

LESSONS FROM RESEARCH-BASED PUBLIC-PRIVATE PARTNERSHIPS FOR AFRICAN SCIENCE GRANTING COUNCILS

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IDRC Grant: 108460-001-Networking Africa's science granting councils

Lessons from research-based public-private partnerships for African Science Granting Councils: An analysis of experiences with PPPs in Africa

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Abstract

This chapter reviews public-private partnerships experiences in Africa, identifying the challenges and barriers to their implementation. The analysis is based on a systematic literature review and supplemented by interviews with representatives of 12 African science granting councils, allowing for a discussion of the role they should play in facilitating partnerships that help drive science-based innovation in African businesses and industries. The chapter seeks to improve our understanding of the realities involved in implementing PPPs in Africa.

Introduction

Public-private partnerships (PPPs) are a policy instrument embracing a wide range of collaboration and institutional arrangements and allowing for the joint development of products and services by the public and the private sector (Klijn and Teisman, 2003). Their adoption is more prevalent in infrastructure projects and can be traced back as far as the 18th century (Nirupama, 2009). Their implementation increased in popularity due to the economic crisis in the late 1970s. By the late 1980s, PPPs were a popular policy instrument used to leverage the experience and funds of the private sector to implement projects at a reduced cost, while also creating jobs, upgrading skills, improving delivery, and increasing the quality of performance (Dykes and Jones, 2016; Grimsey and Lewis, 2007; International Monetary Fund, 2004). Formally, PPPs are understood as those alliances in which the public and private sector enter into long-term collaboration to produce better quality products and services at a lower cost (Roehrich, et al., 2014).

Although PPPs are mostly linked to the development of infrastructure, their cross-sectoral and multidisciplinary nature makes them an excellent instrument for promoting linkages and knowledge flows among stakeholders with different competencies (Lember, et al., 2019). Early in the 2000s, their adoption expanded to many other economic sectors, such as the health and water sector (i.e., supply partnerships). They were also adopted as an instrument to facilitate investment in science, technology, and innovation (STI) to develop industrial processes, products, and services in ways that would not have been possible without the involvement of both the public and the private sector (OECD, 2004). These *PPPs in research and innovation (RI)* are defined as modes of cooperation between publicly-funded research organizations and private firms, characterized by long-term institutional and formal strategic arrangements in order to achieve complementary goals by jointly operating research activities (Buckland, 2009), sharing financial risk, and exploiting research results (Becker and Dietz, 2004).

PPPs in RI are instruments commonly adopted in the innovation policy in Europe and the United States, particularly in addressing societal challenges or the UN Sustainable Development Goals. In developing countries, particularly in sub-Saharan Africa (referred to as Africa from here on), the adoption of PPPs is still in its early-stages. Nevertheless, there are notable cases of PPPs in RI on the continent, as well as explicit efforts by African STI actors to promote the engagement of the private sector in research and the incubation of research to support viable businesses, particularly in terms of solar energy and pharmaceuticals, among other things (Ahmed, 2017; Dorothal, 2019; European Commission, 2015). Although these experiences are recorded in case studies, there are not yet sufficient lessons and insights on how to adapt PPPs for use in building technology and innovation capabilities. In the case of Africa, one of the biggest challenges in the implementation of PPPs is their adaptation to the African landscape, including the underdeveloped

institutional setting, a private sector with high levels of informality, and large rural populations (Adekenle, et al., 2016; Akampurira, et al., 2009; Kajimo-Shakantu, et al., 2014; Rana and Izuwah, 2018).

This study situates itself within broader debates on long-term research and innovation initiatives for sustainable development. It identifies barriers and bottlenecks in the implementation of different types of PPPs (i.e., for infrastructure, health, water, clean energies, tourism) as a way of providing useful lessons and insights for those interested in promoting PPPs in RI in the African context. Barriers and bottlenecks arise at different levels of the innovation system, preventing organizations from implementing solutions (or implementing them inefficiently). A difference between barriers and bottlenecks is that the former refers mostly to the enabling environment, while the latter to factors internal to the organizations engaged in the PPP (Wehn, et al., 2018). Therefore, barriers to innovation can emerge from various elements in the system, such as the presence or absence of learning opportunities between actors, contextual factors such as informal and formal institutions, the nature of decision-making processes, and policy frameworks, among other things (Vallejo and Wehn, 2016).

Among African STI actors, the African science granting councils (SGCs) are 'crucial intermediaries in the flow of international funding and technical support to research and development (RD) performing institutions in a country' (Mouton, et al., 2014, p. 16). However, their way of operating and interacting with other actors in the system, particularly with the private sector, remains full of challenges and can be described as 'patchy' (Chataway, et al., 2017).

The research contributes to an understanding of the types of capabilities needed to overcome these barriers and facilitate the adoption of PPPs in RI as an innovation policy instrument in Africa by identifying barriers and bottlenecks to the adoption of PPPs from a systematic revision of the empirical literature. It recognizes the need to understand the role and practice of PPPs in Africa and why strengthening them is critical. It aims to identify the governance gaps between the academic community and policymakers regarding PPPs in the context of Africa. The analysis is complemented by the perceptions of African SGC representatives (gathered in interviews) on the main challenges preventing them from promoting PPPs as an innovation policy instrument. By adopting this mixed approach, the research compares and benchmarks both the evidence reported in the empirical literature and the perceptions of policymakers to identify not only the overlaps and gaps in the two perspectives but also the relationships between the challenges identified.

The following section presents the methodology adopted in this study. Section 3 describes the patterns of publication of the literature analyzed. Section 4 presents the results of the analysis. Section 5 discusses the main findings. Section 6 presents the conclusions of the chapter.

