CUCRID
DISCOVERIES
No.2

THE WORLD UNIVERSITY RANKINGS 2020 TOP 150 YOUNG
THE WORLD UNIVERSITY RANKINGS 2019 TOP 500

A bi-annual publication of Covenant University Centre for Research, Innovation and Discovery (CUCRID)

RESEARCH LIFTS COVENANT IN COMITY OF WORLD UNIVERSITIES

INNOVATOR OF THE EDITION

Divinely Inspired, Rarely run out of Innovative ideas
- Prof. Omoleye

Pg. 47

RESEARCHER OF THE EDITION

Trajectory of A University Researcher: From A Cleaner to A World-Class Stardom

Pg. 50

Conquering COVID-19 Pandemic Pg.31

THE WORLD UNIVERSITY RANKINGS 2019 TOP 500

THE WORLD UNIVERSITY RANKINGS 2020 TOP 100 EMERGING ECONOMIES

CUCRID

Covenant University

CENTRE FOR RESEARCH, INNOVATION AND DISCOVERY

We take Research Beyond The Shelf

Covenant University Centre for Research, Innovation and Discovery,
CUCRID Building, Covenant University
Km. 10 Idiroko Road, Cannaan Land, P.M.B 1023, Ota, Ogun State. Tel: +234 9028023485
linkedin.com/company/covenant-universitycovenant-university-centre-for-research-innovation-discovery
twitter.com/cucrid-@cucrid instagram.com/cucrid.research
E-mail: cucrid@covenantuniversity.edu.ng Website:www.cucrid@covenantuniversity.edu.ng

"Commitment to generating local solutions, is one way to boost the research endeavours of the University. There are too many problems around us, and our fastest way up as an institution is to focus on solving problem. As I've often said, one cannot be committed and not be creative; one cannot be creative and not be productive; and one cannot be productive and not be successful. And as we grow our success, we become impactful, leaving footprints on the sand of time"

-Dr. David O. Oyedepo

Dr. David O. Oyedepo
Chancellor, Covenant University

Professor AAA. Atayero
Vice-Chancellor, Covenant University

"Research is central to the twin missions of Covenant University to offer solutions to society's big problems and to be a leading, global educational institution. These ambitions are intrinsically linked and the innovations that have resulted from them have benefited the country as well as bringing increasing prominence to the University. Covenant's growing impact as a centre of excellence in Africa has been recognized and ranked by renowned organizations"

– Prof. AAA. Atayero

Contents

Welcome from the Director

I am glad to welcome you to the second issue of CUCRID Discoveries, our research newsletter, which debuted in June 2019. The research profile of Covenant University has witnessed a meteoric leap since the publication of the maiden edition as the University moved up the Times Higher Education (THE) rankings from top 800 to top 500! Covenant has also featured prominently in other world ranking categories including the Young University Rankings, Impact Rankings, Subject Rankings, Emerging Economies Rankings, and the Sustainable Development Goals Rankings. Further validation of the University's scholarly outputs and research endeavours was the listing of no less than 134 authors of the institution in the Top 500 of Nigerian Authors Ranking recently released by SciVal. This issue which is a considerable improvement over the maiden edition is replete with exciting highlights of research and innovation stories; Covid19 health crises; new research awards; interviews; events; travelogues; grant openings and reviews. Also included in this issue is a spotlight on the accomplishments of our graduates. The next edition of our newsletter will come out towards the last quarter of 2020.

Meanwhile, please visit our website (www.covenantuniversity.edu.ng) as it is regularly updated with research news, accomplishments, details of industry presentations, and our latest research papers and publications. We hope that you will find this issue useful and we welcome your contributions, inputs, questions or comments. Thanks for your interest in the CUCRID Discoveries! Enjoy the read and stay safe during this COVID 19 health crises!

Emeka Iweala, Ph. D.
Director, Covenant University Centre for Research, Innovation and Discovery (CUCRID)

Research lifts Covenant in Comity of World Universities

Dr. David O. Oyedepo
Chancellor, Covenant University

Professor AAA. Atayero
Vice-Chancellor, Covenant University

Even though her rise to prominence had been predestined, the reality of her steady rise to fame in the league of world-class universities in a short space of time has not ceased to astound close watchers of events in the education world. Covenant University, established in 2002 with the vision of 'Raising a New Generation of Leaders', has defied all known growth patterns peculiar to young institutions. She ranks among the top 500 Universities in the world in just 17 years!

Currently, Covenant is ranked within the 401-500 bracket by the Times Higher Education (THE), the leading provider of higher education data for the world's research-led institutions. Aside her world ranking making her the best in Nigeria and West Africa, Covenant's status dwarfs that of many American, Asian, and European universities where thousands of Nigerian students are enrolled.

Blessed with a dynamic Chancellor and Chairman of the Board of Regents in the person of Dr. David O. Oyedepo, who provides focused strategic leadership to the University together with members of the Board, Covenant's drive for excellence and growth emanates from the compelling nature of the University's Vision, Mission, and Departure Philosophy. Aside from its vision of raising a new generation of leaders, the University has short term vision of becoming one of the top 10 universities in the world by the year 2022, otherwise known as Vision 10:2022.

Introduced in 2012, courtesy of Dr Oyedepo, efforts at realising Vision 10:2022 began to take shape during the stewardship of two of the previous Vice-Chancellors of the institution – Professor Aize Obayan and Professor Charles Ayo. However, the efforts received a fillip when the current Vice-Chancellor, Professor AAA. Atayero, took the reins of office. His administration proved to be a game-changer courtesy of its ReCITe Agenda.

ReCITe, which means Research + Citation + Innovation + Teaching resulting to Income, was enunciated to intensify research activities and encourage publications in Scopus indexed and other reputable Journals as well as citations in addition to continuous improvements in the learning environment. Through the ReCITe strategy, Covenant is currently ranked in eight categories of the THE rankings - the World University Rankings, the Young University Rankings, the Subject Rankings, the Emerging Economies Rankings, and the

Impact Rankings.

There have been several landmark achievements since the commencement of the Professor Atayero-led administration on the 15th of July 2016, quite notable among which are: Covenant entering the Times Higher Education (THE) World University Ranking (WUR) for the first time in 2019 as the Best West African University, and ranked 6th in Africa. Covenant also got ranked in two (2) THE Subject Rankings, the Emerging Economies Rankings, and debuted in the inaugural THE World Impact Rankings for 2019. Covenant had gone ahead to emerge the undisputed No. 1 in Nigeria and No. 4 in Africa in THE's 2020 World University Rankings, nestled in the 401-500 category globally.

For THE's 2020 Rankings, Covenant had emerged in five (5) Subject Rankings, as either the best among Nigerian Universities ranked or the only Nigerian University ranked. It was an increment of three additional Subject categories on the previous year's performance for Covenant. As a result of this, Covenant University received a letter of commendation from His Excellency, the Federal Minister of Education, for making Nigeria proud in the rankings.

Also, in June 2020, Covenant consolidated her lead as the nation's best by moving up 50 places to rank in the 101-150 brackets of the THE's Young University Ranking (YUR) 2020. The University was the only Nigerian University (private and public) featured in the YUR, which list the world's best universities that are 50 years old or younger. 165 of 170 universities in Nigeria fall in this category.

In addition to Covenant's remarkable results in THE Rankings, she outperformed all other Nigerian Universities in Research in the years 2018 (and 2019), with a total of 1,186 high-impact research publications as at September 2019. Worthy of note was the fact that about 72% of all of Covenant's research output since inception were published in the last three years. This was a testament to the successful drive of Covenant's Research agenda, noting that 60% of the Top 10 Authors in Nigeria are from Covenant University.

Also for her efforts, Covenant University received a UNESCO Chair Endowment in Plant Biotechnology. It had successfully achieved the World Bank Africa Centers of Excellence (ACE-Impact) host Institution status with the Covenant Applied Informatics

and Communication grant (ACE-ApIC).

In the area of research related achievements, Covenant University's WAVE Hub received "The Essential Electronic Agricultural Library (TEEAL) from Cornell University, USA. TEEAL is a full-text, researchable digital library database, which is estimated at over USD 1 million. Covenant University also became a Regional Centre of Expertise for Ogun Climate Change and Development. It successfully became a Centre for Economic Policy & Development Research with a grant sum of over $35,000.00.

Research is promoted at Covenant in many ways. These include through a compelling vision of becoming one of the Top-10 research universities in the world by 2022; an aggressive research agenda (ReCITe) and strategic plan based on research, citation, teaching, industry income and internationalisation; nurturing innovation and enterprise driven by research clusters and centres. Thirty-one (31) research clusters and centres engage in interdisciplinary research cutting across ICT, Engineering, Biotechnology, Bioinformatics, Energy, Health, Environment, Governance, Gender issues and other areas. Covenant provides payment support for publications by faculty in quality journals (SCOPUS and Web of Science).

In February 2020, to the glory of the Way Maker, Miracle Worker, Promise Keeper, and Light in the Darkness, Covenant University underlined her pre-eminence as Nigeria's best research institution, by crossing the 5,000 publications milestone. The development marked a new turn in the research focus of the institution, whose aim to become one of the top 10 universities in the world by the year 2022 had not ceased to receive validations since 2012 when the Vision 10:2022 was launched.

A cursory look at the research profile of Covenant indicated that the University had made tremendous progress in this endeavour particularly since 2016 when research in Covenant received new impetus courtesy of the 5th substantive Vice-Chancellor of the University, Professor AAA. Atayero. From a mere 110 publications in 2011, 111 in 2012, 168 in 2013, 230 in 2014, and 311 in 2015, Covenant publications received a boost with the introduction of the ReCITe Agenda by the Atayero administration.

The ReCITe Agenda, which simply means an intensive research approach to realising the vision 10:2022, had ensured that the research profile of Covenant recorded significant improvement in each successive year. For instance, in 2016, the University had 453 publications, 601 in 2017, crossed the 1,000 mark threshold in 2018 when she posted 1,190, and 1,433 in 2019.

Remarkably, Covenant is not only shoring up her research profile, but she is also consolidating on her reputation as the best research institution in Nigeria, as validated by the Times Higher Education (THE) World University Rankings that rated Covenant well ahead of first-generation Nigerian universities.

Also, Covenant provides regular internal and external capacity building and training for researchers; supports research projects through internal grants and support for collaborations, external funding and impact; sustains robust support for participation in local and international conferences by faculty which had helped to establish new national, regional and international research collaborations from different disciplines with other institutions and industry; and effective management of research by a directorate, Covenant University Centre for Research, Innovation and Discovery (CUCRID), which provides excellent research support services.

CUCRID also enhances research infrastructure, promotes the creation of new intellectual property, improves grant management and enhance research capacity. The centre is supported by a research and development committee.

Covenant Ranks 91 in 2020 THE Emerging Economies Rankings

Covenant University has made a great leap into the top 100 universities in the Emerging Economies Rankings (EER) category of the Times Higher Education (THE) World University Rankings (WUR). The University set a new record by rising from her previous 151st ranking to 91st in the just-released 2020 EER by the Times Higher Education, which made Covenant the only Nigerian institution and one of four African universities to make the top 100 list.

Other African institutions in the top 100 were the University of the Witwatersrand (11), Stellenbosch University (24), and University of KwaZulu-Natal (54).

Chinese institutions occupied the top four places in the rankings, and China was also the most-represented country overall, with 81 institutions. Russia, Taiwan and South Africa were the only other countries that featured in the top 10. Overall, 533 universities from 47 countries made the rankings.

The EER rankings came four months after Covenant recorded a similarly significant improvement in her WUR by advancing from her previous 601-800 ranking to 401-500.

Covenant University remains Best Varsity in Quality Education

Covenant University has sustained her status as the private university that offers best Quality Education in the Nigerian University system. This is quite heartwarming considering the accusations that most nation's tertiary institutions offer nonfunctional education with an abyssal impact on the country's economy.

Covenant University attained the feat by retaining her 201-300 ranking in Quality Education in the recently released 2020 Times Higher Education (THE) Impact Rankings. The THE Impact Rankings are the only global performance tables that assess universities against the United Nations' Sustainable Development Goals (SDGs).

Also, Covenant was ranked 101-200 in SDG 1 of No Poverty; 101-200 in SDG 2 of Zero Hunger; and 401-600 in SDG 3 of Good Health and Well-Being; 201-300 in SDG 12 of Responsible Consumption and Production; 301+ in SDG 13 of Climate Action; and 201-300 in SDG 17 of Partnerships for the Goals amongst others.

Covenant University was the only private university among the four Nigerian institutions in the 2020 THE Impact Rankings, which featured 766 universities from 85 countries. Others included the University of Ibadan, University of Lagos, and the Lagos State University.

The University of Auckland, New Zealand came tops in the ranking, which was dominated by Japan, with 63 institutions.

Covenant Dominates Research, Produces 60% of Top 10 Authors in Nigeria

Dr. Isaac Fayomi

Dr. Roland Loto

Dr. Moses Emetere

Dr. Hilary Okagbue

Covenant University faculty have proved their dominance as the most research-active scholars in the Nigerian University system again. The latest report by SciVal, an online tool that offers access to the research performance of research institutions in 220 countries worldwide, shows that Covenant University produced 60% (6) of top 10 and 45% of top 20 authors respectively in Nigeria, a remarkable improvement on her performance in 2019.

Among the Top 500 Nigerian authors ranked in the same ScVial publication, Covenant University produced about 134 authors listed as most research active in the past five years. It is an impressive performance in a country with 9000 professors and 72,146 PhD holders according to the 2018 reports by the Nigerian Universities Commission (NUC) and the National Bureau of Statistics (NBS) respectively. The professors and PhD holders are categorised as the most research dynamic human resources base of every institution globally.

The Covenant University researchers that made the top 20 Nigeria authors included Professor Sanjay Misra (Computer Engineering), ranked 2nd, with 242 scholarly output and 434 citations; Dr Isaac Fayomi (Mechanical Engineering), ranked 3rd, with

229 scholarly output and 634 citations; and Dr Moses Emetere (Physics), ranked 5th, with 200 scholarly output and 441 citations. Others were Dr Hilary Okagbue, Mathematics (8th) with 137scholarly output and citations 841, Professor Roland Loto, Mechanical Engineering (9th) with 135 scholarly output and 455 citations, and the late Professor Cleophas Loto, Mechanical Engineering (10th) with 125 scholarly output and 925 citations. Professor Aderemi Aaron-Anthony Atayero, Electrical & Information Engineering with 115 scholarly output and 408 citations, Professor Oluseyi Ajayi, Mechanical Engineering with 102 scholarly output and 415 citations, and Olushola Afolabi, Building Technology with 86 scholarly output and 274 citations ranked 11th, 14th, and 18th respectively.

In another ScVial ranking that comprehensively accesses the Top 100 institutions in Nigeria by scholarly output, Covenant University emerged the best on different research fields. According to the computation, Covenant University produced 90 per cent of top Nigerian authors in Computer Science; 90 per cent of top 10 Multidisciplinary Nigerian authors; and 80 per cent of top 10 Nigerian authors in Engineering.

No. 1 by Scholarly Output

In the top 100 list of institutions by scholarly output, which involved activities in research, technology, and industry over the period between 2014 and 2019, Covenant University, with 39 scholarly output, outpaced both the first and second-generation Nigerian universities.

The University of Ibadan (17 scholarly output), University of Nigeria (16 scholarly output), University of Ilorin (8 scholarly output), and Obafemi Awolowo University (7 scholarly output) occupied the 2nd, 3rd, 4th, and 5th positions in that order. At the same time, Covenant University's sister University, Landmark, placed 7th with five scholarly output.

90% of the Top 10 Authors in Computer Science

Not less than nine (9) Covenant faculty members made the top 10 list among the top 500 authors by scholarly output in Computer Science. Top in the list was Professor Sanjay Misra with 184 scholarly output and 278 citations, followed by Professor AAA. Atayero, with 56 scholarly output and 121 citations. Next was Dr Hilary Okagbue, with 49 scholarly output and 314 citations.

Other Covenant faculty in the top 10 list were Dr Segun Popoola, Dr Adewole Adewumi, Dr Michael Agaranta, Professor Oluseyi Ajayi, Dr Abiodun Opanuga, and Dr Isaac Fayomi.

90% of Top 10 Multidisciplinary Nigerian Authors

Also, 90 per cent of the top 10 among the top 500 multidisciplinary Nigerian authors, by scholarly output emerged from Covenant University, with Dr Hilary Okagbue leading the pack courtesy of his 40 scholarly output and 235 citations. Again, Professor AAA. Atayero was next with 25 scholarly output and 161 citations, while Dr P. E. Oguntunde garnered 25 scholarly output and 170 citations to emerge third.

Others in the top 10 list included Odunayo Salau, Dr Maxwell Olokundun, Dr Hezekiah Falola, Dr Stephen Ibidunni, Dr Olumuyiwa Oludayo, and Dr Segun Popoola,

80% of Top 10 Nigeria Authors in Engineering

Covenant University faculty members, with 80 per cent presence, dominated the top 10 cadres in the top 500 list of Nigerian authors in Engineering, by scholarly output. Dr Isaac Fayomi, with 85 scholarly output and 264 citations; Professor Oluseyi Ajayi, with 54 scholarly output

and 194 citations; and Professor Sanjay Misra, with 52 scholarly output and 78 citations ranked 1st, 2nd, and 3rd respectively.

Dr Moses Emetere (4th), Princess Imhade Okokpujie (5th), Professor Roland Loto (8th), Olushola Afolabi (9th), and Dr Anthony Ede (10th) were other Covenant faculty in the top 10 list.

Find below a list of Top 100 among Covenant University's researchers and their assigned ranks in SciVal's Top 500 Nigerian Authors as at Wednesday, May 6, 2020.

