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A COMPARATIVE REVIEW OF THE NATIONAL INNOVATION FRAMEWORK IN AFRICA: CASE STUDY OF MAURITIUS AND SOUTH AFRICA

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Abstract. The current study analyses the National Innovation Frameworks adopted by two strong African economies, namely Mauritius and South Africa. These frameworks have been strategically developed to boost economic growth by fostering a culture rooted in innovation, creativity, and excellence. Recognising the increasing importance of knowledge-based economies, both countries have sought to position innovation at the core of their development agenda, ensuring long-term competitiveness in a globalised world. The study goes beyond a descriptive comparison by critically examining the overall justification for engaging in such innovation frameworks. It explores how innovation contributes not only to economic performance but also to addressing broader societal challenges such as employment creation, social inclusion, and sustainable development. In addition, the research develops a clear understanding of the contextual differences in the design and implementation of innovation approaches in Mauritius and South Africa, recognising that unique historical, institutional, and economic contexts influence their policy priorities and execution. A qualitative research approach is adopted, using a multi-case study method supported by directed content analysis. This methodology enables a systematic and in-depth exploration of the similarities and contrasts between the two national frameworks. The findings are highly relevant to policymakers, practitioners, and academics, as they shed light on the innovation pathways, drivers, and influences that can enhance economic growth and national resilience. The study also highlights the value of innovation-led strategies in enabling African economies to move up the global value chain and sustain long-term development.

Keywords: innovation, comparative review, innovation framework, excellence, economic growth.
JEL classification: O31, O32, O38, O57.

INTRODUCTION

South Africa is one of the BRICS countries and is one of the most developed African economies with a Gross Domestic Product of 385 billion USD. The economic growth was around 1.4% for the year 2018 as compared to 3.8% for Mauritius for same year. Both countries have the ambition of boosting the overall economic growth rate by developing new emerging sectors with

the vision of emerging as high-income economies. South Africa has an income per capita of 6,600 USD as compared to 11,000 USD for Mauritius in 2018. Hence, both countries need to invest in education, research and development, and innovation strategies to be able to stir an overall economic transformation. Mauritius now ranks 13th on the global Ease of doing business index amongst 190 countries. On the other hand, South Africa ranks 84th globally. Hence, Mauritius is taking the lead on different indexes at the African level, such as the Human Development Index, Mo Ibrahim Index for corporate governance, and also the Ease of doing business. However, what about the overall innovative culture of the two African economies? The current research makes a significant contextual contribution to the body of knowledge related to national innovation frameworks in Africa. No prior comparative review of the innovation frameworks of Mauritius and South Africa has been conducted even though both countries share important trade exchanges. The research shows that both countries have a keen interest in developing science, technology and innovation to improve economic growth of the country.

Innovation Indicators: Mauritius and South Africa

It is important analyse the current innovation ecosystem as a starting point based on some key statistics. Some of the key innovation indicators for the two economies are provided below.

Table 1

Innovation Indicators (Mauritius and South Africa)

Innovation Indicators	Mauritius	South Africa
Scimago Country H –index	74 (129th)	423 (35th)
Global Innovation index	31.3	35.13
Human Development index	0.79 (65th)	0.699 (113th)
Gross Expenditure on R & D	0.36%	0.68% of GDP
Patents	Nil	40

Source: Scimago (2018), Global Innovation Index Report (2018), HDI (2018), WIPR (2018)

Hence from the Table 1, it is evident that Mauritius and South Africa are two emerging economies that have an excellent performance in the African continent but still lagging at the international front in terms of innovation. South Africa has an H-index of 423 as compared to 74 for Mauritius based on Scimago Statistics for 2018. In terms of Global innovation Index, South Africa has a slight advantage of 4 points on Mauritius. However, in terms of Human Development index, Mauritius has a comparative advantage and has ranked first in Africa for many years (HDI, 2018). Both countries, conscious about the fact that they cannot continue to rely on the traditional economic sectors, have developed National Innovation frameworks for boosting the overall international economic performance. Hence, this study seeks to contribute by analysing the National Innovation frameworks in terms of:

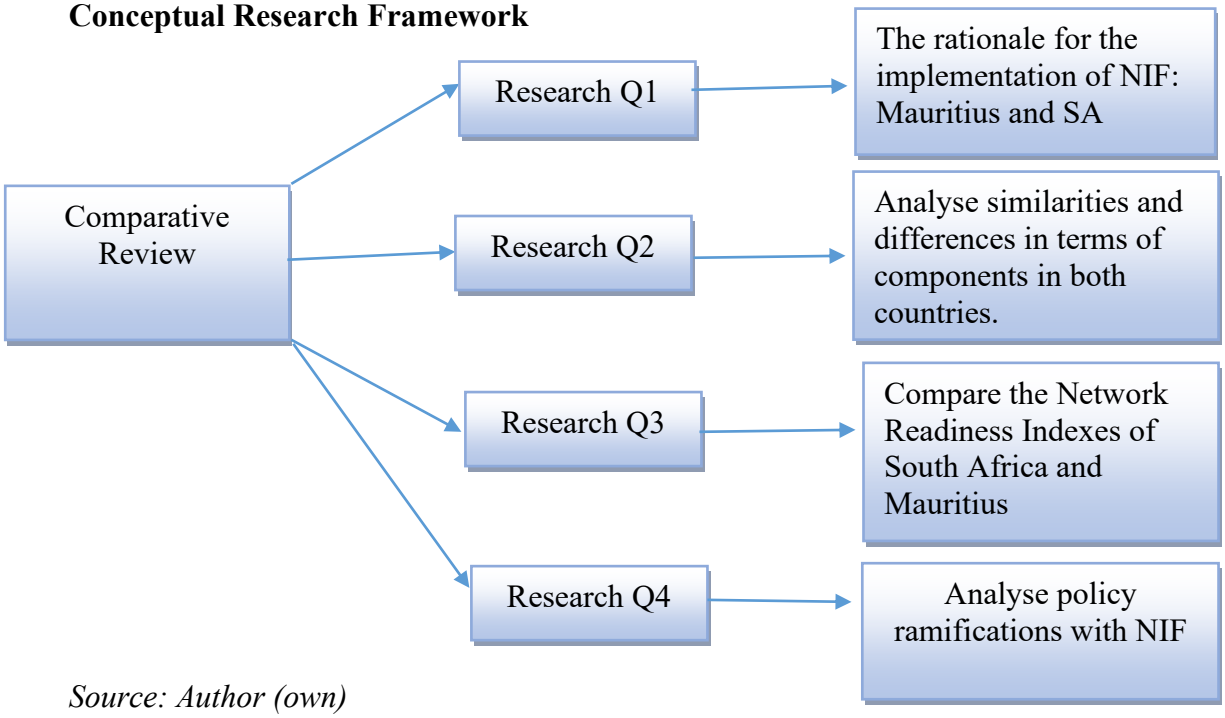
(a) The rationale and expected benefits of National Innovation framework for both economies

