

Nanotechnology: The magic bullet towards attainment of Kenya's Vision 2030 on industrialization

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Nanotechnology, which is the study of manipulating matter on atomic and molecular scales, involves developing materials or devices possessing at least one dimension sized from 1 to 100 nanometers. Nanomaterials (structures with at least one dimension between 1 and 100 nm) are revolutionizing the scientific world mainly on the account of their unique properties in comparison to the traditional micron-sized materials. There are a large number of new opportunities that could be realized by down-sizing currently existing structures into the regime of <100 nm, or making new types of nanostructures.

For Kenya, nanotechnology provides a new focus for research through her stated aim to manufacture from the 'bottom-up' approach that uses state of the art techniques and tools to make complete, high performance products, with its potential in the form of improved water purification systems, energy systems, healthcare, food production and communications, and in agriculture and health. Recent statistics lament on the lack of Kenyan scientists in applying research and technology in advancement of science due to lethargy in research. Although many reasons have been advanced for lack of growth in this field ranging from poor remuneration, lack of infrastructure as well as lack of well-trained researchers and scientists, the country has an opportunity for take-off through resource mobilization and restructuring. The STI Act 2012 and Education Act 2012 are efforts toward the right direction where the government envisages setting about 2% of the GDP on STI and this should enable our fledging scientists to embrace the new and emerging technologies such as nanotechnology. Also the development of Nanotechnology policy 2013 and creation of new Ministry of Industrialization and Enterprise Development shows the political will to industrialize the country as per Vision 2030 development blue print, otherwise it will remain a pipe dream without these concrete steps.

There are so many raw materials that can be improved through value addition in Kenya for example the rice husks that are normally burned can be used to recover silica which continue to revolutionize electrical and electronic engineering and the compost made into viable fertilizers if appropriate technology is applied such as nanotechnology. The Silicon Valley famed for use of silicon developed from simple concepts as is the case with Embraer in Brazil which has used technology to build the world's third most viable aircraft manufacturer. With the discovery of huge deposits of minerals in Kenya from coal in Mutomo, titanium in Kwale, all the way to oils in Turkana, Kenya has a chance to showcase the benefits of using

appropriate technology in efficient utilization of natural resources for wealth creation and poverty reduction. But for this to happen, the government must invest in quick succession on capacity building while emphasizing on technical and vocational training and desist from converting middle level colleges into universities. For example, by identifying institutions such as KIRDI, KARI and KEMRI among others as flag ship projects to drive the economy, the universities will be left with the tasks of teaching and research while these institutions will act as incubation centers and a link between innovators and end users.

Currently, every local university seeks attention as centers of excellence, incubation centers and research park but this at best remains in their charters with colorful vision and mission statements. Thus, for the jubilee government to achieve on her manifesto, it must empower few research centers with infrastructure such as state of the art equipment like transmission electron microscope(TEM), scanning electron microscope(SEM) which will enable researchers across disciplines benefit; audit existing programs and courses in our universities and TIVET institutions as well as set deliverable targets to CEOs in our local research institution in order to eliminate copycat duplications of programs and research. In line with this, the curricula in our universities and TIVET institutions must be made to embrace new and emerging technologies of delivering their contents. Some of them although have technical names are analog in their teaching and research methodologies. Some lecturers and tutors are computer illiterate yet every year they sign performance contracts. Going technology, nanotechnology will enable this country to industrialize at a quicker pace and catch up with emerging economies which have fully embraced the new thinking through manufacturing, drug delivery, farm input encapsulation which saves millions of dollars in wastage to paint industry thus mitigating on environmental pollution. Nanotechnology, unlike biotechnology, possesses no known serious environmental risks and the technology revolves around minimalization with maximum return. It is on this premise that we hope the new CEO at the ministry of industrialization and enterprise development will assemble a visionary leadership that can help him duplicate the corporate success he had at Barclays Plc.

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