

Article

Sustainable Urbanization and Development Goals Strategy through Public–Private Partnerships in a South-Asian Metropolis

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Abstract: Contemporary urbanization appears as a conundrum especially in developing nations. This study will act as an accelerator to spill out snags caused by urbanization with a new approach in the development of sustainable infrastructure through Public–Private Partnerships (3Ps). This study first explains the complications generated by rapid urbanization in different infrastructural sectors in South Asian mega cities like Dhaka and Lahore. Second, the findings of the study elaborate on a new mechanism to adapt to Sustainable Development Goal 11 declared by the United Nations with the engagement of different stake holders working in different silos through 3Ps (like BOT, BOOT, BLT, DBF, PFI etc.). This study uses case studies as part of the research mixed methodology. Studies on Dhaka and Lahore including multi projects through 3Ps, and a detailed questionnaire survey based on critical risk factors from the Meta review of 3P literature are presented to establish the current status of sustainable development goals. This paper primarily contributes in two ways. First, by providing a new direction to policy makers to devise policies using a twofold approach i.e., grasp urbanization with sustainable infrastructure delivery by sustainable enactment of 3P projects. Second, bridge the knowledge gap by identifying the risk factors in the sustainable establishment of 3P projects in developing nations.

Keywords: urbanization; infrastructure; 3P; Sustainable Development Goals (SDGs); sustainability; smart city; critical risk factors

1. Introduction

Today, our world is going through massive urbanization [1], and sustainable urbanization is considered as a mechanism to protect the interest of all stakeholders during this urbanization process. According to a report of the United Nations [2], 54% of the world's population lives in urban areas, with an expected increase to 66% in 2050. However, this increasing population is not equally concentrated among the different parts of the world as the same report states that a larger portion of urban people will be increased in the cities and towns of less developed countries. In this regard, the estimated population growth in Asia is 1.4 billion, 0.9 billion in Africa, and is 0.2 billion in Latin America and the Caribbean by 2050 [3]. Given the rapid growth in their urban populations, these regions will face abundant challenges like housing, health, education, transportation, energy, and water projects. Particularly, because of the messy and hidden urbanization, South Asia does not fully apprehend the potentials of its cities for prosperity and livability. Furthermore, most of the cities are suffering from extreme level of poverty, unhygienic housing conditions, and poor livability even after the impressive

improvement since 2000 [4]. Therefore, developing cities in a sustainable way is a large endeavor here in these developing countries. Another report of the United Nations [5] stated that in 1990, 10 mega cities had almost 10 million or more dwellers each, which conglomerated 153 million individuals that were approximately equal to 7% of the urban population. However, in 2014 it increased to 28 mega cities with 12% of total global urban population having 453 million inhabitants. From these mega cities 16 are situated in Asia. Therefore, the most effective path to sustainable development of this region must pass through cities.

The growth of urbanization regularly leads to the conception of metropolises that function as locomotives of economic evolution, and as hubs for the amalgamation of human and commercial resources that produce innovative thoughts and skills essential for supporting the ecological plus diligent usage of assets [6]. However, it is commonly agreed that there should be some limitations in these economic and social establishments to protect the environmental livability [7]. Although contemporary worldwide urbanization is considered as a socioeconomic risk in developing nations, a number of studies debate whether consistent sustainable evolution is not *prima facie* through the perceptions of urbanization [8,9]. At present, urbanization is going to be acute in the South Asian mega cities as they have to deliver lodgings nearby to one billion individuals alone by the year 2030, thus issuing a burden on rudimentary infrastructure and living prospects [10]. Due to poor urban planning, some metropolises of South Asia like Dhaka and Lahore are devaluing the living standards of city dwellers, mostly in the slums. The traditional urban infrastructure of these cities is unable to ensure the interests of the present, let alone future generations. Sustainable urbanization can play a vital role in improving the current scenario by creating a sustainable infrastructure to offer adequate jobs for better livelihoods, enhance the economic health of the region, strengthen social networks, increase socially responsible attitudes toward using national resources, manage proper healthcare, and reduce environmental pollution. In fact, without sustainable infrastructure, coping with urbanization is impossible [11].

Basically, sustainable infrastructure lies at the core of urban planning. Infrastructure is a main driver of development and comprehensive amplification. The enactment of the 2030 Agenda for Sustainable development and the sustainable development goals (SDGs) present an instant challenge for developing countries. The gap between the infrastructure investments and the capacity of national budgets to fulfill this demand is widening throughout the world. There is no exception for Dhaka and Lahore as they have a scarcity of resources, inefficiency in expertise, and maladministration practices under the definition of developing nations. The many requirements for investment in the establishment of important infrastructures (safe roads, access to energy, purified water, better housing, and modern health care) is encouraging the private sector to participate in financing, risk and profit sharing, and obtaining a greater reputation together. A recent study [12] stated that the SDGs will not be achieved without fostering the 3Ps. Thus, involving private partners in the public interest to develop sustainable infrastructure is encouraged here in this region.

European nations and a significant number of governments worldwide have been working along with their private partners to develop, finance, and manage different infrastructures and services [13]. As the public sector internationally represents a substantial demand for sustainability, 3Ps has more chance to develop more environment friendly establishments and produce green products on a large-scale [14]. Furthermore, 3Ps can develop municipalities worldwide by reconceptualizing themselves as Smart and Sustainable Cities (SSC) by implementing the sustainable development goals (SDG's) of the United Nations (UN). However, social value creation in the form of hybrid organization by 3Ps is often hindered by the odds and is reported more as failure projects rather than as successful [15–17]. So far, the increasing literature on 3Ps [18–20] are only focusing the government's positive expectations about the performance rather than the real [15]. Thus, it becomes crucial to compare the real 3P projects with their estimated goals. Moreover, after making comprehensive literature reviews, no specific research dealing the current issue has been found for South Asia. In this study, we focused on goal number 11, which is to "Make cities and human settlements inclusive,

safe, resilient and sustainable” by using the 3Ps as one of the best mechanisms to do so [21]. However, diverse interests [18] and possible disparate agendas present in 3Ps [22] which vary from broadly social to more narrowly private and political—that results in complex and heterogeneous allies between them—have different objectives and claims ex-post. Therefore, it is very important to develop a strategic contract at the beginning of the 3Ps project which later on shapes into a legal and complete contract such as BOT, etc. Here by considering goal number 11 as a standard, we observed the current 3P practices in the two cities of Dhaka and Lahore as true representatives of South Asia. Indeed, they are the most populous megacities of this region with many economic and industrial activities that threaten sustainability. Throughout the 1980s, urban residential growth in these areas was second after Africa, with an increase of 3.0%–6.5% per annum. This is alarming for the municipal infrastructure, which cannot match this increase due to fast urbanization agglomerations. Due to these, conurbations (which are already susceptible) are becoming more vulnerable to natural calamities such as sinking and landslides that can devastate informal lodging settlements, to earthquakes that can shock control networks and water arrangements [23]. Thus, it has become one of the top priorities of these countries to regenerate, reshape, rephrase, and renew resources and infrastructure for the betterment of the economy, environment, and community in such a way that will be long lasting and beneficial for future generations. By considering the above scenario, the main target of this paper is to investigate the following important research questions: Is there any gap between practices of the existing and prospective 3P projects to improve sustainability conditions here? What are the major risk factors for practicing 3P projects here? And what strategy can be made to encourage more sustainable 3P projects in these two cities?

The above-mentioned research questions are answered by using a mixed method approach. In the first phase of the study, 3Ps experts of the region are contacted who are working on different existing projects. The first-hand information from these experts helped us to form interpretive sense of the existing projects and the gap between the prospects of 3Ps. The discussion with these experts also provided us an opportunity to refine the questionnaire about possible risk factors involved in 3P projects of the sampled region. The refined questionnaire was distributed among academicians, experts, and practitioners. The responses facilitated us to suggest and propose a strategy for sustainable 3P projects in two cities. This study primarily contributes in two ways. First, it will provide a guideline to policy makers to devise policies by using a two-fold approach, i.e., grasp urbanization with sustainable infrastructure delivery by the sustainable enactment of the 3Ps project. Second, it will bridge the knowledge gap by identifying the risk factors in the sustainable establishment of 3P projects in the developing countries.

Given the above discussion, our initial conceptual framework is shown in Figure 1.

