

# Innovation Lab for Legume Systems Research



African Bean Conference 2023

Systems Approach Overview

Livingstone, Zambia

February 2023

# Legume Systems Innovation Lab Key Metrics

**\*FTFMS  
Indicator**

30

Technologies\*

104

Publications & Presentations\*

60

Degree Training\*

30

No. of R&D Projects

13

No. of Partner Countries

Includes United States

98

No. of Researchers

**\*\*10 Institutions  
with  
improved  
performance**

49

No. of Institutional Partners\*\*

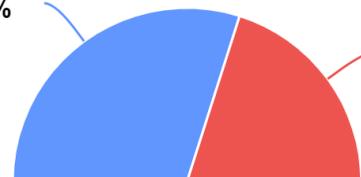
5504

No. of Short-Term Trainees

% Women Served and Engaged

Num Male: 59.8%

Num Female: 40.2%



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graph LR; A[Phenotyping/ Genotyping] --> B[Breeding]; B --> C[Seed Systems]
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Phenotyping/  
Genotyping

Breeding

Seed Systems



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graph LR; A[Production] --> B[Processing]; B --> C[Demand];
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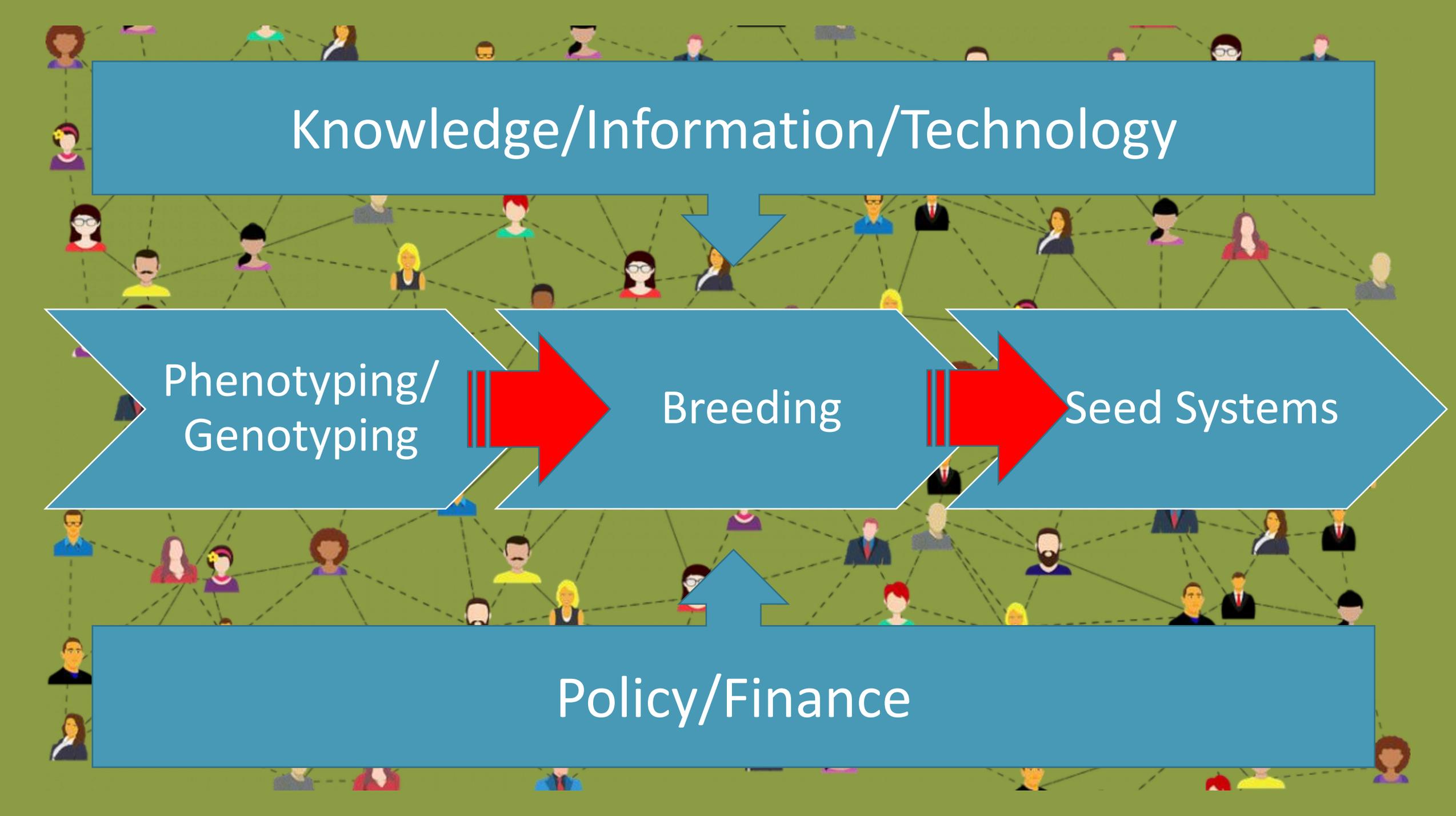
Production