Methodology

The analysis was undertaken in two steps. The first consisted of a systematic review of the literature addressing challenges or barriers to the implementation of PPPs, predominately from the perspective of infrastructure and public sector projects in housing, education, water, and health. The second step consisted of interviews conducted with directors and representatives of 12 African SGCs.

A systematic review of the literature

The first part of the analysis is based on a systematic review of the literature, including only academic articles addressing barriers or challenges to the implementation of PPPs. A systematic

review allows for a replicable, scientific, and transparent process, as it uses a systematic and explicit method to identify, select, and critically appraise relevant research.

Database, search terms and article selection process

To control the quality of the results, the search was limited to peer-reviewed journal articles written in English from January 2000 to August 2019. It was limited to the last 20 years to narrow the focus to current – more recent – issues. The analysis is based on articles published in peer-reviewed journals, as this type of academic output is considered validated knowledge (Podsakoff, et al., 2005), as it has undergone assurance for academic quality and rigor by at least two knowledgeable reviewers (Lockett, et al., 2006). Other authors adopting this rationale include Osei-Kyei and Chan (2015), Roehrich, et al. (2014) and Torchia, et al. (2015).ⁱ

A comprehensive search was carried out using the same search terms in Google Scholar, Web of Science Core Collection, and ScienceDirect. This search was narrowed by searching for a combination of keywords in the 'title/abstract/keyword' field of the search engines, combining either public private partnerships, 'Public-Private Partnership,' or PPPs WITH challenges, barriers, or bottlenecks, which produced a large number of results. Table 1 presents the combinations of keywords used in the search. These results were further restricted by applying the filter of keywords to only the title of the article. The last search resulted in 148 academic references in Google Scholar, 37 in Web of Science, and 8 in ScienceDirect, totaling 193 academic references.

Table 1. Boolean operators used in the search

Google Scholar	Web of Science	ScienceDirect
All in title: (public private partnerships OR "Public-Private Partnership" OR PPP) (barriers OR challenges OR bottlenecks)	TI = (public private partnership* OR PPP* OR "Public-Private Partnership") AND (barrier* OR bottleneck* OR challenge*)	In title: (public private partnerships OR "Public-Private Partnership" OR PPP) AND (barriers OR challenges OR bottlenecks)
Results: 148	Results: 36	Results: 8

A further revision of the academic references resulting from the search was conducted. This was particularly relevant in the case of those references identified by Google Scholar, as this search engine does not allow for the selection of journal articles only. In this step, 92 articles were eliminated, as they were not journal articles, but working papers, discussion papers, theses, policy briefs, books, or book chapters. Additionally, four references were removed from the sample, as they were outside the scope of the current research.

After the elimination of these academic references, 97 research articles were left in the sample. EndNote X8 software was used to manage the selected articles electronically. In the following step, duplicated (repeated) articles were identified across the three databases, and 12 articles were eliminated for this reason, leaving 85 articles. A final step in the selection of the journal articles was to retrieve the articles – when checking for accessibility, 19 of the journal articles were not accessible to the researchers. One more article was dismissed because it was written in French, although the abstract was presented in English, leaving the sample at 65.

Reading and classification of journal articles

The 65 available articles were skimmed (i.e., the abstract, conclusion, and selected parts of the articles were read through). To be retained, an article needed to satisfy two criteria. First, it should

be a case study or a revision of empirical literature. Under this criterion, four articles were excluded, as they were opinion or editorial articles. Second, they needed to be published in a peer-review journal with at least two reviewers involved in the process. Peer-reviewed articles have gone through a standard practice of research validation and quality improvement before publication. The homepages of each of the journals in which the articles were published were revised, in order to identify the 'peer-review policy' of the journal. The following dummy variables were given to each category: (i) journals with a peer-review process (as a minimum requirement) were coded with a dummy value of 1; and (ii) journals without a peer-review process (as a minimum requirement) were coded with a dummy value of 0. Under these criteria, seven articles were excluded, as the peer-review policy did not indicate mandatory reviewing from anyone other than the journal editor, bringing the total number of articles excluded to 11. Figure 1 illustrates the process from database selection up to the final selection of articles to analyze.

