China's National Innovation Systems for success blueprint can be key to Africa's emerging economies.

Case Study of Zimbabwe.

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Policy-Oriented Paper

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Innovation capacity is one of the fundamental sources of a nation's wealth (Antonelli, 2006)[1]. China has made great progress in all fields since the reform and opening-up, especially the accession to the World Trade Organization (WTO). The economy has developed rapidly and GDP per capita increased to more than 5,000 US dollars. The scientific and technological innovation capacity is ranked in the top 10 in the world. Science, technology and innovation now play an increasingly important role in economic and social development. Their supporting and leading roles in sustainable economic and social development are becoming increasingly essential. Using this blueprint for emerging economies can be a doorway for the economic revitalization of many African economies. Staggering socioeconomic deficiencies by many African countries suffering from underdevelopment, decline economies, low industrial and manufacturing production; making pivotal moves on innovative systems that enable science and technology, information, communication and technology and investing in research and development can go a long way to start addressing the short falling of the African economies and venture emerging economies for better economies and prosperity. The Transitional Stabilisation Program (TSP) 2018 - 2020 adopted by the Government of Zimbabwe can arguably be a positive step in trying to achieve economic revitalisation, and the blueprint's focus on ICT, Research and Development is an initiative to drive innovative system. Further, the envisaged new ICT policy – The SMART Zimbabwe 2030 Master Plan is projected to build on the ground set by the Zimbabwe National Policy on ICTs of 2016 – 2020 and the Transitional Stabilisation Program. Using these policy reforms and implementing The Innovative Success Triangle can offer a way for economic development. Nonetheless, these policies and the innovative system as a whole has encountered a lot of deficiencies from its implementation to its governance, that if the policy-makers would emulate the China innovative system they may achieve some notable results.

Keywords: *National Innovation Systems, Global Political Economy, Economic Development, Zimbabwe, China, International Trade, Transitional Stabilisation Program (TSP), National Development Strategy (NDS), ICT, Innovation*

Summary of Recommendations

1. **Zimbabwe needs to create a business environment that can enable innovation and technological innovation.** The Transitional Stabilisation Program (TSP 2018–2020) and the just-launched National Development Strategy 1 (NDS 2021–2025) has encourages the position of a private-led economy.

2. **Zimbabwe needs to create a competitive and open trade regime.** The country also needs to protect its local indigenous businesses against foreign mercantilist practices. There is also a need for transparency and the rule of law for both local markets and foreign markets.

3. **Zimbabwe needs an innovation triangle is a sophisticated and strong innovation policy system for markets to perform.** An innovation policy system includes generous support for public investments in innovation infrastructure. This will go a long way to build an innovation culture that has to be embraced by the education system.

1 Antonelli C et al. Introduction. In: Antonelli C, Foray D, Hall BH, Steinmueller WE, editors. New frontiers in the economics of innovation and new technology. Cheltenham\Northampton: Edward Elgar; 2006. p.3–20.

In this document

1. Introduction.

In 2018, Zimbabwe's tech industry was arguably one of the recognised countries in Africa in terms of the country's regard to ICT and innovation. Quartz Africa stated that Zimbabwe's tech industry had arguably performed better than other companies in the troubled economy of the last decade and a half. In Africa, the big telecom companies bumped up investment into enhancing data capacity and capability, led by Econet (Zimbabwe) – the number one tel-company in the country, spent $1.3 billion over the last decade to expand its 3G and LTE networks.[1] It is in this vein that a focus on ICT and innovation can be a huge boost to the country's economy as already outlined in the reforms aimed by the new government dispensation in their policies. They have stressed the importance of innovation, research and development, digitalisation and governance as a key to realising economic gains in their envisaged Vision 2030. On a great note, the developing country can use strong bilateral ties with its 'all-weather friend' foreign ally, China which is an economic and tech giant. The buzz in Zimbabwe right now for the opportunity of Science and Technology (S&T) and ICT might have a transformational impact on the beleaguered economy. The Southern African country, which has one of the highest literacy rates in Africa, would look to China as a top priority investor to help to build capacity and technological know-how to build one of the continent's biggest IT hubs underpinned by big data and artificial intelligence.[2]

