



Agile local manufacturing of active pharmaceutical ingredients in Africa could improve health security and economic growth

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After decades of dependence on imported Active Pharmaceutical Ingredients (APIs) and multilateral aid, Africa faces a critical turning point, seeking to assert control over its health and economic future. Here we discuss how agile local API manufacturing offers a strategic solution to enhance health and economic security, transforming Africa's pharmaceutical landscape for sustainable medicine access.

People in Africa strive for independent control of health and economic resilience. Decades of dependence on multilateral aid and imported Active Pharmaceutical Ingredients (APIs) have made Africans vulnerable to supply chain disruptions, price volatility, and health crises. Locally driven solutions can counteract reductions in aid and escalating health threats. A shift toward innovative, local API manufacturing could improve Africa's pharmaceutical landscape by enhancing health security, fostering economic growth, creating jobs, and positioning the continent as a global competitor, ensuring sustainable medicine access.

In this Comment, I discuss the advantages of local API manufacturing in Africa, the challenges to its introduction and suggest approaches to enable its introduction across Africa.

Why local API manufacturing matters

Africa has 26% of the global disease burden but accounts for only 3% of global drug production, importing over 95% of APIs¹. Relying on imported APIs creates vulnerabilities during crises such as the COVID-19 pandemic and recent contractions in multilateral aid^{2,3}. Disrupted supply chains and limited resources have hindered access to critical medicines⁴. Localizing API production addresses these issues. By manufacturing APIs domestically, African nations can reduce reliance on imports, ensuring a consistent supply of medicines even during global disruptions. Local production reduces costs by eliminating import-related expenses, such as tariffs and shipping, thereby making medicines more affordable. It also ensures faster access to critical drugs during pandemics or emergencies, which boosts health security. Furthermore, local manufacturing promotes economic growth by creating jobs, fostering innovation, and stimulating local economies.

The agile advantage

Agile manufacturing is already used by technology and automotive industries. It could potentially transform how Africa approaches API production. Unlike traditional, large-scale pharmaceutical plants that require massive investment and long setup times, agile manufacturing emphasizes flexibility, scalability, and efficiency (Fig. 1). This approach is particularly suited to Africa's diverse and resource-constrained environments.

Agile manufacturing employs compact, modular production units that can be rapidly deployed or scaled to meet demand. This requires lower initial investment, which makes it easier to implement in African nations with limited capital. For instance, South Africa's Council for Scientific and Industrial Research (CSIR) is developing the FuturePHARMA Facility⁵, an agile infrastructure to support local production of therapeutics, strengthening health sovereignty. This open-access facility enables local pharmaceutical companies to de-risk investments, fostering sustainable, cost-effective API manufacturing and enhancing Africa's health and economic resilience.

Advances in process chemistry are reducing API production costs and improving sustainability. By optimizing chemical production and integrating Quality by Design (QbD) and continuous flow manufacturing, a technology that streamlines processes and minimizes waste⁶⁻⁸, local manufacturers can effectively compete with global pharmaceutical leaders.

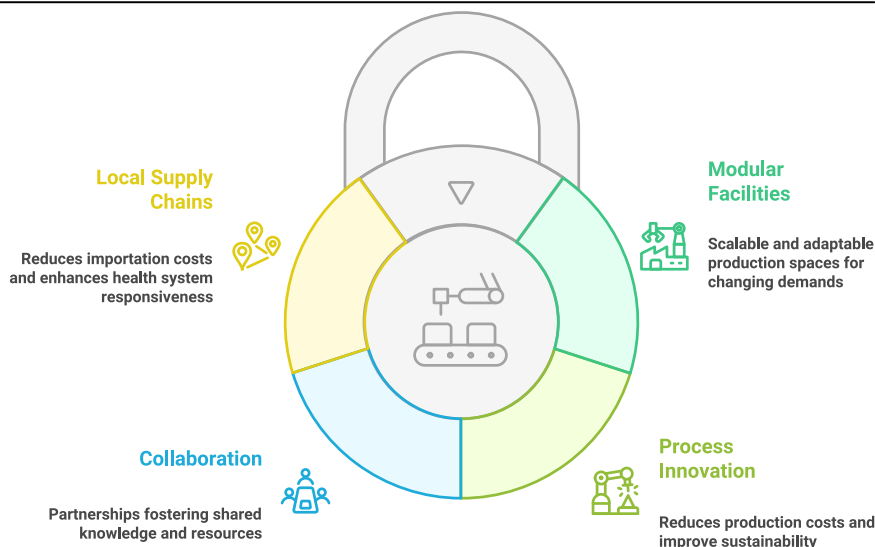
Agile manufacturing thrives on collaboration. Initiatives such as the European Investment Bank's €50 million program in 2020⁹ and partnerships with organizations including the Global Fund are supporting African countries in building local API production capacity. Collaboration among academia, research institutions, industry, and government is crucial, pooling resources, expertise, and funding. These partnerships provide technical know-how, financial support, and access to global markets, enabling African manufacturers to leapfrog traditional barriers and accelerate sustainable, competitive API production.