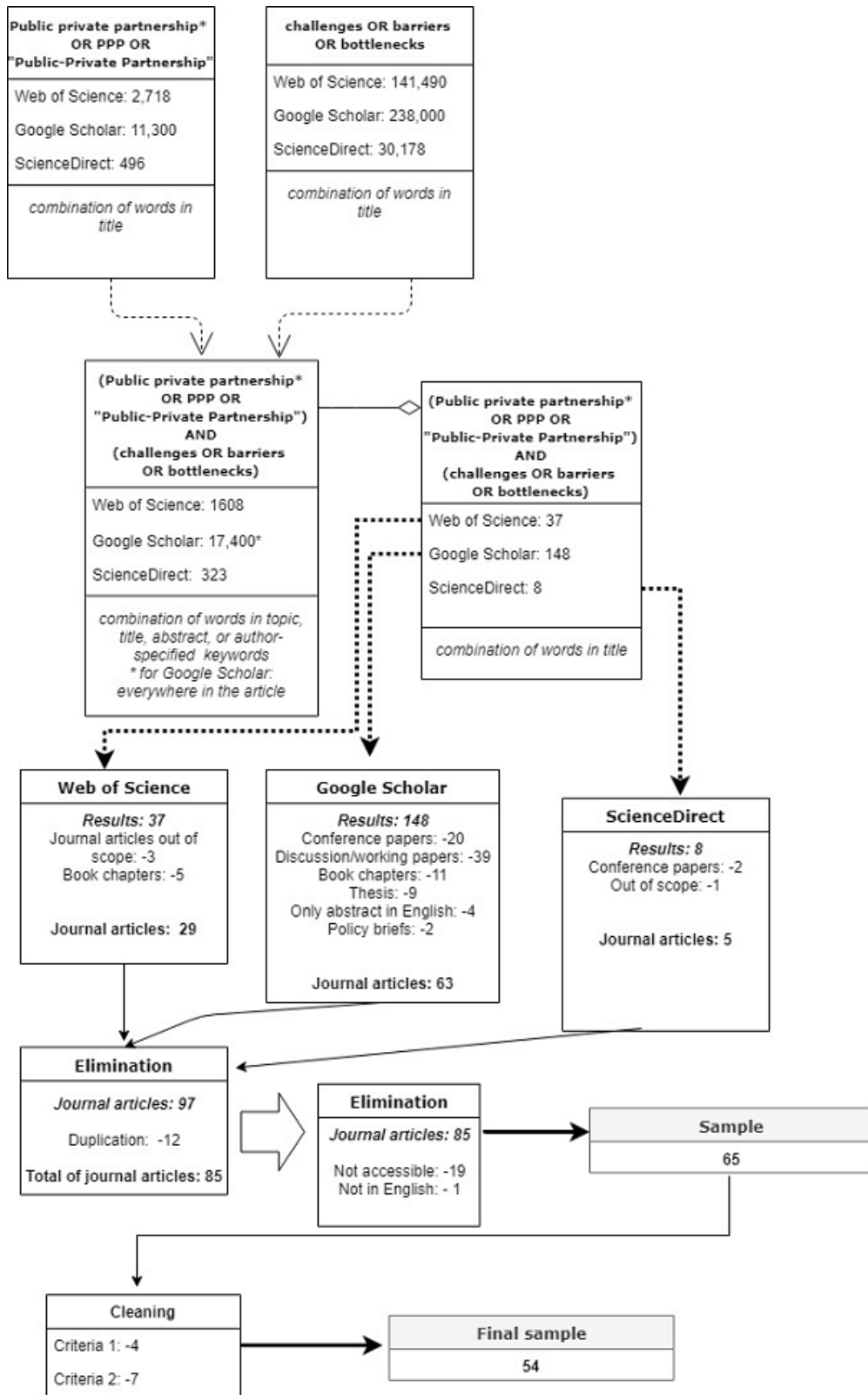


Figure 1. Systematic review flow diagram
Source: Elaborated by the authors.

The remaining 54 research articles were categorized by year of publication, type of article (i.e., case study, questionnaire survey/interviews/mix-method, or literature review), sector of analysis, and region of analysis using EndNote X8 software. This initial classification allowed us to gain a perspective on the distribution of the articles.

In the first round, the articles were read in their totality, and PDF-Xchange editor was used to colour-mark the: (i) paper objective and research question; (ii) sector of analysis; (iii) country or region of analysis; (iv) method of analysis; (v) barriers or challenges to PPPs identified by the article; (vi) key themes identified; (vii) cross-references; and (viii) relevant quotes. An adaptation of the Conceptual Synthesis Excel Dump (CSED) research tool developed by Pacheco Vega (2016) was used for this compilation, as well as research memorandum notes for each journal article. During the second round, the articles were uploaded and read once again in their totality using Atlas Ti (Version 8). The articles were coded while reading using the same logic as the CSED, but focusing in more detail on the barriers or challenges mentioned in the article.

Interviews

Semi-structured interviews were prepared in English and administrated to 12 representatives of research councils and SGCs coordinators in Botswana, Burkina-Faso, Cote d'Ivoire, Cameroon, Ethiopia, Ghana, Malawi, Senegal, Tanzania, Uganda, Zambia, and Zimbabwe. The interviews were conducted at the Annual High-Level Meeting of Science Granting Councils in Livingstone, Zambia, on November 22–23, 2017. All the interviews were voice recorded after obtaining the informed consent of the SGC representative. Each interview lasted about 25 minutes. Each representative was interviewed separately in a private location, away from the conference group.

Two open-ended questions were asked of the interviewees, focusing on the barriers or bottlenecks to the implementation of PPPs in each of the interviewees' countries and on the type of private sector actors targeted by the SGCs. The audios of the recorded interviews were coded using Atlas Ti (Version 8). The results of the interviews are presented, taking care to protect the anonymity of the interviewees.

Code analysis

The documents (printed and audios) were uploaded to Atlas Ti and coded. The codes were grouped into families according to the following attributes: economic and financial constraints; stakeholder constraints and limitations; environmental and institutional barriers; and technological barriers. The literature and interviews were coded using deductive, inductive, and auto-coding; additionally, word cruncher was used to obtain the frequency of the keywords in the text. Document groups were created to distinguish those papers presenting cases in Africa, from those on cases in developing countries in other places (excluding Africa), and those based on cases in developed countries.

Systematic literature review: patterns of publication

Evolution of publication over time

In line with the increase in publications on PPPs over the last two decades, as reported by Cui, et al. (2018), Osei-Kyei and Chan (2015), and Roehrich, et al. (2014), the number of journal articles on challenges or barriers to PPPs published between 2000 and 2019 has also increased, as presented in figure 2. As identified by Osei-Kyei and Chan (2015), our findings showed a major peak in publications on PPPs after 2013. This indicates a gradual rise in interest by scholars in

identifying the challenges and barriers to the adoption of PPPs, particularly in developing countries. About 63 percent of the articles analyzed focus on developing countries, with about 50 percent of them focusing on Africa.

