Some Reflections on the Contextual Preparedness for the Policy Innovation Labs Initiative in Sub-Saharan Africa

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Abstract

In light of the multiple challenges and weaknesses in the policymaking practice that have resulted in policy failures, public sector inefficiencies, and persisting ineffectiveness of public service delivery, many countries in different regions of the world have established what is known as 'policy innovation labs' (PILs), which are novel structures that gather empirical evidence to generate innovative solutions to public problems. The utilization of PILs in policymaking architecture has resulted in the enhancement of public policymaking practice and improved policy performance. Notwithstanding the increasing amount of evidence demonstrating the effectiveness of PILs in policymaking, this paper observes a very slow uptake of the idea in Sub-Saharan Africa. The paper relies on a qualitative desktop review to analyze the preparedness of countries in Sub-Saharan Africa to successfully establish functional and sustainable PILs. The results of the review show that the current African innovation landscape is not quite ready for the establishment of PILs. This is mostly because of the potential complications arising from the inflexibility of the traditional Weberian bureaucratic model in African countries, which limits receptivity to PIL structures and their modus operandi. *In addition, there are observable capacity challenges emanating from the limited financial resources to undertake R&D. The paper concludes that the take-off of PILs remains contingent upon the strength of political will in supporting the whole idea financially, materially, and otherwise.*

Keywords: *African Context, Policy Development, Policy Innovation Labs, Preparedness*

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Introduction

Innovation has attained a special place in the economic development discourse, with many portraying it as a critical source of competitive advantage from industry to national levels (Tamrat, 2021; Adeboye, 1997; Olaoye *et al*., 2021). Most of the recent works on the subject of innovation and development are built from the foundations laid by early works by scholars such as Joseph Schumpeter (1934), whose theory of economic development recognizes the critical role of innovation in boosting national productivity and performance. Africa is slowly awakening to this reality, and a few indicative developments should suffice to give a glimpse of what has happened. In the Science and Technology Consolidated Plan of Action of 2003, AU member states sought to "enable Africa to harness and apply science, technology, and related innovations to eradicate poverty and achieve sustainable development." This objective came across as a very explicit recognition of the critical place of innovation in driving the development agenda of African nations. Africa has further created a new platform, the Africa Innovation Summit, which brings together critical actors (policymakers, business, academics, civil society, innovators, and scientists) who have a role to play in helping African countries harness innovation benefits for national socio-economic transformation. The 2016 Africa Innovation Summit focused on "How can Africa innovate its way out of the myriad of developmental challenges facing the continent" (Adesida *et al.*, 2021, p. 779).

Global efforts towards enhancing innovation with national systems have seen the creation and diffusion of the idea of Policy Innovation Labs (PILs) as critical, innovation-focused structures innovating on policy design using lab-based experimental approaches unscientifically testing, measuring, and producing policy design prototypes for implementation in the public sector (Komatsu *et al*., 2021). Governments that have established PILs within their national innovation systems have started to harness benefits from that initiative for the past decade (Williamson, 2015). However, with the global proliferation of PILs to date, most sub-Saharan African countries - except for South Africa - have yet to adopt the initiative. The non-existence of PILs in many public sectors of sub-Saharan Africa explains the current literature gap on the subject of PILs on the continent. A systematic review of the literature on PILs by Wellstead, Gofen, and Carter (2021) found neither publications on PILs in Africa nor any studies about African PILs from scholars outside Africa. Hence, the global directory of government innovation labs only has details for one PIL in Africa - the South African Centre for Public Service Innovation.

Nevertheless, there is a strong case for adopting PILs in Sub-Saharan Africa. For a start, Africa's development challenges have partly been attributed to weak policy formulation practices (Alonce, 2004), and in cases of weak states, there has been an industrial failure or de-industrialization (Oyelaran-Oyeyinka, 2014). Poorly developed industrial policies coupled with limited industrial and manufacturing capacities further justify the establishment of PILs in Africa (Sampath, 2014; Soludo *et al*., 2004). Most African economies are agro-based, and some rely heavily on extractive industries, yet the capacity for beneficiation and value addition of agricultural produce or minerals is still developing (Hooli & Jauhiainen, 2018). Historically, colonial African economies were designated producers of raw materials exported for processing in Western industrial capitals (An, 2015). The education system by colonial governments was never designed to technically equip African learners with industrial skills for processing raw materials from agriculture and mining, eventually leading to the transformation of African economies (Diop, 2015). This state of affairs is why some have argued for the reconstitution of current African economic systems to reverse the persistence of exploitative economic relations (Kieh, 2009). Such reconstitution efforts are expected to be spearheaded by robust national innovation systems (Godin, 2009), with PILs playing a decisive role on the policy front (Tõnurist *et al*., 2017).

Statement of the Problem

Under the above background, this paper approaches the subject of PILs in Africa through policy transfer and policy learning, considering that PILs are an overseas innovation that Africa seeks to 'import' and adopt. Despite the portrayal of Africa as a slow adopter of the latest technologies, a reform laggard, and an aggregate non-producer of new technologies (Sachs *et al*., 2004), post-independence Africa has been learning, emulating, and transferring policy ideas from overseas several times in history - a fact which accounted for the increased visibility of Bretton Woods institutions in influencing policy choices and extending technical advice on economic issues in the past (Van de Walle, 1999). Unfortunately, despite all that, meaningful economic development continues to elude the continent (Sampath, 2014). Following the successes of the Newly Industrialized Countries (NICs) of Eastern Asia in the 1970s, many saw their experiences as transferable and replicable in contexts of underdeveloped economies of the Third World

(Hamilton, 1987). More recently, the Chinese development model has also drawn substantial scholarly attention, and many have debated its potential applicability to the African development impasse (Hodzi & Åberg, 2020; Babones, 2020). The running thread in this discourse is the transfer of ideas, policies, and models from their original environments in the Asian world to developing countries. Experience, however, shows that policy transfer and diffusion of innovation have not been smooth in numerous past experiences due to context-related inhibitive factors in the receiving environments. Chances of failure to adapt and indigenize foreign ideas are high, and there is always the huge possibility of "dilemmas of diffusion" (Locke & Jacoby, 1997, p. 34). Insights from policy transfer literature amply demonstrate the potency of attendant conditionalities in determining the success or failure of policy transfer (Dolowitz & Marsh, 1996). In addition, transfer institutions are viewed as socially embedded (Locke & Jacoby, 1997), which directs attention to the primacy of contextual variables in each case. Innovations are also appreciated as contextually embedded (Williams & Woodson, 2012). With this understanding, the success of the transfer and adoption of PILs as innovations in policy design and policy development in the African context is equally subject to compatibility and alignment with contextual variables in the receiving environments. When successfully established, PILs should be instrumental in indigenizing transferred policy ideas and generating robust, context-sensitive policy designs that adequately speak to national imperatives.

