

# IITA GENE BANK Ibadan, Nigeria



## Germplasm maintained by IITA

**± 28 000 accessions**

### **SEED CROPS**

**Cowpea: 15122**

**Bambara ground nut: 1827**

**Vigna wild relatives: 1615**

**Soybean: 1754**

**African yam bean: 150**

**Various legumes: 600+**

**Maize: 876**

### **CLONAL CROPS**

**Cassava: 3078 +**

**Yam: 3087**

**Musa: 275**

# Manihot germplasm at IITA

## Field bank (80s)

-*Manihot esculenta*: 3078 accessions with passport data

## Arboretum (70s)

-*M. epruinosa* (17 plants)

-*M. leptophylla* (2 plants)

-*M. glaziovii* (5 plants)

## Seed bank (1993 and later)

-*M. epruinosa* (13 accessions)

-*M. flabellifolia* (1 accession)

-*M. mossamedensis* (2 accessions)

-*M. peruviana* (12 accessions)

-*M. violacea* (2 accessions)

-*M. caerulescens* (3 accessions)

# Manihot germplasm at IITA

2004

**Field bank (80s)**

**-*Manihot esculenta***



***In vitro* bank**

**Arboretum (70s)**

**-*M. epruinosa***

**-*M. leptophylla***

**-*M. glaziovii***



**Rejuvenation**

**Seed bank (1993 and later)**

**-*M. epruinosa***

**-*M. flabellifolia***

**-*M. mossamedensis***

**-*M. peruviana***

**-*M. violacea***

**-*M. caerulescens***



**Viability test,**

**Field regeneration**

**Identification**

***In vitro* introduction**

# Manihot germplasm at IITA

## Field bank (80s)

-*Manihot esculenta*



*In vitro* bank

