

THE PATHOGEN ECONOMY

By

BRENDA NAKAZIBWE

TEAM LEADER

PRESENTATION AT THE NATIONAL BIOSAFETY FORUM

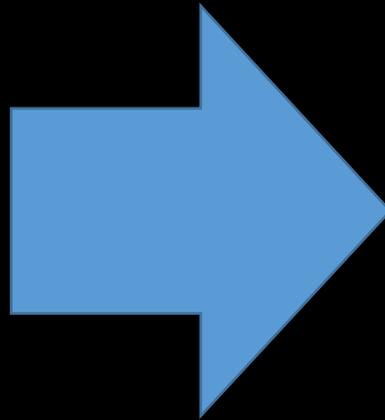
22nd June, 2022

THE PATHOGEN ECONOMY TEAM – “MAKING UGANDA THE BEST”

When 'i' is
replaced By 'we'

Even
'illness'
Becomes
'Wellness'

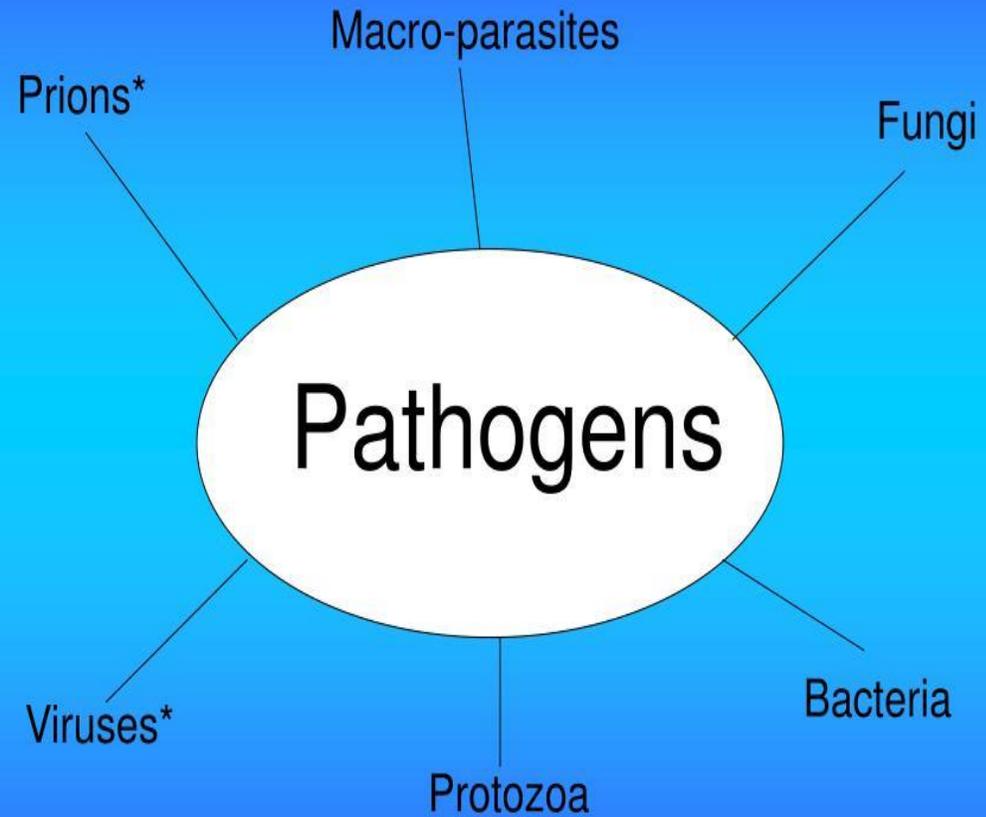
www.olaalaa.com





WHAT ARE PATHOGENS?

Pathogens are micro-organisms that can cause human, animal and plant diseases



Pathogens are micro-organisms that can cause human, animal and plant diseases



WHAT IS PATHOGEN ECONOMY?

- **Refers to the making, selling and use of goods and services related to the prevention, control and treatment of damage due to pathogens.**

Uganda industry

Import dependent - > 90%

21 human medicine manufacturers,

- 4 large > 100 employees (CIPLA, APDL, KPI and Rene),
- 16 - medium (31-99 employees)
- 1 small (less than 30 employees).
- Vet industry are Alfasan, MTK, Nile Services, Bukola and Nsanja
- Majority of these just import, assemble and packaging.

