

PUBLIC-PRIVATE PARTNERSHIPS: A THEORETICAL REVIEW OF THE NATIONAL SYSTEM OF INNOVATION IN SOUTH AFRICA

Christopher K MOTLOI¹
Krishna K GOVENDER^{2*}

Received: November 2022 | Accepted: December 2025 | Published: December 2025

Please cite this paper as: Motloi, C.K. and Govender, K.K. (2025). Public-private partnerships: a theoretical review of the national system of innovation in South Africa, *Holistica Journal of Business and Public Administration*, Vol. 16, Iss. 2, pp.155-171

Abstract

This theoretical paper critically examines the role of the National System of Innovation (NSI) in research and innovation through networking. This secondary research focuses on critically reviewing the literature on public-private research partnerships (PPPs) and interrogating their relationship with and impact on the performance of the NSI. The study analyses the current state and approach to partnerships by the NSI, highlights constraints to forming partnerships, and unveils approaches and models that may be adopted to foster Public-Private-Partnerships needed to attract private sector investment necessary for the NSI.

Keywords: research; innovation; partnerships; government agency

1. Introduction

Although some studies have been conducted on Public-Private Partnerships (PPPs), these have mostly focused on how different countries have established efficient NSIs that resulted in economic expansion, enhanced innovation outputs and establishment of businesses in various sectors through the PPPs. For example, Jakovljevic (2018) investigated the lack of suitable business models and innovation in South African Universities, and Wanjiru (2020) explored the relationship between universities and the private and public sectors for innovation within the Triple Helix Model. Wanjiru's (2020) study examined the interrelations between the actors of the Triple Helix model, referred to as the Model for Innovation. The principle that underpins the model is that innovation and economic growth in society lie in the role and partnership of the university, privately owned businesses, and the government in producing institutional and social formats for the production and transfer of knowledge. This model has opened the way for research

¹ Graduate School of Business & Leadership, University of KwaZulu-Natal, South Africa, ckmotloi@gmail.com

* Corresponding author

² Graduate School of Business & Leadership, University of KwaZulu-Natal, South Africa, govenderk@ukzn.ac.za

to be conducted to understand each actor's role within the Triple Helix, but it has not looked at how fostering partnerships between the three actors can be used to improve impact within the NSI. To this end, this secondary research study was conducted to explore each respective actor's role in building PPPs and improving the impact of the NSI.

2. Literature Review

2.1 Business partnerships and PPPs

Purnomo, Suryana and Sari (2018) defined a business partnership as a collaborative effort to attract and share resources such as finances, skilled labour, competence and information to benefit two or more collaborators involved in the partnership. The definition of partnership, as set out by Purnomo et al. (2018), highlights that the essence of a business partnership between two or more businesses matches a social exchange relationship, such as mutual trust, dependency, and commitment to partnership objectives.

On the other hand, PPPs are long-term contractual agreements involving a publicly and privately-owned entity where the government leverages private sector capabilities and assets to execute or implement an agreed project (Mashwama et al., 2019: 371). The basic difference between a PPP and traditional business partnerships is that a PPP is a contractual agreement between a public entity and a private party, where the private party assumes duties that is usually provided by the public sector and uses public property to perform the function and transfers the risk associated with the project to the private party (National Treasury, 2022), traditional business partnership are formed through a partnership between any business and institutional association within may not be from the public and the private sector which joint activity takes place to achieve determined objectives (Osei-Kyei et al., 2023).

2.2 Public-Private Partnerships

Public-Private Partnerships (PPPs) have been defined differently by scholars and businesses. Mashwama et al. (2019: 371) define PPPs as "long-term contractual agreements involving a publicly-owned entity and a private sector company where the government leverages private sector skills and assets to execute or implement an agreed project". The parties involved in a PPP share the risks and payments of the project. The World Bank defined PPPs as "a long-term contractual agreement between a private and public entity for providing a public service in which the private party manages associated risk, responsibility and payment is correlated to performance" (World Bank, 2021).

The South African Treasury's Regulation 16 of the Public Finance Management Act (PFMA) defines PPPs as "a legally binding arrangement whereby a private sector company performs an institution's functions and utilises state property for commercial purposes and gains. The private party assumes monetary and operational risks linked with the tasks and receives a benefit according to agreed performance criteria," (National Treasury, 2022).

It is apparent from the above definitions that the common feature for PPPs is that they involve collaboration between public institutions and a privately-owned business to provide goods or services to the public and involve an arrangement of roles and responsibilities in which a private and a public entity collaborate in a balanced way to achieve their objectives through joint pursuit.

