

**SHITTU'S CONFERENCE
PROCEEDINGS 10(a) – 10(e)**



**SCHOOL OF ENVIRONMENTAL TECHNOLOGY,
FEDERAL UNIVERSITY OF TECHNOLOGY
MINNA, NIGER STATE, NIGERIA**

EDITORS IN CHIEF

R. E. Olagunju

B. J. Olawuyi

E. B. Ogunbode

**SETIC
2020
INTERNATIONAL
CONFERENCE**

BOOK OF PROCEEDINGS

MAIN THEME:

Sustainable Housing And Land Management



3RD -5TH MAY, 2021



**SCHOOL OF ENVIRONMENTAL TECHNOLOGY COMPLEX,
FUT, MINNA, NIGER STATE, NIGERIA**

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Federal University of Technology Minna, Nigeria

Host:

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*Dean, School of Environmental Technology
Federal University of Technology Minna, Nigeria*

**School of Environmental
Technology International
Conference
(SETIC 2020)**

3RD - 5TH MAY, 2021

**Federal University of Technology Minna, Niger
State, Nigeria**

CONFERENCE PROCEEDINGS

EDITORS IN CHIEF

R. E. Olagunju

B. J. Olawuyi

E. B. Ogunbode

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PREFACE

The School of Environmental Technology International Conference (SETIC 2020) is organised by School of Environmental Technology, Federal University of Technology Minna, Nigeria. In collaboration with Massey University New Zealand, Department of Civil Engineering Faculty of Civil Engineering and Built Environment Universiti Tun Hussein Onn Malaysia, Malaysia Centre For Professional Development and Industrial Project Development School of Professional and Continuing Education (SPACE) UTM-KL Malaysia, Global Academia, Department of Architecture, Faculty of Engineering and Architecture, Istanbul Gelisim University Istanbul Turkey, Sustainable Environmental and Technology (SET) Research Group, Department of Architecture, Universiti Sains Islam. The main theme for this year conference is "SUSTAINABLE HOUSING AND LAND MANAGEMENT". This promotes and encourage innovative and novelty for policy issues for inclusive and sustainable housing, access to finance for housing and land development, sustainable building materials, building cost management, sustainable and resilient cities, geoinformatics for land management, rapid urbanization, sustainable land use and spatial planning, gender issues in access to land.

The responses from participants for this conference are overwhelming, well attended, and successful. The operation mode was Virtual for all participants who choose the oral presentation mode. While, Physical for all poster medium presenters. Our participants are from various Universities and other sector across the globe, from countries like United State for America (USA), Turkey, Malaysia, China, Saudi Arabia, Kenya, New Zealand just to mention a few. Hence, this conference provides a good platform for professionals, academicians and researchers to widen their knowledge and approach on latest advances in research and innovation. Papers presented in this conference cover a wide spectrum of science, engineering and social sciences.

Finally, a note of thanks must go to SETIC 2020 Local Organizing Committee (LOC) for their remarkable dedication in making this conference a success. We hope the event will prove to be an inspiring experience to all committee members and participants.

ACKNOWLEDGEMENTS

The effort put together in achieving the success of SETIC 2020 is predicated on the feat of the first and second edition of School of Environmental Technology International Conference held in 2016 and 2018, respectively. The support and goodwill from Vice-Chancellor of Federal University of Technology, Dean School of Environmental Technology, Dr Dodo Y. A. Iyemoh S. and many other highly motivated people are highly appreciated.

It is also my privilege and honour to welcome you all, on behalf of the Local Organizing Committee (LOC) to the 3rd edition of the Biennial School of Environmental International Conference (SETIC 2020). This Conference which was earlier schedule for 7th to 11 April, 2020 is holding now (3rd to 5th May, 2021) due to the challenges of COVID-19 Pandemic and the ASUU-FGN crisis which made our public Universities in Nigeria to be closed for about one year. We thank God for keeping us alive to witness the great SETIC2020 event, in an improved form exploiting the new-normal situation posed by the Pandemic for a hybrid (i.e. both physical and virtual) form of Conference participation.