2300 accessions

## Arboretum (70s)

-*M. epruinosa*

-*M. leptophylla*

-*M. glaziovii*



Rejuvenation

## Seed bank (1993 and later)

-*M. epruinosa*

-*M. flabellifolia*

-*M. mossamedensis*

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-*M. violacea*

-*M. caerulescens*



Viability test,

Field regeneration

Identification

*In vitro* introduction

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Rejuvenation

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Viability test,

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Viability test,

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Rejuvenation

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Viability test,

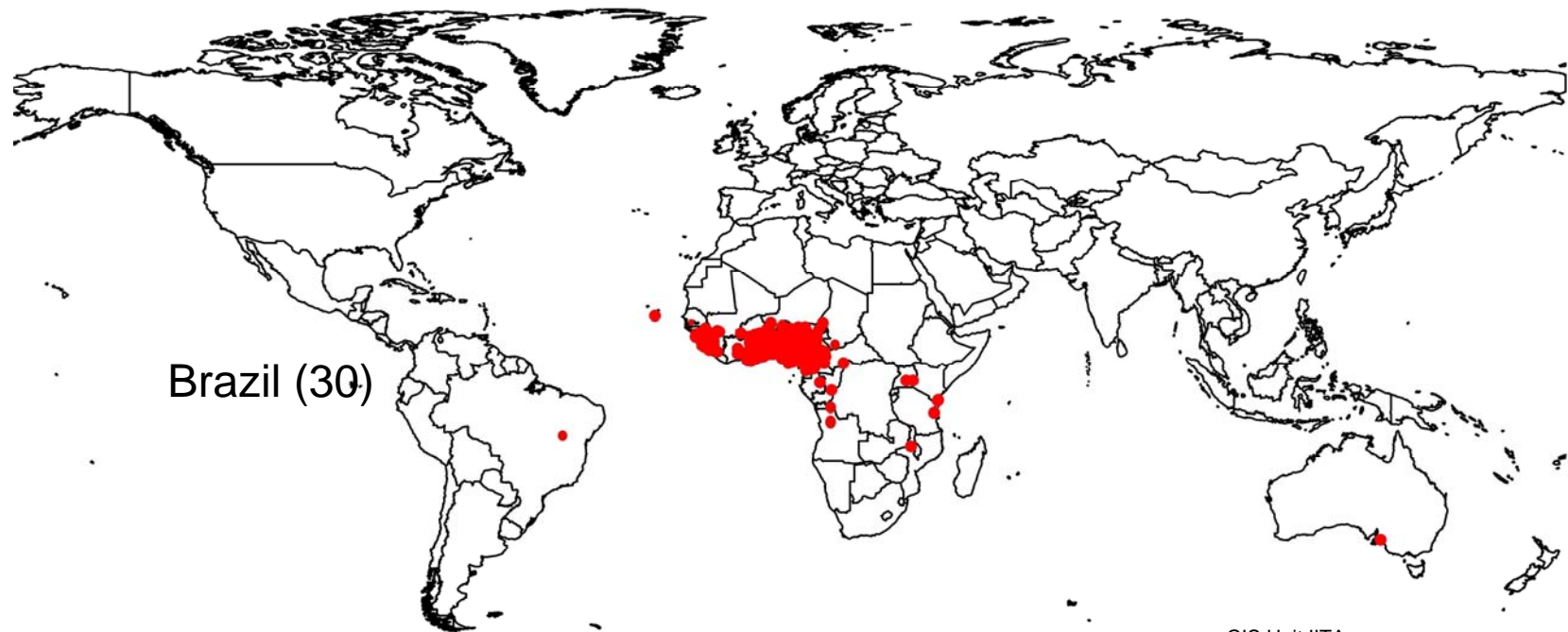
Field regeneration

Identification

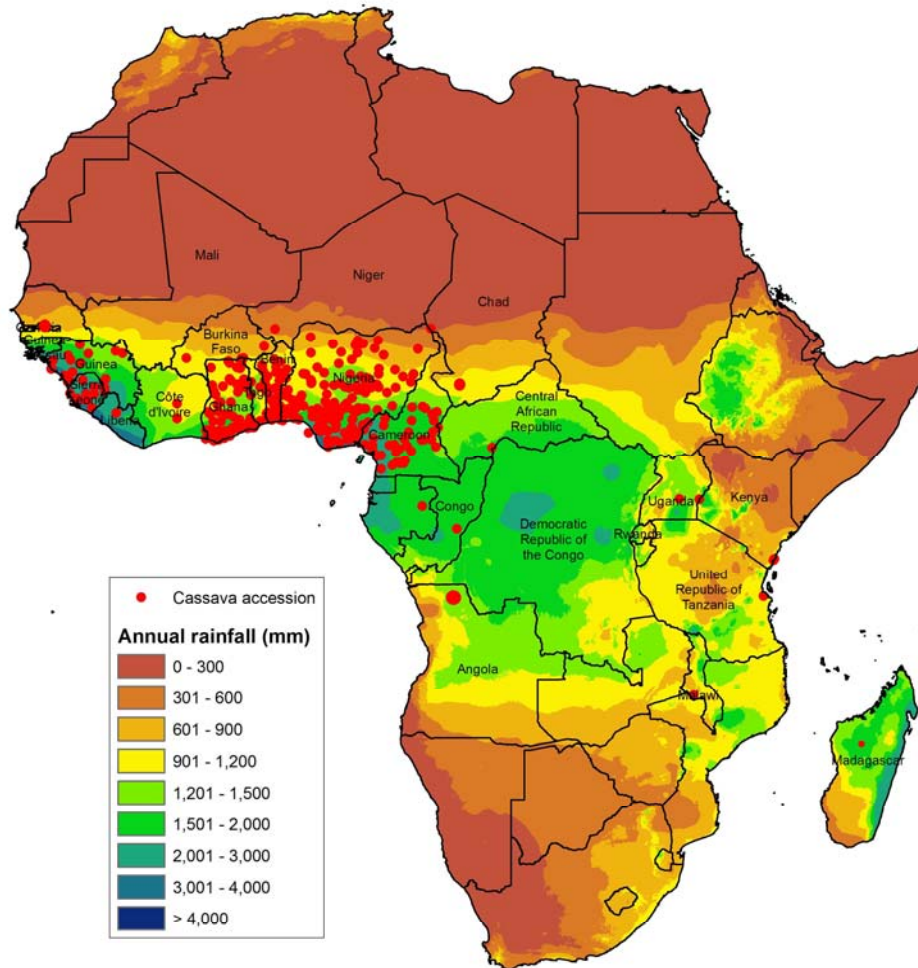
*In vitro* introduction



**3078 accessions with minimum passport  
In trust**

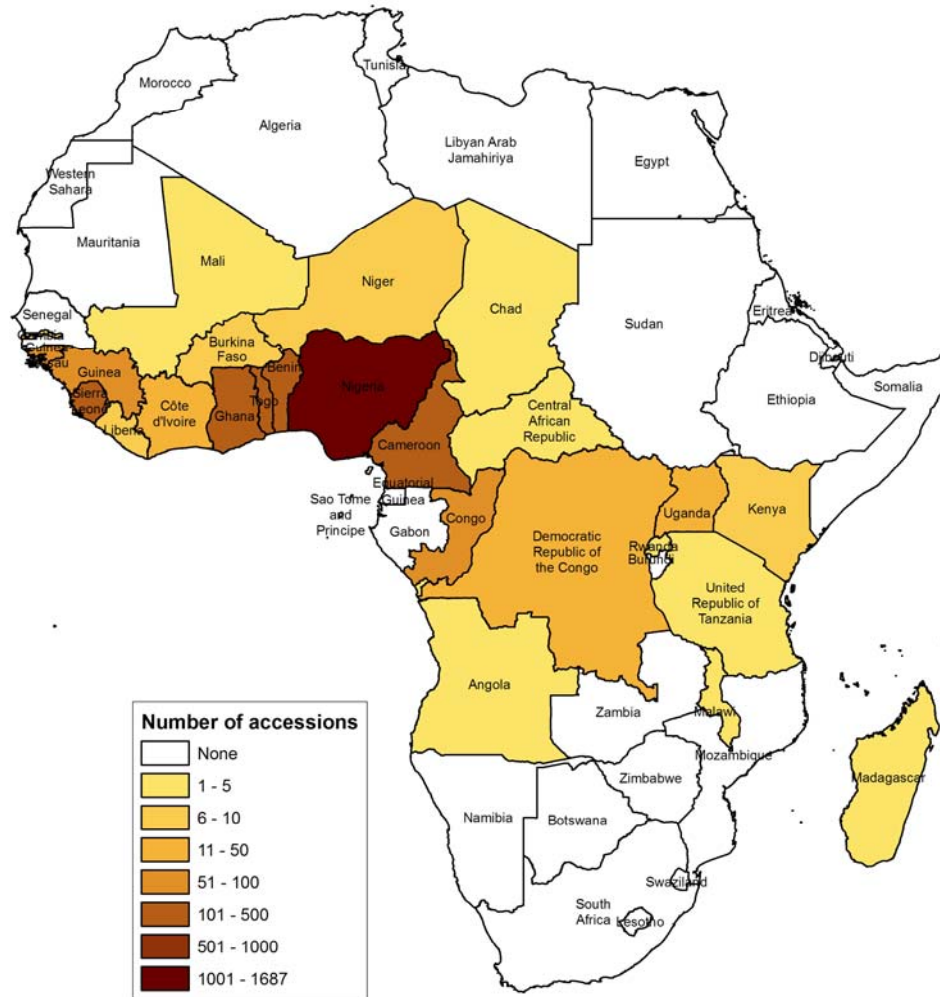


# Cassava germplasm origin



**40% of accessions  
with georeferences**

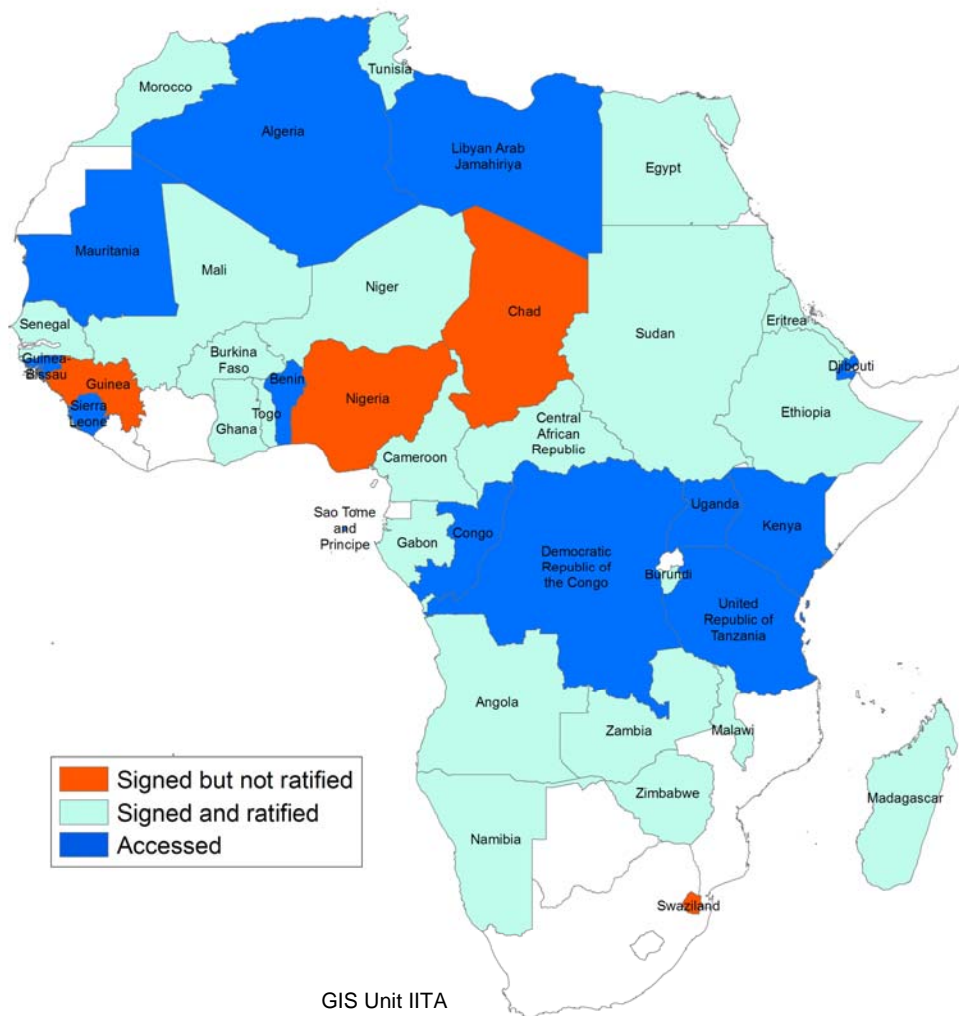
# Cassava germplasm



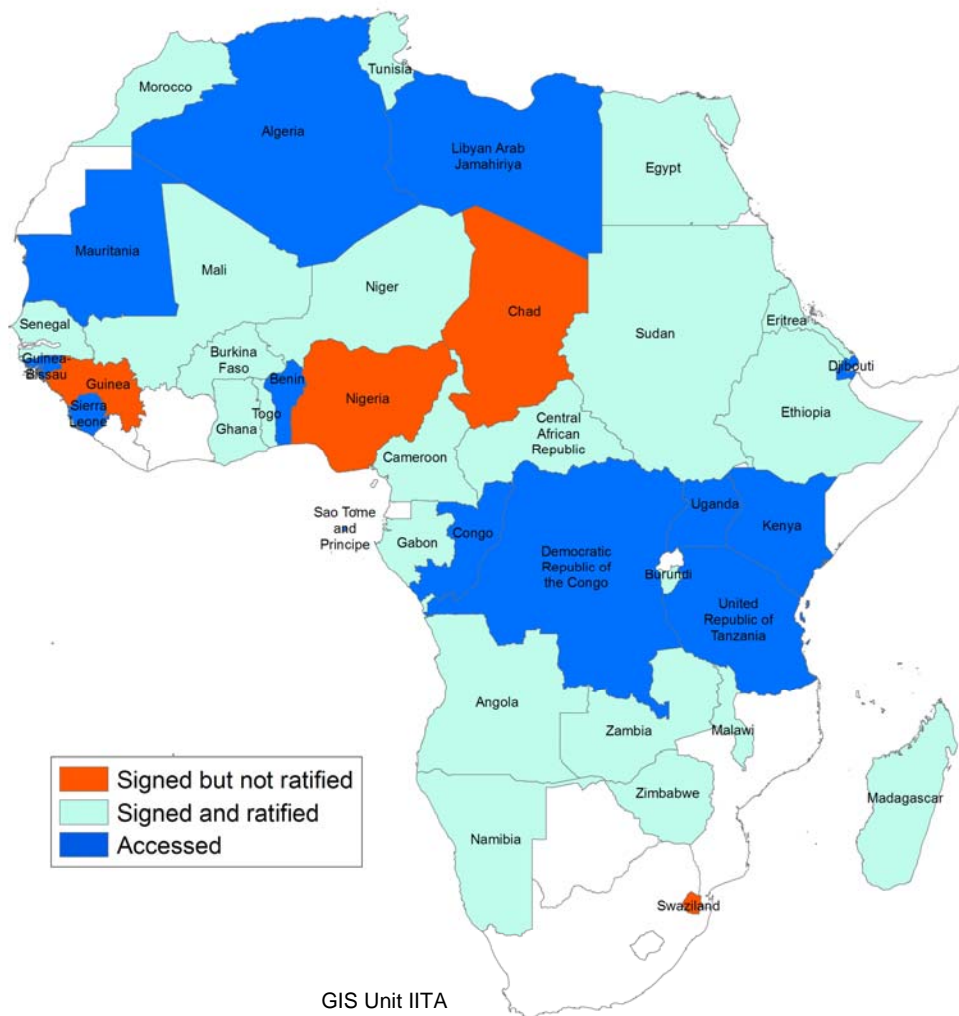
Obvious gaps:  
 Gabon  
 Mozambique...

Prospection/Acquisition?

## INTERNATIONAL TREATY PARTIES (FAO data April 08)



## INTERNATIONAL TREATY PARTIES (FAO data April 08)



Mozambique  
South Africa  
Cote d'Ivoire  
Liberia  
Burundi...