The use of S&T, ICT and innovation can boost the countries production sectors which have largely been dominated by agriculture and mineral exploration. Recent technological innovations have been diffused to the sectors with such in Agriculture the implementation of SMART Agriculture and Farm Mechanisation reforms has been a positive step to boost productivity. Zimbabwe's economy has long been dominated by particularly with the export of cash crops like tobacco and cotton. But like some other African countries including Ethiopia, Ghana and Rwanda, more nations are exploring the potential of investing or supporting a knowledge-led economy to rely less on the vagaries of global agricultural or mineral commodity markets. Thus, it is imperative to invest in the national innovation systems that would lead to economic growth.

In all this, considering the close relationship between the governments, China has a key role in Zimbabwe's bid to reimagine itself as a technological hub and a knowledge-led innovative and productive economy. The close bilateral cooperation and the foreign policies of the two governments, The Look East Policy stance by the Zimbabwean government can be useful to make the country reimage itself in the ICT sector as well as unlocking the economic stagnation.

It is necessary to study the characteristics of Zimbabwe's national innovation system, especially the policies in place, deficiencies, and problems, and appropriate recommendations that are required for its future development. Following is a review of Zimbabwe's national innovation system from a neo-Mercantilism perspective substantiated by projected policy reforms, a juxtaposition of China's innovative system, an analysis of problems

1 https://qz.com/africa/1306520/zimbabwe-needs-china-for-its-tech-and-ict-ambitions
2 https://qz.com/africa/1306520/zimbabwe-needs-china-for-its-tech-and-ict-ambitions

and challenges faced by Zimbabwe's national innovation system, and some recommendations for reaching the Vision 2030 goal.

2. Background relationship between China and Zimbabwe.

China's interaction with Zimbabwe stretches back to its support of Zimbabwe's liberation struggle against colonialism and racial oppression.[3] The relations between China and the former President R.G. Mugabe's government was defined by the catchphrase, 'All-weather friends' that was grounded on China's support of the Zimbabwe African National Union (ZANU), one of the movements which fought for the liberation of Zimbabwe. Ties solidified stretching into the era for President Mugabe's administration. With the coming in of the successor President E.D Mnangagwa was a renewal of that same catchphrase that saw the confirmation of China continued relations with the new Zimbabwean government administration under E.D Mnangagwa.[4] Today, China is Zimbabwe's top export market and investor which accounts for nearly three-quarters of all foreign direct investment into the country (mainly centred on energy, mining, and agriculture projects). Beijing has also promised billions of dollars in aid. It is in these relations between China and Zimbabwe that has propelled Zimbabwe's foreign policy, The Look East Policy that has sought engagement of East Asia mainly China as its foreign ally for development.

2.1. The 'Look East' Policy – China's Involvement in Zimbabwe.

From the backdrop of a rapidly failing economy and a dented political image, the Zimbabwean government was compelled to look for alternative sources of financial and diplomatic support, hence the formulation and adoption of the 'Look-East' policy in 2003.[5] The policy was formulated to curtail the effects of international isolation by courting investors and political allies from South-East Asia, the Far East and the Pacific countries. In this endeavour, Zimbabwe was able to develop cordial relations with countries such as China, Malaysia, India, Singapore, Indonesia Iran, and Pakistan. 'Look East' policy is believed to be primarily calculated to shift economic and political dependence from the West to China.[6] Stephen Marks (2006) notes that the policy was designed so that China could fill the gap left by Western disengagement from Zimbabwe as an alternative source of unconditional assistance and investments.[7] 'Look East' policy was a strategy to construct a new dependency patron by engaging China. Complementing the 'Look-East' policy, China and Zimbabwe entered into various cooperation agreements during the crisis period. China also made important strides in supporting Zimbabwe through loans, grants and investing in the country's key economic sectors. It is in this background that many analysts have revered the bilateral relationship as a key to Zimbabwe's economic revitalisation that can be ushered in with the assistance of the world giant China to enhance the economic situation that ICT and innovation systems are a most appealing way.