Author/Researcher	College	Department/Unit	Rank
Sanjay Misra	CoE	Computer Engineering	2
Fayomi Ojo Sunday Isaac	CoE	Mechanical Engineering	3
Emetere Moses E.	CST	Physics	4
Okagbue Hilary I.	CST	Mathematics	7
Loto Roland Tolulope	CoE	Mechanical Engineering	9
Loto Cleophas Akintoye	CoE	Mechanical Engineering	10
Atayero Aderemi A.	CoE	Electrical & Information Eng.	11
Ajayi Oluseyi O.	CoE	Mechanical Engineering	14
Afolabi Adedeji Olushola	CST	Building Technology	19
Akinlabi Esther Titilayo	CoE	Mechanical Engineering	24
Opanuga Abiodun A.	CST	Mathematics	25
Ede Anthony N.	CoE	Civil Engineering	28
Popoola Segun I.	CoE	Electrical & Information Eng.	30
Okokpujie Imhade Princess	CoE	Mechanical Engineering	32
Tunji-Olayeni Patience	CST	Building Technology	34
Okeniyi Joshua Olusegun	CoE	Mechanical Engineering	35
Usikalu Mojisola Rachael	CST	Physics	36
Edeki Sunday Onos	CST	Mathematics	37
Oguntunde P. E.	CST	Mathematics	40
Olokundun Maxwell	CBSS	Business Management	42
Ibidunni Ayodotun Stephen	CBSS	Business Management	47
Oyedepo S. O.	CoE	Mechanical Engineering	50
Oyeyemi Kehinde D.	CST	Physics	51
Afolalu S. A.	CoE	Mechanical Engineering	52
Sanni Samuel Eshorame	CoE	Chemical Engineering	53
Adagunodo Theophilus A.	CST	Physics	54
Ojelabi Raphael Abiodun	CST	Building Technology	58
Omeje Maxwell	CST	Physics	60
Awoyera Paul Oluwaseun	CoE	Civil Engineering	62
Omeje Maxwell	CST	Physics	61
Olofinnade Oluwarotimi M.	CoE	Civil Engineering	63
Abioye A. A.	CoE	Mechanical Engineering	69
Akinyemi Marvel Lola	CST	Physics	70
Ohunakin Olayinka Soledayo	CoE	Mechanical Engineering	72
Bishop Sheila Amina	CST	Mathematics	76
Okokpujie Kennedy O.	CoE	Electrical & Information Eng.	79
Ayo Charles Korede	CST	Computer & Information Science	85
Agarana Michael C.	CST	Mathematics	86
Lekan Amusan M.	CST	Building Technology	90
Okoro Emeka E.	CoE	Petroleum Engineering	91
Joel Emmanuel S.	CST	Physics	92
Omole David O.	CoE	Civil Engineering	94
Idachaba Francis Enejo	CoE	Electrical & Information Eng.	96
Adewumi Adewole	CST	Computer & Information Science	111
Omotosho Temidayo Victor	CST	Physics	116
Akinwumi Isaac I.	CoE	Civil Engineering	117

Author/Researcher	College	Department/Unit	Rank
Akinwumi Sayo Akinloye	CST	Physics	118
Ibem Eziyi Offia	CST	Architecture	125
Aizebeokhai Ahzegbobor P.	CST	Physics	126
Ofuyatan Olatokunbo M.	CoE	Civil Engineering	128
Joshua Opeyemi	CST	Building Technology	130
Omuh Ignatius Owoicho	CST	Building Technology	131
Salau Odunayo Paul	CBSS	Business Management	133
Akinlabi Stephen	CoE	Mechanical Engineering	136
Odun-Ayo Isaac	CST	Computer & Information Science	144
Emenike C. P.	CoE	Civil Engineering	145
Owoloko E. A.	CST	Mathematics	149
Ayoola Ayodeji	CoE	Chemical Engineering	154
Falola Hezekiah O.	CBSS	Business Management	155
Osabuohien Evans Stephen	CBSS	Economics & Dev. Studies	162
Nicholas Ikhu Omoregbe	CST	Computer & Information Science	167
Salau Enesi Y.	CoE	Mechanical Engineering	168
Anawe Paul Apeye Lucky	CoE	Petroleum Engineering	174
Busari Ayobami Adebola	CoE	Civil Engineering	178
Benson Nsikak U.	CST	Chemistry	180
Akinlabi Grace O.	CST	Mathematics	186
Osibanjo A. Omotayo	CBSS	Business Management	187
Oyebisi Solomon Olakunle	CoE	Civil Engineering	188
Inegbenebor A. O.	CoE	Mechanical Engineering	189
Oke Sunday Ayoola	CoE	Mechanical Engineering	200
Abolaji Amos Olalekan	CST	Biochemistry	208
Orodu Oyinkepreye David	CoE	Petroleum Engineering	209
Ogbiye Adebanji Samuel	CoE	Civil Engineering	210
Joseph Olufunmilayo O.	CoE	Mechanical Engineering	212
Amoo Emmanuel Olagunju	CBSS	Economics & Dev. Studies	214
Ajani Olayinka Oyewale	CST	Chemistry	225
Bamigboye Gideon Olukunle	CoE	Civil Engineering	228
Rotimi Solomon Oladapo	CST	Biochemistry	236
Efeovbokhan V. E.	CoE	Petroleum	240
Efobi Uchenna Rapuluchukwu	CBSS	Accounting	241
Adeniji Anthonia Adenike	CBSS	Business Management	245
Agboola Olasunmbo O.	CST	Mathematics	255
Agboola Oluranti	CoE	Chemical Engineering	256
Adelekan Damola S.	CoE	Mechanical Engineering	261
Ojewumi Modupe Elizabeth	CoE	Chemical Engineering	262
Azeta Ambrose Agbon	CST	Computer & Info. Science	266
John Samuel Ndueso	CoE	Electrical & Info. Engineering	276
Idiegbeyan-Ose Jerome	CLR	CLR	277
Adewoyin Olusegun Oladotun	CST	Physics	281
Adekitan Aderibigbe Israel	CoE	Electrical & Info. Engineering	283
Oluwafemi John O.	CoE	Civil Engineering	292
Odetunmibi Oluwole A.	CST	Mathematics	298
Babajide Abiola Ayopo	CBSS	Banking & Finance	300
Ehi-Eromosele C. O.	CST	Chemistry	301
Oluwafemi John O.	CoE	Civil Engineering	304
Ayeni Augustine Omoniyi	CST	Chemistry	312
Bolu Christian A.	CoE	Mechanical Engineering	321
Alege Philip Olasupo	CBSS	Economics & Dev. Studies	324
Ikpefan Ochei Ailemen	CBSS	Banking & Finance	325
Ogundipe Adeyemi A.	CBSS	Economics & Dev. Studies	226

Covenant University Rules in Subjects Rankings

Covenant University has continued to lead the subject rankings of all universities in Nigeria. The University significantly moved up the ladder in the 2020 Engineering and Technology Subject Rankings of the Times Higher Education (THE) World University Rankings (WUR). She moved from her former 501-600 bracket to 301-400.

The University also recorded another milestone, with the institution making her debut in 2020 THE Subject Rankings for Computer Science. It was a remarkable achievement for the University to have entered the Subject Ranking for Computer Science at Top 400, globally. Also, her big move in the 2020 Engineering and Technology Subject Rankings constituted an improvement of 200 places over her 2019 position in the subject rankings.

The University equally made a remarkable stride in scholarly output in other subject areas. According to a report published by Elsevier's SciVal between April and May 2020, the scholarly output of Covenant University in Business, Management, and Accounting, Engineering, and Computer Science since 2014 surpassed that of an average of 64 other Nigerian institutions combined.

Precisely, in Business, Management, and Accounting, Covenant University exceeded that of 54 other Nigerian institutions, both public and private combined. The University was the unparalleled frontrunner in these subject areas with 507 scholarly output, according to the data sourced from Scopus. Other Universities that trailed behind Covenant were the University of Nigeria, Nsukka 2nd position, Obafemi Awolowo University (3rd) with 173 scholarly output. The University of Lagos (131), and Pan-Atlantic University (126) took the 4th and 5th positions, respectively.

Also, in Engineering, the report showed that Covenant's output within the same period exceeded that of 65 other Nigerian universities put together. The University emerged the numero uno with a daunting 1,391 scholarly output. The Federal University of Technology, Akure came second with 525 scholarly output, and the University of Lagos (463), University of Nigeria, Nsukka (452), and Obafemi Awolowo University, Ile-Ife (412) complete the Top 5. The second half of the Top 10 featured University of Benin (387), University of Ibadan (386), Ahmadu Bello University, Zaria (383), Landmark University (302), and Federal University of Technology, Minna (298).

Furthermore, the aggregate of scholarly output recorded by Covenant University in Computer Science within the period covered by the Elsevier's report surpassed a combination of 72 other institutions in Nigeria, both public and privately owned. The University had a 1,062 output. The Federal University of Technology, Minna and the University of Nigeria Nsukka emerged first and second runners-ups to Covenant with 244 and 238 scholarly outputs respectively. Other Universities in Nigeria in Top 10 ranking are University of Lagos (226); University of Ibadan (212); the Federal University of Technology, Akure (206); University of Ilorin (189); Ahmadu Bello University (184); Obafemi Awolowo University, Ile-Ife (170); and Landmark University, Omu Aran, Kwara State (160).

The performance of Covenant University in this ranking is a validation of the progress so far made in her efforts to become one of the top 10 universities in the world in a few years.

Chancellor's Exceptional Researchers List 2019:

20 Faculty Honoured

Professor Sanjay Misra

Professor Roland Loto.

Dr. Ojo Fayomi

Dr. Moses Emetere

Covenant University has continued to recognize and reward excellence in scholarship among her faculty, staff and students. This reward system comes in different modes, including the Chancellor's Exceptional Researchers Lists. The Lists comprise of Covenant University faculty whose extraordinary research endeavours have contributed to the achievement of the University's Vision10:2020 aimed at listing her among the top 10 universities in the world by 2022.

Twenty faculty drawn from different disciplines in the University made the 2019 list. The recipients, according to the University management, had not less than 20 research publications in Scopus for the year 2019 as of January 20, 2020. They also have an excellent track record for outstanding feats in research publications and are listed among the best in Nigeria. The current awardees constitute about 3.89% of the entire University faculty but contributed 721 (52.06%) of her 1,388 publications indexed in Scopus for 2019.

Leading the pack of these exceptional faculty is Dr Isaac Fayomi of the Department of Mechanical Engineering with 98 publications. Dr Fayomi had been the numero uno since 2017. His research interests include Materials science, Mechanical Metallurgy, and Advanced Surface Engineering with Nanocomposite Multifunctional Fabrication of Alloys. Dr Moses Emetere of the Department of Physics with 76 publications came second. Dr Emetere is an expert in Multidisciplinary Modelling. Professor Esther Akinlabi of the Mechanical Engineering Department came third with 64 papers. Professor Akinlabi is a serial grant winner in the research areas of Laser-based Additive Manufacturing,

cont. on pg 21

Processing Patent Applications at CUCRID IPTTO Office

Taking innovation beyond the shelves involves developing an innovative product. However, ideas, theories and publications are not protected by patents; only tangibles products are. Hence, the need to take a decisive step to file a patent for your newly birthed product. CUCRID IPTTO Office will make the process a sweatless experience for you by following the steps below.

Tit-Bits for Patent Acquisition through CUCRID

1. Fill a patent application form obtained from CUCRID Office.
2. Make submission back to CUCRID office.
3. CUCRID patent desk will carry out a search for title and ensures completeness of submissions.
4. The request is send to NOTAP Consultant for further verification.
5. NOTAP consultant sends the application back to CUCRID for final corrections, compilations and processing of Management's approval.
6. Submissions send back to NOTAP through the consultant.
7. Payment made to NOTAP consultant for consultation and preprocessing costs.
8. NOTAP processes and sends the request to the Ministry of Commerce.
9. Continuous follow-ups with NOTAP office by CUCRID's patent desk.
10. Notification of approval and collection of Patent.

Ultra-modern CUCRID Building

Covenant made Impressive Outings at 6th Nigerian Raw Materials, FMS&T Expos 2020

Covenant University Team at the 6th Nigerian Raw Materials and Development Expo 2020 held at Landmark Event Centre, Lagos

CUCRID Director, Prof E. Iweala making presentation at a panel session while Prof J. Omoleye and others listen with rapt attention at the Expo

Covenant University researchers and product developers made impressive presentations at the 6th Nigerian Raw Materials and Development Exposition held at the Landmark Event Centre, Oniru, Victoria Island, Lagos between March 10-12, 2020. The University Team led by Director, Covenant University Centre for Research, Innovation and Discovery (CUCRID), Professor Emeka Iweala, made two resounding presentations during panel sessions of the Expo that featured key players in the manufacturing and raw materials sectors of the Nigerian economy.

Prof Iweala gave the first presentation, which focused on the research profile of Covenant University. His presentation received a resounding applause from the audience who acknowledged the great feats achieved by the University within the short period of her existence.

The second presentation made by Professor J. A. Omoleye focused on commercial values of research products of Covenant University exhibited at the Expo and the need for the industry to buy into them.

Other members of the University that participated in the Expo included, Dr Stephen Oluwatobi (Deputy Director, Commercialization), Mr Emmanuel Igban (Research Information and Industry Partnership), Mr. Akindele Ayoola (Product Developer), Mrs T. Owoeye (Product Developer), Mrs D. K. Akinlabu (Product Developer), Mr S. Igbamerun (Product Developer), and Mr M. Fagbohun (Product Developer). Covenant University also participated in the Federal Ministry of Science and Technology (FMS&T) Expo 2020. The Expo which held at the Eagles Square, Abuja commenced on Monday 16th March through Friday 20th March 2020. It was presided over by Honourable Minister of Science and Technology, Dr Ogbonnaya Onu, who visited the Covenant University's stand to grace her research products on display. The exhibitors and officials that represented Covenant at the annual event included Professor E.E.J. Iweala, Dr S. Oluwatobi, Dr G. Bamgboye, Mr E. Igban, Mr O.G. Vincent, Mr. Akindele Ayoola, Mrs D.K. Akinlabu, and Mr S. Igbameru.

Officials from the Federal Ministry of Science & Technology during visit to Covenant stand at FMS&T Expo 2020 at Abuja

Covenant University Team at the FMS&T Expo 2020

Federal Ministry of Science & Technology's team of assessors at Covenant stand during the Expo

Covenant to Co-host Expos with Host Community, OCIIP Nigeria

Vice-Chancellor, Prof. AAA. Atayero (2nd Right) in a handshake with Olota of Ota's Representative after signing an MoU with Olota FECODEIN while Registrar, Dr Promise Omidiora (1st Right) looks on.

Members of CU-Ota Tech Expo Committee with His Royal Majesty, Olota of Ota, Oba Adeyemi Abdulkabir Obalanlege during a courtesy visit of t he Committee to the Olota's palace at Ota.

It was the most fantastic events at CUCRID main auditorium on 19th September 2019 when Covenant University inaugurated the Local Organizing Committees (LOCs) to drive two strategic expositions to be co-hosted by the University with her two stakeholders. The two committees inaugurated by the Vice-Chancellor, Professor AAA. Atayero were the LOCs for the CU/Ota Tech. Expo and the CU/OCIIP exhibition and conference 2020.

The CU/Ota Tech. Expo is a partnership between Covenant University and Ota, her host community, under the aegis of Olota FECODEIN (Olota of Ota's foundation). The Expo themed: "The 4th Industrial Revolution: Future for Businesses, the Work Place and Communities," is a Town & Gown initiative aimed to expand the frontiers of ICTs in Ota community and beyond.

On the other hand, the CU/OCIIP exhibition and conference is a collaboration between Covenant University and the OCIIP Nigeria Ltd whose promoter is an alumnus of the University.

In his remarks, the Vice-Chancellor welcomed all the stakeholders at the events. He acknowledged the strategic importance of the expositions in promoting research and innovation as well as the existing relationships between the University and the two partners. He expressed happiness that while other institutions were at loggerheads with their host communities, Covenant University was collaborating with hers to promote progress and endowment of developmental legacy for posterity.

Prof Atayero also noted that the founder of OCIIP Nigeria, graduated from Covenant University and that during his studentship at Covenant, he had opportunities to travel abroad on Student Exchange visits, which impacted on him positively as evident in his current endeavours. He said the University was therefore glad to welcome his idea to promote creativity, innovation, and research.

Covenant to Co-host Expos with Host Community, OCIIP Nigeria

Contd. from pg 18

Vice-Chancellor, Prof. AAA. Atayero and other members of Covenant University Management with the newly inaugurated Members of CU-OCIIP Expo Committee

He further stated that Covenant University had been recently ranked in the bracket of 401-500 of the Times Higher Education (THE) ranking and it had brought greater visibility to the institution. He reaffirmed Covenant's commitment to building capacity in all human spheres, adding that the acceptance of the proposals to collaborate with the two organisations was in fulfilment of that responsibility.

Furthermore, he admonished members of the LOCs to work together in unison and be guided by the Terms of Reference to achieve maximum impact towards the scheduled international Expos.

"This indeed marks a good way of commencing a new academic session," said the Registrar of Covenant University, Dr Olusegun Omidiora, in his welcome address. He noted that it was the desire of the management of the University to make a global impact in all ramifications. He, therefore, saw the collaborations as avenues to further impact on humanities.

Prof.Atayero (l) and the Chairman, OCIIP, Mr Michael Esuong at the event.

The Director, Covenant University Centre for Research, Innovation and Discovery (CUCRID), Prof Emeka Iweala gave background overview of the partnerships and hinted that the international Expositions were proposed to hold in early 2020. He implored members of the LOCs to work together as teams to ensure success of the Expos.

The Olota of Ota, His Royal Majesty, Oba Adeyemi Abdulkabir Obalanlege, who was represented at the event by the Director-General of Olota FECODEIN, Alhaji Rafiu Oduanye, appreciated Covenant University Management for the acceptance to host the Exposition. He expressed optimism that the programme would be a massive success because of the University's reputation and pedigree of excellence.

In the same vein, the chairman OCIIP, Mr Michael Esuong, expressed gratitude to Covenant University management for the warm reception he received and the interest to collaborate with his company on the platform of reaching out to the public to promote research, innovation, and creativity. He promised that he and his team would maximize the opportunity to ensure that the Exhibition records huge and matchless success.

