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A QUALITATIVE STUDY OF THE IMPLICATION OF ENVIRONMENTAL SUSTAINABILITY IN PUBLIC SECTOR CONSTRUCTION PROJECTS IN PAKISTAN

SABEEL SAJJAD
PhD Scholar, Limkokwing University of Creative Technology, Malaysia.
Email: sabeelsmalik@gmail.com

Dr. MEHRUNISHAH BEGUM VPS BATUSHA HAMID
Post Graduate Center (PGC), Limkokwing University of Creative Technology, Malaysia.
Email: mehrunishah.begum@limkokwing.edu.my

Abstract

In Pakistan, the construction industry is the most prominent and fastest-growing sector. If modern construction procedures are adopted on time, construction can contribute significantly to Pakistan's GDP. The study aims at identifying gaps in knowledge and challenges associated with implementing sustainable practices in construction projects in Pakistan. Sustainability is often limited by the natural laws that govern the natural system. The methodology used for this research is qualitative. This study adopted the qualitative method. The study initially conducted ten interviews and by the tenth interview, the researcher started to observe saturation in the themes and information. However, the researcher then continued to conduct five more interviews to have sufficient qualitative data and ensure comprehensive information. It was also revealed that the educated stakeholder also contributes greatly to promoting the implementation of sustainability in the planning phase. However, in the design phase, the factor which was identified that contribute greatly toward promoting sustainability implementation in the construction industry includes budget, schematics, action plan, community participation, technological development, political cohesion and alternative plans.

Keywords: Sustainability Implementation, Pre-Bidding, Competitiveness Factor, Sustainable Building, Qualitative Study

1. INTRODUCTION

Globally, there has been a lot of focus on sustainable development. In the past a lot of work has been done concentrating on opportunities and challenges faced by sustainable development in the construction industry. Sustainable development offers substantial opportunities within the context of public sector construction and mainly in infrastructure and housing development (Tang, Shen, and Cheng, 2010). This phenomenon is defined as a climate change attributed directly or indirectly to human activity according to the United Nations Framework Convention on Climate Change, which alters the composition of the global atmosphere and adds to the natural variability of climate observed for comparable periods (Walker and Brammer, 2012). It is fact that climate change is a covert reality and that every day is more real. Human health is badly affected due to changes in weather stations and the impact on global warming (Abidin, 2010).

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There is limited research available in Pakistan which focuses on sustainable construction. Azeem, Naeem, and Waheed, (2020) have discussed the significant barriers to the implementation of sustainable practices in Pakistan. The study reported that the important barriers to implementation are lack of awareness about sustainable practices and its benefits among construction sector stakeholders. The barriers to the most effective strategy are to conduct public awareness campaigns and encourage consumers to demand sustainable and green building projects are study recommendation are needed to be address. This may be accomplished by holding lectures, talks, and workshops. Additionally, the study also suggested that there is a need to enhance and improve current industry regulations and quality standards requirements. It will encourage business entities to adopt green practices in construction projects.

Sustainable development is an important source for Pakistan to boost economic growth in country. Sustainable construction is one of the common factors in Pakistan since the construction industry is an important pillar in the economy. Green construction strategies may reduce energy consumption and improve resource efficiency. Latest report on sustainable building suggests that reduce generation of solid waste by approximately 70%, reduce consumption of water by 40%, and reduce carbon dioxide and greenhouse gas emissions by 39% according to Intergovernmental Panel on Climate Change (IPCC). The integration of sustainable development in Pakistan has not changed at all. Meanwhile, there is a lacking of scientific information to assess and track Pakistan's long-term performance. It is reasonable to believe that there are considerable obstacles to the adoption of sustainable methods in Pakistan's construction industry. If practical measures are implemented that remove obstacles and facilitate adoption of green practices in Pakistan, Sustainable development can be improved in Pakistan.

The study is conducted to evaluate the challenges related to the implementation of environmental sustainability in public sector construction projects. In this study the main focus is the construction projects that are specifically relates to the public sector. The main target population of the study includes the participants that are project managers of the public sector construction project and data collected through the interviews.

