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Innovation, Social Policy and Improvement of the Quality Of Life of Citizens in Nigeria

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***Abstract*:** *Using the Economic Recovery and Growth Plan (ERGP) as the development plan framework encapsulating the technology domain of Nigeria and the National Social Protection Policy (NSPP) as the policy ecosystem and tool, we examined the technology – policy interface as mediated by innovation in Nigeria. The paper utilized recent field data and national vast troves of data for its analysis and policy recommendations. The recent rethinking on the role of technology as policy performance enhancer posits the possibility and desirability of applying flexible technological innovativeness to cater to all efforts and diversity, including policy ecosystem. The argument is that policy infrastructure and ecosystem itself must benefit from the application of innovative technologies to its activities to unleash its full capacity on delivery of services for the attainment of quality of life for the citizens. Although there are currently many social technologies in Nigeria, it could, however not be established how technological innovativeness shapes or influences the policy ecosystem. There are no empirical studies and data in Nigeria to permit such analysis. This sets the exciting recommendation of urgently launching the broad national innovation studies initiative.*

Keywords: Innovation, Techno – policy connections, social technology

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I. INTRODUCTION

The convergence theorists should be in expansive celebration mood today. Back in the 1970s and early 1980s they had anticipated the synergy in human enterprises to make improvements in the lives of people everywhere in the world. Technology and the efficacy of collaboration it has unleashed, particularly since in the information communication technology (ICT) revolution, has guaranteed the realization of this global desire. Whether the endeavour is presented as globalization or sustainable development goals (SDGs), the common driver of success is technology. Technology, in its various forms, underpins the mandate delivery of virtually every sector and wealth creating activities in society. However, this notion of the universalism of technology is a product of recent thinking, spearheaded by the expansion of borderless or seamless innovation into economic and social domains, a departure from the early orthodox view of technology being a silo monopoly of the hard, mechanical world. The emergence of the soft, social technologies have opened wide opportunities for the application of social innovation to finding solutions to government and social services challenges to deliver with maximum efficiency and effectiveness on the mandates that improve the quality of life of citizens.

Innovation is the power behind the success of technology in providing solutions to a wide range of societal problems. Innovation, as a concept and process, has witnessed unprecedented upsurge in the last two decades. There have been a wide range of flexible technological innovations, including social innovations that have emerged to cater for the diversity in the identified four segments of societal endeavours – creation of knowledge capital, enhancing economic competitiveness, improving the general wealth creating capacity and enhancing the quality of life of each segment of the population (Perez, 2000). Today, technological innovativeness is used as a measure of a nation's advancement.

Innovation has taken the centre stage in development discussions and practice. For example, the theme of recent global and local summits and conferences revolves around innovation. The 10th Convergences World Forum held in Paris, France on September 4-5, 2017 had as its theme: 'Together, Let's Innovate for a 3Zero World'. The 8th World Innovation Summit for Education (WISE) scheduled for November 15-16, 2017 in Doha, Qatar has as its objective to consider the latest innovation, research, reforms and trends. The just concluded 2017 World Bank Annual Meeting held on October 10-14, 2017, Washington, D.C, dedicated sessions to discuss and demonstrate technology and innovation. The 23rd Nigerian Economic Summit (#NES 23) held on October 10-12, 2017 in Abuja, Nigeria had as its third objective to set out a reviewed framework for entrepreneurship and innovation. For the first time in its over two decades' history, NES included its first start-up Pitching Event, with the sub-theme 'Creating Opportunities for Start-ups' aimed at connecting venture capitalists to entrepreneurs (innovators and dreamers).

Today, global, national and sub-national development frameworks and programmes rely on the application of what the World Bank calls 'solutions-minded technology' to unlock their grids for successful implementation. It is said of the Sustainable Development Goals (SDGs), 'there isn't an SDG that would succeed without the internet'. The ubiquity of technology is not in doubt especially as the world approaches the 'Internet of Everything' era (Igoe and Edwards, 2017). For example, achieving SDG1 (End poverty in all its forms everywhere) calls for all men and women having access to basic services and appropriate new technology (SDG1.3). The last SDG (Strengthen the means of implementation and revitalize the global partnership for sustainable development) seeks strong policy framework supported by knowledge, expertise, technology and financial resources (SDG17.14 & 16).

The SDG's imperative cascades to national development architecture. The current Nigerian development framework is the Economic Recovery and Growth Plan (ERGP) 2017-2020, a Medium Term Plan. ERGP is developed consistent with SDGs and aimed at eliminating the bottlenecks that impede innovation and market-based solution. Accordingly, it recognizes the need to leverage science, technology and innovation (STI) and build a knowledge-based economy (FMBNP 2017A:13). At the core of SDGs is providing citizens a life of wellbeing with inclusion and provision of basic social services. ERGP endorses this goal and is presented as 'innovative where science and technology will be efficiently harnessed to drive national competitiveness, productivity and economic activities in all sectors'. In fact, the plan anticipates and encourages 'the use of science, technology and innovation to drive growth' (FMBNP, 2017A:13-14).