(b) Analyse the similarities and differences in the frameworks between the two countries

(c) Compare the Network Readiness Indexes of South Africa and Mauritius

(d) Analyse policy ramifications for both countries with the overall development of the National Innovation framework.

Conceptual Research Framework



Source: Author (own)

LITERATURE REVIEW

Understanding the National Innovation framework

Jackson (2011) defines an innovation ecosystem as 'the complex relationships that are formed between actors or entities whose functional goal is to enable technology development and innovation'. Hence, the national innovation framework seeks to support an innovative culture and also engage in a structured approach for encouraging higher research and development, effective systems, and technological design. However, defining an effective innovation policy in developing countries is very complicated as the policy design should also encourage inclusive development and also seek to achieve socio-economic objectives (Bastos and Weber, 2018). An effective economic system may be divided by the development of fundamental research and also research related to improving economic growth through new product developments, patenting, and technological breakthroughs. There are different actors and forces which constitute the overall innovation ecosystem, namely the material resources, the human capital, and also the governmental and institutional support, including the industry-research collaboration.

There are some differentiating factors between an innovation ecosystem and from the traditional concepts such as Science and Technology parks, regional innovation systems or innovation clusters (Rogers, 1962; Fetters et al. 2010) such as the fact that the former is

1. More elaborate and systemic
2. Interactions between the different components of the ecosystem
3. The rising importance of technology and digitalisation
4. Open innovation and collaboration

Hence, a national innovation framework is an integrated and structured approach to promote national research and development, technology and product development to achieve sustainable economic growth and development.

National Innovation Framework and economic growth

Several authors have emphasized on institutional support for promoting innovation that may lead to achieving higher economic growth (Oyelaran-Oyeyinka and Sampath, 2006; Tebaldi and Elmslie, 2008a; Tebaldi and Elmslie, 2008b; Tebaldi and Mohan, 2008; and Schiliro, 2010). Hence, Africa can bolster its economic growth by adopting appropriate innovation systems by promoting conducive research culture. The African Union has set an Agenda 2063 to position Africa as a strategic player in the global economy through improvement in education and science technology. Juma (2016) is of the view that the creation of 'innovation universities' that combine research, teaching, community service, and commercialization in their missions and operations. This will require a departure from the standard practice where education is carried out in universities that do little research, and where research is done in national research institutes that do not undertake teaching.

Kariuki (2017), who is the Director for Accelerating Science in Africa is of the view that African governments need to invest more resources and prioritise investments that will deliver science and technology benefits to the continent. Surprisingly, only 1.3% of global research and development costs is spent in Africa. The Director is of the view that it is essential to get greater access to funding from government and private sector for improving economic growth.

The African Observatory for Science, Technology and Innovation (AOSTI) which has been established by the African Union has invested massively in the capacity-building program of national innovation systems in Africa to put in place a framework to evaluate NIS in Africa and regularly inform African decision-makers on the status and impact of innovation activities and related policies on the continent.

STEM Education in the African Context

The African Union, through the Agenda 2063 seeks to make Africa a diversified and industrialised economy that can achieve sustainable economic growth. Currently, the teaching of Science, Technology, Education and Mathematics needs to be bolstered to boost up the human capital development and achieve a higher level of creativity and innovation (Tikly et al., 2018). Some African economies, such as Mauritius are also conscious about the need for people with more technical than academic skills. This explains why Mauritius has recently invested in three specialised Polytechnics to cater to a lack of qualified and professional people in some specific skills such as tourism, ICT and health sciences (Ministry of Education, 2019).

A study by Maulloo and Naugah (2017) shows declining intakes in chemistry and biology, but especially for biology between the years 2000 till 2016. The only science subject which has remained stable is physics. With the introduction of computer studies and design & technology, other science subjects, namely chemistry and biology, are becoming less attractive. The rate of popularity of approximately 1.5% per annum (p.a.) for computer studies is higher than for design & technology (less than 0.5% p.a.). Hence, even in Mauritius, students are more interested in studying Accounting and Business rather than science and maths. This could be explained due to the lack of job opportunities in those fields both in the Mauritian and African context.

Importance of National Innovation Framework

An innovation system includes all institutions and policies put in place in the overall process for the promotion of innovation and development of a particular country. The purpose of NIF is about knowledge creation and promoting scientific research based on a structured framework aligned to the national economic goals and objectives of a nation. Many studies have shown a positive link between human capital development, innovation, and economic growth.

Research by (Vannoorenberghe and Voeten, 2016) shows that there is "no clear cause-effect relation identified between innovation resulting in more export, or the other way around". The expectations of innovation policy should be realistic in terms of directly resulting in more export as well. Regardless of the absence of a strong causality, innovation and export do mutually strengthen each other within a firm. Cunningham (2015) explains that innovation and ICT entrepreneurship are now recognised as essential drivers for the socio-economic development of Africa. However, there is lack in terms of skills development, entrepreneurial skills and overall policy support. Besides,

African economies need to collaborate regionally to fill the expertise, research, and knowledge gap, especially in the field of science, technology, and innovation.