2. LITERATURE REVIEW

Environmental Effects of Commercial Activities

The environment is directly affected by human activities. As a result of human action and climate change, these activities can degrade, pollute, and deplete areas on our planet that have suffered degradation and pollution. One of the human actions that most impact the environment in the construction industry and for this reason it is one of the driving forces for meeting sustainable development goals (Huang, Wu, and Yan, 2015). Urbanization is one the major cause of environmental pressure. In developing countries, the pursuit of growth brings with it increased urbanization. Almost fifty percent of the population of the world lives in urban areas as reported by United Nations. Over 70% of

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the population already resides in urban areas in emerging nations. The influence on the environment is expanding, according to this scenario, which was only predicted for 2030. (Moss and Marvin, 2016).

The release of the polluting wastewater from the industries leads to the environmental degradation in many countries. In developing countries the problem is severe where no specialized treatment takes place before the discharge of the water. Industries are required to implement safe practices for the management of waste water due to the increased quantity of waste water (Malekpour, Brown, and de Haan, 2015).

Sustainable Development

It started as a response to the energy crisis in the 1970s that led to the term sustainable development. Since it was concern about the undue exploitation of the environment by man. It was not until the realization that environmental resources limited economic growth and the global economy that the discourse began to shift (Joss, 2011). In 1980s, the focus was expanded to include waste concerns and environmental problems arising from the emission of carbon dioxide into the atmosphere and other gases that contribute to the ozone hole and the greenhouse effect became evident lately in the 1990s. Sustainable buildings, eco-housing, and symbiotic housing are added to previous concerns (Marques, da Cruz, and Pires, 2015).

In addition to, the organizations around the world should be accountable towards maintaining the sustainably in the country and strict actions should be taken if any industry found in violation of the rules and regulations (Tjallingii, 1995). Breheny (1992) argues that the consumption of resources needs to be more effective in order to make the country sustainable and environmentally friendly. From the perspective of entrepreneurship, the shared economy promotes social sustainable development in many ways, not just in terms of sustainability for itself, but also in terms of social sustainability.

Sustainable Construction

Some of the important interpretations of Agenda 21 in the construction sector include Habitat II Agenda in 1996, CIB Agenda 21 on Sustainable Construction in 1999, and Agenda 21 for Sustainable Construction in Developing Countries in 2002 (Dhakal and Chevalier, 2017). When the principles and notion of sustainable development are integrated into the entire construction lifecycle, sustainable Construction is achieved. A multidisciplinary process that aims to restore and maintain harmony between the built environment and the natural environment can be achieved. In addition, it must ensure that human dignity is maintained while economic equality is achieved (Newell, et al., 2013).

It is expected that the architects responsible for this stage will provide most of the solutions that minimize a building's environmental impact during the project's life cycle (Voytenko, et al., 2016). Throughout its life cycle, the building interacts with the

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environment at different times. The construction of a building involves a number of different agents.

Sustainable Development and Urban Sustainability

The construction sector stands out nationally for its continuous process of expansion. For being directly responsible for the construction of the urban structure, promoting social changes in the conditions and quality of life in cities. While at the same time posing threats to their sustainability to occupy spaces that can impact the natural environment and the quality of life of the population. Since it consumes a lot of natural resources and generates a lot of solid waste, it has a negative impact on the environment (McCormick, et al., 2013). It is often incorrectly and indiscriminately used to refer to sustainable development. Applied to all scenarios of human life, it has practical applications and a broad concept. The concept is under construction, therefore, and it meets the intended objectives and the characteristics of the geographical space (Jennings, Larson, and Yun, 2016). According to Childers, et al., (2014), through the complexity of new values, sustainable development is a way of understanding reality. Science has developed new concepts that prioritize holistic and ecological rather than mechanistic and anthropocentric perspectives. Holistic thinking encompasses the idea that interrelationship is an essential feature of understanding biological, physical, cultural, social, and economic phenomena that are fundamental to humankind's reconciliation with nature. Therefore, the holistic view also contributes to the achievement of sustainable development (Nelson and Sterling, 2012).

