



Solidarity

Equality

Sustainability

Context for Bioeconomy Development: Skills, Resources & Science Infrastructure

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About the CSIR: Mandate



“The objects of the CSIR are, through **directed** and **particularly multidisciplinary research** and **technological innovation**, to foster, in the **national interest** and in fields which in its opinion should receive preference, **industrial** and **scientific development**, either by itself or in **co-operation with principals** from the **private** or **public sectors**, and thereby to contribute to the **improvement of the quality of life** of the people of the Republic, and to perform any other functions that may be assigned to the CSIR by or under this Act.”

(Scientific Research Council Act, 1988 (Act 46 of 1988, amended by Act 27 of 2014)

The African Context: Key opportunities



28.6B

Value of Africa's pharmaceutical industry in 2023, predicted to jump to USD 70 billion by 2030. African Union goal for on-continent vaccine manufacture by 2040



60%

Proportion of Africa's labor force employed in the food system, and Africa's food systems contribute 15-35% of Africa's GDP, with recognized potential of the bioeconomy to transform food systems further



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The African Context: major bottlenecks

The **GAP**: the absorptive capacity to enable local development and localization

Strong infrastructure is required along the value chain, from sound research infrastructure in basic research, analytics through scaling up and production of clinical grade batches

Infrastructure

From bench to pilot scale

+

People

Skill and knowhow (more than one of each specialty)

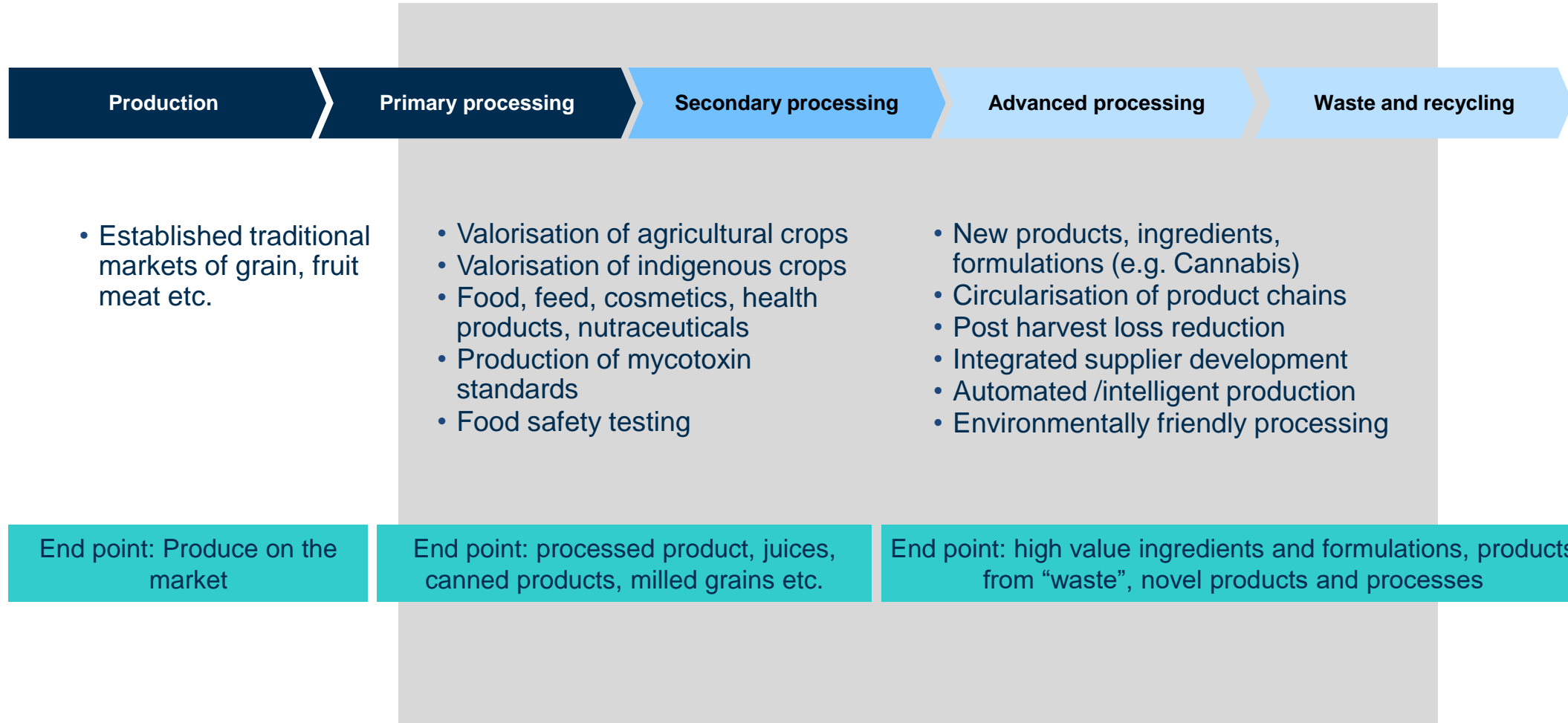
Research ready skills from tertiary institutions and translation requires skills beyond just the science and engineering, to include techno-economics, regulatory etc.