Processing

Demand







Knowledge/Information/Technology

Phenotyping/  
Genotyping

Breeding

Seed Systems

Policy/Finance

Knowledge/Information/Technology

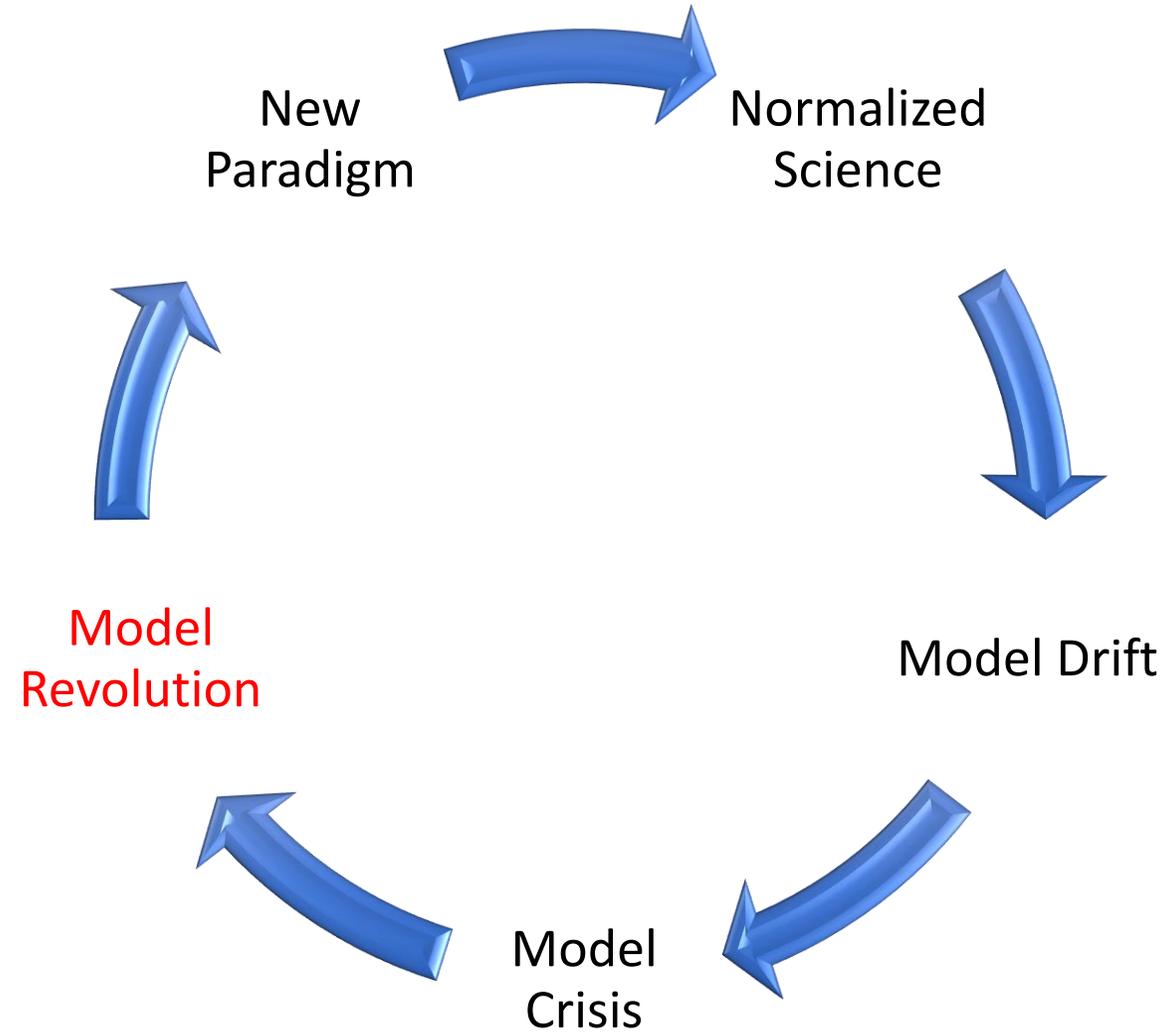
Production

Processing

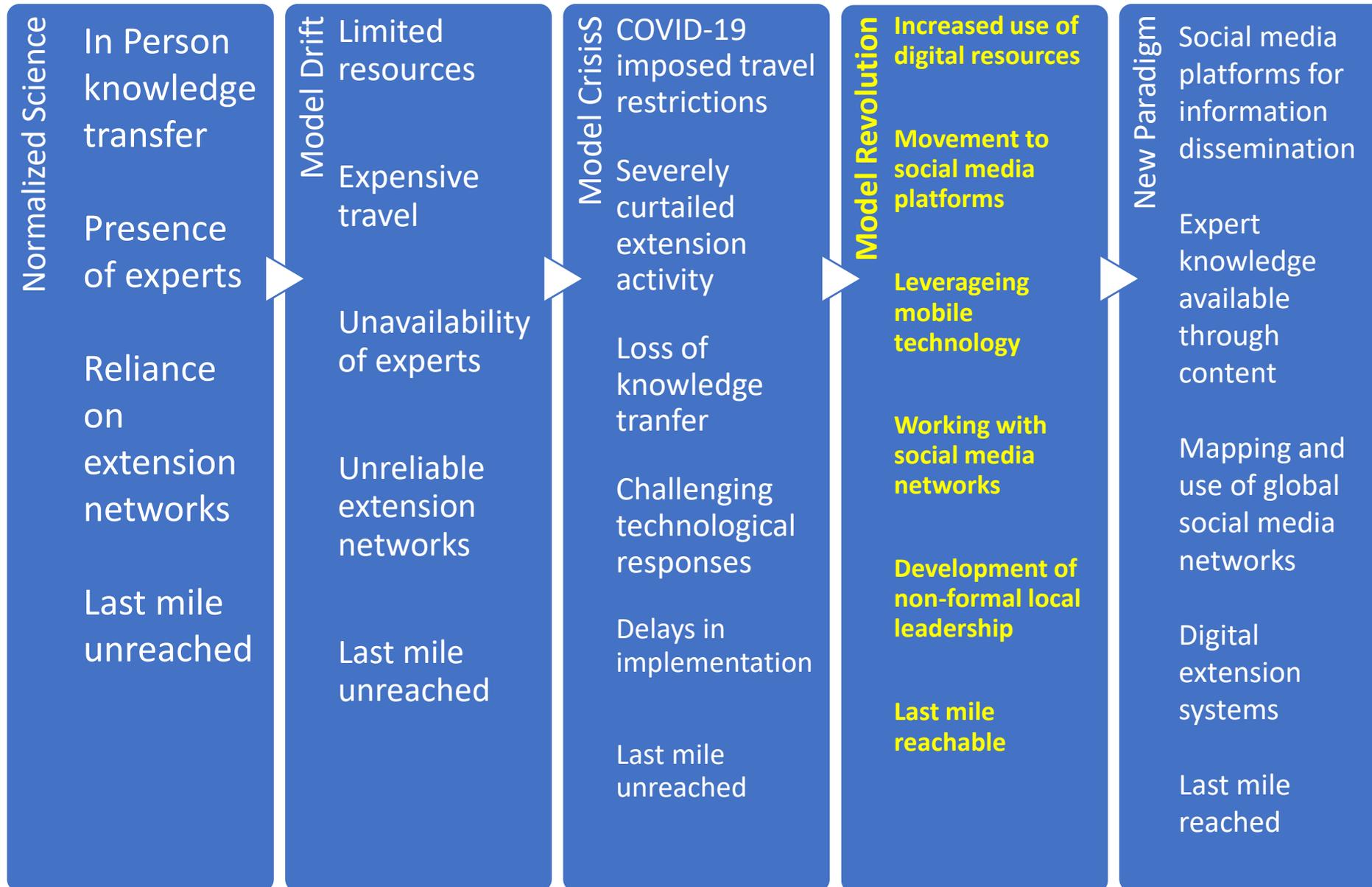
Demand

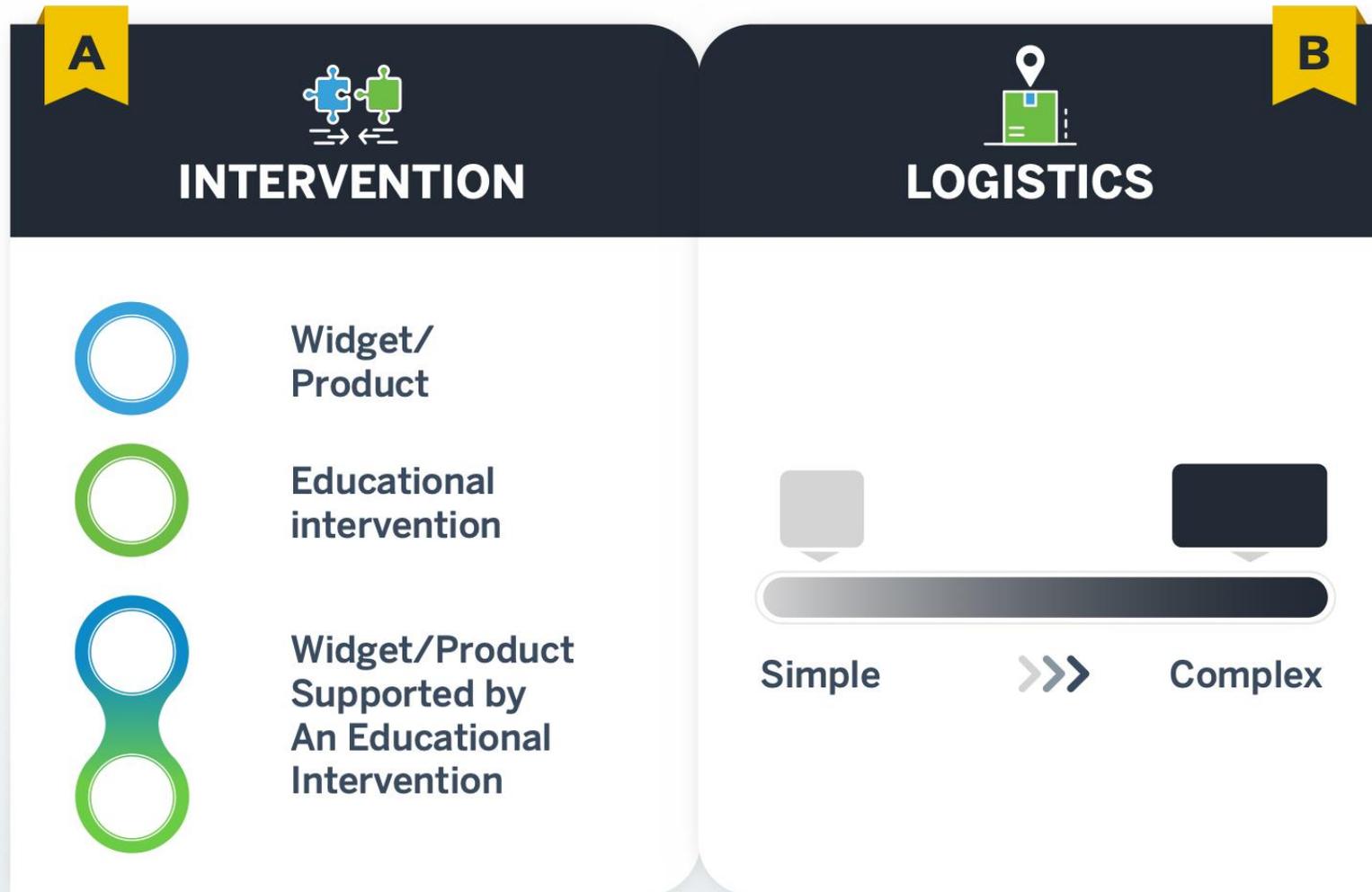