Objective

The main objective of this paper is to evaluate the extent of preparedness of sub-Saharan African countries for the establishment and sustainability of PILs, taking a panoramic perspective of experiences and contextual variables. The paper is organized as follows: It briefly presents the methodology of the study and discusses the concept of PILs. It proceeds to take a global perspective in reviewing literature around PILs. Thereafter, it unpacks the African innovation landscape as it relates to establishing PILs in different countries. In the process, several challenges are presented and discussed, and a conclusion is drawn to close the discussion.

Methodology

This paper is a qualitative desktop research that selected and reviewed papers focusing specifically on PILs, public sector innovation in Africa, bureaucratic traditions, and the attendant challenges inhibiting the promotion of innovation cultures in the African public sector. The

literature was selected using the documentary analysis method, often credited as "useful in discovering and describing underlying patterns and meanings in a phenomenon" (Sankofa, 2022, p. 746). The documentary material was drawn mainly from the Google search engine, Google Scholar, and EBSCO host. Analysis of data took the form of qualitative content and thematic analysis.

Conceptual Framing of PILs

PILs go by various names, and some of them include “policy labs”, “policy design labs”, “government innovation labs”, “innovation labs”, “public sector innovation labs”, “social innovation labs”, among others (Williamson, 2015; Lewis, 2021). PILs are defined as units of multidisciplinary, technical experts applying design thinking and innovative scientific methods to solve public problems inclusively and collaboratively. They are experimental laboratories engaged in systematic searches for solutions to social problems and public service challenges, but doing so through collaborative exchanges of ideas and information with key stakeholders and defined target groups (Williamson, 2015). Some scholars, such as Whicher (2021), restrict the existence of PILs to government structures only, which is not a true reflection of experiences on the ground. PILs are not confined to government *per se*. They have also been created in universities, not-for-profit and for-profit entities (Lewis, 2021). In other words, PILs are found across public, private, and voluntary sectors. This is because PILs came in the wake of rising pluralism in policymaking, which saw the inclusion of non-state actors in policy advisory systems that stretched beyond public sector boundaries (Craft & Howlett, 2013). It somewhat reflects the "deinstitutionalization" and/or "externalization" of policy advice whereby non-state actors are stepping forward to complement efforts of internal policy structures of government (McGann *et al*., 2021). Studies on PILs in Europe show that they often come with affiliations, which can be "governmental, municipal, multi-sectorial, academic, non-profit, or private sector" affiliations (Gofen & Golan, 2020). Other structures closely related to PILs are ‘living labs’, which are understood as user-driven platforms for innovation, co-creation, and co-designing of innovative ideas involving multiple stakeholders (Hoolie *et al.,* 2016). These are commonly found in municipalities and other local government structures.

There are some notable overlaps due to several similarities between PILs and traditional structures such as think tanks and research institutes. They both commonly work to provide solutions to policy problems, but while the work for think tanks is almost strictly 'research *for* policy' and 'analysis *of* policy', PILs go beyond this by superimposing the innovation element in their research work, and as a result, the methods and approaches used have given rise to some of their distinct definitive characteristics (Tõnurist *et al.*, 2017). For a start, PILs go beyond the reach of think tanks by introducing collaboration whereby solutions to social problems are sought together with the affected populations in the sense of co-creation and co-designing, making the beneficiaries active partners rather than passive recipients of policies (Carstensen & Bason, 2012). PILs have effectively institutionalized design-thinking methodologies to solving social problems (McGann *et al*., 2021) and adapting scientific methodologies and experimental approaches to solving social problems (Wellstead *et al*., 2021). Usage of the "lab" concept may well be very apt in conveying the practicalities of work inside PILs as 'design spaces' for experiment-based policy. Williamson (2015:252) calls it "labification" because of the use of scientific approaches characterized by experiments, measurements, and testing of solution proposals. As a matter of common practice, PILs also take a user-centered approach, which involves engaging target populations in the design process. Credit given to PILs often revolves around borrowing design methodologies and applying design thinking in generating credible, evidence-based policy by subjecting every proposed design to scientific measurement and testing to produce prototypes. Others believe PILs can help governments achieve SDGs targets (Barau *et al.*, 2020; Gofen & Golan, 2020). They are also seen as capable of helping reduce hunger and poverty in places such as Africa, where countries normally experience short-lived economic growth (Lee *et al*., 2020). PILs are also better placed to deal with complex, wicked, and systemic problems (Cole, 2021) mainly because the design culture/practice that is infused into their operation brings with it inherent capabilities to deal with complex problems of the 21st century (Komatsu *et al*., 2021). In other words, PILs enhance the problem-solving capacities of governments (McGann *et al.*, 2021). All these roles are made possible because PILs - as "islands of experimentation" - act as change agents endowed with capacities to explore new opportunities, as well as disrupt and challenge established traditions of public sector practice (Tõnurist *et al*., 2017).

Literature Review

PILs, innovation, and contextual issues

Innovation is understood as "the introduction of new products, technologies, business processes, and ideas in the market, as well as the invention of new ideas" (Cirera & Maloney, 2017). It normally originates from at least three kinds of action: science-based technological breakthroughs (technological revolutions), importation and adaptation of new practices and ideas (assimilation of technological revolutions), and diffusion of technological knowledge (Olaoye *et al.*, 2021; Schumpeter, 1939). Some of the main hallmarks qualifying PILs as an innovation include the "labification" of policy design and the infusing design thinking into traditional policy formulation practices, resulting in enhanced policymaking processes (Carstensen & Bason, 2012). What normally follows all good innovations is their diffusion and assimilation in other contexts. This follows the argument that in the modern world, international knowledge and transfer of innovation through learning processes have a huge impact on national innovation systems (Pietrobelli & Rabellotti, 2011). PILs, as inventions external to Africa, are being transferred to the African context as tried and tested structures from the developed world. However, context matters in all innovations that are 'imported' into a new environment. Rogers (1962) discusses two critical aspects of the diffusion of innovation. The first is the sociology of innovation, focusing specifically on the role of culture in the diffusion of new ideas. There is a considerable possibility of cultural resistance, which, if it does happen, blocks the transformative change that innovations promise to bring (Daniels, 2020). Social systems are never uniform, and their differences account for variations in the reception, acceptability, and rate of assimilation of innovations across national contexts. Social systems are distinguished on the basis of whether they have traditional or modern norms (Rogers, 1962). Traditional norms are characterized by limited technological development and lower literacy rates, while norms of modern societies show marked technological advancement and high standards of scientific education and literacy. Second, Rogers (1962) summarized some of the ideas of diffusion research, highlighting the five strongest potential attributes that characterize innovations and determine their rate of adoption: (a) relative advantage, which refers to the extent of advantages that an innovation has over the already existing structures, processes or practices. The greater the advantages, the greater the rate

of adoption of the new innovation; (b) the extent of compatibility of a new innovation with a society's values. If society sees more compatibility with their norms and values, the rate of adoption of the innovation becomes high; (c) the extent to which an innovation can be grasped and understood. The more complex an innovation, the slower the rate of adoption; (d) the degree to which an innovation is divisible. Is there a possibility of a piecemeal implementation approach whereby an innovation can be staggered over time instead of instant wholesale implementation? (e) The extent to which an innovation can easily be communicated to others.