3. What does a National Innovation System would mean for Zimbabwe.

Friedrich List (1841) first introduced the concept of a national system and analysed how it influenced one country's economic development and technological policies.[8] Joseph Schumpeter (1911) first put forward the concept of innovation and defined it to be a procedure introducing a new production function.[9] Christopher Freeman developed the concept of a national innovation system to explain Japan's economic success (Lundvall 2010; Liu 2009).[10] Many researchers have developed the concept of a national innovation system. Lundvall (1992), a well-known researcher of the national innovation system, defined it as the elements and relationships that interact in the production, diffusion, and use of new and economically useful knowledge and that are either located within or rooted inside the borders of a nation-state.[11] Nelson (1993) saw it as a set of institutions whose interactions determine the innovative performance of national firms.[12] Patel and Pavitt (1994) defined it as the national institutions, their incentive structures, and their competencies, which determine the rate and direction of technological learning in a country.[13] Freeman (1995) regarded a national innovation system as the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify, and

3 Ian Taylor: China and Africa: Engagement and Compromise, Routledge Taylor and Francis, London, UK, 2006, p. 106.
4 https://thediplomat.com/2018/04/china-renews-all-weather-friendship-with-zimbabwes-new-president
5 Percyslage Chigora and Taderera Hebert Chisi: "The Eight years of Interaction: Lessons from Zimbabwe's 'Look East' policy and the Future of African Counties and Asia-Pacific Region," Journal of Sustainable Development in Africa, Volume 10, No. 4, 2009, p. 7.
6 Jeremy Youde: "Why Look East? Zimbabwean Foreign Policy and China," Africa Today, Volume 53, Number 3, Spring. 2007, p. 6
7 Stephen Marks: "China in Africa – the new imperialism?" Pambazuka News, Issue. 244, March 2006, Available online at http://www.pambazuka.org/en/category/features/32432
8 Freeman C. The national innovation system in historical perspective. Camb J Econ. 1995; 19:5–24.
9 Schumpeter J. Theorie der wirtschaftlichen Entwicklung. Berlin; 1911.
10 Liu XL. National system of innovations in developing countries: the Chinese national system of innovation in transition. In: Lundvall B-A, Joseph KJ, Chaminade C, Vang J., editors. Handbook of innovation systems and developing countries: building domestic capabilities in a global setting. Cheltenham\ Northampton: Edward Elgar; 2009. p. 119–38.
11 Lundvall B-A, editor. National systems of innovation. Towards a theory of innovation and interactive learning. London: Pinter; 1992. p. 957.
12 Nelson R, editor. National systems of innovation: a comparative study. Oxford: Oxford University Press; 1993.
13 Patel P, Pavitt K. The nature and economic importance of national innovation systems. STI review, NO.14. Paris: OECD; 1994.

diffuse new technologies.[14] Metcalfe (1995) defined it as a system of interconnected institutions to create, store, and transfer the knowledge, skills, and artefacts that define new technologies.[15]

In the case of China's national innovation system, the period from 1950 to 1977 was the formation phase of the national innovation system. In 1978, China adopted policies of reform and opening-up and began to explore the development model of the national innovation system. China set forward a series of national plans of S&T, such as the High-tech Research and Development Program (863), the Torch Program, the Spark Program, the Major Achievement Promote Program, the National Natural Science Foundation, and the Climbing Program. China also reformed the funding system, developed technology markets, promoted the commercialization of S&T achievements, and issued many innovation policies. Some researchers have studied China's national innovation system (Liu and White 2001; OECD 2008). Xielin Liu and White (2001) studied the structure and dynamic of China's national innovation system from R&D, implementation, end-use, education and linkage.[16] Shulin Gu and Lundvall (2006) studied the current characteristics of China's production and innovation system, especially how they have been shaped by history and the major challenges they face in the future.[17] Rowen (2008) found that China's national innovation system originated from an underdeveloped topdown, centralized, and state-run system.[18]

