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Will the agricultural renaissance come from Africa?

By Prof Arun Tiwari

HISTORICALLY, the scientific renaissance was crucial in fostering innovation, critical thinking, and advancements that helped societies evolve beyond periods of stagnation and violence. It emerged in Europe, especially in Italy. It lasted roughly from the 14th to the 17th century and was a pivotal period that helped humanity transition from the Dark Ages to the modern era. However, it could not stop the brutal and greedy colonisation of the Global South by the Europeans and the two world wars.

The Green Revolution in the 1960s solved the food deficit problem in densely populated Asia, but poverty

and hunger remain. Traditional farming was not a business but the main livelihood of the people. As the population increased, rural people migrated to cities to sell their labour. First, industrialisation and then globalisation took control of agriculture from smallholders, similar to pirates capturing a ship or hijackers diverting a plane.

Smallholder farmers are trapped in producing food for the people, much like the bonded labourers of the past – slaves of the colonial powers, miners and mercenaries. Billions of illiterate and poor in the modern world are deprived of amenities like safe drinking water, sanitation, basic education and primary healthcare. The entire political spectrum – from left to right – has failed to deliver

prosperity to the producers, who are trapped in a cycle of buying inputs, using them to produce agricultural goods and selling them for cash, while others profit from their efforts.

The status quo of a constant supply of cheap food has hindered the revitalisation of agriculture, preventing it from providing new economic opportunities, improving livelihoods and enhancing rural development through better market access and financial tools. Only after climate change began posing significant challenges, such as extreme weather, decreased biodiversity and shifting agricultural zones, did murmurs arise and awareness dawn that innovative approaches in agriculture are essential.

The concept of Agricultural Renaissance involves revamping and revitalising agrarian practices to address contemporary challenges and opportunities. As the global population grows, there is an increasing need to produce more food. Innovative farming practices, improvements in crop yields and enhanced distribution systems can help address food scarcity. Many African communities possess traditional knowledge about sustainable agriculture that can be combined with modern techniques to improve productivity while maintaining ecological balance.

Agriculture is not only sensitive to climate change but is also a major factor as a producer of methane, thus causing climate change. Adopting climate-resilient crops and farming practices can mitigate the impact of agriculture on climate while adapting to changes such as altered growing seasons and increased weather volatility. Integrating technology such as precision agriculture, biotechnology and data analytics can improve

efficiency and productivity, allowing for better resource management and crop monitoring. But how will it happen?

Modern agriculture often relies on monoculture practices, which have decreased biodiversity, and the trend continues. The focus must shift to polyculture and preserving diverse species of plants and animals, which can improve resilience and ecosystem health. There needs to be more concern about the nutritional quality of mass-produced food through nutrient-dense crops. Improving supply chain efficiency and waste management is crucial to reducing food loss from farm to table. Innovations in storage, transportation and packaging can play a significant role. Most importantly, it is essential to reform these channels, as they often earn manifold compared to the food producers for merely handling and transporting the goods.

Africa possesses some of the most extensive tracts of uncultivated

arable land worldwide. Properly utilised, this land could significantly increase global food production and become the cradle of sustainable agriculture. The continent's diverse climate allows for various crops and livestock, fostering agricultural biodiversity and resilience. With a large and young population, Africa has the potential to cultivate a new generation of farmers who can adopt innovative farming technologies and practices. Technological advancements such as mobile technology and digital tools are increasingly being used in Africa for agricultural extension services, market access and real-time weather information, aiding farmers in improving productivity and income.

India can significantly help Africa overcome scientific barriers in agriculture by leveraging its experiences and technological advancements. India has made substantial progress in agricultural research and development, including developing high-yield crop varieties, pest-resistant strains and efficient



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irrigation practices. Sharing this know-how and experience, mainly developed indigenously in a most cost-effective manner, can be most beneficial to African smallholders. Collaborating on educational programs and vocational training of African farm professionals can help build local capacity. Indian agricultural universities and research institutions can partner with their African counterparts to offer training and joint research initiatives.

India's advancements in affordable and scalable agricultural technologies—such as drip irrigation systems, mechanisation equipment and mobile-based agricultural advisory services—can be transferred to African contexts, helping improve efficiency and reduce costs. Partnerships between Indian and African agricultural research institutions, universities and private companies can be fostered to drive innovation and address shared challenges. India can also share its experience in implementing farming policies that have increased productivity, such as support frameworks for smallholder farmers.

I envision four pillars supporting the tower of New Agriculture: (1) Soil management, (2) Bio-solarised powering, (3) Urban amenities in rural areas, and (4) Integrated livestock management. AI will provide a roof-like support, both holding up these four pillars and being supported by them.

Soil Management involves practices that protect and enhance soil health, such as crop rotation, cover cropping, and reduced tillage. Healthy soil increases productivity, mitigates erosion, and enhances carbon sequestration.

Bio-solarised powering relates to harnessing renewable energy sources, particularly solar energy, in agricultural practices and anaerobic digestion of agro-waste to create biofertilisers and energy. It could involve using solar panels to power farming operations or hybrid systems that combine biological processes with solar energy to improve efficiency.

Enhancing living conditions in rural areas is vital for attracting and retaining populations. This includes improving access to healthcare,



education, transportation and digital connectivity, which can support agricultural innovation and community development.

Integrated livestock management is a holistic approach that combines various livestock production practices, including breeding, feeding, health management and animal welfare, to optimise productivity and sustainability. Cloning and tissue culture are advanced biotechnological methods that significantly enhance livestock production. These methods will lead to better herd management through enhanced reproductive technologies, improved disease management and animal health through advanced biotechnologies, and sustainable practices that increase productivity while minimising environmental impact.

Together, these pillars can help create a more resilient and sustainable agricultural system that addresses the challenges of modern agriculture, including climate change, food

security and economic viability. A growing youth population provides a dynamic labour force that can drive innovation, entrepreneurship and new agricultural practices. Programmes fostering agricultural entrepreneurship can empower young people to create businesses in food production, processing and distribution.

Economic, technological, and societal changes in sub-Saharan Africa have created the potential for an agricultural renaissance. By leveraging these opportunities, the region can enhance food security, improve livelihoods, and contribute to sustainable development. Collaborative efforts among governments, NGOs, private sectors, and local communities will be crucial in realising this potential. This will transform agriculture into a more efficient, sustainable, and equitable system capable of supporting a growing global population and preserving the planet for future generations.

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