Policy/Finance

# Thomas Kuhn: The Structure of Scientific Revolutions

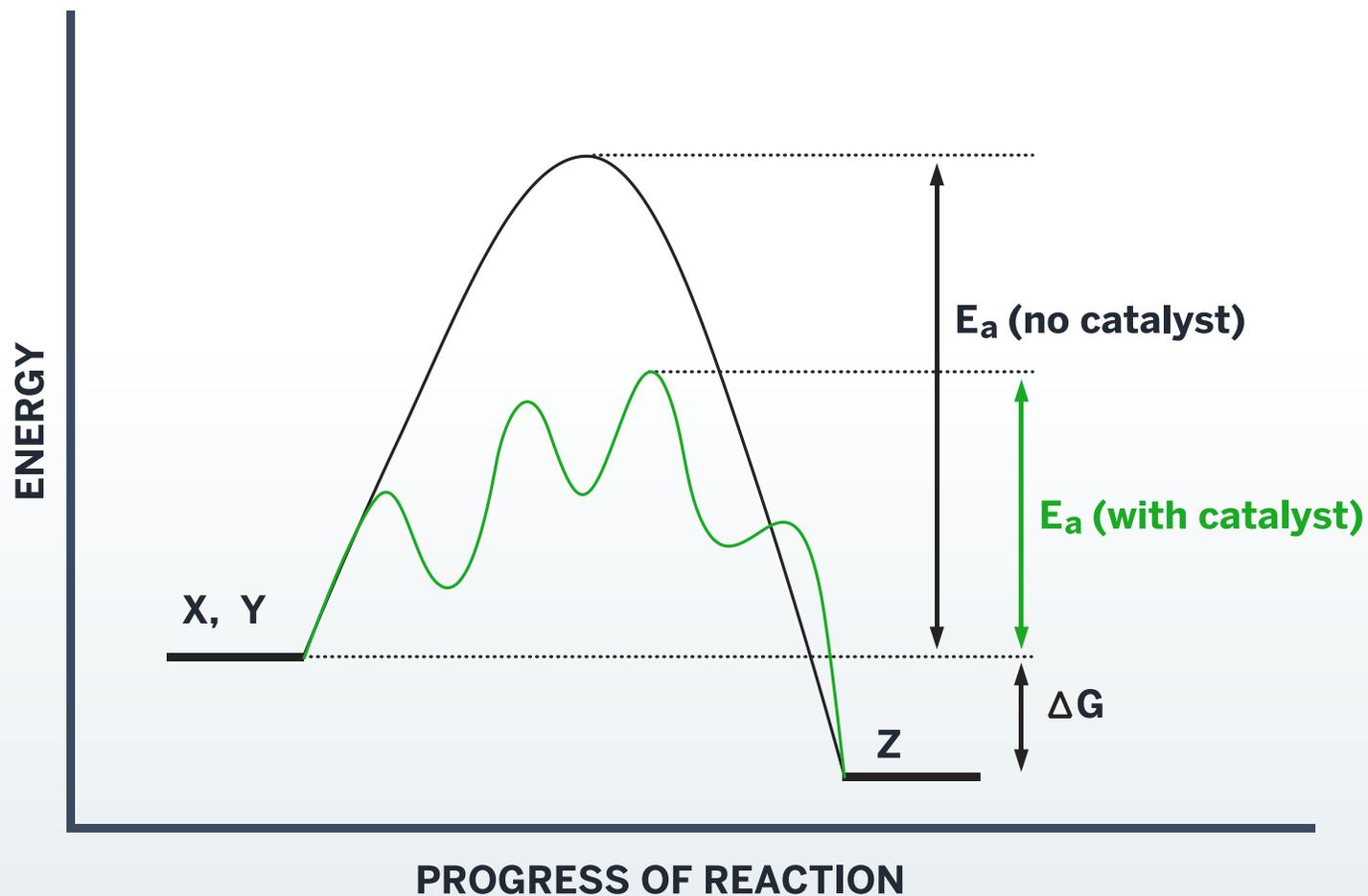


# The Emerging Development Revolution





Bello-Bravo, J., A. Lutomia, J. Medendorp, & B. Pittendrigh. Failing Forward: A Systems Approach to International Development. Forthcoming.