Civil Construction And Sustainability

The area of construction encompasses all the works and infrastructure production activities required for a city. It covers functions of planning, execution and maintenance of works of different segments, such as buildings, roads, ports, airports, navigation channels, tunnels, building installations, sanitation works, foundations and land in general. All activities related to operations such as transportation system management, water treatment plant operation, dams etc. are excluded from construction (Pincetl, 2012). Pratic and Vaiana (2012) asserted, based on a review of the literature, that the construction industry exhibits a rising trend with the adoption of practises that value the low environmental impact associated with the improvement of quality of life, with support from the legislation, tax, and economic incentives that are developing quickly.

Sustainability: Promises and Limits

According to Dobson, et al., (2013) the concept of sustainability has a set of aspects and limitations that follow. This perspective is inherent in the concept of reducing, reusing, and recycling, and it includes considerations of population expansion, quality of life, level of living, and technology advancements that are presumed to be taken into account. The natural laws that control the natural systems that are the focus of preservation and protection, such as the laws of physics, thermodynamics, chemistry, and ecology,

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however, place restrictions on sustainability. Systems cannot produce more energy than they use, according to the first rule of thermodynamics, and they cannot prevent their energy and quality from degrading, according to the second law (Sourani, 2011).

3. RESEARCH METHODOLOGY

Qualitative research methodology is used in this study. The study initially conducted ten interviews and by the tenth interview, the researcher started to observe saturation in the themes and information. However, the researcher then continued to conduct five more interviews to have sufficient qualitative data and ensure comprehensive information (Mihas, 2019).

Therefore, a total of 15 interviews were completed. It is important to note that there is no universal rule to determine the number of interviews in research that are sufficient, unlike questionnaire surveys where 30 or higher participants are required to gain statistical significance. In this regard, Hammarberg, Kirkman, and de Lacey, (2016) argued that majority of the experts in research community opines that the number of the interview depends upon the methodological and practical issues that are unique to every research process. The methodological issued considered in this piece is the fact that there is some degree of reluctance among public sector construction managers to avoid discussing government issues and critique upon policies.

After conducting the interviews, the study identified common categories and themes regarding the challenges of implementation of sustainability. A thematic analysis is an analytical method for qualitative data in exploratory sequential method, particularly in case of large pieces of text(s) which in our case is interview transcripts. The basic purpose of the researcher is to identify common themes in the data that reflect common ideas and patterns in the behavior, or perception recorded in the form of text (Walliman, 2015). There is a variety of techniques that are applied to conduct thematic analysis, however, there are common elements and processes such as coding and categories leading to themes (Bryman, 2016).

Keywords were identified from interview questions and then all transcripts were searched and scrutinized to accumulate information. The researcher then further analyzed the categories to identify common responses from participants. These common responses were considered as themes and reported as a form of narrative. In addition, the researcher provided quotations from participants' interview transcripts as supplementary evidence to support the inferences and conclusions drawn from results. Furthermore, the researcher also compared the quotations and themes with past literature in order to evaluate consistency and identify new ideas and information. The basic purpose of the researcher is to identify common themes in the data that reflect common ideas and patterns in the behavior, or perception recorded in the form of text(s) (Walliman, 2015). There is a variety of techniques that are applied to conduct thematic analysis, however,

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there are common elements and processes such as coding and categories leading to themes (Bryman, 2016).

4. FINDINGS AND ANALYSIS

Thematic Analysis

In this section of the study, an in-depth thematic analysis has been presented wherein different themes and subthemes were created to analyse the findings. The identification, interpretation and analysis of pattern of meaning within qualitative data is emphasised by it.

Outcomes of Project Phases and Sustainability Implementations

This is the first and most fundamental theme of this section that is concerned with the outcomes of the project phases and how it impacts on the sustainability implementation. Therefore, under this theme, five sub-themes are discussed and analysed. The sub-themes are related execution, planning, designing, strategies, pre-bidding and implementation phases of the construction projects.