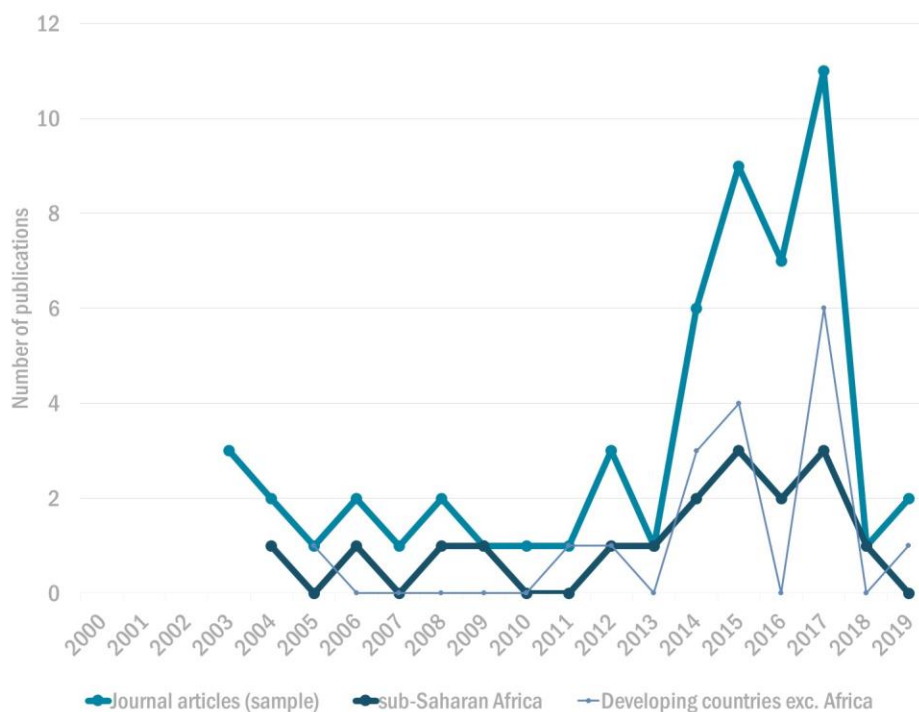


Figure 2. Number of publications on challenges or barriers to PPPs (2000–2019)
 Source: Elaborated by the authors.

Sectors of analysis

Most of the selected papers (i.e., 69 percent) focus mainly on two categories: infrastructure and public services, as illustrated in figure 3. Under this classification, *infrastructure* refers to those articles dealing with issues related to infrastructure, construction, transport and transportation, housing, real estate, and building (about 41 percent of the sample). Although *water* (4 percent of the sample), *education* (4 percent of the sample), and *health* (17 percent of the sample) are public services, they are presented as separate sectors to be more illustrative for the reader. *Public services* refer to energy, waste management, security, and other services (excluding water, education, and health) and account for about 4 percent of the sample. Legal and contractual aspects, accounting and fiscal issues, and governance represent about 19 percent of the sample and are grouped under *legal and financial*. Other categories are *agriculture* and *tourism*.

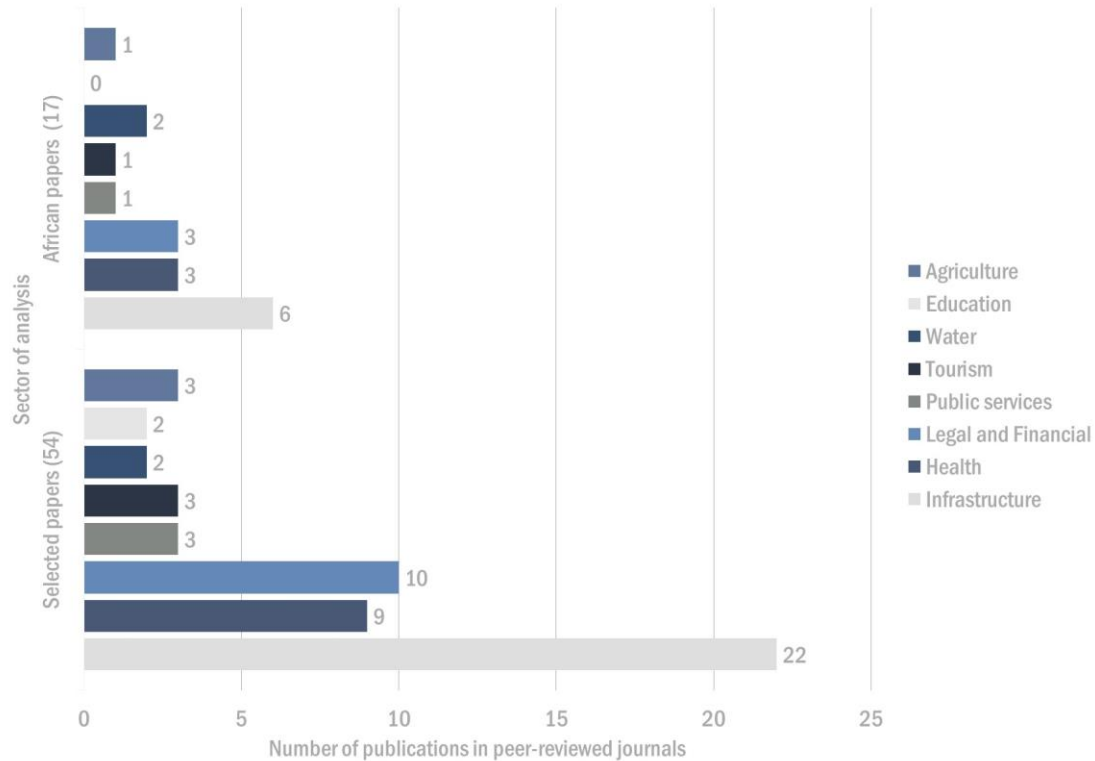


Figure 3. Number of journal articles classified by sector of analysis
Source: Elaborated by the authors.

Emerging barriers and bottlenecks for PPPs in Africa identified in the analysis

Inadequate access to financial resources

Chalons-Browne (2005) highlights a lack of access to sustainable funding as a major barrier to PPPs in low- and middle-income countries. PPP consortiums rely on loans (equity) to operate; therefore, local banks and financial institutions are needed to provide private companies with financial loans. Studies on PPPs for infrastructure in Malawi (Sukasuka and Manase, 2016), the road sector in Zambia (Chilala and Mulenga, 2017), the water sector in Botswana (Molokwane and Tshombe, 2017), and the housing sector in Nigeria (Muhammad and Johar, 2018) point to the difficulties experienced by local firms when accessing local loans (or equity), and the very high-interest rates of the loans available, as important barriers to local private participation in PPPs.