Translational capabilities

Products that undergo clinical development, and proceed to full scale manufacture

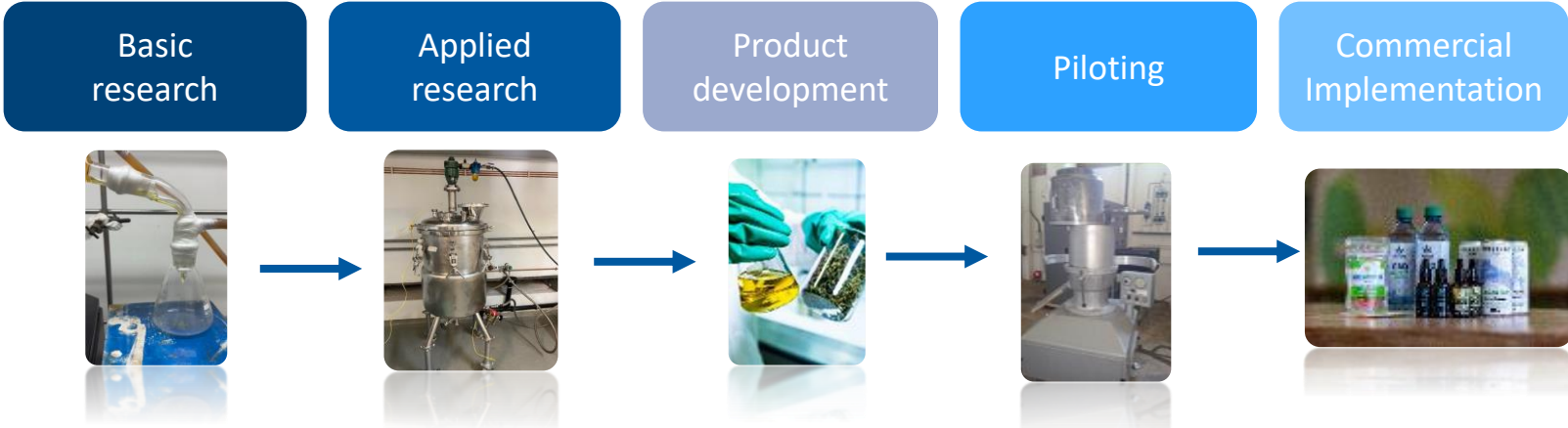
Agroprocessing: Gaps in the value chain



Bridging the gap: Infrastructure as a basis of enterprise and skills development



Biomanufacturing Industry
Development Centre (BIDC)



“Product formulation to Commercial Reality”

Integrate the capabilities into your overall
business for long term sustainability



Cannabis product development



Multiple (41) companies incubated to date



Elvema Moringa Nutritional Instant Porridge, moringa powder and capsules are sold locally and exported to 34 African countries including Uganda, Lesotho, Cape Verde, Kenya, Nigeria, Somalia and Madagascar.