Execution

This sub-theme is intended to elicit information about the outcomes in the execution phase and sustainability practices associated with this. Therefore, when question was asked that what factors promoted use and implementation of sustainability practices in the execution stage of public sector construction projects, one of the of respondent responded to this question as:

"*Well at the execution stage the economic sustainability is the factor that promotes and encourages the implementation of the sustainability practice. The productivity of the execution stage leads to the sustainability implementation*"

The respondent stresses the importance of economic sustainability that promotes sustainable practice, whereas the other has highlighted the importance of community involvement and cooperation in this regard. It increases the outcomes of the project phase and hence also leads to the implementation of the sustainability in the project.

Planning

This second sub-theme of this section that is intended to elicit information about outcomes of the planning phase of the construction project and sustainability process associated with it. Therefore, when the respondents were asked question pertaining to this, one of the respondents retorted to this question as:

"*In the planning stage … the concept of sustainable practice is itself a motivating factor for construction projects in the public sector and requires the participation of the community as well including the costs of the project. The successful outcomes of the planning of project leads to the adoption of the successful adoption of the sustainability*."

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It has been revealed in the above responses that planning stage outcomes results in the proper aligning of stakeholders and project objectives, which leads to the successful implementation of the project sustainability adoption.

Design

When the respondents were asked question that in the design stage of public sector construction projects, what are the most important factors that promote use and implementation sustainability practices. One of the respondents responded to this question as: "*Factors that promote use and implementation of sustainability practices in the planning begin with the drafting phase of the design that includes schematics, budget, and the plan of action developed and depends on the factors of community participation exhibited by the Community in the project."*

If the above response is considered, it can be comprehended that sustainability is crucial in product design. The respondent has highlighted different factors through which the practices of sustainability can be promoted in project design.

Strategies

When this question was asked from the respondents that what could be effective strategies for reducing environmental impacts from public sector construction projects, one of the respondents said that;

"The world around is changing continually hence our strategies must too irrespective of the public or private sector. So that we too have up to date & more effective policies regarding sustainable environment & can achieve better results".

From the above response, certain new strategies have been found that could be applied, first, it could be an effective use of resources, and using an effective urban design that can reduce soil, water, and air pollution and usage of greenfield land.

Pre-Bidding

The participants were asked with the factors that are promoting the use and implementation of sustainability building in the pre-bidding stage. On this basis, participate A has stated that:

"The factors that promote use and implementation of sustainability practices in the pre-bidding stage are by evaluating the demand and gathering appropriate and thorough background information this is followed by the general decision to initiated with the request for intervention or the decision to end that highly depends on the Socio-cultural factors."

The rationale behind the socio-cultural as the most important factor as the quality of buildig has a major influence on the social condition and environment the citizens (Memon, Rahman, and Azis, 2011).

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Implementation

The factor for implementing the sustainability practices for the planning of public sector construction project is assessed. On this basis, Participant A has stated that:

"Factors that promote use and implementation of sustainability practices in the planning begin with the drafting phase of the design that includes schematics, budget, and the plan of action developed and depends on the factors of community participation exhibited by the Community in the project. The outcomes of the project and the stability of the project leads to the successful implementation of the project. "

In respect to the planning stages of implementing sustainable practices, the participant has demonstrated that the most important and crucial factor are budget and participation of the communication.

Sustainability *Building and Challenges in Sustainability* Implementation

This is the second important theme of this section that is aimed to focus on the information pertaining to sustainability building and the sustainability implementation. There are four sub-themes under this theme, which are related to practice to promote environmental sustainability, cost, time and revenue requirements, impact of construction waste and role of resource utilisation and challenges faced to implement sustainability.

Best Practices to Promote Sustainability

When the respondents were asked question regarding the best practices to promote sustainability, one of the respondents responded to this question: "hmm… the best approach…. well…as per my understanding there is a variety of practices available but for the least…. One could begin with premises that are efficient in terms of energy usage…. and…. appropriately dispose of or reuse the construction waste. The sustainable creating elements leads to the promotion of the sustainability"

In above responses, it can be analysed that appropriate dispose of or reuse of the construction waste is the considered one of the most important. It can be understood in a way that the recycling of construction materials, such as asphalt, plasterboard, rubble and bricks can help to mitigate the environmental degradation impact of such waste.