National innovation systems as the basis of PILs

The PILs discourse must be appreciated within the background of knowledge creation, innovation, and technology transfer in driving national economic development (Adeboye, 1997; Tamrat, 2021). This is backed by shared academic opinion suggesting that a strong connection exists between economic growth and competitiveness of modern economies and the quality of their national innovation systems (Bartels & Koria, 2014). What is known as national innovation systems are defined as "set[s] of institutions whose interactions determine the innovative performance of national firms" (Nelson, 1993, p. 4). These systems basically constitute networks of institutions and organizations drawn from public, private, and voluntary sectors, and typical examples include universities, think tanks, research institutes, industry associations, and government agencies (Manzini, 2012). Every country has its own national innovation system, but what sets countries apart is the quality, effectiveness, and efficiency of their national innovation systems (Bartels et al., 2016). PILs are part of the network of institutions that form the national innovation system and whose interactive efforts revolve around the initiation, importation, modification, adaptation, and diffusion of new technologies and policy designs (Freeman, 1987). National innovation systems mainly focus on creating new, economically useful knowledge consumable within industries and government. These activities of producing evidence-based policy designs and industry-relevant knowledge cumulatively raise the economic performance and global competitiveness of national economies (Lehmann & Schenkenhofer, 2020). Twenty-first-century industrial economies have grown out of effective creation, accumulation, and use of productive knowledge generated from industrial research disseminated among firms in various industries (Holguin-Pando & Phillips, 2014; Freeman, 1995). There will be variations in terms of skills capacity, governmental policy support, and the extent of local technical expertise available across countries (Cunningham et al., 2016). Hence, the extent of effectiveness of innovation

policies across countries depends so much on national competencies and capacities broadly underpinned by investments in scientific and technological training, trade, and economic policies that promote competition among firms (Mowery & Oxley, 1995).

PILs on the broader world: motivation, critical factors, experiences

Practical experiences from industrialized countries reveal that PILs are generally established to serve as innovation catalysts within their host organizations and national innovation systems (Carstensen & Bason, 2011). PILs reflect one of the significant responses to complex and vexing problems in public administration and the broader society (Acevedo & Dassen, 2016). In dealing with complex problems, PILs have the advantage of lowering the cost of policy failure and associated risks because everything starts at a smaller scale - at an experimental stage in the lab - before a full-scale roll-out is done (Acevedo & Dassen, 2016). PILs allow ideas to be tested at a smaller scale in lab-like settings to confirm potency, effectiveness, and sufficiency to address current problems. The rise of digital economies founded in the wake of the ICT revolution has made the operation of PILs even smarter by introducing automation of some of the innovation activities. The success of PILs, however, depends on factors such as political support, availability of financial and human resources, functional policy networks, technical adaptation of innovations, and how shared meanings are built (Acevedo & Dassen, 2016).

Political support: This involves the acquisition of buy-in from the political leadership, which plays a critical role in resource allocation, collaborating with governmental institutions and agencies, and opening policy windows to accommodate the change that new innovations bring (Acevedo & Dassen, 2016). The establishment and sustainability of PILs depend so much on demonstrable political will and sustained government commitment to transformative change, which comes through solving complex social problems and offering improved public services to society. All innovation activities, from establishing structures to financing R&D activities, require political support and commitment. Brock (2021) argues that PILs resulted from an official announcement of the government's commitment to improving service delivery and achieving policy goals in Canada. This kind of political commitment was also noted in Latin American countries. A study by Calvo-González, Eizmendi, and Reyes (2017) analyzed speech texts of politicians in selected Latin American countries to determine the frequency of subjects

such as innovation and found a positive correlation between political commitment and the degree of innovation. In the Canadian case, the realization of limits to government provision of solutions to social problems inspired the decision to make problem-solving a joint effort involving public, private, and voluntary sectors. Against this background, PILs were introduced to break "through the public sector aversion of risk" and create new spaces for designing evidence-based solutions to complex social problems (Brock, 2021).

Flexibility in budgetary and human resources, and (c) technical adaptation of innovations: Closely linked to the aspect of political support is the availability of financial and human resources to support innovation activities. Some tasks for personnel in innovation systems include “prototype implementation, impact assessments, and early-stage processing, such as analyses of best practices and the preparation of proposals” (Acevedo & Dassen, 2016). These activities, however, raise the question of the availability of requisite, multidisciplinary personnel to undertake innovations, either as breakthrough innovations originating in a country or innovations being imported from other environments. In that context, Acevedo and Dassen (2016) note the twin challenges of the technical complexity of innovations on the one hand and the lack of technical capacity to implement innovations on the other. Several cases demonstrate the importance of technical flexibility and availability of absorptive capacity in a country. In the Japanese experiences with innovation, Mowery & Oxley (1995) concluded that Japan benefitted significantly from inward technology transfer because of its strong national absorptive capacity. This meant the availability of abilities to originate innovations and to import and domesticate foreign ideas in a manner beneficial to the Japanese national and industrial needs. Heavy investment in R&D explains Japan's technological progress and economic competitiveness in the world. In 1995 alone, Japan invested US$70 billion in R&D; by that time, that amount was 3% of the country's GDP (Goto, 2000). Another notable aspect of Japan's national innovation system is the key role of universities in contributing to the national R&D output. Japan had very prolific scientists and engineers who earned a global record in the production of papers and patents, more than any other country in the 1990s (Goto, 2000).

Policy networks: Innovations stand a better chance of succeeding where functional internal and external policy networks are characterized by mutual trust and the free flow of strategic ideas and information (Acevedo & Dassen, 2016). Networks are necessary because PILs thrive when coordination and cooperation with other institutions and structures are achieved in the national

innovation system. High fliers in terms of national innovation system scores have benefitted immensely from stronger bonds between critical stakeholders in the national systems (Cirera & Maloney, 2017). For example, South Korea had a rotation of personnel between the university and industry, whereby postgraduate students would move to work temporarily in industry. Not only did this practice ensure an alignment of supply and demand of economically useful knowledge, but was also believed to be one of the best ways of technology transfer because earlier, academics accused the industry of inability to utilize the knowledge they were producing, yet industry was making a counter-claim that the knowledge universities were producing was not addressing their needs and demands (Cirera& Maloney, 2017).

Building shared meanings: PILs should be able to test all innovations thoroughly and demonstrate the results to all concerned. The idea is to demonstrate the effectiveness and kind of public value a particular innovation promises before scaling it up (Ferrarezi, Brandalise & Lemos, 2021). Innovations by PILs can only succeed if they communicate to stakeholders who matter, specifically the representatives from other government agencies and departments who, in turn, are responsible for overseeing the implementation of the same innovation in their respective organizations (Acevedo & Dassen, 2016). Meanings can easily be shared where innovations are co-produced and co-designed, implying the involvement of critical stakeholders from inception to completion of a particular innovation. Labs such as the GNovain and the Brazilian Federal government proceed through the active participation of partners within federal public institutions (Ferrarezi *et al.*, 2021). Participation of partners boosts capacity and facilitates a change of mindset among those who may ordinarily resist innovations.

