THE NIGERIA WARD BASED TECHNOLOGY PROGRAM: A CATALYST FOR INDIGENOUS INNOVATIONS AND INVENTIONS AS TOOLS FOR RURAL DEVELOPMENT

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ABSTRACT

This paper examines one of the key ways governments of developing countries can entrench a technological culture on her people in rural or semi rural settings. It will discuss the importance of 'technological governance' through the National Innovation System as a way of building viable economic environment and solving societal challenges.

ABSTRACT CONT'D

The paper also takes a look at the government policy approach for technological diffusion and drive for strengthening indigenous innovations and inventions through the National Innovation System at grassroots in a developing country's context, taking into account the idiosyncrasies of the actors and sectors involved .

ABSTRACT CONT'D

Over the years, low technological perception has remained a major concern within rural dwellers. There is therefore a need to reevaluate existing government approach to develop policy instruments useful for supporting innovation at grassroots.

ABSTRACT CONT'D

Drawing from existing literature and cases from Nigeria, the paper explores the roles that such public policies could play in supporting innovation at grassroots, which may be jointly developed by stakeholders, formal sector, individuals in the informal sector, unattached professionals or companies in collaboration with local people. And most effective of this is achieved through a systematic Technology Needs Assessment.

ABSTRACT CONT'D

The paper concludes by suggesting areas that policy support could help in fostering innovative activities at grassroots, thereby addressing local problems and contributing to development.

KEY WORDS

Nigeria; Ward Based Technology Cluster Project (WBTCP); Technology, Innovation at Grassroots; Science, Technology and Innovation; Developing Countries; third world; Community; Federal Ministry of Science and Technology (FMST); National Innovation System (NIS);

OBJECTIVE

- To address viable approaches by which government of third world or developing countries can leverage on strategic platforms to encourage and mainstream indigenous inventions and innovations
- To shares the Nigeria's innovation system successes, challenges and ultimately its roles in redefining socio-economic paradigm of Nigeria as a developing nation

GOAL

- To understand and fast track the role of indigenous inventions and innovations and the National Innovation System in transforming the livelihood in rural communities in developing nations through key political and technological strategies.

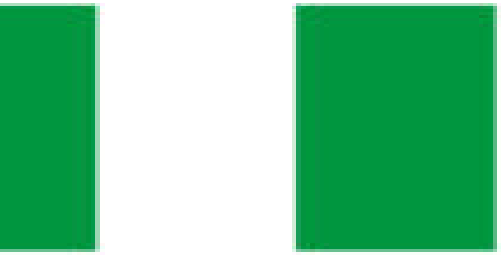
OUTLINE

- Abstract
- Objective
- Goal
- Overview
- Introduction
- Problem Statement
- Justification
- Project Goal
- Specific Objective
- Expected Outcome
- Policy Framework
- Concept of the Ward Based Technology Cluster Project (WBTCP)

OUTLINE

- Project Beneficiaries
- Identified Stakeholders
- Implementation Plan/Activities
- Roles of Stakeholders
- The Nigeria National Innovation System: Successes and Challenges
- Key challenges of the Nigeria National Innovation System
- Innovative Initiatives to strengthen the WBTCP and the Nigeria National Innovation System (NNIS)
- Conclusion
- Recommendation
- Final Word

Nigeria

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Lesotho
South Africa

OVERVIEW

- Nigeria is a country with a landmass of 923,763 km^2 and is a key regional player in West Africa, with a population of approximately 197 million.
- Nigeria accounts for about 47% of West Africa's population, and has one of the largest populations of youth in the world.
- A federation that consists of 36 autonomous states, Nigeria is a multi-ethnic and culturally diverse society. With an abundance of resources, it is Africa's biggest oil exporter, and also has the largest natural gas reserves on the continent. WorldBank report (April, 2019)

OVERVIEW CONT'D

- While Nigeria has made some progress in socio-economic terms in recent years, its human capital development remains weak due to under-investment and the country ranked 152 of 157 countries in the World Bank's 2018 Human Capital Index.
- Furthermore, the country continues to face massive developmental challenges, which include the need to reduce the dependency on oil and diversify the economy, address insufficient infrastructure, and build strong and effective institutions, as well as governance issues and public financial management systems.