Also present at the ceremonies, were the Deputy Vice-Chancellor of Covenant University, Prof. Akan Williams, the University Chaplain, Pastor Kayode Martins, Prince Oke Oyede of Olota FEDECODEIN, and other members of the Local Organizing Committees from Covenant University and the partnering institutions.

The committees started work immediately after the inaugurations and have held webinars on some pertinent issues related to themes of the Expos.

CUCRID Set to Partner MAN in R&D

Covenant University Centre for Research, Innovation and Discovery (CUCRID) is poised to partner with the Manufacturers Association of Nigeria (MAN) to promote research and development (R & D) as well as building the workforce base of industries in Ogun State.

The officials of CUCRID led by the Director, Professor Emeka Iweala, revealed this strategic intent at a meeting with the Executive Committee of the Manufacturers Association of Nigeria, Ogun State Chapter on March 5, 2020.

According to Professor Iweala, the University through the Centre in collaboration with organizations promotes R&D endeavours that solve problems in the real world, which in turn improve the performance and success of both the industry and the University.

CUCRID Director said the University had contributed immensely to the development of her host communities through her innovative Community Development Impact Initiative programme. He added that to secure the development future of these communities, the University, therefore, need to improve the working relationship with the manufacturing industries in Ota and the entire Ogun State. Such collaboration, according to him, is very crucial to turning great ideas and research findings from Covenant University into products that impact on the industry, especially those located in her immediate environment. He stated that CUCRID considers MAN, Ogun State Branch as an excellent platform for forging such an active collaboration for the desired impact.

CUCRID Director, Professor Emeka Iweala making presentation at the meeting with MAN's Executive Committee

CUCRID Team, which also included Dr Stephen Oluwatobi, Deputy Director of Commercialization and Mr Emmanuel Igban of the Industry Partnership, used the occasion to market the activities of research clusters in the University . They urged MAN and her members to leverage them to build the capacity of technical staff in the industry.

In his response, the Chairman of MAN Ogun State Branch, Mr Seleem Adegunwa, applauded the University's achievements within the short period of her existence. He promised that MAN Ogun State would work with Covenant University to

expand the frontiers of knowledge and functional education.

Mr Adegunwa, who is also the chairman of Rite Foods Ltd, and his committee members implored CUCRID to initiate capacity building training programmes tailored to the needs of low cadre factory workers such as electricians, machinists and others.

Other members of MAN Executive Committee at the meeting included Mr Rammos Pawagiotis (PMW), Ms Motunrayo Elegberun (Executive Secretary MAN Ogun State), Richard Ben (MAN Ogun), Mr Chris Uzoalu (Crown Pack, Nig. Ltd.), and Mr Adio Emmanuel (Rite Foods).

CUCRID Team and members of MAN's Executive Committee after the meeting

Chancellor's Exceptional Researchers List 2019: 19 Faculty Honoured

Cont. from pg. 15

Friction Stir Welding, Surface Coating and Renewable Energy.

Other faculty on the List are Professor Roland Loto, Professor Oluseyi Ajayi, Dr Stephen Akinlabi, Engr. Imhade Okokpujie, Professor Cleophas Loto, Professor Sunday Oyedepo, Dr Abiodun Abioye, Dr Sunday Afolalu, and Professor Olayinka Ohunakin all of the Mechanical Engineering.

Also in the List were Professor Sanjay Misra of the Department of Electrical and Information Engineering (EIE), Dr Emmanuel Okoro (Petroleum Engineering), Dr Theophilus Adagunodo (Physics), Professor AAA. Atayero (EIE), Dr Mojisola Usikalu (Physics), Dr Hilary Okagbue (Mathematics),Dr Samuel Sanni (Chemical Engineering), and Dr Anthony Ede (Civil Engineering).

The 2019 Chancellor's Exceptional Researchers Lists was dominated by faculty from the Department of Mechanical Engineering (62.55%), followed by Electrical and Information Engineering (10.82%), Petroleum Engineering (3.88%), Chemical Engineering (2.77%), and Mathematics (2.77%).

Dr. Hilary Okagbue

Dr. Usikalu Mojisola

Hebron Startup Lab: Redefining University Education in Nigeria from Enterprise Dimension

Student Innovators at the Hebron Startup Lab

Student Innovators at the Hebron Startup Lab

Startup Labs and Incubation Centres are redefining University education, giving it an enterprise dimension hitherto lacking especially in the third world countries. Many great companies such as Microsoft, HP, Google, Facebook, Yahoo, Dell, Time Magazine, Reddit, Tripod, among others sprouted from students' ideas and mindsets generated and cultivated from the university campuses. Their founders, who are now billionaires, have proved that ideas consciously articulated and translated into value-adding products in the market rule the world. Covenant University, known for her trailblazing and value-adding education, is also at the forefront of harnessing and accelerating the ideas of her students, graduates and staff from concepts to products to market. Saddled with this task is the University's startup accelerator known as Hebron Startup Lab. The Lab has made a significant stride in giving a true meaning to enterprise education. In this interview, the Curator of the Lab, Dr Stephen Oluwatobi gives a revealing insight into its activities which resonate beyond the shores of the University campus.

What is Hebron Startup Lab?

Hebron Startup Lab is Covenant University's Startup Accelerator for taking ideas from concept to product to market. It has been a learning platform for not only the students and beneficiaries but also for us. Our core focus has been on the CU student; but recently, we have opened up to serve faculty, staff as well as the neighbouring communities in Ogun and Lagos states.

Though we officially started in November 2016, activities and efforts had been in place earlier. For instance, we were operating as the Dreamers' and Visioners' Project from September 2015. Before then, informal activities had been ongoing to enable and support the ideas to impact the society, which I got the privilege of being involved in since 2012.

Foundational traction is gained now, which is being boosted by the support of the Covenant

University management; these are reflected in the provision of support and facilities that include workspace, funding of programmes, as well as physical infrastructures such as electricity and the internet.

What services do you offer aspiring entrepreneurs?

We offer aspiring entrepreneurs a couple of services and supports to enable them to start and build their own companies. The supports we provide include mentorship, training, workspace, infrastructure, administration, networks/contacts, funding and access to markets. We categorise these under venture support, and our Venture Support Team Lead (Gideon Okuazun) helps coordinates this. Other services we provide include Training, Learning and Development, which we use to upskill the entrepreneurs. Noting that entrepreneurs can only build to the extent of their capacity, we take this seriously. Thus, we have a Team Lead for Learning and Development (Efosa Uwoghiren).

What differs from the current offerings of the Centre for Entrepreneurial Development Studies (CEDS)?

The CEDS is essential to help manage the curriculum aspect of entrepreneurship for Covenant University; thus, the CEDS helps to manage and coordinate the entrepreneurial classes, both general class and the practicals. The Director of the Centre is doing a fantastic job coordinating these coupled with running active businesses, which the students also use for their practicals platform. The Hebron Startup Lab, on the other hand, is not curriculum-based for now; and when we open that arm, it won't be in the same order as what CEDS does to avoid duplication. It's just like Stanford University, which has an entrepreneurship centre in addition to Stanford eCorner, Stanford SEED as well as other executive programmes for Entrepreneurs. The Hebron Startup Lab seeks to explore every possibility to cultivate high-growth entrepreneurs in Covenant University and beyond for the good of all. Africa needs more entrepreneurially-minded people, who know how to master problems and solve them through building sustainable enterprises. It explains why part of our approach is a flexible and hands-on means for cultivating high-growth numbers; thus, we support those who have relevant solutions to build and work on; and this demands much deeper thinking effort and innovation.

Dr Stephen Oluwatobi, Curator, Hebron Startup Lab

Why do you focus students'' interest in startups instead of savvy skills for the world of work?

Not all students are interested in startups; some are interested in building their career working with an xisting

Facilitators at the Edustart Summit organised by the Hebron Startup Lab. With them is the Deputy Vice-Chancellor, Prof Akan Williams (4th Left)

A cross section of participants at the Edustart Summit organised by the Hebron Startup Lab. recently

organisation, while some others want to develop their platforms. Either way has its toughness. Exposing students to building a company, however, is the immediate answer Africa needs for now. The world of work is yet to absorb the supply of talents from Higher Education Institutions (HEIs); HEIs, therefore, need to focus on supplying skills that know how to create ventures that will not only employ them but create employment opportunities for others. Besides, building a company makes you think differently, gives a sense of responsibility and a platform to create massive value at scale. But, going this path, demands courage.

Mention some of your startup incubation programmes and other programmes you have organised?

We have the Venture Acceleration Programme; and recently, specifically in June this year, we started the micro version to help small business owners succeed with their ventures. Others include our entrepreneurial upskilling programme, digital skills training programme, mentorship programme, boot camps, and the talent community.

Do you have plans to provide spaces and other facilities for housing and nurturing the fledging enterprises of CU Alumni entrepreneurs?

Yes, we do. But we need to gain more traction first and achieve specific milestones that will warrant this. We want to make sure it is sustainable, and the ventures have grown to pay for such facilities. We foresee this as translating to the Science Park. We are gathering the necessary momentum to make that happen.

Do you have collaborators and accelerators within and outside the University?

Oh yes. We are open to faculty members who have amazing innovations that have market potentials. We are happy to work with Departments and clusters, that can feed us with creative ideas worth enterprising. Externally we have a couple of collaborators that includes accelerators, investors, industrialists, entrepreneurs, Universities, international institutions and organisations.

Do you provide innovation grants for students and other prospective entrepreneurs that incentivise and support the creation of unique products and

Nnamdi Ezeigbo, Foounder/CEO, SLOT Systems Ltd- a regular mentor at Hebron Start Lab

distinctive business models? If you do, how can one access such grants?

Yes. The University has been generous here; not just financially. One of the founders, who recently graduated has been lodged in the University to help him focus on building a fantastic product. That's substantial in monetary terms. We also have partners we leverage on to connect promising startups. But, we don't want to pay attention to grants anymore. We, however, connect our startup and HSL community members with grant programmes and competitions that provide funding and support. Covenant University provides grants for research and development via CUCRID; however, if it is seed funding or growth capital to build a company, it has to be in exchange for equity. External investors also show interest. In summary, the way to benefit from venture funding is to build something remarkable and worth funding.

This year, Hebron Startup Lab won a grant from the British Council, what is it the purpose?

It's for the scaling up of the Lab into a hub. It includes equipping the facilities, capacity development. The main aim, however, is to cultivate high-growth entrepreneurs, who will create a venture and create jobs. These are the expectations of the project. We are in it in collaboration with the Centre for African Entrepreneurship and Leadership (CAEL), University of Wolverhampton and Kwara State University.

There is always a big gap between innovation and market viability, how is Hebron Startup Lab bridging the gap, which seems profound in the Nigerian university system?

The central gap is the knowledge gap. University System is supposed to an engine for market-worthy and revenue-generating innovation; however isolated and disjointed relationships between the University and the industry, which I believe started a long time ago, has culminated in creating disconnected solutions. I call them disconnected solutions because the researchers in Universities, who provided such solutions, did not understand the problem beyond what they read in the literature. In the 1920s, Prof James McKinsey of the University of Chicago started McKinsey Company to address such issues. He and his team believed the best way to solve the industry's problem through research and innovation was to mingle and be immersed in the industry to study and understand their challenges. It turns out that it was a profitable business, and

Foluke Michael at a Hebron Startup Lab's programme

the industry had been starved of meaningful and connected-solutions. If researchers can look beyond gaining points to climb the corporate ladder and be connected with reality like James McKinsey was, I believe, we can bridge this gap. What we are doing at the Hebron Startup Lab is to, first of all, enlighten everyone, through our training. What we presently see is researchers seeing publication and patents are the end instead of the means to the end. This scenario explains why immersing to understand the real problem to provide the practical solution is yet to be a priority for some. It represents one of the concerns that made us start the Entrepreneurial Skills training for Faculty and Staff and the STEM research to market programme.

How many startups have grown from the stable of Hebron Startup Lab?

We've have had over 30 from our last count. Every year, we generate new sets through our venture acceleration programme. Some fall by the wayside. Some do well. But the joy for us is what the founders would have become; because we have seen instances, where the founders of the startups that don't do well, go on after graduation to start something better and more successful. So, the initial failure for them is part of the learning process. It is a lesson we have learned as well; hence, we have focused on making the entrepreneur and encouraging startup teams to make bold moves to build solutions even if they fail.

What is the developmental trajectory for nurturing a viable startup or spinoff?

Everything begins with an idea. But not all plans are viable. Real ideas are borne out of problems worth solving. Next is to ascertain the team, the people. A feasible idea cannot transform itself; it needs people who have the vision, commitment, drive, hunger, and capacity to make it happen. It explains why real investors invest mainly in the team, not the idea per se. What the Startup team does is to prove the viability of the concept by developing a testable prototype. They need a minimum viable product

Cont. on pg. 47

Presenters at a Hebron Startup Lab event

Student Innovators pitching for grants at a Hebron Startup Lab's programme

Ethics and Scientific Standards for Conducting Research in Covenant

A Special Focus on Covenant Health Research Ethics Committee (CHREC)

Covenant Health Research Ethics Committee (CHREC) is the Institutional Review Board (IRB) of Covenant University for ethics and scientific standards in research. It is registered with the National Health Research Ethics Committee (NHREC) of Nigeria (Reg. No. NHREC/25/10/2018) and the United States Department of Health and Human Services (IORG #: IORG0010037). The registration is renewable on expiry. ***CUCRID Discoveries*** had a chat with Prof S. N. Chinedu, Chairman, CHREC and here is the excerpts:

What are the specific aims of CHREC in driving research agenda of Covenant University?
CHREC aims to promote and sustain the highest level of ethical and scientific standards in research at Covenant University. To achieve this, CHREC:

I. organises periodic training on ethical issues in research for faculty and staff who may serve as Committee members and/or reviewers of research protocols;

ii. promotes continuous training, skill acquisition and certification on bioethics for members and all applicants of ethical review of research protocols;

iii. sensitises and guides researchers in the University and those from the external context on matters relating to ethical and scientific standards in research;

iv. determines whether a research protocol qualify for ethical review or exemption from ethical review;

v. carries out ethical evaluations of research protocols of faculty, staff and students of Covenant University and others from the external context;

vi. provides ethical approvals and clearance for researchers to carry out studies involving human and animal subjects or products intended for human use;

vii. monitors approved research protocols to ensure

Prof S. N. Chinedu, Chair, CHREC

compliance with ethical and scientific standards as contained in the institutional, national and international codes of ethics for researchers;
viii. protects research participants, researchers, and end-users of research products from exploitation or harm that may arise from research activities.

What is ethics in research?
Ethics may be defined as the determination of what is good or bad. Ethics in research refers to the rules or the codes of conduct that researchers need to observe to carry out ethically and scientifically acceptable research.

Why is it essential to adhere to ethical norms in research?
Adherence to ethical norms in research is important principally to protect research participants, researchers, and future users of the research findings or products from any form of exploitation or harm that may arise because of research. Before commencing a study, the researcher is required to submit a written plan and detailed information about the proposed research (the research protocol) to the Research Ethics Committee (REC) for consideration, guidance and approval. If it qualifies for ethical review, the REC then goes ahead to reviews the protocol, including the entire process of research activities, to determine whether it meets the specified ethical and scientific standards. The Committee may approve, disapprove or recommend some amendments to the research protocol.

What are the major ethical issues in conducting research?
Ethical issues in the conduct of research revolve around stopping unethical activities that may impact negatively on the study participants and unsuspecting public. It is essential to identify and avoid such unethical conducts as:
i. Exposing study participants to physical, emotional, and/or social harm;
ii. Not providing adequate care for persons participating in research;
iii. Not safeguarding the confidentiality of research participants;
iv. Not seeking informed consent from study participants;
v. Asking research participants to pay for research;
vi. Using false claims, inducement and pretences to attract participants;
vii. Conducting research that is not of benefit to study participants.

Are there core principles that guide ethical decision making in research?
The core principle guiding ethical decision on a research proposal hinges on adherence to stipulated ethical and scientific standards. The research plan and its execution must be in line with the institutional, national and international codes of ethics for researchers. Among the principles are:
i. Respect for persons: protection of subjects, especially vulnerable populations.
ii. Value: the design and implementation of the research must culminate into knowledge that adds value to human life.
iii. Justice: subject selection, inclusion/exclusion and recruitment of subjects. There must be a fair selection of the study participants.
iv. Beneficence: risk/benefit analysis, experimental design, qualifications of the principal investigator (PI), There must be a favourable balance of potential benefits over risks to the participants
v. Scientific integrity: Application of best practices must be evident in the study design, methodology, literature review, sampling, and result analysis.
vi. Ethical validity: Independent review and monitoring by a competent Research Ethics Committee.
vii. Non-maleficence:

informed consent, surrogate consent, Assent. Safety and wellbeing of enrolled participants must be guaranteed before, during and after the research is completed.

viii. Only competent persons, including investigators and their representatives, should be involved in the conduct of the research.

ix. Partnership with communities: The feedback from the study. Appropriate dissemination of research findings

Many disciplines and professions have ethical standards that suit their particular aims and goals. How essential is research ethics in collaborative research endeavours?

The challenges confronting man and his world today are multifaceted. Tackling these problems requires a multidisciplinary or interdisciplinary approach. Hence, collaborative research, involving persons from different disciplines or locations, has become the order of the day. Ethical principles are applicable across disciplines and apply at different levels: individual, institution, country, regions and the entire world. There are local and international collaborative researches. These have given rise to ethical issues bordering on the funding and conduct of international researches, particularly oversea recruitment of vulnerable persons to participate in studies such as clinical trials of vaccines and drugs. Ethical review and monitoring by independent Research Ethics Committee are required to conduct such studies.

Sometimes researchers face difficult choices in their research, especially on subjects that deal with ethics, morality and legality. How can one resolve such ethical or moral dilemmas in research?

