Contractual and Relational Governance Mechanisms in The Power Generation Sector of Pakistan: Adopting Public-Private Partnership Models

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Abstract

PPP is the main element of participatory governance. Since the late1980s, PPPs have become an essential element in infrastructural development worldwide. In Pakistan, the PPPs approach has contributed to the infrastructural development, especially within the power generation sector. Energy stands essential element of economic growth and an energy deficit significantly affects progress, impacting the socio-economic development of the country. In this article, the researcher examines the effects of contractual and relational governance mechanisms instead of the principle of governance in the energy sector. Contractual and relational governance mechanisms have different dimensions that make the governance process align with policies and implementation processes. The poor governance mechanism and inefficient policy implementation extract negative effects on the energy sector that become the cause of the energy crisis and create a vacuum for many other problems. PPP models and approaches directly impact the intergovernmental coordination and governance structure. Moreover, the infrastructure of the transmission lines is not capable enough to produce and supply maximum demand. The objective of this study is to analyze and evaluate the existing PPP models, governance mechanisms, regulatory framework and strategies within the power generation sector of Pakistan.

Keywords: Public-Private Partnerships, Contractual and Relational Governance, Power Generation (PG) Mechanism and Energy Policies

Introduction

Public-Private Partnership (PPP) has been an important procurement strategy for governments in developing and developed countries for infrastructure development since the late 1980s (Cartlidge, 2006; Engel et al., 2020; Kuan, 2009;

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Moskalyk, 2008). In the contemporary world, PPPs serve as the fundamental instrument of neo-liberalism, promoting free market principles, efficient management practices (best practices), well-structured organizational structures and governance mechanisms (Casady et al., 2020; Crouch, 2011; Robinson et al., 2009; South et al., 2017). PPP define different business approaches and their mechanism in the shape of PPP models. These PPP models define contractual governance mechanisms that strengthen the long-term contractual collaboration between public and private sector organizations to provide public infrastructure projects and service delivery.

Public and private organizations can seek mutual benefits by forming strategic partnerships, which are characterized by effective administrative practices, efficient governance mechanisms and the performance of the projects. PPPs are generally initiated by the public sector in collaboration with the private sector for planning, financing, implementing, constructing and operating developmental projects (Kendagor, 2023). By utilizing private sector expertise, advanced technologies, efficient administrative practices, and diversified stakeholder investments, PPPs enable governments to address complex socio-economic challenges, optimize resource allocation and enhance public service efficiency. PPP mechanisms contribute to sustainable development by encouraging innovation, improving service delivery and ensuring long-term financial and operational viability. The main focus of such partnerships among the organizations is to efficiently mobilize resources for the projects employing best practices to achieve the project goals effectively (Khaliq & Hamid, 2017). Through the PPP contractual mechanism, both sectors work towards mutually agreed shared objectives, ensuring that projects are successfully executed and deliver lasting benefits to society.

Energy Governance

The increased prominence of the terminology "energy governance" in contemporary times may be attributed to the urgency of global energy challenges and the growing significance of emerging actors, such as corporations and civil society. These actors perform a significant role in bridging gaps between national energy policies and strategies by driving innovation, advocating for sustainable practices, and facilitating collaboration between public and private sector organizations (Sanderink, 2020).

Governance, at its core, refers to the fundamental processes, systems, and institutions involved in addressing collective issues that individuals and markets cannot resolve on their own. Governance involves the formulation of policies, implementation and reinforcement of rules ensuring effective coordination, accountability, participation and decision-making to promote the common good. In short, governance encompasses the establishment and reinforcement of rules. Traditionally, the government has been the primary actor of governance, utilizing

established systems to devise rules supported by coercive authority. Nevertheless, governance can also originate from diverse sources such as the private sector, public sector, institutions and supranational institutions. For example, supranational institutions may establish rules and regulations for developing countries and frequently exert pressure on them in the governance process (Du et al., 2023; Florini, 2013). Applied to the energy sector, this perspective suggests that energy governance involves the formulation and enforcement of policies aimed at addressing collective action challenges related to power generation and consumption. This involves a range of processes, including agenda-setting, negotiation, implementation, adoption, monitoring and enforcement of rules and agreements related to energy. Energy governance is a multiple-stakeholder effort, engaging governments, international non-governmental organizations, supranational funding institutions, multinational corporations, local actors, civil society organizations (CSO) and end consumers (Sovacool & Florini, 2012; Zheng et al., 2023). Collective collaboration and active participation ensure more inclusive decision-making that develops transparency and enhances the effectiveness of policies aimed at attaining sustainable energy governance.

Governance in PPPs has been a topic of discussion from diverse perspectives in developing and developed countries around the world. Considerations in these discussions include factors like transparency, accountability, value for money, partnership relationships, risk transfer, and sustainable development. In the context of the energy sector of Pakistan, the scholars tried to explain the success and failure of the governance process by the determining principle of governance (Hashmi, 2020; Malik, 2012; Mirjat et al., 2017; Mirjat et al., 2018; Muhammad & Johar, 2019; Munir & Naqvi, 2017; Naqvi et al., 2022; Rauf et al., 2015; Raza et al., 2022; Syed et al., 2020). In this research, the researcher tried to explain the success and failure of the governance process through contractual and relational governance mechanisms.