Phiri et al. (2016) are of the view that a transformative social policy in South Africa improves innovation through human capital development and helps enormously to reduce business risks. Hence, innovation may help in achieving inclusive growth in South Africa. However, there is a need for institutional support so that change may lead to higher economic growth and development (Oyelaran-Oyeyinka and Sampath, 2006; Tebaldi and Elmslie, 2008a; Tebaldi and Elmslie, 2008b; Tebaldi and Mohan, 2008; and Schiliro, 2010). In the current study, the Mauritius Research and Innovation Council and the NACI are the supporting arms that may help to achieve the set objectives. The assumption is expected to be beneficial to the African continent in general. This can be evidenced by the Solow growth model, which stipulates that innovation contributes about 85% of economic growth as compared to 15% for factor inputs based on the endowment theory (Romer, 1990; Romer, 1994). The economic success of Singapore and Japan is a clear testimony of the model. This can only be possible by boosting up the human capital development. Currently, African countries have a low score for innovative output when compared to countries from other regions of the world. For example, the World Development Indicators revealed that Africa's contribution to world innovation in 2009, measured by the amount of scientific and technical journal articles, is less than 1 percent (0.64%) compared to Europe (36.84%), East Asia (24.17%), South Asia (2.72%) and Latin America (3.04%).

The National Innovation Framework in Mauritius

The National Innovation Framework for the period 2018 till 2030 was launched in 2017 by the Ministry of Technology, Communication, and Innovation. The aim of the framework is to foster an innovative ecosystem that can support the growth and transformation of the Mauritian economy in the years to come. The Honourable Minister, while launching the NIF had the following to say justifying the need for a National Innovation Framework:

"Mauritius is an upper middle-income country and is poised to transition to the level of a high-income country, where innovation becomes the key driver of socio-economic development. At the same time, the country has the potential to lead the African Continent into a new wave of growth and can become a gateway for global business to enter Africa."

The Minister also emphasised that Mauritius does not possess natural resources, and therefore, the only way to compete at an international level is through fostering a culture of research and innovation (Ministry of Technology, 2017). He explained that despite resource constraints and lack of resources, Mauritius has still been able to win the 1st Prize of the KiboCUBE Programme 2018 organised by the United Nations Office for Outer Space (UNOOSA) and the Japan Aerospace Exploration Agency (JAXA) in June 2018. The National Innovation framework embeds the international best practices from the world to promote research, innovation, and new product developments. The framework also seeks to address several key aspects relating to funding for innovation, as well as provide appropriate incentives to encourage the partnership between the private sector and government in the innovation process. The ultimate objective is to inculcate a culture of research and innovation at all levels of businesses and society in the Mauritian context. Several National innovation initiatives have been introduced to foster greater collaboration between academia and the industry and facilitate technological transfer. Social innovation has also been included to maintain the equilibrium between applied and basic research. The World Bank (Uexkull et al., 2019) report stresses the complexity for Mauritius to manage its transition to a knowledge-based high-income economy driven by innovation and productivity growth. The World Bank is of the view that there is need for a business ecosystem that seeks to reduce bottlenecks to "new sources of growth and private investment, such as a lack of connectivity, skills shortages, and misaligned incentives". Mauritius now ranks 13th in the Ease of doing business, which is a good sign of significant improvements in the administrative bureaucracies.

The South African Context for National Innovation

The South African government published a consolidated policy entitled The White Paper on Science and Technology: Preparing for the 21st century in 1996 (DACST, 1996). The White Paper emphasised on the role that technological innovation will play in the further development of the South African economy (DACST, 1996: 9) by stating:

'The stimulation of a national system of innovation will be central to the empowerment of all South Africans as they seek to achieve social, political, economic, and environmental goals. The development of innovative ideas, products, institutional arrangements, and processes will enable the country to address more effectively the needs and aspirations of its citizens. This is particularly important within the context of the demands of global economic competitiveness, sustainable development, and equity considerations related to the legacies of our past. A well-managed and properly functioning national system of innovation will make it possible for all South Africans to enjoy the economic, socio-political, and intellectual benefits of science and technology." (DACST, 1996:8)'.

Based on the South African Innovation Survey 2008 (covering the years 2005–2007) a total of 65.4% of firms reported being engaged in some sort of innovation activities, while 34.6% of enterprises reported that they are not involved in any innovation activities. Only 27.2% of enterprises reported to have successfully developed innovative products and processes in South Africa. Survey 2008 shows that South African enterprises have a fairly high innovation rate and that the degree of innovation of South African innovations was relatively high. The South african economy has faced dual challenge of integrating itself into the "competitive arena of international production and finance; and reconstructing domestic social and economic relations to eradicate and redress the inequitable patterns of ownership, wealth and social and economic practices that were shaped by segregation and apartheid" (Badat, 2004).

METHODOLOGY

The current research methodology uses a qualitative approach to conduct a comparative study of the National innovation frameworks for two emerging African economies, namely Mauritius and South Africa.

The qualitative research approach uses a mix of multi-case study methods and content analysis to have a better understanding of the different research questions explained earlier. The case study method, and in particular, the multiple–case studies approach offers academic researchers an effective strategy for an in-depth understanding of a specific phenomenon (Zach, 2006). The case study represents a research philosophy within the qualitative research paradigm (Creswell, 1998) and "attempts, on the one hand, to arrive at a comprehensive understanding of the event under study but at the same time to develop more general theoretical statements about regularities in the observed phenomena" (Fidel, 1984, p. 274). Hence, the use of qualitative research is justified mainly in understanding the overall philosophy of adopting the National innovation framework and comparing the structures for the two African economies.

Some of the critical research questions relate to analysing (a) the rationale for implementing the NIF (b) any differences in the innovation frameworks (c) evaluating the perception of the current structures and whether it is linked to the overall economic growth and development of the two economies. The multi-case methods will involve the content analysis (Hsieh et al., 2005) of the National Innovation framework documents of Mauritius and South Africa and other documents published by NACI and Mauritius Research and Innovation Council which are responsible for implementation and monitoring of innovation policies. In the digital age, content analysis may also be used to analyze digital texts (eg, Web-published news, Internet forums, and social media discussions). Once the research aim is stated and the source of data (content components) is identified, data may be sampled and subjected to either qualitative or quantitative analysis, or both (Hamad et al., 2016). In view of improving the reliability, a directed content analysis was carried

out based on the existing notion of innovation frameworks with clearly defined constructs mentioned earlier (Potter & Levine-Donnerstein, 1999).