Researchers should seek advice and proper guidance from a competent Research Ethics Committee. It is important to note that ethics is not a law. One could obey the law without necessarily acting ethically. By subjecting proposed research to ethical review and scrutiny of the Research Ethics Committee, a researcher can obtain constructive feedback that can enable him to resolve any legal, moral or ethical concern in the conduct of a given study.

Do we have research ethics in Covenant University? Who are the drivers?

Definitely, Covenant University, as an emerging research university, has a Research Ethics Committee. Covenant Health Research Ethics Committee (CHREC) is the statutory body saddled with the responsibility of promoting and ensuring adherence to scientific and ethical standards by all researchers in Covenant University. The Committee is directly responsible to the Vice-Chancellor who oversees all issues on quality assurance and academic standards as the chief academic officer of the University. The Vice-Chancellor, Professor AAA. Atayero, is the chief driver of research ethics in the University. The effectiveness of CHREC today is largely the result of his unwavering support and commitment in providing all that is required for the Committee to perform its statutory duties. He also champions the registration exercise of CHREC with the national HREC and other international bodies. CHREC consists of a desk officer and 21 listed members drawn from the University's four Colleges and the Medical Centre. The Committee has a two-year tenure. Presently, Miss Mercy Olaleye works as desk officer of the Committee while Professor Shalom N. Chinedu, Dr. Grace Olasehinde, and Dr. Tayo George respectively serve as Chairman, Coordinator, and Secretary.

What are the ethical principles that Covenant University's

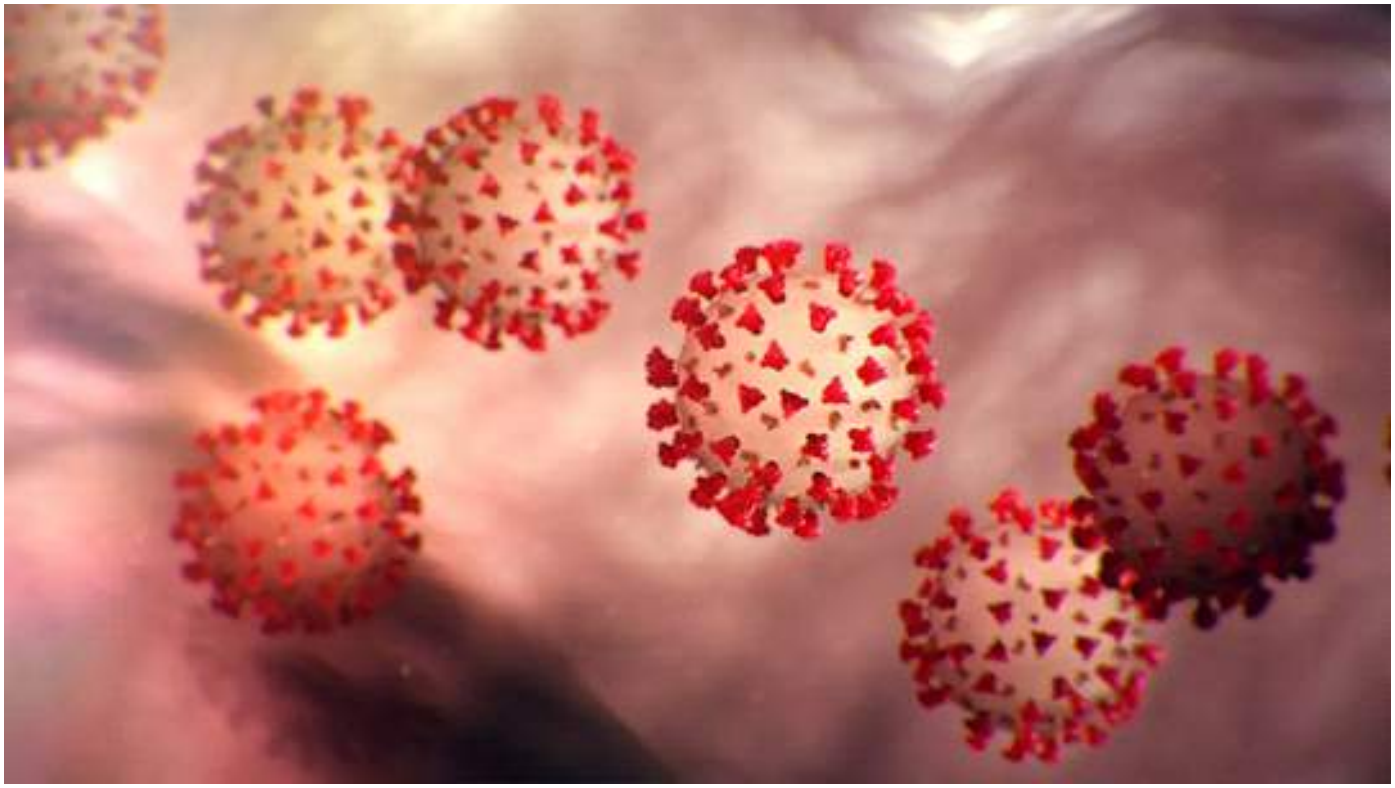
Prof S. N. Chinedu, Chair, CHREC

research code addresses?
CHREC, in line with the provisions of the National Code for Health Research Ethics of Nigeria, reviews research protocols involving human and animal subjects and Phase III and IV clinical trials including those in vulnerable populations provided the studies have been received and approved by the Ethics Committee at the clinical sites where the studies are to be conducted. CHREC is also authorised to review social and behavioural research, trials in alternative and complementary medicines as well as epidemiological studies. However, it is not authorised to review Phase I and II clinical trials.

How can ethical norms in research help to build public support (grants and endowments) for research at the University?
Ethical approval from a competent Health Research Ethics Committee boosts the confidence of the public on the scientific and ethical validity of research and thereby assist researchers in attracting grants for their researches. Most donor agencies and organisations make ethical approval/clearance certificate a non-negotiable condition for a grant application. Having a Research Ethics Committee that is recognised, nationally and internationally, help build donors' confidence to support research activities in our University. By the grace of God, CHREC, through its endeavours, has greatly assisted the University to attract endowments and Centre of Excellence and helped many researchers to win big research grants, obtain patents for several research products, and to publish research articles in high impact journals indexed in leading databases, such as the web of science and Scopus. This has positively affected the ranking of the University, her researchers and academic disciplines.

How is ethical conduct in research being promoted in Covenant University?
Ethical conduct in research is promoted mainly through the activities of Covenant Health Research Ethics Committee (CHREC). This comes in the form of training and sensitisation of the university community on the benefits of scientifically and ethically sound research and the dangers of unethical conduct in research.

Are there penalties for any researcher who contravenes the University's ethical standards?
Certainly yes. There are penalties, based on laws and regulations guiding the conduct of faculty and staff, for established cases of flagrant disregard of scientific and ethical standards in research.



CONQUERING COVID-19 PANDEMIC

Shalom N. Chinedu
Department of Biochemistry, Covenant University

Introduction

Emerging coronaviruses are persistent global public health threats due to their diverse nature, pathogenicity, fast spread, and the close interactions between humans and wild, domestic and companion animals. In late December 2019, a novel coronavirus emerged in Wuhan, China, causing the deadly coronavirus disease 2019 (COVID-19), characterised by the World Health Organization (WHO) as a pandemic. By April 2020, the disease has spread around the world, infected over 3 million people and killed over 210,000 of them, and devastated the world's economy. The fear of coronavirus has permeated the hearts of man, but there is hope for an imminent and quick defeat of the virus.

COVID-19 Illness

COVID-19 is an acronym for 'Coronavirus Disease 2019', a highly contagious respiratory disease, first identified in December 2019 during an outbreak of respiratory illness in Wuhan City, Hubei Province, China. The illness may be mild (some have no apparent symptom) or severe (including those that result in death). Signs and symptoms of COVID-19 may appear after an incubation period of between 2 and 14 days of exposure. The common symptoms are fever, cough, shortness of breath (difficulty in breathing), and invasive lesions of the lungs. Most people who contact COVID-19 experience mild to moderate illness and recover without special treatment. People at a higher risk of severe COVID-19 illness include those who are older, those with existing chronic medical conditions (such as heart disease, lung disease, diabetes, severe obesity, chronic kidney or liver disease), and those who have compromised immune

systems. In severe COVID-19 illness, damage to the alveoli, the small, elastic air sacs in the lungs, may occur; then, the patient may require hospitalisation or to use a ventilator. The virus kills by creating inflammation and clogging the alveoli with a kind of slime, which eventually obstruct oxygen supply to the body's organs. The mortality rate of COVID-19 illness ranges from 2 to 3% generally. It increases with age to about 14.8% (148 deaths per 1000) for persons aged 80 years and above.

The Causative Agent

COVID-19 is caused by a new coronavirus, named, 'Severe Acute Respiratory Syndrome Coronavirus 2 (SARS CoV-2), formerly, "2019 novel coronavirus (2019-nCoV)". Coronaviruses are a large family of zoonotic viruses. They are common in many different species of animals, including camels, cattle, cats, and bats, and can infect humans via animal-to-person contact. A coronavirus has an enveloped, crown-like, viral particle, from which it derived its name. The surface of the coronavirus is covered with spike proteins; which enable it to invade and infect its hosts. SARS-CoV-2 and two other highly pathogenic coronaviruses, which had previously caused epidemics in humans, SARS-CoV and the Middle East Respiratory Syndrome Coronavirus (MERS-CoV), are beta-coronavirus. Genetic heterogeneity has been observed in SARS CoV-2 sequences. Different strains of the virus are known to have different genomic sequences. The SARS-CoV-2 genome is a positive-sense, single-strand RNA (+ssRNA), 27–32 kb in size. One sequenced SARS-CoV-2 genome was found to consist of a 29,811 nucleotides long single, positive-stranded RNA.

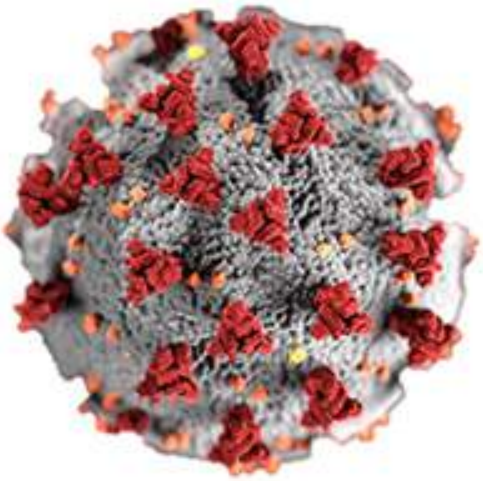


Plate 1: Coronavirus – The surface is covered with spike proteins with which it invades and infects humans. (Source: CDC)

COVID-19: A Pandemic

The virus spreads quickly and sustainably in the community via animal-to-person and person-to-person transmission. The International Health Regulations Emergency Committee of the World Health Organization (WHO), on January 30, 2020, declared the outbreak of the disease a "Public Health Emergency of International Concern (PHEIC)". On March 11, 2020, the WHO characterised the disease as a pandemic, the first pandemic known to be caused by a coronavirus. A pandemic is a global outbreak of disease; it occurs when a new virus emerges and begins to infect and spread between people sustainably. This happens because there is little or no pre-existing immunity against the new virus. By April 20, 2020, COVID-19 has spread to over 213 countries around the world, infected over 3,000,000 persons and killed more than 210,000 of them. About 86% of the reported cases and over 90% of the deaths occurred in two regions of the world, Europe and the Americas. To date, the United States has the highest number of COVID-19 cases and fatalities, followed by Spain. The number of COVID-19 cases and the associated deaths are rising steadily in Nigeria and other African countries. There are also reports of a resurgence of COVID-19 in China after the end of the first wave of infections. More disturbing are reports of SARS-CoV-2 reinfection of persons who had previously tested negative and recovered from COVID-19.

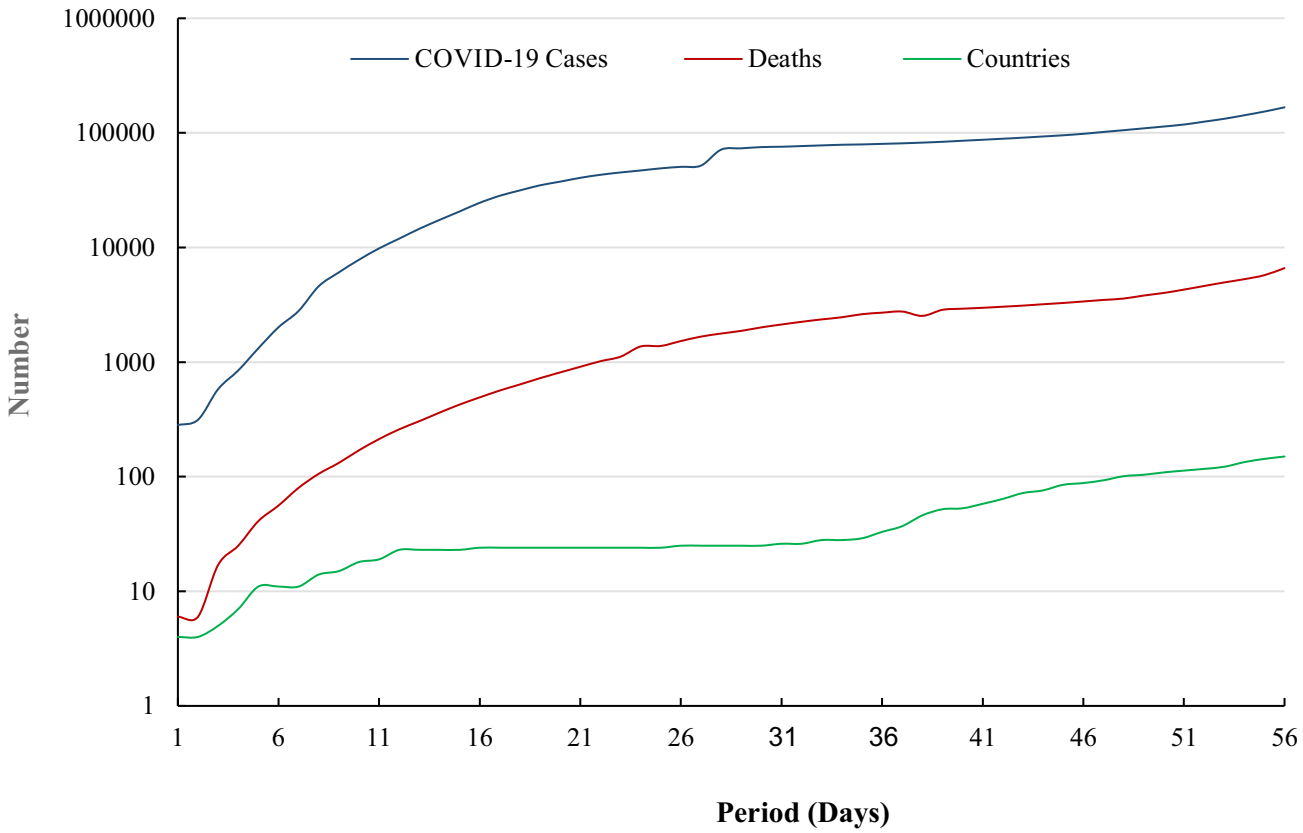


Fig. 1: COVID-19 Spread: Number of confirmed cases, deaths and countries affected between January 21 and March 16 2020 (Plot from WHO data).

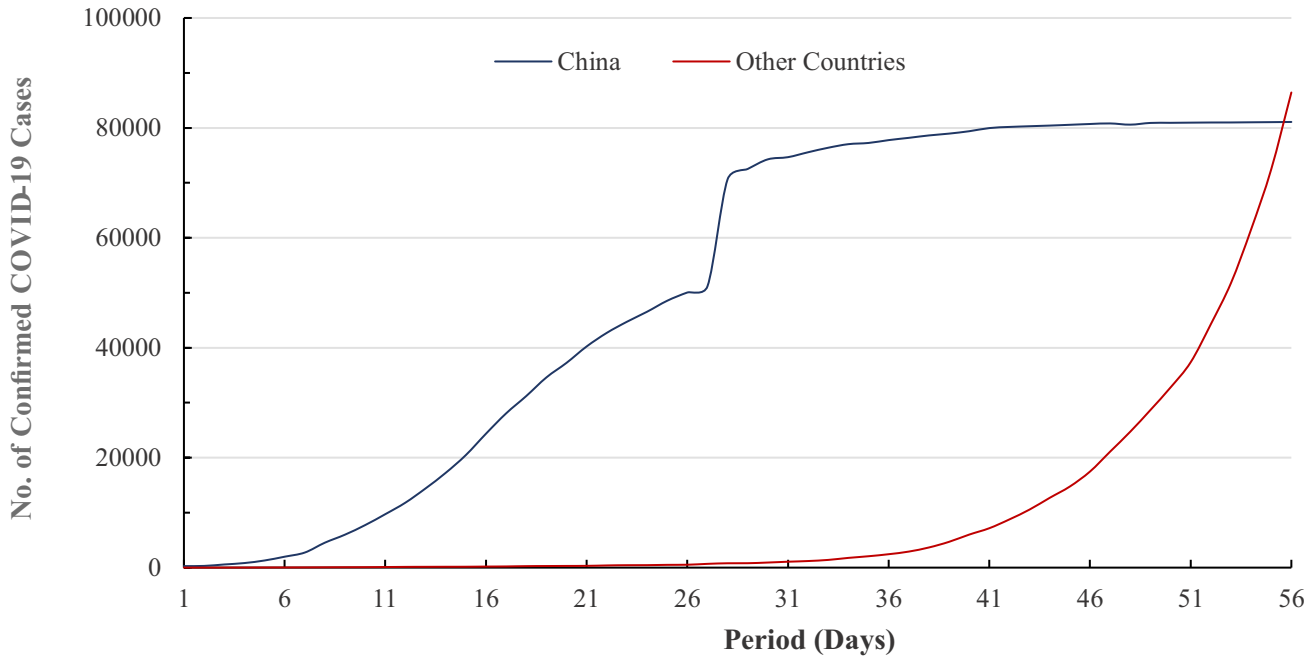


Fig. 2: COVID-19 spread in China versus the rest of the world: Number of confirmed cases between January 21 and March 16, 2020 (Plot from WHO Data).