Innovation has been assigned a huge transformational role in the improvement of the quality of the life of citizens basically because it interfaces technology and policy. Social technology is considered as policy performance enhancer. It is innovation that creates the enhancement. While it is true that innovation, the force behind technology, is universal in application to all fields of human endeavours, it is doubtful if technological innovativeness has fully permeated and influenced the policy ecosystem in Nigeria to strengthen it for optimal delivery of services. Policy is the tool through which development programs are delivered and the quality of the deliverables are as good as the capability of the policy infrastructure is.

Only recent literature points to the possibility and desirability of applying flexible technological innovativeness to cater to all efforts and diversity, including policy ecosystem (Perez, 2000). Hitherto, much attention had been focused on the potential of technology, especially ICT, to engender economic development via boosting the entrepreneurship of the young population (building skills, invention, establishing business and job creation). But policy infrastructure and ecosystem itself must benefit from the application of innovative technologies to its activities to unleash its full capacity on delivery of services. It is commonplace to easily overlook the necessity of strengthening the capacity of the instrument through which improvements, including STI, are delivered within nation, institutions and organizations. Policy is that instrument. The National Social Protection Policy (NSPP) recently adopted by the Federal Government of Nigeria (MBNP, 2017B) approximates the expectations of both SDGs and ERGP. Paradoxically, as its anticipatory assessment reveals, NSPP is in urgent need of technological infusion at the point of implementation to succeed in delivering a life of wellbeing and dignity to the citizens (Ukpong, 2017).

The trend is rethinking the role of technology and innovation beyond the conventional mechanical setting to include their influence in every sector of economy and society. Ironically, while this possibility has been admitted, very little focused attention is paid to how technology and innovation can be seamlessly applied to policy infrastructure and ecosystem to enhance its delivery capacity in economic and social activities as well. It is time to seriously consider social technology as policy performance enhancer. The notion of universalism of technology and the continuous widening of the scope of innovation have inspired this thinking. This paper seeks to encourage the debate and current thinking on the role of STI on policy strengthening for optimal delivery by highlighting those areas in which social technology can be applied to enhance, shape or strengthen policy performance, using ERGP and NSPP as substantial evidence.

Data

Two sources provided the data for this study. Field data collected in 2012-2016 for the drafting of the NSPP exist and had been utilized for similar purpose as this (Ukpong, 2017). In 2001, at the national level, an international conference on ICT was organized in Abuja. Being the first of its kind in Nigeria, the conference yielded rich resource/data that have been preserved (Anyanwu and Ukpong, 2002). At the sub-national level, AkwaIbom state organized two conferences on science and technology in 2000 and 2002 respectively. The data and related resources have been secured (Asuquo, 2003). Fortuitously, the author of the article played lead and key role in the events. According to World Bank (2017) institution's vast troves of data can be directly used to create models and make policy recommendations. However, a 'variety of judgment calls' to validate the interpretation of the array of data is necessary (McArthur and Rasmussen, 2017). This procedure was followed.

Conceptualizing Techno-Policy Innovativeness

There is a consensus that (science and) technology drives the major changes and development generally, in the world. But it is policy that shapes the direction and character of technology. Technology has the capacity to enhance the delivery capability of a policy. Technology and policy interface. The susceptibility of the policy ecosystem, like other sectors, to the advancements of technology is the chasm of innovation (Ukpong, 2009 and 2002; Perez, 2000). Chowdhurry (1998) had earlier listed the role of information and communication technology (ICT) in particular to include capacity strengthening. Thus, it is logical to expect policy infrastructure and ecosystem to benefit from the application of innovative technology to unlock its full capability for optimal delivery of mandates and services.

However, the interrelationships are not exactly this simple as stated here. This is particularly so as changes have taken place in broadening the meanings of concepts and phenomena addressed here. This calls for a brief elaboration in this sector.

Traditionally, technology is defined as 'the application of scientific study and use of mechanical arts to practical tasks in industry, the processing of goods and services, and commercial objectives. It is the entire body of methods and materials used to achieve industrial or commercial objectives' (Essien, 2003:80). Technology has been viewed as the demarcating index between the developed and developing world. But there has been a fundamental shift in the conceptualization of technology to move away from the limited, silo-perspective (Perez, 2000). The holistic and pragmatic view of technology is that it is a utility and source of power. In this perspective, technology is seen to have its domain beyond the mechanical arts and applied sciences to include its unleashing impact on obtaining optimal social and economic results (Ekpo and Umoh, 2003). It is this seamless perspective that underscores the notion, potentially, of the universalism of technology, where the advanced knowledge of science and technology is being applied to virtually every aspect of human life and the society. The borderless, universal application is made possible through research and development (R&D).