Choice of Countries as Case Studies

The choice of the two countries for the comparative review needs to be justified. In the first instance, both countries are emerging economies that ambition to become a high-income economy. Both countries have implemented a National innovation framework to foster a culture of research, an innovation that may influence the overall economic growth (MRIC, 2017 and NCIA, 2018). Though Mauritius has a relatively higher economic growth than South Africa, both countries have a staggering economic growth and plan further to diversify the economy through economic and social transformations by improving the current innovation ecosystem/

Research Approach

The aim of the research is to analyse similarities, differences and any contextual divergence in terms of the overall national innovation frameworks. The research is exploratory in nature grounded on existing literature and policy documents regarding innovation frameworks in two promising African economies namely Mauritius and South Africa. As explained earlier, Africa is lagging behind in terms of research and innovation and therefore it is also important to analyse the motivation for the development of the framework as well as any differences in the actual framework. A thematic analysis based on the main research themes (based on research questions) was carried out and substantiated with relevant facts and figures. The main documents used apart from literature review are provided in the Table 2:

Table 2

Documents used for Content Analysis

Mauritius	Source	South Africa	Source
The National Innovation Framework for Mauritius (developed by Mauritius Research and Innovation Council)	Ministry of Technology, Communication and Innovation (2018)	The White Paper on the role of Technological innovation for economic development	DACST (1996)
Assessment Report of National Innovation system for Mauritius	Institute for Innovation and Technology (2015)	The National Innovation Framework for South Africa	NACI (2020)
Network Readiness Indexes for Mauritius	Network Readiness Index(2018)	Network Readiness Indexes for SA	Network Readiness Index (2018)
Scimago Reports on Publications	Scimago Country Rankings	The Science, Technology and Innovation Report by NACI (2016- 2019)	NACI Briefing Reports and STI
Main Websites	Mauritius Research and Innovation Council http://www.mric.mu	National Advisory Commission for Innovation https://nationalgovernment.co.za	

Source: Mentioned in Table

Hence, the research approach is qualitative, where there might be an element of subjectivity. However, subjectivity in opinions does not influence the overall academic rigour as the aim of the current research is not to generalise but to develop a more in-depth insight of how African countries are taking the initiative to bridge the research and innovation gaps explained in many reports. Hence, the overall ontological perspective adopted is that National Innovation frameworks may help encourage the global research and innovation gaps in the two economies. It is important to

highlight that the research does not evaluate the overall effectiveness of the implementation of such policies as Mauritius has recently embarked in implementing such a framework.

RESULTS AND DISCUSSION

Thematic Analysis 1: The Rationale for National Innovation Framework

Part A: South Africa and Innovation ecosystem

Based on the literature review, the quest to achieve a research and innovation culture formally started in 1996 with the White Paper on the role of technological innovation for the overall economic development. The white paper emphasises the importance of research and technological developments to tap the natural and mineral resources of the country. Akec (2017) in a recent research paper, explained that African economies are under pressure to create economic growth and development with the aim to increase economic growth and to increase jobs. This is based on the exogenous growth theory, which states that economic growth may be influenced by technological and scientific development. The NCIS resumes the overall need for research and innovation as follows:

‘Sound measurement of innovation is crucial in policy formulation and implementation, to monitoring spending in this regard, assessing the contribution of innovation to achieving social and economic objectives. Reporting on the measurement of innovation serves to legitimise public intervention by enhancing public accountability’

Manzini (2015), based on qualitative research is of the view that the current research framework of South Africa is more focused on technological innovation and does not focus on the larger ecosystem. He is also of the opinion that there are gaps regarding the broader conditions of learning and assessment of innovation in South Africa and there is need to broaden the research metrics as explained below

'there is a need to sharpen the metrics for measuring non-technological innovation and to define, account for and accurately measure the 'hidden' innovations that drive the realisation of value in management, the arts, public service and society in general.'

Some of the other objectives in addition to the overall economic development, is resumed below (NACI, 2019):

"innovation that addresses the triple challenge of inequality, poverty, and unemployment and enables all sectors of society, to equitably access the knowledge infrastructure, participate in creating and actualizing innovation opportunities as well as enabling all individuals to share in the benefits of innovation to advance development goals."

Hence this consolidates the earlier view that research and innovation may help Africa achieve higher economic growth and development. However, the above illustration is much inclusive as it states that research and innovation should be able to make more equitable access to infrastructure and help the overall society in its socio-economic development. Does Mauritius differ in the overall rationale adopted for the overall framework? This will be developed in the next section. However, the STI Report for 2019 shows that there has been a consistent increase in the number of scientific publications per million inhabitants (from 192 in 2008 to 350 in 2019). The report also highlights that the human capital development of South Africa is very good as compared to other upper middle income countries but the research and development budget is still very low.