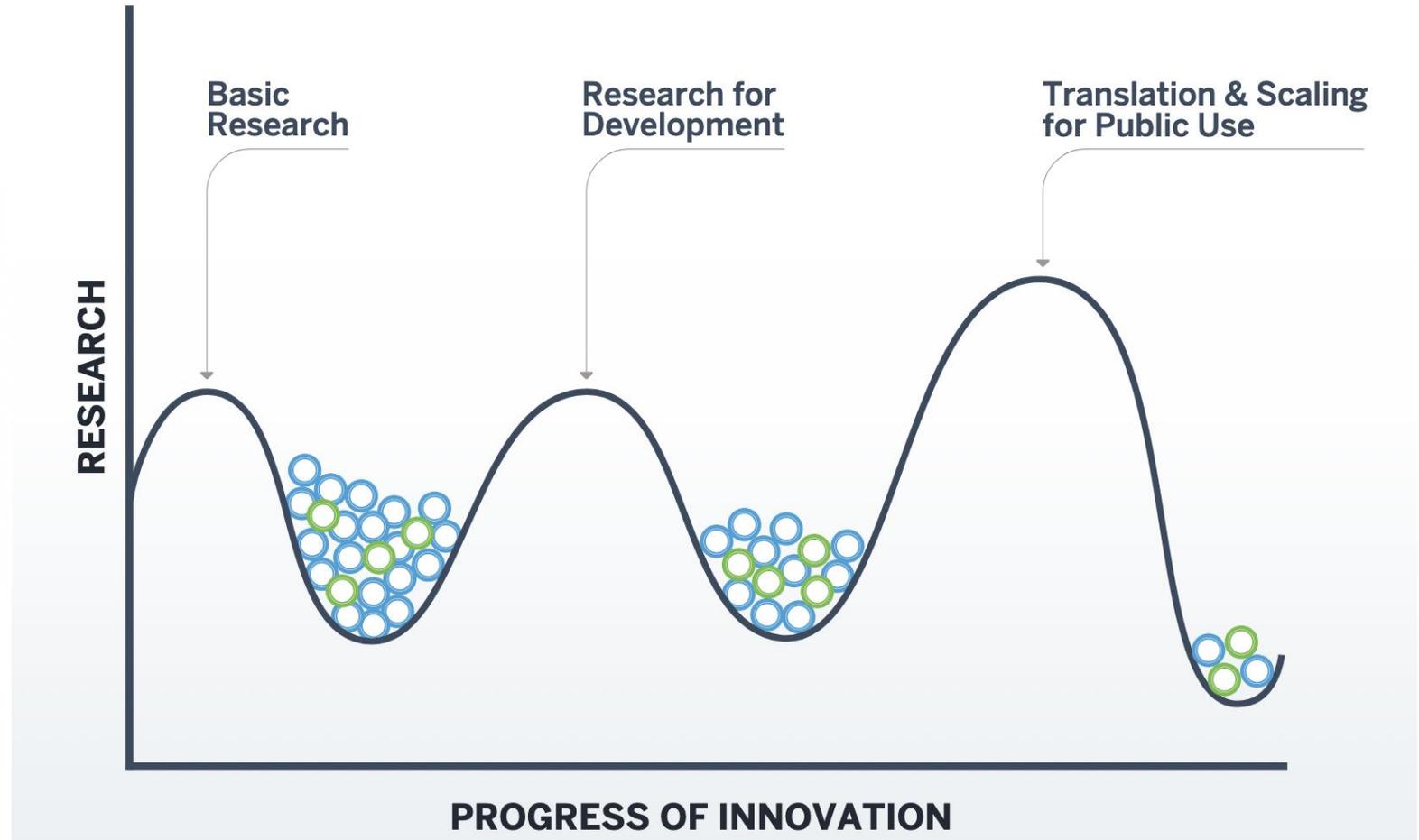
Bello-Bravo, J., A. Lutomia, J. Medendorp, & B. Pittendrigh. Failing Forward: A Systems Approach to International Development. Forthcoming.