Subedi (2020) argues that the public and private parties share the project's risks and returns, and the public entity retains control over the project. Wang, Cui and Liu (2018) further argued that besides risk sharing and enabling access to resources, PPPs allow access to new technologies, new markets, and new skills, which in turn help to drive innovation and create more competitive manufacturing operations.

Audretsch, Link and Scott (2019), who conducted a study on the effects of partnerships on business, argued that a partnership business entails an agreement between two or more parties that jointly invest in the partnership, operate the business to create assets, provide services to customers and distribute profits and losses. The main difference between regular business partnerships and PPPs is that PPPs are generally established because of market failures and involve partnerships between a privately-owned company and the public sector. PPPs may also be considered as instruments that combine the strength of government and private sector provisions to respond to market failure and minimise the risk of government failure, while business partnerships may not involve cooperation between the private sector and a public sector organisation (World Bank, 2020).

Purnomo, Suryana and Sari (2018) defined a business partnership as a collaborative effort to attract and share resources such as finances, skilled labour, competence and information to benefit two or more collaborators involved in the partnership. The partnership definition of Purnomo et al. (2018) highlights that the essence of a business partnership between two or more businesses matches a social exchange relationship such as mutual trust, dependency and commitment to partnership objectives.

Kiss (2020) argued that a business partnership may be looked at in two ways. The first is a legal business between two or more individuals who plan to share management and profits. The second way to look at business partnerships is as a formal relationship between two or more businesses that intend to operate a business and share revenue (Kiss, 2020).

Mashwama et al. (2019) further added that the basic difference between a PPP and traditional business partnerships is that a PPP is a contractual agreement between a publicly owned and a private company, where the private company assumes a role that is usually provided by the public entity and uses public property to perform the function and transfers the risk associated with the project to the private party (National-Treasury, 2022), a traditional business partnership is formed through a partnership between any business and institutional association within may not be from the public and the private sector which joint activity takes place to achieve determined objectives (Osei-Kyei and Chan, 2020).

According to the National Treasury (2019), PPPs began emerging in South Africa in 1997, and since then, there has been an increase in the formation of PPPs in South Africa. However, a sharp decrease has been recorded through the National Treasury review due to reasons ranging from poor governance, negative economic growth, Covid-19 and misaligned priorities (National-Treasury, 2019).

Jomo et al. (2016) highlighted that PPPs were formed as concessions for infrastructure development in the 1970s and started gaining popularity in the 1980s to eliminate government bureaucratic processes. Another study by Arimoro (2018) found that PPPs were formed to mitigate infrastructure shortages and budget deficits and gain access to private-sector capital and management expertise.

In the case of the NSI, the number of successful PPPs has been generally low, which has compromised the NSI in addressing key national priorities. Table 1 below summarises the legal and operational types of PPPs.

Table 1: Types of PPPs

Type of PPPs	Description
Build-Operate-Transfer (BOT)	This type of PPP includes transferring the responsibility of construction, funding and operating a facility to a private sector partner.
Design-Build-Finance-Operate (DBO).	The DBO type of PPP entails contracting a private company responsible for providing funding for the construction project, and the public entity purchasing assets from the designer for an agreed price before contracting and assuming the risk associated with the project.
Build-Operate-Own (BOO).	BOO entails the public entity handing over the ownership rights of a facility permanently to the developing, funding and maintaining party.
Design/Build (D/B)	This form of PPP entails the private sector company designing and constructing the project for an agreed price, to meet the performance specifications of the public owner.
Design, Build, Maintain (DBM)	DBM entails the private entity designing and building the facility, but the project owner operates the asset while the private sector company maintains the project assets.
Design, Build, Finance, Operate (DBFO)	The privately-owned entity is responsible for operating and funding the project from private investments, and the investment is used to finance the project.
Design, Build, Operate, Maintain (DBOM)	The privately owned party is responsible for maintaining and financing the project.
Design, Build, Finance, operate, maintain (PFI)	The privately-owned company designs, funds and maintains the facility, assumes all functions and provides the funding for the project.
Build, Transfer, Operate (BTO)	The private entity and public institution enter into an agreement that entails the private sector company operating the project for an agreed period.