Part B: The Drivers for National Innovation Framework in the Mauritian Context

Unlike South Africa, Mauritius does not have natural resources such as minerals and gold. Hence, the Mauritian economic development has always been driven by higher human capital development. Mauritius ranks first on the Human Development Index in Africa until 2018. The tourism and financial services sector are the major contributors to the overall Gross Domestic Product (more than 70%) for Mauritius. In contrast, agriculture, mining and the manufacturing industry contributes more to GDP of South Africa (hence the emphasis on more technological innovation). Thus, Mauritius wishes to engage more change that helps support the priority areas for

the economic development of the country as cited below (Ministry of Technology, Communication and Innovation, 2020):

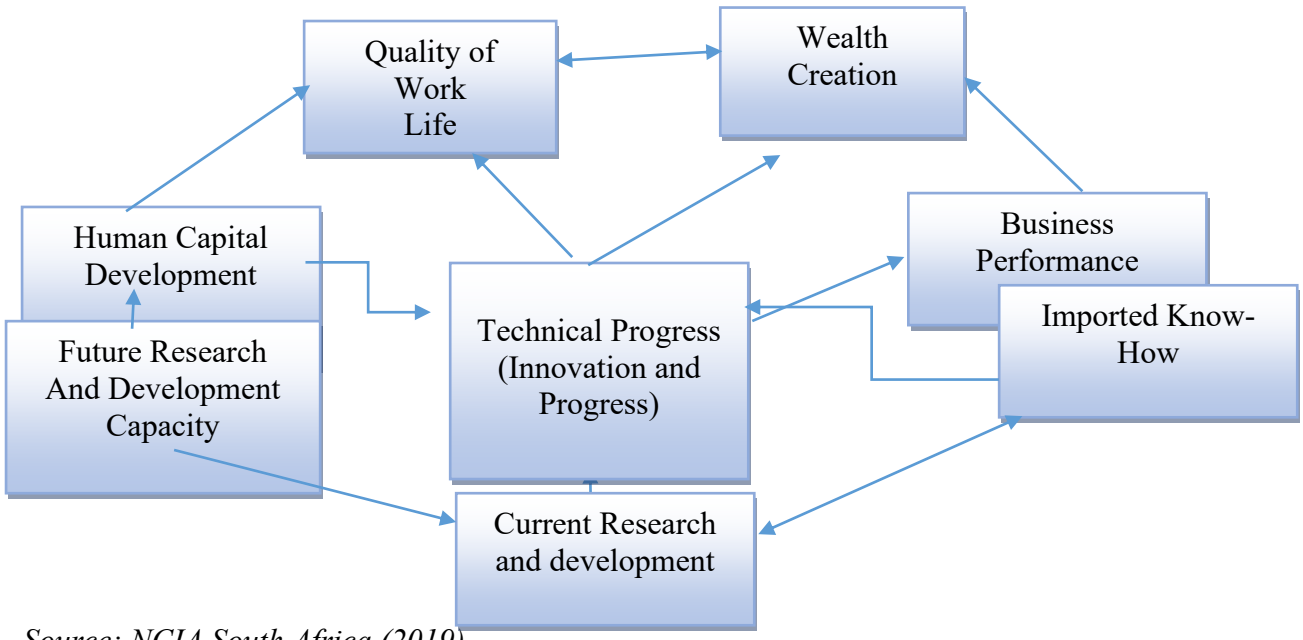
'Given this opportune time for Mauritius to put in place a National Innovation Framework, my Ministry has come up with a strategy for innovation through an understanding of national priority areas and where our scientific, technological, and social entrepreneurs can collaborate and maximize their collective impact'.

The specific objectives stated in the National Innovation Framework (2017) are to achieve: Sustainable economic growth, Creating an innovation culture, Address the big challenges facing Mauritius

Hence, the objectives concur with the statistics which show a lack of research and innovation culture (evidenced by the low Scimago H-index, lack of doctoral research, and also no patenting and product innovations). Mauritius has also a staggering economic growth rate of 3-4% for the last five years (Statistics Mauritius, 2020). Kasseah (2013) studied the role of innovation in improving firm performance for Mauritian SMEs. The change was proxied in terms of acquisition of technological developments, high expenditure on research and development, and the development of new products. The findings show a link between innovation and the overall firm performance (after controlling for different factors such as the experience of managers and other factors). Hence, this consolidates the need to adopt a National innovation framework in the Mauritian context. Gotollli et al. (2018) from the Mauritius Research Council have made reference to the body of evidence which relates how innovative performance of enterprises and by extension, the global economy is connected to how the different components of their national innovation system are linked and how they relate to each other for knowledge transfer and use (See Geiger 2004; Yusuf et al 2008). Hence, both Mauritius and South Africa wish to use the national innovation framework for promoting economic and social development. However, the only difference could be that South Africa is aiming more technological innovation based on its current economic structure and development as compared to Mauritius. This could be explained since South Africa has embarked on research and innovation for quite some time. Mauritius though conscious about achieving a high level of research and innovation, has developed a National Innovation framework only recently (2017).

Thematic 2: Similarities and Differences in the National Innovation Framework

Institutional Framework: Components of the Research and Development Framework (South Africa)



Source: NCIA South Africa (2019)

Regional Economic Collaboration and Development

Mauritius aware of the fact that it lacks technical, technological, and human skills for achieving the overall innovation and competitiveness; wants to establish regional and international collaborations to boost up the knowledge and research gaps. Many local universities have established essential links to bridge the current gaps in terms of resources.

Innovation Infrastructure

In terms of innovation infrastructure, there is mention on the "need to implement the basic elements of infrastructure required for Smart Cities. The Smart City model originated in Europe where digital technology or ICT were used to enhance the quality, efficiency, and performance of urban life". Hence, Mauritius is not aiming for breakthrough innovation in terms of science and technology. However, it wants to be able to acquire the necessary resources and technology to achieve some of the economic priorities of the country.

Table 3

Discussion of Findings based on Content Analysis

	Similarities	Differences
1	2	3
Approach and philosophy	Both the South African and the Mauritian National Innovation framework seek to use it to improve economic growth and development and improve the overall standard of living (Akec, 2018). However, in the Mauritian context as we have recently embarked on this venture the aim is also to develop an overall innovation ecosystem. Both countries are also of the view that it can help create jobs in emerging sectors such as smart technologies and artificial intelligence (National Innovation frameworks of Mauritius and South Africa)	The South African Innovation framework refers to the need to reduce poverty and reduce inequality. This could be explained due to the fact the income per Capita for Mauritius (11000 USD) is much higher than that of South Africa (7400 USD). It should also be mentioned that the population of South Africa is much bigger than Mauritius. South African Science, Technology and Innovation (STI) policies increasingly focus on economic growth and social development imperatives alike (Hart et al, 2014; Ramoroka et al, 2017).
Processes and Systems in Place	Emphasis on Human Capital Development, research, and innovation. Approach external experts for capacity building. Both countries face problem of human capital development to promote innovation (NACI Briefing Report, 2017 and MRIC). Need to boost up overall publications and patents to boost science, technology and innovation based on national priorities. Samuel (2014) explains that both Mauritius and South Africa face an under-production of doctoral research.	The processes have been geared to the overall economic vision and future development of the country. For example, South Africa seeks to improve more the manufacturing technologies and technologies to tap the different resources (NACI STI Report, 2017). In the Mauritian context, more emphasis is being laid on the creation of Smart Cities and the use of artificial intelligence (MRIC, 2017) The South African government has set up the framework since long and also publishes innovation indicators at regular interval (NACI STI Reports).