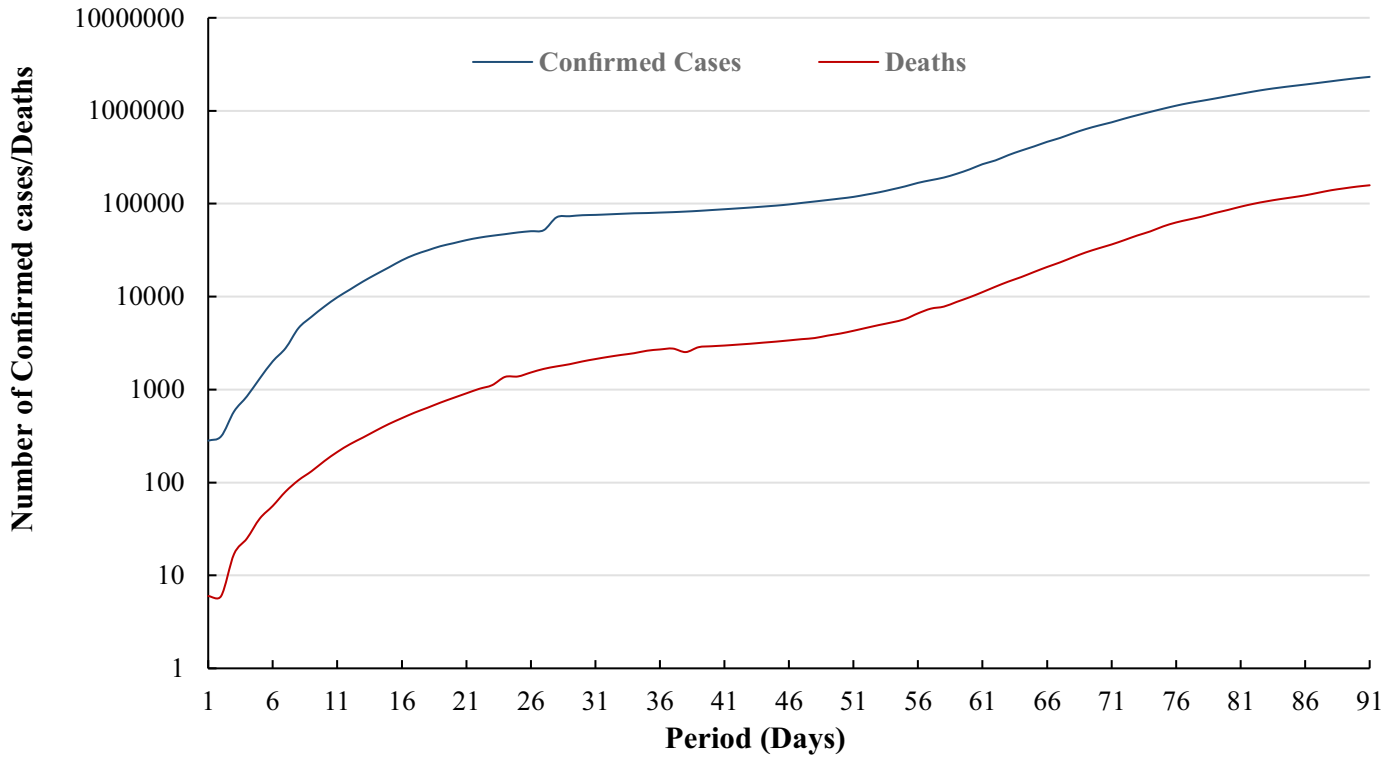


Fig. 3: COVID-19: Confirmed cases and deaths across the world between January 21 and April 20, 2020 (Plot from WHO Data)

CURBING THE SPREAD OF COVID-19

The main route of SARS-CoV-2 transmission is respiratory droplets from the cough or sneeze of infected persons. The virus is also detectable in other body fluids and excreta. Current efforts at curtailing transmission of COVID-19 strives to:

1. Identify, isolate and trace contacts of those infected, and treat them:

Testing, isolation and contact tracing are the mainstay of the response to COVID-19 pandemic. Current treatment procedures involve symptom relief and supportive care, with many requiring hospital care. Early medical attention may reduce the severity of the illness. A patient is deemed to have fully recovered from COVID-19 infection when two tests conducted in a 24-hour interval show negative results. It is essential to:

- Test every suspected case (showing signs of infection),
- Isolate the people that test positive,
- Trace who they have been in close contact with them up to two days before they developed the symptoms, and
- Test those people also and repeat the process over again.
- Quarantine them for at least two weeks after the symptoms disappear, and they test negative, so they don't infect others.

2.Prevent infection of those not yet affected by the virus, and protect: them:

There is yet no approved vaccine to prevent SARS-CoV-2 infection. The best way to prevent COVID-19 illness is to avoid being exposed to the virus. The most efficient way to achieving this is by maintaining high-level hygiene and social distancing, disinfecting the environment regularly, wearing protective mask/equipment, and complying with approved emergency measures such as lockdown and travel restrictions; natural events such as high temperature and high

humidity can also help curb virus transmission.

· Wash your hands with soap and water for at least 20 seconds or use sanitiser that contains at least 60% alcohol;

· Avoid touching your eyes, nose, and mouth;

· Practice respiratory hygiene – cover your mouth and nose with a bent elbow or tissue when you cough or sneeze, and properly dispose of the used tissue;

· Wear a facemask when you are around other people;

· Keep a safe distance from people if COVID-19 is spreading in your community.

· Avoid close contact with people who are sick; maintain at least 1 metre (3 feet) distance between yourself and anyone who is coughing or sneezing.

· Put on personal protective equipment (PPE) while on duty as frontline medical personnel and caregiver.

WINNING THE WAR AGAINST COVID-19 PANDEMIC

COVID-19 pandemic poses a severe threat to human existence. It has struck humanity with dreadful fear and an avowed resolve to decimate the human race and destroy the world's economy. However, it will surely be defeated like the previous pandemics, orchestrated by influenza viruses. Stopping the scourge of COVID-19 will require effective preventive and curative strategies against the disease. Happily, the race towards the development of effective vaccines, drugs and alternative remedies against COVID-19 virus is beginning to yield positive results.

1. Prevention of COVID-19

The best-known approach to prevent viral infection is by vaccination. Several efforts towards developing effective vaccines against SAR-CoV-2 are ongoing. Some have reached the clinical trial stage. Appreciable time is required to establish the safety and efficacy of a vaccine before making it available to the public.

· *Vaccines*

The first human clinical trial of a potential COVID-19 vaccine (mRNA-1273) was conducted in the U.S. on March 16, 2020. Administration of the newly approved vaccine to the public has commenced in the United States. However, the issues of genetic heterogeneity of SARS CoV-2 sequences and reinfection of recovered patients may hamper the ability of approved vaccines to protect people from COVID-19 virus.

· *Plasma from recovered patients*

Plasma from recovered COVID-19 patients is believed to contain antibodies that may help fight the disease. The U.S. Government is currently supporting a national Expanded Access Program intended to collect and provide convalescent plasma to patients in need across the country. Antibodies produced by patients during infection give them immunity against the specific virus for months or even years. However, researchers are still figuring out if and how that works with COVID-19 given many reported cases of reinfection.

2. Cure of COVID-19

There is presently no approved antiviral drug for the cure of COVID-19. Some existing antivirals and several herbal formulas are currently in use for the treatment of COVID-19 patients. The potential of new broad-spectrum antivirals and bioactive compounds from herbal formulas should be studied, and effective ones followed up with clinical trials promptly.

· *Antiviral drugs:*

The potential use of some existing drugs for the treatment of COVID-19 have been publicised. Among the indicated drugs are Chloroquine (an anti-malarial drug) and its derivative, hydroxychloroquine. Others are Azithromycin, an antibiotic, and Remdesivir, an antiviral

drug. A combination of hydroxychloroquine (or Chloroquine) with Azithromycin is claimed to reduce the viral load of patients. This claim is not yet validated by a clinical trial!

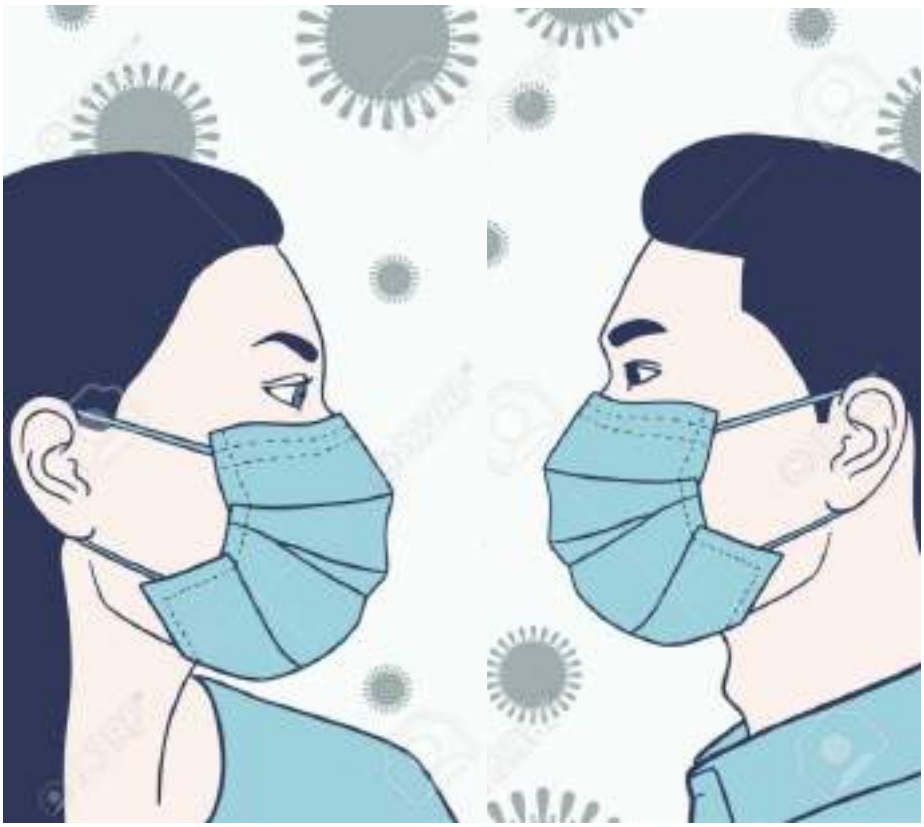
· *Herbal preparations:*

There are several claims in different parts of the world of the efficacy of herbal formulas, lemons, ginger, etc. to prevent or cure COVID-19. Among them is a local herbal remedy, called "COVID-Organics" claimed to prevent and cure the novel coronavirus, which was recently launched by Madagascar's President, Andry Rajoelina. The Malagasy Institute of Applied Research (IMRA) developed COVID-Organics from Artemisia plant. In Nigeria, many medicinal plants have been recommended to treat coronavirus infection. Seyi Makinde, Oyo State Governor, South-west Nigeria, who recently recovered from COVID-19 infection, said he used the herbal formula, consisting of "honey, vitamin C, and blackseed oil" to clear the virus out of his system. The WHO, however, has warned people to be vigilant about these claimed cures for COVID-19. The United States Centre for Drug Control and Protection also said emphatically that: "There is no scientific evidence that any of these alternative remedies can prevent or cure the illness caused by COVID-19. In fact, some of them may not be safe to consume."

Claims of the success of some of these local regimens in treating COVID-19 infection should not be dismissed outrightly. Instead, these herbal formulas should be subjected to scientific investigations, further research and improvement. The role of medicinal plants in drug development is well known. Professor Maurice Iwu once noted that: "Of the hundreds of pharmaceutical products currently in use around the world, 74% have been derived from plants; 75% of the plants were from tropical forests in Africa and South America."

CONCLUSION:

In conclusion, winning the battle against COVID-19 pandemic demands synergy between government, experts, opinion leaders, and the public. A better understanding of the basic biology of coronavirus and host-virus interaction could lead to the discovery of drug targets. The potential of existing broad-spectrum antivirals should not be disregarded; clinical trials on these drugs should start in a timely fashion. Innovative technologies such as gene therapy should be explored for their potential to combat coronavirus and act as another line of defence against emerging viral diseases (Tse et al., 2020).



REVIEW OF NIGERIA'S EFFORTS IN MEETING GOAL 6 of the United Nation's Sustainable Development Goals

By Prof. David O. Omole

Prof. David O. Omole

Introduction

The Millennium Development Goal (MDG) that spanned between 1990 and 2015 recorded much success. Despite this success story, some countries, including Nigeria, did not meet the MDG targets of halving the number of persons without access to clean water and sanitation by 2015 (Omole, 2013). In fact, it was reported that 40% of all those who were yet meet clean drinking and sanitation goals in the world resided in Sub-Sahara Africa (Omole, 2013). At the end of the 2015 lifeline for the execution of the MDG, the Sustainable Development Goals (SDGs) were inaugurated and once again, Goal 6, focused on providing access to clean water and sanitation (UN, 2019). The SDGs target 2030 as the year of completion. It is barely 11 years from now. The questions that come to mind are:

i. what were the reasons for missing out on the earlier MDGs?

ii. Are the challenges being addressed in the current dispensation?

iii. Is there a possibility of meeting the SDGs?

iv. What can be done to pick up the pace?

I. Reasons for missing out on the MDGs –

some of the reasons for missing out on the MDGs include:

a. Inadequate funding: There is evidence that Goal 7c of the MDGs received an insufficient financial commitment from the Federal Government, whereas the provision of clean water and sanitation requires massive investments in infrastructure. An analysis of Nigeria's budget (2002-2011) indicates the dwindling Government interest in this subject (Omole, 2013). The analysis showed that within these 10 years, Nigeria's budget allocated an average of 30 cents per capita to the Federal Ministry of Water Resources (which is the main organ responsible for Water and Sanitation),

whereas, aid from foreign donors to Nigeria amounted to an average of $1.1 per capita to Nigeria. This is indicative that foreign donors were doing more about the water and sanitation challenges of Nigeria than its Government.

b. Poor distribution capacity: Only 24% of Nigeria's population is reached by piped water from public infrastructure (Omole et al., 2016). The others source for water themselves from ground and surface water sources. This lack of distribution capacity is linked to other factors such as the absence of water distribution infrastructure, improper or absence of urban planning, vandalism, among others.

c. Lack of capacity: in many of Nigeria's River Basin Development Authorities (RBDAs) all over the country, the personnel lack proper training and modern tools required to function at cutting edge. Some still enter daily data on sheets of paper because functional computers are absent. Proper planning and advice for cutting edge water resources planning can only be given by competent personnel. This is missing in the Nigerian system.

d. Weak Law enforcement: in situations where corporate organisations and individuals pollute available freshwater bodies, it would be expected that appropriate sanctions should be meted. However, this is not always so. There is flagrant pollution of the environment, and the available laws are either too weak, or the law enforcement agents are unwilling or too corrupt to enforce the applicable laws (Longe et al., 2010).

e. Weak institutions – the administration of the water resources of any nation requires strong institutions. The Federal Ministry of Water Resources (FMWR) and Ministry of Environment govern the nation's water resources and sanitation matters. Under the FMWR are the twelve RBDAs, serving the 36 States and the Federal Capital Territory (Omole et al., 2015). Thus, there is a proper structure, but each institution is under-equipped, under-staffed, and under-utilised.

f. Water losses: another challenge to efficient water distribution is water loss, primarily through vandalism of piped water and old pipes that require replacement. Reports from some sections of the country say between 60 – 80% of piped water is lost in transit due to burst pipe, illegal connections, vandalism and ageing infrastructure (Omole et al., 2016)

g. Population explosion: provision of sufficient and functional water infrastructure is highly dependent on the population served. With the exponential increase in population and decreased capacity for distribution, the situation keeps getting compounded by the year.

h. User apathy to payments: the lack of willingness by the vast majority of water users to pay for public services rendered is also a significant threat. A survey of water users in Lagos indicated that nearly 50% of the surveyed population believed that Government should provide and cover the costs of piped water to the homes. It is also common to see people who dump their refuse by the highway so that government sanitation workers can pick them up for disposal. If persons pay for these services, as practised in developed countries, there will be positive multiplier effects in the economy in terms of a cleaner environment, employment opportunities, contracts, among others.

i. Open-air defecation: Nigeria has the reputation of having the second-highest number of open-defecators in the world (Obinna, 2018). There is also report that between 1990 and 2015, the number of persons without access to sanitation worsened increasingly and peaked with 47 million people practising open defecation as of 2015

(FMWR, 2015). Thus, while the rest of the world was actively driving down the number of persons without access to proper sanitation, Nigeria's population of persons without access was increasing.

II. Are the challenges being addressed in the current dispensation?

In 2015, the Federal Government, in conjunction with UNICEF, European Union and UK-Aid published a road map for making Nigeria Open-Defecation-Free by 2025 (FMWR, 2015). The report pointed out that Nigeria loses about $20/capita per year that the problem of sanitation persists. The report also stated that the sum of N959billion was needed to stem the problem and Nigerian Government was expected to provide N234 billion between 2016 and 2025 (N23 billion per annum) while the balance was expected to come from international donor organisations and private investors. However, a perusal of the 2016 and 2017 National budget allocation for the FMWR shows no reference to this road map and the highest allocation (N600 million) to sanitation came from the African Development Bank (ADB), which was not part of the initial road map. Consequently, there is a derailment from the road map (FMWR, 2015).

III. Is there a possibility of meeting the SDGs?

Yes, through reversion to the earlier discussed road map, before the 2030 deadline. The road map requires revision and making-up for time lost to avoid compounding the problem.