OVERVIEW CONT'D

- Nigeria has the largest economy in Africa - in close competition with South Africa. The country has the 30th largest economy in the world based on GDP volume. (Export Enterprises, SA -2019)
- Moreover, the volatility of Nigeria's growth continues to impose substantial welfare costs on Nigerian households. Economic growth is expected to hover just above 2% in 2019 and over the medium term.

OVERVIEW CONT'D

- Swift focus on macroeconomic and structural reform priorities articulated in the country's Economic Recovery and Growth Plan (ERGP 2017-2020) by the renewed government administration and acceleration of their implementation could immediately promote needed economic resilience and can be expected to strengthen growth further than current projections.

INTRODUCTION

- Nigeria is richly endowed with natural resources that are inclusive of solid minerals, water resources, land resources, agriculture and agro-allied resources. These resources mainly remained utilize due to lack of appropriate technologies.

INTRODUCTION CONT'D

- Nigeria operates three constitutional tiers of government which are the federal, states and Local Government Area (LGA).
- The Local Government Area is known as the grassroots government because of its closeness to the people.
- **Nigeria** is divided in 36 states plus Abuja Federal Capital Territory. Each state is divided into a total of 774 Local Government Areas (LGA's), and each LGA is further divided in a minimum of 10 and a maximum of 15 **wards**.

INTRODUCTION CONT'D

- The ward is a politically recognized demographic area where people live.
- The ward is a creation of the act of law
- The ward is a political entity
- There are 9,995 wards in Nigeria

INTRODUCTION CONT'D

- The Nigeria Ward Based Technology program called **'The Ward Based Technology Cluster Project (WBTCP)'** is an initiative of the Technology Acquisition and Adaptation Department in the Federal Ministry of Science and Technology aims towards its policy drive for technology diffusion and inclusion at a grassroots approach
- The **WBTCP** is a grassroots oriented technological strategy enunciated on the principles of technology transfer and comprehensive Technology Needs Assessment

INTRODUCTION CONT'D

- The Federal Ministry of Science and Technology (FMST) through some of its agencies has developed, acquired and piloted various technologies that have added value to local raw materials with substantial capacity to fast track development of rural communities in Nigeria.
- The expected output has improved socio-economic indices through employment generation and wealth creation in addition to improving the social status of our people.

INTRODUCTION CONT'D

- These proven technologies developed with the funding support from the federal government are yet to benefit from wide spread patronage nationwide, either by the private sector or government at all levels.
- The Ward Based Technology Cluster Project (WBTCP) which is Science and Technology driven has to be deployed to the rural or semi rural settings in order to fast track the federal government's development agenda within the shortest period of time.

INTRODUCTION CONT'D

- The Ward Based Cluster Project (WBCP) provides the platforms for the demonstration and further application of these technologies which will specifically transform identified natural resources, provide housing, roads, create micro industries, foster critical development mass, and engage community development through effective partnership structures with improved marketing for achieving increased human capacity and economic indices (Uket, 2017)

PROBLEM STATEMENT

- Nigeria is faced with grievous challenges especially the inability to have a technological roadmap that utilizes indigenous content and adaptation of home grown technologies in fan tuning small scale enterprises that will serve meaningful economic purposes. These reasons and many more has prompted the essence of the WBTCP, which is an envisaged panacea for technological backwardness of Nigeria.

PROBLEM STATEMENT CONT'D

- The gross inadequacy or absolute lack of technological know-how at the grassroots has impacted negatively on the economic blueprint of Nigeria. This growing concern has hitherto driven to inertia sectors such as agriculture, commerce and Science and Technology which should be viable operational gains for the country at the third tier of government. Therefore, the obligation to salvage Nigeria and bring technology to the people is inherent on the task of the WBTCP as a tool for economic development.