SA TWALA- VEISA Trading CSIR developed an okra juice formulation with only natural preservatives that met shelf life, microbial testing requirements. Sold in SPAR and several petrol station convenience stores.





LIQUI MEAL

DRINK, FILL UP AND FEEL GOOD

LOW FAT • CHOLESTEROL FREE • GLUTEN FREE

500 ml

HIGH IN: Protein • Essential Amino Acids • Energy • Carbohydrates • Vitamins A, E, C, B9 • Zinc

MANUFACTURED BY
Lizbridge Trading Enterprise
7 Sandalwood,
Van Der Bergh Rd
Lyttelton, 0157
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SETŠONG

DIYA
red root tea

indigenous detox tea

lemon, ginger & berry fusion
with Beta-carotene & Zinc

SETŠONG

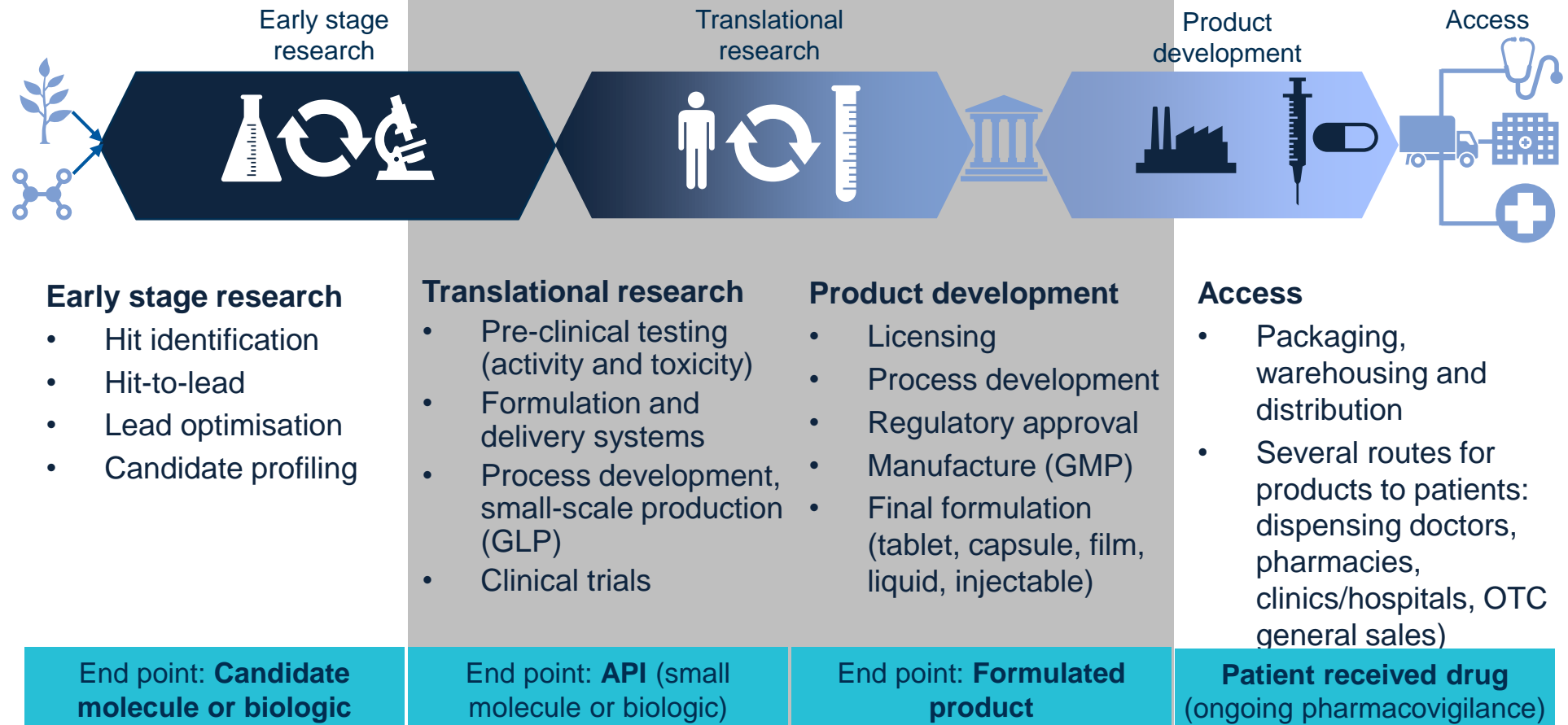
DIYA
red root tea

indigenous calming tea

orange, ginger & turmeric fusion
with Beta-carotene & Zinc

Pharmaceuticals: Gaps in the value chain

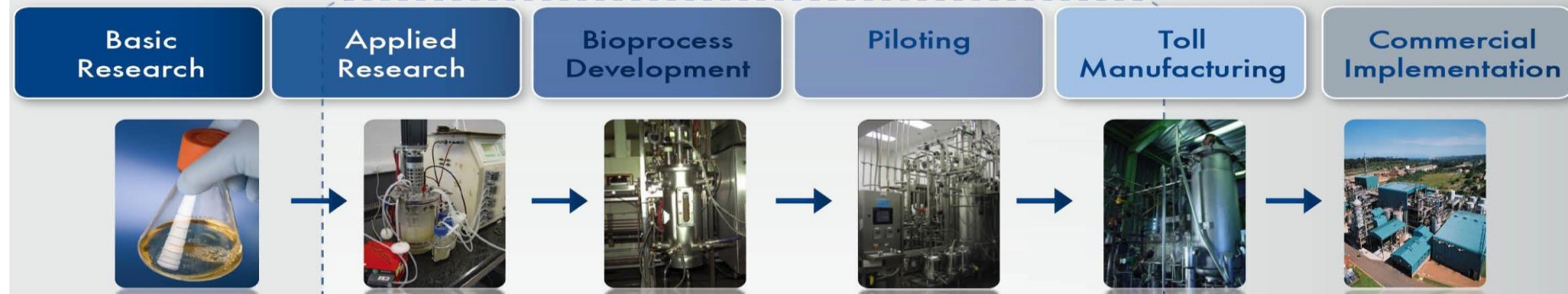
Complex developmental pathway: Various integration points



Bridging the gap: Infrastructure as a basis of skills development



Biomanufacturing Industry Development Centre (BIDC)



“Fermentation Concept to Commercial Reality”

Integrate the capabilities into your overall business for long term sustainability