This paper thus suggests that using the China national innovative system framework can be a key to unlocking the economic development of African emerging economies and with particular attention of this paper, Zimbabwe's economic revitalisation. It is in this background that this paper proposes using the already existing frameworks and policy reforms laid by the Government of Zimbabwe that are outlined in policies such as the Zimbabwe National Policies on ICT, The Transitional Stabilisation Programme and the projected SMART Zimbabwe Master Plan Vision 2030, that builds based on Science and Technology, ICT and innovation that can be utilised for productivity and economic development. Thus the paper recommends as the projected SMART Master Plan policy is to be adopted and implemented, it can adopt the national innovation system framework approach, implement the innovative success triangle approach as it would assist to realise the national and fiscal goals. Using the case of China, Zimbabwe can emulate the use of a national innovative system framework or approach to developing, meanwhile leveraging the friendly bilateral cooperation between the two countries for foreign direct investment (FDI).

4. Zimbabwe Innovation Policies (from 2016 to date).

The projected SMART Zimbabwe 2030 Master Plan, will seek to exploit the potential of ICTs so that Zimbabwe attains its vision of becoming an upper-middle-income economy by 2030. This vision is predicated on, among others, building on the achievements of the Zimbabwe National Policy on ICTs of 2016 - 2020 which further strengthens Zimbabwe's economic base and improves its economic environment for accelerated growth towards achieving a Digital Government, a Digital Economy and a Digital Society, by 2030. This SMART Zimbabwe 2030 Master Plan is built on the ground set by the Economic Strategic Plans set by the Ministry of Finance and Treasury; The Transitional Stabilisation Program (TSP) 2018-2020 which is superseded by the two 5-year National Development Strategy One and Two.

4.1. The Transitional Stabilisation Program (TSP) 2018-2020.

In 2018, The Government of Zimbabwe launched a Transitional Stabilisation Programme (TSP) in a bid to set the economy on a recovery path after years of stagnation. The programme, which runs from October 2018 to December 2020, was announced by Finance and Economic Development Minister Mthuli Ncube. "The vision will see Zimbabwe becoming a middle-income country with a per capita income of US$3500 per person."[19] The Transitional Stabilisation Programme acknowledges policy reform initiatives of the new dispensation to stimulate domestic production, exports, rebuilding and transforming the economy to an upper-middle-income status by 2030. According to the policy document, the Transitional Stabilisation Programme will focus on the following factors: stabilising the macro-economy, and the financial sector; introducing necessary policy and institutional reforms to translate to a private sector-led economy; addressing infrastructure gaps, and launching quick-wins to stimulate growth.[20] (Ministry of Finance and Economic Development: Zimbabwe Treasury). The shortterm programme will be superseded by two 5-year

14 Freeman C. The national innovation system in historical perspective. Camb J Econ. 1995; 19:5-24.
15 Metcalfe S. Innovation systems, innovation policy and restless capitalism. In: Malerba R, Brusoni S, editors. Perspectives on innovation. Cambridge/New York: Cambridge University Press; 2008. p. 441–54.
16 Liu XL, White S. Comparing innovation systems: a framework and application to China's transitional context. Res Pol. 2001:1091–114.
17 Gu SL, Lundvall B-A. China's innovation system and the move toward harmonious growth and endogenous innovation. DRUID working paper no 06-7. 2006.
18 Rowen H. Introduction. In: Rowen H, Hancock MG, Hall ME, editors. Greater China's quest for innovation. The Brookings Institution; 2008. p. 931–81.
19 https://www.tralac.org/news/article/13732-zimbabwe-2019-national-budget-presented-to-parliament.html
20 Zimbabwe Treasury (2019) http://www.zimtreasury.gov.zw/index.php?option=com_content&view=article&id=131:govt-launchestransitional-stabilisation-programme&catid=83&Itemid=613

Development Strategies, with the first one running from 2021-2025, and the second covering 2026-2030. In November 2020, the Ministry of Financed announced the National Development Strategies (2021-2025) which is an extension from the TSP. The Transitional Stabilisation Programme (TSP) outlines policies, strategies and projects that guide Zimbabwe's social and economic development interventions that will set the ground for more innovative reforms that will be aiming at targeting Vision 2030; whilst simultaneously targeting immediate quick-wins and laying a robust base for economic growth for the period 2021-2030.[21] The TSP sets the ground for the anticipated new ICT policy that is to be launched by the Government this year. The Government is crafting a new Information Communication Technology (ICT) policy to drive the growth of this strategically key economic sector over the next 10 years. As the Minister of ICT said, 'the ICT master plan will guide the sector's contribution to economic growth in line with Government's Vision 2030,'[22]

Importantly, this SMART 2030 Master Plan is based on the Transitional Stabilisation Programme that has sought in investing in public infrastructure, prioritising quick-win projects in energy, water and sanitation, ICT, housing and transport, with a focus on expediting completion of on-going infrastructure projects, that way contributing to the revival of the economy.