Generally, the innovation trajectory in emerging economies such as the BRICS block and Latin American countries has been very promising, with implications for the thriving of PILs in such environments. The preparedness of most of these countries for the uptake of PILs has been facilitated by the actions of the respective governments to promote an innovation culture within public sectors. Silva Junior & Emmendoerfer (2023) argue that one of the main reasons behind the adoption and promotion of the culture of innovation in South American countries has been the multitude of challenges that the countries faced, including resource constraints, the expanding role of the state, and the limited viability of public organizations in delivering

collective welfare. In light of these challenges, it was felt that a new approach to service delivery was needed. This led to the prioritization of the innovative route of establishing innovation laboratories at local, regional, and national levels of government to provide solutions to public service challenges. Countries such as Brazil went on to establish laws (e.g., Law No. 14,129 of 2021) to push for digital transformation and innovation in public institutions. These laws specifically mandated "the creation and structuring of innovation laboratories (Silva Junior & Emmendoerfer, 2023). Another observable trend in emerging economies has been the adoption of import substitution industrialization policies, which have triggered economic growth and the development of local technological capabilities, which have a positive effect on innovation initiatives. The enactment of laws and formulation of policies promoting an innovation culture serve as evidence of political support in promoting an innovation culture that has seen the establishment of several PILs and the modernization of public institutions to capacitate them in addressing challenges that conventional bureaucracies are ill-equipped to handle.

The Sub-Saharan African Innovation Landscape

Innovation in Sub-Saharan Africa still has a long way to go, and governments have to continue investing in the processes to strengthen their national innovation systems. Developments so far indicate that many governments have formulated science, technology, and innovation (STI) policies and established innovation hubs, industrial parks, and other forms of knowledge-producing entities (Dobrzanski *et al*., 2021; Friederici, 2019). Innovation hubs are increasingly becoming popular in Africa. About 170 were established between 2010 and 2016; as of 2018, the total number of innovation hubs in the continent was between 173 and 314 (Friederici, 2018). Examples include the Innovation Hub in South Africa; the Maputo Living Lab and Science Park in Mozambique; @iLabAfrica, iHub and NaiLab in Kenya; the HiveCoLabs and iLab@MAK in Uganda; the Cameroon Innovation Hub in Cameroon. Zimbabwe currently has six innovation hubs established at six state universities, and there are plans to establish industrial parks on selected sites operated by state universities. In addition to innovation units, governments have established ministries, commissions, and agencies dedicated to science, technology, and innovation. Some of the examples are the Technology Innovation Agency and the Department of Science and Technology in South Africa; the National Council for Science and Technology in Uganda; the National Commission for Science and Technology in Malawi; the Ministry of Science and Technology in Mozambique, among others (Iizuka *et al*., 2015).

At the policy level, so many countries have formulated science, technology, and innovation policies, the implementation of which has been placed in the established entities highlighted above. Following the OECD's guidelines for collecting, reporting, and using data on innovation (Oslo Manual), countries such as Ethiopia, Kenya, and Uganda have started gathering relevant innovation data and undertaking innovation surveys to ascertain the extent of innovation among firms and industries. Adeboye (1997) identified three distinct models of technological innovation for economic development. First, the US model is driven by "highly qualified scientists, engineers, and technologists" and largely benefits from huge R&D spending. Second, the European model is characterized by a shared technical culture and an educational system emphasizing *"*hands-on technical apprenticeship, vocational and technological training" (Adeboye, 1997, p. 213). Third, the diffusion model simply transfers, adopts, and adapts existing knowledge. Africa appears to be following the diffusion model naturally because of little to no innovation originating from within its environment. However, one pre-condition for succeeding with the diffusion model of innovation is "the ability to learn, use and adapt new knowledge without necessarily contributing to it" (Adeboye, 1997). In addition, the national innovation system of the receiving system should also be capable of offsetting existing market and institutional weaknesses (Lall & Pietrobelli, 2005).

Bureaucratic hurdles

There is a shared claim that public sectors are naturally not accommodative to innovation because most innovations "run up against restrictions and limitations, precisely because they challenge many systems and processes in the host agency" (Stewart, 2013, p. 241). Carstensen & Bason (2012) observed an "anti-innovation DNA" in the public sector and further explained that despite the calls for a joined-up government (Carey & Crammond, 2015), many bureaucracies still maintain organizational siloes and continue to see no incentives for sharing knowledge and tasks in a collaborative manner. Where collaborative structures such as innovation labs have been established under these conditions, the same units have been deemed "exotic" (Carstensen & Bason, 2012). The rigidity of the public sector has partly been addressed through the implementation of public sector reforms, which, in effect, broke down monolithic structures into smaller, efficient units and further instituted a culture of performance, accountability, and

innovation (Pollitt & Bouckaert, 2011). Successful reforms in most European countries meant increased tolerance and accommodation of innovations within governmental structures. Following these developments, sub-Saharan Africa's readiness for innovation, in general, should also be judged in line with the extent to which the countries have gone with implementing public sector reforms over time. Reforms, especially under the umbrella of the famed New Public Management (NPM) paradigm, were expected to lay the foundation for the reception of innovations in the public sector. It is commonly assumed that NPM-related reforms stimulate innovation in public sector organizations (Hijal-Moghrabi *et al*., 2020). The NPM paradigm generally sought to inject private-sector managerial practices and corporate culture into public-sector organizations, with the view to make them more efficient, effective, innovative, and competitive, just like their private-sector counterparts (Osborne & Gaebler, 1992; Basheka & Tshombe, 2018).

Reform results in the African context, sadly, do not reflect the general trend in the Western world, where reforms produced ideal conditions for innovations in public sector organizations (Pollitt & Bouckaert, 2011). Besides the generally accepted tag of Africa as one of the reform laggards on the global stage, experiences from reforms undertaken show that most reforms were not successful, and in some cases, the reform results ranged from total failures to complete disasters (Mlambo, 1997). Reforms attempted in Africa could not produce the desired results mainly because of reasons linked to the challenges of contextualizing them (Olowu, 2002), as well as the undue influence of external players such as the Bretton Woods institutions. Academic evaluations of the reform results in Africa often lament the inappropriate yet dominant role of external institutions, limited institutional capacity, inappropriate reform models, flawed reform designs, and lack of contextual sensitivity, especially because of the cut-and-graft approach adopted by the promoters of such reforms (Zvoushe, 2022; Kumah, 2020; Larbi, 1999). The fact that reform results in Africa show more failure than success means the ground is neither receptive nor conducive for the successful adoption and adaptation of innovations. Empirical research by Hijal-Moghrabi *et al.* (2020) found that NPM reforms and organizational innovation are positively correlated, confirming the assumption highlighted earlier that reforms do stimulate innovation in the public sector.