Contractual and Relational Governance Mechanism

Different schools of thought on PPP emphasize that, alongside contractual governance elements, relational governance elements are also essential for the success of PPP projects. Both governance mechanisms brought together from neo-institutional organization perspective that strengthen the relationship among the stakeholders (Benítez-Ávila et al., 2019; Cantù et al., 2021; Claro et al., 2003; Colombelli et al., 2019; Ferguson et al., 2005; Warsen, 2021; Zheng et al., 2008). The combination of contractual and relational governance highly affects the performance of the project.

The original idea of PPP projects is highly based on contractual governance (Abednego & Ogunlana, 2006; Benítez-Ávila et al., 2018; Khurana et al., 2022). Contractual governance is a dominant mode of governance (Warsen, 2021). Contractual governance is seen as a formal structured system and constituted rules

and regulations defined in a written document and sanctioned through a formal position of authority and ownership (Benítez-Ávila et al., 2018; Zenger et al., 2000). Moreover, contractual governance includes multiple factors that elaborate contracts such as terms and conditions, guarantees, tax exemption, performance indicators, monitoring, risk allocation and sanctions ((Andrews et al., 2015; Cruz & Marques, 2011; Edkins & Smyth, 2006; Gerrard, 2001; Gwary et al., 2016; Nuwagaba & Molokwane, 2020; Obayelu, 2018; Vahdatmanesh & Firouzi, 2018; Van Garsee, 2008). These factors of contractual governance strengthen the administrative process within the PPP perspective and lead to legitimate and appropriate practices. Hart and Moore (2008) stated that in PPP partnership, terms and conditions specified in contracts concerning risk distribution, payment structure and sanctions mechanism linked to infrastructure accessibility serve as benchmarks. These benchmarks help in improvising unwritten rules (relational norms) that guide the stakeholders in how they collaborate and manage daily project issues without harming each other.

Relational governance establishes informal rules of social exchange, communication, and trust, promoting flexibility in contracts, strengthening coordination among stakeholders and active participation in decision-making and problem-solving through communication and consultation (Benítez-Ávila et al., 2018; Xue et al., 2017). Furthermore, relational governance builds relationships based on trust and cooperation, and sharing information is crucial for the success and stability of interactions between organizations. Even when there are chances for self-interest and opportunistic behaviour of organizations, these relational governance approaches help to minimize losses. With time, relational governance approaches interaction enhances the overall strength of the relationship among the organizations. Interdependent organizations in the same sector establish a culture of sharing information and working closely together, which makes it easier to coordinate, reduce conflicts, eliminate opportunistic behaviour and address operations-related issues (Abednego & Ogunlana, 2006; Benítez-Ávila et al., 2019; Benítez-Ávila et al., 2018; Khurana et al., 2022; Warsen, 2021; Zheng et al., 2008).

The literature reveals that collaborative governance (contractual & relational) and governance networks highlight important activities for managing the relationships among the partner organizations. However, despite high levels of trust or well-written contacts, conflicts are likely to emerge due to varying perceptions and interests among actors and stakeholders, affecting the performance of PPP projects (Klijn & Koppenjan, 2015).

The success of governance efforts depends not only on using governance mechanisms but also on how project stakeholders and network organizations respond to governance mechanisms. If there is distrust in the relationship between the stakeholders and organizations, relational governance may not be effective as

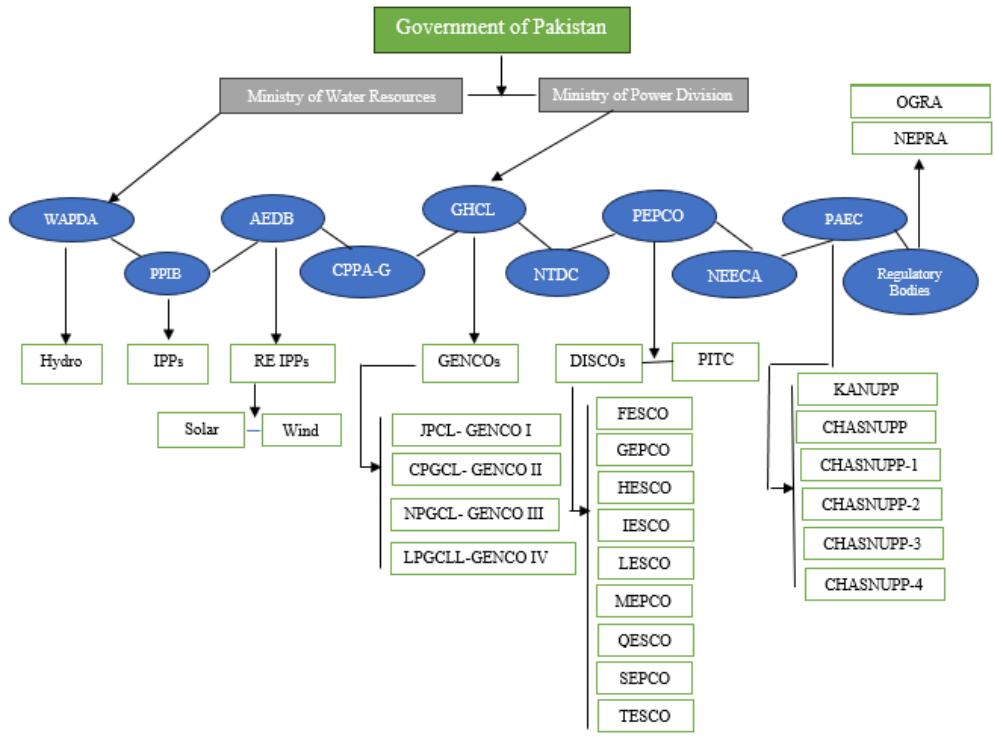
stakeholders might not fully engage with this mechanism. Conversely, strict implementation of contracts may also weaken the relationships among stakeholders, leading to more opportunistic attitudes, which can make things worse. In the framework of the collaborative governance mechanism, relational governance acts as a mediator between contractual governance and PPP project performance.