Design, Build, Finance, Operate, Maintain, Transfer (DSBFOMT)	The private sector company performs all project-related duties, including funding the project, maintenance and payment of revenue generated. The private sector company also takes ownership of the project facility for the duration of the PPP project.
Lease, Develop and Operate (LDO)	The private sector company leases the facility from the public institution and uses the revenue to enlarge the facility.
Build, Own, Operate, Transfer (BOOT)	The private entity assumes the ownership of the project for the contracted duration and may or may not partially fund the project.
Concession	The public owner sells the operation to a private company for a prolonged duration and the private sector company is remunerated from the earned profits.

Source: Mashwama et al. (2019)

2.3 Higher Education and Research Partnerships

Linkages between Higher Educational Institutions (HEIs), industry and the public sector or government generate collective societal benefits and improve economic growth and industrial competitiveness (Wanjiru, 2016). According to Walwyn et al. (2016), governments worldwide are major funders of Research and Development (R&D), and this is mainly because of negative economic growth and market failure and the business and private sector failing to fund R&D because R&D is associated with uncertainty and low levels of return on investment (ROI). The R&D that is funded by either the government or the private sector is mainly performed by Higher Education Institutions (HEIs) and research-performing institutions (National Research Foundation, 2019). HEIs are important contributors to PPPs within the NSI because they produce knowledge, skills development and innovations needed to enhance sustainable economic growth (Wanjiru, 2020).

HEIs face the challenge of limited funding to demonstrate their social and economic relevance and produce the needed knowledge to drive innovation within the NSI. The challenge of limited funding within HEIs in most developed countries is addressed by the government and the private sector, playing a key role in establishing networks and partnerships that can contribute to bringing investment opportunities to address the financial limitations faced by Universities (Walwyn et al., 2016).

2.4 Research and Development - the Role of Governments

Walwyn et al. (2016) argued that the role of the government is to fill the funding void and supplement research and development (R&D investment that the private sector is failing to make due to market failures and other related economic challenges, like inflation and negative growth. The view that the government must intervene in economic development is not supported by neo-liberals, who argue for decreased government spending and reduced involvement by the government in economic activities (Adino & Nebere, 2016). Neoliberalism is an economic and political paradigm associated with free trade, privatisation, capitalism, deregulation and limited intervention from government regulation and policies (Adino & Nebere, 2016).

The view that the government should intervene in developmental activities was supported by some researchers (Labonte, 2010), who assert that the government should intervene in the economy in four ways, which are through the production of goods and services, such as health, infrastructure, primary and tertiary education, and maintaining law and order. Labonte (2010) further argued that the government should support the common good by distributing wealth, transferring income to enable economic developmental activities, and collecting taxes to pay for its outlays to enhance economic efficiency by influencing markets and consumer behaviour. (Moffatt, 2019) further adds that the government intervenes in economic activities by developing policies and setting regulatory frameworks to regulate trade, price stability and other economic activities for the greater good.

The position taken by several researchers (Wulandari, 2016; Moffatt, 2019; Akala, 2021) supports and affirms the important role of government in economic activities indicates that the government has a critical role to play in creating an enabling environment for organisations in the NSI to achieve their mandates through fiscal allocation, policy formulation, creating an suitable environment for innovation, business activities and providing the needed support systems to enable NSI organisations to make a positive contribution to economic development and in improving performance in the NSI (Department of Science and Innovation, 2019).

The brief overview of views espoused above on the role of government within an economic system has been further supported by Katarina (2020), who also argued that government plays a critical role in the economy by using fiscal policy to ensure sustainable economic growth and poverty reduction. In addition, the government plays a critical role in policy formulation and implementation. Government policy lays the foundation for economic growth, the success of businesses and organisations in the public sector and enhanced social-economic conditions. Government policy also enables the institutional environment that encourages economic maturity in which organisations thrive. The government also sets policy strategic intent, develops a set of business-friendly regulatory frameworks, including administrative procedures and regulations, drives inclusivity, provides financial and non-financial resources needed by NSI organisations and develops acts that enable a culture of partnership and innovation within the NSI (Department of Science and Innovation, 2019). In addition, the government should play an important role in fighting corruption and improving investor confidence in the public sector for initiatives that will benefit the NSI and society.