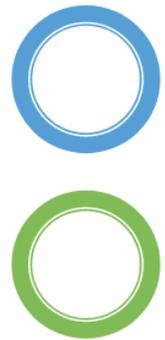


Widget/  
Product



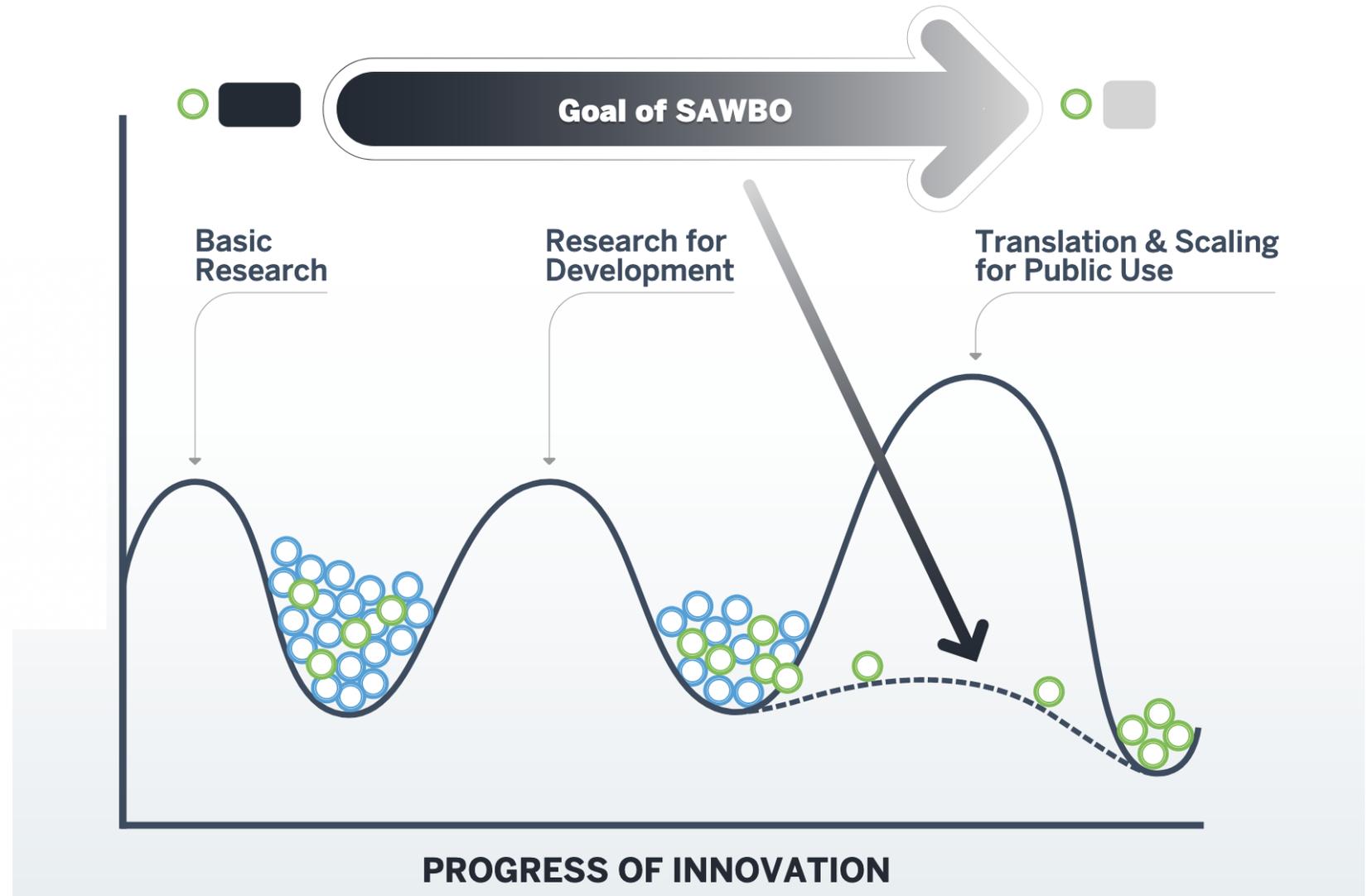
Educational  
intervention

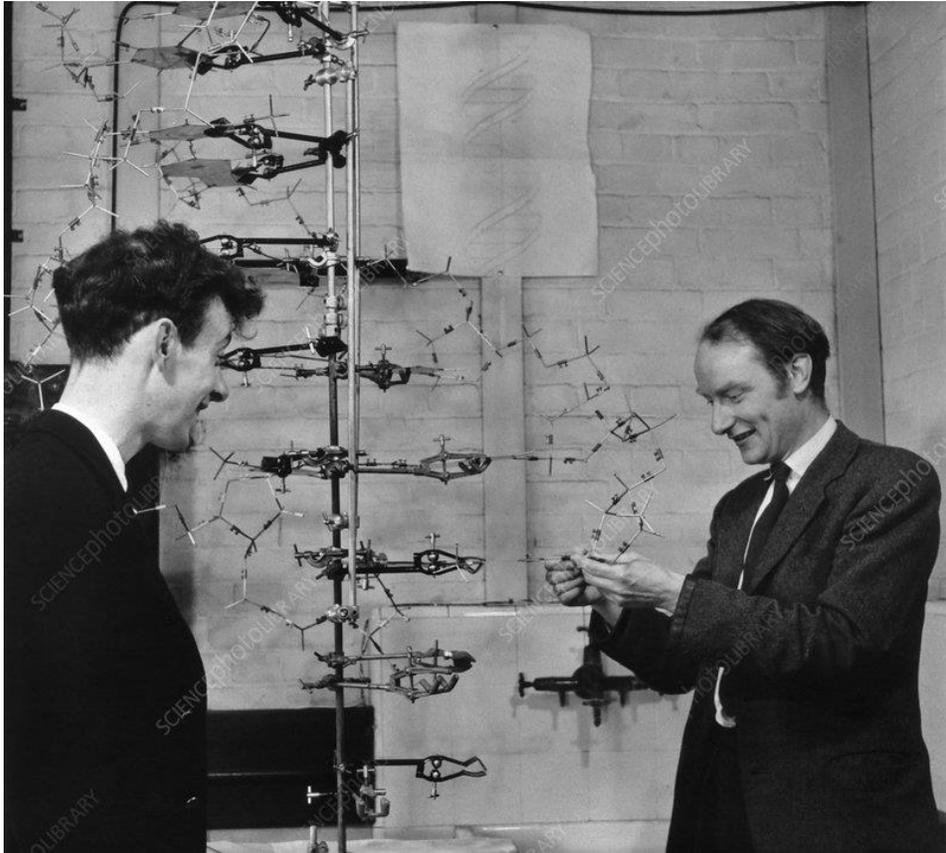




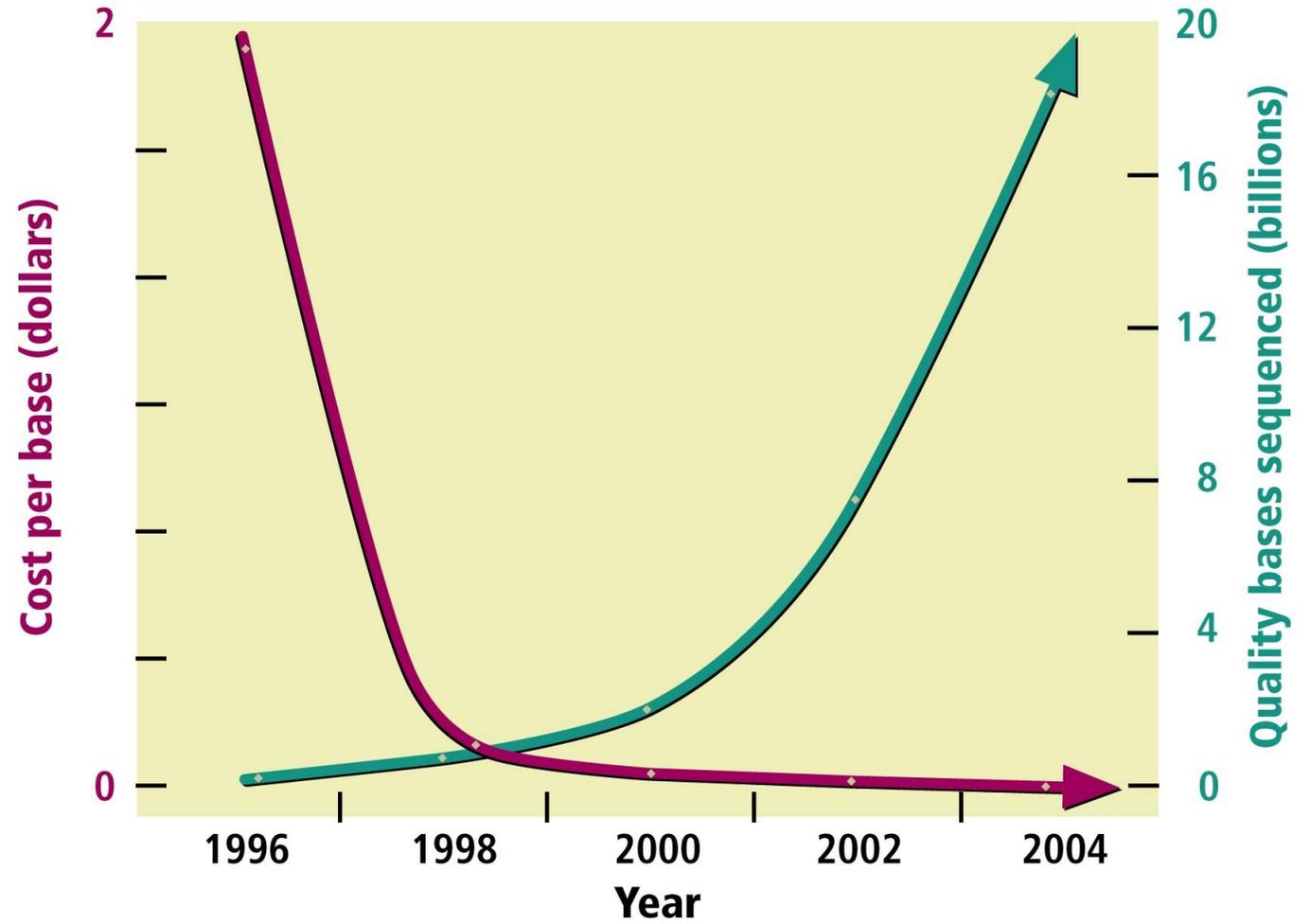
Widget/  
Product

Educational  
intervention





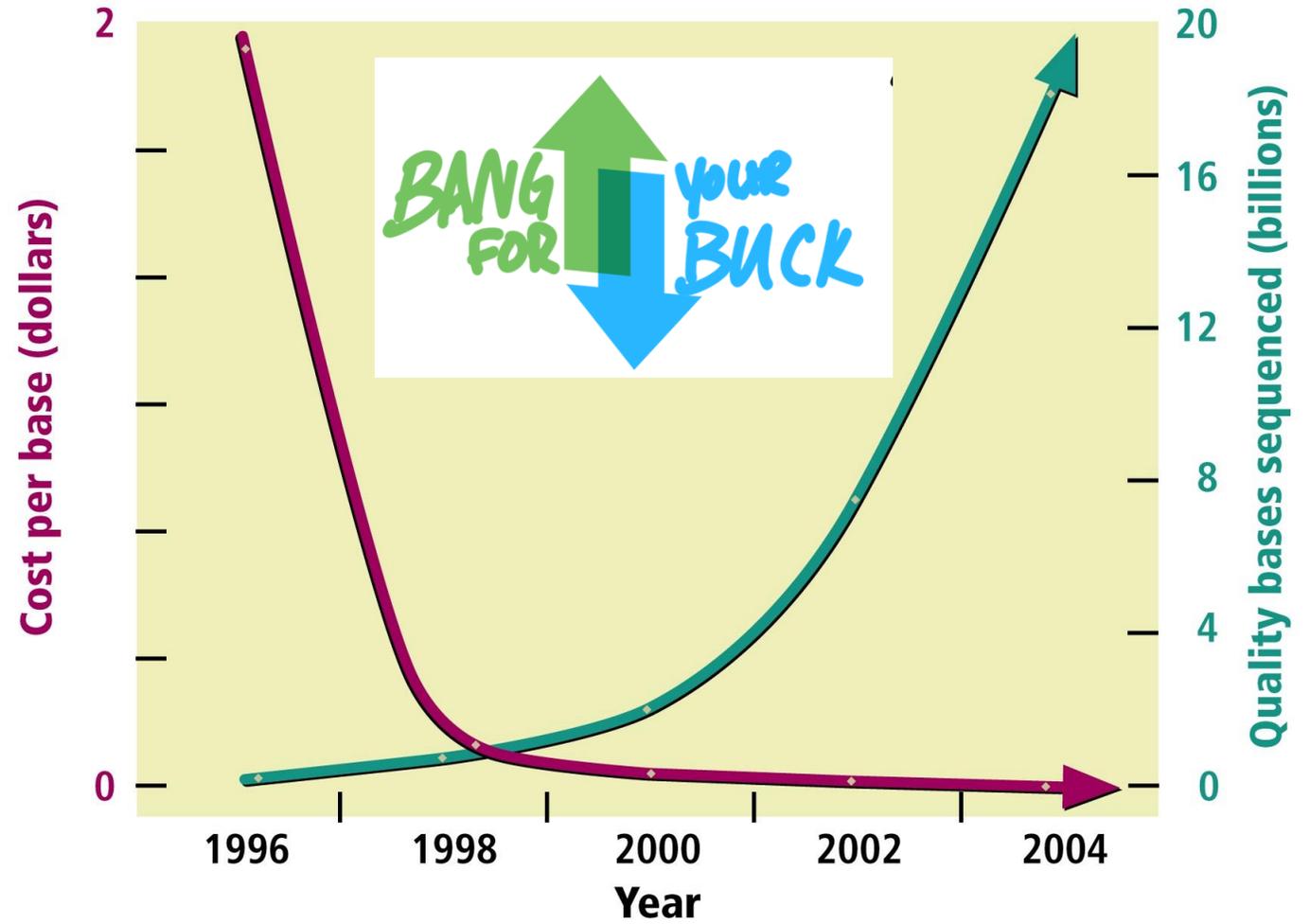
<https://www.sciencephoto.com/media/222785/view/crick-watson-with-their-dna-model-in-1953>