BIDC, catalytic projects



Work Force Development Program



Pharmaceuticals: Responding to continental aspirations

Pharmaceuticals development can drive Africa's bioeconomy

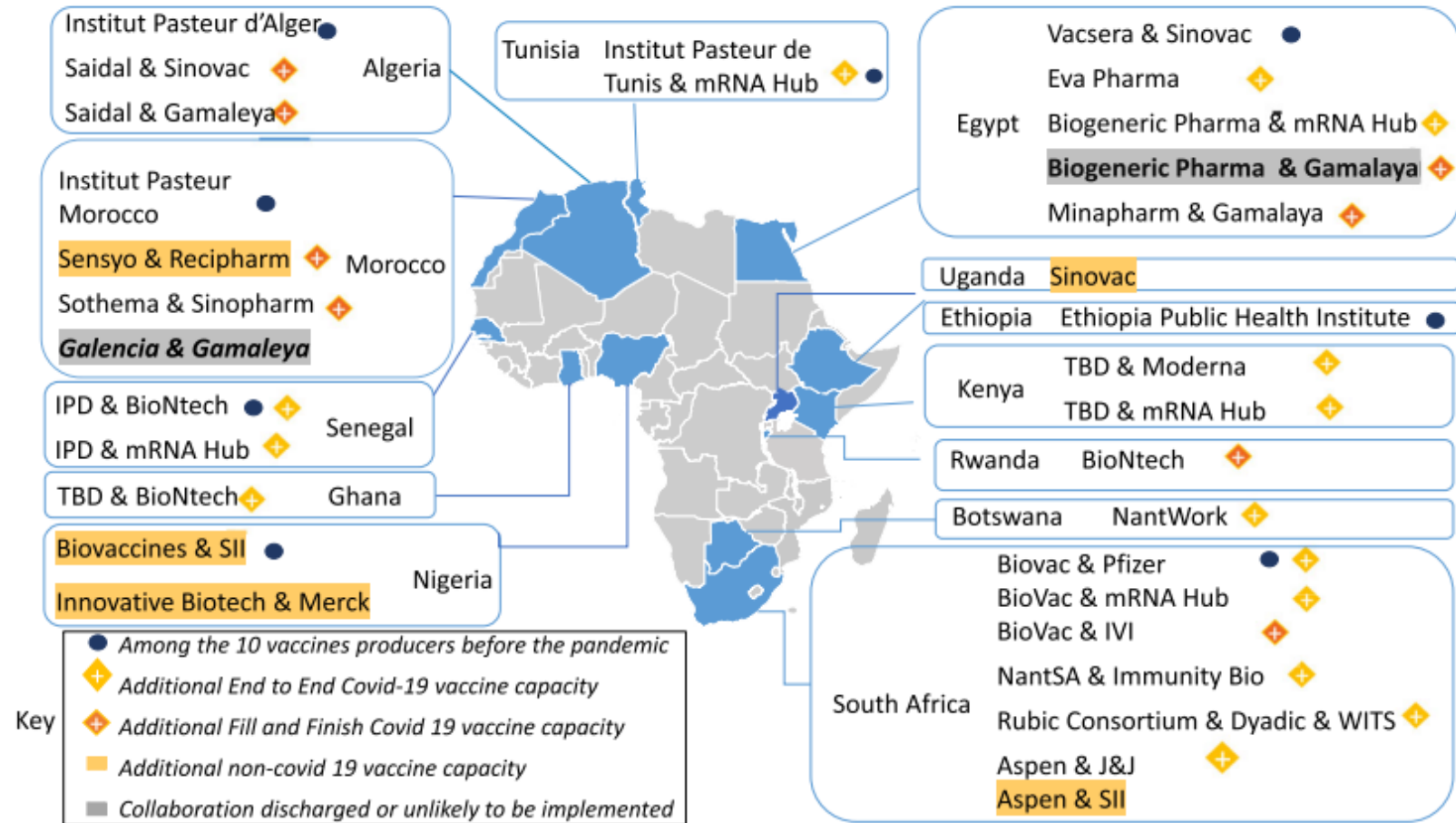
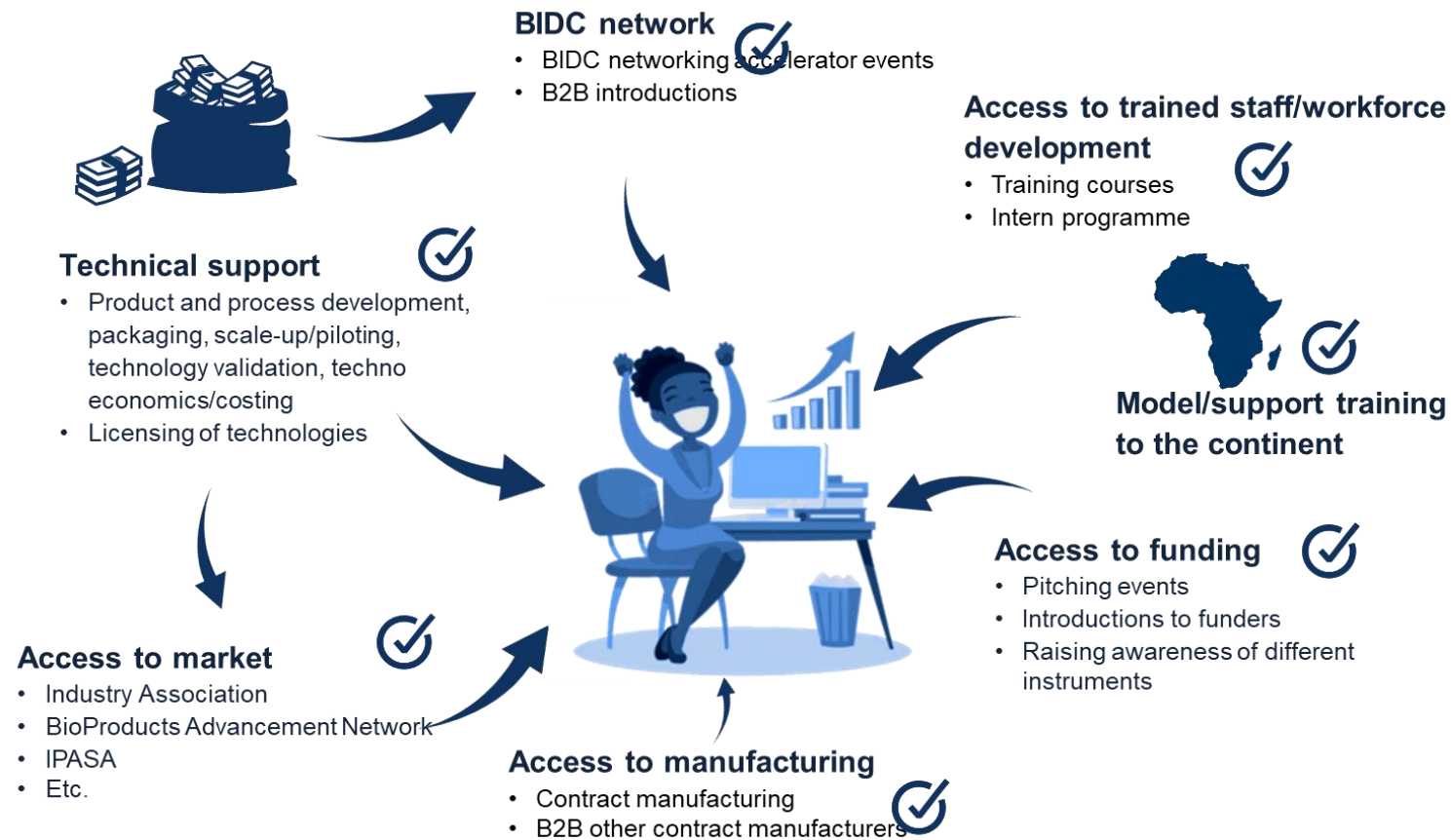