1	2	3
Implementation	Mauritius and South Africa want to institutionalise innovation by developing a framework. They seek to achieve this objective by developing research and innovation schemes.	Mauritius lags behind in terms of STEM education and also in terms of the development of the National innovation framework (Maulloo and Nauga, 2017; Kariuku, 2017). Mauritius is extensively dependent on the financial services sector where the Multinational companies that have brought the technology transfer. Mauritius relies heavily on other countries for expertise in many fields which explains why many expats have top management positions both in the private and public sectors (Le Defi, 2016)

DISCUSSION

At the African level, regional trade blocs such as SADC and COMESA have always pushed African countries to adopt National innovation frameworks for boosting economic growth. Policies relating to STI in many African governments have been encouraged by NEPAD, many of which has adopted a science-push. The UNCTAD (2015:82) notes that STI policies should not simply adopt a science-push approach to innovation, but rather focus on building an entire NSI. A weak and fragmented NSI in developing countries is a major challenge as observed by Knutsen (2004:16-17).

Innovation Reporting

South Africa has embarked on the development of a National innovation framework much earlier than Mauritius (recently in 2018). Hence, while South Africa has already STI Indicators Reports regarding the overall state of innovation, Mauritius is still at incubation phase as many of the components have not yet been implemented. South Africa has implemented a Composite Innovation Indicators (NACI STI Report, 2017). The NACI report also identified problems in STEM education especially Maths and Science. Hence, Mauritius lags behind in terms of innovation indicators as the only statistics are the global indexes. A study by Meier et al. (2015) shows that the Mauritius has a weak National Innovation policy and calls upon the development of cluster frameworks for the important economic activities.

Human Capital Development

Both countries wish to increase their human capital development geared towards the economic development of the country. The NACI Briefing Report (2017) clearly highlight important gaps in the education system as reported below:

‘Much of the problem lay with the fact that the quality of teaching of maths and science was insufficient, and there often was not enough money to employ qualified teachers. The Committee was assured that there would not be a focus on universities who had developed innovation through expertise in maths and science.’

In addition, the Committee members also highlighted the fact that

‘the proportion of students who went into technical training was relatively low compared to university for academic qualifications. There was a need to focus more on technical skills relative to academic skills.’

How does this compare with the situation in Mauritius? A study by Maulloo and Naugah (2017) shows declining intakes in chemistry and biology, but especially for biology between the years 2000 till 2016. The only science subject which has remained stable is physics.

Thematic 3: Comparing the Network Readiness Indexes of Mauritius and South Africa

The redesigned Network Readiness Index is based on four pillars: Technology, People, Governance, and Impact. Each pillar is further composed of three sub-pillars. The network readiness index reflects on the overall technological competitiveness of a country from a more holistic perspective. This index may be therefore a good indicator of the innovation ecosystem from a technological development perspective for Mauritius and South Africa.

In Africa, there is a significant gap even within the top 3, with Mauritius ranked 53rd and South Africa is second in Africa (72nd), where the levels of Trust (38th) and Inclusion (46th) contribute to making Governance (47th) its best pillar. South Africa also finds itself in the third quartile concerning technology (58th), primarily as a result of the country's position in Content (54th) and Future Technologies (53rd). Its greatest challenge, meanwhile, concerns the Impact (99th) of the network economy, especially as it relates to improving Quality of Life (118th). As for Mauritius, its level of Trust (32nd) also makes a significant positive contribution to the Governance (41st) pillar. Its weakest dimension is People (70th), with considerable room for improvement in all three sub-pillars (Individuals, 73rd; Businesses, 68th; Governments, 69th).

Hence, Mauritius ranks well above in terms of Network Readiness as compared to South Africa (more than 18 rank difference). Mauritius has a better governance system compared to South Africa inspiring higher trust. A study by Hardin-Ramanan et al. (2018) based on EFA and CFA with a survey with 192 firms in Mauritius confirm the strong IT governance including Green IT . Mauritius has poor people index in all three dimensions which calls for more human capital development in the field of ICT. Roopchund and Ramlowat (2019) makes reference to lack of highly qualified and experienced people in the field of ICT.

CONCLUSION

It is important for Mauritius to benchmark its national innovation framework with other countries to bring appropriate adaptations and changes to achieve the set objectives. Mauritius should also set important innovation indicators as in South Africa so as to evaluate the state of innovation. The study also shows that Mauritius scores higher in terms of network readiness and governance as compared to South Africa. However, both countries lag behind in terms of human capital development despite high index in Africa. The research also triggers the need to engage in STEM education which can help in making leapfrog development. Mauritius and South Africa both a low investment in terms of Research and Development budget as a percentage of GDP. The Economic Development Board of Singapore explain that “companies are able to tap on a diverse pool of talent, draw on cutting-edge research from top universities and connect with thought leaders in their industries”. While comparing the innovation frameworks both Mauritius and South Africa, both countries lags in terms of industry collaboration as well and available of high calibre people who may promote innovation. Farinha et al. (2018) confirm that innovation and sophistication factors are crucial to the competitiveness of economies based on analysis of 148 countries.