Cost, Time and Resource Requirements

This is another sub theme in this section, which focused towards the cost, time and resource requirement that are resulted by promoting sustainability practices in construction projects. Therefore, when the respondent was asked question to elicit information about this, one of the respondents responded to this question as:

"The practices of sustainability benefits in decreasing the cost as it neglects the different traditional sustainable practices and encourage new construction process that has been

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recognized as most cost effective. On contrary to this, it also decreases the manufacturing time because of the effective resource utilization."

Based on the above response, it can be understood that cost, time and resource requirements are imperative in construction projects. It has been analysed that by adopting the practice of sustainability, costs can be reduced in construction projects.

Challenges due to Cost and Time

The questions were asked from the respondents about the cost and time allocated for the sustainable practices. One of the respondents have provided with the response that;

"*The practices of sustainability are very effective on one hand and is also costly in terms of investment, time spend and the resources utilized. It may be effective for dealing with the environment and safety measures but can also be time consuming and costly for the companies to cater to the requirements".*

The means of sustainability practices are imperative for the businesses to gain better means of operations in the construction-based firms. As referred to the study of Olawumi et al (2018) there are different kinds of methods that can be used for enhancing the performance and can also provide with better quality operations.

Impact of Construction Waste

The impact of construction waste is considered one of the most serious environmental problems in recent times. When the respondents were asked question regarding this, a response obtained from one respondent states that:

"*I believe that construction waste leads to more destruction because the construction will often contain dangerous and unsafe material and is also more detrimental than usual waste, leading to further deterioration of the environment."*

The above presented response highlights the negative impact of construction waste in environment. It has been analysed that there is perilous material used in construction project that can be disastrous for environment.

Role of Resource Utilisation

The role of resource utilisation is to address the necessities and needs of the current environment, whereas environmental degradation and sustainability practices are considered a critical factor in construction projects. Hence, when the respondent was asked regarding the role of resource utilisation in construction projects, one of the respondents respond to the question and state:

"Like in any other project even in construction sector effectiveness of usage of resources is compulsory. Through effectiveness, we can achieve a sustainable environment, sustainable economic growth & increases competitiveness overall"

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From the above response, it can be analyzed that resources are considered as a critical factor in every project. The reason is that effective resource utilization greatly assists in attaining sustainable growth, sustainable environment, and also enhance the overall competitiveness.

Challenges in Resource Allocation and Utilisation

Based on the following issue and the question for constraints that affect the effectiveness of sustainable practices in the optimization of resource allocation and utilization, one of the respondents have answered that;

"*There are some constraints that influences on the effectiveness of the sustainable practices for optimizing the allocation and using the resources. The most crucial constraints are the local and global guidelines and rules. The rules are the biggest constraints when not supporting the sustainability practices as most of the person are obliged to follow the rule that are set by the governments".*

It has been observed that the project managers face different issues in terms of dealing with the effectiveness of resources and managing them for increasing the value of the project.

Competitiveness of Project Managers in Implementing Sustainability Practices

This is the third most critical theme of the section which aimed to shed light on the role and competitiveness of the project manager in executing or implementing sustainability practices. There are three following sub-themes which are created under this theme, which comprises of the contribution of construction manager, quality of life, and risk reduction and damages to the ecosystem.

Contribution of Construction Managers

The construction manager plays a critical role in the integration of sustainability toward project building during the process of construction and design to deliver sustainable projects. Therefore, when the respondent was asked questions related to the construction manager contribution toward social equity one of the respondents revealed:

"*Project managers have to face a lot of obstacles if the sustainable practices are implemented for the first time. Employees need proper training which needs a good healthy budget; In order to save the cost, the companies do not go for such practices and have zero interest in saving the environment*."

The above response reveals that generally there are a lot of obstacles which are being faced by the construction manager in implementing the sustainability practice for the very first time. Therefore, the employee requires appropriate training for it which can only be done if the company have a good budget.