2.5 The South African National System of Innovation (NSI)

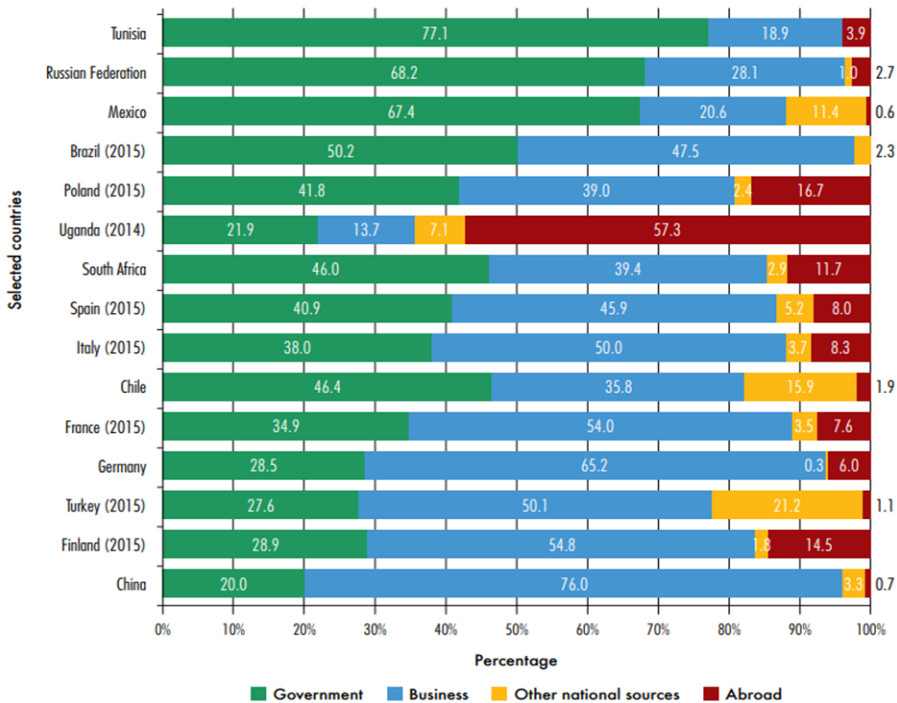
The NSI is highly underfunded, compounding the challenges state-owned entities (SOEs) and NSI organisations face to achieve their respective mandates (Department of Science and Innovation, 2022). The Department of Science and Technology's (DST) Ministerial Review Report also highlights that a few of the national priorities that have been set for the NSI will not be achieved if the NSI remains underfunded. Funding allocation is needed to enhance NSI performance, attract international investment, ignite technology transfer

and develop public incentives to attract private-sector investment (Department of Science and Innovation, 2019).

Figure 1 below depicts the government expenditure on research and development (GERD) by source of funds in selected countries between 2016 and 2017. It is evident that governments are the predominant funders in middle-income countries, and businesses and the private sector are the primary funders of R&D in research-intensive countries like Germany and China (Centre for Science, Technology and Innovation Indicators, 2019).

Increased private sector funding of R&D-related activities within the NSI contributes to the innovation value chain and positively influences increased innovation outputs and economic growth (ISED, 2023). As reflected in Figure 1, 46% of South Africa's R&D activities are government-funded, and only 39.4% of R&D activities are funded by businesses. The overall Business Expenditure on Research and Development (BERD) must be increased to improve research intensity within the NSI, and that is achieved through the government's intensifying efforts to establish political stability in the country (Onyekwere, 2019). As such, the government must enable the NSI by allocating the needed resources for organisations to achieve long-term objectives and facilitate business prosperity through developing favourable legislation, favourable tax rates and tax incentives that may allow and encourage private sector investment into the NSI through partnerships (Onyekwere, 2019).

Figure 1: GERD by different sources of funders in selected countries



Source: Centre for Science, Technology and Innovation Indicators (2019).

Ekoth (2023) posited that the government can foster PPPs through tax incentives, which attract private sector investment into the NSI. Tax incentives, defined as "tax rules that go against the recognised principles of tax neutrality aimed at supporting and attracting both foreign and local investment," are crucial for investments and competitiveness (Sebele-Mpofua, Gomera & Sibanda, 2022). In advanced economies, tax incentives promote R&D in the NSI, enhance production efficiency, boost exports, increase product competitiveness globally, and protect the investment base within the economy (Ekoth, 2023).

The South African government introduced a tax incentives scheme, which is executed under Section 11D of the Income Tax Act of 1962. The incentives were implemented through the Department of Science and Innovation (DSI) and the National Treasury. According to the scheme, private sector companies can get a tax rebate of 150% irrespective of their company's tax rate and company size. This translates to 150% of a company's qualifying for R&D spending from its income managed by the South African Revenue Services (SARS), amounting to a saving of 14c for every rand spent on R&D at a tax rate of 28% (National Treasury, 2021).