Opportunities for Uganda

Virus name	First detection in Uganda	Year of first isolation	Virus isolation		
			Humans	Sentinel monkeys	Mosquitoes
Yellow fever virus	*		/	/	/
Rift Valley fever virus	*		/		/
West Nile virus	West Nile region	1937	/		
Bwamba virus	Bwamba region	1937	/		/
Semliki Forest virus	Bwamba region	1942			/
Ntaya virus	Bwamba region	1943			/
Bunyamwera virus	Bwamba region	1943			/
Mengo virus	Entebbe region	1946	/	/	/
Zika virus	Entebbe region	1947		/	/
Uganda S virus	Bwamba region	1947			/

*Yellow fever and Rift Valley fever viruses were discovered for the first time in countries other than Uganda.

- Over 200 pathogens resident, many without effective solutions yet
- Located in Tourism zone
- Sizeable scientific capital

Like oil, pathogens flow across borders. Moreover, pathogens hinge towards a renewable resource, which as technology evolves continuously result into new products

UNIQUENESS OF THE PATHOGEN ECONOMY

- *Political and business interests in the sector*
- *Security implications*
- *Need for Strategic foresight*
- *Sophisticated knowledge systems*
- *An effective R&D Model*
- *Proper Ideological Orientation for R&D*



VISION

Leveraging pathogens to contribute to achieving a science-led economy

GOAL

To provide a suitable platform to facilitate rapid research and development by local scientists geared at helping the country fast track progress towards health security from epidemics and other public health threats.

STRATEGIC OBJECTIVES

1. To identify research and development priorities required to lead the country towards containment of the Epidemics and other public health security threats.

2. To conduct rapid epidemiological analysis of (global and local) evidence and recommend appropriate interventions against Epidemics at national level.

3. Provide funding for local scientists to enable them fast track development and production of biologics (therapeutics, vaccines and other prophylactics), materials, equipment

4. To Think Tank strategic research and analyses geared to strengthening policy and design of socio- economic interventions as well as harnessing opportunities arising from Epidemics