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Management and Authoritative Role

This sub theme is based on revealing that what are the specific roles and duties of corporate governance and management through which, environmental sustainability can be ensured. It was asked the respondent to share their perspective regarding the implementation of sustainability practices in the execution stage of public sector construction projects. Verily, one of the replies were,

''Monitoring is very important in the phase of the implementation. This is because it let the manager know if there is any loophole in the decided blueprint of the project.''

The words of the respondents are helpful to understand the functioning of the corporate governance system in this regard that significantly marks on their performance. The management, as well as the authoritative role of the corporate governance in terms of environmental sustainability, is not just confined to considering that the working body puts in great efforts to attain success in the project.

Quality of Life

Project managers mainly worked over the projects, unrelated to the organizational governance and strategy. There are several issues that the project managers are facing regarding quality of life in implementation of sustainability practices, on asking construction project managers regarding this issue they have stated that:

"I believe project managers face several issues…in terms of quality of life of the occupants…. the most crucial one is … the general acceptance of the change by the occupants."

It is considered as change management in most of the researches as it is stated that they should approach change inflexible manner because the activities of change management can be integrated with the other activities of the project and contribute to the success of the business (Asiedu and Alfen, 2014).

Risk Reduction and Damages to Ecosystem

On asking the project managers regarding the obstacles that have been faced by them in the implementation of sustainable practices that are related to the reduction of risk as well as damages to the ecosystem, the project manager responded.

"In managing the risks reduction and ecosystem damages, the managers face different obstacles. Most importantly the obstacles are the lack of the interest of teams and cost utilization. This leads to sustainable implementation to be affected."

It is evaluated that the usually people are not taking interest to shift over sustainable practices, as they are very used towards traditional methods. This is the main reason that is listed for people not taking interest in sustainable practices.

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Greenhouse Emission and Carbon Footprints

The next question that was asked from the respondents about the challenges of implementing sustainability practices and in the construction-based projects. One of the respondents have provided with the comments that;

"*There are different obstacles that can be constraint in the sustainable practices of the emission of greenhouse gas or the carbon food print. The stakeholder perception is one of the biggest obstacles in this way."*

The comment has also been supported in the discussions of Kapetanovic et al (2019) that has also provided with the perception of public regarding the issue of sustainability that creates biggest obstacle for the consumers and the businesses as well.

4. DISCUSSION

Sustainable designs are defined as a "practice for structural development and systems that have environmental sustainability and efficiency throughout a construction life cycle from start to conception, building, operation, repair, refurbishment and demolition," as the Environmental Protecting Agency (EPA USA, 2010) says. The classical architecture problems of economy, utilities, reliability and comfort are complemented and expanded.

Pakistan has been more concerned with solving the rising environmental problems since the 1980s. It has attempted to introduce 14 (MEA) and is regularly participating in global environmental meetings organized by the MEA. The Commission on Sustainable Development (CSD) and the UNEP Governing Body has been involved regularly in those meetings held by country annually (Irfan, Hassan, and Hassan, 2018). Besides that, in general, in recent years and current government policy, Pakistan's sustainability policy to cope with the challenge at state scale has stressed four additional goals and objectives, to a certain degree, to foster balanced and inclusive economic growth. The 'multi-sector' policy would develop the industry sector's capacity through the introduction of cleaner manufacturing processes (Nizam et al, 2020).

The first objective that has been designed by the researcher was to assess the concept of sustainability and in construction projects and collect reliable empirical evidence with respect to sustainable construction in Pakistan. It has been observed that the researcher has highlighted the findings and analysis of different studies where different supporting and contradictory findings has been gained. Olawumi et al (2018) and Zolfani et al (2018) has highlighted that the concept of sustainability is one of the foremost aspects that can be used by the construction businesses to carry out the operation and activities.

The second objective that was designed by the researcher was to identify the main challenges in sustainability implementation in Pakistan and assess their impact on sustainability performance of public sector projects in Pakistan. According to the analysis

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of Saqib et al (2020), the construction firms in Pakistan go through different kinds of problems and challenges that hinders the sustainability in the country. It has been observed that the country Pakistan lies on the implementation of Sustainable Development Goals (SDGs) that also has certain challenges in terms of development, democracy, and defence (Hussain, Ahmad and Iqbal, 2019). The study of Jabeen, Farwa and Jadoon (2017) has highlighted that the issue of poor heath and poverty in the country leads towards the generation of ideas and tackling the climate change and natural resources that hinders the growth and sustainability in the country.