PILs, by nature, exhibit an orientation towards change, transformation, and disruptive novelty, which may not be compatible with the traditional Weberian bureaucratic structures that are still

prevalent in most African public sectors (Ferrarezi *et al*., 2021). The challenge lies in the fact that such traditional structures are not only resistant to change but also tend to retain an inherent aversion to risk (Brock, 2021). Present-day public problems the world over are increasingly becoming complex and numerous beyond the capabilities of a traditional bureaucratic structure. To make matters worse, in some cases, the problems are occurring in turbulent environments (Carstensen & Bason, 2012). Many countries across the world constantly have to deal with "wicked" and even "super-wicked problems," which Peters and Tarpey (2019) defined as "extremely vexing contemporary policy problems." Four major attributes that characterize these problems are diversity, uncertainty, ambiguity, and complexity (Head & Alford, 2015). Problems exhibiting these features only require the development of radically new solutions (Carstensen & Bason, 2012), which may not be expected from old bureaucratic structures with their religious regard for predictability often ensured by the institutionalization of standardized procedures of operation. A predictable, standardized approach in a typical bureaucracy has the effect of discouraging initiative and creativity (Fukuyama, 2013).

Underdeveloped capacities of national innovation systems

Essentially, in most African countries, the national innovation systems are still weak, ineffective, underdeveloped, and even dysfunctional in some instances (Hooli & Jauhiainen, 2018). Cunningham *et al.* (2016) identified factors impacting open innovation and ICT entrepreneurship in Africa. The same factors equally affect national innovation systems across countries. Some of them include the availability of demonstrable political will to support innovations by making available human and financial resources as well as enabling policies and regulations. Political support should ordinarily go together with the leadership's appreciation of potential benefits from innovation. Prioritization of innovation by policymakers should also mean their inclusion in national development plans and commitment to the development of structures within the national innovation system. The other critical area noted is the availability of demonstrable will and capacity to cooperate with other players in the national innovation system. Cunningham *et al.* (2016) further noted the need for sufficient expertise and sensitization of the public about the innovations.

The analysis by Lee*et al.* (2014) also shows that Africa generally lacks innovation capability, which manifests in "capability failure", "market failure", and "system failure" - all serving as barriers to innovation. Market failure is associated with not just low R&D capability among firms but also zero R&D activities because of the perceived uncertainty on returns expected from such efforts. This leaves them relying on acquired external technologies, and because innovation capacity is low, there is a tendency of avoiding complex manufacturing systems which would require expert technical capacity to operate (Lee *et al*., 2014). System failure relates to the failure or lack of effective and productive interaction among key actors in an innovation system. The engagement of critical actors (government, universities, industry, financial institutions, communities, and civil society)in the national innovation systems is a prerequisite for the successful operation of any national innovation system (Metcalfe, 2005). However, synergistic interactions in the innovation system do not occur naturally. Therefore, "government activism" (Lee, 2013b) is expected to cover this gap by providing a platform as well as encouraging interactions among key players in the national system.

Capability failure comes as a challenge commonly felt in developing countries generally and is a result of a lack of innovation capacity. Sub-Saharan Africa particularly has limited absorptive capacity (King, 2007; Djeflat, 2009) and, as a result, needs significant investments towards improving its learning capacity and boosting local technical skills that are critical to innovative experimentation as well as production, application, and dissemination of economically relevant scientific and technological knowledge. As highlighted earlier, in most developing countries, not much R&D is being pursued by private firms (Lee *et al*., 2014), and among the few innovating, sometimes there is backsliding and a sheer lack of sustained effort. For example, Tamrat (2021) reports that in Ethiopia, the number of organizations undertaking innovation activities fell from 60% in 2015 to 19.4% in 2019. The ambivalence and lack of consistency in innovation activities in the private sector are often further worsened by the lack of policies that encourage businesses to take the risk of innovating. From the experiences of countries such as China and Thailand, the governments were proactive in incentivizing the process of innovation among businesses and knowledge-generating institutions (Ding & Li, 2015). In China, the government not only developed science and technology infrastructure but also encouraged research and ensured the environment was conducive to the innovative transformation of the national economy (Ding & Li, 2015).

Capability issues appear to be further complicated by the state of investment in human capital development, which in turn should have the net effect of boosting the absorptive capacities of national innovation systems. Technical skills provide the basis for building technological capacities (Lall & Pietrobelli, 2005), yet Africa, in general, has perennially been saddled with technical skills deficits over the years. At some point in the post-2000 period, the number of students enrolled for engineering at the tertiary level in the whole of sub-Saharan Africa was just 12% (77 000) of that of South Korea (577 000) (Lall & Pietrobelli, 2005). The situation is further worsened by the low STEM capacities that sub-Saharan Africa has had in recent years owing to lower levels of STEM enrolment on the one hand and continuing skills flight in STEM fields on the other. Comparatively, sub-Saharan Africa continues to lag behind other regions in the world. For example, Kigotho (2019, p. 1) highlights that "the global average number of researchers per million inhabitants stands slightly above 1,000; in sub-Saharan Africa, the number is under 100".

It has also been argued that in most developing countries, the innovation phenomenon is relatively new and evolving, such that in countries such as Ethiopia, the very first innovation survey was carried out in 2015 (Tamrat, 2021). Most African national innovation systems also suffer a lack of cooperation and coordination among stakeholders in the system (Ssebuwufu *et al*., 2012). In other words, there is low government activism in bringing together key actors and stakeholders for productive interactions. The university-industry, university-industry-government, government-industry, and government-government linkages are often weak or somewhat dysfunctional and, therefore, inimical to the thriving of innovation efforts (Iizuka *et al*., 2015). Several African universities are recording limited R&D outputs, at least for two reasons: first, limited funding for research, and second, frequent losses of expert scientists and technicians to Western and other universities outside the continent as a result of poor conditions of service and uncompetitive remuneration packages (Geber, 2013). The university-industry linkage has also been affected by the lack of developmental universities capable of playing the role of agents of economic change through technological advancement, which either originates locally or is imported and adapted for local consumption. Others feel the university-industry linkage in Africa is affected by the missing elements of technopreneurial education and effective technopreneurial universities (Kolade *et al*., 2022). The World Competitiveness Report (2017)

found that the quality of scientific institutions and university-industry collaboration is generally higher in advanced countries than in developing countries.

Several factors affect the policymaking capacities of African nations. When the situation is analyzed closely, it reveals that in some cases, there is a lack of local capacity, and in other cases where local capacity may be available, it is not utilized as policymakers defer to external policy experts for input and guidance (Ayuk & Marouani, 2007). This has often signified the politicians' lack of faith in local expertise. It further comes across as one of the constraints inhibiting the full adoption of the practice of evidence-policy making in much of sub-Saharan Africa. The suspicions and mistrust of academia by the political class have seen limited uptake of knowledge products from universities and think tanks (Zvoushe, 2023). Hence, the link between local research and policy development has yet to be strengthened to the extent that policies formulated are informed by locally generated policy solutions.