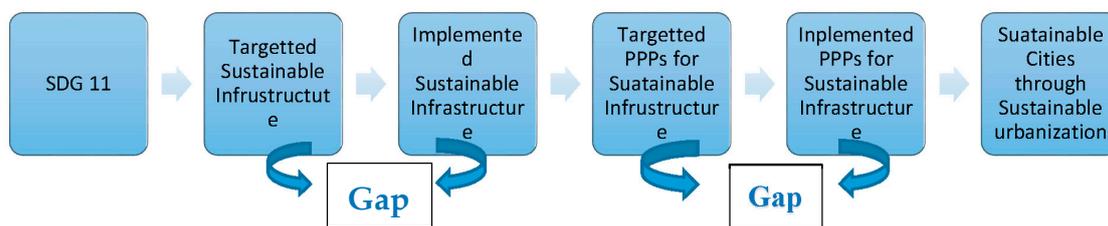


Figure 1. Conceptual framework of the paper. (Adapted from the conceptual model used in [24]).

The remainder of the paper is set as follows: Section 2 is a literature review mentioning the SDGs of the UN report with a focus on the goal 11, the role and the relevance of the 3Ps, its governance in the development of this goal by defining sustainable cities and their infrastructure, in 3P projects.

Section 3 is the research methodology, data profile, discussion of critical risk factors in sustainable execution of 3P projects. Section 4 presents the case study of Dhaka and Lahore cities, mentioning

a 3P detailed scenario in infrastructure projects; and finally, our conclusions and recommendations, followed by the limitations of this study.

2. Literature Review

2.1. Sustainable Development Goals (SDGs) of the United Nations (UN)

On 25 September 2015, a total of 193 participating nations unanimously agreed on a set of 17 areas to transform the world. These goals were broad and universal and focused on significantly reducing poverty, safeguarding the globe, and ensuring prosperity was aimed entirely towards an innovative sustainable development agenda where every goal line had exact objectives to be accomplished over the following 15 years. Governments, businesses, and civil society collectively with the UN have started to unify energies to accomplish this SDA by 2030. The SDGs, also recognized as Global Goals, were constructed based on the achievement of the Millennium Development Goals (MDGs) and their innovative goals were inclusive in the way that they appealed for action by all nations, regardless of income to stimulate affluence by guarding the globe [25]. Moreover, these 17 goals had a 360-degree coverage for moving the planet toward sustainability. Within these 17 goals, our target was focused on goal 11, “Sustainable Cities and Communities”. The concept of sustainability was developed in the 18th century by Saxony’s (Germany) regional mining administrator, Carl von Carlowitz, during the time of severe scarcity of timber which put thousands of lives in danger as a result of intensive logging for mining and the smelting of minerals. He fought against this hazard by introducing sustainability principles to limit the number of trees cut down to trees that were estimated to grow back. Essentially, the emergence of these United Nations SDGs (2015) was a sequential step to make the world more livable, and they recognized the interconnections between the environmental, economic, and social facets of sustainability [26]. Over the last two decades there have been a number of international agreements and declarations regarding sustainable developments (Table 1).

Table 1. International treaties towards sustainable development.

1992	The United Nations summit on development and environment in Rio de Janeiro, Brazil. The earth summit meeting main framework was based on a two-point agenda related to sustainable development.
1997	The Kyoto Protocols for industrialized nations to reduce CO ₂ emissions by 5% from the level of 1990 till to 2012.
1999	The United Nations launched the initiative global compact system of sustainable guidelines for industry enterprises.
2000 MDGS	Millennium development goals (MDGs) issued by the UN for the wellbeing of future generations.
2009 and 2010	Climate change conferences with goals to stop the earth warming by 2 °C.
2014 IPCC	Intergovernmental panel on climate change report indicated that atmosphere transformation was the biggest risk for sustainable development, which can be condensed with the reduction of GHG (greenhouse gas) emissions.
2015 COP21	Paris climate conference main agenda was to limit the global temperature rise to 1.5 °C.

2.1.1. Goal 11: Sustainable Cities and Communities

The SDGs ascertain the influence of urbanization in speeding up prosperity and welfare, and provide cities with a vibrant starring role in this renovation. Sustainable development cannot be accomplished without renovating the method of how we build and cope with our urban spaces [23]. The key aim of this goal is to build cities and human settlements that are all-encompassing, harmless, resilient, and sustainable (supporting targets listed in the Appendix A, Table A3).

Mentioned in the targets of the SDGs is that as more individuals migrate to municipalities to explore a healthier life, there is an increase in urban residents, and accommodation concerns intensify.

In 2014, 30% of urban residents lived in slum-like settings; in sub-Saharan Africa, this number was 55%, which was the largest of any region. Moreover, more than 880 million persons worldwide resided in slums until 2014. Additionally, megacities are the main contributors of carbon emissions and weather changes. Therefore, it is hardly surprising that governments and business leaders are now keenly focused on cities and their effects on economic development and public well-being, to climate variation and sustainability [27].

2.1.2. The Definition of Sustainable Cities and Communities

The sustainable city is a comparatively new idea that has grown in popularity in recent decades, both through the global community and through grass root actions [28]. Due to its huge acceptance and necessity, multiple organizations, social sites, and knowledge workers have defined it variously.

According to the official websites of the SDGs by the UN, building cities safe and sustainable means confirming access to safe and cheap housing, improving slum settlements, investing in public transportation, forming green public spaces, and refining urban planning and supervision in a way that is both participatory and comprehensive [23].

The definition of a sustainable city as stated by the Institute for Sustainable Cities is that “A sustainable community is one that is economically, socially and environmentally healthy, and resilient”. It meets tasks through assimilated solutions rather than through fragmented methodologies that come across at the expense of the others. This entails a long-term perception. One that is concentrated on both the present and future, beyond the next budget or election rotation [29].

The Institute for Sustainable Communities [30] explained it in a more detailed way and focused on all possible sections such as “Sustainable communities are defined as townships and municipalities that have taken steps to remain vigorous over the long period. Sustainable communities have a durable logic of habitation”. They have a vision that is embraced and actively encouraged by all key subdivisions of society including businesses, destitute groups, ecologists, civic associations, government agencies, and religious groups. They are spaces that construct on their assets and challenge to be innovative. These communities place significance on healthy ecosystems, consume resources competently, and keenly seek to preserve and enhance a locally centered economy. There is an omnipresent volunteer spirit that is compensated by solid results. Partnerships sandwiched among management, the business sector, and nonprofit organizations are common. Public discussion in these societies is engaging, inclusive, and productive. Unlike traditional municipal growth approaches, sustainability approaches emphasize the entire community (instead of just disadvantaged neighborhoods); environment protection; significant and broad-based citizen participation; and pecuniary self-reliance.

2.2. 3P and Its Relevance

There is no widely accepted definition of 3P. The term 3P describes a range of potential relationships among public and private entities in the milieu of infrastructure and other facilities [31]. According to the European Investment Bank, 3P is a general name defining all relationships between the private sector and public organizations, aiming at the application of private resources or experience to support the public sector in providing assets and services [32]. A 3P can be defined as a widespread contractual relationship between the public and private divisions with the purpose of generating public services or infrastructure [33]. 3P models offer a number of benefits and disadvantages as presented in Table 2.

Table 2. Benefits and disadvantages of 3P [34–37].

Risk Reduction	Knowledge and Skills
Municipal authorities are capable of sharing the risk of investment with private firms.	Private groups may have technical knowledge of urban government's deficiency or vice versa.
A local focus	Political, social, economic benefits
Paralleled to centrally led development scheme, 3Ps are planned for the urban zone, employ local players, and allow local establishment greater freedom and control over facility provision.	The usage of local organizations can boost public engagement and job foundation in the region
Disadvantages of 3Ps	
3Ps have become the critical element for the delivery of both economic (tunnels roads and bridges) and social (schools, hospitals, prisons, stadiums) infrastructure. However, the performance of 3Ps has yet to be opaque due to several shortcomings. Such as, they are prone to facing cost overruns, time delays (pre-construction contracts preparation etc.), harmonizing the public and private organizations, lack of flexibility concomitant with long-term agreements, higher capital costs and not carrying projected value during their maintenance and operation phases [35,36]. Further, the poor performance of 3Ps is due to the lack of an operative and comprehensive performance measurement arrangement. There has been a propensity for the performance of 3Ps to be measured out based on their ex-post norms of cost, time, and quality. Such norms do not encompass the intricacies and life expectancy of an asset. So this issue is addressed by [37] in which they develop the methodology of sequential triangulation to examine the effectiveness of a "Process Management Life Cycle Performance Measurement System". Furthermore, through life management (TLM) benefit achievements, the 3P model has to be restructured to secure incentivization headed for TLM and include TLM at the level of the production structure as described by [35]. However, detailed investigation of this area is out of scope of this paper's objective.	