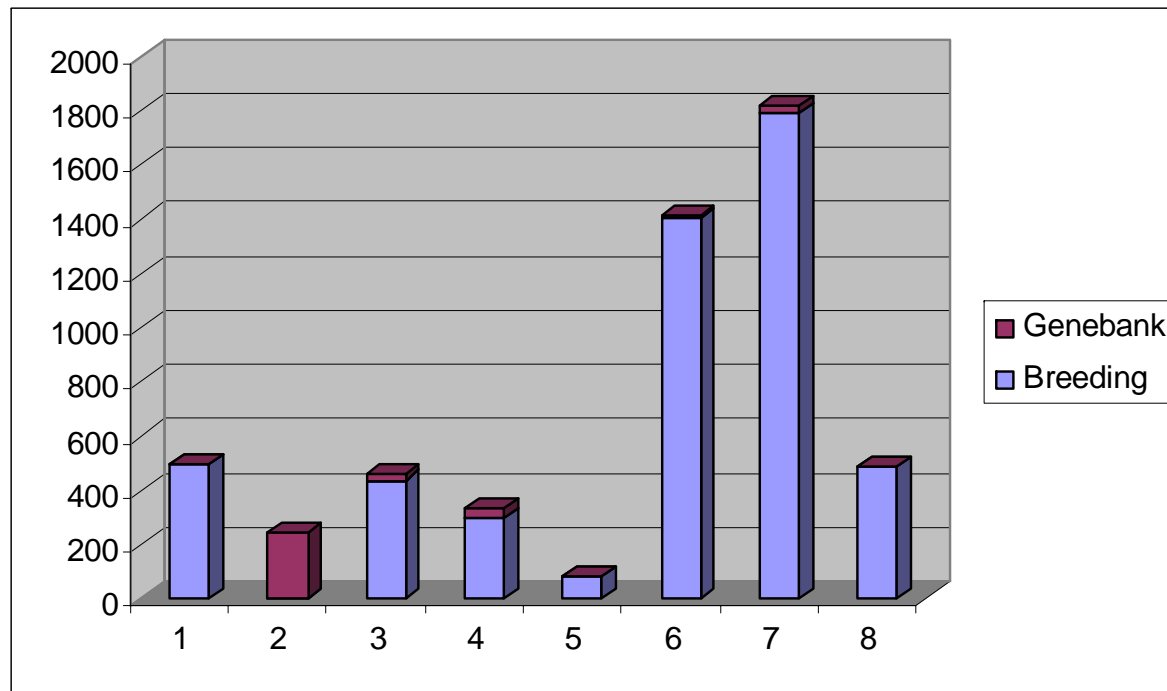
## Distribution Genebank and Breeders

**Distribution 2000-2007**

**TOTAL = 5389 accessions**

**Cuttings and seedlings 99%**

**Mainly *M. esculenta* / NARS + University**

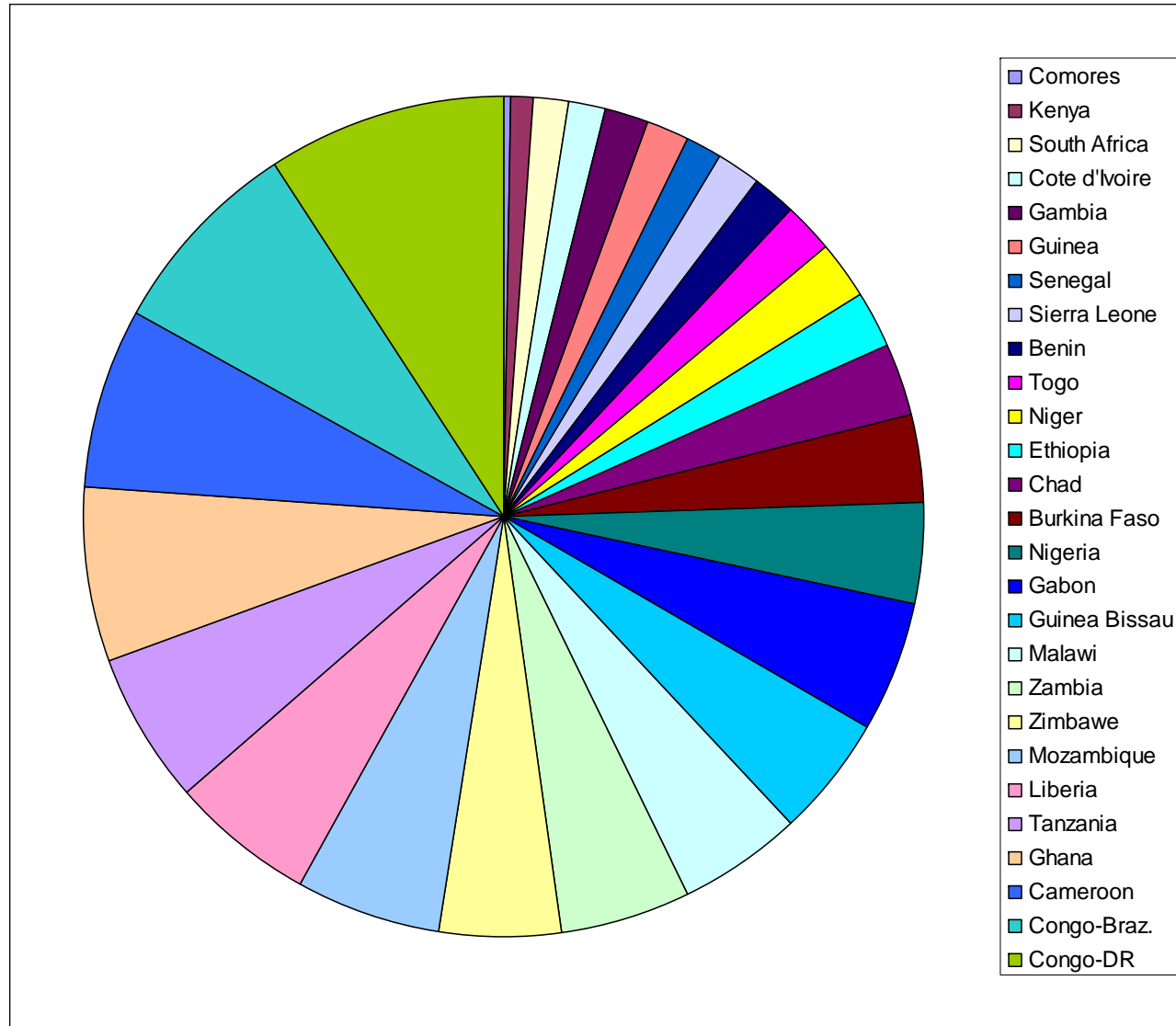


# Distribution per country

**95% in  
 Africa  
 27 countries**

**SMTA**  
 MTA

+  
 Japan  
 USA  
 Denmark  
 Austria



## Field bank



Ibadan  
2 ha plantation  
8 cuttings per accessions  
Regeneration every 2 years

## In vitro bank



Ibadan (Nigeria): 3 sub-culture rooms + 2 storage rooms  
Cotonou (Benin): 1 Storage room (safe duplication)  
Capacity of storage rooms: 30000 seedlings each

HR: 3 Supervisors + 10 Technicians + Casual workers

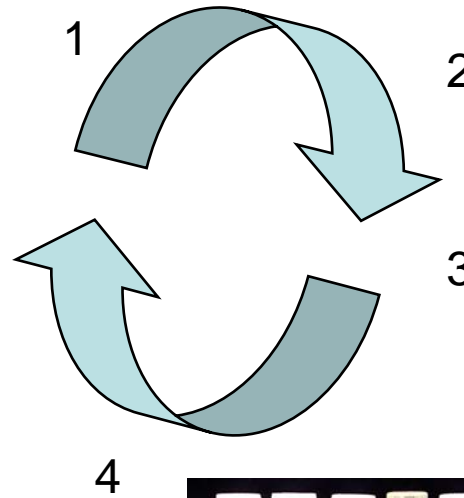


# In vitro banking

Germplasm preparation



Germplasm cleaning



Germplasm Storage  
(±16°C  
Light 12h)

