



## **Harnessing plant-based nanotechnology for enhancing life in sub-Saharan Africa: current trends and opportunities**

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### **ABSTRACT:**

The discovery of exceptional properties in material with nanometer-sized have tremendously improved human well-being all around the globe. Nanoscience/Nanotechnology is yielding far-reaching societal benefits in various aspects of life including biomedical area, manufacturing, environmental protection, energy production and storage, food and feed among others. Nanomaterials are increasingly being used as smart health care devices, household products or integrated in daily consumer stuffs. Though conventional physical and chemical synthetic processes have been successful in sustainably synthesizing nanomaterials with all the desirable properties, large-scale, simple, safe and low-cost production remains challenging. A recent developed approach named “*green synthesis*” that uses biological systems (*plants and microorganisms*) as nanofactories has shown significant potential to boost nanoparticles production without the use of harsh, toxic, and expensive chemicals. Therefore, exploring plant-based nanotechnology might enhance life in sub-Saharan Africa, a rich and diverse biogeographical region where population still rely on plant resources for various basic necessities. Indeed, our research group have extensively screened numerous plants for the synthesis of metallic and organic nanoparticles for waste-water treatment, fresh vegetable conservation, malaria vector control, age-related diseases management and cancer treatment among others. However, significant efforts are still needed to overcome the challenges of building new systems that meet basic requirements. Conducting cutting edge research supported by industries, institutions and universities in a public-private partnerships to develop and promote green nanotechnology may help to achieve this. The strategy of such approach and associated opportunities will be outlined.

**Keywords:** Green nanotechnology, plant resources, sub-Saharan Africa, well-being.