After extensive literature review of 3P, we can articulate the following features described in References [38–40].

- (1) Partnership variants occur along a continuum determined by the extent to which several services and amenities are bundled inside the contract like accommodation only, concession arrangement, specific purpose vehicle, institutionalized 3P or mixed company, system of franchise issued to private for revenue earn with strict control by government, involvement of full service provision etc.
- (2) A private finance element increases the efficiency in delivery of services or quality of infrastructure because disbursements can be associated to performance.
- (3) Risk assigned to the party which contains the smallest premium or better capable to bear it as imperfect provision of the risks, establishes one of the main reasons of the private sector involvement failure.
- (4) Composite contractual tasks and deliverables diverge over the agreement period as the project passages through its phases, such as from funding to assembly and the process of handing over infrastructure/services to the control of the government at the completion of the agreement tenure or; the delivery of facilities by the private sector on behalf of the government following the serenity of design and construct tasks.

Currently, this issue of public and private interests working together is at a fever pitch over the global financial crisis [18]. By these 3Ps, governments want to shift the up-front capital expenditure and to utilize expertise of the private parties and the private parties' desires for the best return of their investment [40]. Therefore, financing infrastructure should be value-additive in the form of growth in cleaner transport, renewable energy, effective and resilient water arrangements, and smart metropolises. Furthermore, due to exacerbation in population evolution and an increased demand in building, modernizing or swapping, brownfield/existing assets would lead to higher costs. In addition, a contemporary USD \$1 trillion per annum investment shortfall has been globally estimated in infrastructure [41]. According to the estimation by the World Bank, this additional

demand is at 1.3% of GNP (global gross national product), whereas almost 1.2% of GNP is required for the maintenance and operating cost of brownfield/existing infrastructure [42]. According to the 2013 McKinsey report [43], infrastructure investment will escalate 60% over the next 18 years. Another report presented in 2014 [44] predicted that worldwide infrastructure costs per annum would require further augmentation from USD \$2.6 trillion in 2011 to almost USD \$4 trillion until 2030. Broadly stated, 3P models (people, planet, profit) have been undertaken to develop a risk-sharing relationship between the public and private sectors to make public policies in practice [45]. Owing to private sector participation in the establishment of urban infrastructure it does not only share the financial burden of these governments (having limited financial resources) but also plays vital roles in sustainable development in forming smart cities with greater potential through different structures under mechanism of 3Ps [46] as illustrated in Table 3. Moreover sustainability, design of 3Ps matters. As 3Ps can be arranged through various contracts like (BOT, BOOT, BLT, DBF, DBFM, DBFOM, etc.). The contract type selected is probably to affect sustainability results, due to its diverse incentive arrangement. In this study some respondents rated DBFOM more suitable as this type provides incentives for life cycle costing, whereas other respondents mentioned all 3P types have sustainability advantages over traditional procurement methods in which project phases are separated rather than integrated.

Table 3. Various arrangements under 3Ps [47].

Abbreviation	Arrangements		Impact on Sustainability Indicators			
	Name	Ownership	Operate	Economic	Environmental	Social
DBT	Design-build-transfer	Pb	Pb	Low	Low	High
BLT	Build-lease-transfer	Pb	Pb	Low	Low	High
DOT	Design-operate-transfer	Pb	PP	Low	Low	High
BOT	Build-operate-transfer	Pb	PP	Low	Low	High
BOR	Build-operate-renewal	Pb	PP	Low	Low	High
ROT	Refurbish-operate-transfer	Pb	PP	Low	Low	High
DBOM	Design-build-operate-maintain	Pb	PP	Low	Low	High
DBFO	Design-build-finance-operate	Pb	PP	Low	Low	High
DBO	Design-build-operate	Pb	PP	Low	Low	High
BTO	Build-transfer-operate	Pb	PP	Low	Low	High
BOOTT	Build-own-operate-train-transfer	Pr	Pr	Low	Low	High
BOOT	Build-own-operate-transfer	Pr	Pr	Low	Low	High
BLO	Build-lease-own	Pr	Pr	Low	Low	High
BOOM	Build-own-operate-maintain	Pr	Pr	Low	Low	High
ROO	Rehabilitate-own-operate	Pr	Pr	Low	Low	High
BOO	Build own operate	Pr	Pr	Low	Low	High

Pb—Public Sponsors, Pr—Private Sponsors, PP—Public Private Sponsors.

Involvement of 3Ps has risen in most regions as shown in below Figure 2.

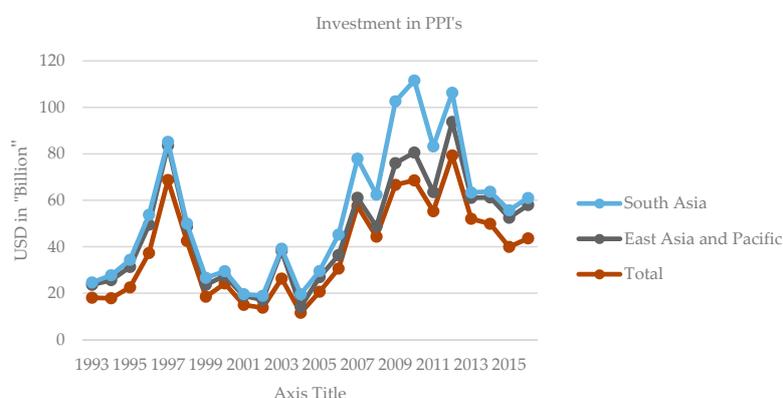


Figure 2. Investment assurances to infrastructure projects with private participation by region 1990–2020. Source: Private participation infrastructure project database, 2016.

2.2.1. Governance for 3P Sustainability

Sustainability is usually perceived as a TBL (triple bottom line) model composed of social, ecological, and economic dimensions [48,49]. However, some scholars believe that just the TBL approach is not sufficient and claim for the addition of assets and governance dimensions. Usually, the asset dimension is linked with physical infrastructure concomitant with performance, reliability, durability, flexibility, and adaptability of the system. On the other hand, Governance is associated with transparency, the rules and laws of the game, abiding of the laws/rules by all stake holders, their involvement in the decision building procedures, efficiency, and usefulness of those decisions and the quality of the transparency and modification mechanism [50–52]. Furthermore, several insights from sustainability literature illustrate that radical transformations and sustainable development benefit from a governance tactic as well as better governance are essential for stepping towards sustainability [53,54]. So governance tools are used to incorporate sustainability in 3Ps. In practice, policy making in sustainability matters is the consequence of elucidated discussions between mixed networks of private and public sector actors instead of decision making within the context of formal, bureaucratic and institutional administration frameworks at just one policy level [53,55,56]. Furthermore, urban development plans usually comprise complex settings in which local communities, politicians, autonomous public agencies, civil servants, municipal governments, investment businesses are intermingled within hybrid partnerships [55]. This complex relationship between private and public actors is the crucial characteristic of 3P projects. A recent study [57] states that incentives and specific governance tools can be applied within 3P projects to strengthen and stimulate its sustainability. In this scenario, it is imperative to recognize the accessible “control mechanism” i.e., the tools and instruments used by the state governments to intentionally affect the decisions and performance of other private and public actors in 3Ps to accomplish the objectives [58,59]. Consequently, both formal and informal governance instruments can be used to establish 3Ps. Formal governance tools comprise of top down command, control and procedures regarding competition, outputs, and transactions whereas informal governance tools are described as a network or relational governance tools. Network literature highlights the relational governance tools as interdependent relationships, belief, trustworthiness, and reciprocity [60]. So, the level of mutual trust, process management, and cooperative decision-making are realized as features that impact the performance of 3Ps [58,61–63]. Reference [57] stated that in 3P projects, informal governance tools might be deployed after the contact with bidders and contract administration. In fact, formal and informal governance tools might strengthen each other in attaining sustainability goals.