Figure 1. A summary of vaccine manufacturing on the African continent, courtesy of Myriam Grubo, Medicines Patent Pool. IPD: Institut Pasteur de Dakar; J&J: Johnson & Johnson; SII: Serum Institute of India; TBD: to be determined; WITS: University of Witwatersrand.

Critical role of infrastructure in local industry establishment



Key lessons learned...

Investment

Financial investment
Research and development (GERD 1% and above ideal), translational hubs with end-to-end capabilities, industrial infrastructure and entrepreneurial endeavors

Infrastructure

Build infrastructure;
Accessible infrastructure to support the value chain but particularly to facilitate translation of R&D into products and services, consider regional hubs of excellence with end-to-end capabilities.

Skills

Workforce Development
Graduands from tertiary institutions have gaps in technical skills, need to learn the practical skills that make them industry ready, with specialization along the value chain, providing qualified pool of local talent to innovate and to facilitate tech transfer.

Enabling policy and infrastructure



Coherent policy

Policy that drives localization, efficient regulations and incentivizes local production of critical products, and offers offtake guarantees especially for high value products and predictability of demand



Industrial infrastructure

Infrastructure to drive local production of high-quality goods, include risk sharing mechanisms to underpin infrastructure for production, storage and transportation of products

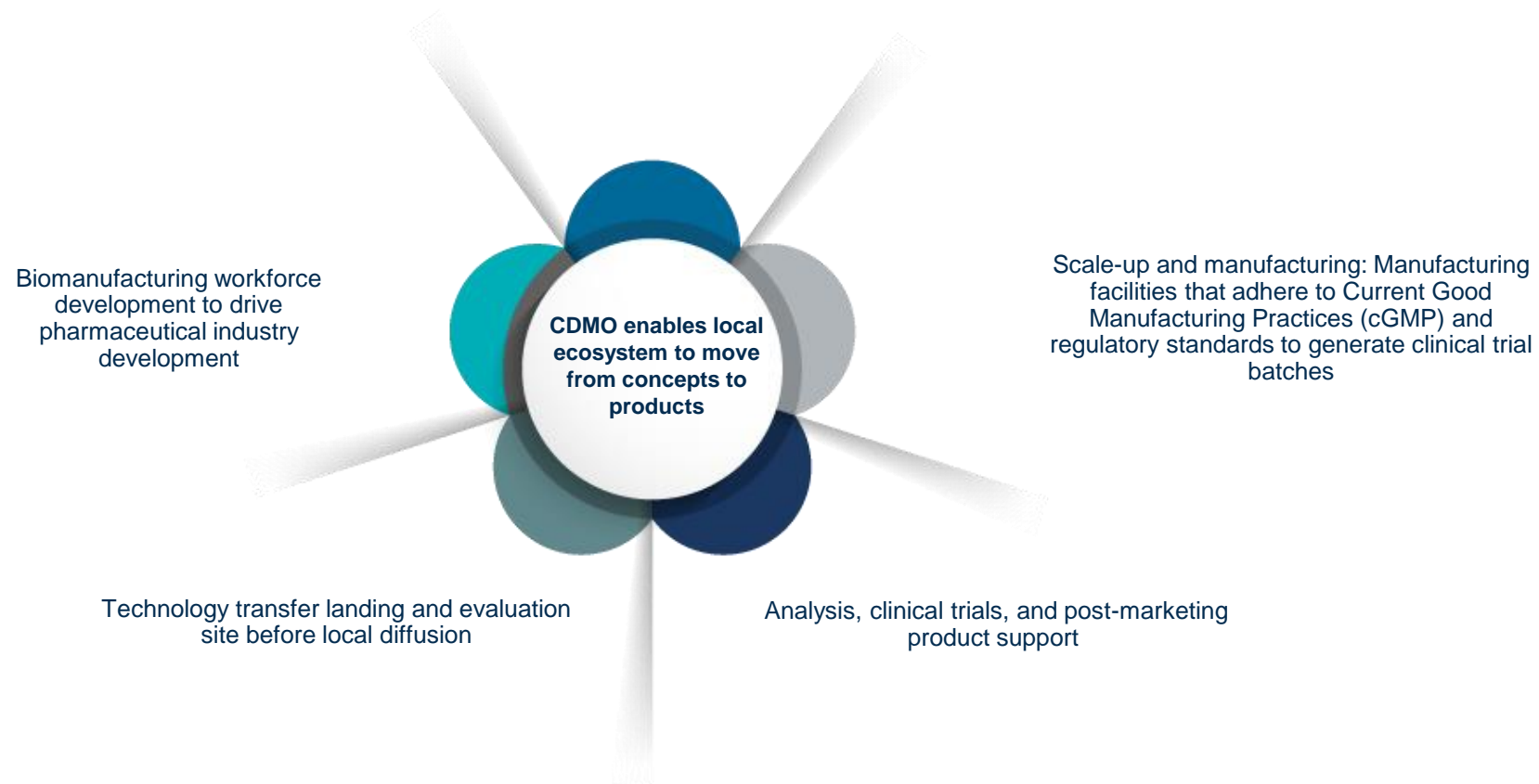


Transportation and logistics

End to end logistics to ensure supply of consumables, but also open up local and global markets

Strengthening the ecosystem to move RDI outputs into products and services on the market

Contract Development and Manufacturing Organisations (CDMOs) cover the gap, providing the requisite skills and infrastructure to pull through products REPEATEDLY





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Thank you