There are fundamental changes and widening of the scope of technology (see Table 1). This has been made possible by constant rethinking of the possibilities of technology. Today, the concern is to bring technology to directly impact the quality of life positively (Hassan, 2000). The technological revolution that emerged in 1970s is intensifying and opening limitless opportunities and transformations. Of particular interest, worthy of note, is the widening of the scope of technology to include organizational, managerial and social capabilities and know-how geared to enhancing the quality of life of the citizens (Perez, 2000:46). The implication is that there are new technologies which have applications outside the old, orthodox mechanical context. They have been variously called social tools, flexible technologies, emerging technologies, social technologies or soft applications (apps) (Goddard, 2017; Cheney, 2017).

Table 1: SCIENCE AND TECHNOLOGY PARADIGMS

	Previous paradigm (1950s-70s)	**Present paradigm (from 1980s)**
Focus of technological efforts	Mainly manufacturing industry (to escape from raw materials dependency)	All wealth-producing activities, from raw materials to information and social services
Type of technology pursued	Tangible technology (embodied in equipment and products, while human know-how was about using them)	Tangible and intangible technologies (not only software and design, but also organizational know-how)
Aim of technological development	Radical innovations, patentable products which can be "sold" and/or processes that can be "packaged"	Radical and incremental innovations. Those that can be sold and those that imply constant modifications, adaptations and improvements (which make a difference in results, but cannot be sold as such).
Where and by whom is technology developed	In R&D departments inside firms or in university institutes by scientists, engineers and technologists	In firms, in institutes and between them, done by all members of society
What is innovation in society	Innovation is a "job" in a specialized organization	Innovativeness is the way of living and working in the knowledge society
Range of application and perception	Hard, visible instruments as magic wands	Invisible systems and hardwares as solutions providers or enhancers

Source: Adapted from Perez(2000) P.45.

Driving the technological revolution or change is the force called innovation. Innovation, specifically technological innovation, itself is progressive as anticipated in Kondratieff's waves of innovation (in five phases or waves, the first starting in 1785 and the fifth with dominant digital characteristic tapering off after 2020). The last two decades have witnessed unprecedented global upsurges in innovations and innovation itself has taken broader meaning. The current, broad meaning of innovation makes it more and more variegated, complex and comprehensive in scope. It involves the upgrading of all technologies, affecting all sectors and wealth creating activities in society (Thomas, 2000:54-55).

While the conventional view of innovation is radical change at the frontier of an industry, the liberal or broader understanding is that it covers continuous improvement in product design and quality changes in organization and management routines, creativity and modifications inproduction and processes that bring costs down, for example, increase efficiency and ensure sustainability (Myteika and Ohiorhenuan, 2000). The scope of innovation is broad, covering as well and required even more urgently in government and social services to deliver management and well-being with maximum efficiency and effectiveness. It is innovation that creates the flexible and adaptable technologies required to cater for this diversity. Diversification of technological innovativeness covers all efforts in the four segments of societal endeavours- creation of knowledge capital, enhancing economic competitiveness, improving the general wealth-creating capacity and enhancing the quality of life of citizens/population (Perez, 2000:46-47).

Goddard (2017) deepens our insight on the broader meaning of innovation thus: 'some people think innovation is only about gadgets, high-tech industries and laboratories….the truth is that there are many types of innovation that can have a transformational impact on everyday peoples lives'. An example of an app and social tool developed by a South African start-up, Sweep South, is named in this direction. This points to the emergence of a new category of innovation called 'social innovation', that is focused on contributing to poverty reduction by making goods and services more affordable for the poor and increasing the quality and outreach of public services. The tele-medicine apps are categorical example here. Technology, particularly social technology, is considered as policy performance enhancer.

Innovation functions in strategic and important ways. It brings interconnection, strategic linkages, cooperation and mutually reinforcing policies within the technology triangle-producers of knowledge and skills, multipliers of knowledge and enablers of knowledge and skills(Ukpong, 2002:25-26, Choucri, 1998:46). Innovation interfaces technology and policy through the innovation triangle - the tripartite relationship between the three main actors-science and technology infrastructure, the production structure and government policies. The desire to deliver optimal services compels the yielding of the leadership of the public services to the technocrats, who are considered to be innovative and experts (Ekanem, 2011). The technocrats are expected to validate the creed that innovation spurs competitiveness and builds prosperity (Uzonwanne, 2000). Perhaps the most strategic function of innovation is engendering technological transfer through leapfrogging and networking (Choucri, 1998). This is achieved by constantly reacting to the change factors, called innovation drivers that confront the system-nation, state, industry and firm (see Table 2).