The conference provides an international forum for researchers and professionals in the built environment and allied professions to address fundamental problems, challenges and prospects Sustainable Housing and Land Management. The conference is a platform where recognized best practices, theories and concepts are shared and discussed amongst academics, practitioners and researchers. This 2020 edition of SETIC has listed in the program a Round Table Talk on Housing Affordability beyond COVID-19 with selected Speakers from across the globe available to do justice on the topic of discussion.

Distinguished Conference participants, permit me to warmly welcome our Keynote and Guest Speakers:

- Prof. Ts. Dr. Mohd Hamdan Bin Ahmad, *Deputy Vice Chancellor (Development) Universiti Teknologi Malaysia (UTM)*;
- Assoc. Prof. Dr. James O.B. Rotimi, *Academic Dean Construction, School of Built Environment, College of Sciences, Massey University of New Zealand*;
- Assoc. Prof. Sr. Dr. Sarajul Fikri Mohammed, *General Manager, Centre for Professional Development and Industrial Project Development School of Professional and Continuing Education (SPACE), UTM-KL*;
- Prof. Ts. Dr. Zana'il Abidin Akasah, *Visiting Professor on Sustainable Solar Integrated Design Building Design, International Micro Emission University (IMEU)/HIMIN Ltd. China & Senior Research Fellow, The Architects Resourcery, Jos, Nigeria*;
- Ar. Dr. Elina Mohd Husini, *Department of Architecture, Faculty of Engineering & Built Environment, Universiti Sains Islam*;
- Asst. Prof. Dr. Yakubu Aminu Dodo, *Department of Architecture, Faculty of Engineering and Architecture Istanbul Gelisim University, Istanbul Turkey*

and the five Speakers for our Round Table Talk on Housing Affordability Beyond COVID-19

- Dr. Muhammad Mustapha Gambo, *Manager, Policy, Research and Partnerships, Shelter Afrique, Nairobi, Kenya*;
- Prof. Dr. Soumia Mounir, *Department of Architecture Ecole Nationale d'Architecture d'Agadir [The National School of Architecture of Agadir] Morocco*

- Dr. Said Alkali Kori, *General Manager, Projects and Portfolio management, Family Homes Fund, Federal Ministry of Finance, Abuja;*
- Ts. Dr. Sasitharan. Nagapan, *Department of Civil Engineering, Faculty of Engineering and Built Environment, Universiti Tun Hussein Onn Malaysia, Malaysia;*
- Dr. Mercy Nguavese Shenge, *AIA Assoc. Historic District Commissioner, City of Rockville, MD, USA.*

for accepting to share from their knowledge, wealth of experience and be available to interact with participants on varied issues on “**Sustaining Housing and Land Management**”.

As reflected on the Conference program, the Conference activities will be Virtual for power point presenters to run in four parallel sessions on the Zoon platform while the participants for Poster presentations (mostly Postgraduate students) are expected to have their Posters displayed in the Environmental Complex Building of the Federal University of Technology, Minna. With a total of One Hundred and One (101) articles captured in the Conference Proceedings covering the seven subthemes of the Conference, I have no doubt that we are all in for an impactful experience at SETIC2020 as we brainstorm, exchange ideas, share knowledge and participate in evolving more approach to sustainable housing and land management drives.

I implore us all to enjoy every moment of the deliberations and ensure we maximize the great opportunity offered by the Conference to network for better research and career development as we also make new friends.

I also on behalf of myself and the LOC express our appreciation to the Dean, School of Environmental Technology and the entire Staff of the School for giving us the opportunity to steer the ship for SETIC2020. To the Reviewers and various Committees that served with us, I say thank you for helping us through despite the pressure of work.

Thanks, and God bless you all.