A total of 1211 companies participated in the scheme in collaboration with several NSI organisations from 2006 to 2021, and 1666 pre-approval applications encompassing 7,201 projects were received since 2012; 1,580 applications were assessed by February 2021, and 33 applications were awaiting assessment and evaluation (National Treasury, 2021).

According to the National Research Foundation (NRF), the results indicate that private sector players are interested in the scheme despite reported administrative challenges. The response to the tax incentive schemes by the private sector also indicated that the government must enable the private sector to partake in the scheme by improving administration processes, implementing the recommendations of the impact evaluation study and ensuring that the scheme is advertised for prospective investors in the industry and private sector to participate (NRF, 2022).

2.6 PPPs and the Private Sector

The debate on the position of the South African (SA) government and private entities in driving the development of the economy has been a topic of interest within business and academia for a long time. However, most of the focus has been on the role of the state and how the state should be involved in developmental activities. This is mainly supported by the Fredman doctrine, which is referred to as the shareholder theory (Rakan, 2021). The shareholder theory is a doctrine adopted in business that suggests that the primary objective of a business is to maximise shareholder profit and that shareholders must take priority over stakeholders (Rakan, 2021).

Rashed and Shah (2021) argued that a developmental state and a vibrant and agile private sector are needed to achieve long-term objectives. These researchers report that the private sector accounts for 75% of South Africa's workforce, the investment majority in the country and a substantial contribution to the NSI through investing in R&D. The recent

economic report on innovative finance for private sector development in Africa published by the United Nations (UN) has highlighted that a strong private sector is vital for the development of sustained economic growth (Rashed & Shah, 2021). The private sector may be considered the engine of economic expansion and has enormous potential to contribute directly to the country's development (Kumar-Arora, 2019).

South Africa has a low GERD compared to emerging economies, which should be addressed through the private sector, increasing the nation's overall GERD. According to the White Paper on Science and Innovation, the private sector contribution to GERD increased by 25% between 2005 and 2016, while government contribution increased by 101% in the same period, which indicates that the government was responsible for most of the increase (Department of Science and Innovation, 2019). Figure 1 (above) shows that this is not the trend in most developed countries. As such, the private sector should be encouraged to play a critical role in investing in the NSI. Particularly in R&D and STEM-related research and technology development initiatives that will positively impact the economy (National Advisory Council on Innovation, 2023). South Africa's GERD and BERD are relatively low compared to those of developing countries. Ildirar, Ozmen and Iscan (2016) defined BERD as investments associated with partnerships between the public and private sectors.

Global trends in funding R&D activities within the NSI indicate that most of the R&D investment made in the NSI is through the private sector (National Advisory Council on Innovation, 2023). In contrast with developing countries like Scotland and the United Kingdom (UK), South Africa has not prioritised attracting more private sector investment to the NSI to increase its BERD. The National Scotland Statistics Publication (2019) report on GERD studies highlighted that in 2019, BERD was 1,409 million Pounds in Scotland, which was 5.4% of the total UK BERD in the same reporting period (Gov.Scot, 2019). Between 2018 and 2019, Scotland's BERD spending increased by 1.5% in 2018. While the UK BERD increased by 0,8% over the same period. BERD was the highest contributor to GERD in Scotland in the same reporting period, which increased by 107.2% between 2007 and 2019 (Gov-Scot, 2019). The Scottish BERD is currently at 0.84%, and the percentage of GDP was below that of the UK, which was 1.17% in the same period (Gov-Scot, 2019).

A comparison between the Scottish and UK BERD as a measure of business contribution to GERD indicates that both nations had almost the same GERD; the difference, however, is that the Scottish GERD was mainly achieved through private sector investment, which increased to 107% in 2019 (Gov-Scot, 2019). South African government funding of R&D within the NSI has grown substantially over the past five years amid negative economic growth (National Treasury, 2021). Table 2 below depicts South Africa's declining BERD by province. As depicted in Figure 2, the South African BERD has declined since the financial year 2017/18.