4.1.1. Components of the TSP Policy aligned to the National Innovation System[23]

Infrastructure Development

The Government continue to facilitate the development of the necessary infrastructure to meet the increased demand for the use of ICT service, which is mainly being done by the private sector. The Transitional Stabilisation Programme will, therefore, through the Universal Services Fund, enhance the development of telecommunications infrastructure in remote areas that are often sparsely populated and located in difficult geographical environments, and provide low returns on investment for service providers.

Digital Transformation

The Transitional Stabilisation Programme recognises that the digital economy offers immense opportunity for growth to the entire economy, against the background of the role ICT is revolutionising global business and offering multiple products and services. In Zimbabwe, infrastructure investments by such private companies as Econet Wireless are envisaged to play their part in contributing towards the set-up of the building blocks for digital transformation, attracting interest from local and international investors.

The Digital Economy

Harnessing the digital economy and digital entrepreneurship contributes significantly to economic growth, and has the potential of creating jobs for the youth and at low cost, benefitting from applications of digital platforms. Furthermore, studies have shown that SMEs grow by between 2 and 3 times faster when they embrace digital technologies to transform their business activities and provides opportunities for entrepreneurship.

Banking and Financial Sector

The TSP stated that the Reserve Bank will foster deeper and broader financial intermediation by requiring banking institutions to provide innovative and quality financial services and products under the development of the economy through financial inclusion of underserved segments. This will promote technological innovation spurred by increased globalisation and harness the potential of financial technology in contributing to economic growth and inclusivity. In this regard, the banking sector will benefit from developments in mobile technologies, cloud computing, big data, cryptography, and security technologies targeting the banking community.

Skills Development

The rapid advancement in technology is creating a huge gap between human skills and technology. The government will also prioritise coordination efforts towards the rollout of e-skills for better utilisation of ICT services, as well as ensuring that our people, particularly the youths become developers of ICT applications and technology. The Transitional Stabilisation Programme will, therefore, promote the development of human resource capacities in line with the attendant demand for higher technological and technical skills through enhancing the teaching of science and innovation subjects from early childhood learning up to tertiary education.

Research & Innovation

Central will be support for innovation and collaborative research among institutions of higher learning, in partnership with technology-oriented industry, taking advantage of opportunities and niches in the digital economy. This will also benefit from the Government's initiatives to establish research and innovation hubs across provincial capitals, which will provide the incubatory environment for young innovators & entrepreneurs, leading to the commercialisation of their innovative initiatives.

SMART Productive Sectors

Programme initiatives aim to drive sectoral growth in the productive sectors of agriculture, mining, and

21 https://zimbabwe.un.org/en/50093-zimbabwe-transitional-stabilisation-programme-2018-2020

22 https://allafrica.com/stories/202010200300.html

23 TRANSITIONAL STABILISATION PROGRAMME: REFORMS AGENDA - October 2018 – December 2020. Government of Zimbabwe, Treasury, 2018.

manufacturing which will be underpinned by market-driven policies towards support for value addition and beneficiation, reducing the need for predominantly subsidy oriented interventions. Government incentives for enhancing industrial productivity will be targeted at the promotion of innovation, and infusion of technology, including adaptation to suit the domestic production environment.

E-Government

The Transitional Stabilisation Programme targets broadening the adoption and utilisation of e-Government across Ministries, Departments, local authorities and State-owned enterprises in the provision of public services to cut loopholes for corruption. Online public service platforms foster arms-length relationships between public officials and the citizenry and, hence, reduce opportunities for graft. The use of ICTs by the Government also improves efficiency in the delivery of public services, simplifies compliance with Government regulations, and yields cost savings to citizens, whilst enhancing revenue generation to the State.