Power Generation Sector in Pakistan

Every country (developed or developing) needs energy to run socio-economic affairs the strengthen its economic growth. The power generation sector of Pakistan is lagging in comparison to other South Asian countries. Pakistan holds a crucial strategic geographical position for global trade as well as for the Asian continent. The total area of Pakistan is 796,095 square kilometers, and it is home to approximately 207 million people (Bhutto et al., 2011). Of this population, 36% live in urban areas and 64 live in rural areas. Pakistan is experiencing rapid urbanization, making it one of the fastest urbanization countries in South Asia (Waleed & Sajjad, 2023). The power sector of Pakistan is a complex structure, comprising different entities for various administrative functions that lead to governance issues (Masroor et al., 2021; Rehman & Habib, 2023).

According to the National Electric Power Regulatory Authority (NEPRA, 2022) annual report indicates that Pakistan's total installed power generation capacity stands at 43,775MW (Awais & Wajid, 2024). This capacity is primarily sourced from thermal (fossil fuels), which accounts for 63%, followed by hydro at 25%, nuclear at 6.5% and renewable sources -including, wind, solar, and biomass- at 5.4%. The success or failure of energy sector partnerships is largely influenced by institutional framework, governance structure, and implementation effectiveness, Highlighting the crucial role of policy coordination and regulatory oversight in ensuring sustainable energy development (Fong, Wong, & Hong, 2018; Pattberg & Widerberg, 2016; Quelin, Cabral, Lazzarini, & Kivleniece, 2014). Currently, Pakistan's power generation sector is divided into four main entities: Water and Power Development Authority (WAPDA), Pakistan Electric Power Company (PEPCO), Independent Power Producers (IPPS) and Pakistan Atomic Energy Commission (PAEC). WAPDA is responsible for managing and generating electricity from hydropower plants, while PEPCO oversees thermal power generation. Independent Power Producers (IPPs) operate both renewable and non-renewable plants, whereas the Pakistan Atomic Energy Commission (PACE) generates nuclear energy. Additionally, the country's power infrastructure includes ten power distribution companies and a single energy transmission line company, ensuring the delivery of electricity across various regions (Khatri et al., 2021).

Figure 1: Power Sector Governance Structure in Pakistan



The electricity demand has risen over the past two decades due to population growth and significant industrialization in the country. Since the 1990s due to the electricity shortage in Pakistan, the country has introduced new power generation policies that attract the private sector in the energy sector(Rehman & Habib, 2023). According to PPIB, since the 1990s, the inception of the PPP approach in the energy sector Pakistan has introduced nine power generation policies which include, Power Generation Policy 1994, Hydropower Policy 1995, Power Generation Policy 1998, Power Generation Policy 2002, 2008 National Policy for Co-generation, 2010 National Energy Policy, Power Policy 2013, Power Generation Policy 2015 and National Power Policy 2021. GoP also introduced two transmission line policies in 1995 and 2015. Furthermore, the government of Pakistan also introduced renewable energy policies in 2006 in 2019.

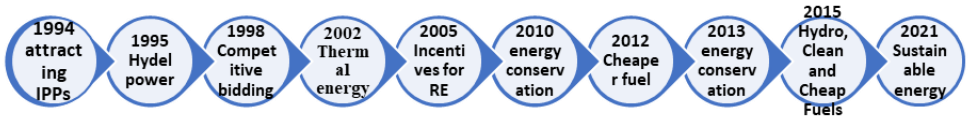
Energy Policies Overview in Pakistan

The **1994 energy policy** focuses on encouraging private investment in the energy sector. The Government of Pakistan's energy strategy introduced PPP models, wherein power plants function under BOO (Build Own Operate) and BOOT (Build Own Operate Transfer) models. Fossil fuel plants follow the BOO model, while hydro plants operate based on the BOOT model (Khan et al., 2020; Latief & Lefen, 2019). 1994 energy policy framework and incentive package were implemented to increase electricity generation capacity and attract private mega investment in the electricity sector. The 1994 energy policy is considered Pakistan's most liberal, granting private investors greater freedom in terms of local selection and exemption from taxation. Key elements of this policy include the selection of location, fuel, source, and technology, along with the guarantee of GOP purchases during high power consumption and payment of bulk energy costs. Financial arrangements, security packages, and the formation of autonomous organizations that facilitate the private sector like PPIB were key elements of the 1994 energy policy (Khan et al., 2020; Latief & Lefen, 2019). The government strongly supports energy-saving technologies such as integrated circulating gas engines, diesel, and thermal plants under the 1994 energy policy. The policy successfully attracted private investment, leading to the construction of more than 3,000 MW of power generation (Kamran et al., 2019; Raza et al., 2022).