**THE PATHOGEN ECONOMY
FRAMEWORK**

MULTISECTORAL

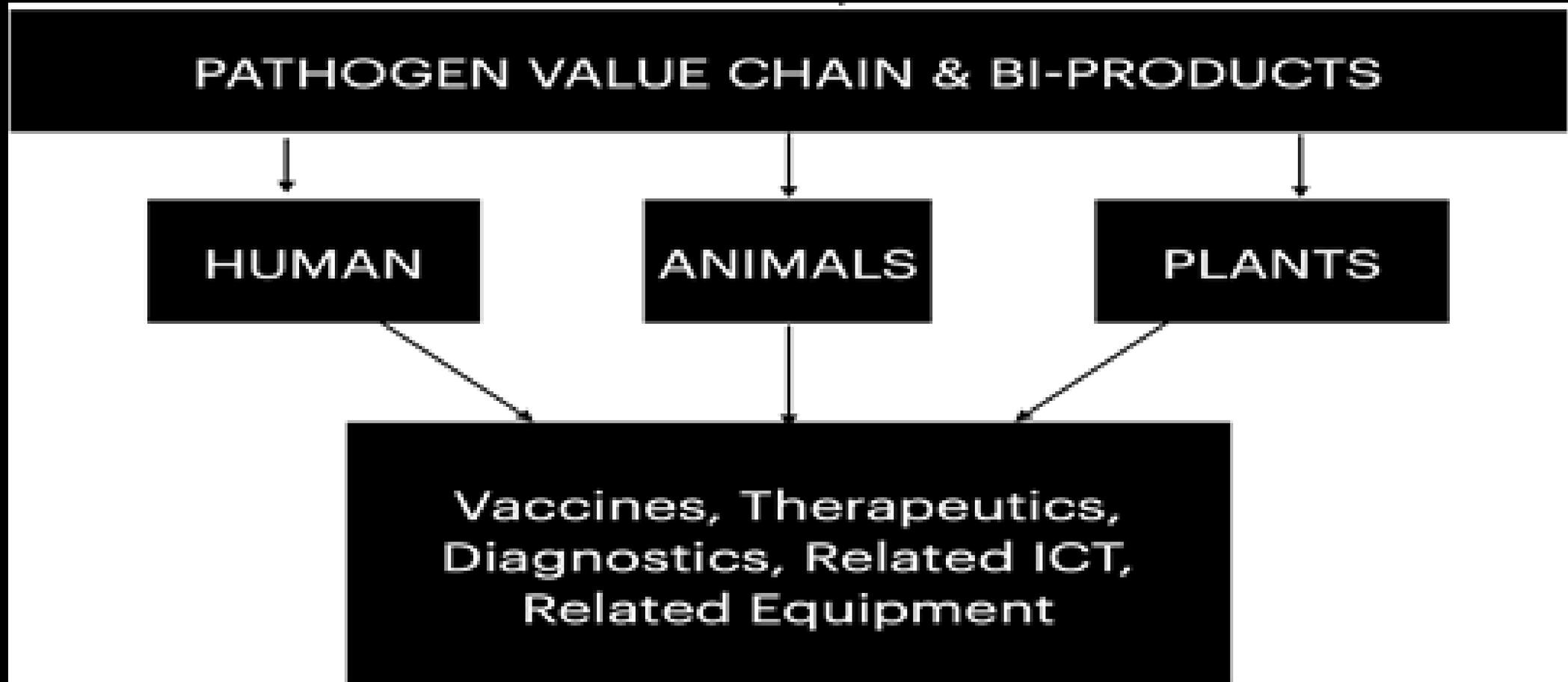
MULTIDISCIPLINARY

**SCIENTIFIC
THINK TANK**

**THE
SECRETARIAT**

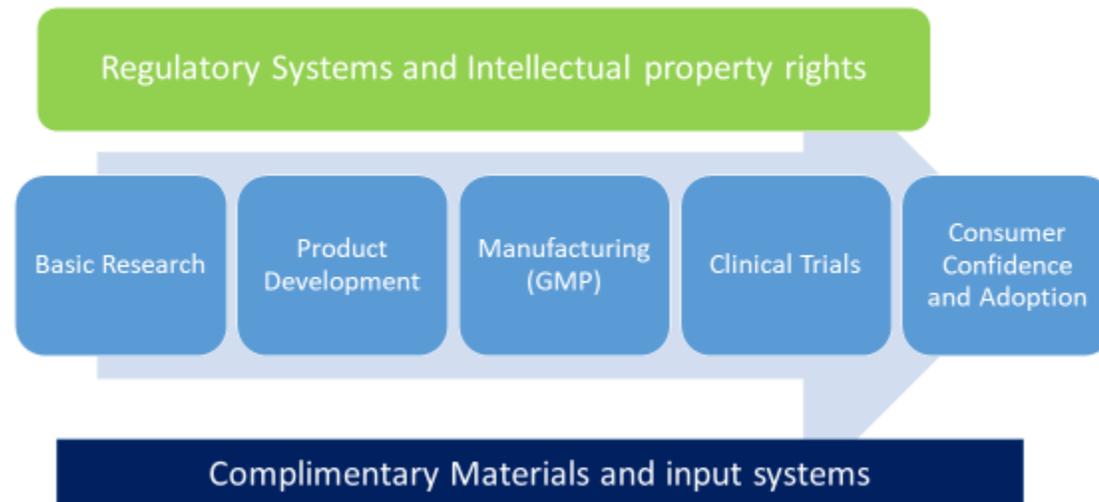
**RESEARCHERS
&
INNOVATORS**

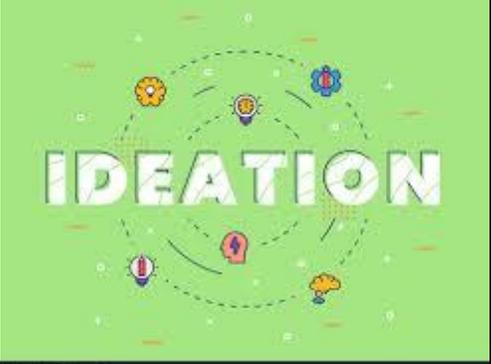
OUR MANDATE



Value Chain Approach

Value Chain Approach





MARKETING AND DISTRIBUTION



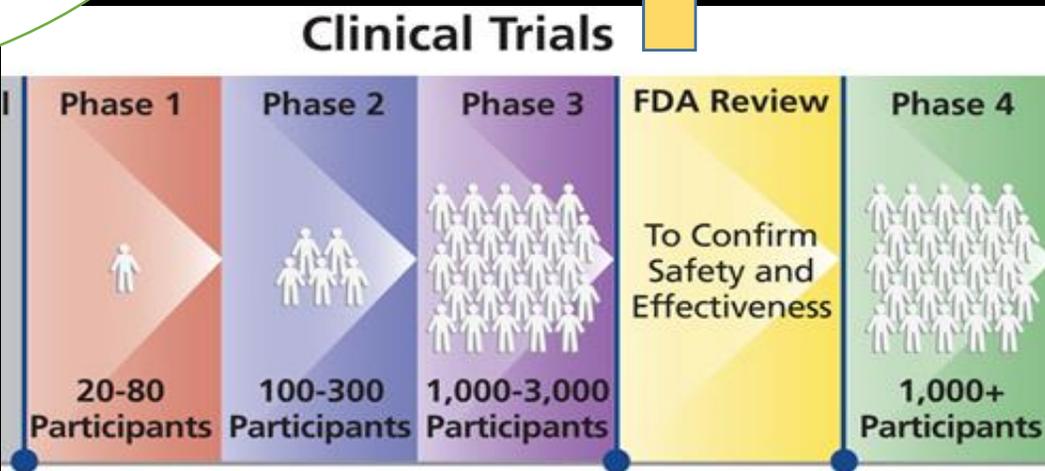
FILL AND FINISH



Vaccine Development Value Chain



GMP vaccine candidate manufacturing process



Drug Approved for Testing in Humans

Drug Submitted for FDA Approval

Drug Approved

DRUG DEVELOPMENT VALUE CHAIN



Herbalists