Bar coding  
in progress



Germplasm culture



Germplasm excision

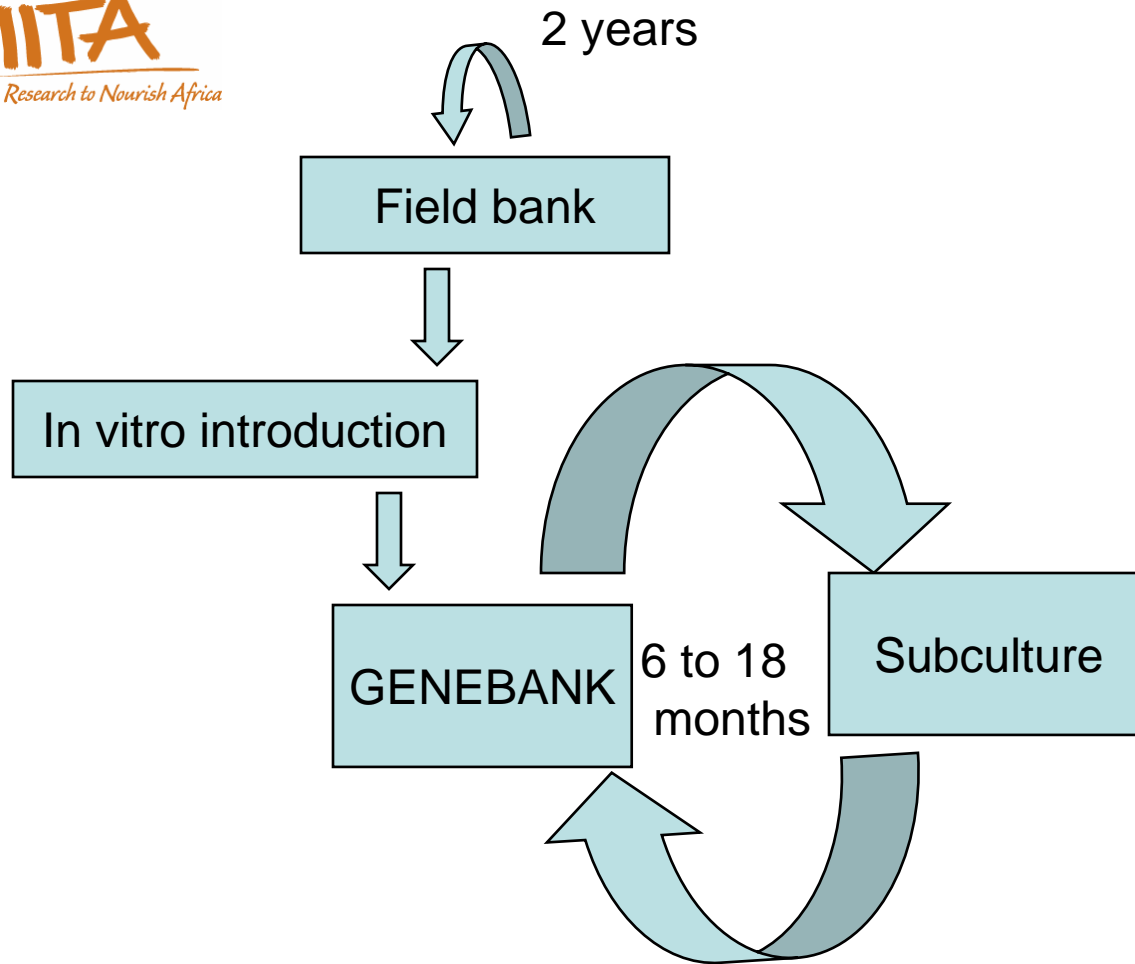
REGENERATION EVERY 6 to 18 MONTHS

- **Development phase**
  - 2 Cryopreservation approaches tested on 50 accessions
    - Vitrification
    - Encapsulation dehydration
  - Validation in progress