In 1995, the GoP introduced the hydropower policy, this policy was formulated to develop hydro energy capacity with the help of IPPs. This policy is specified on BOOT models for twenty-five years, which means the ownership will transfer from the private sector to the public sector (Mukhtar, 2023; Raza et al., 2022; Ullah et al., 2019). The formation of NEPRA in 1997, NEPRA's main responsibility to regulate and monitor the performance of power generation organizations both public and private (Ali & Beg, 2007; Malik, 2022). Power Generation Policy 1998, is a revised policy for IPP projects, offering securities from specific duties and taxes. The Power Policy 2002 aimed to connect projects in the joint venture schemes. In this policy, most of the IPP projects use natural gas in the country and produce electricity. In this policy different schemes were introduced as public-private, private and public sector projects were introduced and encourage national industries to develop joint venture schemes targeting a 20GW optional by 2015 (Khatri et al., 2021). In 2008 another power generation policy was formulated. This national policy for co-generation power covered bagasse-dependent cogeneration schemes, estimating a potential 3GW from the country's 83 sugar industries. National Energy Policy 2010 focused on energy preservation strategies, encompassing short and long-term plants, including Rental Power Plants (RPPs) and existing power plant restoration (Valasai et al., 2017). In 2013, another national power policy was introduced that was typically based on energy security and additional capacity generation. Moreover, this policy

transitioning to fuel and hire the power generation plants (Aziz & Ahmad, 2015; Bacon, 2019; Irfan et al., 2019).

The Power Generation Policy 2015 opened gates for both domestic and international investors to harness local energy resources and generate energy at the lowest cost. This policy is in alignment with CPEC energy projects, aiming to enhance the development of the energy sector. Additionally, it encourages government-to-government (G2G) projects by utilizing local and imported coal plants. According to PPIB PG policy 2015, a total thirteen projects were planned, with an estimated power generation capacity of 11,648 MW. Out of these thirteen, eight projects have already been commissioned and the remaining five projects are expected to be completed by the end of 2028. Looking ahead, National Electricity Policy 2021 aims to promote sustainable energy production, develop a new energy transmission system, and establish a transparent energy market to attract private investors for exploiting domestic energy sources. The main objective of this policy is to provide an effective implementation plan for the energy power plants held under the PG policy of 2015. *Figure 2: predicts energy policies and their major focus.*



Total power generation Installed Capacity (Public & Private sector)

According to NEPRA State Industry Report 2022, the total installed capacity for power generation in Pakistan is 43,775MW. The public sector contributes 18,053 MW to the power generation sector (including Hydro, Thermal and Nuclear), which accounts for approximately 39% of installed capacity. The private sector contributes 27,771 MW to the power generation sector (including Hydro, Thermal and Nuclear), which accounts for approximately 61% of installed capacity. Karachi-Electric (KE) contributes (Oil/Gas/RE) 2,962 MW. Table 1 predicts the power generation capacity in percentage and MW.

Table 1: Sectors

Public Sector		**Private Sector**	
Hydro	9,702 MW (21%)	Hydro IPPs	1,053 MW (2%)
Thermal	4,731 MW (10%)	Thermal IPPs	21,121 MW (46%)
Nuclear	3,620 MW (8%)	RE IPPs	2,635 MW (7%)
		KE (Oil/Gas/RE)	2,962 MW (7%)
Total	18,053 MW (39%)	Total	27,771 MW (61%)
Installed Capacity 43,775MW			

Source: NEPRA State of Industry Report 2022, PPIB

IPPs Under CPEC

The total installed capacity for IPPs under the CPEC is 13,048 MW to the power generation sector including Hydro, Imported Coal, Thar Coal, Solar and Wind.

Which accounts for approximately 28% of installed capacity in the power generation sector. Moreover, Matiari to Lahore 600 KV HVDC transmission line project of 4000 MV transmission capacity is also included in the CPEC projects. Table 2 predicts the power generation capacity under CPEC in percentage and MW.

Table 2: Power Generation Projects

Power Generation Project	**Capacity in MW**
Hydro	4,054 MW (26%)
Imported Coal	4,260 MW (32%)
Thar Coal	2,640 MW (30%)
Solar	1000 MW (7%)
Wind	100 MW (3%)
Total MW	**13,048 MW**

Source: NEPRA State of Industry Report 2022, PPIB

According to the Ministry of Planning, Development, & Special Initiative (PDSI) are 21 power generation projects were approved under the CPEC which include coal, Wind, Hydro solar and one Transmission Line project. 15 projects are completed and 6 projects are in-pipeline, as mentioned in Table 3.

Table 3: Coal-fired projects

	Coal-fired projects	**Source**	**MW**
1	Sahiwal Coal-Fired Power Plant	Imported Coal	1320MW
2	Port Qasim Coal-Fired Power Plant	Imported Coal	1320MW
3	Hub Coal Power Project	Imported Coal	1320MW
4	Gwadar Coal Power Plant	Imported Coal	300 MW
	Total Imported Coal Fired Capacity 4,260 MW		
5	Engro Thar Coal Power Project	Thar Coal (Local)	660MW
6	Shanghai Electric Thar Block-I Coal Power Plant	Thar Coal (Local)	1320 MW
7	Thar Energy Limited Power Plant	Thar Coal (Local)	330 MW
8	Thal Nova Power Thar Plant	Thar Coal (Local)	330 MW
	Thar Coal (Local) Fired Capacity 2,640		
	Total Coal Fired Capacity (Imported and Local) 6,900 MW		
9	Sukhi Kinari Hydropower Project	Hydro	870 MW
10	Karot Hydropower Project	Hydro	1,590 MW
	Total Hydro capacity 2,460 MW		
11	Quaid-e-Azam Solar Park	Solar Power Projects	400 MW