JUSTIFICATION

- The WBTCP is critical strategy for the actualization of the country's development agenda as it will catalyze National Industrial Revolution Plan (NIRP) as well as the current Economic Recovery and Growth Plan (ERGP 2017-2020) through its multiplier effects. This is because WBTCP **relies on natural resources available at the ward level which require value addition that will lead to the development of micro industries, thus creating platforms for employment generation and improved exports.**

PROJECT GOAL

- To deploy indigenous technologies developed by Federal Ministry of Science and Technology as well as indigenous inventions and innovations to harness endowed natural resources and raw material in the country for economic benefits of the rural dwellers
- The main goal/objective of the WBTCP is to fast track natural resources development through the deployment of developed indigenous technology

SPECIFIC OBJECTIVE

- The core objectives of the Ward Based Cluster Projects (WBTCP) are to:
- Deploy proven technologies for value addition to resources/ raw materials at the ward level;
- Create wealth and jobs at ward level, through spin off enterprises;
- Increase development of new products;
- Build requisite capacity (Human and Infrastructure);
- Enhance product competitiveness; and
- Encourage Gender re-orientation

EXPECTED OUTCOME

- Increased revenue and growth in the national GDP;
- Employment creation;
- Improvement in the living standards of the citizens;
- Stimulation and enhancement of competitiveness;
- Increased local productivity;
- Increased income;
- Value addition and resultant transformation of the natural endowments of every ward into value-added and marketable products and services;
- Wealth generation; and
- Gender re-orientation

POLICY FRAMEWORK

- The key policies in place are:
- the National Policy on Science, Technology and Innovation which advocates for ensuring R & D activities are directed towards the development of appropriate technologies for the product of industrial goods and services in small, medium and large scale firms; as well as
- the National Industrial Revolution Plan
- The Economic Recovery and Growth Plan

CONCEPT OF THE WBTCP

The WBTCP is a Ward Based Innovation Clusters. These clusters at the various 9,995 wards (grassroots) in the country will captures the six geopolitical zones and the Federal Capital Territory (FCT), with the aim to empower people at the ward level with relevant technology for development and promote innovation.

The technologies developed in the urban research centres will be impacted on the people within the local community so that they can make good use of their raw materials to create capital for investment. This will spur up innovation. This will draw people from different localities to acquire skills and become entrepreneurs. The innovation will centre around the raw materials from that environment and make technologies relevant to those raw materials to drive development.

PROJECT BENEFICIARIES

- The beneficiaries of the WBTCP include but not limited to:
- Cooperative Societies in the communities;
- Community Development Committees;
- Local Government Areas;
- Investors and entrepreneurs; and
- Women and youth

IDENTIFIED STAKEHOLDERS

- FMST and all of the agencies under its supervision
- Local Government Areas
- Community Development Associations
- Cooperative Societies
- Ministries Departments and Agencies
- Development partners

IMPLEMENTATION PLAN/ACTIVITIES

- Ward Population Analysis;
- Technologies chosen to leverage existing ward natural resources;
- Review of existing ward housing structure & needs assessment;
- Market analysis to explore what is feasible in each ward;

IMPLEMENTATION PLAN/ACTIVITIES CONT'D

- Assessment of the availability of potable water;
- Inventory of existing road structure and feeder road requirements;
- Estimation of energy demand for project & household utilization;
- Pilots in 9 locations across the six geopolitical zones;
- Construction of model feeder roads;

IMPLEMENTATION PLAN/ACTIVITIES CONT'D

- Construction of model houses using local resources;
- Improvement of production Capacity for local bio-resources;
- Establishment of micro and cottage industries to promote value addition to the local resources; and
- Provision of power for rural (remote area) electrification;