Exclusionary policymaking practices

Policymaking practices in sub-Saharan Africa still reflect elitism and unilateralism expressed through non-inclusive practices and imposition of policy positions. Top-down policymaking practically plays down the emphasis on joint approaches and inclusivity espoused in PILs practice (Ferrarezi*et al*., 2021). A study on transformative innovation policy conducted in Ghana, Kenya, and Senegal by Daniels (2020) noted an observable preference for top-down policymaking approaches in these countries as governments sideline other key stakeholders in the policy environment. Masunungure and Zvoushe (2023) equally observed an entrenched culture of exclusionary governance in Zimbabwe, and argue that this modality of governance has been nurtured by the adopted ‘command and control’ approaches that draw from the militaristic nature of the politics in the country. By nature, top-down governance approaches are non-inclusive and have the effect of muting citizen voices even in matters where their involvement may be critical. Government dominance, if not monopoly, in charting policy, undermines claims of entrenched pluralism in policy development (Craft & Howlett, 2013). The result of adopting non-inclusive policymaking approaches has been a disconnect between stakeholders in the national innovation systems. Such conditions are not conducive to the thriving of PILs, which call for the co-creation of knowledge and the co-designing of innovative solutions to social problems.

Limited financial capacities

Financial capacity is another significant challenge affecting innovation efforts, such as the establishment of PIL in much of sub-Saharan Africa. AU member states resolved that one of the targets in the Africa Science, Technology and Innovation Indicators Initiative (ASTII) should be to achieve the ratio of R&D spending to GDP at 1% or more, but so far, most governments find themselves financially constrained to fund R&D activities and projects. Dobrzanski *et al*. (2021) view it not just as inadequate spending but also as inefficient R&D spending, which has the effect of deepening the innovation gap. This is happening at a time when evidence from studies conducted clearly shows that increased financing of R&D significantly enhances national economic productivity and competitiveness (Sinimole & Saini, 2020; Kaur & Singh, 2016). The underfunding crisis also extends to higher education in most sub-Saharan countries. In West and Central Africa, the financing of higher education constitutes 1% of GDP (Kigotho, 2019). This happens when most countries outside Africa dedicate at least 4% of their GDP to scientific research (STEMpedia, 2019). These scenarios have led some to conclude that limited R&D funding is the reason for the increasing visibility of the third sector as a strong innovator in less economically developed countries (Williams & Woodson, 2012). NGOs have resultantly been linked with so many innovations in those contexts because of their financial capacity and commitment to undertaking science projects and the development of new technologies (Williams & Woodson, 2012).

Conclusion

From the outset, this paper explained the connection between innovation and economic development and argued that PILs are only one of the key elements in the innovation universe of a country. A common conclusion among economic development commentators is that low scores on economic development can be explained by the low innovation capacities of the countries in question (Tamrat, 2021). Much of the innovation is often marked by the transfer of technology, and as history has shown, the economic development experiences of nations are replete with emphases on sharing and/or transfer of ideas and policies, which incorporates the diffusion of innovations(Adeboye, 1997; Rimmer, 1961). PILs constitute a relatively recent example of such innovations. It is argued herein that the fate of PILs in Sub-Saharan Africa should be appreciated

against the historical background of Africa's development crisis in the face of global economic progress in other regions. This is because, first and foremost, PILs, like most innovations, originated outside Africa and, therefore, reflect an imported idea that is being replicated across the world. Trends of copying ideas are perhaps the reason why development in underdeveloped countries is not based on innovation originating in those environments but rather on assimilating existing innovations - a phenomenon Schumpeter terms "derivative development" (Rimmer, 1961). In other words, there are little to no innovations originating within developing countries, such that they so much depend on the"transfer, adoption, adaptation and diffusion of existing knowledge" from the West (Adeboye, 1997, p. 213). This position is also shared byLall&Pietrobelli (2005), who equally concluded that in developing countries, there is "absorption and improvement of existing technologies rather than innovation at the frontier." Continued reliance on technology transfer and diffusion of innovation for development have left sub-Saharan Africa's development paths heavily dependent on models from mature industrial economies of the Global North. The analysis in this paper has demonstrated the ill-preparedness for the diffusion of innovation that is pervasive in sub-Saharan Africa. Most countries have low innovation capability, and the general environment appears fraught with inhibitive factors militating against the smooth diffusion of innovations. Some notable factors range from limited funding for PILs and R&D to capability failures and hurdles from failed public sector reforms. Hence, the diffusion of innovation, technology transfer, or policy learning processes will not be smooth in the sub-Saharan African context, not least because of limited state capacities and poor environmental stimuli for innovation in most countries. Scholars such as Oyelaran-Oyeyinka (2014) have equally observed massive difficulties associated with technological learning for industrialization in sub-Saharan Africa.

The main limitation of the study is its lack of primary data from the field to establish the opinions of key informants such as policymakers, policy analysts, and think tanks on the subject of PILs. On this note, future studies may seek to evaluate arguments raised in this paper against empirically gathered data from key players such as think tanks, universities, and relevant government institutions regarding the potential limitations and challenges of adopting PILs in the African continent.

References

Acevedo, S. & Dassen, N. (2016). Innovation for better management: The contribution of policy innovation labs. Technical Note. New York: Inter-American Development Bank.

Adeboye, T. (1997).Models of innovation and sub-Saharan Africa's development tragedy. Technology Analysis and Strategic Management 9(2), 213-236.

Adesida, O., Karuri-Sebina, G.,& Kraemer-Mbula, E. (2021). Special issue: Can innovation address Africa's challenges? African Journal of Science, Technology, Innovation and Development 13(7),779-784.

Alence, R. (2004). Political institutions and developmental governance in sub-Saharan Africa. Journal of Modern African Studies 42(2), 163-187.

An, J. (2015). Lenin's "Theory of Imperialism": historical debates and contemporary appraisal. Social Sciences in China 36(3), 20-36.

Ayuk, E.T. & Marouani, M.A. (2007). (eds). The Policy Paradox in Africa: Strengthening Links Between Economic Research and Policymaking. New Jersey: IDRC & Africa World Press.

Babones, S. (2020). China's development model: Can it be replicated in Sub-Saharan Africa? Politics & Policy 48(5), 988-1010.

Barau, A.S., Kafi, K.M., Sodangi, A.B.,& Usman, S.G. (2020). Recreating African biophilic urbanism: The roles of millennials, native trees, and innovation labs in Nigeria. Cities & Health DOI:10.1080/23748834.2020.1763892

Bartels, F.L.&Koria, R.(2014). Mapping, measuring and managing African national systems of innovation for policy and development: the case of the Ghanaian national system of innovation. African Journal of Science, Technology, Innovation and Development 6(5), 383-400.

Bartels, F.L., Koria, R.,&Vitali, E. (2016). Barriers to innovation: the case of Ghana and implications for developing countries. Triple Helix 3(12), 1-30.