REFERENCES

Aguirre-Bastos, C., & Weber, M. K. (2018). Foresight for shaping national innovation systems in developing economies. Technological Forecasting and Social Change, 128, 186–196. https://doi.org/10.1016/j.techfore.2017.11.025 IDEAS/RePEc+1

Akec, J. (2017). A framework for transforming African economies through university-led innovations. *Africa Policy Journal, 13*, 76–90. Retrieved from https://apj.hkspublications.org/a-framework-for-transforming-african-economies-through-university-led-innovations.

Creswell, J. W. (1998). Data collection. In Qualitative inquiry and research design (2nd ed., pp. 109–135). Thousand Oaks, CA: Sage.

Cunningham, P. (2015). Insights into open innovation and ICT entrepreneurship in Africa. In 2015 IEEE International Symposium on Technology and Society (ISTAS) (pp. 1–8). IEEE. https://doi.org/10.1109/ISTAS.2015.7439405

Department of Arts, Culture, Science and Technology [DACST]. (1996). The White Paper on Science and Technology. Government of South Africa. Retrieved July 15, 2019, from https://www.gov.za/sites/default/files/gcis_document/201409/sciencetechnologywhitepaper.pdf

Farinha, L., Ferreira, J. J., & Nunes, S. (2018). Linking innovation and entrepreneurship to economic growth. Competitiveness Review: An International Business Journal, 28(4), 451–475. https://doi.org/10.1108/CR-07-2016-0045 ScienceDirect+2ResearchGate+2

Fetters, M. L., Greene, P. G., Rice, M. P., & Butler, J. S. (2010). The development of university-based entrepreneurship ecosystems. Cheltenham, UK: Edward Elgar.

Fidel, R. (1984). The case study method: A case study. Library and Information Science Research, 6(3), 273–288.

Geiger, R. L. (2004). Knowledge and money: Research universities and the paradox of the marketplace. Stanford, CA: Stanford University Press.

Gottoli, G., Neeliah, H., Peedoly, A., & Gopaul, N. (2011). Collaborative Mauritius: A case study of driving innovation. Mauritius Research Council. (Unpublished report).

Global Innovation Index. (2018). Global Innovation Index Report 2018. Cornell University, INSEAD & WIPO. Retrieved March 20, 2020, from https://www.globalinnovationindex.org

Hardin-Ramanan, S., Chang, V., & Issa, T. (2018). A green information technology governance model for large Mauritian companies. Journal of Cleaner Production, 198, 488–497. DOI: 10.1016/j.jclepro.2018.07.04

Hart, T., Jacobs, P., Letty, B., Ramoroka, K., Mangqalaza, J., Mhula, A., & Ngwena, M. (2014). Promoting innovation for inclusive rural transformation in South Africa. Cape Town: Human Sciences Research Council.

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. Qualitative Health Research, 15(9), 1277–1288. https://doi.org/10.1177/1049732305276687

Human Development Index. (2018). In Human Development Report 2018. United Nations Development Programme. Retrieved November 20, 2019, from http://hdr.undp.org/en/2018-update

Jackson, D. J. (2011). What is an innovation ecosystem? National Science Foundation. Retrieved December 10, 2019, from http://erc-assoc.org/sites/default/files/topics/policy_studies/DJackson_Innovation%20Ecosystem.pdf

Juma, C. (2016). Innovation and its enemies: Why people resist new technologies. Oxford, UK: Oxford University Press. https://doi.org/10.1093/acprof:oso/9780190467036

Kariuki, T. (2017, January). Africa's future depends on its scientists: Time to stop the brain drain. World Economic Forum Agenda. Retrieved February 17, 2020, from https://www.weforum.org/agenda/2017/01/africa-s-future-depends-on-its-scientists-time-to-stop-the-brain-drain/

Kasseeah, H. (2013). Innovation and performance in small- and medium-sized enterprises: Evidence from Mauritius. Innovation and Development, 3(2), 259–275. https://doi.org/10.1080/2157930X.2013.825069

Kamudu Applasawmy, B., Naugah, J., & Maulloo, A. K. (2017). Empowering teachers to teach science in the early years in Mauritius. Early Child Development and Care, 187(2), 261–273. https://doi.org/10.1080/03004430.2016.1226354

Knutsen, R. D. (2004). Towards understanding the role of new materials in South African society (Report). Cape Town: University of Cape Town / HSRC.

Le Défi Mauritius. (2016). Foreign expertise: How far can Mauritius open itself? Le Défi Media. Retrieved February 24, 2020, from https://defimedia.info/foreign-expertise-how-far-can-mauritius-open-itself

Maulloo, A. K., & Naugah, B. J. (2017). Upper secondary education in Mauritius: A case study. Royal Society / Education policy document. Retrieved October 7, 2018, from https://royalsociety.org/-/media/policy/topics/education-skills/Broadening-the-curriculum/mauritius-case-study.pdf

Ministry of Technology. (2017). Launch of the National Innovation Framework 2018–2030. Retrieved January 18, 2020, from https://www.myt.mu/sinformer/dossiers/actualites/515173/launch-of-the-national-innovation-framework-2018-2030-nbsp.html

NACI. (2017). STI Report. Parliamentary Monitoring Group. Retrieved May 10, 2020, from https://pmg.org.za/committee-meeting/27267/

Oyelaran-Oyeyinka, B., & Sampath, P. G. (2006). Rough Road to Market: Institutional Barriers to Innovations in Africa. Maastricht: UNU-MERIT.

Potter, W. J., & Levine-Donnerstein, D. (1999). Rethinking validity and reliability in content analysis. Journal of Applied Communication Research, 27(3), 258–284. https://doi.org/10.1080/00909889909365539

Phiri, M. Z., Molotja, N., Makelane, H., Kupamupindi, T., & Ndinda, C. (2016). Inclusive innovation and inequality in South Africa: A case for transformative social policy. Innovation and Development, 6(1), 123–139. https://doi.org/10.1080/2157930X.2015.1047112

Ramoroka, K. H., Jacobs, P., & Mangqalaza, H. (2014). Actor networks and innovation activities among rural enterprises in a South African locality. African Journal of Science, Technology, Innovation and Development, 6(3), 185–191. https://doi.org/10.1080/20421338.2014.940169

Rogers, E. M. (1962). Diffusion of innovations. New York: Free Press.