ROLES OF STAKEHOLDERS

- **Agencies/partners**
- **FMST**
  -Coordination, monitoring and Evaluation;
- **FMST's Participating Agencies**
  -Fabrication of indigenous technologies
  -Deployment of indigenous technologies;
- **Host Communities**
  -Provision of land
  -Provision of about 10% labour
- **Indigenous Inventors and Innovators**
  -bring about value addition

ROLES OF STAKEHOLDERS CONT'D

Local Governments Areas

-Provide support and supervision

-make operational guide lines

- **Community/Community Leaders**

-ownership

- **Community Development Committee (CDC)**

-Have representation of all stakeholders

-host meetings, and make appraisals

THE NIGERIA NATIONAL INNOVATION SYSTEM: SUCCESSES AND CHALLENGES

The Nigeria Ward Based Technology Program called 'Ward Based Technology Cluster Project (WBTCP)' is a success story of a well coordinated approach using the Nigeria National Innovation System.

The *National Innovation System* (also NSI, *National System of Innovation*) is the flow of technology and information among people, enterprises and institutions which is key to the *innovative* process on the *national* level.

THE NIGERIA NATIONAL INNOVATION SYSTEM: SUCCESSES AND CHALLENGES CONT'D

The **Nigerian National Innovation System** through the WBTCP has been able to utilize critical Research and Development (R&D) results and **innovation** capabilities in selected areas of the pilot project which have direct bearing on the lives and needs of the rural people. The Research Institutes of the FMST have been tasked on mainstreaming their R&D with a citizens-centered approach which midwives the WBTCP.

THE NIGERIA NATIONAL INNOVATION SYSTEM: SUCCESSES AND CHALLENGES CONT'D

For example, in the WBTCP, the Nigerian Building and Road Research Institute (NBRRI) has a mandate to provide the building and access roads while the National Agency for Science Infrastructure and Engineering fabricates the indigenous technologies required.

Similarly, all other stakeholder performs different functions in line with their operational mandate(s).

THE NIGERIA NATIONAL INNOVATION SYSTEM: SUCCESSES AND CHALLENGES

Accordingly, the notion that science, technology and innovation (STI) are critical to development is a globally accepted statement of fact. The implication of this statement is now being taken more seriously in Developing Countries (DCs) where STI is seen as the route (and in some quarters, maybe the only sure route) to addressing the pressing societal, economic and developmental challenges facing these nations (Acs and Naudé, 2011; Chataway et al., 2005; Lundvall et al., 2009).

THE NIGERIA NATIONAL INNOVATION SYSTEM: SUCCESSES AND CHALLENGES

It is worth noting that Universities and Research Institutes are key components of the Nigeria National Innovation System (NNIS) responsible for creating economic opportunities and wealth in nations. The capabilities of each component and the strength of their interactions determine the extent of wealth creation, economic development and global competitiveness of individual nations.

THE NIGERIA NATIONAL INNOVATION SYSTEM: SUCCESSES AND CHALLENGES

In Nigeria, budgetary allocation to S&T rose from N 1.5 billion (US0.01billion) in 1998 to N16billion (US 0.11 billion) in 2006, representing a 730% in 8 years. As impressive as the figures look, they represented only 0.11% of GDP.

Furthermore, Nigeria only accounts for 0.01% of global expenditure on R&D, her Global Competitiveness Index (GCI) ranking is 94 (out of 134 nations), and she has no university in the world's top 500.

THE NIGERIA NATIONAL INNOVATION SYSTEM: SUCCESSES AND CHALLENGES CONT'D

Nigeria has aspirations to be one of the top 20 world economies by 2020 creating two key issues - a need for massive investment in S&T Research & Development (R&D) over the next decade and strategic opportunities for Researchers in R&D and New Product Development. (W. O. Siyanbola et al, 2013). This is mostly achievable on embracing holistically the WBTCP, which is a proponent of indigenous technologies as key for economic transformation.