Basheka, B.C. & Tshombe, L.M. (eds.). (2018). New public management in Africa: Emerging issues and lessons. London: Routledge.

Brock, K.L. (2021).Policy labs, partners and policy effectiveness in Canada. Policy Design and Practice 4(2), 228-241.

Calvo-Gonzalez, O., Eizmendi, A.,& Reyes, G. (2017). Winners never quit, quitters never grow: Using text mining to measure policy volatility and its link with long-term growth in Latin America. Working Paper. Washington, DC: World Bank, https://doi.org/10.1596/1813-9450-8310

Carey, G. & Crammond, B. (2015). What works in joined-up government? An evidence synthesis. International Journal of Public Administration 38(13/14):1020-1029.

Carstensen, H. & Bason, C. (2012). Powering collaborative policy innovation: Can innovation labs help? The Innovation Journal, 17(1), 2-26.

Cirera, X. & Maloney, W.F. (2017). The innovation paradox: Developing country capabilities and the unrealized promise of technological catch-up. Washington DC: World Bank Group.

Cole, L. (2021). A framework to conceptualize innovation purpose in public sector

innovation labs. Policy Design and Practice,https://doi.org/10.1080/25741292.2021.2007619

Craft, J. &Howlett, M. (2013). The dual dynamics of policy advisory systems: the impact of externalization and politicization on policy advice. Policy and Society 32(3), 187-197.

Cunningham, P.M., Cunningham, M.,&Ekenberg, L. (2016). Factors impacting on the current level of open innovation and ICT entrepreneurship in Africa. The Electronic Journal of Information Systems in Developing Countries 73(1), 1-23.

Daniels, C. (2020). Research report on transformative innovation policy. Cape Town: Africa Hub.

Ding, X. & Li, J. (2015). Incentives for innovation in China: Building an innovative economy. London: Routledge.

Diop, M. (2015). Policymaking in Africa: Reflections from decades of practice. https://www.worldbank.org/en/news/speech/2015/03/31/policymaking-in-africa-reflections-from-decades-of-experience (Accessed 23 January 2023).

Djeflat, A. (2009). Building systems for innovation 'take off' in African economies. African Journal of Science and Technology, Innovation and Development 1(1), 53-75.

Dobrzanski, P., Bobowski, S., Chrysostome, E., Velinov, E.,&Strouhal, J. (2021). Toward innovation-driven competitiveness across African countries: An analysis of efficiency of R&D expenditures. Journal of Competitiveness 13(1), 5-22.

Dolowitz, D. & Marsh, D. 1996. Who learns what from whom: A review of the policy transfer literature. Political Studies XLIV, 343-357.

Ferrarezi, E., Brandalise, I.,&Lemos, J. (2021). Evaluating experimentation in the public sector: Learning from a Brazilian innovation lab. Policy Design and Practice 4(2), 292-308.

Friederici, N. (2018). Innovation hubs in Africa: assemblers of technology entrepreneurs. In Tynnhammar, M. (ed.). New Waves in Innovation Research Management.Wilmington: Vernon Press, pp. 435-454.

Friederici, N. (2019). Innovation hubs in Africa: What do they really do for digital entrepreneurs? InTaura, N.D., Bolat, E. &Madichie, N.O. (eds.). Digital Entrepreneurship in Sub-Saharan Africa: Challenges, Opportunities and Prospects. Cham: Palgrave Macmillan, pp. 9-28.

Freeman, C. (1987). Technology policy and economic performance. London: Pinter Publishers.

Freeman, C. (1995).The 'national system of innovation' in historical perspective. Cambridge Journal of Economics 19(1), 5-24.

Fukuyama, F. (2013). What is governance? Governance: An International Journal of Policy, Administration, and Institutions 26(3), 347-368.

Geber, H. (2013). Can monitoring decrease the brain drain of academics from Africa? Procedia – Social and Behavioural Sciences 93, 215-220.

Godin, B. (2009). National innovation system: the system approach in historical perspective. Science, Technology, & Human Values 34(4), 476-501.

Gofen, A. & Golan, E. (2020). Laboratories of design: Acatalog of policy innovation labs in Europe. https://ssrn.com/abstract=3684515 or http://dx.doi.org/10.2139/ssrn.3684515 (Accessed 14 February 2022).

Goto, A. (2000). Japan's national innovation system: current status and problems. Oxford Review of Economic Policy 16(2), 103-113.

Hamilton, C. (1987). Can the rest of Asia emulate the NICs? Third World Quarterly 9(4), 1225-1256.

Head, BW & Alford, J. (2015). Wicked problems: Implications for public policy and management. Administration and Society 47(6), 711-739.

Hijal-Moghrabi, I., Sabharwal, M.,&Ramanathan, K. (2020). Innovation in public organizations: Do government reforms matter? International Journal of Public Sector Management 33(6/7), 731-749.

Hodzi, O. &Åberg, J.H.S. (2020). Introduction to the special issue: strategic deployment of the China model in Africa. Politics & Policy 48(5), 804-814.

Holguin-Pando, C. & Phillips, P.W.B. (2014). Technology transfer in transitional economies: the case of Mexico. International Journal of Technology, Policy and Management 14(2), 111-132.

Hooli, L., Jauhiainen, J.S.,&Lähde, K. (2016). Living labs and knowledge creation in developing countries: Living labs as a tool for socio-economic resilience in Tanzania. African Journal of Science, Technology, Innovation and Development 8(1), 61-70.

Kaur, M. & Singh, L. (2016). R&D expenditure and economic growth: An empirical analysis. International Journal of Technology Management and Sustainable Development15(3), 195-213.

Kieh, G.K. (2009). Reconstituting the neo-colonial state in Africa. Journal of Third World StudiesXXVI(1), 41-55.

Kigotho, W. (2019). World Bank project seeks to stem academic skills deficit. https://www.universityworldnews.com/post.php?story=20190415151518157 (Accessed 23 December 2023).

King, D.A. (2007). Governing technology and economic growth. International Journal of Technology and Globalisation 2(3-4), 311-322.

Kolade, O., Rae, D., Obembe, D.,& Beta, K.W. (eds.). (2022). Thepalgravehandbook of African entrepreneurship.Cham: Palgrave Macmillan.

Komatsu, T., Salgado, M., Deserti, A. & Rizzo, F. (2021). Policy labs challenges in the public sector: The value of design for more responsive organizations. Policy Design and Practice 4(2), 271-291.

Kumah, R.K. (2020). China as an alternative to the Washington Consensus: Implications for African sustainable development.Journal of Sustainable Development in Africa 22(1), 22-34.

Lall, S. &Pietrobelli, C. (2005). National technology systems in sub-Saharan Africa. International Journal of Technology and Globalisation 1(3/4), 311-342.

Larbi, GA (1999). The new public management approach and crisis states. United Nations Research Institute for Social Development. Discussion Paper No. 112. Geneva: Palais des Nations.

