Furthermore, the financial benefits of the green buildings were shed light upon as the net benefit of total 20-year benefit accounted from $50 to $65.

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