[https://web.ornl.gov/sci/techresources/Human\\_Genome/project/whydoe.shtml](https://web.ornl.gov/sci/techresources/Human_Genome/project/whydoe.shtml)

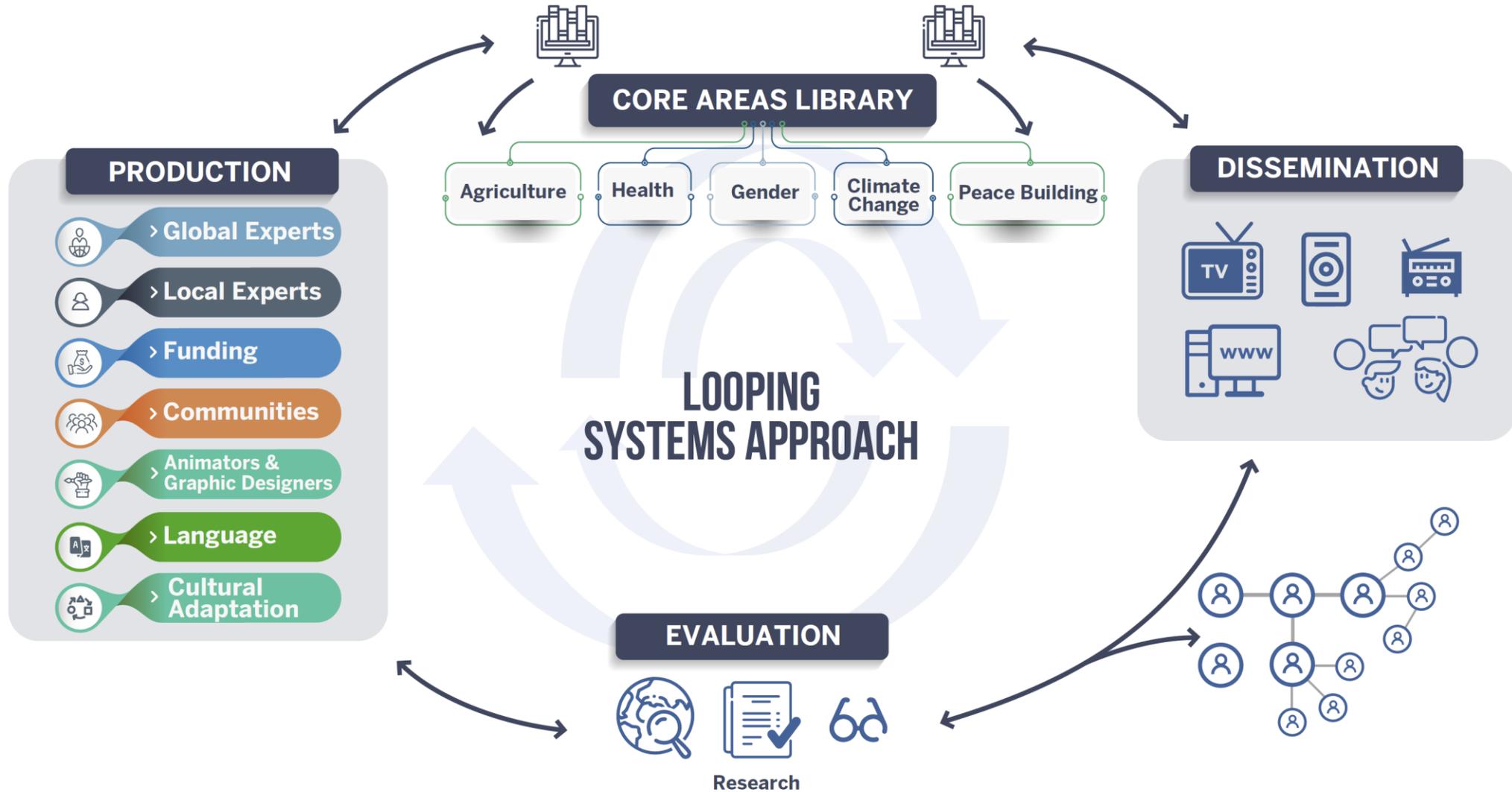


<https://www.sciencephoto.com/media/222785/view/crick-watson-with-their-dna-model-in-1953>



[https://web.ornl.gov/sci/techresources/Human\\_Genome/project/whydoe.shtml](https://web.ornl.gov/sci/techresources/Human_Genome/project/whydoe.shtml)