Lee, K. (2013b). Capability failure and industrial policy to move beyond the middle-income trap: from trade-based to technology-based specialization. In Lin, J. & Stiglitz, J. (eds). Industrial Policy Revolution 1. London: Palgrave Macmillan, pp. 244-272.

Lee, K., Juma, C.,& Mathews, J. (2014). Innovation capabilities for sustainable development in Africa. In Monga, C. & Lin, J.Y. (eds.). The Oxford Handbook of Africa and Economics. Oxford: Oxford University Press, pp. 272-286.

Lehmann, E.E. & Schenkenhofer, J. (2020). National systems of innovation.In Oxford Research Encyclopaedia of Business and Management.https://oxfordre.com/business/view/10.1093/acrefore/9780190224851.001.0001/acrefore-9780190224851-e-31 (Accessed 16 February 2024).

Lewis, J.M. (2021). The limits of policy labs: characteristics, opportunities and constraints. Policy Design and Practice 4(2), 242-251.

Locke, R. & Jacoby, W. (1997).The dilemmas of diffusion. Politics and Society25(1): pp. 34-65.

Manzini, S.T. (2012). The national system of innovation concept: an ontological review and critique. South African Journal of Science 108(9/10), 1-7.

Masunungure, E.V. and Zvoushe, H. (2023). An analysis of the existing form of governance politics in Zimbabwe and proposals for a new kind of policymaking. AJIS: African Journal of Inclusive Societies 2(1), 14-30.

McGann, M., Wells, T.,& Blomkamp, E. (2021). Innovation labs and co-production in public problem solving. Public Management Review 23(2), 297-316.

Metcalfe, J.S. (2005). Systems failure and the case for innovation policy. In Llerena, P. & Matt, M. (eds.). Innovation Policy in a Knowledge-Based Economy: Theory and Practice. Berlin: Springer, pp. 47-74.

Mlambo, A.S. (1997). The economic structural adjustment program: The case of Zimbabwe, 1990-1995. Harare: University of Zimbabwe Publications.

Mowery, D.C. & Oxley, J.E. (1995). Inward technology transfer and competitiveness: The role of national innovation systems. Cambridge Journal of Economics, 19(1), 67-93.

Nelson, R.R. (ed.). (1993). National innovation systems: A comparative analysis. Oxford: Oxford University Press.

Olaoye, I.J., Ayinde, O.E., Ajewole, O.O. &Adebisi, L.O. (2021). The role of research and development (R&D) expenditure and governance on economic growth in selected African countries. African Journal of Science, Technology, Innovation and Development 13(6), 663-670.

Olowu, D. (2002). Introduction: New public management: An African reform paradigm? Africa Development 27(3/4), 1-16.

Osborne, D. &Gaebler, T. (1992). Reinventing government: How the entrepreneurial spirit is transforming the public sector. Boston, MA: Addison-Wesley Publishing.

Oyelaran-Oyeyinka, B. (2014). The state and innovation policy in Africa. African Journal of Science, Technology, Innovation and Development 6(5), 481-496.

Peters, B.G. &Tarpey, M. (2019). Are wicked problems really so wicked? Perceptions of policy problems. Policy and Society 38(2), 218-236.

Pietrobelli, C. &Rabellotti, R. (2011). Global value chains meet innovation systems:are there learning opportunities for developing countries? World Development 39(7), 1261-1269.

Pollitt, C. &Bouckaert, G. (2011). Public management reform. Oxford: Oxford University Press.

Rimmer, D. (1961).Schumpeter and the underdeveloped countries. The Quarterly Journal of Economics 75(3), 422-450.

Rogers, E.M. (1962). Diffusions of innovation. New York: The Free Press.

Sachs, J.D., McArthur, J.W., Schmidt-Traub, G., Kruk, M., Bahadur, C., Faye, M.,& McCord, G. (2004). Ending Africa's poverty trap. Brookings Papers on Economic Activity 2004(1), 117-216.

Sampath, P.G. (2014). Industrial development for Africa: Trade, technology and the role of the state. African Journal of Science, Technology, Innovation and Development 6(5), 439-453.

Sankofa, N. (2022). Critical method of data analysis. International Journal of Social Research Methodology 26(6), 745-757.

Schumpeter, J.A. (1934). The Theory of Economic Development. Cambridge, Mass.: Harvard University Press.

Schumpeter, J.A. (1939). Business cycles: A theoretical, historical, and statistical analysis of the capitalist process. New York:McGraw-Hill.

Silva Junior, A.C. & Emmendoerfer, M.L. (2023). Innovation labs in South American governments: congruencies and peculiarities. Brazilian Administration Review 20(4), e220173.

Sinimole, K.R. & Saini, K.M. (2020). Performance evaluation of R&D organizations: an Asian perspective. International Journal of the Economics of Business,https://doi.org/10.1080/13571516.2020.1858703

Soludo, C., Ogbu, O.,& Chang, H. (eds.). (2004). The politics of trade and industrial policy in Africa. Trenton: Africa World Press.

Ssebuwufu, J., Ludwick, T.,&Béland, M. (2012). Strengthening university-industry linkages in Africa: A study on institutional capacities and gaps. Accra: Association of Africa Universities.

STEMpedia.(2019). STEM education in Africa – the past, present, and future. https://thestempedia.com/blog/stem-education-in-africa-the-past-present-and-future/ (Accessed 23 February 2024).

Stewart, J. (2014). Implementing an innovative public sector program: the balance between flexibility and control. International Journal of Public Sector Management 27(3), 241-250.

Tamrat, W. (2021).Tackling the barriers to a national innovation system. https://www.universityworldnews.com/post.php?story=20210209152432773 (Accessed 10 January 2024).

Tõnurist, P., Kattel, R.,&Lember, V. (2017). Innovation labs in the public sector: What they are and what they do? Public Management Review 19(10), 1455-1479.

Van de Walle, N. (1999). Economic reform in a democratizing Africa.Comparative Politics 32(1), 21-41.

Wellstead, A.M., Gofen, A.,& Carter, A. (2021). Policy innovation lab scholarship: Past, present, and the future – Introduction to the special issue on policy innovation labs. Policy Design and Practice 4(2), 193-211.

Whicher, A. (2021). Evolution of policy labs and use of design for policy in UK government. Policy Design and Practice 4(2), 252-270.

Williams, L.D.A. & Woodson, T.S. (2012). The future of innovation studies is less economically developed countries. Minerva 50(2), 221-237.

Williamson, B. (2015). Governing methods: Policy innovation labs, design and data science in the digital governance of education. Journal of Educational Administration and History 47(3), 251-271.

World Competitiveness Report.(2017).

Zvoushe, H. (2022). The social impact bonds bandwagon: Critical reflections and policy implications for Africa. Eastern Africa Social Science Research Review 38(2), 119-144.

Zvoushe, H. (2023). Public policymaking in Africa: experiences of Zimbabwe. In van der Waldt, G. (ed.). Handbook of Public Management in Africa. Cheltenham Glos: Edward Elgar, pp.108-130.