11b	Quaid-e-Azam Solar Park	Solar Power Projects	600 MW (not operational)
	Total Solar Power Projects Capacity 1,000 MW		
12	Sachal Wind Farm	Wind	50 MW
13	Three Gorges Second & Third Wind Power Projects	Wind	100 MW
14	Hydro China Dawood Wind Farm	Wind	50 MW
15	100MW UEP Wind Farm, Fhimpir, Thatta	Wind	100MW
16	50MW Sachal Wind Farm, Fhimpir, Thatta	Wind	50MW
	Total Wind Power Projects Capacity 350		
	Under Construction		
17	Azad Pattan Hydropower Project	Hydro	700 MW
18	Kohala Hydropower Project	Hydro	1,124 MW
19	Mahl Hydropower Project	Hydro	640 MW
20	720 MW Karot Hydropower Project, AJK/Punjab	Hydro	720 MW
	Total Under- Construction Hydro Project 3,184 MW		
21	Matiari to Lahore 660 KV HVDC Transmission Line Project	Transmission Line	4000 MV Evacuation

Source: Ministry of Planning, Development, & Special Initiative (PDSI)

The governance mechanism in the energy sector is weakened due to the formation of multiple policies and the involvement of numerous institutions, ministries, supranational institutions, public sector organizations, autonomous entities, NGOs and stakeholders. Pakistan processes a gigantic electricity network designed to provide sufficient energy capacity. The electricity network struggles to offer sustainable and affordable energy due to limited resources and is highly dependent on imported fossil fuels. Currently, Pakistan is considered an energy deficit country due to bad governance and an ineffective policy implementation process. Annually, Pakistan spends a significant portion of its foreign exchange currency, about 60%, on importing fossil fuels like coal, natural gas, and oil. For instance, the country imports 308,000 barrels of oil daily, while its own oil production is only around 63,000 barrels per day. To meet energy needs, Pakistan also imports coal, despite having ample coal reserves of 185 billion tons within the country (Khatri et al., 2021).

Public Private Partnership Mechanism, Approaches & Institutions

Many countries across the world especially developing countries are becoming increasingly dependent on international energy actors to effectively formulate and implement their energy policies (Teisman & Klijn, 2002; Wang et al., 2018). Many regions and countries have been actively promoting PPP mechanisms to address the limitations of traditional public procurement methods. Developed countries such as Great Britain, Australia, Portugal and Spain have seen a steady rise in PPP Projects while developing countries like Pakistan, India, and Bangladesh, as well as Central Asian and African countries, are increasingly adopting PPP frameworks to develop and manage their infrastructure. However, the success of the PPP initiative depends on strong collaboration among the key stakeholders, including the public sector, private sector, lenders, international consultants and supranational institutions.

In the institutional context, a Public-Private Partnership (PPP) can be understood as a strategic cooperative institutional arrangement between public and private sector actors. It aims to effectively utilize their unique expertise and resources to enhance sustainable, efficient, and reliable public service delivery, infrastructure development and policy implementation and initiatives more efficiently and effectively. (PPP) (Hodge, 2007; Teisman & Klijn, 2002; Wang et al., 2018). The institutional environment includes formal institutions refer to laws, policies, regulations and legal systems (North, 1990; Saad et al., 2021). On the other hand, informal institutions refer to norms, values and cultural expectations that guide the business environment (Howell & Annansingh, 2013; North, 1990).

Institutions typically provide the framework that economic actors depend on to coordinate their decisions, actions, and strategies. In the context of public-private partnership, a lack of understanding of this structure can lead to higher transaction costs, including expenses related to identifying and negotiating with potential partners, as well as monitoring their performance (Li & Zhang, 2007; Saad et al., 2021; Wu et al., 2017)). According to Cheng et al. (2018) stated that institutions act as a safeguard for ensuring the efficient and effective management of inter-organizational collaboration activities by eliminating the risk of misunderstandings between partners, and hence controlling relational risk. This, in turn, leads to the sustainability and productivity of alliances. Therefore, it is critical to analyze the impact of institutional frameworks on performance in partnership settings.

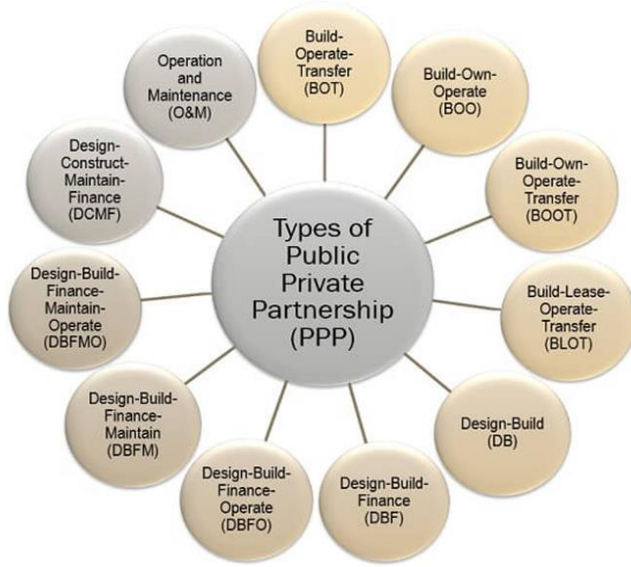
Three Institutions control the power generation sector of Pakistan. These institutions are the Planning Commission, Ministry of Energy (Power Division) and Ministry of Water and Resources. Multiple government and semi-government organizations work under the umbrella of these institutions.