Olawuyi, B.J. (PhD)
Chairman, LOC
SETIC2020

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DECLARATION

PEER REVIEW AND SCIENTIFIC PUBLISHING POLICY STATEMENT

3rd MAY 2021

TO WHOM IT APRIL CONCERN

I wish to state that all the papers published in SETIC 2018 Conference Proceedings have passed through the peer review process which involved an initial review of abstracts, blind review of full papers by minimum of two referees, forwarding of reviewers' comments to authors, submission of revised papers by authors and subsequent evaluation of submitted papers by the Scientific Committee to determine content quality.

It is the policy of the School of Environmental Technology International Conference (SETIC) that for papers to be accepted for inclusion in the conference proceedings it must have undergone the blind review process and passed the academic integrity test. All papers are only published based on the recommendation of the reviewers and the Scientific Committee of SETIC

Babatunde James OLAWUYI
Chairman SETIC 2020
Federal University of Technology, Minna, Nigeria

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PROFILE OF KEYNOTE SPEAKERS AND GUEST SPEAKERS

SEFB 2020 organisers wishes to thank our keynote speakers, and Guest speakers for accepting to create time to share from their rich wealth of knowledge and interact with delegates and participants on varied issues being examined at this year's conference. A brief profile of each keynote speaker is provided here, this would allow for future interaction and networking with them.



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**CONFERENCE
PROCEEDING 10(a)**



E-Procurement Implementation in the Public Construction Sector in Nigeria: A Review

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Abstract

E-procurement is seen as one of the essential tools that could be used by government for public procurement in an attempt to reduce the menace of corruption in the procurement processes. Anecdotal evidence has proved that about 75% of corrupt practices in Nigeria are procurement based. This study therefore, intend to explore the barriers to the implementation of e-procurement in the Nigerian construction sector using a desktop research approach. The approach provides the researcher opportunity to obtain basic information from the literature search that can serve as foundation for future research. However, it was revealed that E-procurement implementation has begun in Nigeria, but the lack of empirical research has hindered a clear framework for the adoption as expected and what is required in the public sector goes beyond the present practice. The current practices of e-procurement in the construction is at formative stage, hence more efforts are required for the implementation to yield the desire results. The paper thus concludes that unavailability of services, investment cost, technical know-how, electricity supply, internet diffusion and cyber-security are some of the factors affecting implementation of e-procurement in the country.

Keywords: Construction, E-procurement, Implementation, Nigeria, Public Sector.

Traditionally, in the Nigerian construction industry, most construction procurement activities use paper-based system in procuring construction projects. The traditional procurement process involved paper-based advertisement, submission of tenders, and selection/award of contracts that is characterized with high cost of lithographic works and unethical practices. Country Procurement Assessment Report (CPAR) (2000), revealed that long before 1999, Nigeria lost \$10 billion every year to corruption through award of contracts. Thai and Grimm (2000) found that the implementation of Electronic Procurement initiatives should be seen as an effort to improve the procurement goals, which normally include quality; timeliness; cost minimizing, business's financial and technical risks; maximizing competition; and maintaining integrity while Alam and Noor (2009) established that E-procurement has obvious benefits that include increasing transparency and accountability, standardising and monitoring, enhancing fair competition amongst bidders, avoiding human interference, reducing human errors and personal discretion in purchasing decision, and maximising value for money. According to Mahmood (2010) public procurement represents 18.42% of the world GDP; Neupane (2014) affirmed that public procurement accounts for almost 10 to 15 percent of Gross Domestic Product (GDP) in developed countries and almost 20 percent or more of GDP in developing countries. Change in the procurement process is evidently necessary not only due to the issues with traditional procurement systems but also because organisations want to meet the challenges of greater competition in the global market (Hampton *et al.*, 2012). Neupane (2014) further saw it as an essential tool for a sincere attempt to reform the government public procurement processes as well as to reduce the chances of corruption since corruption is said to be a threat to economic and human development in all countries and is

believed to be increasing at alarming rates, especially in developing countries -Nigeria inclusive (Neupane, 2014).