Table 2: **Innovation drivers and inherent opportunities and threats**

Change factor	Opportunities	Threats
Growing role of knowledge	• Possibility of leapfrogging in selected areas of economic growth • Resolution of social problems (food security, health, water supply energy, environment)	• Increasing knowledge gap among nations • Redundancy for learning laggards
Technological revolution (ICT)	• Easier access to knowledge and information • Low cost tech (apps) Emergence of flexible technologies for diversity • Increase quality and outreach of public services	• Growing digital divide among and within nations, MDAs
Global labor market	• Easier access to expertise, skills and knowledge embedded in professionals • Access to best practices and bench-mark	• Growing brain drain and loss of advanced human capital • Growing higher cost for experts
Demand for prompt policy responses (political and social change) • Spread of democracy • Violence, corruption, and crime • HIV/AIDS, etc	• Positive environment for reform • Linkages to public sector progress	• New resources required to meet growing expectation • Growing brain drain and political instability

Source: Adapted from Ukpong, 2010:21.

The Innovativeness of Nigerian Environment

Innovation is about management as much as technology (Chavez, 2017). In assessing the level of innovativeness of a setting, it is important to look at both the hard and soft elements as well as the processes and products of technology. Goddard (2017) had inadvertently identified the basic indices for measuring innovativeness in the simplest setting. Such include ascertaining the start-up apps (with international recognitions) that are linked to critical needs or everyday activities of the society and citizens, looking at the

number of business incubators, accelerators and innovation centres that have been spawned, especially those providing access to previouslyunattainable resources, services, networking capabilities, etc., determining programmes that link entrepreneurs and innovators to bring new products to the market, creating jobs, promoting growth and reducing poverty, accounting for research and development (R&D) programmes and increasing scope as well as taking stock of institutions and policies that engender innovativeness.

There is no holistic mapping of the Nigeria innovativeness environment along the identified criteria that is easily available. There are however studies that elaborate on the historical and general character of Nigerian STI (Adeoti, Odekunle and Adeyinke, 2010, Okongwu, 2003 and Essien, 2003). Siyanbola*etal* (2012) offer an interesting vistas on the subject by presenting regional landscape of indigenous technologies. He presents the innovativeness of clusters of leather tanning, aluminium and bronze casting located at different geo-political zones of Nigeria. He suggested the possibility of regional characterization of Technology Business Incubators (TBIs) based on local skills and infrastructure.

The earliest efforts at injecting innovation into Nigerian system targeted institution building and policy setting. The research centres on agriculture and medicine established in the 1960s were pooled to form the Nigeria Council for Science and Technology (NCST) in 1970. Then followed the National Science and Technology Development Agency (NSTDA),1977 and a full-fledged Federal Ministry of Science and Technology (FMST) in 1979 and with it the six Federal Universities of Technology which were mandated to provide the technological leap. A national Science and Technology policy was formulated in 1995 and reformulated in 2001. In 2012 a new and enhanced National Policy on Science and Technology was adopted aimed at fighting poverty and deprivation. For the first time, policy recognized STI as a key tool of transformation. However, its implementation is said to be laggardly.

Further agencies were established under FMST to accelerate innovation in the country. They are in three broad areas of science namely:

1. Health science

(i) Nigerian Institute for Medical Research (NIMR) at Yaba in Lagos

(ii) National Institute for Pharmaceutical Research and Development (NIPRD) at Idu, Abuja

(iii) Nigerian Institute for Tryponosomiasis Research (NITR) in Kaduna and its school of Medical Laboratory Technology in Jos.

2. Industrial science

(iv) Federal Institute of Industrial Research Oshodi (FIIRO) in Lagos.

(v) National Office for Technology Acquisition and Promotion (NOTAP) in Abuja.

(vi) National Research Institute for Chemical Technology (NARICT) in Zaria.

(vii) Nigerian Building and Road Research/Institute (NBRRI) in Abuja.

(viii) Project Development Institute/Agency (PRODA) in Enugu.

(ix) Raw Material Research and Development Council (RMRDC) in Abuja.

(x) African RegionalCentre for Engineering Design and Manufacturing (ARCEDEM) in Ibadan.

(xi) Energy Commission of Nigeria (ECN) in Lagos.

(xii) National Agency for Science and Engineering Infrastructure (NASENI) with five satellite centres namely:

- Centre for the Adaptation of Technology (CAT) in Awka.
- Hydraulic Equipment Development Institute (HEDI) in Enugu.
- Scientific Equipment Development Institute in Enugu (SEDI-E).
- Scientific Equipment Development Institute in Minna (SEM-M).
- Engineering Material Development Institute in Akure (EMDI-A).\

3. Agriculture and Natural Science

(xiii) Nigerian Stored Product Research Institute (NSPRI) in Ilorin.