2.2.2. 3P for Sustainable Infrastructure

Improving sustainability enactment in emerging infrastructure ventures is an important policy for following the operation of sustainable development. In recent years, the 3P corporate model has been promoted as an effective approach in developing infrastructure projects [47]. Basic structures like highways, water and sewage pipes, and electrical power remain sporadic in many emerging states [37], which were traditionally built solely by the public sector. However, national budget deficiencies and inadequate managerial efficiency opened the sector to private investment [64]. According to the 2016 World Bank report, when designed well and implemented in a balanced regulatory environment, 3Ps can bring greater efficiency and sustainability to the provision of public services such as water, sanitation, energy, transport, telecommunications, health care, and education. Furthermore, it has also been mentioned that a substantial proliferation in infrastructure funds in emerging marketplaces and developing economies (EMDEs) is required to sustainably accomplish poverty reduction and mutual prosperity, reach the SDGs, and grab environment alteration. Thus, 3Ps can be an effective tool to deliver much needed infrastructure services. Different types of 3P have been experienced in infrastructure enlargement in both developed and developing countries with varying results [65]. Many projects across a broad range of sectors have been successfully developed through 3Ps with significantly increased value to the outputs including bridges, roads, railways, ports, airports, power, water supply,

waste disposal systems, telecommunication networks and accompanying services of information technology, schools, hospitals, hotels, prisons, and even the armed services. Governments sometimes use 3Ps as the catalyst to aggravate the extended discussion and obligation to a sector transformation agenda, of which 3Ps is only one component.

2.2.3. Sustainable Infrastructure for Sustainable Cities

According to Reference [66], “The infrastructure associated with human accomplishments comprises composite and interrelated physical, economic, social and technological arrangements such as energy production and dispersal, transportation, communication, water resources controlling, waste management, facilities supporting rural and urban communities, sustainable resources expansion and environmental fortification”. Another more practical definition which integrates all physical assets plus societal requirements was given by Reference [67] where “Infrastructure comprises all those physical apparatuses of interconnected systems providing services and commodities vital to support, sustain or develop public living circumstances”. Various aspects of sustainability studied in the literature are mentioned in Table 4.

Table 4. Articles about various aspects of sustainability [68,69].

Author Name	Year	Eco Environment	Economic Feature	Physical Feature	Institutional Feature	Energy	Policy
Ameen et al.	2015	✓					
Li et al.	2014	✓					
Zuo & Zhao	2014	✓					
Wang et al.	2014	✓					
Zenker & Rütter	2014			✓			
Charron, Dijkstra, & Lapuente	2014				✓		
Ye et al.	2013	✓					
Zenker, Petersen, et al.	2013	✓	✓	✓			
Grewal & Grewal	2013					✓	
Ren et al.	2012	✓					
Wu & Tan	2012	✓					
Zhao et al.	2011					✓	
Piguet et al.	2011					✓	
Lior, & Jin	2011					✓	
Ma et al.	2011					✓	
Zhao	2011						✓
Vettorato et al.	2011	✓					
Zhou et al.	2011	✓					
Platten, & Shen	2011	✓					
Baum et al.	2010	✓					
Insch & Florek	2010			✓			
Baum, Arthurson, & Rickson	2010			✓			

where “✓” denotes the mentioned variable included in the respective study.

It has been predicted by the UN that world population will grow 9–10 billion by 2050, when almost 3 billion people (40% of today’s global residents) will be carried into the blue-collar class [70]. This will cause a significant demand for all types of social and economic infrastructure, so growth in sustainable development will be influenced mostly by the development of sustainable infrastructure. Furthermore, environmental hazards such as climate related catastrophes and water paucity have upsurged over the past 30 years, where the rapid flow in weather related calamities over the last thirty years can be seen in report Ref. [71].

Such extreme weather calamities can amplify risks to the physical reliability and practicality of infrastructure systems. As a result, restraints from economic growth, global population rise, resource paucity, civil rights, labor matters, and unsustainable urbanization problems all require a transformation in planning, or a shift on the road to consequent sustainable infrastructure development.

Infrastructure is dynamic to the construction of sustainable cities, and proper scheduling is dynamic to the conception of sustainable infrastructure [72]. According to Reference [73], present infrastructure systems are inclined to be planned exclusively in isolation from each other and from

urban planning. This unplanned urbanization, especially in developing nations, is causing economic, social and ecological devastation. Principally, sustainability and infrastructure share the joint goals of meeting the existing and long-term objectives of society and the accountability for this sustainability is distributed to a broad set of stakeholders [74,75]. The extant literature provides an opportunity to modify our suggested model for sustainable urbanization with the help of 3Ps. Figure 3 explains the flow to achieve sustainable cities in developing countries. It is suggested in the model that public and private partnership either local or international build sustainable infrastructure for different key sectors, such as energy, water, transport, food supply, housing, green space, and health care [39]. The sustainable infrastructure further leads to achieve sustainable urbanization. Thus, initiatives from all related parties need to be considered to design new technologies and policies. As indicated in the following modified model, the infrastructure development in seven key sectors proceeds in such a way that will enhance the environmental sustainability, health, and livability of our cities, today and in the future.

Thus, initiatives from all related parties need to be considered to design new technologies and policies in the following Figure 3 in which seven key infrastructure sectors of energy supply, water supply, waste management, transportation, buildings, green spaces, and food supply in such a way that will enhance the environmental sustainability, health and livability of our cities, today and in the future.

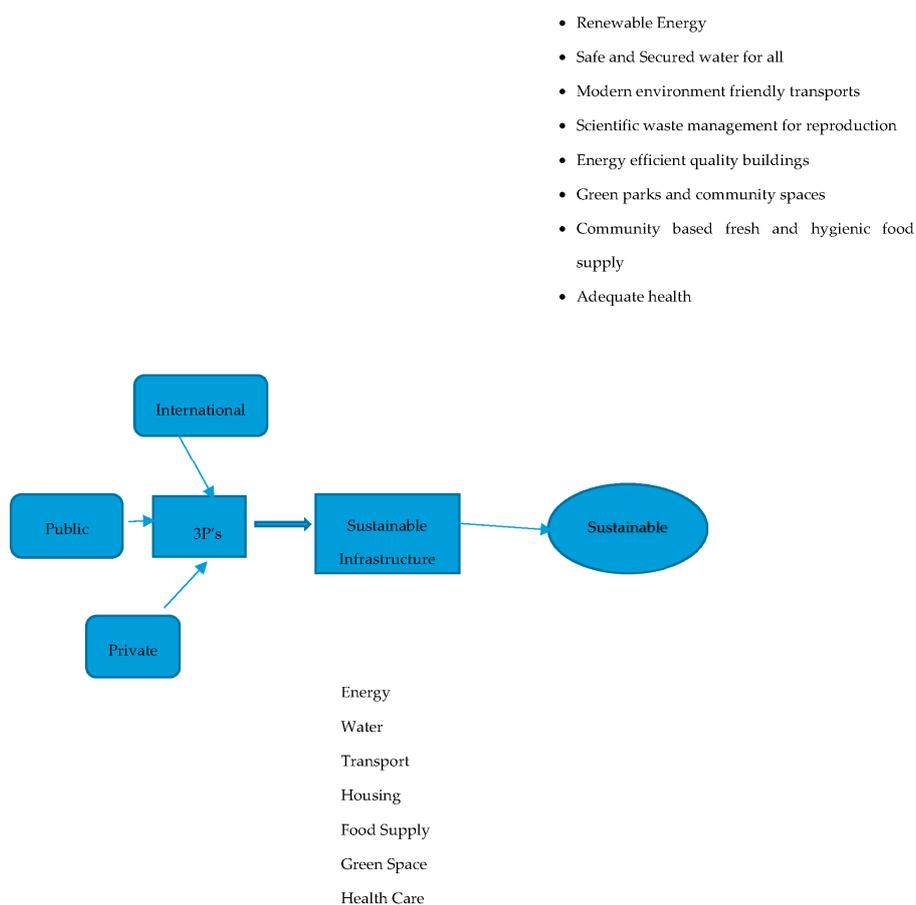


Figure 3. The modified model.