Agile manufacturing emphasizes localized supply chains, reducing reliance on imported raw materials and packaging. This not only de-risks the supply chain but also supports African businesses, from raw material suppliers to logistics providers.

Success stories and momentum

The push for local API manufacturing is gaining traction across the continent. In South Africa, the continent's pharmaceutical hub, companies including Aspen Pharmacare are producing APIs for essential medicines, setting a model for others to follow. Meanwhile, countries including Kenya, Nigeria, and Ghana are exploring API production through public-private partnerships and investments in infrastructure.

Fig. 1 | Key enablers of agile manufacturing to support local API production in Africa.



The World Health Organization's 2021 Resolution on strengthening local production (WHA74.6) has spurred African governments to prioritize domestic manufacturing. This resolution, coupled with regional initiatives such as the African Union's Pharmaceutical Manufacturing Plan for Africa, is creating a roadmap for self-sufficiency.

Innovative startups and established companies, including Nigeria's Emzor Pharmaceuticals, South Africa's Chemical Process Technologies, and Fine Chemical Corporation (an Aspen subsidiary), are advancing local API production capabilities. Concurrently, research institutions, including the CSIR, Nelson Mandela University, and the University of Pretoria, are driving process innovations to enhance manufacturing cost-competitiveness. These collaborative efforts demonstrate Africa's potential to produce high-quality APIs that comply with global standards.

Challenges and next steps

Despite the promise, local API manufacturing in Africa faces significant hurdles. Limited infrastructure, regulatory complexities, and a shortage of skilled workers pose challenges. Additionally, the high cost of establishing Good Manufacturing Practice (GMP)-compliant facilities and the need for consistent energy supplies can deter investors.

To overcome challenges in local API manufacturing, African governments can encourage investment through tax incentives, subsidies, ensuring stable supply of electricity and simplified regulations while addressing the skills gap via targeted training programs. The highly successful Biomanufacturing Workforce Development programs, hosted by CSIR and funded by the Bill & Melinda Gates Foundation, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), and Germany's development bank, Kreditanstalt für Wiederaufbau (KfW), has significantly impacted the biomanufacturing sector by training a skilled workforce at scale^{10,11}. Additionally, the African STARS (Science, Technology, and Research Scholars) Fellowship Programme, a Mastercard funded collaboration between Stellenbosch University and Institut Pasteur de Dakar, is fostering the next generation of scientists, innovators, policymakers, and healthcare leaders¹². These models could be adapted for API manufacturing and formulation. Regional initiatives such as the African Continental Free Trade Area (AfCFTA) can further enhance


economies of scale by creating a unified market for African-produced APIs, driving sustainable growth.

A vision for the future

The contraction of multilateral aid and withdrawal of major donors should not be viewed negatively for Africa but instead catalyse economic growth and a push for health sovereignty. Ideally the outcome will be an Africa where every country has access to affordable, locally produced medicines and health crises no longer result in empty pharmacy shelves and loss of life. This will enable scientists and entrepreneurs to drive innovation in sustainable pharmaceutical manufacturing, creating jobs and global partnerships. This vision is within reach, and agile API manufacturing and collaboration is key.

By embracing agile approaches and collaboration, African nations can transform their pharmaceutical sector into a powerhouse of innovation and resilience. The journey has begun, with investments, partnerships, and policies laying the foundation. As the continent continues to build its manufacturing capabilities, medicines, empowerment, self-reliance, and a healthier, more prosperous future should result for all Africans.

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Competing interests

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