THE NIGERIA NATIONAL INNOVATION SYSTEM: SUCCESSES AND CHALLENGES CONT'D

In a bid to 'leap-frog' and 'catch-up', DCs are oftentimes caught between formulating and implementing divisive public (including STI) policies that either focus on 'mission-oriented' innovation activities (like going to space or putting a man on the moon) or policies geared towards supporting innovation and development at grassroots level.

THE NIGERIA NATIONAL INNOVATION SYSTEM: SUCCESSES AND CHALLENGES CONT'D

National Innovation System is a doorway by which government can boost innovation at grassroots. Strengthening the National System of Innovation (NSI) equally strengthens innovations at the grassroots.

A more dynamic NSI would ensure that innovation from grassroots is more adequately catered for in DCs NSI (Daniels, C. U, 2015). In India, for instance, where such activities have been practiced and researched over the last two to three decades resulting in better documentation and awareness, the concept is better

THE NIGERIA NATIONAL INNOVATION SYSTEM: SUCCESSES AND CHALLENGES CONT'D

articulated in the nation's NSI. This is not yet the case in Nigeria where for example, neither the recently formulated national STI policy of 2012 (FMST, 2012) nor the nation's NSI stipulates clear policy measures and instruments targeted at the development and promotion of innovation at grassroots. As in most other DCs, weaknesses in Nigeria's NSI are well documented, resulting in poor collaboration amongst the actors (Oyewale et al.,2013).

THE NIGERIA NATIONAL INNOVATION SYSTEM: SUCCESSES AND CHALLENGES CONT'D

Government policy support geared towards strengthening the NSI may help clarify the role of actors and institutions in promoting, facilitating, shaping, and enhancing the potential gains of innovation at grassroots towards addressing local needs and contributing to national development.

THE NIGERIA NATIONAL INNOVATION SYSTEM: SUCCESSES AND CHALLENGES CONT'D

Government policy support geared towards strengthening the NSI may help clarify the role of actors and institutions in promoting, facilitating, shaping, and enhancing the potential gains of innovation at grassroots towards addressing local needs and contributing to national development.

Some of the other challenges of the Nigeria National Innovation System include but not limited to factors such as: lack of expanded mandate for the R&D institutes to commercialize result outputs, lack of a national institutional policy or agency for indigenous inventions and innovations

KEY CHALLENGES OF THE NIGERIA NATIONAL INNOVATION SYSTEM

- Some of the other challenges of the Nigeria National Innovation System include but not limited to factors such as:
- Lack of expanded mandate for the R&D institutes to commercialize result outputs,
- Lack of a national institutional policy and/or agency for indigenous inventions and innovations
- Poor funding
- Lack of political will
- Lack of awareness
- Lack of direct policy support for indigenous innovators and inventors

INNOVATIVE INITIATIVES TO STRENGTHEN THE WBTCP AND THE NNIS

- Some of the innovative ideas that will strengthen the WBTCP as well as the NIS in Nigeria include:
- One Legislator One Project Innovation Competition: This Legislators innovation Award at all Federal Constituencies and Senatorial Districts will be targeted at solving the peculiar problems of that community.
- Nigeria Innovation Portal: The portal also offers collaboration space in form of innovation communities, to foster cross fertilization of ideas and knowledge flows. The portal will host communities for various innovation users including innovation clusters, State and sectoral innovation councils.

INNOVATIVE INITIATIVES TO STRENGTHEN THE WBTCP AND THE NNIS

- Form a Diaspora liaison for NSI funding, advocacy, venture capital injection, R&D etc
- Adopting the Silicon Valley strategy of funding pet engineering projects of few weeks
- Research agencies running summer innovation camps on STI and STEM
- Promoting innovation through reality TV shows. Business successes driven by innovation to be showcased
- Institutionalize innovation week for all levels of Government

INNOVATIVE INITIATIVES TO STRENGTHEN THE WBTCP AND THE NNIS

- Creating a program to develop and encourage innovation for gifted children
- Develop the Nigeria Innovation Toolkit: The Innovation Toolkit is intended to act as a guide and a handbook to aid innovators in various aspects of innovations and related areas. The toolkit intends to address the requirement for both literary and handy resources which help innovation. It shall be developed in all languages and not just major languages.