5. Challenges to the Innovation System faced by the current R&D in Zimbabwe.

5.1. Innovative Infrastructure

Currently, there has been stagnation in progress, as there has not been any notable realisation of the progress to 'SMART Vision 2030', especially innovative country construction. One of the key problems has been that the allocation of government organizations and government functions has not wholly met the demand of the national innovation system. The responsible government departments such as the Local Governance and the Office of The President and the Treasury to back up the innovation initiative has been the least minimal. Scientific research is out of touch with education, and technology innovation is out of touch with the economy. Further, much innovation activity has mainly been dominated by the private sector; in which the government have not taken strides to back such initiatives due to the stagnation of the economy. Meanwhile, the government has also been responsible for targeted sabotage to the private sector innovation which has led individual companies to seek better conditions in the Region. A case in point, Econet Wireless which has won Regional awards for one of the upcoming tech-hub and innovative companies, due to unfavourable policy regulatory structures in the country, it establishing some of its great innovations in countries such as Kenya, Nigeria etc. Although in the China innovative system framework, the top-bottom approach seems to have managed to attain the results for innovation and policies, it has also faced critiques to this approach. As the OECD (2008) suggested that China should adopt more bottom-up decision making and help the private sector to play a more important role.[24]

5.2. Enterprises as the main player in the innovation system.

Although it can be said that enterprises have been the main player in innovation basing on data such as R&D investment and patent application number, it can be also found that enterprises are not the real main player from views of the decision-making around innovation themselves, the major part of government innovation resource allocation and high-end innovative talents including those who want to establish their start-ups. Although the TSP highly stress the position that it wants to create a privateled economy, there is still a pivotal role of the public regulatory structure and backing that can be imperative to the national innovation system. The investment policies, trade policies, and intellectual property protection policies are not coordinated enough with the innovation policies.

5.3. Resource allocation.

Investment in innovation infrastructures such as large scientific or engineering facilities, laboratories, engineering research databases, and data and information databases is inadequate in Zimbabwe. Innovation resources, whether S&T infrastructure, innovation bases or R&D funds, are less likely deployed due to the current economic crisis. Much of the activity has been witnessed through the private sector and with less support from the government. The proportion of basic research on R&D funding has been the least of the total national expenditure for many years. Moreover, there is also an issue with the management of S&T and innovation funding. The most important problem is the lack of openness to the public and transparency. The expenditure of projects funds isn't enough to be open and fair either due to government officials' corruption antics or the misgovernance of the responsible departments.

5.4. The implementation of the innovation policies.

Although on paper, the policies are set in place to support innovation systems, much of the work is not done on implementing the policies. To date, there have been no implementing regulations and supporting policies for the Transitional Stabilisation Programme and even though we are reaching the end of its term and now looking to leap into the new SMART Zimbabwe Master Plan. Thus, there are no detailed regulations for instance on research institutions, technology transfer, S&T fund management, and service and non-service invention etc.

24 OECD. Innovation in science, technology and industry: OECD reviews of innovation policy: China/Paris: OECD; 2008.

5.5. The construction of the innovation culture.

Notable progress has not been made in the construction of the innovation culture to date. The bureaucratic, counterfeiting and impetuous cultures suffocate, harm, and restrict innovation culture construction. The scientific community is far from established, the development of scientific ethics lags, and the protection of intellectual property rights has a long way to go. Society overall has only a weak awareness of innovation culture. There are large gaps between the current creative talent nurturing model, curriculum design, teacher configuration, and education conditions and the demand of the innovative country. The building of knowledge capital through the development of cognitive skills has been dismal. This has been much been affected by a lagging economy that has stifled other government departments such as Education which has been marred with strikes thus leading to a failing department that is supposed to be the backbone of constructing the basis for cognitive skills that are useful to the innovative system.