PPP Mechanism, Models and Characteristics

The Government of Pakistan has introduced multiple power generation projects by adopting various Public-Private Partnership (PPP) models to meet its energy needs and accelerate the transition to clean and sustainable power. Multiple models of PPP used in PPP mechanisms around the world such as Build-Own-transfer (BOT), Build-Own-Operate (BOO), Design-Build-Finance-Operate-Transfer (DBFOT), Design-Build (DB) Operate and Maintenance (O&M) Build-Operate-Own-Transfer (BOOT), Build-Lease-operate-Transfer (BLOT) Joint-Venture (JV), Management-Contract (MC), and Build-Operate-Own-Share-Transfer (BOOST) and Hybrid Annuity Model (HAM) (Anopchenko et al., 2019; Dolla, 2025; Sridharan et al., 2025). Only two PPP models are utilized in the power generation sector of Pakistan. These models are BOO and BOOT. BOOT model projects after 25 to 30 years transfer to the government of Pakistan. BOOT models are adopted in Hydro and Renewable projects and this model has sustainability as compared to BOO projects (Muhammad & Rahman, 2025). BOO model adopts in Fossil Fuel projects. Interestingly, the researcher has observed that all IPPs, adopt these two (BOO, BOOT) models whether government or private sector own project (IPP). PPP's key characteristics include regulatory oversight, long-term agreements sectoral diversification and FDI involvement. In the energy sector, the government signs Power Purchase Agreements (PPA) with IPPs which include Energy Purchase Price (EPP) and Capacity Purchase Price (CPP) to ensure electricity procurement at pre-determined rates and grid stability.

Another important aspect is to understand the fundamental characteristics of public-private partnership which includes a strong service-oriented approach, a whole-life costing perspective to ensure cost efficient over the project's lifespan, a focus on innovation to enhance service delivery mechanism, clearly defined participant roles, effective risk allocation between public and private organizations and resource sharing to optimize financial and operational capacities. These characteristics develop the strong foundation of PPP projects. First PPP emphasizes long-term public-service facilitation through infrastructure projects. Second, whole life costing of the PPP project calculates and predicts the total cost over its lifespan, risk sharing, implementation, operation cost, maintenance and encompassing total cost of the project. The third aspect is innovation and technology which play an important role in reducing cost and increasing the efficiency of the project. Fourth, public and private companies determine risk allocation mechanisms. The private sector manages high-risk infrastructure projects and maintains long-term relationships to manage and execute projects efficiently. Finally, Resource sharing in PPP involves the joint utilization of capital and financial and design resources between the public and private entities for successful project completion.

Figure 3: Types of Public Private Partnership



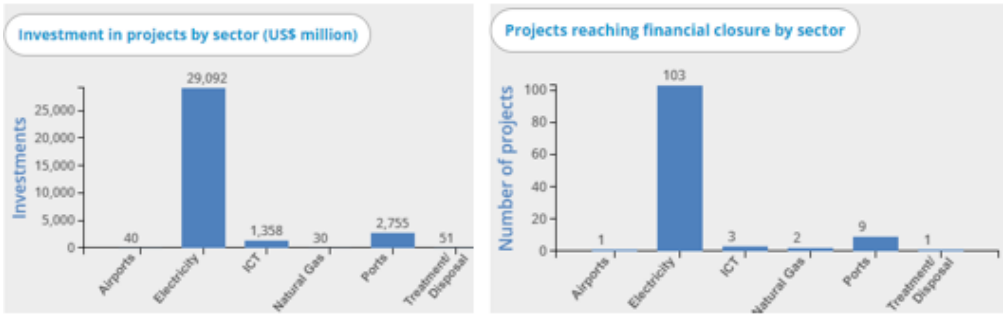
Source: (Roehrich & Caldwell, 2012)

PPP Policy, Acts and Private Investment in Pakistan

The first PPP project was started in the 1990s in the energy sector, a time when Pakistan did not have any specific act or policy for PPP project implementation in the energy sector. The first PPP policy was introduced in 2010 and the first PPP act was passed by the parliament in 2017. Before March 2017, Pakistan did not have any legislation specifically for public-private partnerships at the federal level. Prior to PPP Act 2017, the private sector participated in infrastructure projects through the PPP policy of 2010. This policy offered detailed guidelines and a regulatory framework for infrastructure projects, aiming to facilitate and support PPPs in Pakistan. In 2021, the National Assembly approved the amendment of the federal PPP Act 2017, which is called the PPPA Amendment Act 2021.

According to the Private Participation in Infrastructure (PPI) World Bank Group database (2023), the total number of infrastructure projects (airports, electricity ICT, Natural Gas, Ports and treatment) that attracted private investments in Pakistan and achieved the financial closure from 1990 to 2022 were 119 projects. The total investment of these projects is 33,325 US Million Dollars. 88% of electricity projects are dominantly and 103 projects reached financial closure. The rest of the 16 projects are related to other sectors. Total private investment in the energy sector is 29,092 US Million Dollars. Of these, only one energy project was cancelled or under distress still 2022.