INNOVATIVE INITIATIVES TO STRENGTHEN THE WBTCP AND THE NNIS CONT'D

- Holding annually a National Innovation Summit to create synergy for stakeholders
- Instituting innovation prize or scholarship at all levels of government
- Honouring indigenous innovators/Inventors as icons and change agents
- Creating a social media advocacy on innovation. This will leverage the effective tools of the social media to drive indigenous innovation

INNOVATIVE INITIATIVES TO STRENGTHEN THE WBTCP AND THE NNIS CONT'D

- Daily innovation quotes. Advocacy for innovation through partnership with media houses (print and electronic) to run captions on innovation. The schedule will show innovation motivational captions everyday of the year across all media.
- Provide grants and support for innovation fairs
- Catalogue international free patents and make them easily accessible for full benefits.

INNOVATIVE INITIATIVES TO STRENGTHEN THE WBTCP AND THE NNIS CONT'D

- Initiate a forum to form groups of financier and supports to be cheer leaders for various innovation programmes
- Enlist motivational speakers, comedians and celebrities as ambassadors of innovation. This will be funded by cheer leaders
- Include innovation in school curriculum at all levels of education. This will compliment the current entrepreneurial programmes.
- Develop a platform to show case innovation by the bottom of the pyramid like local artisans, farmers etc

INNOVATIVE INITIATIVES TO STRENGTHEN THE WBTCP AND THE NNIS CONT'D

- Special advocacy for Parents to encourage innovation in their wards without killing the innovative tendencies of their kids. Helping parents to know when the child is showing innovation and how to encourage it.
- PTAs in all schools to create award for innovation
- Develop categories of innovation with reward in public service, financial services, conflict resolution, fashion, science, engineering etc

INNOVATIVE INITIATIVES TO STRENGTHEN THE WBTCP AND THE NNIS CONT'D

- Special innovation events targeted at real commercialization where the innovator becomes a shareholder in the spin off company
- Institutionalization of proof of concept centres aimed at outright commercialization
- Promoting innovation clubs in rural schools
- Promoting movies and songs on innovation through funding of Nollywood
- Making each member of the three arms of government at both Federal, State or Local Government Areas patrons/matrons of innovation clubs in their communities

CONCLUSION

- The WBTCP is future driver of the NIS in Nigeria. Innovations require not just inputs and capacity but also a political economy of reform and a mindset shift, and this initiatives of the FMST aims to foster this paradigm change. This will involve creating a constituency for innovation where Government, academia, industry and the citizenry are all actors in the innovation movement.

This will also involve creating an innovation eco-system not only concerned with creating high-tech products, but with enhancing the quality of life for everybody by creating sustainable solutions, and changing processes and mindsets especially among women in rural areas.

CONCLUSION CONT'D

The WBTCP is key to institutionalize and foster technological governance and entrench an innovation culture among the citizenry in the country.

Undoubtably, with the WBTCP, Nigeria is set to blaze its own trail with a technological model of inclusive innovation specific that meets the country's needs and development goals.

With this in mind, we know that the WBTCP is a path for Nigeria to actualize her technological and scientific aspirations in the near future.

RECOMMENDATIONS

- Develop a national blueprint for the WBTCP
- Evolve a legal framework for the WBTCP through well guided policies and legislature at levels of governments
- To create the stakeholders ownership of the WBTCP
- To amend laws establishing R&D institutes within the NIS in order to allow for commercialization of R&D outputs as well as indigenous innovations and inventions
- Adequate funding of the ongoing pilots projects of the WBTCP

FINAL WORD

- Thank you for your attention!!!