Table 2: South Africa's BERD by province

Province	2016/17	2017/18	2018/19	2019/2020	2020/21
	R' 000				
Eastern Cape	690 478	707 348	674 516	439 537	214 755
Free State	1 060 177	1 105 873	991 206	694 454	470 355
Gauteng	7 876 139	8 285 425	7 617 873	5 447 407	5 577 133
KwaZulu-Natal	1 553 130	1 679 718	1 446 281	1 193 914	821 492
Limpopo	171 567	223 014	184 199	78 484	199 637
Mpumalanga	284 655	304 990	392 986	370 695	256 575
North-West	526 962	565 486	601 653	566 308	526 476
Northern Cape	49 508	60 007	50 561	39 576	29 084
Western Cape	2 568 653	2 927 324	2 488 558	1 874 107	1 949 835
Total	14 781 270	15 859 185	14 447 833	10 704 481	10 047 344

Source: National Advisory Council on Innovation, 2023

2.7 PPP Projects in South Africa

All PPPs and projects in South Africa are regulated through the National Treasury regulations and the PFMA and approved according to the test requirements of feasibility, value for money and risk transfer. In addition, the National Treasury maintains and reports on all PPPs and executed projects in South Africa (National Treasury, 2019). The National Treasury reported 34 completed projects in South Africa since PPPs started gaining popularity, and the projects were reported.

There were 34 completed PPP projects in South Africa between 1998 and 2019, valued at R 89,6 billion (National Treasury, 2019). In addition, 21 PPP partnership projects were in the South African pipeline by the end of 2019. Most of the projects in the pipeline are infrastructure development projects and not projects related to the NSI and igniting innovation programmes in the country. The South African government has established a solid regulatory framework that manages the risk associated with PPPs. However, the latest report on PPPs from the National Treasury reported a decrease in the number of completed PPP projects due to several challenges leading to project interruptions and terminations in some cases.

Evidently, the number of new PPP contracts has decreased since 2017/18 (National Treasury, 2019). The National Treasury and the Government Technical Advisory Centre (GTAC) reviewed the PPP regulatory framework to address the decrease in completed PPP projects in considering best practices from other countries on how successful PPP partnerships and project execution are. The review highlighted the following:

- "PPP policies are not overarching and cannot be used as a basis for national fiscal planning. A more integrated policy approach is needed to ensure that it is driven by PPP champions with clear roles and responsibilities.
- The regulatory framework and guidelines include multiple and tedious steps and approvals. As such, low-priced projects should be excluded from procurement approval processes and approval time frames must be set.
- Declining private-sector capacity and poor public engagement. The review highlights that the role of the private and public sectors has to be clarified, and a financing support system must be established to attract private sector resources and improve the bankability of PPP projects.
- Inadequate institutional arrangement. The national treasury is not fully capacitated to perform the expected regulatory functions. As such, a well-capacitated national treasury should enter into partnerships with third parties or outsource some of its regulatory functions. Several shortcomings have also been identified in the PPP project lifecycles, and these include lengthy, rigid and costly, poor contract management, and a lack of customised PPP toolkits for some sectors," (National Treasury, 2022).

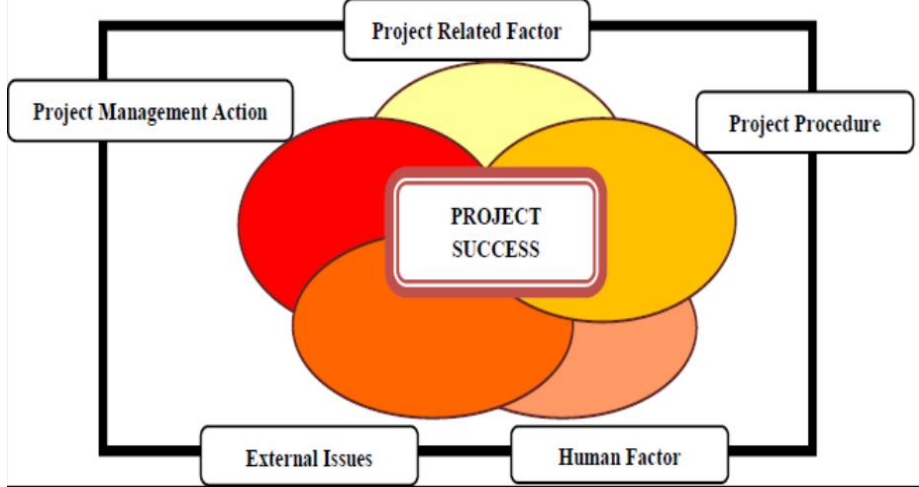
2.8 Critical success factors for PPPs

The concept of critical success factors (CSFs) was first announced by Ronald Daniel in 1961 and was further refined and popularised by John Rockart in the 70s (Ismail and Ajija, 2019). These researchers defined CSFs as key activities required to achieve favourable results. Ismail and Ajija (2019) further argued that there is not enough literature on PPPs to pay attention to identifying the CSFs for PPPs.