The third objective of this study has been identified by the researcher for addressing the research problems, which was to analyse the perceptions of managers in the public sector regarding the influence of the challenges related to sustainability implementation on the overall construction industry in Pakistan. In this regard, the following objective was based on examining the opinions of managers in the public sector that helps in the public sector, which determines that construction industry is found to be one of the most significant industries that contribute its part towards the socio-economic growth especially to developing countries. Whereas, sustainability implementation on the overall construction industry in Pakistan is found to be a big challenge. The fourth objective has been illustrated by the researcher for addressing the research problem based on sustainability implementation in public sector projects. It is recommended to integrate effective framework, which has been determined by Ali, and Ahmed, (2019); the author which highlights the subthemes of sustainability strategies in order to possess towards sustainable success of the projects. The purpose of this objective is to develop new strategies that could help the organization especially construction companies to integrate sustainable implementation that could lead the world towards green environment which is free from pollution.

5. FINDINGS

A major objective of this study was to determine the sustainability challenges being faced in the public sector. In order to gain a better understanding of sustainable construction in Pakistan, the study explores the concept of sustainability in construction projects. Based on the thematic analysis, the study identified three main themes. The project managers revealed that economic sustainability, monitoring and evaluation, and community involvement are considered to be a major factor that promotes the implementation of sustainability in the execution stage. When asked about the factors which certainly encourage the implementation and use of sustainability in the execution stage, the respondent indicated that those factors are definitely encouraged.

Furthermore, the execution phases play a significant role in the overall project. Furthermore, long-term advantage and cost effectiveness were also identified as important factors. Aside from that, it is also revealed that the planning phase also has great significance because it is considered as the driving force behind sustainable construction. Accordingly, the factors that contribute to sustainability at the planning stage

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are community participation, project cost, stakeholder number, climate change, and customer interest. Furthermore, educated stakeholder participation also plays a key role in promoting sustainability implementation during planning. There were, however, several factors identified during the design phase that contributed significantly to the implementation of sustainability in construction, including budgets, schematics, action plans, community participation, technological developments, political cohesion, and alternative plans.

This study also identifies a factor that promotes sustainability implementation at pre-bidding stage. Socio-cultural factors, environmental conservation, development of economy and social justice are included in findings. In the construction sector, all of these factors greatly contribute to and assist in promoting sustainability. Furthermore, the study reveals that the best method of promoting sustainability is to start the project by using energy and resources efficiently and by reusing and disposing of construction waste appropriately. According to the findings, another best practice is that the majority of the population does not possess adequate knowledge or awareness about the issues, so it would be best to educate the public about the environmental challenges and consequences they face.

6. CONCLUSION

With regards to the research topic, sustainable construction practices serve the purpose of representing the responsibility pertaining to sustainable development within the construction industry. Pakistan, however, has significant potential to implement sustainable procedures that achieve the purpose of industrialization considering sustainable procedures appropriately if they are implemented appropriately. In the next century, developing countries such as Pakistan will face many critical problems related to economic products, human capital, and climate. Thus, it looks that at least a century will be needed to plan, implement, and evaluate S&T activities for sustainability (Sun et al., 2020). As a result, the new contract for research and engineering, which is demanded in many debates on basic infrastructure, should be adopted for all professions as a fundamentally progressive contract, not just for studies or enterprises (Awais et al., 2019).

Recommendations

In light of the findings presented in the relevant research, it is possible to state that, in terms of suggestions that can be made to achieve the goal of improving the breadth of the relevant research, businesses should first make improvements to their company operations (Olawumi et al., 2018). To further clarify the aforementioned point, it may be added that firms should make adjustments to their operations that are seen to be in line with the construction methods that are accepted globally and that seem to satisfy the fundamental principles of sustainability, respectively (De Souza et al., 2017).

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