In spite of this development and the extensive research yield going with it, there is limited understanding of the nature of technological modernisations in the use of web-based technologies in executing construction procurement undertakings (Laryea, 2014).

STATEMENT OF PROBLEM

The Nigerian government had identified the need for public procurement system that will urgently eliminate or reduce the global perception of corrupt practices and inefficiencies that have potentials to impact on good governance, and to build trust through the procurement system (BMPIU, 2005). However, E-procurement implementation has begun in the country Nigeria but e-procurement activities are actually very truncated in the country (Mundy and Musa, 2010). It can further be said that what is required to achieve a more successful procurement process in Nigeria goes beyond the present practice. In fact, Afolabi (2017) stated that construction stakeholders currently have the suitable hardware, software and other enabling settings to actively partake in the e-procurement process but Afolabi (2019) however stated that there is still need for improved wakefulness of the e-Procurement tools and technologies and the benefits that are accumulated from their usage among public sector construction participants.

E-PROCUREMENT

Chang and Wong (2010) defined E-procurement as an attempt to automate the traditional procurement system using various communication media to facilitate efficiently the process between different parties. Nawi *et al.* (2014) also stated that e-procurement is an efficient process that automates business transactions, reduces cost, improves management and brings transparency in business processes while McCormack and Johnson (2016) defined e-procurement as the use of advanced electronic technologies to develop the traditional procurement process into a more advanced one.

PUBLIC E -PROCUREMENT

Burton (2005) indicated that public E-Procurement is the core instrument that helps in economic management of public resources while Vaidya *et al.* (2006) stated that Public e-procurement is an inter-authoritative data system, which automates any piece of the procurement process in order to improve efficiency, quality, and transparency in government procurement. Furthermore, Vaidya (2007) saw public electronic procurement as the use of any Internet-based Inter-organisational Information System, which automates and integrates any parts of the procurement process in order to improve efficiency and quality in procurement, and promote transparency and responsibility in the wider public sector.

PROBLEMS WITH TRADITIONAL METHOD OF PROCUREMENT

Nawi *et al.* (2014) stated that traditional procurement is work intensive and prone to errors, which are very expensive for the business in both the long and the short term. Banwo (2016), identified the problems of traditional procurement as: Very long project duration when compared to other strategies as the strategy is sequential and construction cannot commence prior to the completion of design (with no parallel working possible), there is no input into the design or planning of the project by the

contractor and supplier, who will not be appointed at the design stage, the strategy is based upon price competition, which can result in adversarial relationships developing and the client is likely to end up paying a high-risk premium where it is difficult to accurately define the full scope of the project.

IMPLEMENTATION OF E-PROCUREMENT

E-procurement has been seen as the resolution to the insufficiencies of the traditional procurement method because of the success seen to date in the private sector (Teo *et al.* 2009; Tatsis *et al.*, 2006; Muffato& Payaro, 2004). Grilo and Jardim- Gonclaves (2011) expressed that each organisation needs to accomplish the best quality procurement with the least investment, negligible risks and duplication while keeping up a competitive position and picture in the market. These successes which have been well established, indicates that there is potential for similar benefits to be realised in the public sector (Panayiotou *et al.* 2014).

However, In a study conducted by the world atlas, in spite of the rapid growth of E-readiness in most countries in the world, the Middle East and Africa currently serve a total of about 1m internet broadband subscribers, a small sum compared with the 53m in Asia and 42m in the Americas. Low levels of investment and limited sources of financing constitute the primary reasons for the slow progress. With public and private funds for infrastructure development lacking, even broadly available technologies remain too costly for widespread adoption.