(xiv) National Centre for Genetic Resources and Biotechnology (NACGRAB) in Moore Plantation, Ibadan.

There are additional Research and Development Agencies/Projects which are concerned with technological products and development. Some have direct responsibility for entrepreneurship development. They are the second generation institutions and include:

1. National Centre for Remote Sensing (NCRS) in Jos
2. National Centre for Technology Management (NACETEM) in Ile-Ife
3. United Nations Center for Space Science and Technology Education at ObafemiAwolowo University, Ile-Ife.
4. Regional Programme for Technology Management (REPTEM) in Lagos.
5. Sheda Science and Technology Complex (SHESTCO) in Abuja.

6. Technology Business Incubator Center (TBIC) in Aba.
7. Technology Business Incubator Center (TBIC) in Kano
8. Technology Business Incubator Center (TBIC) in Lagos
9. Technology Business Incubator Center (TBIC) in Mina
10. Technology Business Incubator Center (TBIC) in Nnewi
11. Technology Business Incubator Center (TBIC) in Calabar.
12. College of Chemical and Leather Technology (CHELTECH) in Zaria.

Additional TBICs were subsequently established in Warri, Uyo, Maiduguri, Bauchi, Gasau, Sokoto, Zuru, Benin and Igbokoto in Ondo state.

It is interesting to note that each of the 36 states and FCT is expected to establish a Ministry (or Bureau) of Science and Technology, which have hardly been done. Also and more importantly, of all the three post-1960 categories of institution/agencies established, none was set up to strengthen 'technologically' or innovatively the policy products of the government. This might have been intentional as the Nigerian Institute of Social and Economic Research, Ibadan which was earlier set up was expected to discharge this role.

The third category of institutions to emerge has been the regulatory type for which the National Information Technology Development Agency (NITDA), an agency under Federal Ministry of Communication, was established in 2001 at the apex of this category. It is also to coordinate IT development in the country. NITDA has established 660 IT centres since its inception. The existence of NITDA has provoked the establishment of related organizations such as the Nigeria Computer Society (NCS), the umbrella organization of all IT professionals. It emerged in 2002 out of the Computer Association of Nigeria (COAN) for the advancement of IT science and practice. NITDA has two subsidiaries under it- Office for Nigerian Content Development in IT (ONC) and the Office for IT Innovation and Entrepreneurship (OIIE) to develop vibrant and world class indigenous IT industry in Nigeria, create digital jobs and enhance local content through entrepreneurship. There are other regulatory agencies both at industry and national levels such as the National Communications Commission (NCC).

Nigeria silently entered a new phase in institution building and human capital formation efforts for technological innovativeness when the Federal Ministry of Education through the National Board for Technical Education (NBTE) in 2007 decided to select and license some tertiary institutions, both public and private, to kick-start Innovation Enterprise Institutions (IEI) for the production of professionally skilled ICT graduates in the country. The impact of this innovation is not yet known as there no studies yet on the programme.

The expected immediate outcome of these institution-building, regulatory and practical efforts is the availability of flexible technological applications (apps), the adoption of same and commitments to aligning functions and activities to the protocols of the emergent technologies. There is no avalanche of indigenous technological apps yet but Nigeria is generally receptive to technological advancements as demonstrated by the citizens' excitement and versatility with mobile phone and internet so far.

There is innovation deficiency in Nigeria, a problem attributed to low and skewed pattern of expenditure on R&D. (Elebeke, 2016, Adeoti, Odukunle and Adeyinka, 2010). This notwithstanding, Nigeria has demonstrated prodigiousness in local innovativeness in software (application) development and entrepreneurship as documented by the Institute of Software Practitioners of Nigeria (ISPON). It is to the credit of local, Nigeria innovators that REMITA, the software driving the national single treasury account (TSA), had been created. TSA is to check corruption in the country. The software driving the about-to–be-launched Security and Safety Network Operating System (SNOS) in a product of Nigerian innovation. The software senses smoke, fire, gas and water leakages, sends alert via SMS, e-mails, and do more.

The various levels of government in Nigeria have endorsed public services reforms which call for innovation. E-government is accepted in the country (FMBNP, 2017A,Ikoh, 2011, Nkang, 2010). The most recent bold and visible expression of government's desire to further deepen the penetration of technological innovation is conveyed in the Executive Order No. 003 – Support for Local Content in Procurement by Ministries, Departments and Agencies of Federal Government of Nigeria issued on May 18, 2017. No doubt, the available innovative technologies tilt in favour of supporting the knowledge-based economy and the creative society.