3. Research Methodology

The methodology of this article was established using a mixed methods approach where first, a questionnaire survey from 3P experts from Bangladesh and Pakistan, as well detailed 3P projects in Dhaka and Lahore. This method of finding risk factors in the execution of 3P projects has been used

by many researchers in different countries including China, Hong Kong, Malaysia, and the UK as described in References [76–84]. According to Osipova, the support of practitioners and academicians is essential to illuminate the condition of how it can increase mutual risk management by intermingling different administration approaches [85]. First, we verified the questionnaire through a pilot study conducted on a few practitioners as well as academics in the Agricultural University of Dhaka (Bangladesh) and Quaid-e-Azam International University Islamabad (Pakistan) after amendments were made to the questions and including other factors prior to finalization. Second, as global issues related to sustainability are multifaceted involving social environmental and economic tasks [78], measuring sustainability is a tricky area at the macro level of cities. However, the best way to cover a maximum are possible by conceiving cities (data used were collected by secondary sources, like official websites, multilateral international agencies, local government websites, newspapers, archival records, reports) as case research as it creates a practice of interpretive logic making, which encourages the value of contextualization data in these cities related to building a sustainability concept through 3Ps. This same aspect of using case study based research was endorsed by Reference [86], who described conceiving case research as a form of interpretive sense making, which supports the value of contextualization to hypothesizing. Thus, we concluded the results after verifying all information by considering the views of the 3P experts. After the pilot study, a finalized questionnaire was devised to collect data from both countries. The questionnaire consisted of three main sections. The first section addressed the respondents' profile and understanding of public-private partnership projects. The second part was the meta-analysis of risk factors to find the critical investigation in selected emerging economies in all types of 3P projects. A five-point Likert scale (1 = least important factor; 2 = low important factor; 3 = moderate important factor; 4 = high important factor; and 5 = extreme important factor) was adopted to assess the risk criticality as risk assessment criticality is manifold and nebulous qualitative verbal terms are mandatory [87]. The third part of the questionnaire provided free space for comments specifically for practitioners/academicians/public servants regarding their feedback for risk identification, critical risk factors, and key drivers for sustainable 3P projects in these emerging economies.

3.1. Data Profile

The participants in this study were from both countries (Pakistan and Bangladesh). The data were collected between the period of October 2015–June 2016. A total of 150 questionnaires were circulated, 75 in Bangladesh and 75 in Pakistan through social media (WhatsApp, emails, Facebook) as well as face to face. Among them, 42 from Bangladesh and 38 from Pakistan were received (53% of sent questionnaires returned). The details of the respondents are summarized in Table 5.

Table 5. Data profile of respondents from Bangladesh and Pakistan.

Primary Role	BAN	Public sector	30.2%
		Private sector	47.6%
		Academia	15.9%
		Others	6.3%
	PAK	Public sector	30.3%
		Private sector	41.4%
		Academia	18.2%
		Others	10.1%

Table 5. Cont.

Industry Experience	BAN	<5 Year	38.1%
		5–10 Year	23.8%
		11–16 Year	15.9%
		17–20 Year	22.2%
Industry Experience	PAK	<4 Year	26.3%
		5–10 Year	30.3%
		11–16 Year	26.3%
		17–20 Year	17.2%
Project Type	BAN	Transportation	22.2%
		Power & Energy	31.7%
		Water and Sanitation	30.2%
		Information and Telecommunication	15.9%
Project Type	PAK	Transportation	17.2%
		Power & Energy	35.4%
		Water and Sanitation	32.3%
		Information and Telecommunication	15.2%
Project involvement	BAN	In one 3P Project involvement	
		In two 3P Projects involvement	3.2%
		In three 3P projects involvement	28.6%
		Above three 3P projects involvement	68.3%
Project involvement	PAK	In one 3P Project involvement	3%
		In two 3P projects involvement	6.1%
		In three 3P projects involvement	19.2%
		Above three 3P projects involvement	71.7%

3.2. Data Analysis

The whole average and standard deviations of risk factors were calculated and are presented in the subsequent figures and Table 6. These results demonstrated that factors affecting the execution of 3P projects were the same in both republics at the macro-level with little variation difference (standard deviation). This may have been caused by the Pakistan economy being more unpredictable than Bangladesh due to numerous dynamics within the economy, such as imports, exports, FDI (foreign direct investments), India and Pakistan nuclear standoff, and terrorism prima [81,82]. The average and standard deviation between Bangladesh and Pakistan risk factors are displayed in Figure 4.

Table 6. Risk/barrier factors in the sustainable execution of 3P projects.

Descriptive Statistics	Bangladeshi Respondents		Pakistani Respondents	
	Mean	STD.	Mean	STD.
RCF1: Lack of attention and engagement from government level at national as well provincial/municipal levels	4.62	0.55	4.53	0.85
RCF2: Unsound government	4.70	0.50	4.60	0.70
RCF3: Strong political meddling	4.29	0.73	4.24	1.22
RCF4: Policy commitment & consistency regardless shift in political regime	4.41	0.59	4.38	1.35
RCF5: Institutional reluctance of metropolitan owners to delegate assured structure visions to business	4.10	0.87	4.07	1.47
RCF6: Withdrawal of government support network	4.02	0.86	3.94	1.37
RCF7: Terrorism image hindrance	2.00	0.80	4.16	1.32

Table 6. Cont.

Descriptive Statistics Risk Factors	Bangladeshi Respondents		Pakistani Respondents	
	Mean	STD.	Mean	STD.
RCF8: Lack of substantially devised 3P schemes on the metropolitan level	3.81	0.84	4.13	1.33
RCF9: Corruption, Nepotism, Cronyism & bribery	4.25	0.80	4.19	1.27
RCF10: Expropriation/nationalization of assets	3.83	0.83	3.83	1.53
RCF11: Poor financial market	2.71	1.05	2.83	1.46
RCF12: Financial uncertainty	3.75	0.82	3.71	1.56
RCF13: Termination of concession by the government	2.60	1.04	2.55	1.42
RCF14: Inflation	4.03	0.88	4.00	1.42
RCF15: Interest rate risk	3.19	0.93	3.13	1.69
RCF16: Persuasive economic events (advertising, promotions, political campaigns etc.)	4.19	0.82	4.12	1.29
RCF17: Inadvertent fluctuation in currency convertibility	2.88	1.14	2.90	1.63
RCF18: Inadequacy of regulatory/legal frame work	4.43	0.69	4.40	1.06
RCF19: Frequent legislation change	4.00	0.88	3.89	1.50
RCF20: Amendment in tax regulation	3.11	1.05	3.05	1.66
RCF21: Amendment in industrial administration	3.08	1.02	3.03	1.65
RCF22: Redundant contract variation	3.37	0.96	3.32	1.69
RCF23: Imprudent contract	3.60	0.89	3.57	1.59
RCF24: Premature juristic system	3.45	0.77	3.48	1.47
RCF25: Lack in critical model required for 3P projects	4.05	0.86	4.06	1.32
RCF26: Inadequate custom of provision of public services by private sector	3.70	0.82	3.69	1.56
RCF27: Level of public consensus to project	4.08	0.91	4.02	1.41
RCF28: Shifting in market requirement	3.24	0.93	3.16	1.69
RCF29: Lack of Solid institutional outline	3.51	0.93	3.48	1.63
RCF30: Standing of each party in case of force majeure risks	3.57	0.91	3.52	1.63
RCF31: Environmental affect assessment	1.67	0.74	1.17	0.38
RCF32: Geotechnical circumstances (evaluation of physical suitability of land)	1.68	0.74	1.60	0.70
RCF33: Inadequate distribution of responsibilities and risks	2.83	1.45	3.24	1.69
RCF34: Inadequate distribution of authority in partnerships	3.27	0.94	3.24	1.69
RCF35: Lack of commitment from either party	2.03	0.84	2.03	1.08
RCF36: Differences in working method	2.19	0.84	2.14	1.14
RCF37: Lack of consortium expertise	3.13	1.30	3.28	1.70

where RCF stands for risk critical factor.

According to the respondents' feedback analysis, the most critical risk factor in the sustainable execution of 3P projects in developing nations (especially Bangladesh and Pakistan) was the unsoundness of political governments (Mean values are 4.70 and 4.60), which exist due to frequent military involvement since their inception and is the cause behind why stable democratic government was never established [88].