Competition between programmes for funding is identified by Otairu, et al. (2012), in their survey of public sector officials, as a barrier to the implementation of PPPs in infrastructure in Nigeria. The authors mention the political interest of local governments in awarding road or civil engineering works as a way to siphon funds from the public treasury with little accountability. This deprives private companies involved in PPP projects from guarantees of repayment within an agreed period, as low-cost (or free) alternatives are provided to the public by local governments. Kostyak, et al. (2017) and Njau, et al. (2009) also identify competition for funding with other programmes as a source of inefficiency and waste of resources.

A challenge identified for PPPs in RI in both the interviews and journal articles is insufficiency in the allocation of public funds. Three of the interviews revealed that when involving the local

private sector, it is the government that, through pre-designed calls, specifies the value of the grant and the goals to be targeted (Interviewee 6, 2017; Interviewee 7, 2017; Interviewee 8, 2017; Interviewee 11, 2017). Some of the respondents indicated that the allocation of funds is always insufficient and does not necessarily correspond with what is reported on paper (Interviewee 8, 2017). The Organisation for Economic Co-operation and Development (OECD, 2014) indicates that public financing rarely meets crucial expenditure requirements. This is also indicated by Molokwane and Tshombe (2017) in their study on PPPs for water utilities in Botswana, where the insufficiency of public funds has resulted in the deterioration of existing infrastructure and lack of improvements, resulting in a call for the participation of the private sector through PPPs to fill the gap. In addition, the interviews revealed that public funds are frequently allocated to projects seeking commercialization and upscaling, rather than to investments in science, technology, and innovation, which receives a low contribution of public funds (Interviewee 1, 2017; Interviewee 2, 2017; Interviewee 3, 2017; Interviewee 6, 2017; Interviewee 7, 2017; Interviewee 8, 2017; Interviewee 11, 2017).

In the absence of accessible financial loans, PPPs rely on foreign financial institutions (or donors) to finance projects (Otairu, et al., 2012). Our interviews with SGCs representatives identified reliance on international donors to finance projects as a challenge to the sustainability of PPPs. The increasing participation of foreign-financed PPPs, with the consequent demand for short-term results, has, in some cases, reduced national ownership and interaction with programmes (Kostyak, et al., 2017; Interviewee 8, 2017). There are concerns that internationally-funded PPPs may divert national priorities and increase the inequality of vulnerable groups, as priorities are set according to donors' interests (Kostyak, et al., 2017; Interviewee 8, 2017).ⁱⁱ

Inability or inexperience in managing PPPs

Lack of relevant experience of the public sector in the management of PPPs is identified as a bottleneck that inhibits and complicates the implementation of PPPs, demotivating private sector participation and, in some cases, contributing to the failure of the partnership (Babatunde, et al., 2014; Babatunde, et al., 2015; Chilala and Mulenga, 2017; Hall, 2006; Interviewee 7, 2017). This includes public sector inability or inexperience in managing consultants (Babatunde, et al., 2015; Chilala and Mulenga, 2017; Otairu, et al., 2012), and limited capacity to make choices that improve the outcomes of the PPP (Kamugumya and Olivier, 2016) and steer it towards the agreed objectives (Muhammad and Johar, 2018). The appropriate selection of private partners is critical to the success of a PPP (Muhammad and Johar, 2018). Therefore, the lack of technical expertise in the public sector (Chilala and Mulenga, 2017; Desta, et al., 2014; Hall, 2006; Muhammad and Johar, 2018; Otairu, et al., 2012), as well as lack of time and resources (Chilala and Mulenga, 2017), often mean that the public sector is unable to engage with technically competent and financially capable firms (Muhammad and Johar, 2018). Inadequate assessment tools to determine the feasibility and affordability of partners, as well as lack of clarity about the assessment process, has been identified as a bottleneck in the implementation of PPPs, as it discourages the participation of private partners (Molokwane and Tshombe, 2017; Nkrumah, 2004; Sukasuka and Manase, 2016). Failing to monitor the performance and proper implementation of the PPP is also seen as a barrier, as it discourages the public sector from engaging in this type of activity (Fombad, 2013).

Shortage of skilled workforce and inefficient local industry

Inefficient local industry and a shortage of capable local contractors has resulted in a large number of PPPs being handled by foreign firms that have the financial strength and competence

required for these projects (Otairu, et al., 2012). Babatunde, et al. (2014) and Otairu, et al. (2012) identify the inexperience of local firms in Africa, low level of skills among the local workforce, and scarcity of materials as significant bottlenecks in the implementation of PPPs in Nigeria. This is supported by Molokwane and Tshombe (2017) in their study of water management PPPs in Botswana, in which the authors identify the shortage of expertise among the technical staff as a factor underpinning PPP performance. In the case of African PPPs in RI between international partners and local public research partners, the outcomes are often not useful, as no local private sector actor is usually able to join the partnership (Hall, 2006).