IV. What can be done to pick up the pace?

Goals were created to be actively driven. Setting and doing nothing about them is mere wishes, and as the saying goes, if wishes were horses, beggars would ride. The leadership and citizens need to realise that foreign aid cannot make up for the national commitment. The foreign donors should not be expected to feel the need for transformation more than the primary stakeholders. Most of these donor organisations only make available their counterpart funds when they see evidence that the affected nation has fulfilled its part of the agreement. According to Mara (2017), there can be no solutions without political solutions. Thus, the Federal Government needs to pay more than lip service to this

problem of water and sanitation as much is being lost through inaction. Equally, the willpower to achieve clean water distribution and sanitation for all can be achieved quicker if the 60 – 83 % water loss earlier described can be harnessed and properly channelled. The road map, for which the Federal Government hired a foreign consultant to develop, has already outlined what must be done to solve the water and sanitation challenges (FMWR, 2015). These include capacity development; promotion of improved technology options through sanitation marketing; provision of sanitation facilities in public places; Community-Led Total Sanitation; promotional and media campaigns; creating enabling environment and coordination mechanism. It will do the nation much good to follow the road map.

REFERENCE

1. FMWR (2015). Making Nigeria open-defecation-free by 2025: A road map. Available at: www.unicef.org/nigeria/mdeia/1491/file/Nigeria-making-Nigeria-open-defecation-free-by-2025.pdf.pdf.
2. E.O. Longe, D. O. Omole, I.K. Adewumi and A.S. Ogbiye (2010). Water Resources Use, Abuse and Regulations in Nigeria. Journal of Sustainable Development in Africa, Vol. 12 (2): 35-44.
3. Mara, D. (2017). The elimination of open defecation and its adverse health effects: A moral imperative for governments and development professionals. Journal of Water, Sanitation and Hygiene for Development, 7(1):1-12.
4. Omole, D.O. (2013). Sustainable Groundwater Exploitation in Nigeria. Journal of Water Resources and Ocean Science. Vol. 2, No. 2, pp. 9-14.
5. Omole, D.O. and Ndambuki, J.M. (2015). Nigeria's Legal Instruments for Land and Water Use: Implications for National Development. In Evans Osabuohien (Ed): In-Country Determinants and Implications of Foreign Land Acquisitions (pp. 354-373). IGI GLOBAL, Hershey, PA, USA: Business Science Reference. DOI: 10.4018/978-1-4666-7405-9.ch018.
6. Omole, D.O., Ndambuki, J.M., Badejo, A.A., Oyewo, D.O., Soyemi, T.O. (2016). Public Feedback on State of Domestic Water Supply in Lagos: Implications for Public Health. Indian Journal of Traditional Knowledge, 15(2):245-253.
7. Omole, D.O. and Ndambuki, J.M. (2015). Nigeria's Legal Instruments for Land and Water Use: Implications for National Development. In Evans Osabuohien (Ed): In-Country Determinants and Implications of Foreign Land Acquisitions (pp. 354-373). IGI GLOBAL, Hershey, PA, USA: Business Science Reference. DOI: 10.4018/978-1-4666-7405-9.ch018.
8. Obinna, C. (2018). Why Nigeria ranks second worst open defecating country in the world – Report. Punch Newspaper, September 30, 2018.
9. UN (2019). About the Sustainable Development Goals. Available at: https://www.un.org/sustainabledevelopment/water-and-sanitation/. Accessed October 9, 2019.

How Covenant University Emerged As Host for World-Bank Funded African Centre of Excellence

It's no longer news that Covenant University is hosting the World-Bank Funded African Centre of Excellence, what is novel though is thorough processes involved in the selection that saw the University emerged among the 17 successful applicants out of 146 proposals received from Nigeria.

Recall that following the success of the first phase of the Africa Centre of Excellence (ACEI) Project, the World Bank and governments of participating countries recognized the need to escalate the success and expand the benefits accrued to the Centres and their countries. Consequently, the third phase of the Project titled the ACE for Development Impact (ACE Impact) was approved by the World Bank. The 12 participating countries include Benin, Burkina Faso, Cameroon, Cote d'Ivoire, Djibouti, Ghana, Guinea, Senegal, The Gambia, Togo, Niger and Nigeria. ACE Impact seeks to increase the quality and relevance of postgraduate education in selected universities through regional specialization, applied research, upfront university-industry linkage and better regional and international coordination. ACE Impact Project is focused on scaling up postgraduate education and applied research that is fundamental to economic growth in the region. The universities housing the Centres are expected to meet global standards for quality of education, recruit students across the region and collaborate with other African universities. The total investment across the countries is expected to reach USD 300 million, with funding from the World Bank and Agence Francaise de Developpement (AFD). The priority fields of ACE Impact are Science, Technology, Engineering and Mathematics (STEM), Health Sciences, Agricultural Sciences, Environmental Sciences and Applied Social Sciences. Subsequently, the governments of the participating countries launched the ACE Impact project in May 2018 building

The World Bank officials with the Covenant University Management Team during the recent visit of the Bank to Covenant Applied Informatics & Communication Africa Centre of Excellence (CApIC-ACE)

on the successful implementation of and lessons learnt from ACE I in West and Central Africa.

The selection process formally started in September 2018 with a call for Proposals advertised in national newspapers in the participating countries. Nigeria received a total of 146 proposals from which 45 were selected and forwarded to AAU. Subsequently, a total of hundred and ten (110) proposals consisting of new and renewal projects (from existing ACEs) were submitted to AAU by the higher education agencies of participating countries including the National Universities Commission (NUC). Experts carefully reviewed these proposals in the various thematic fields of Health, Agriculture, Environment, Social Sciences and STEM (Science, Technology, Engineering and Mathematics). Following the desk and remote panel evaluations, 65 proposals were shortlisted, and onsite visits were undertaken to the higher educational institutions which submitted them. The goal was to find out more about the institutions in terms of their readiness and commitment to host the potential Centres of Excellence. The rigorous selection process of the ACE Impact, came to a close on 2nd November 2018, with the conditional selection of 44 beneficiaries. The choice was the high point of the two-day meetings, hosted by the Association of African Universities (AAU) at its General Secretariat in Accra, Ghana. First was the 13th ACE I Project Steering Committee (PSC) meeting, which reviewed the performance of the Centres under the ACE I, followed by the first ACE Impact Ministerial Project Steering Committee meeting, where the selection of the 44 Centres was done. A break-down of the 44 beneficiaries showed that 26 were new ACEs, while 18 were old Centres in the first phase (ACE I), which got their Projects renewed through additional funding. Nigeria led the pack with 17, followed by Ghana with eight, Cote d'Ivoire and Senegal, four each; Burkina Faso and Togo, three each; Benin Republic got two, while Cameroon, Guinea and Niger got one each. Ten out of Nigeria's 17 Centres are newly selected, and the remaining seven got renewals.

Covenant Applied Informatics & Communication Africa Centre of Excellence (CApIC-ACE) proposal submitted by Covenant University was one of the ten new centres selected from Nigeria to be funded by the World Bank for 2018 – 2022 cycle. CApIC-ACE was established based on the urgent need to build a critical mass of indigenous African scientists with the necessary knowledge and skills in bioinformatics, molecular biology, and information and communication engineering to drive and sustain impactful researches in collaboration with academic, clinical and industrial institutions in Nigeria, West Africa, Africa, Germany, US and UK. CApIC-ACE is built on the existing infrastructure and personnel as well as externally-funded research projects for malaria and FEDGEN (NIH H3ABioNet, NIH WASLITBRe and German Science Foundation (aka DFG) and cancer (CaPTC) at Covenant University. It hopes to evolve a Federated Genomic (FEDGEN) cloud infrastructure (with in-memory computing and cloud AI capabilities) customized to process and analyze indigenous genomic data to address African health issues including health education, medication efficiency and early disease diagnosis. The CApIC-ACE team is made up of Covenant University scholars including Ezekiel Adebiyi, Emeka Iweala, Emmanuel Adetiba, Victor Osamor, Olubanke Ogunlana, Humphry Adebayo, Solomon Rotimi, Olarenwaju Oyelade and a host of other faculty and staff.

Partnership Crucial to Sourcing Fund for Research, says Expert

An international business and strategy development expert, Dr Akanimo Odon, has urged researchers at Covenant University to look beyond their immediate environment and consider researching from a problem-solving perspective as well as embracing partnership if they must excel in their quest for grants.

Dr Odon, who specialises in education and training, energy and environment, oil and gas, media, charities and government, gave this advice at a recent training with the theme 'Accessing International Fund' organised by the Covenant University Centre for Research, Innovation and Discovery (CUCRID).

While adducing reasons for why Europeans and Americans tended to flock to Africa, the facilitator said that people from the west liked to come to Africa because it was full of problems and the westerners always looked for problems to solve. He implored participants to consider researching from a problem-solving perspective, adding that in an environment bedevilled by so many issues, it was the responsibility of the academia to find the solutions.

The Lancaster, UK-based Expert stated that partnership was crucial to sourcing funds in this new era. He highlighted some action plans to be done by participants and warned the researchers not to limit their space as they could be limiting their place by so doing. According to him, the researchers must find a consortium of partners in other African countries in their respective areas of specialities. He added that they should utilise their contacts, because they may not have access to grants available in Nigeria but collaborating with a faculty in Kenya, where the grant was, could open the door.

While emphasising that the researchers needed to build a research consortium, the facilitator emphasised that they must embrace multidisciplinary/interdisciplinary research, which was the way to big grants. Researchers, he stated, must develop a partnership profile with partners in industries, non-governmental organisations, and government, and also improve the skills in writing persuasive proposals.

Speaking further, Dr Akanimo encouraged participants to develop their money crews, and these included their source persons, liaison persons, finance persons, and

Cont. on pg 46

Top Funding Opportunities in Fogarty International Center, UKRI GCRF & **IAHCCJ**

FOGARTY INTERNATIONAL CENTER

The Fogarty International Center at the United States National Institutes of Health (NIH) has announced the following funding opportunities for researchers working in the field of global health research. These opportunities and many others can be accessed via the link *https://grants.nih.gov/funding/*

NIH funding opportunity focusing on global health and foreign collaboration.

- U.S.-India Collaborative Environmental Health Research Program (R01 Clinical Trial Optional) (RFA-ES-20-010). NIH's National Institute of Environmental Health Sciences NIEHS and the Indian Council for Medical Research (ICMR) are interested in supporting collaborative research and research training through joint U.S.-India partnerships that address or seek to understand how exposures to toxic environmental insults alter biologic processes and are linked to disease initiation, progression, or morbidity.

  Application Receipt Date: October 15, 2020

Upcoming Deadlines

Japan Society for the Promotion of Science (JSPS) Fellowships

· Application deadline for short-term US Postdoctoral Fellowships in Japan: October 1, 2020

Strengthening Institutional Capacity to Conduct Global Cancer Research in LMICs

Application deadline: July 24, 2020

HIV Research Training Program for LMIC Institutions

· Application deadline: August 20, 2020

Mobile Health: Technology and Outcomes in LMICs

· Application deadline: September 24, 2020

AIDS application deadline: December 3, 2020

Global Infectious Disease Research Training

· Application deadline: October 28, 2020

Emerging Global Leader Award

· Application deadline: November 4, 2020

Global Brain Disorders Research

· Application deadline: November 6, 2020

Reducing Stigma to Improve HIV/AIDS Prevention, Treatment and Care in LMICs

Application deadline: November 12, 2020

UKRI GCRF/NEWTON FUND AGILE RESPONSE CALL TO ADDRESS COVID-19

Proposals are invited for short-term projects addressing and mitigating the health, social, economic, cultural and environmental impacts of the COVID-19 outbreak in countries identified on the OECD DAC list of ODA recipients.

This call is funded through the Global Challenges Research Fund (GCRF) and the Newton Fund. These Funds address global challenges through disciplinary and interdisciplinary research and strengthen capability for research and innovation within both the UK and developing countries as well as providing an agile response to emergencies where there is an urgent research need. These Funds form part of the UK's Official Development Assistance (ODA) commitment.

Researchers holding existing UKRI GCRF grants should, in the first instance, consider whether they could repurpose that funding to address the objectives of this call. You can apply to switch your existing funding

on UKRI GCRF website-https://www.ukri.org/research/international/international-funding-opportunities/stage-1-first-links/. Repurposing your existing grant is the quickest way to start the research.

- **Project length:** up to 18 months
- **Eligibility:** UK applicants must be eligible to receive Research Council funding.
  Additional eligibility rules apply for international applicants, please see below
- **Closing date:** none – apply at any time
- **Funding:** 80% of the full economic cost (fEC) for Research Council funding.
  Additional funding rules apply for international applicants, please see below
- **The primary benefit** of proposals should be to any countries on the OECD DAC list of ODA recipients likely to be negatively impacted by COVID-19.
- **Award range**: there is no specific budget for this call. We are interested in funding research of any scale that can demonstrate it will deliver impact during the lifetime of the project.

COVID-19 is fundamentally a global crisis. The pandemic presents an unprecedented challenge, threatening the lives and livelihoods of millions of people around the world. While the epicentre of the pandemic is currently focused around Europe and the US, a growing number of cases are reported in Africa, the Middle East, and Central, South America and Asia with potentially serious social, economic and political consequences for these regions. Some of the most impoverished societies in the world will be the least prepared and most vulnerable to the effects of the virus. Other Low and Middle-Income Countries may, however, have experiences, for example, from TB / HIV / Ebola, of responding to epidemics from which they and the rest of the world can learn.

UKRI will support excellent proposals which meet at least one of the following:

- New research or innovation with a clear pathway to impact on policy or practice that has the potential (within the period of the award) to deliver a significant contribution to the understanding of, response to, and recovery from the COVID-19 pandemic in a developing country context.
- Supports the manufacture and/or wide-scale adoption of intervention with significant potential for impact in developing countries.
- Gathers critical data and resources quickly for future research use.

Applications for funding that do not, as their primary objective, benefit the welfare of low or middle-income countries should apply instead to the UKRI open call for funding to address the impacts of the COVID-19 outbreak.

HERMAN DIEDERIKS PRIZE IN CRIME HISTORY OPENS 2020 COMPETITION

The Herman Diederiks Prize is awarded each year by the International Association for the History of Crime and Criminal Justice (IAHCCJ) to recognise a novel article relating to the field of crime history and penal justice written by a researcher at the beginning of his/her career.

The Prize was established in 1997 as a tribute to the Association's founding president and is maintained with the support of France's Fondation Maison des Sciences de l'Homme (FMSH).

Entries are invited from doctoral students and postdoctoral researchers within two years of PhD award at the date of submission. The article must be written in either French or in English and must be unpublished.

The winner will receive a grant of €1,000 to be used for research, study or another professional purpose. In addition, the winning article will be published in Crime, History & Societies, which is the official journal of IAHCCJ.

Entries for the 2020 Prize must be submitted by September 30, 2020.

A specially-constituted international prize jury judges entries. The prize winner shall be announced in December.

More information about this research funding opportunity and the application process is available on the RESEARCHconnect funding information platform. https://www.researchconnect.eu/archive/herman-diederiks-prize-in-crime-history-opens-2020-competition/

RESEARCHconnect provides up-to-the-minute content, insight and analysis on research funding news and policy..

Hebron Startup Lab: Redefining University Education in Nigeria from Enterprise Dimension

Contd. from pg. 28

(MVP) that can be tested in the market to study how users and customers react to the product, the price and whether or not they will pay for it. We need to explore how it can make money. Gaining traction here attracts the necessary support. From the point you have your first paying customer, you have a startup company. What makes a spinoff different is that the idea comes from research. If it achieves problem-solution fit and product-market fit, it will naturally end up a spinoff company. Venture fund or an existing organisation that values it will go for it.

What's your role in Hebron Startup Lab and who are the other members of your team?

I am the Curator of the Startup Lab. It's just like saying the Director. We use less formal titles to allow flexibility and openness in communication and feedback. Other members include Gideon Okuazun (Venture Support Team Lead), Dr Adedeji Afolabi (Research & Publication Team Lead), Efosa Uwoghiren (Learning & Development Team Lead), Damilola Awolaja (Venture Acceleration Team Lead), Dr Onyeka Emebo (Portfolio Manager), Adeola Oyeyode (Programme Manager), Ogechi Amonu (Administrator) and Deborah Elabor (Space Manager).

Seun Runsewe and Oghenetega Iortim making presentations at the Edustart Summit of the Hebron Startup Lab

Partnership Crucial to Sourcing Fund for Research, says Expert

Cont. from pg 42

media persons. He explained that the source person combed the internet looking for where the grant was; the liaison person looked at the dimension of the grant and who to call; the finance person with expertise in budgeting; and the media person who ensured the researcher had enough visibility on different platforms to attract patronage.

Dr Akanimo, who was accompanied to the event by Mr Peter O'Hara of the University of London, commended Covenant University for the giant strides she had made within a short space of time. He most especially acknowledged Covenant's research-friendly environment, state-of-the-art facilities, and good positioning in the global ranking of world's universities.

Divinely Inspired, Rarely Run Out of Innovative Ideas

Prof. James Omoleye

He eats, breathes and lives innovation. It is an apt description of Professor James Omoleye, a professor of chemical engineering and the winner of CUCRID Discoveries' second Biannual Innovators' Award. An innovative researcher for the past 39 years, Professor Omoleye, is passionately committed to the development of innovations and technologies that transform lives and change the way we live. He has recorded many firsts and blazed the trail in numerous research areas, including the development of Poundo yam flour, conversion of a fuel combustion Engine to electric, development of a car speed limiter, non-contact solar/electric powered automated soap-water dispenser, among others. He has developed over fifteen inventions and registered eight patents. In this interview, Professor Omoleye, who was the former Director of Covenant University Centre for Research and Development and current head of Product Development Research Cluster in the university, reveals secrets of his feats as well as how to cope with the task of making innovation happen.

Sir, what makes an Inventor?

From our experience, five factors play significant roles in the making of an Inventor. These include Creativity, Wisdom, Knowledge, Inspiration, and Conducive atmosphere. Apart from knowledge and a conducive atmosphere, all others are divinely endowed. Even then, they can also be requested. However, there are inventions in history accredited to some people that were not laboured for but obtained freely through divinely guided observations.

