

How Can Microbiology Improve the lives and Livelihood of Nigerians?

Building a strong and sustainable livelihood is pivotal to realizing our vision of a just Nigeria without poverty. But the pursuit of a better society may continue to elude us just like the failed “vision 20: 2020” until the right mechanisms and tactics are embraced to add value to the preexisting systems in a sustainable fashion. There have to be an upgrade of the triad of development: Food, Energy and Health to improve the lives and livelihood of Nigerians. Microbiology is potentially at the epicentre of this value-added chain and has a plethora of roles to play in making our dreams come through.

Fermented food products represent an important segment of the current food market as it makes up one-third of global food consumption. A viable food market in Nigeria will be triggered if the conditions enabling the brazen inequality chasm that exists for similar products from different regions is annulled. While bio-drinks such as the Japanese *Yakult* is an international brand with thousands of employees, its Nigerian analogue “*Nunu*” has a very low-income generation. The barriers in the demand and marketing of many of our traditional food products such as Awara, Agidi, Pito, Kunun -Zaki, e.t.c would be evicted if there is a strong partnership between microbiologists and bio-investors as they will leverage on predictive microbiology models to elucidate the biokinetics and microbial ecology of these foods at all stages of processing to improve their quality, shelf life and safety profile. Moreover, Dr Akinwumi Adesina, the President of the African Development Banks explains that by 2030, the size of the food and agribusiness will reach \$1 trillion. What an opportunity to engage! Today, Nigeria is one of the highest producers of sugar cane in Africa since the likes of Atiku Abubakar and Dangote began investing in sugar cane farming in Northeastern Nigeria. Comprehensive bio-refining can be adopted by these big farmers and not too long we will start experiencing a lucrative sugar cane business like Brazil. The by-product, sugarcane bagasse could be channelled for fermentation for bioelectricity production for the communities where these large farmlands are situated. If successful, this indeed would motivate the government to utilize our wastes on a larger scale to generate biofuels. Despite our excellent fit in Africa as one of the top producers of sugarcane, 90% of sugar consumed in Nigeria is imported. Organic farming, the use of bio-fertilizers is a green inexpensive alternative that can optimize the fertility of more lands making them suitable for cane sugar production and other agro products in high demand.

Furthermore, it is truisitic that 80% of our revenue in Nigeria is from the petroleum industry and this translates that a boost in oil production portends a stronger economy. But the disturbing decrease in the supply of petroleum products makes the potentially cheap microbial enhanced oil recovery (MEOR) valuable. According to the Nigerian National Petroleum Cooperation Nigeria (NNPC), Nigeria exports about 2.5 million barrels of crude oil per day but it is startling to know that about 67% of the crude oil is trapped in the reservoir. Cooperation between microbiologist and NNPC (which presently doesn't exist) could enhance oil recovery by 50% by leveraging avid hydrocarbonoclastic microbes to drive residual oil trapped in the reservoirs. This method practised by developed climes would generate more income and ensure adequate energy supply.

Finally, the current Covid-19 pandemic has precipitated the relevance of accurate diagnosis in building a stronger public health response to sharp relief. While a neighbouring country like Ghana has conducted the highest Covid-19 diagnostic test per population ratio in Africa, Nigeria records one of the lowest in Africa. Besides, Nigeria is now the global capital of out-of-school children and this is potentially linked to the high prevalence of neglected tropical diseases (NTDs) as we have the highest burden of these diseases in sub-Saharan Africa. Advancement in molecular microbiology will accentuate research for the development of multiplexing diagnostic platforms which is critical for the elimination of NTDS. This would also enhance the accurate diagnosis of a plethora of diseases such as Covid-19 and resolve the highly fatal consequences of antimicrobial resistance in Nigeria. In conclusion, the multidisciplinary nature of microbiology makes it potentially strategic to improving lives in Nigeria. Therefore, there is a need to develop synergy between experts in microbiology and the energy, food and health institutions in Nigeria. The government should encourage microbiologist in the diaspora to return home for the reversal of the brain drain in the country and help propel this country to greater economic heights by deploying their expertise in Microbiology.