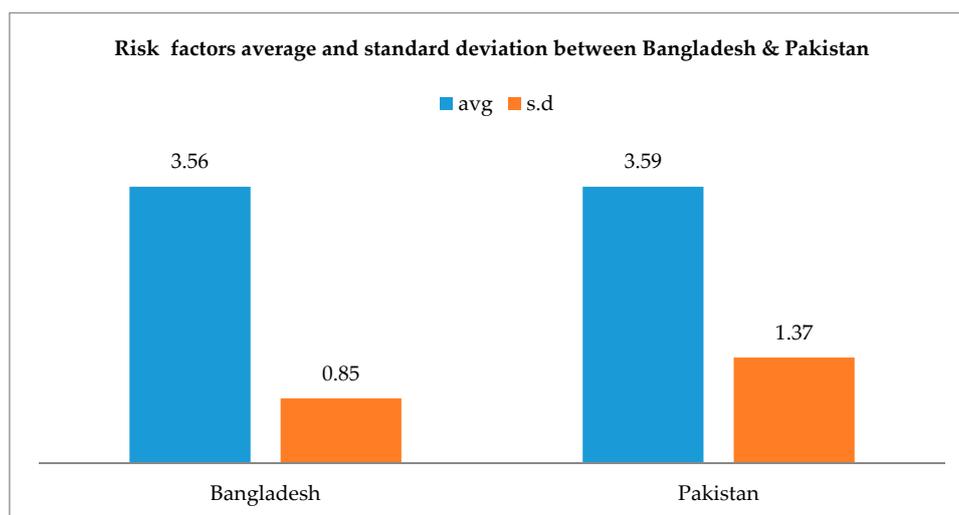


Figure 4. Average and standard deviation between Bangladesh and Pakistan risk factors in 3P projects.

The second and fourth critical risk factors were the lack of attention and engagement from government at national as well provincial/municipal levels, as well as policy commitment and consistency regardless of shifts in political regime (mean values were 4.62 and 4.53, and 4.41 and 4.38, respectively). In Pakistan, the appropriate 3P policy is still pending approval at parliament. A study of the country level review of partnerships conducted by the Asian Development Bank described that Pakistan had a policy that supported 3P power generation projects, but even that also fell prey of malpractices in 1990, when the Ehtesab Bureau [89] unwrapped different types of queries from foreign investors of the awarded company Hub Power Co. and ultimately exited. A similar situation was created for foreign investors in the Lahore-Islamabad Motorway after a change of government. Therefore, these types of circumstances create reputational risks for governments. In Bangladesh, it has been recognized as a priority in the power sector as well as other corporate infrastructure projects like the initiation of a landlord port at Chittagong to gain the maximum output, but has not been established due to the political situation [90].

The third critical factor was the inadequacy of legal frameworks (mean values of 4.43 and 4.40). Both countries do not have a mature legal framework to deal with the complex transactions involved in 3P projects. According to a recent study by the World Bank, for 3P projects to be successful, a sound legal and regulatory structure, monetary and commercial frameworks, institutional procedures, and their capacity to handle complex transactions are essential. This case was seen from a Pakistani context, when two big mining companies approached the government to develop the Reko Diq gold and copper mines, and have had to face litigation and linger in arbitration.

The fifth and sixth critical factors were strong political meddling (mean values of 4.29 and 4.24) and corruption and nepotism (mean values of 4.25 and 4.19). Different measures were taken to eradicate this menace from Pakistani society in the form of the Ehtasab Commission (1996), The National Accountability Bureau (NAB; 1999) with the National Anti-Corruption Strategy (NACS) and the PPRS (Public Procurement Regulatory Authority) [91]. Furthermore, there has been substantial progress in the freedom of the press and media, which is auspicious in eradicating this evil [92].

The aftermath of these developments can be seen in the recent report and ranking by Transparency International about South Asia where Pakistan's ranking in the Corruption Perceptions Index (CPI) 2015 was upgraded from the 50th most corrupt country in 2014 to 53rd in 2015 [93,94]. The menace of corruption also permeates Bangladesh. Twenty-two years' worth of information (1971–1993) obtained from the Ministry of Finance demonstrated that an amount of BTD 1800 crore (USD \$22.22) was shattered due to unfair transactions and theft [95]. Out of all types of corruption in politics and administration, the most omnipresent forms are monetary kickbacks [96]. According to the new CPI in

2015, Bangladesh scored 25 with no improvement on its 2014 score, and was the second worst area in South Asia, just ahead of Afghanistan [97].

The seventh and eighth critical risk factors in both countries were the problem of various persuasive economic events and the institutional reluctance of metropolitan owners to delegate assured structure visions to business (mean values of 4.10 and 4.12; 4.10 and 4.07, respectively). Without solid reasons and any specific agenda, but to create further instability in the government, a trend of protests and marches by political parties with campaigns against the government sometimes not only sabotages the business activities, but also creates a state of anarchy. The ninth and tenth critical factors were the lack in critical models required for 3P projects and the level of public consensus to such projects (mean values of 4.05 and 4.06; 4.08, and 4.02, respectively). Other important critical risk factors weighted by respondents in these countries were the withdrawal of government support networks (mean values of 4.02 and 3.94), the lack of sustainability devised 3P schemes on the metropolitan level (mean values of 3.81 and 4.13), inflation (4.04 and 4.0), and frequent legislation change (4.0 and 3.89).

4. Case Studies

4.1. Dhaka City

Dhaka City is one of the most populated cities in the world. It is the capital of Bangladesh and consists of an 815.85 square kilometer (approx.) area with more than 15 million people. The city suffers from overpopulation and is also under tremendous risk for low quality urbanization facilities. AKM Nurun Nabi, a professor of population sciences at Dhaka University, recently described his concern regarding the infrastructure of Dhaka City to a reputed newspaper in Bangladesh where he was quoted as saying “Every year around 1.8 million to 2 million people are accumulating to the total population. But we cannot construct our infrastructure to encounter these requirements”. He also said that the national population development rate was 1.37%, with a country-wide rate of internal movement at 4.5%, and a frequency of migration to Dhaka of 6% [98].

4.1.1. Dhaka City’s Urban Infrastructure

The basic concept of urbanization in Dhaka is simply the gathering of numerous people in urban areas from rural areas for the sake of various purposes. Today, there are many people who live in city slums where there is poor sanitation. Furthermore, the water plants, gas and energy power system, sanitization, transportation, and housing system are below standard in Dhaka City. With the increase of a huge population, the demand of the above-mentioned factors is increasing drastically with the city unable to supply what is required. As a result, the city is facing a lack of electricity, which causes load shedding problems, especially at night. According to the official statistics, the electricity shortage in Bangladesh is 1000 megawatts (MW) to 1259 MW with almost every part of Dhaka City conducting load shedding every day for at least four to five hours [99]. A limitation of resources, low generation capacity, high demand, poor capacity of power station machineries etc., are the reasons behind this; moreover, the lack of economic dynamism, governance failure, severe infrastructure and service deficiencies, inadequate land administration, massive slums, and social breakdown are some of the unavoidable crises faced by this city. At present, growth in and around Dhaka is extremely unexpected and unplanned, which indicates a high degree of congestion and overcrowding and malfunctioning of the traffic system. High-rise buildings are also increasing very rapidly, which may risk the lives of people due to unplanned construction and design [100]. In 2010, 21.3% of the Bangladeshi urban population lived below the national poverty level, and in 2009, around 62% of urban inhabitants lived in the slums.

4.1.2. Road Connectivity

Dhaka is connected to the other parts of the country through highway and railway links. Five of the eight major national highways of Bangladesh start from within Dhaka.

These are the N1 (Dhaka-Chittagong), N2 (Dhaka-Sylhet Highway), N3 (Dhaka-Mymensingh), [https://en.wikipedia.org/wiki/N5_\(Bangladesh\)](https://en.wikipedia.org/wiki/N5_(Bangladesh)) (Dhaka-Banglabandh), and N8 (Dhaka-Patuakhali). Dhaka is also directly connected to two of the longest routes of the Asian Highway Network (AH1 * and AH2 **, as well as to the AH41 *** route). Highway links to the Indian cities of Kolkata, Agartala, Guwahati, and Shillong have been established by the Bangladesh Road Transport Corporation (BRTC) and private bus companies also run regular international bus services to those cities from Dhaka.

4.1.3. Metro Rail System

In 2016, there was no underground metro rail service in Dhaka City. There are few over ground rail services that are not only limited in number, but are also unsatisfactory due to very poor services. However, by 2019, a 10-km metro line is expected to be completed with a cost of Tk. 22,000 crore (USD \$2.5 billion). The Dhaka Metro Project will develop the urban transportation structure by constructing a high-capacity metro line, which will be later be integrated with the Mass Rapid Transit (MRT) and Bus Rapid Transit (BRT) lines currently under construction [101].

4.1.4. Airport

There is only one airport in Dhaka City, the Hazrat Shah Jalal International Airport, which is completely under public ownership and control. More than 4 million global and 1 million national passengers as well as 150,000 tons of carriage and mail interchange use the Shah Jalal International Airport (DAC) on an annual basis [102].