REGISTRATION (URSB)

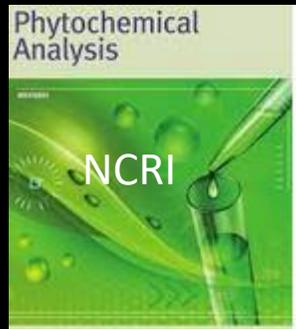
LOCAL & INTERNATIONAL REGULATION

CONSUMER CONFIDENCE

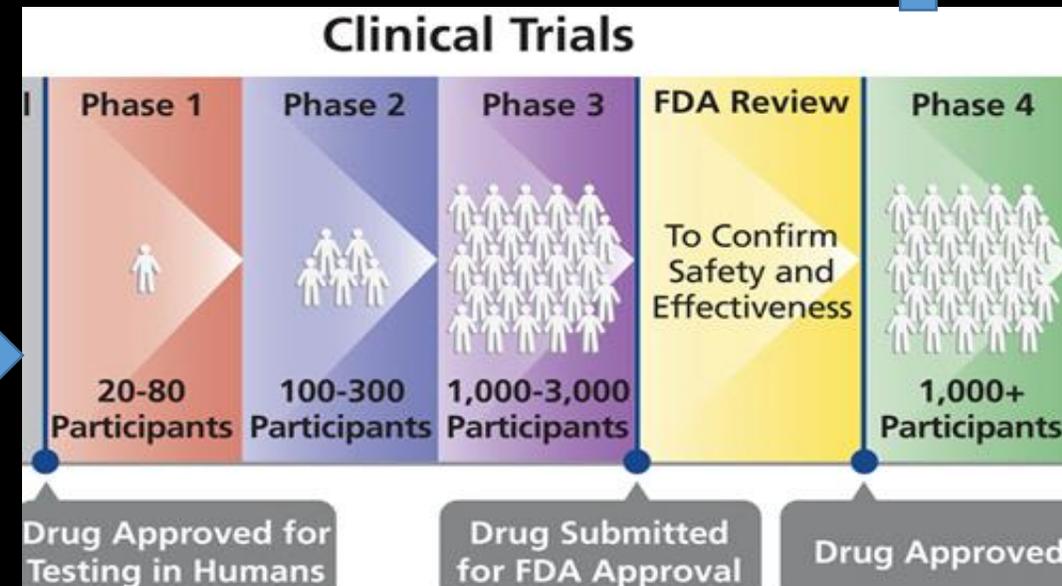
MANUFACTURING & GMP

LOCAL REGULATION

OFFTAKE & MARKET



INVITRO TESTS



Targeted products for Pathogen Economy July 2022 - June 2024

S/N	Project Name	Status
VACCINES -#1		
a	Humans	
01	COVID-19 Subunit Vaccine	Basic research finished; prototype available, preclinical studies finalized
02	Inactivated Covid-19 Vaccine	Basic research finished; prototype available, purification of cells done
03	Novel Adeno-vector COVID-19 Vaccine	Basic research finished; prototype available, backbone ready.