Social Policy Milieu

There are two general assertions of policy ambivalence usually expressed about Nigeria. The problem with Nigeria is not a lack of policy but implementation of any. Umo (2012), in affirmative manner, pointed out that within three decades, the Federal Government alone had put in place about forty major policy programmes and projects for tackling the challenges of employment and poverty but without making a dent on the twin challenges. The second is the sad narrative that Nigeria has not recorded significant progress in translating its rich potentials and impressive economic performance into improved wellbeing for the generality of Nigerians.

The new explanation and consensus is that for too long, the mistake of playing growth against inclusion had been accepted within the policy and planning circle. In other words, economic and political policies had been given primacy of place while social policy was considered as an adjustment variable, a mere consequence of other polices and exclusively in terms of cost (AU, 2008). Every policy misplacement has huge cost (Ukpong, 1989). The prevalent consequence has been open poverty, income inequality, malnutrition, unemployment, social exclusion and insecurity, among others.

Social policy is considered the appropriate tool to address the gap and its consequences. Social policy has productive role and therefore should be considered up-front and as an investment. By strengthening social policy, it means investing in the people-in active labour market, social inclusion, active ageing, education, health and lifelong learning. The African Union Commission considers social protection as the basic function of social policy. Social protection is an active instrument of intervention, comprehensive in nature and not limited to the traditional measures of social security (Ukpong, 2017, AU, 2008:8-11). Social protection models and deflects the quality of life. The global experience is that it is 'countries with the most effective social protection system and with the most developed social partnerships that are among the most successful and competitive economies in the world' (Richelle, 2012).

On July 19, 2017 the Federal Executive Council formally adopted Nigeria's National Social Protection Policy (NSPP). NSPP is an umbrella policy, expressing the commitment of the Government of Nigeria to effectively mobilize and utilize national resources to improve the quality of life of its citizens. The summary of the provisions of NSPP is given here.

For its purposes, NSPP defines social protection as:

'a mix of policies and programs designed for individuals and households throughout the life cycle to prevent and reduce poverty and socio-economic shocks by promoting and enhancing livelihoods and a life of dignity'. The overreaching goal of the NSPP is to establish a gender-sensitive and age-appropriate framework to ensure a minimum social floor for all Nigerian citizens for a life of dignity. This follows a life cycle approach, with ten specific objectives it intends to achieve, including

- Reduce poverty among the people vulnerable to being poor;
- Empower the poor and people vulnerable to economic shocks;
- Provide guiding principle for managing social protection projects and programs;
- Protect individuals and households from shocks that can make them fall into extreme poverty; and
- Promote synergy and coordination among all social protection intervention agencies.

The policy is to be implemented following a transformative social protection framework, which takes into consideration both economic and social forms of vulnerabilities.
The policy measures (PM) designed for implementation are 16 and are classified into 8 categories as follows:

Education and Health Services,

1. Free school meals will be provide to all pupils in primary schools;
2. Scholarship, learning materials, uniforms and cash transfers to children from poor households and children living with disabilities;
3. All children and adults living with disabilities have access to free health care, education, and require special services and assistive devices;
4. Free health care services for pregnant women, lactating mothers, children under-5, the aged (people over 65 years old) and people living with disabilities; and
5. Universal access to Health Insurance Scheme (HIS) or CBHIS and other social health insurance scheme.

Social Welfare and Child Protection

6. Health services, emotional support, and counselling for victims of child labour, child abuse, child rape and human trafficking.

Social Housing

7. Decent and affordable housing for the homeless, the monetary poor, and families living in overcrowded and unhealthy conditions.

Livelihood Enhancement and Employment

8. Unemployment insurance and non-cash unemployment benefits for job seekers;
9. Labour based conditional cash transfer/public works programs for youths, persons with disabilities and the unemployment;

10. Provide support for sustainable livelihood through skills training, access to land, input for smallholder farmers, affirmative action for youth and women's employment, and access to micro and small enterprises and finances and
11. Provide affordable child care services for children under 5.

Social Insurance Scheme

12. Provide cash transfer to families and cash for work schemes which are activated at the onset of emergencies.
13. Contributory and non-contributory pensions available to all citizens over 65 years old.

Social Assistance

14. Cash and food grants for poor families, orphans, street children, and persons vulnerable to harmful traditional practice.

Traditional Family and Community Support

15. Support existing family and community-based mechanisms and systems for the intended beneficiaries to respond to shocks and extreme poverty.

Legislation and Regulation

16. A legal framework that specifically protects intended beneficiaries including children through inheritance rights, birth registration, child care services and breast feeding.

The issues of targeting and registration are addressed in pursuit of one of the fundamental principles of the NSPP being universality. Appropriate targeting schemes and canvassing mechanisms are outlined in the policy. Graduation and exit provisions are also made.

Finally, NSPP addresses the important issues of coordination and integration. Interventions are expected to be delivered in a coordinated manner and the institutional framework for achieving this is specified (FMBNP 2017 B).