Poor interaction between stakeholders and information asymmetry

Inadequate inclusion or consultation of stakeholders is identified in the interviews and literature as a barrier to the success of PPPs in Africa (Babatunde, et al., 2015; Interviewee 2, 2017; Interviewee 3, 2017; Interviewee 6, 2017; Interviewee 8, 2017; Interviewee 11, 2017). In their study on PPPs in the provision of health services in Tanzania, Kamugumya and Olivier (2016) state that the private sector and non-public actors are not always adequately represented in strategic and planning decisions and, on many occasions, are severely marginalized. This is supported by the findings of Desta, et al. (2014), Kamugumya and Olivier (2016), and Molokwane and Tshombe (2017). This exclusion not only means that all potential service providers are excluded, but also that many of the people whose names appear in the PPP contract are not part of the planning and strategic decision sessions (Kamugumya and Olivier, 2016). Civil society is weakly, or not at all, represented in discussions with public actors, even though, in some cases, their centrality is key to the PPP's institutionalization and arrangements (Lo, 2008). Fombad (2013) and Nkrumah (2004) report the exclusion of citizens and civil society organizations from the negotiations between public and private partners, which, on many occasions, are conducted in secrecy. In the case of partnerships with influential international donors or multi-national corporations, local governments in many developing countries have expressed their concern about not being fully involved in decision making for projects (Kostyak, et al., 2017).

Lack of transparency and information asymmetry between stakeholders, which includes unclear information on the project, is a recurring theme identified in the performance accountability of PPPs (Chilala and Mulenga, 2017; Fombad, 2013; Lo, 2008). Babatunde, et al. (2015) and Kamugumya and Olivier (2016) mention the lack of understanding and inadequate information available prior to the project as relevant barriers to the success of PPPs. The poor quality of information and data prevents stakeholders from adequately assessing risk. Substantial gaps in the information shared between the public and private sectors increase mistrust and decrease potential value creation outcomes (Kamugumya and Olivier, 2016; Molokwane and Tshombe, 2017). Hall (2006) identifies weak communication between the different ministries, as well as the fragmentation of available scientific resources among them, as examples of information asymmetry in PPPs in RI.

Technological path dependency and entry costs of new technologies

A relevant barrier to PPPs identified in the interviews is the cost of new technologies. Interviewees 3, 6, and 8 (2017) all pointed out that importing technology is cheaper and more comfortable than investing in local STI (Interviewee 3, 2017), which discourages local STI efforts. Other barriers identified in the interviews are lack of communication and cooperation between the private sector and local universities (Interviewee 2, 2017; Interviewee 3, 2017), lack of interest by the private sector in academic output (Interviewee 3, 2017; Interviewee 6, 2017), and poor

leadership by SGCs and related agencies in the national policy-making arena (Interviewee 1, 2017; Interviewee 6, 2017; Interviewee 8, 2017; Interviewee 11, 2017).

Irregular procurement process

In most African countries, PPPs are the result of tenders based on predetermined goals and designed by the government (Interviewee 6, 2017; Interviewee 7, 2017). However, most of the interviewees do not consider this to be the most efficient way to construct partnerships. A partnership involves elements of collaboration contracted through a written agreement. The kind of arrangement adopted depends on the type of project, the needs addressed, and the sector of implementation (European Commission, 2003). An important bottleneck to the implementation and performance of PPPs in Africa is ineffective contractual arrangements.

Kamugumya and Olivier (2016) report that, in the case of health PPPs in Tanzania, most PPPs are informal, except those funded by international donors, for which, usually, only a memorandum of understanding (MoU) is in place. The lack of written formal legal agreements allows for misunderstandings between parties and limits progress towards the goals of the PPP (Molokwane and Tshombe, 2017). Muhammad and Johar (2018) indicate that contract complexity is a significant bottleneck for PPPs. A complex contract requires a higher level of management and steering capacity on the part of the public sector, which is often nonexistent (Muhammad and Johar, 2018). Otairu, et al. (2012) and Fombad (2013) identify inadequate project preparation and poor specification of the desired output as bottlenecks in the operational phase of PPPs in South Africa and Nigeria. Therefore, a properly formulated contract is needed to specify the distribution of risks, prevent the private sector from changing prices, and prevent the government from imposing changing political exigencies on the PPP (Mustafa, 2015; Otairu, et al., 2012). Miranda Sarmiento and Renneboog (2017) present evidence of opportunistic bidding for PPP contracts, which, once acquired – and the competition eliminated – lead to renegotiation to increase revenue. Their analysis shows that incomplete legal arrangements (due to contract complexity, size and length) favour renegotiation at the operational stage. Election years (the year leading up to an election) are positively correlated with the renegotiation of large PPPs, either by governments or the private sector (Miranda Sarmiento and Renneboog, 2017).

Another identified barrier is contract secrecy. In most cases, PPP arrangements are kept confidential, preventing public access to partner selection, targets, and goal setting, as well as the formulation of guidelines (Kostyak, et al., 2017). Fombad (2013) identifies the non-disclosure of PPP contracts as a source of accountability issues, particularly regarding public perceptions of government transparency in public procurement in South Africa. Muhammad and Johar (2018) report how in the case of housing delivery in Nigeria, the lack of transparency in the procurement process was linked to corruption and political influence, due to a lack of clarity in the guidelines.

Absence or weak competition and lack of incentives

The absence of competition is identified in the literature as an essential barrier to the performance of PPPs (Babatunde, et al., 2015; Sai, et al., 2015). The scarcity of bidders for PPP projects is a barrier, particularly in environments where the local private sector is mostly formed by small and medium-sized companies unable to compete with large or international companies (Chilala and Mulenga, 2017; Fombad, 2013). Authors like Fombad (2013) mention that in the absence of competition, successful bidders for PPPs become monopolistic suppliers to the public sector. Firms tendering on a PPP should not only be able to understand the procurement process and have knowledge of the sector, but also be able to cover the costs of preparing their proposal and have

access to finance before the conclusion of the bidding process (Chilala and Mulenga, 2017; Fombad, 2013; Muhammad and Johar, 2018; Otairu, et al., 2012).