# SAWBO'S SYSTEMS APPROACH



# Scientific Animations Without Borders

- Systems Approach for Research and Scaling for Extension/Outreach globally
- 140+ topic areas in a total of over 260 languages
- Content used in over 130 countries globally
- Over 50 million people touched (documented) (including 17 million on YouTube)
- Recently Funded 1.6 million dollar COVID grant
- Collaborations with USAID, FAO, The World Food Programme, the W.H.O. – plus over 100+ other knowledge partner groups – SAWBO creates - “they scale” – SAWBO researches scaling outcomes
- Extension data results in “big data” – Machine learning tools (research) to optimize scaled education programs

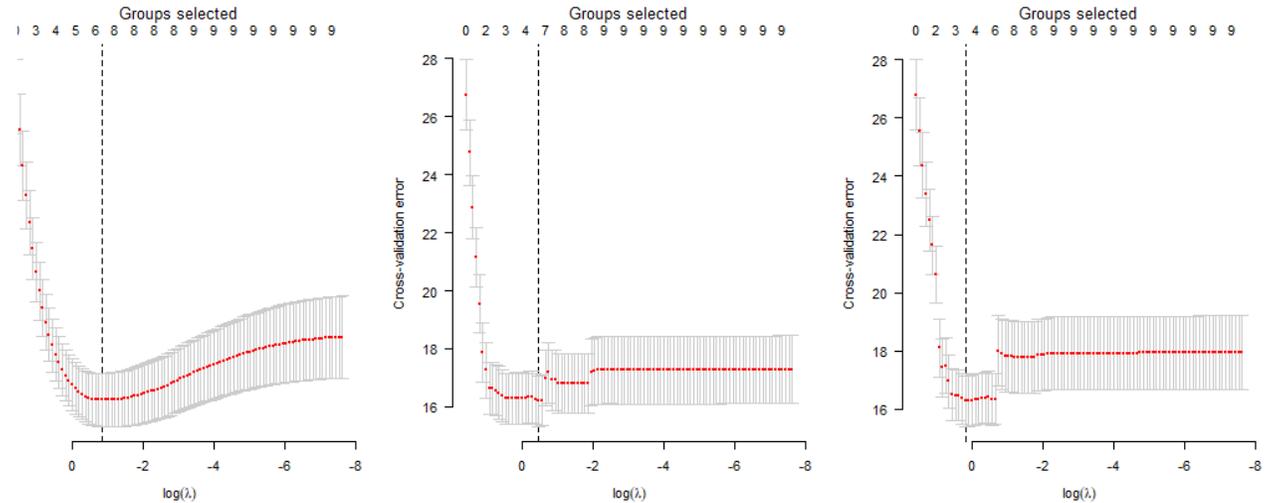
Table 1. Descriptive statistics of the 1070 training sessions<sup>b</sup>

Characteristics	N (%)
Trainer that conducted sessions	
Gender (Female)	104 (9.7)
Years of education <sup>a</sup>	8 (2.5, 2 - 16)
Total number of trained persons <sup>a</sup>	123 (103.7, 15 - 600)
Total number of trained women <sup>a</sup>	23 (25.8, 0-150)
HUB	
Dinajpur	529 (49.4)
Faridpur	203 (19.0)
Jashore	295 (27.6)
Rajshahi	43 (4.0)
Month	
October	135 (12.6)
November	299 (27.9)
December	391 (36.5)
January	245 (22.9)
Day of the week	
Sunday	154 (14.4)
Monday	143 (13.4)
Tuesday	137 (12.8)
Wednesday	147 (13.7)
Thursday	155 (14.5)
Friday	167 (15.6)
Saturday	167 (15.6)
Time of day <sup>a</sup>	3:00 PM (5.4, 7 AM – 10:30 PM)
7 AM – 11 AM	307 (28.7)
11:01 AM – 3:30 PM	240 (22.4)
3:31 PM – 6:00 PM	356 (33.3)
6:01 PM – 10:30 PM	167 (15.6)

<sup>a</sup> Mean (Standard deviation, Range)

<sup>b</sup> Ten sessions have the gender of the trainer missing

# Training session with 134,000 farmers in Bangladesh



# Penetration Study

	Ghana (n = 92) <sup>a</sup>	Kenya (n = 1463) <sup>a</sup>	Nigeria (n= 1574)
Is the SAWBO video the one that the person saw? (Yes)	67 (72.8)	1353 (92.5)	919 (68.7)
Do you understand how to use the jerrycan for storage? (Yes)	76 (83.0)	1352 (92.0) <sup>b</sup>	1020 (64.9)
Can you explain the technique to another person? (Yes)	73 (79.0)	1285 (88.0)	1029 (65.4)
Have you used the technique after you watched the video? (Yes)	23 (25.0)	738 (50.0)	768 (48.8)

<sup>a</sup> Only among those who said that did watch any video on the jerrycan technique

<sup>b</sup> The answer “No” includes “No” or “Not so sure”

# Dramatic Results

## In Ghana

- it cost between \$0.08-1.10 to have one person watch 100% of video.
- it cost between \$0.06-0.89 to have one person watch 75% of video.
- it cost between \$0.04-0.68 to have one person watch 50% of video.
- it cost between \$0.03-0.39 to have one person watch 25% of video.

## In Nigeria

- it cost between \$0.36-1.79 to have one person watch 100% of video.
- it cost between \$0.19-1.79 to have one person watch 75% of video.
- it cost between \$0.14-1.23 to have one person watch 50% of video.
- it cost between \$0.08-0.67 to have one person watch 25% of video.

## In Kenya

- it cost between \$0.11-1.69 to have one person watch 100% of video.
- it cost between \$0.08-1.22 to have one person watch 75% of video.
- it cost between \$0.06-0.85 to have one person watch 50% of video.
- it cost between \$0.04-0.45 to have one person watch 25% of video.

A group of women are walking away from the camera on a dirt path in a rural, green landscape. Each woman is carrying a large yellow jerrycan (water container) balanced on her head. They are wearing colorful, patterned clothing. The background shows tall trees and a clear blue sky.