Figure 4: Investments and Number of Projects



Source: Private Participation in Infrastructure (PPI) World Bank Group database (2023)

The PPP regulation and monitoring process is one of the federal government matters that shifted to provincial matters after the 18th Amendment. Now the provincial governments of Pakistan formulate their policies and implement legislation processes. Moreover, provincial governments do development infrastructure projects with respect to their provincial PPP jurisdictions.

Circular Debt and IPPs in Pakistan

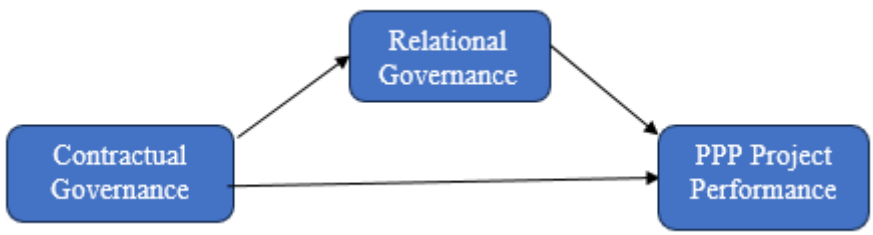
Circular debt refers to the outstanding payments and liabilities among different organizations (Ali & Badar, 2010; Kessides, 2013). Circular debt arises when government agencies face challenges in revenue cash payments from their customers, leading to face difficulties and being unable to pay their suppliers. Due to wrong contracts with the private sector, GoP has to facilitate IPPs in terms of subsidies, taxes and capacity purchase price. In Pakistan, as of June 2023, the circular debt had accumulated to Rs 2.31 trillion, up from Rs 2.25 trillion at the end of the previous fiscal year 2022. Since the 2007 fiscal year cumulative losses reached Rs 5.7 trillion. This circular debt could be attributed to various factors, including mismanagement, inefficiencies, corruption, distribution losses and economic challenges. On the other side, GoP subsidies amounted to Rs.3.4 trillion since the fiscal year 2007 (Cheema et al., 2022; Recorder, 2023). Anwar et al. (2023) stated that the primary reason for the circular debt in Pakistan because of extensive subsidies. Hence, these accumulated subsidies within the electricity sector led to the creation of circular debt that ultimately undermined the market-framework electricity. There is another important component that creates circular debt in Pakistan which is bad governance. Bad governance in the energy sector includes multiple governance domain like economic governance, administrative governance, generation and distributional governance (services). These governance factors highly effect on the performance of economic growth of Pakistan.

Methodology

The researcher adopted the qualitative approach for this research and reviewed ministry reports, official documents, policy papers, energy articles, news reports, books and PPP and PG policies. Furthermore, the scope of the study is limited to the PPP Policy 2010 & Power Generation Policy 2015 in the power generation sector and governance mechanism.

This study is structured into different sections to accomplish the research question and objective. The first section gives a brief review of PPP and governance definitions. The second section provides an overview of governance mechanisms from both relational and contractual perspectives and briefly illustrates the governance framework. The third section presents a detailed review of power generation sector policies and governance structure mechanisms in Pakistan in this section researcher focuses on inter-organizational relationships in the energy sector. The fourth section is related to PPP models, approaches, and characteristics in the power generation sector. The fifth section is related to the discussion and finally, the last section is related to the conclusion and recommendation.

Figure 5: Conceptual framework (Contractual and Relational Governance Framework)



Conceptually, the contractual and relational governance of the PPP project performance can be defined as follows:

First, PPP is a procurement mechanism that creates a contractual agreement that encourages cooperation between public and private entities, which is advantageous to both. Under this long-term agreement, the private sector finances, plans, and carries out the project, and government agencies assess, assist, and keep an eye on the private sector's performance.

Secondly, contractual governance is a formal agreement between the government and the private sector that safeguards their interest including risk allocation, responsibilities and sanctions.

Thirdly, relational governance is an informal relationship that complements contractual agreement by developing inter-organizational relationships through trust, and open communication, reducing opportunistic behaviour of organizations and

developing flexibility in the contractual bounding that affects the performance of PPP projects.

Research Questions

Which flaws within Pakistan's power generation sector's PPP energy policies, models, approaches, regulatory and governance mechanisms (contractual and relational) hinder IPP performance?

The question aims to investigate the specific flaws in Pakistan's power generation sector related to its PPPs' energy policies, models, approaches, regulatory framework, and governance mechanism. These investigative flaws are recognized as factors that impede the overall performance of the power generation sector.

Research Objective

The objective of this study is to analyze and evaluate the existing PPP models, governance mechanisms, regulatory framework, and strategies within the power generation sector of Pakistan. The aim is to identify existing flaws and inefficiencies within the PPP mechanisms in the power generation sector.

Discussion

The public-private partnership mechanism has become a dilemma for developing countries like Pakistan. Policymakers in Pakistan often lack a clear understanding of PPP models and their implementation. A significant debate exists among different PPP schools of thought regarding IPPs - whether they operate under the PPP framework or function solely as independent business entities.