So far, NSPP has generated much national enthusiasm. The current administration's Social Investment Programme (SIP), the largest single social intervention in the history of Nigeria, is anchored on a social protection framework. A number of state governments have developed their state specific social protection policies, including Osun, Jigawa and Zamfara states. The international development partners, notably UNICEF, World Bank, DFID, Save the Children International and Action Against Hunger have supported the development and implementation of NSPP as well as committed additional measures towards the cascading of NSPP to the state level. But some challenges are being anticipated at this stage of implementation of NSPP. The issues of vague conceptualization of social protection, dearth of skills and tools for implementation, being a new field of endeavour, and the absence of lead institution are prominent ones (Ukpong, 2017;2016). Massive policy strengthening would be required to address these challenges for optimal delivery. This is where social technology is required to 'engineer' solutions.

The Techno-Policy Connections

Techno-policy connections refers to the positive bearings of technology on policy as mediated by innovation and applied by technocrats (policy managers and administrators). As Mytelka and Ohiorhenuan (2000:75) have demonstrated, the real issue developing countries like Nigeria must understand and act upon is not simple about the acquisition of technology but the 'ability to master it and to innovate', noting that 'the innovation process itself grows out of a multiplicity of interactions between producers and users of knowledge, goods and services and the policies'.

Technology affects, and potentially can be harnessed and applied in all facets and activities of human life (Karsten and West, 2015). The renewed commitment of the Government of Nigeria to improve the quality of life of the citizens is contained in ERGP as a development planning framework and in NSPP as a policy tool. Both share perspectives in goals, action plans and possible limitations to their executive capabilities. It is in the common interest of innovators, citizens and policy community to optimize the delivery of the provisions in the development blueprint (ERGP) and program instrument (NSPP), both promoted by the same Federal Government Ministry of Budget and National Planning (FMBNP). Which provisions require policy strengthening for implementation and what social technology/innovation should be applied?

As already stated in the introductory section of this article, ERGP is conceived as an innovative plan expected to leverage STI to drive national economic, social and environmental issues on sustainable basis. The vision of ERGP is to significantly grow the economy and achieve maximum welfare for the citizens. The main strategy for attainment of the goal is the promotion of Digital-led growth, building on the smart Nigeria Digital

Economic Project to increase the contribution from ICT and ICT-enabled activity to GDP. EGRP sets out 60 strategies with which to attain its vision (FMBNP, 2017:136-164). The strategies that are central to the maximization of citizen's quality of life are aligned with NPP's policy measures (PM) and provisions and the possible social technologies innovations that can optimise policy performance are suggested (See Table 3).

Table 3: Quality of Life Provisions and Policy Performance Enhancers

SN	EGRP Strategy/Key Activities	NSPP PM/Key Activities	Possible Techno/Innovation APPs
I	#3. Cut cost through optimization initiatives • BVN, IPPIS	Institutional framework • Coordination & Integration • N & E	Digitalization
2.	#12. Promote Innovation and Tech-led industries • Science parks & Innovation hubs • Entrepreneurship & Innovation	Livelihood Enhancement PM. 9 – Public Works programme for youths	
3.	#16. Promote ICT Sector • Hard & Software Development • Fund entrepreneurship	Livelihood/Employment PM. 10 – Support for training& access to financial services • SMEs	
4.	#42. Social Safety net • Conditional cash transfer • Home Grown School Feeding Programme	Education/Health/Social Assistance PM 1. Free School meals PM 2. Cash and non-cash transfers PM 13. Cash transfer & works schemes	• Digital identification system • Mobile Tech
5.	#43. Social Programmes for aged and physically challenged • National relief programme • Adapted infrastructure	Livelihood/Employment/Social Insurance/Assistance PM 9. Labour based cash transfer and public works for persons with disabilities PM 12. Contributory Pension/Food & non-food grants to 60+	• Digital identification system tech • Digital tech - Digital currencies - Interoperability platform
6.	#44. Job Creation • Volunteer Corps • Construct housing units • Enforce local content policy	Social Housing/Livelihood/ Employment PM 7. Affordable housing PM 9. Labour based cash transfer/ public works for youth PM 10. Sustainable livelihood through skills training, access to financial services and affirmative action	Social tool/app • Labour market linked apps • e-commerce apps
7.	#45. Improve employability • Training • Skills acquisition centres • Internships/traineeships • National manpower policy	Livelihood/Employment PM 10. Sustainable livelihood through skills training, access to financial services and affirmative action	• New or emerging technologies • Networking - Electronic venues
8.	#49. Improve Transparency in management of public resources	Institutional Framework • M & E as tool • Performance measurement	• Mobile Apps • Open software apps
9.	#52. Centralized Identity Management • Data Sharing and management	Legislation/Regulation/Targeting/ Registration PM 16. Legal Framework that protects rights • Birth registration • Universal coverage	• Digital identification system • Digital Tech on data collection - Mobile phone - Satellite imaging
10	#55. Leverage technology to improve public service productivity • e-government across	Institutional Framework • M & E	• Identification tech - Digital - Biometric
11	#56. Develop skills of public servant • Institutional capacity in planning, policy analysis, leadership, etc.	Institutional Development Invest in capacities Action plan on training, ICT, Technical assistance, etc.	
12	#57. Performance management practices • Procedures for performance management • Incentives for result-based management in public service	Performance Measure Evidence of performance Coordination across board	
13	#60. Strengthen the Delivery Unit • Track and monitor strategy progress • Develop solutions	Institutional Framework • Performance measurement • M & E	Digitalized Apps