4.1.5. 3P Project Scenario in Dhaka

In August 2010, the government of Bangladesh issued a policy and strategy for 3Ps to facilitate the development of core sector public infrastructure and services vital for the people of Bangladesh. A report on '3Ps in Bangladesh: Reality and Prospect' [103] mentioned that the government has already placed six projects for implementation under 3Ps in the current fiscal, which, in total, would cost some [USD] \$13.85 billion or Tk. 951 billion. The projects are the Dhaka-Chittagong Access Control Highway, a Sky Rail around Dhaka City, the Dhaka City Underground Railway, Dhaka City Elevated Expressway, Dhaka-Narayanganj-Gazipur-Dhaka Elevated Expressway, and two 450 megawatt gas- or coal-fired power stations. Furthermore, the government has plans to construct smaller links and approach roads, bridges, flyovers, underpasses and tunnels, university residential halls, and hospitals under the 3Ps in Dhaka city. Table shows a summary of 3P projects in Dhaka city (Appendix A).

4.1.6. Prospect of 3P Projects in Various Sectors in Dhaka City

There have been few 3P implemented projects in Dhaka City, but there are innumerable sectors like power, water, transportation, and housing etc. where 3P can take the initiative to begin new projects. It could benefit the nation to reduce the tremendous urbanization problems as well as create a business opportunity for firms looking for investment in the relevant sectors. Approximately 1.5 million women are employed in different garment factories [104] which presents a very prospective opportunity to invest in the garment sector with 3P projects as currently this sector has already been successful and is very competitive in the world market. Furthermore, the scenario of Dhaka City could be completely changed with help of sustainable 3P projects i.e., with the participation of the private sector (including community involvement, multilateral agencies, NGOs, etc.) with public bodies.

4.2. Lahore

Lahore is the second largest city of Pakistan with an estimated population about 9,245,000 and a growth rate of 5.8% [105]. It is the capital of Punjab and is surrounded by the Qasoor, Pattoki, Shekhupora, and Okara districts. Including West Punjab, the people of these districts always migrate from their areas to Lahore for better lives and to enjoy the best facilities. Due to the lack of infrastructure

facilities, people cannot survive in rural areas; however, this shift also brings potentially negative practices to urban cities. When people migrate from undeveloped areas to cities, they also bring their culture, habits, attitudes, and family lifestyle with them where sometimes these unfamiliar cultures do not merge well with the current urban environment. Furthermore, this migration burden on cities creates other social issues like unemployment, housing shortages, water and sanitation issues, and limited energy supplies. To prevent these situations, the government has to provide enough effective infrastructure to meet the needs of the incoming rural people, which can also assist them in obtaining employment. The government develops hospitals, railways, roads, educational facilities, and environmentally friendly energy resources that will assist in controlling the changes in population. To increase the rate of development within urban and rural areas, the government must work alongside the private sector for more effective results. This allows the government to control migration patterns in underdeveloped countries such as Pakistan.

Major Infrastructure and Contribution of 3P Projects in Lahore

Since 1990, the government of Pakistan has been working on 3P projects to develop infrastructure in the country. Motorways, dams, railways structures, airports, energy sources, hospitals, and education institutes are some examples where 3P has been involved. The Lahore Development Authority (LDA) also makes infrastructure development plans for the city to expand to absorb the projected migration trend. LDA is working on this issue to provide infrastructure to the farthest areas around the Lahore city to stop increased migration to Lahore. A package of Rupees 58.03 billion (USD \$550.704 million) has already been assigned for the purposes of overcoming issues of energy, road networks, water supply, drainage systems, waste management, sewerage issues, flood protection, and better health facilities. New metro bus systems and an orange train are also mega projects for Lahore to overcome traffic issues and to provide an efficient public transportation system. With the help of public-private partnerships, implementation has become easier as the private sector can invest more finance and the best expertise necessary for execution. The LDA divides Lahore into eleven sectors to work efficiently with the following allocation of funds: the transportation sector 43.1%, parks recreation 10.34%, education 19.6%, water and sewerage 8.1%, health sector 7.1%, and all other sectors are 2%–4% as illustrated in Figure 5.

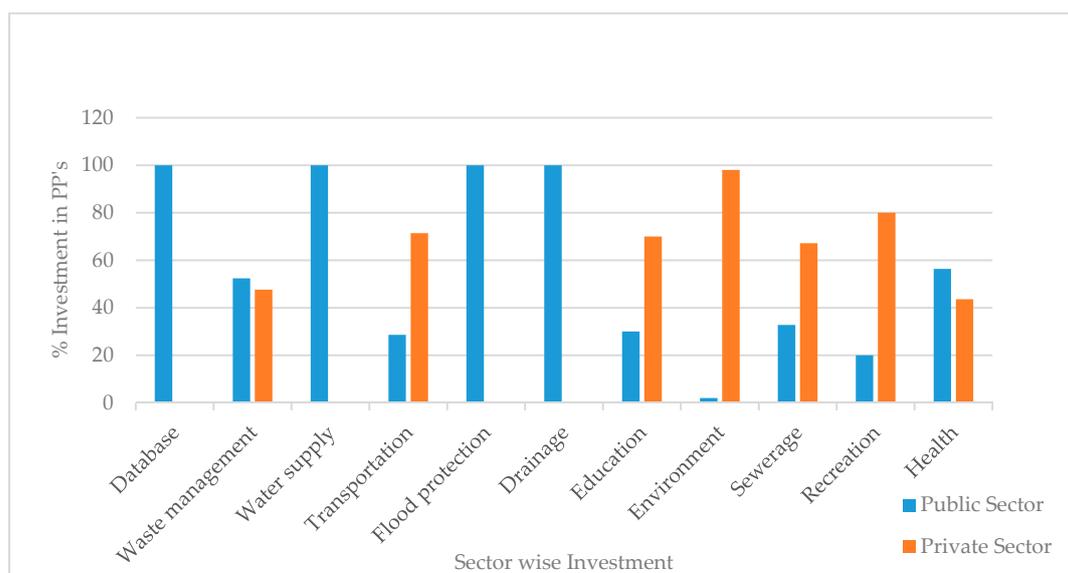


Figure 5. Sector-wise allocation of funds with year wise chart [106].

The total investment in the first phase (five years) of the project is Rs. 58.03 billion, out of which Rs. 20.543 billion (35.4%) was contributed from the public sector and Rs. 37.487 billion (64.6%) shared by the private sector. This is the first five-year city project, called a short-term plan. After this phase is another five-year plan called the medium term, followed by a long-term plan of ten years for a total of 20 years. The Lahore city plan has funds of Rs. 263.2 billion to expand the city with facilities to accommodate the migration surrounding Lahore.

From Figure 5 and Table 7, it is easy to understand how public/private partnerships joined to finance the LDA plan for Lahore to be able to absorb more inhabitants from surrounding villages and small cities.

Table 7. Year wise funds allocation chart [106].

Year	Investment in Billion
1	8
2	12
3	13
4	13
5	10

Moreover, Figure 6, provides a snapshot of the different 3P projects that will take place in Lahore with the percentage of public and private participation.

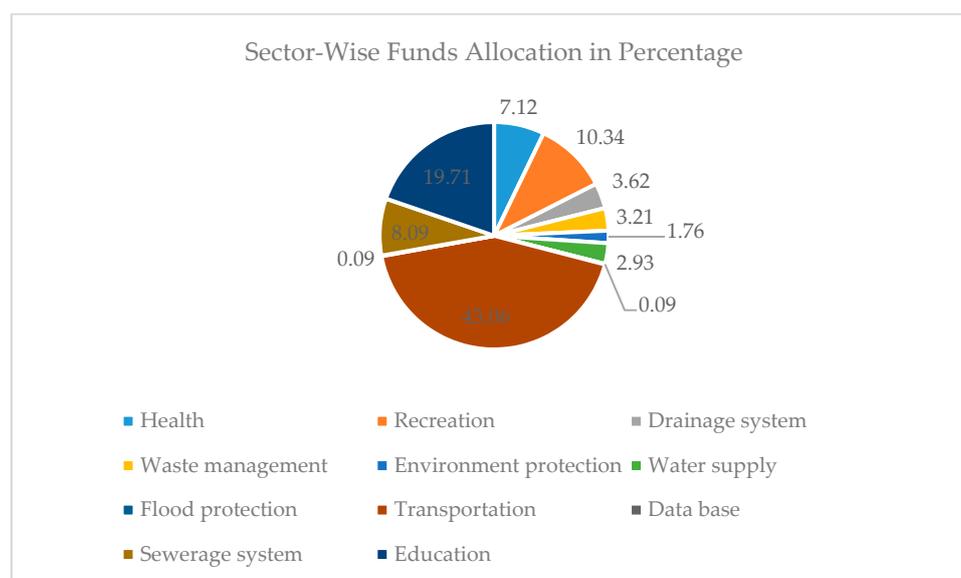


Figure 6. Public–private sector contribution [106].