If IPPs are independent businesses, why do they adopt PPP models like BOO & BOOT? Why does the government facilitate them through different text exemptions like import text and why pay the capacity purchase price to IPPs? On the otherside, if IPPs fall PPP under the PPP framework, why does Public-Private Partnership Authority (PPPA) not officially recognized as PPP project. For instance, many Renewable Energy Projects, such as "Quaid-e-Azam Solar Park", operate as pure PPP projects but PPPA does not acknowledge them as PPP projects. Supranational Institutions like the World Bank and Asian Development consider IPPs as PPP Projects, further complicating the debate.

Those organizations based on the PPP model tend to provide services and goods at high cost while securing sovereign guarantees from the host country. This PPP form of business was primarily formulated for developed countries, nurturing strong bounding and collaboration between the public and private organizations based on mutual trust. In these developed settings, long-term strategies for infrastructure development and service delivery highly rely on PPP policies and governance mechanisms.

However, in developing countries, PPP mechanisms are often imposed by supranational institutions. This imposition tends to ensure their economic system and create a monopoly in a particular field. Private companies utilized their own country's resources in developing countries at high costs, instead of utilization of their local indigenous resources. For instance, within Pakistan's energy sector, most of the power generation projects rely on imported fuel instead of utilizing local indigenous resources. Every year, IPPs contribute to the accumulation of circular debt, adversely impacting the country's economic growth.

As the researcher discussed earlier, PPP is based on the collaboration of public and private organizations. The formation of collaboration is based on the contractual agreement. The contractual agreement decides the roles and responsibilities of both sectors. Contractual form of relationship between the organizations developed a governance mechanism that is based on opportunistic behaviour, rigid rules, control information sharing and lack of trust. Most of the researchers believed that relational governance strengthens the collaboration between public and private organizations by eliminating opportunistic behaviour, developing more trust, more information sharing and bringing flexibility to the relationship (Benítez-Ávila et al., 2019; Cantù et al., 2021; Claro et al., 2003; Colombelli et al., 2019; Lu et al., 2015; Warsen, 2021; Zheng et al., 2008). Social capital and relational governance in the collaborative sector bring economic prosperity (Hitt et al., 2002; Wulandhari et al., 2022; Zhang & Huang, 2022).

There are multiple flaws in PPP policies, legislation and governance processes that hinder the performance of IPP projects. Apart from the policy flaws, other administrative processes and organizational cultures also affect the performance of power generation plants in Pakistan. For instance, the bureaucratic nature of the PPP process poses a significant hurdle in decision-making and implementation. Organizational culture also creates a gap between public and private administrative work. The private sector is more innovative, transparent, effective and efficient as compared to the public sector. There is also a lack of transparency and accountability right from the bidding process that creates more problems for the decision-makers and government. Therefore, it is evident that when accountability and transparency mechanisms are missing in the process they weaken the legitimate procedure as well as the arbitration process as in case of dispute with the private sector. The intervention of other institutions in the energy sector also contributes to problems like the National Accountability Bureau (NAB) in Pakistan. Fear of NAB prevents decision-makers from taking immediate action.

There is a dire need for immediate actions in Pakistan's power generation sector that make the more prosperous energy sector. Decisionmakers of the energy sector and Industrial sector must collaborate to formulate policy that effectively utilises the full energy capacity of power plants. Such initiatives would help in reducing circular debt and also provide cheap energy to end users.

Conclusion & Recommendations

This research provides insight into the PPP and governance mechanism - relational and contractual- functioning within the power generation sector. It addresses the hybrid nature of governance, spanning the public and private sectors in the power generation sector. This mechanism indicates flaws within the PG policies and governance mechanism of the power generation sector. Moreover, the researcher tries to point out that the absence or weakness of relational governance mechanisms can lead to dilemmas within the power generation sector. These dilemmas include such as distrust, opportunistic behaviour, weaken arbitration mechanisms and challenges within the inter-governmental governance structure. Furthermore, the researcher highlights that a lack of understanding regarding the PPP approach and its model has hindered policymakers' inability to develop a policy framework conducive to conducting a fair competitive bidding process within the power generation sector.

The majority of IPPs were established through Government-to-Government (G2G) arrangements instead of having a competitive procurement process. Besides governance and policy flaws within the power generation sector, researchers have also found that the instability of governments has impeded the visionary plan of the previous governments. For instance, CPEC energy projects increased the power generation capacity, but other industrial ventures hesitated due to government instability, resulting in the ineffective utilization of the generated electricity. Consequently, the Pakistani government accumulated substantial power generation capacity bills owed to IPPs that created circular debt within the country. The high cost of electricity poses the most significant issue within the power generation sector due to the "Take or Pay" concept. The take-or-pay concept bound the government to pay the capacity charges to IPPs, irrespective of whether they produce electricity less than their capacity. Pakistan is trapped in a circular dept due to the "take or pay" mechanism. Pakistan is a developing country and faces a lot of economic issues. Political instability and inconsistency policies often lead to disputes among the stakeholders, pursuing partners into the courts. Relational governance mechanisms establish arbitration processes and reduce opportunistic behaviour, encouraging more flexible relationships among stakeholders.

Finally, policymakers may formulate a comprehensive PPP policy encompassing different sections for various sectors. This policy demarcates PPP models, approaches, and sector-specific characteristics aimed at enhancing infrastructure development's effectiveness and cost efficiency for the country as well as end users. These kinds of approaches facilitate the formulation of sector-specific contracts, terms and conditions thereby streamlining administrative processes within the intergovernmental governance structure, making them more efficient and effective.

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