Can you talk briefly on your career as researcher, innovator and inventor?

My career as an innovative researcher started as far back as 1981 when we investigated the development of black and white photographic chemicals. It was highly exciting to see a professional photographer use compounded chemicals to print quality photographs. That pioneering work preceded successful development of Poundo yam Flour and Emergency Light system using regular fluorescent tube between 1987 and 1989 (we pioneered them). While the Poundo yam flour was sold directly to individuals, the Chanrai Supermarket in Port-Harcourt bought and sold the Emergency light. Between then and now, the Lord has helped us successfully develop dozens of products.

Can you talk about the Electric Vehicle you developed in 2010?

It was the first major project we embarked upon at Covenant University in 2009. The research started as students final year project in 2005 when there was no awareness it would soon be in demand worldwide. In June 2010 we recorded our first success of converting a fuel combustion Engine to electric Engine. That year it was driven on the Covenant University roads. It was the first of its kind in Nigeria. Then we were not aware of anyone of its kind in any African country. After this feat, we have advanced to the following areas: development of

a Controller for a four-wheel amusement park car; fabrication of a 3-wheel electric tricycle using fibreglass material; development of a dual powered electric engine for more extended coverage (patented); and the Incorporation of the air condition to assembled electric engine car. The introduction of both solar and wind-powered charging system was successful but made no significant improvement to a high-powered electric vehicle with standard body size. At the level of our achievement, we are ready to partner with any willing entrepreneur for its assembly in Nigeria.

What are your current products as well as the number of inventions to your credit?

We have just completed work on the development of a Non-contact Solar/Electric powered Automated Soap-Water Dispenser and a high speed Non-contact Electronic Sanitizer Dispenser with a capacity for 5000 people and dispenses at the rate of 15 persons per minute. We developed them to control the spread of COVID-19 pandemic in schools and other public places. We have also created a Rural Plate Farm Produce Dryer, a highly hygienic and cheap way of using solar energy to dry agricultural produce in rural areas. We have successfully converted catalytic pyrolysis of waste plastics to quality diesel; and developed an evaporative Solar Fruit and Vegetable Cooling Chamber, a device for cooling and preserving vegetables and fruits for days using solar power during sales.

In all, we have, by God's grace, both as individuals and in groups, about fifteen inventions, of which eight are patented, and two are under patent processing.

Electric Vehicles produced by Prof James Omoleye's Research Team in 2010

What is the socio-economic viability of your inventions?

Most of our research works are problem-based, hence are usually relevant to society. Also, almost all of our patented products are economically viable. The synthesis of diesel oil from waste plastics is not only financially feasible because of its quality and cheapness compared to regular hydrocarbon-based biodiesel, but it is also a significant solution to the environmental pollution caused by non-biodegradability of plastic wastes.

Which of your products could you consider as the most outstanding?

It is hard to point to just one of our products as the most outstanding because the most notable in terms of quality and impact on people is not the most outstanding in terms of creativity and complexity of the technology involved. The three products of high commendation, however, are the non-alcoholic wine from Hibiscus Sabdariffa, a health wine tasted and commended by over three hundred people with no single complaint. Another is the smart Vehicle Speed Limiter, a high tech, highly innovative device with the ability to limit vehicle speed and also report details of the violating vehicle real-time, to the owner and law enforcement agents. There is also the Zeolite-Y catalyst developed from Nigerian clay which is a vital chemical used in the refinery for the formation of high octane level gasoline. This product will save the nation hundreds of billions of Naira spent annually for its importation.

How many external validations have you received in terms of awards and recognitions?

The following are some of our major awards:

2005: NUC Award as one of the significant Contributors of Innovative Products leading to 1st overall position at Nigerian Universities Research and Development Fairs, (NURESDEF 2005)

2007: NOTAP Award as

Contributor to one of the best three products to represent Nigeria in WIPO/AU Organized International Innovation Contest in Ethiopia.
2010: NUC Award of 2nd position under Research in Technology won by Covenant University in NURESDEF 2010.
2010: NUC individual Award of 2nd position under Product Development in Technology won by Covenant University in NURESDEF 2010.
2018. Best University undergraduate Engineering Students' Project Supervisor
2019: Award by Nigeria Contents Development and Monitoring Board to Build a Pilot Plant for the Conversion of Waste Plastics to Diesel Oil at Covenant University.

How can one cope with the challenges of making innovations happen?
Challenge is the bane of every research. The essence of research is to find a solution to challenges. However, innovative research leading to the invention is more demanding because many times you have to do exploit beyond existing known principles. Creative research has an enormous demand for time, money, substance, concentration and self-denial of sleep and leisure. With all these demands, an innovative researcher has a natural inner motivation to continue the research with courage when there is a hope of success.

However, if an innovative researcher runs dry of ideas as to what to do in the cause of solving any of the numerous challenges encountered, the natural motivation becomes insufficient to sustain the interest. Our own unique experience is that we rarely run out of idea or the solution to the numerous challenges encountered in the cause of research. It is the divine inspirational dimension of our research work.

How do we get a research product off the shelf?
The first step to ensure that research product does not remain on the shelf is for the researcher to engage on research that is relevant to the needs of the society; research that solves societal challenges, and ensures the competitive quality of the researched product. The second requirement is to introduce the developed product to relevant entrepreneur not only through comprehensive exhibition but also by direct engagement with them.

What are the best ways to motivate budding innovative researchers?
Budding innovators could be motivated through the creation of conducive atmosphere (Infrastructures, well-equipped and staffed laboratory and workshop) for research and innovation to thrive. Access to a research grant, sound reward system (promotion criteria, fair commercialization policy) and proper mentoring by experienced innovators as well as favourable Government policy on local contents are also very important.

How do you assess Covenant University in this regard?
The Vision that birthed Covenant University through the Chancellor, Dr David Oyedepo is undeniably clear. The passionate implementation of the Vision has resulted in a conducive atmosphere that has encouraged the success of many innovative research products. The policy of Covenant University that focused equally on teaching and research has distinguished the institution from all other ones in Nigeria.

What is your engagement like when not working?
I share my spare time with my family and in the discharge of my pastoral assignments

A Non-contact Solar/Electric powered Automated Soap-Water Dispenser and a high speed Non-contact Electronic Sanitizer Dispenser produced by Prof Omoleye's Research Team in 2020

Trajectory of a University Researcher: From a Cleaner to a World-Class Stardom

Ojo Sunday Fayomi

The secrets of successful people, we are often told are embedded in their stories. The story of Ojo Sunday Fayomi is laced with uncommon incidences, humility, the strength of character and faith as well as dints of hard work. These have been the defining features of his life, which enabled him to break limits, thereby moving from grass to grace.

Fayomi's path to academic stardom started the day he decided to drop his higher national diploma (HND) certificate in Mechanical Engineering to take up an appointment as a cleaner at the cafeteria section of the Covenant University's Strategic Business Unit (SBU), in 2007. It was a tough decision considering his passion for research and excellent academic records at the polytechnic where he graduated with a distinction and topped his class. Ordinarily one would think the cleaning chores would have drowned this burning craving for scholarship. But that was not the case with young Fayomi who would return home after every day's toil to read and deepen his knowledge of the research work he did at the polytechnic.

Two months into the cleaning job, through divine orchestration he attended an employment interview for the post of a technologist. The current Vice-Chancellor of Covenant University, Professor A.A. Atayero, and late Professor Cleophas Akin-Loto, a great researcher, who later became his Head in the Department of Mechanical Engineering, interviewed him. "I recall at the interview; Professor Loto jokingly said 'I need this young man in my department'." He got his appointment letter three days later. "When I reported for duty at the Department, I saw Prof Loto, who said he needed me in his Department. As I greeted him, he said 'young man, I have been waiting for you but now that your laboratory is not ready, follow me to class and carry that projector.' Then, he was teaching a large class (GEC 223: Materials Science and Engineering). After I had set up for him, he said, 'go to the back and watch what I do.' I got home that day very excited as it was the first time I had close par with a professor," he reminisced.

That privileged observation at Professor Loto's class did not only boost his passion for teaching and research but marked the beginning of a glorious journey into academic mentorship that would serve as a springboard for his research exploits. "I became so close to him; he would chat me up on what research was all about, some foreign Universities he had visited and equipment he had

handled. There were such rich mentoring sessions that made me desire to become a global researcher and an exceptional professor one day," he also recalled with a sense of fulfilment. Prof Loto also thought Fayomi how to guide undergraduate students in their research projects.

Just like the famous biblical question, "Can anything good come out of Nazareth?" Fayomi's journey to academic scholarship and research was not without a dose of scepticism and cynicism. According to him, "In 2010, I approached two lecturers in Mechanical Engineering Department and said to them, 'Bros, I have wanted to see you guys, please teach me how to write technical papers.' One of them responded, 'Fayomi, you are a technologist that is not your line.' I laughed and told myself that as the Lord lives, I will be a great researcher with a difference in this Department."

That resolve propelled him not to settle for mediocrity in the quest for academic glory.

In 2011, he miraculously got admission into the Tshwane University of Technology, South Africa for Masters and Doctoral degrees in Metallurgical and Materials Engineering. Prof API Popoola and Prof Loto, who was then a visiting professor at the University, supervised him. Within one year, Fayomi churned out 17 quality research publications in reputable international journals. This feat was possible because Professor Popoola opened him up to the world of research opportunities and international exposure. "I was willing to learn the ropes, and it was a great experience but very tough", he enthused. The opening also accorded Fayomi, who completed his PhD in 2015, privileges to visit and serve as a visiting senior scholar, research and innovative associate in different universities both in Nigeria and abroad. "I have enjoyed by God grace international fellowships and won several awards in my career path. I

have also supervised postgraduate students with seasoned researchers in my field of expertise globally. Equally, I won and handled many grants and led several teams as a researcher and administrator."

Fayomi has worked in diverse research areas of New Materials and Mechanical Metallurgy of alloys and superalloys. He has developed a niche for myself overtime on Surface Engineering and Coating technology. Presently, he is working on electrolytic co-deposition of metallic alloys through composite and nanocomposite materials for different industries ranging from the optoelectrical application, defence, aerospace, ballistic, construction and automotive. This area of research is multifaceted and addressed the modern challenge in manufacturing sectors. The uniqueness in this intriguing focus is the development of electrolytic bath framework and formulation for surface protection technologies, which his research team have used to empower individuals, SMEs and oil and gas industries both locally and internationally. The research feat that took him five years of sleepless laboratory work to achieve.

Fayomi has likewise published widely in this research area and harvested so many outstanding invitations and awards. The most notable among them was an award he received in one of the papers published in 2019 on the optoelectrical performance of developed composite coating which opened him up to extensive range consultancy services to many industries and speakership in conferences, workshops etc.

His current publication profile, including citations and hi-index in high impact outlets, is quite intimidating. As at October 2019 (when this interview was conducted), he had above 350 articles with over 50 co-authors around the globe and most of the publications are indexed in Scopus, Web of Science and other international reputable journals outlets. His Google scholar citation was 1295, h-index 19, i10-index of 40 while the ResearchGate score was 35.08, Scopus index of h-index 15.

Fayomi's yearly research publication is mindboggling. In the last seven years, he has published 347 papers with Covenant University affiliation. Between 2016 and 2018, he recorded a yearly average of 45 articles all indexed in Scopus. The figure doubled in 2019 with 98 publications, thereby topping the list of Chancellor's Exceptional Researchers for 2019 in Covenant University, which he has won consecutively since 2017.

Apart from the latest accolades and the whopping publications, Fayomi who never failed to attribute his meteoric rise to academic stardom to God's grace and mercy has equally harvested numerous awards and recognitions for teaching and research excellence both national and international. Some of the awards include the Scientific Achievement by South African Association for Advancement in Science Medal Award (A2S3 Medal for Original Research); a Postdoctoral Research Scholar and an awardee of the Institutional Best Postdoctoral fellow for Teaching and Innovations at the Tshwane University of Technology, Pretoria, South Africa. He also won the highly rated and competitive best doctoral degree award students of the year 2015 at the same University.

Fayomi was named the Outstanding African Researcher, and 2018 Most Innovative Scholar in Surface Science and Engineering. Likewise, according to 2017, 2018, rating of researchers globally by Elsevier Scopus (Scival), he ranked number one (1) researcher in the world in the area of Composite, Electrodeposition of Materials and the number one (1) researcher in Nigeria, 2019 in

the field of Materials Science and Engineering. Also, he ranked number 4 top published author in Nigeria in accredited Journal by Elsevier Scopus as at October 2019.

He enjoys outstanding peer reviews and currently serves as the technical Chairman of International Conference on Engineering for a sustainable world (ICESW) which publishes its conference proceeding in Scopus indexed Journal yearly. He equally serves as editor to several books, conference outlets, and Journals.

Fayomi is one of the few researchers that have been able to cope with challenges associated with managing quality and quantity in research endeavours.

The secret of his success is rooted in humility, dedication to assignment and sensitivity to divine inspiration. For instance, it is a rarity in our clime to see a lecturer maintaining an office in the laboratory. Fayomi is one of the very few. His office is inside his laboratory despite his conversion from technologist to academic staff. As an experimental researcher, he believes that the research room is a theatre room where you think, plan and execute. This arrangement helps him to management and controls the quality as well as the volume of research output emanating from his stable. While giving insight into his daily schedule, Fayomi says, "As I am running my experiment and analyzing the result, I can get a heavenly inspiration on a new area. Then, I will quickly note down and call my research assistant to travel down and before you know you are setting up another experiment as one is ending. Such a schedule is difficult to drive, but it is all about a personal commitment to yourself and vision of the University per time. There are stages also in your research in which even if you wish to have less; you cannot."

Fayomi is supervising numerous PhD and Master's degree students in different Universities in Nigeria and abroad. "Here at Covenant University, I have five PhDs students under my watch, and the condition for student graduation states that you must have published your work in Scopus Journals at least three. In my case, my students only have three years to spend with me because you can't occupy other people slot, so from the beginning we on the same page. I train my students and tailor their work to the extent that I will not need to tell you to write, the spirit of writing enters you automatically" he enthused.

He maintained an excellent linkage with graduate students after completion of studies. Many of them still make use of his laboratory and have joint publications with him.

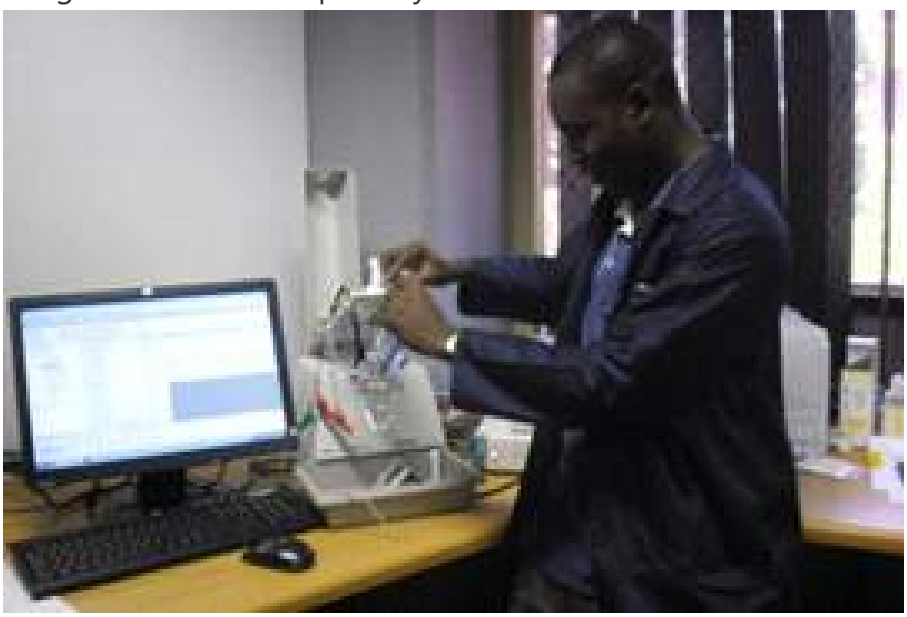
Fayomi is grateful to Covenant University for helping him to build and sustain his scholarly rating. The University's management, according to him, has been amazingly striving to provide a continuous enabling environment for research, which helped his research focus.

On what makes an outstanding scholar, he said chief among them is the fear of God, then right attitude, proper planning, time investment, focus, discipline and creativity. He admonished that scholars should do away with an unhealthy competition that promotes strife and envy, sentiment and pride because all these go before fall. He said one vital thing that kept him going was his decision to allow mockers to mock him. He, therefore, advised scholars to be resilient and indifferent to mockeries.

Fayomi maintained that the greatest motivations every budding scholar need to scale up their research endeavours is the personal knowledge that it cost fulfilling future. "They have to make personal sacrifice and commitment first to their drives. However, with dreams, everything is within their reach. Therefore, they should try to win their day, do not fake it; find it. Be humble at every level you

find yourself, never give up, and persist until you prevail. Above all, always celebrate God's act on every output at every level. For the University and senior researchers to motivate budding scholars, we can provide a motivating policy, a thank you policy, an academic reward system that is globally competitive. We can also continuously upgrade resources to facilitate existing activities for a budding scholar," he reiterated.

Fayomi advocated collaborative research across academic disciplines and departments in all Nigerian Universities. In his words: "The present age research is multifaceted and interdisciplinary in a global world. Such collaborations have become indispensable, outstanding researchers, who understand the benefits of bringing together a wide range of interdisciplinary knowledge, partner across frontiers to generate products that would be impossible within a discipline. You see from experience, 95% of individual research ends up in conference and paper publication, and this is the problem in Nigerian Universities." He lamented that the ideology of interdisciplinary research (IDR) had not scaled or yielded any frontier in the nation's university system even though IDR was the way to go if we must develop excellent products and meet with 4th/5th industrial revolution concept. He, therefore, warned that our universities would remain second feeders to their contemporaries, especially in terms of product development that solve local problems if we fail to address our long-aged orientation towards only departmental and discipline-based research. He stated that reorientation and firm policy are a very cardinal factor in addressing complex paramount issues even in society. He added that if we could solve the barrier to IDR, then we could win the rewarding gain and profitability involve in interdisciplinary research. According to him, these barriers are issues associated with limited resources, academic reward system, different institutional culture, programme evaluation, different departmental goal and procedure, among others.