5. Conclusions and Recommendations

The accomplishment of SDGs is closely associated to governance, and 3P is a distinctive practice of governance. This study provided us with insights of the existing 3P projects in the major metropolis of two developing countries. The experts of 3Ps of the regions found that there is a lacking of institutionalization in the field of 3P in these countries. The cases research of different 3P projects in Dhaka and Lahore highlighted the potential of 3Ps in the region. However, the lack of policy-making in the domain of 3Ps may create problems for the Prospect 3Ps. The results of the study indicated that the incompleteness of the contract in 3Ps is the major concern of the existing 3Ps. The institutional governance which provides a solution for complete contracts like BOT, BOOT, etc. may overcome this problem. Further, this study also pointed out some of the major risk factors that are involved

in the existing 3Ps. Political instability is a concerning risk factor of the existing 3Ps. The political instability promotes distrust among the actors of 3Ps which causes a failure of the project. Meanwhile, the remaining risk factors identified in this study such as lack of attention and engagement from the government at national and provincial level, inadequacy of legal frameworks, strong political meddling, corruption and nepotism, persuasive economic events and the institutional reluctance of metropolitan owners to delegate assured structure vision to business, and lack of critical models required for 3Ps, should not be ignored. Similar critical risk factors like lack of support from government, inadequate experience of PPP, unstable government, lack of legal framework identified by Ref. [107] in Singapore and amendments in law, delay in approvals, corruption found by Ref. [108] in China in public private partnership projects, endorse this study result in Bangladesh and Pakistan.

A focus on governance implies focus on procedures rather than organizations. Governance encompasses institutions of state and the practice through which institutions intermingle [109], and good governance includes the participation and actions of all players (i.e., local, regional and central governments, private parties, citizens, and all other stakeholders) [110]. This implies that only coherent progression of various tasks is expected to engender added value. In joint venture 3P practice, most importantly, public players consider added value in content and procedure, whereas private parties primarily account for the most important financial, practice and external added value [20]. Thus, these added values are associated with the vision of both public and private players [111], and the wide-ranging idea is that collaboration leads to improved outcomes [112]. Furthermore, UN multilateral development banks, multilateral agencies, and other international organizations will support, not only on a worldwide level, but also at local, regional, and national levels.

By focusing especially on Bangladesh and Pakistan for the sustainable development of 3P projects, it is recommended that there should be stability in the procedures concerning 3P projects regardless of the change of political government, which can be only possible with the establishment of clear policy frameworks. Further, management should fully support 3P projects and maintain focus on constructing their structure using a 3P model. Governments should provide an atmosphere where the institutional reluctance of metropolitan owners to delegate assured infrastructure visions to business is removed. Moreover, management should explain the cost of the ventures and the potential revenue to ensure that stakeholders are informed of the financial health. It is also recommended that strong legal frameworks should be established at local as well as national levels to identify and follow all rules and regulations, which would reduce any legal and financial ramifications. In order to ensure transparency at every stage of the project, governments should establish an SPV (special purpose vehicle) for all types of projects and employ experts with high reliability and impeccable reputational standards with knowledge. Further, governments should propose enhanced and customized facilities to appeal and sustain dynamic routes. There should be adaptation capacities between the partnerships (modification in institutional structure). It is imperative to focus on three different strategies for the execution of sustainable urbanization projects namely rural-urban integration, mobilization, and sustainability of urban public finance and regional growth policies.

By going forward, the SDGs are intended to promote an integrated approach, going beyond the out-of-date silo “three pillars” methodology (economic, social, and environmental pillars). The “nexus” methodology of water, food, and energy is a significant model of an assimilated approach, but other nexuses between other area combinations could also be considered. Finally, it is estimated that research outputs would enlighten policy makers and local practitioners of the right processes to embrace when engaging in upcoming ventures.

6. Limitations and Future Research

This study identified the general risk factors in Bangladesh and Pakistan in the execution of sustainable 3P projects. The study was also confined to finding the risk factors and comparing between the two countries which is also a scrupulous job but it can be expanded with a larger span towards key drivers, success factors in 3P projects, and especially focusing urbanization projects. Overall this study

mostly focused on macro factors, other studies can explain categorically micro factors larger scale by comparing other emerging nations.

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Author Contributions: Bilal Anwar proposed the main research idea, detailed literature review of 3P's following focus on 3P's survey, analysis of results through SPSS 21 following conclusion and recommendations. Zhongdong Xiao acted the supervisory role by formatting the whole manuscript especially methodology, conclusion sections. Sharmin Akter contributed in introduction part, literature review as well coordinated in collecting questionnaire data. Ramiz-ur-Rahman mainly contributed in the revision part of this manuscript. Lastly, thankful to the all three anonymous reviewers whose useful suggestions added a significant value in our manuscript.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. 3P projects under processing, tendering, and planning in Dhaka. Source: InfraPPP, Infrastructure Knowledge.

Date Modified	Project	Country	Current Stage	Value (\$MM)	Sector
4 July 2016	Rampura-Amulia-Demra 3P road project	Bangladesh	Project in planning	200	Transport
7 March 2016	Upgrade of Dhaka By-Pass road through 3P	Bangladesh	Project in tender		Transport
30 September 2015	5 star hotel project at Zakhir Hossain Road through 3P	Bangladesh	Project in tender		Social & Health
24 June 2015	Mirpur Integrated Township Development (MITD) 3P project	Bangladesh	Project in tender		Social & Health
23 June 2015	Dhaka Elevated Expressway (DEE) 3P project	Bangladesh	Financial close	1250	Transport
12 May 2015	Oboshor: Senior Citizen Health Care and Hospitality Complex	Bangladesh	Project in tender		Social & Health
12 May 2015	Kamalapur Railway Hospital 3P project	Bangladesh	Project in planning		Social & Health
12 May 2015	Flyover from Shantinagar to Dhaka-Mawa Road (Jhilmil) on 3P basis	Bangladesh	Project in planning		Transport
12 May 2015	Dhaka-Ashulia Elevated Expressway 3P Project	Bangladesh	Project in planning	1150	Transport
5 February 2015	Dhaka Hemodialysis centers	Bangladesh	Project signed	3	Social & Health
19 December 2014	Dhaka-Chittagong Expressway 3P project	Bangladesh	Project in planning		Transport
13 October 2014	Supply, Installation and Commissioning of a Multi-Mode Surveillance System at Hazrat Shahjalal International Airport, Dhaka	Bangladesh	Project in tender		Telecom
19 February 2014	Shantinagar to Dhaka-Mawa expressway 3P project	Bangladesh	Project in planning	338	Transport
17 May 2013	Expressway Aminbazar-Azimpur	Bangladesh	Project awarded		Transport
4 February 2013	Water treatment plant in Khilkhet (Dhaka) under 3P	Bangladesh	Project in planning		Water & Waste

Table A2. 3P projects under processing, tendering, and planning in Lahore. Source: InfraPPP, Infrastructure Knowledge.

Date Modified	Project	Country	Current Stage	Value (\$MM)	Sector
17 October 2016	Hyderabad-Sukkur BOT motorway (Karachi-Lahore motorway)	Pakistan	Project in tender		Transport
3 June 2015	Lahore metro line BOT project	Pakistan	Project in planning	1610	Transport
10 June 2014	Khanewal-Lahore BOT motorway (Karachi-Lahore motorway)	Pakistan	Project in tender		Transport
25 April 2014	Overlay and Modernization of Lahore—Islamabad M-2 motorway	Pakistan	Project signed		Transport
22 January 2014	Lahore's BRT build-operate-transfer project	Pakistan	Project in tender		Transport
1 May 2013	Cairns Hospital 3P	Pakistan	Project in tender		Social & Health
15 February 2012	Lahore ring road BOT	Pakistan	Project in tender		Energy

Table A3. Targets of sustainable development goal 11.

- By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums;
- By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons;
- By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries;
- Strengthen efforts to protect and safeguard the world's cultural and natural heritage;
- By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global GDP caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations;
- By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management;
- By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities;
- Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning;
- By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai framework for disaster risk reduction 2015–2030, holistic disaster risk management at all levels;
- Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials.

Source: [113].

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