Addressing the Connections Gaps

The paucity of entries in the last column of Table 3 gives cause for concern. There are three possible explanations:

- There are not many social technologies/innovations available yet
- Very little is known about this category of technology
- Currently, it is difficult to assess how technology influences policy and quality of life, so little attention is paid to the phenomenon and it easily escapes public reckoning.

The literature is rich in reporting on emerging technologies, with the current sensation being the rise of cryptocurrencies (Bitcoin, Monero, Dash, Ripple and NEO) and blockchain technology. The 2017 Annual World Bank Meeting discussed this issue. In Africa and the rest of the world, innovative technologies are reported of being applied as solutions to key challenges. For instance, the Pulse of South-Sudan, an app using mobile phone to collect real time data, Listening to Africa (LZA) initiative monitoring health care facilities in Tanzania, Sweep South, a social app developed by a South African start-up, connecting domestic workers with potential clients, Mojaloop, an open software facilitating interoperability between financial service providers and payment platforms in Tanzania and the Zipline drone delivery networks currently used to deliver blood to large segments of rural Rwanda, amongst several other technology have been reported to be in existence (Cheney 2017; Goddard 2017; Igoe and Edward, 2017; World Bank Group, 2017). To this list should be added REMITA, the software driving Nigeria's treasury single account which checks corruption and leakages.

These and other similar technological innovationshave recorded successes in their applications (Cousins, 2017). However, the narratives have not shown how technology influences policy infrastructure and ecosystem as an entity. The simple reason for this failure is that this relationship has not been studied and there are no sufficient empirical data to do any meaningful analysis. As Wallace (2017) asserts, social scientists need more research to get the level of detail that can permit inference and conclusions on policy issue.

Table 3 also shows a strong pointer to the dominance of ICT-led apps and innovativeness in the contribution to the quality of life. This further justifies the choice of ICT-led strategy for EGRP by the Federal Government of Nigeria. The flip side of this is the reported shortage of requisite skills and appropriate technology necessary to drive the programmes of the plan, and by extension, the policy (FMBNP, 2017A:14)

Finally, Nigeria is experiencing a low and deficit level of innovation (Adeoti, Odekunle and Adeyinka, 2010). R&D spending, a common measure of innovation, is low and declining. As shown by Elebeke (2016), the government's approved spending of one percent of GDP on R&D has not been implemented. This should be a source of worrying for policy makers.

Policy Recommendation

The following policy options are suggested.

i. Innovation Studies Initiatives

The level of innovation in the country is low both in absolute and comparative terms. We know so little about the innovation process. High on the global agenda is innovation. There is need to launch urgently, the broad National initiative on the study of innovation which should be in partnership with the critical tripartite stakeholders. It should also be concerned with aligning research with broader business and societal needs. As we look for innovations in technology, we also need deep insights on 'innovations in approaches' (Fu, 2017).

ii. Establish Incentives System

As Chavez (2017) has argued, policy ecosystem must benefit from innovation. Focus must be on improving policies and programmes that encourage innovation as a national ethos with rewards system. To be competitive, nation and firms need to adapt new technologies and better management practices.

iii. Take Stock and Act.

Take stock of policies and infrastructure on innovation and improvement and see how effective, adequate and current they are. Review STI spending. Review the stock of human capital. The goal is to strengthen the innovative framework for competitiveness and quality delivery.

Tentative Conclusion

Innovation has become an imperative. Nigeria is committed to it as expressed both in plan (ERGP) and policy (NSPP). The policy ecosystem must benefit from technological innovativeness to engender quality of life for the citizens. There are no data yet to explain how innovation shapes or influences the policy ecosystem but available evidence show that social technologies are solution apps. This is the motivation for further studies and action.

The enthusiasm is further boosted by other existing success stories. Finland is a successful model of integration of technological innovativeness and high standard of citizens' wellbeing. Finland is among the world's most wired countries (Uzonwanne, 2002) and prides itself as an inclusive welfare state where no one is abandoned (Pietila, 2001).

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