Fayomi conducting researcher in his Laboratory

On his motivation as a researcher, Fayomi said he had been very privileged through God's leading to enjoy quick exposure to renowned scholars and academic administrators. They were high flyers in his field as mentors. "So, they tailored me to see solving societal challenges as the reason why we are researchers. That is why every bit of my research are application based and societal focus. I am also grateful for the rewarding part of it. I developed an electrolyte for an institute on behalf of its host nation, and the invention is still in use today by SMEs and some industries. I was honoured and rewarded for the feat, and today I enter that nation without a Visa. Another motivating factor as a researcher is seeing you teach with ease in the classroom what you know. For instance, I teach research methodology in my Department from

undergraduate to PhD levels, and it's quite motivating to see students expressing satisfaction and desire to receiving more at the end of every lecture," he said with a sense of fulfilment.

Fayomi, whose goal is to meet his global target as instructed by God's leading, wants to continue to contribute his quota to Covenant University in her drive toward achieving vision 1:10:2022. More so, he desires to continue to give his undergraduate and postgraduate students the best of supervision and training that reflect the global standard.

It is not all work and no play, Fayomi love to hang out with his family for relaxation when not researching. He also reads inspiration books when his wife is busy and attends to invitations for a motivational slot during the weekend. He is very time conscious and judiciously invest it to the point of his satisfaction.

Dr Fayomi

Research Poems

Its starts with a willing heart
A mind filled with optimism
Venturing from known to the unknown
Stars of hope I see
When I see the nature
Perfectly fashioned
So unquestionable
Irresistible!
Unfathomable, wittingly crafted
Great inventions of men
Vacuums filled and unfilled
Leaving the beauty duty
A task on humans
Gaps in knowledge
My soul yearns for more!!
The work of nature
As perfect as ever
A word is trending
Trembling thrives
Be innovative, creative, inquisitive and proactive
My soul yearns for more

Stir the torrent
Of deep feelings
Of thoughts so real
Hallucination, imagination
Intangibility of ideas
Have become plausible
In the hands of our researchers
Kudus to the great minds
Birthing solutions to the craving world
They cross the rivers
They cross the seas
Clear all impediments
To see their dream thrives
Let's stir the torrents together
Unity of purpose eases the burdens
Never scar to dare
Let the minds sower
Returning to reality, bearing the matchless proofs
Unveil to beautify
Explore to reveal
Mending the broken walls
Bridging the gaps of old
Turning our world to Paradise!
A task I vow to fulfill, a duty call for all
Not in letters boundaries alone
Tangibility a proof of verdict
The world is revolving, evolving
Stir the torrent, disprove the canon, disrupt the settings
Deafening and clamoring for a change
The world is moving, gradually departing
A change is the trend

Avant-gardes I salute

By Mrs. Olawuyi Mojisola, Covenant University, Canaan Land, Ota

My Life In Tech: At 28, Oghenetega Lortim is solving Africa's coldchain logistics problem

Oghenetega Lortim, an Alumnus of Covenant University

Gricd occupies a small office space in a factory inundated with large machinery. The factory is in Oregun, an industrial area on the Lagos mainland. The first time I learn about Gricd, I am writing a pitch about new storage technologies tackling post-harvest losses on the continent and the startups driving these innovations. My pitch comes in a bit too late, but I would get the chance to meet Gricd founder, Oghenetega Iortim on a two-week tour of Asia during the CCHub Pitchdrive Asia tour in August. In the days that follow, as we fly across time zones, suffer jet lag and as he pitches his business over and over to investors, Iortim's often serious mien would unravel a witty and jovial persona which strikes a balance with his knack and thirst for business.

"Without sounding too cocky, I am a thinker," Iortim says after a long silence when I ask him to describe himself.

"Almost every week, I have a new idea of a solution to a problem." While some go on to become businesses that generate revenue, others are things to mull over or discard.

From selling Goody Goody, flat chocolate candies that were popular in the 90s, to his classmates in primary school to selling airtime and Indomie noodles in secondary school and progressing to building websites in university, Iortim has been doing business for as long as he can remember.

Gricd was one his ideas that had business potential. Having graduated with a degree in Information and Communication Engineering from Covenant University, Iortim became very involved in agriculture working closely with Ayodeji Arikawe and Uka Eje, both who are now co-founders of Thrive Agric. He would fund and source for funds for planting cycles particularly vegetables but was running into losses due to poor preservation and delayed offtake of the farm produce.

"There were some days people will come and offtake quickly and there were other times when people didn't or you were waiting for a future harvest and while you were waiting, the current batch was going bad."

"I've invested in bringing soybeans to Lagos. I know the heartache of putting your whole investment on the road for four days," he tells me.

Iortim began designing a cold-storage technology to curb these post-harvest losses. Keen on sourcing for materials and producing locally, Gricd's premier design was crude and

leveraged the cooling technology of clay.

"We wanted to see how we could leverage this technology to keep vegetables fresh for longer periods but, who wants to buy clay?" We burst into laughter. While many could see the usefulness of the technology, not many cared for its weightiness and bulky design.

Since 2018 when Gricd became fully operational, there have been a number of iterations to that first design and the current model is a rectangular cold storage box that can be easily strapped onto a motorbike or on the back like a school bag ensuring nimbleness in mobility. The unfortunate tradeoff with these iterations has been pivoting away from farm produce to healthcare supplies because there is only so many kilograms of soybeans or carrots you can fit into Gricd's rectangular cooling box.

Healthcare, which came up in the many pitch rounds the company went through when it first launched its operation, proved to be a more viable path to take.

"The Gricd box can only take less than a bag of tomatoes," Arikawe, of Thrive Agric, who agrees the pivoting was a smart move to bring about quick wins for the company, says.

Iortim and Arikawe as well as PiggyVest co-founder, Odunayo Eweniyi were all classmates at Covenant University in Ogun State in southwest Nigeria. Both Arikawe and Iortim have known each other for 11 years and Arikawe describes him as having grit and a long-standing record of successfully running small businesses.

Gricd's pioneer product was built in March this year. The Frij Box comprises a plastic outer casing that is sourced from China.

"Then we build in our technology," Iortim says. In the Gricd office, his lean staff consisting of marketing, finance, and design teams are at work including the engineer who is tinkering with circuit boards, wires and assembling the machinery that powers the box. Most of the components have to be sourced in Asia; resistors, capacitors, even

printed circuit boards. Gricd's engineering team designs the schematics of the box, sends them to China to be printed and assembles the parts when they are returned to the country.

"The compressors, sometimes we get it locally, sometimes we import," Iortim adds.

Frij Box also comes fitted with a thermometer, a GPS tracker and an attending mobile application that communicates real-time temperature data. So far, the Frij Box has transported 219 vials of vaccine and 615 blood samples including blood plasma, a delicate component of the blood.

The price of each box start somewhere around 100,000 naira ($275) and so far Gricd has provided cold chain solutions for the Nigerian Institute of Medical Research, DrugStoc and the University Teaching Hospital in Kwara among a number of others.

As with many startups operating within Nigeria's regulatory grey areas, Gricd continually has to contest the irregularities of customs laws and border dynamics every now and again.

"There were come components we were paying a 5% duty on in January. Before August we were paying 20% duty. As at yesterday [our interview held in October], there are some components which cost 30,000 naira we are paying 14,000 naira on duties and logistics."

"We are just in an environment where everything is unpredictable. And for the fact that we do not manufacture in bulk because we are not a very very huge company, you can't stock ahead of the next 12months for instance in order to stabilise your prices," Iortim adds.

These and costs of importing some aspects of the Gricd technology can affect prices by almost 40% which is around the percentage of profit on the cost of production. In the long run, not only is there the danger of not turning out a profit, there are accrued losses he constantly has to battle with.

In August 2018, Iortim had to temporarily lay off his staff, two of whom he re-hired, and shut down his business to afford a bone surgery that cost more than N3 million including therapy sessions which saw him spending 27,000 naira weekly out of pocket for three months.

"No insurance company will cover that."

"If I just said I'm down, I'm out, let me just sit at home, who will blame me? Is it really my fault?"

But what gets him up and going are his family and friends to whom he feels a certain commitment to make something tangible out of Gricd in spite of the country's dysfunctional systems. With a median age of 28 among startup founders in Nigeria, 76% of these small and medium scale businesses are creating jobs with an average of 8.5 FTE per venture in spite of immense challenges, he argues.

"Look at Thrive Agric. Their [government's] Anchor Borrowers Programme was supposed to do what Thrive Agric is doing. But Thrive Agric has successfully done it. But inasmuch as they have, can Thrive Agric go into a CBN or NIRSAL tomorrow and say, we've done this successfully, let us handle this. Will they give it to them? In all honesty?"

"If not for venture capitalists, how many of our businesses will survive?"

"The country is a ticking time bomb and it is small businesses that are preventing it from exploding," he says.

While he is wary about government bureaucracies and its inefficiencies, Iortim says there are plans for Gricd to pursue a Pioneer Status from the Nigeria Investment Promotion Commission. Open to a number of sectors, the Pioneer Status Incentive exempts eligible companies and products from taxes for an initial period of three years renewable for another two years. Iortim is also hoping that the startup community comes together more and more into a united front to tackle government irregularities which have direct bearings on the profitability of businesses across board.

In another five years, Iortim says he should've exited Gricd.

"That's the plan."

By then, he hopes to have grown Gricd's operations large enough to make it one of the biggest logistics players in the country especially as it concerns agricultural produce and healthcare supplies. The Frij Box, for instance, would have more than quadrupled in size as at then to cater to more bulky farm produce which Frij Box is unable to at this time and partnerships with companies like Kobo360 will be a possibility as there are lines of intersection for both businesses.

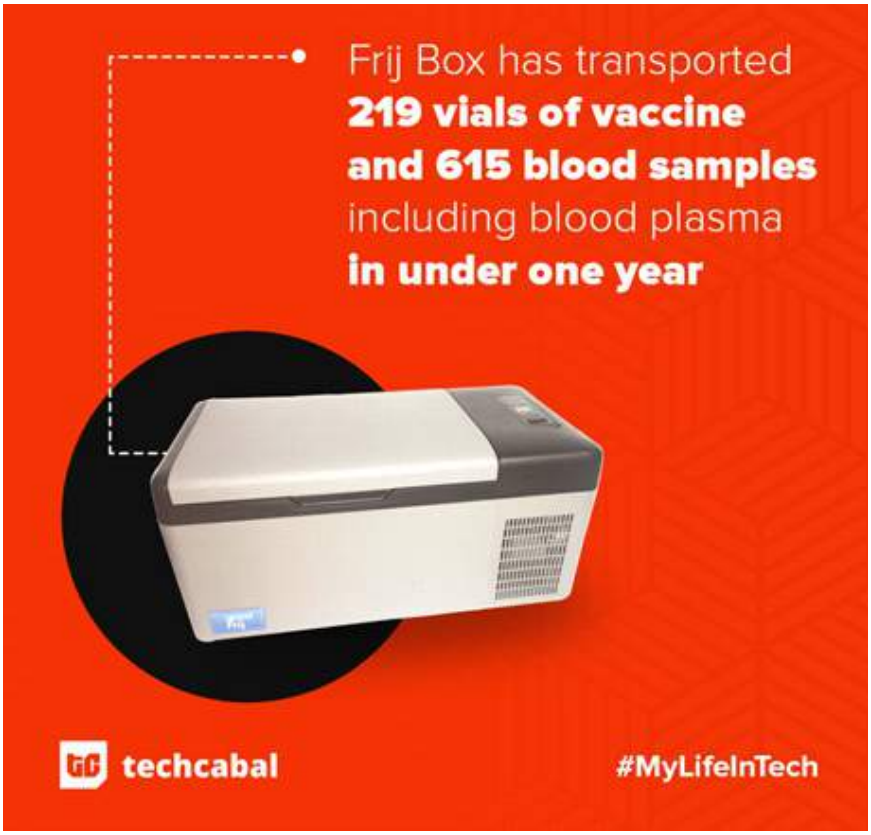
"We are still going back to providing for the Agric space but we need to figure out how to build this technology on a larger scale before we go back."

Actively in pursuit of manufacturing partnerships initiated during the PitchdriveAsia tour with a handful of Asian manufacturers including Yamaha, Gricd is on its path to reducing its production costs and growing its imprint in the country and on the continent.

Iortim is adamant that startups, especially technology-driven startups hold the key to economic growth and solving dire challenges of the country and must be taken a lot more seriously by the government.

"I'm not saying that we can solve all the problems but I'm saying that this ecosystem has made life a whole lot better.

Written By Kay Ugwuede
Culled from *techcabal.com*



Research Titbits

Covenant University has some laid down policies and procedures for accessing research publication sponsorship, including conference application supports. Below are the checklists for such supports:

CHECK LIST FOR PUBLICATION SUPPORT

- Form signed by the Dean of college
- Full paper attached
- Acknowledgement of covenant University in each paper
- Indicated two Covenant University authors of articles that are in Scopus
- Clearance certificate for Director CLR
- Turn It In Report
- Proof of Journal Index in Scopus
- Document showing bank Payment Details/Invoice

CHECK LIST FOR LOCAL CONFERENCE APPLICATION SUPPORT

- Form Signed by the Dean
- At least one paper attached
- Acceptance letter
- Flyer of conference showing Details of the conference
- Acknowledgement of Covenant University in attached Paper
- Clearance certificate for Director CLR
- Turn It In Report

CHECK LIST FOR INTERNATIONAL CONFERENCE APPLICATION FORM

- Form filled and signed by the Dean
- Minimum of 2 full papers attached
- Acknowledgement of CU in each paper
- Indicated 2 Covenant University authors of articles that are in Scopus
- Acceptance letter for each paper
- Flyer of Conference showing detail of conference
- Proof of Conference in Scopus
- Turn It In Report
- Clearance Certificate from Director CLR

CHECK LIST FOR CUCRID PROFESSIONAL FORM

Either local or international conference, the following at required.

- Form filled and sign by Dean
- Flyer of Conference
- Certificate of membership
- Receipt of last payment made to the professional body

Note: Application Forms can be processed electronically via email to: cucrid@covenantuniversity.edu.ng

TRAVELOGUE

Prof Emeka Iweala, Director, CUCRID was part of the Executive Course in Project Management Professional which held from 9th to 23rd November **2019** at Jk Michaels Institute, Opebi, Ikeja, Lagos, Nigeria. During the course, which included executives and managers of other blue-chip companies, participants were trained in the science and art of project life cycle management

Prof Iweala also participated in the 3-day 2019 Stakeholders Workshop for Human Capacity Development (HCD) in the Nigerian Oil and Gas Industry which held between 19th to 21st November **2019** at Presidential Hotel, Port-Harcourt, Rivers State, Nigeria. The workshop which was organized by NCDMB in conjunction with stakeholders in the Oil and Gas industry provided a platform for discussions on the training of employable graduates by industry practitioners and academia.

The Director, CUCRID, who is also a member of the PI, Prostate Cancer Transatlantic Consortium-Covenant University (CaPTC-Covenant), participated in the NCI-NIH

Prof. Iweala (2nd right back row) and participants at the NCI-NIH "Clinical Trials in Action" course held at the University of Cape Town, South Africa.

Prof. Iweala at the 2019 Stakeholders Workshop for Human Capacity Development (HCD) at Port-Harcourt

Prof. Emeka Iweala at the NCI-NIH Course at UC, South Africa

Prof. Emeka Iweala and other participants at the Executive Course in Project Management Professional held in Lagos

Prof. Emeka Iweala with one of the participants at the NCI-NIH "Clinical Trials in Action" course held at the University of Cape Town, South Africa.

Agboola after a session with Andy Worrall

Dr Agboola after CDE Overview and Updates with Linda Amrane-Cooper

"*Clinical Trials in Action*" course, which held from 11th to 15th August **2019** at the University of Cape Town, Cape Town, South Africa**.** The course focused on the conduct of clinical trials in cancer patients.

Prof Iweala at the World Bank-AAU African Centres of Excellence (ACE IMPACT & ACE1) Workshop held at King Fahd Hotel, Dakar, Senegal.

Dr M. G. Agboola, Deputy Director of Research and ODL, CUCRID, attended ODL Capacity Building Workshop in London in July 2019. The workshop was jointly organized by the National Universities Commission (NUC) and the University of London (UoL). He also participated in a 2-day Training and Introduction Session to the University of London Operations for ODL at the UoL campus in London, November 2019. Before the training, Dr Agboola had attended a Joint Conference of NUC-UoL on Policy and Practice in ODL, at the NUC, Abuja, November 2019.

THE WORLD UNIVERSITY RANKINGS 2019 TOP 500

THE WORLD UNIVERSITY RANKINGS 2020 TOP 100 EMERGING ECONOMIES

CUCRID

Covenant University

CENTRE FOR RESEARCH, INNOVATION AND DISCOVERY

We Make Innovation Happen

Covenant University Centre for Research, Innovation and Discovery,
CUCRID Building, Covenant University
Km. 10 Idiroko Road, Cannaan Land, P.M.B 1023, Ota, Ogun State. Tel: +234 9028023485
linkedin.com/company/covenant-universitycovenant-university-centre-for-research-innovation-discovery
twitter.com/cucrid-@cucrid instagram.com/cucrid.research
E-mail: cucrid@covenantuniversity.edu.ng Website:www.cucrid@covenantuniversity.edu.ng

Produced by Covenant University Centre for Research, Innovation and Discovery (CUCRID) CUCRID Building, Covenant University, KM10 Idiroko Road, Canaan Land, Ota, Nigeria
Email: cucrid@covenantuniversity.edu.ng
Website: www.cucrid@covenantuniversity.edu.ng