Mundy and Musa (2010) stated that E-procurement implementation has begun in lower middle income countries like Nigeria but the lack of evidence and research has hindered a clear framework for the adoption as expected, in fact e-procurement activities are actually very truncated in the country Nigeria but how long will Nigeria as a country keep avoiding the implementation of e-procurement in spite of the facts that the same e-procurement have been adopted and implemented successfully to some magnitude in other parts of the world (Oseni & Dingley, 2014). It is clear that some of the sectors of the public in Nigeria are in the publish stage and a few government organisations are at the transact stage. Some organisations have even avoided the interact stage thereby giving no chance for citizen requests or feedback. It can further be said that what is required to achieve a more successful procurement process in Nigeria goes beyond the present practice of these sectors.

FACTORS AFFECTING E-PROCUREMENT IMPLEMENTATION IN NIGERIA

Many researches have established the factors affecting e-procurement implementation in Nigeria Oseni and Dingley (2014) stated that issues like awareness and availability of services and trust all need further development in order to allow e-procurement services to be delivered and used by citizens. . Aduwo *et al.* (2016) established that that the two elements with the most noteworthy challenge on the uptake of e-Procurement were the high investment cost, and absence of technical know-how required in setting up e-procurement technologies and procedures. Other factors which are evident include

Electricity Supply

According to the reports provided by the Electricity Generating companies, the average power supply in Nigeria is 3851MW. The highest averaged power supply was fixed in January 2017 and was around 4425MW. The largest cities of the country are provided

with the majority of the power and energy and there are no significant changes to this situation till date (power-nigeria, 2019). From this, it clear that the power supply pattern in Nigeria is not enough to give room to implementation of e-procurement

Internet Diffusion

The Global State of Digital in 2019 report discovered that there are 98.39 million internet users in the country compared to January 2018, there has been a 4 million increase in the number of internet users. Despite this increase, overall internet penetration remains low, with only 50% of the population connected to the internet when compared to the global average of 57%. It was further stated that out of the 98.9 million Nigerian internet users, 54% access the internet on a daily basis while only 12 % (24 million) have active social media accounts. To improve on this, on the 2nd of April, 2019, the minister of communication, said the federal Government will ensure free access to the internet in public places across Nigeria. He further listed the challenges faced by the government in providing free internet service to include high cost of access, low broadband penetration, poor internet infrastructure and poor enabling environment (Digital, 2019).

Cyber-Crime and Cyber- Security

Although this is not peculiar to Nigeria alone, but a lot of work will need to be done to ensure that the cyber space is secured. Bharat and Abhijit (2010) stated that Security, protection and trust-related issues are basics for the successful implementation of e-procurement.

According to Frank and Odunayo (2013), Cyber-space refers to the boundless space known as the internet. It refers to the interdependent network of information technology components that underpin many of our communications technologies in place today while Cyber security is the collection of tools, policies, security concepts, security safeguards, guidelines, risk management approaches, actions, training, best practices, assurance and technologies that can be used to protect the cyber environment, organization and user's assets. Cyber security strives to ensure the realisation and preservation of the security properties of the organization and user's assets against relevant security risks in the cyber environment. However, Nigeria moved from a country with zero legislation on cyber security to a country with an extensive law with the enactment of the cybercrime (prohibition, prevention) Act ("The Act") in 2015. Despite this act, Nigeria is said to loose N127, 000,000,000 (one hundred and twenty seven billion Naira) annually through cyber-crime (Iroegbu 2016). Osuagwu (2018) further reported that 60% of Nigerian businesses experienced cyber-attacks in the year 2018.

CONCLUSIONS

It is evident that e-procurement is the way forward in achieving an efficient and well desired procurement process in Nigeria but it has not been fully implemented. What is desired goes beyond what is presently practiced. There are a lot of impediments to the implementation of e-procurement in the country and these factors need to be looked into and curbed so that an efficient system is achieved. This paper through a review of literature, highlighted the factors affecting e-procurement implementation in Nigeria and for e-procurement to be fully implemented, availability of services, investment

cost, technical know-how, electricity supply, internet diffusion and cyber-security needs to be improved upon.

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