Lack of incentives for PPPs was identified as a barrier to their implementation in both the interviews and literature (Interviewee 2, 2017; Sai, et al., 2015). Taxation is a severe barrier to the implementation of PPPs, as identified by stakeholders in the various African countries studied (Interviewee 2, 2017; Kostyak, et al., 2017; Molokwane and Tshombe, 2017; Njau, et al., 2009; Otairu, et al., 2012; Sai, et al., 2015). Customs duties, as well as complicated taxation systems, have been reported by some authors as barriers to PPPs, mainly when international partners are involved (Kostyak, et al., 2017; Njau, et al., 2009). Njau, et al. (2009) identified import difficulties, taxation problems, and the lobbying of influential individuals, as important barriers for PPPs and a waste of resources.

Conflicting values and norms

A significant barrier to the success of PPPs is the conflict of interest among stakeholders (Babatunde, et al., 2015; Interviewee 2, 2017; Interviewee 8, 2017; Kamugumya and Olivier, 2016). Self-interest driven behaviour by local government officials is not uncommon in PPPs in Africa and other developing countries (Kamugumya and Olivier, 2016). In their case study on health service provision in Tanzania, Kamugumya and Olivier (2016) report how the District Council Team influences decisions based on politically-motivated interests, rather than value distribution, thwarting private actors' engagement in the partnership. Sukasuka and Manase (2016) relate how the involvement of a cabinet minister in the decision committee of the private company involved in infrastructure PPP in Malawi led to conflict, promoted corruption, and prevented the participation of potential investors. Similar experiences were reported in the interviews with SGCs representatives, which described how the personal interests of influential policymakers determined the direction and coverage of the PPPs in RI (Interviewee 8, 2017).

Corruption is frequently identified in the literature as a barrier to the design, implementation, execution, and performance of PPPs in Africa (Kostyak, et al., 2017; Mustafa, 2015; Otairu, et al., 2012; Sukasuka and Manase, 2016). Examples of corruption range from bribery, which is endemic in Africa, including under-the-table payments (involving not only local actors, but also international firms), to issues such as political influence and interference, such as the personal interests of policymakers in specific private counterparts (Muhammad and Johar, 2018; Sukasuka and Manase, 2016). Reliance on foreign donors is sometimes associated with corruption and moral hazard. Hilmarsson (2017) in his analysis of PPPs for clean energy (i.e., geothermal energy) presents a case where a government ended up paying the cost of disputes with foreign private partners, as these private partners had a close relationship with the World Bank and leveraged this relationship in the dispute.

Inadequate regulatory framework

The use of public funds to finance large infrastructure projects as a way to drain off such funds with low levels of accountability is also a barrier to PPPs (Otairu, et al., 2012). The phenomenon of 'tenderpreneurship'ⁱⁱⁱ is also commonly referred to as a form of corruption facing PPPs in the region (Fombad, 2013; Otairu et al., 2012). A weak or poor regulatory framework has been identified as an important barrier to PPP implementation by Hall (2006), Njau, et al. (2009), Nkrumah (2004), Otairu, et al. (2012), and Interviewees 2 and 3 (2017). Another barrier identified in both the interviews and articles is bureaucracy (Hall, 2006; Interviewee 2, 2017; Interviewee 6, 2017; Interviewee 11, 2017; Njau, et al., 2009; Nkrumah, 2004; Otairu, et al., 2012).

Discussion of findings

This study takes a dual approach consisting of desk and empirical research. The desk research identified barriers and bottlenecks in the implementation of several types of PPPs in Africa. The empirical research, consisting of interviews with representatives of African SCGs, identified specific local barriers, which in the perspective of the SGCs should be addressed to create an enabling environment for the successful adoption of PPPs in RI. The combination of both approaches provides insights and lessons from the implementation of PPPs in several sectors that should be considered when designing and adopting PPPs in RI in the African context. Figure 4 presents the recurrent barriers and bottlenecks mentioned in the literature and identified in the interviews.