Vaccines-#2

S/N	Project	Status
b	Animals	
04	2 Anti tick vaccines	Prototype available, phase 1,2 trials finalized. Project is at phase 3 trials
06	Swine fever vaccine	Basic Research finished; project is at prototype level.
07	East coast fever vaccine	Project is at Basic Research level
08	Kuku star Vaccine (Poultry)	Basic research finished; prototype ready.

DIAGNOSTICS

S/N	Project	Status
09	The PCR and anti-body diagnostic kits	Basic research finished, prototype developed, project is at field trial stage.
10	RARA PCR-based diagnostic assay	Basic research finished, prototype developed, validation of the kit is done, project is set for pilot testing.
11	Saliva Diagnostic Kit	Basic research finished, prototype developed, project is set for pilot testing.
12	Colorectal cancer screening testing kit	Project is at basic research level

THERAPEUTICS

S/N	Project	Status
a	Humans	
13	UBV 01N drug	Basic research finished, prototype developed, phase 2a clinical trial finished. Project is set for 2b clinical trials.
14	TAZCOV Syrup	Basic research finished, prototype developed, invitro studies finished, project is set for 1(a) clinical trial.
15	VIDICINE syrup	Basic research finished, prototype developed, reports available on invitro studies, project is set for 1(a) clinical trial.
16	Vitamin D tablets/capsule	Idea formulated, Vitamin D levels in different groups determined, national vitamin D reference ranges, project is at basic research.
17	Covilyce drug	Basic research finished, prototype developed, project is set for 1(a) clinical trial.

Plant Health Projects

S/N	Project	Status
18	Organic fertilizer, pesticide, fungicide production project	Idea generated, prototype finished, project is set for basic research.
19	Plant tissue propagation project	Idea generated; project is at basic research

CENTRAL FACILITIES

S/N	Project	Status
18	Animal lab house	Project design finished, funded for two years under PRESIDE, refurbishment of the structure finished, procurement of mice is ongoing.
20	Centre for clinical trials in Uganda (CoNATU)	Idea formulated, already executed UBV-01N project in the 2020/21 FY, set to undertake three herbal products under clinical trials.
22	Centre of excellence for herbal medicines research (Rukararwe)	Area already established, land available, research team established, engagement framework established.
23	Centre for invitro studies in Uganda (UVRI)	Idea formulated, 05 products, reviewed, 3 are going to undergo clinical trialsthrough in the 2021/22 FY.



Hon. Minister leading P.E Scientists at the Proposed Pathogen Economy Industrial Park for Biomedical Kits Manufacturing at Busunju



The Hon. Minister planting a tree at the proposed Centre of Excellence for Herbal Medicine Research at Rukararwe- Bushenyi



Moments at State House discussing Drug Development with H.E, STI, WHO and Scientists

Lessons from our 2-year Experience

- Mind-set change for the TEAM players in the ECOSYSTEM
- System enhancement and creation for sustainability
- Holistic capacity development (social, intellectual, spiritual and physical)
- Strategic planning
- Timely monitoring and evaluation of funded projects
- Zero tolerance to corruption
- Build a strong data base to guide in planning and intervention



Next Steps; 2022/2023

- Establishment and Operationalization of a National Micro-Organism Bio-Bank Facility in the Country.
- Establishment of plants to produce inputs for Vaccines, Diagnostics, and Therapeutics, e.t.c for Humans, Animals and Plants.
- Research and Development to produce Acaricides, Pesticides and Insecticides.
- Support R&D in the Indigenous Knowledge Value Chain for Import Substitution.
- Establishment of Specialized Research and Capacity Development Labs Linked to the National STI System (BSL4 Lab). A BSL4 is a specialized research laboratory that deals with potentially deadly infectious agents like Ebola.

What to look out for

- Clearance by URSB and UNCST
- Symposium for vaccines
- CONAT Launch
- EASTECO 1st Science Youth
- The National Science Week

I CREATE NEW
PRODUCTS AND
SERVICES
BECAUSE,
WHERE ONE SEES
A PROBLEM I SEE
A SOLUTION.

~ L.BEAN