Romer, P. M. (1990). Endogenous technological change. Journal of Political Economy, 98(5), S71–S102. https://doi.org/10.1086/261725

Roopchund, R., & Ramlowat, D. (2019). Adapting the Mauritian higher education system for effective workforce development. Industry & Higher Education, 33(6), 414–424. https://doi.org/10.1177/0950422219878384

Samuel, M. A. (2016). Values and purposes of a PhD: Comparative responses from South Africa and Mauritius. In Higher Education Forum, 13, 1–23. Hiroshima, Japan: Research Institute for Higher Education. https://doi.org/10.15027/39937

Schiliro, D. (2010). Investing in knowledge: Knowledge, human capital and institutions for long run growth. In M. J. Arentsen, W. Rossum, & A. E. Steenage (Eds.), Governance of Innovation (pp. 33–50). https://doi.org/10.4337/9781781000830.00009

Scimago. (2018). Scimago country ranking. Retrieved February 5, 2020, from https://www.scimagojr.com/countryrank.php

Statistics Mauritius. (2020). Economic and social indicators of Mauritius. Retrieved March 15, 2020, from http://statsmauritius.govmu.org/English/Publications/Pages/all_esi.aspx

Tebaldi, E., & Mohan, R. (2008). Institutions-augmented Solow model and club convergence. Munich: Munich Personal RePEc Archive.

Tebaldi, E., & Elmslie, B. (2008a). Do institutions impact innovation? Munich: Munich Personal RePEc Archive.

Tebaldi, E., & Elmslie, B. (2008b). Institutions, innovation and economic growth. Munich: Munich Personal RePEc Archive.

Tikly, L., Joube, M., Barrett, A. M., Bainton, D., Cameron, L., & Doyle, H. (2018). Supporting secondary school STEM education for sustainable development in Africa. Bristol Working Papers in Education. Bristol: University of Bristol School of Education. Available from https://www.bristol.ac.uk/media-library/sites/education/documents/Supporting%20Secondary%20School%20STEM%20Educa

tion%20for%20Sustainabale%20Development%20in%20Africa.pdf?utm_source=chatgpt.com

Hamad, E. O., Savundranayagam, M. Y., Holmes, J. D., Kinsella, E. A., & Johnson, A. M. (2016). Toward a mixed-methods research approach to content analysis in the digital age: The combined content-analysis model and its applications to health care Twitter feeds. Journal of Medical Internet Research, 18(3), e60. https://doi.org/10.2196/jmir.4368

Uexküll, V., Echandi, E., & Rojas, M. (2019). World Bank in Mauritius. World Bank Group. Retrieved November 20, 2019, from http://documents.worldbank.org/curated/en/415161568876900195/World-Bank-in-Mauritius

United Nations Conference on Trade and Development [UNCTAD]. (2015). Strengthening regional economic integration for Africa's development. In Economic Development in Africa Report 2015. Geneva, Switzerland: UNCTAD.

Vannoorenberghe, G., & Voeten, J. (2016). Exports and innovation in emerging economies: firm-level evidence from South Africa. Policy brief for DFID / Tilburg University research: "Enabling Innovation and Productivity Growth in Low Income Countries (EIP-LIC)", 1–4.

The World Bank. (2019). Mauritius overview. Retrieved January 17, 2020, from https://www.worldbank.org/en/country/mauritius/overview.

Yusuf, S. (2008). Intermediating knowledge exchange between universities and businesses. Research Policy, 37(8), 1167–1174.

Zach, L. (2006). Using a multiple-case studies design to investigate the information-seeking behavior of arts administrators. Library Trends, 55(1), 4–21. https://doi.org/10.1353/lib.2006.0055

ПОРІВНЯЛЬНИЙ ОГЛЯД НАЦІОНАЛЬНОЇ ІННОВАЦІЙНОЇ СИСТЕМИ В АФРИЦІ: ПРИКЛАД МАВРИКІЯ ТА ПІВДЕННОЇ АФРИКИ

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У цьому дослідженні здійснено аналіз національних інноваційних систем, упроваджених у двох провідних економіках Африки - Маврикії та Південній Африці. Ці рамки були стратегічно розроблені для стимулювання економічного зростання шляхом сприяння культурі, заснованій на інноваціях, креативності та досконалості. Визнаючи зростаючу важливість економік, заснованих на знаннях, обидві країни прагнули поставити інновації в центр своєї програми розвитку, забезпечуючи довгострокову конкурентоспроможність у глобалізованому світі. Дослідження виходить за межі описового порівняння, критично аналізуючи загальну обґрунтованість залучення до таких інноваційних рамок. Воно досліджує, як інновації сприяють не тільки економічним показникам, але й вирішенню більш широких суспільних проблем, таких як створення робочих місць, соціальна інклюзія та сталий розвиток. Крім того, дослідження дає чітке розуміння контекстуальних відмінностей у розробці та впровадженні інноваційних підходів на Маврикії та в Південній Африці, визнаючи, що унікальні історичні, інституційні та економічні контексти впливають на їхні політичні пріоритети та виконання. Застосовано якісний підхід до дослідження, використовуючи метод багатовипадкового дослідження, підкріплений спрямованим контент-аналізом. Ця методологія дозволяє систематично та глибоко дослідити подібності та відмінності між двома національними системами. У цьому дослідженні аналізуються національні інноваційні рамки, прийняті двома сильними африканськими економіками, а саме Маврикієм і Південною Африкою. Ці рамки були стратегічно розроблені для стимулювання економічного зростання шляхом сприяння

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культурі, заснованій на інноваціях, креативності та досконалості. Визнаючи зростаючу важливість економік, заснованих на знаннях, обидві країни прагнули поставити інновації на перше місце. У дослідженні також підкреслюється значення інноваційних стратегій для просування африканських економік у глобальному ланцюжку створення вартості та забезпечення сталого розвитку в довгостроковій перспективі.

Ключові слова: інновації, порівняльний огляд, інноваційна система, досконаліть, економічне зростання.