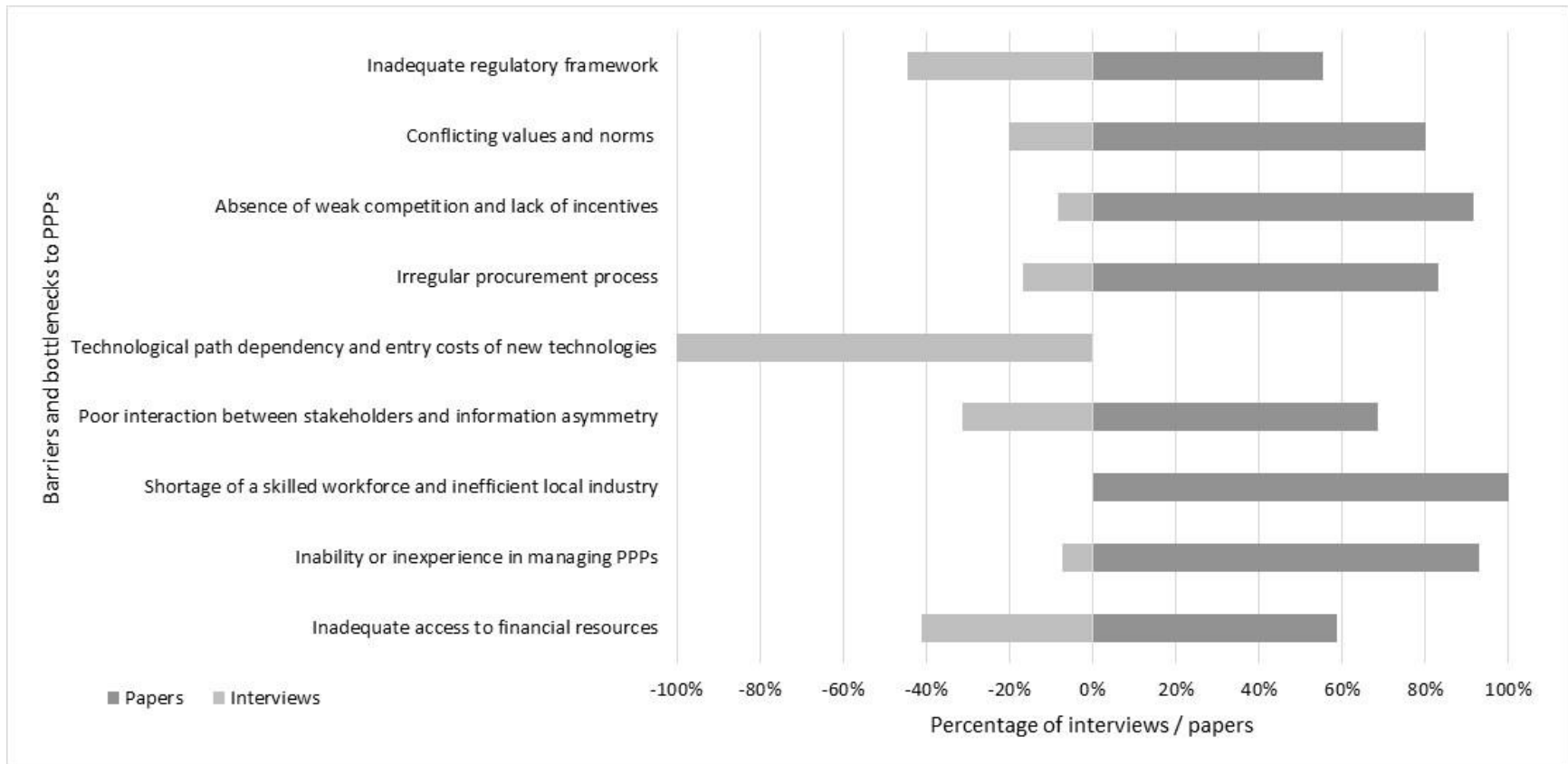


Figure 4. Challenges and barriers to PPPs
 Source: Elaborated by the authors.

The analysis included at least three barriers and bottlenecks to the adoption and adaptation of PPPs (including PPPs in RI) affecting the involved organization's ability to engage in innovation and learning activities. These barriers are: (i) *inadequate access to financial resources* (60 per cent of the papers and about 90 per cent of the interviews); (ii) *technological path dependency and entry costs of new technologies* (75 per cent of the interviews); and (iii) *irregular procurement process* (59 per cent of papers and 25 per cent of interviews). These are barriers and bottlenecks that require a reconfiguration of the existing decision-making arrangements and governance structures and the capacity strengthening of organizational resources, as well as leadership and management.

An innovation system is an institutional concept. In terms of formal institutions, the analysis shows that *an inadequate regulatory framework* is also a barrier to innovation through PPPs (29 per cent of papers and 50 per cent of the interviews). *Lack of trust between stakeholders* (71 per cent of papers and 25 per cent of interviews) is another barrier to PPPs identified in both the literature and the interviews. The role that informal institutions play in innovation is recognized in the capacity building literature, particularly through commonly shared social and cultural values. The analysis identifies *conflicting values and norms* (47 per cent of papers and 25 per cent of interviews) as a barrier to PPPs.

Interactive learning among actors in the system enables change and innovation. About 65 per cent of the papers and 63 per cent of the interviews identified *poor interaction between stakeholders and information asymmetry* as an important barrier to PPPs (including PPPs in RI). In the interviews, SGCs' representatives highlighted the need to include partners such as ministries of agriculture and civil society.

Capacity development is needed to address the public sector's *inability or inexperience in managing PPPs* (76 per cent of papers and 13 per cent of interviews), the *shortage of a skilled workforce* and an *inefficient local industry* (24 per cent of papers), as well as the *lack of incentives and weak competition* (47 per cent of papers and 25 per cent of interviews).

Conclusions

The identification of barriers and bottlenecks in the implementation of PPPs provides an overview of what needs to be addressed by SGCs in the adoption of PPPs in RI. In general terms, the barriers and bottlenecks identified by the papers addressing multisectoral cases of PPPs are in line with the perception of SGCs' representatives of the barriers to PPPs in RI. The nature of the barriers reveals weaknesses in several components of the African innovation system. This focuses attention on the need to integrate private, political, technological, and social perspectives in the adoption of PPPs in RI as a development tool.

Limitations of the study

As in any other systematic review of the literature, some important articles that address relevant aspects were missed. Owing to the combination of keywords used, all those addressing barriers to PPPs, but not using the words 'challenges, barriers, or bottlenecks' in the title are not included in this review. However, the results presented here are a robust first step towards the recognition of those challenges and barriers to the design and implementation of PPPs in Africa. These results open the door to future research on the causes of these challenges and the extent to which they could be addressed. There is no doubt that there is a need for more academic empirical evidence in Africa, through lessons learned and best practices, as input for policymakers.

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Acknowledgment

This research was financed by funds made available to the Science Granting Councils Initiative (SGCI) in sub-Saharan Africa by the International Development Research Centre (IDRC), Department for International Development (DFID), and National Research Foundation (NRF). The funding sponsors had no role in the design of the study; collection, analysis, or interpretation of the data; writing of the manuscript, or decision to publish the results. Our sincere gratitude goes to those interviewed who shared their experiences, knowledge, and time.

Disclaimer: The results and conclusions drawn from this study do not necessarily reflect the views of the organizations to which the authors are affiliated. The usual caveats apply.

Endnotes

ⁱ The authors acknowledge that there is a significant amount of material on PPPs in RI in Africa that has not been published in academic journals.

ⁱⁱ Foreign funding in health has been linked to increased opportunities for corruption and the leakage of funds to other sectors (Kostyak et al., 2017).

ⁱⁱⁱ ‘Tenderpreneurship’ is where a person uses his/her political contacts to secure public procurement contracts (Piper and Charman, 2019).