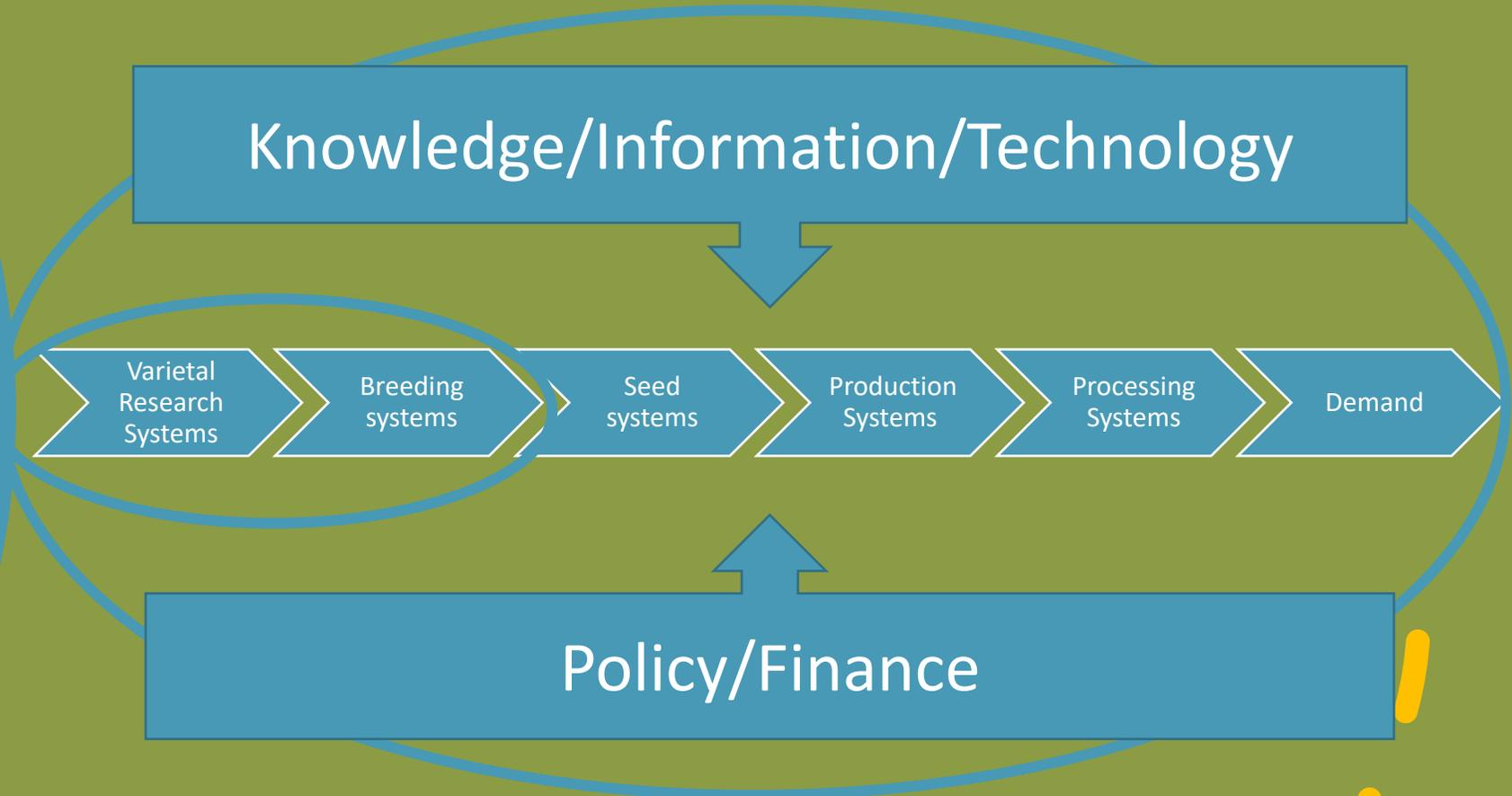
## Doing a little math ...

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- Approximately 40 lbs of beans in a jerrycan (20 liter container)
- Approximately 62,720 calories
- 30% of 62,720 = 18,816
- $4,795,448 \times 18,816 = 90,231,149,568$  calories
- This will feed 206,007 people for one full year.

# MSPs

Phase II



Knowledge/Information/Technology

Varietal Research Systems

Breeding systems

Seed systems

Production Systems

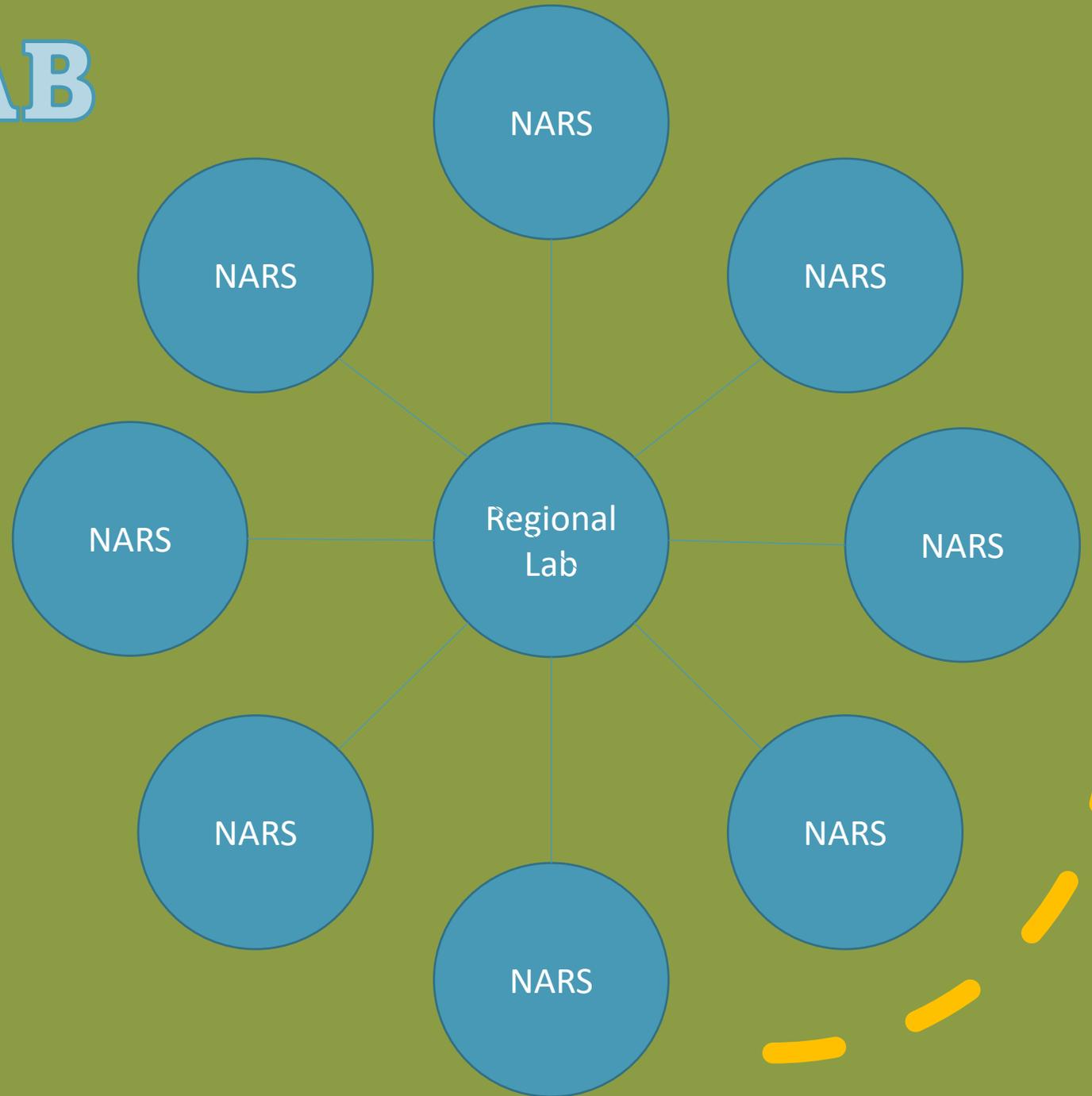
Processing Systems

Demand

Policy/Finance

# MAB

Phase II



# Innovation Lab for Legume Systems Research

The Scientific Animations without Borders (SAWBO) Responsive, Adaptive, Participatory Information Dissemination (RAPID) Scaling Program (hereafter SAWBO-RAPID), Cooperative Agreement No. 7200AA20LA00002, an Associate Award under 7200AA18LE00003 Feed the Future Innovation Lab for Legume Systems Research, was awarded to Michigan State University on May 18, 2020, for a one-year period, and then extended first to September 30, 2021, and then to December 31, 2021.



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

[www.feedthefuture.gov](http://www.feedthefuture.gov)



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