5.6. Lack of venture capital for entrepreneurs.

Venture capital means funds made available for start-up firms and small businesses with exceptional growth potential. Venture capital is money provided by professionals who alongside management invest in young, rapidly growing companies that have the potential to develop into significant economic contributors. However, due to the deepening economic crisis in the country, the government resource allocations for start-ups has not been realised leaving much of the responsibility to private actors that are burdened to cater for much.

6. Conclusion and Recommendations

Understanding this paper using the Mercantilism perspective on national interest, one can point that following the innovation systems framework can be a key to unlocking Zimbabwe economic development. Whilst also understanding a clear cut example of China national innovation system, noting that this paper has tried to juxtapose the case and history of China's national innovation system and found that China was gradually being transformed from a technology innovation system to a national innovation system. Likewise, emerging economies such as Zimbabwe's economy can emulate such a framework. Henceforth, in the construction of an innovative country, to achieve the goal of a national innovation system, Zimbabwe not only needs to optimize the innovative success triangle but will need to fall through to its implementation and backing of the policies.

1. The first is to establish an effective business environment that includes the institutions, activities, and capabilities of a nation's business community as well as the broader societal attitudes and practices that enable innovation. As already exists in Zimbabwe much of innovation and technological innovation has been led by the private actors, such as Econet Wireless which has established itself as an innovation powerhouse in the region. Moreover, the TPS and the just-launched National Development Strategy 1 (2021-2025) has stressed the position to have a private-led economy, therefore, one can argue this can be imperative to the establishment of a business environment that can enable innovation. Factors specific to business include high-quality executive management skills; strong IT (ICT) adoption; robust levels of entrepreneurship; vibrant capital markets that support risk-taking and enable capital to flow to innovative and productive investments easily and efficiently; and a business investment environment that strikes the right balance between short- and long-term goals. Broader factors include a public acceptance and embrace of innovation, even if it is disruptive; a culture in which inter-organizational cooperation and collaboration are embraced; and a tolerance of failure when attempting to start new businesses.

2. The second is to enable an effective trade, tax and regulatory environment feature, a competitive and open trade regime. This includes serious efforts by the government to protect its local indigenous businesses against foreign mercantilist practices; support for competitive markets such that new entrants, introducing new innovative business models to suit the economic environment that allows businesses to flourish. Also, the Government of Zimbabwe has to introduce processes by which it's easy to launch new businesses and to bring innovations to market this may include the enterprise registration processes that has to be less stringent has been evident in Zimbabwe where most entrepreneurs have ended up resorting trading illegally due to the stringent compliance regulations. There is also a need for good governance that prevails in the county, this involves transparency and the rule of law for both local markets and foreign markets, a case in point one can note the infamous Indigenisation Policies which has been heavily criticised. Moreover, reasonable business tax burden, especially on innovation-based and globally traded firms; a strong and wellfunctioning patent system and protection of intellectual property; regulatory requirements on businesses that are, to the extent possible, based on consistent, transparent, and performance-based standards; limited regulations on the digital economy; limited regulations on labour

markets and firm closures and downsizing; a balanced approach to competition policy; and government procurement based on performance standards as well as open and fair competition. To be sure, a good regulatory climate does not mean simply the absence of regulations. Importantly, it should be noted that the government of Zimbabwe need a regulatory climate that supports rather than blocks innovators and that creates the conditions to spur even more innovation and market entry, while at the same time providing more regulatory flexibility and efficiency for industries in traded sectors.

3. The final leg of the innovation triangle is a sophisticated and strong innovation policy system. While markets are key to innovation, without an effective innovation policy, markets will underperform. An innovation policy system includes generous support for public investments in innovation infrastructure (including science, technology, and technology transfer systems); support for digital technology infrastructures (such as smart grids, broadband, health IT, intelligent transportation systems, e-government, etc.); targeting R&D to specific technology or industry research areas; funding sector-based industry university-government research partnerships; reshaping the corporate tax code to spur innovation and IT investment, including R&D and capital equipment and software incentives; a skills strategy, including highskill immigration and support for science, technology, engineering, and math (STEM) education; encouraging private-sector technology adoption, especially by small and mid-sized manufacturers; supporting the regional industry. Further, this will go a long way to build an innovation culture that has to be embraced from the education department in schooling institutions going further to institutions of higher and tertiary education.