Dahlan et al. (2018) investigated CSFs for a stadium building project in Australia and concluded that the partnership was a success mainly because of CSFs, which included the developed legal/fiscal/economic framework to aid governance of the partnership and project, avoiding interruptions and unforeseen costs through conducting feasibility studies, project management ability and expertise, partnerships, using existing infrastructure, political stability, innovation, inflation, interest rates, financial capability and support.

Alias, Zawawi, Yusof and Aris (2014) studied the variables needed to manage PPPs successfully in the construction sector. It developed a framework of success variables that should be considered to ensure that PPPs are successful. Alias et al. (2004) identified five critical variables needed to ensure optimal PPP performance, which are depicted in Figure 2 below.

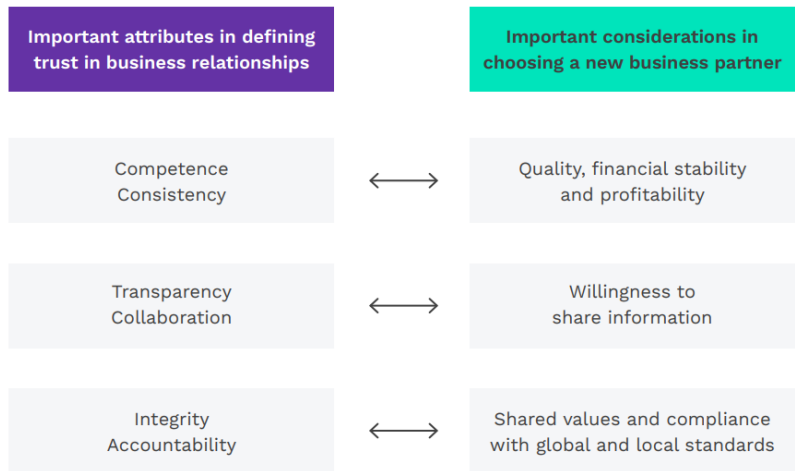
Figure 2: Factors impacting Project Partnership Success



Source: Alias et al. (2014)

Presti, Berger, Koncelik, Epstein, Hodak, Romano, Cino, Glaser, Miller and Nonberg (2020) outlined the following factors, namely trust, compatible views of company culture, mutual respect, common mission, good communication and clearly defined roles, as contributing to successful PPPs. Jakeman (2023) surveyed the most critical aspects of a business that benefit when business partnerships are built on trust. The results depicted in Figure 43 highlight that 41% of participants agreed that customer satisfaction and loyalty increase when partnerships are built on trust, 36% of participants believed operational efficiency and sustainability are positively affected by business partnerships that are built on trust and 35% felt that long term revenue growth and employee satisfaction also increases as a result of trust in business relationships (Jakeman, 2023).

Figure 3: The relationship between trust and other considerations when choosing business partners



Source: Jakeman (2023)

Figure 4 depicts the business areas that improve as a result of partnerships built on trust.

Figure 4: Business areas that improve as a result of partnerships built on trust



Source: Jakeman (2023)

The literature reviewed also demonstrates that business partnerships that are established on shared values and visions are generally successful. For example, Smilevski, Galovska and Gjorgjievski (2021) investigated the effects of shared vision on partnership success and concluded that there is a positive relationship between shared vision and partnership success. In addition, the study found that shared vision improves partnership profitability. The shared value concept also enables businesses to prioritise economic development targets and enable business sustainability, which relates to managing a business by considering three different aspects: the economy, society, and the environment. The approach to consider is not only the business's economic aspect but also the triple bottom line approach (Mahajan and Bose, 2018).

2.9 PPPs and Organisational Performance

Clarke and MacDonald (2019) believe that partnerships offer many advantages, including long-term stability and increased profit margin, but further contend that partnerships have a variety of disadvantages. Feng, Zhao and Chen (2022), on the other hand, argued that partnerships positively impact a business's sustainable performance. Wanjiku (2016) investigated the effect of partnership strategies on the performance of commercial banks in Kenya and found a positive relationship between partnership strategies and organisational performance. Clarke et al. (2019) further argued that the increased global competition in the business landscape has compelled organisations to collaborate. Wulandari (2024) adds that PPPs provide several benefits, such as offering government relief from budget limitations, as significant funding usually comes from the private sector. According to Mashwama et al. (2019), increased certainty of expected outcomes

is one of the most important attributes that has resulted in the formation of PPPs in recent years. In addition to the abovementioned benefits, an exhaustive search of literature on the benefits of PPPs has revealed that PPPs have the following benefits:

- Exploring PPPs to introduce private sector technology results in increased value for money, better results and improved efficiency (Bovis, 2010).
- PPPs enable access to knowledge transfer, allowing partners to learn from another perspective, learning from another partner enables the development of a competitive advantage (Wang, Zhou, Xiong and Yan, 2019).
- PPPs offer long-term stability. Businesses intend to maintain market relevance and dominance and achieve long-term corporate goals. Getting into long-term strategic partnerships and PPPs enables organisations to operate in partnerships and not in isolation, enabling access to innovation, expertise and resources (Profib-Blog, 2019).
- PPPs enhance business credibility and image. Business partnerships enhance a business's brand and public image, enabling the business to provide better products (Profib-Blog, 2019).
- PPPs distribute and lessen the risks between the partners. This ensures that parties that enter into a PPP contract are exposed to less or no risk, which may also enable motivation for more resources into PPP projects and partnerships (Wang et al., 2019).

In line with the aim of this research paper, namely to undertake a descriptive study on research PPPs with specific reference to the NSI in South Africa, the method followed in the study is explained below.

3. Method

This paper is a deviation from traditional empirical papers in that it involves a theoretical approach to explore what has been documented on the topic critically. Most recent relevant journal articles and research reports were analysed to synthesise the information and critically examine the 'topic', which is not phrased as a research problem, but an area of concern in the context of limited research funding. The 'desk-top' study allowed the researchers to critically engage with the topic and derive some conclusions and recommendations on how PPS involving government agencies and the private sector could be better exploited to advance research and innovation.

4. Conclusions and Recommendations

The critical literature also indicates a gap in how forming partnerships may help create a conducive environment in the NSI and help develop policies that may affect NSI performance. Thus, the study alluded to the need for empirical studies on the NSI and the impact on partnerships to improve the attraction of financial investment and aid in achieving economic development goals.

A key finding is that most PPPs in South Africa have been established for infrastructure development projects, and few have been fostered within the NSI to ensure improvement of impact and performance in the NSI. These gaps also demonstrate a need to unveil the approaches that should guide organisations in the NSI in networking, collaborating and fostering strategic partnerships to improve the performance and impact of the NSI, contribute to the country's economic growth and create sustainable local and global competitive advantage.

The study also aimed to critically assess the role of collaboration and networking in improving performance in the NSI and to evaluate the benefits of collaborating and networking in the NSI. The focus of the engagement with the literature was on the following critical aspects of the study: what are business partnerships and how different are they from PPPs, systems thinking approach and how it relates to the NSI and the impact of partnerships and PPPs on organisational performance. As such, a study that critically analyses the current state and approach to partnership within the NSI, aspects that constrain the formation of partnerships and unveils approaches and models that may be necessary to foster PPPs that are needed to attract private sector investment is needed in the NSI.

The study also reflected on the situation in the NSI through a detailed situational analysis of the NSI landscape, looking at the role played by NSI organisations, the challenges faced by organisations in the NSI. The contemporary business environment is highly competitive, and this has increased the demand for partnerships necessary to ensure that businesses remain relevant and create shareholder and customer value (National Research Foundation, 2019). As a result, the competitiveness of individual businesses depends on the success of the strategic partnerships with other businesses that share common goals and values and are strategically aligned.

Mutual respect is one of the most critical components to building long-term strategic relationships in business. Business partnerships are built based on respective business values, processes, skills, and management styles. As such, the foundation of partnerships should be built on trust and mutual respect for each partner's values, objectives, and cultures (Dugguh et al., 2014).

Businesses that want to enter into partnerships should strive to find common ground and set clearly defined goals to be used as a performance measure and drive accountability. Partnerships create the synergy that businesses need to achieve long-term goals. Badgett (2016) has highlighted that effective communication in partnerships improves team building, boosts business growth, improves innovation efficiency and productivity and increases employee engagement.

The NSI is central to South Africa's economic development; as such, both the private sector and government should get into partnerships that enable the efficiency and maximised performance of the NSI through partnerships. Government funding is inadequate for growing and improving NSI performance. Intensifying private sector

contribution to the NSI is essential to advance private sector objectives and support the achievement of the government's economic development goals.

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