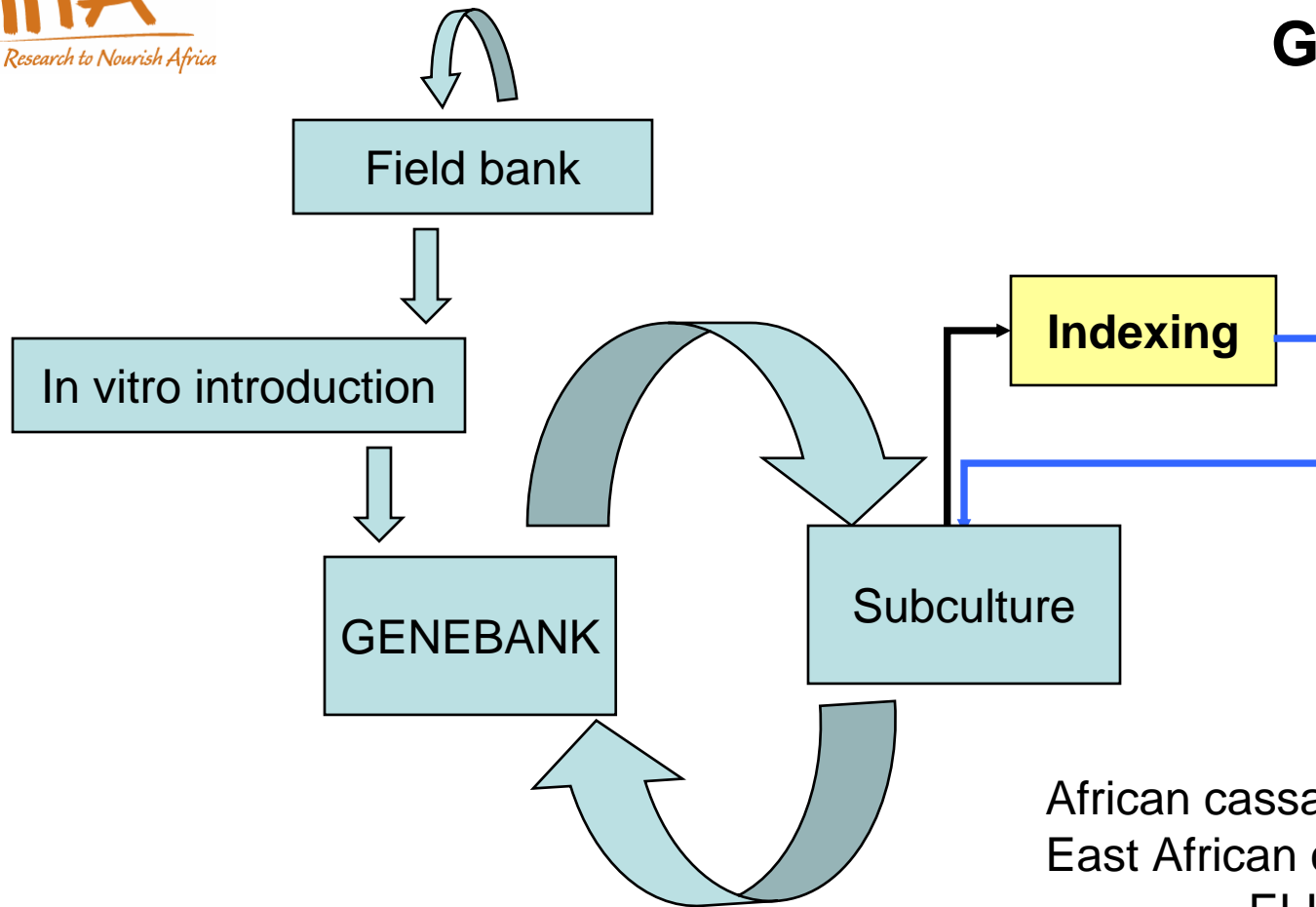


.....Cryobanking by December 2008

# Germplasm flow

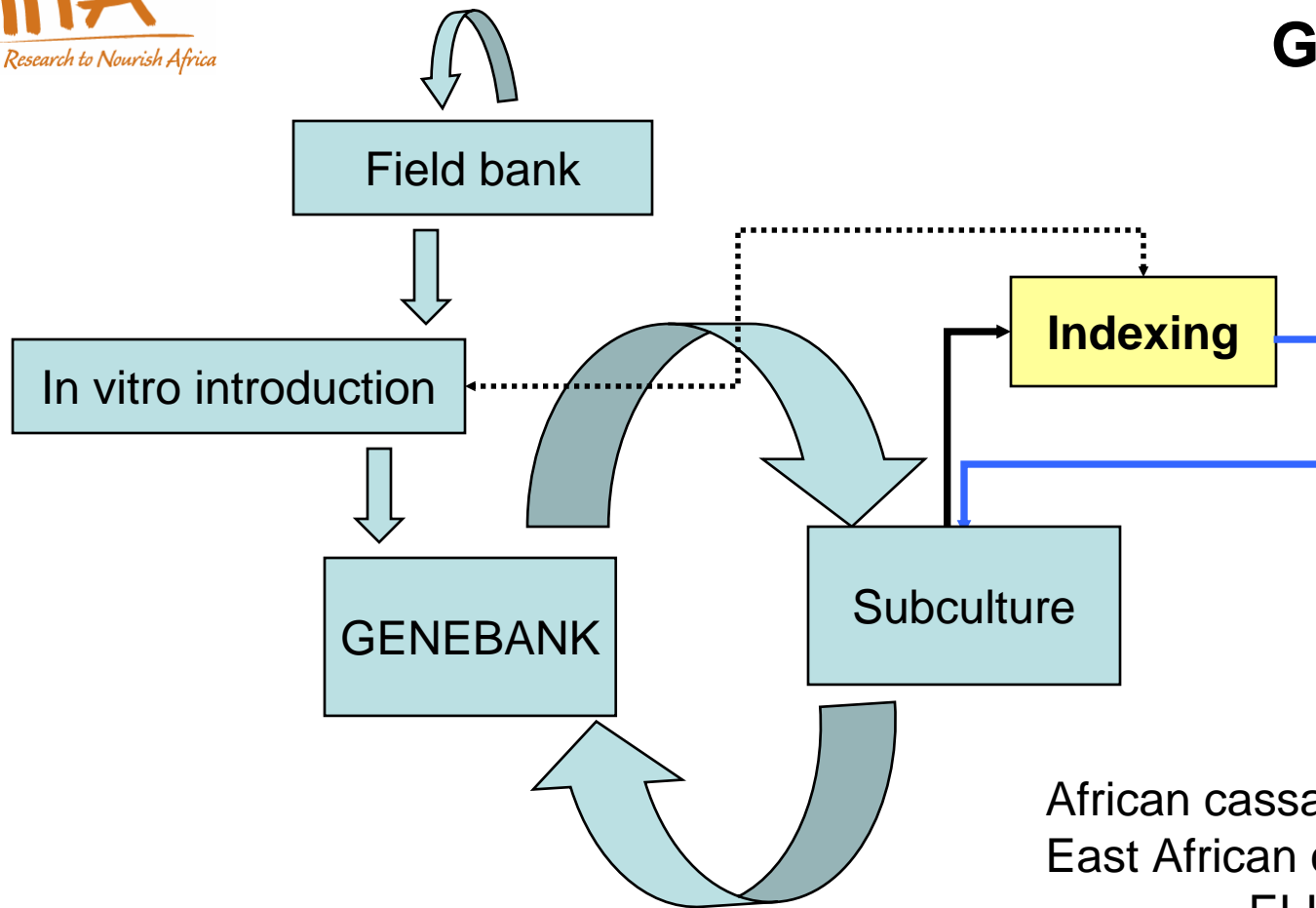


## Germplasm flow



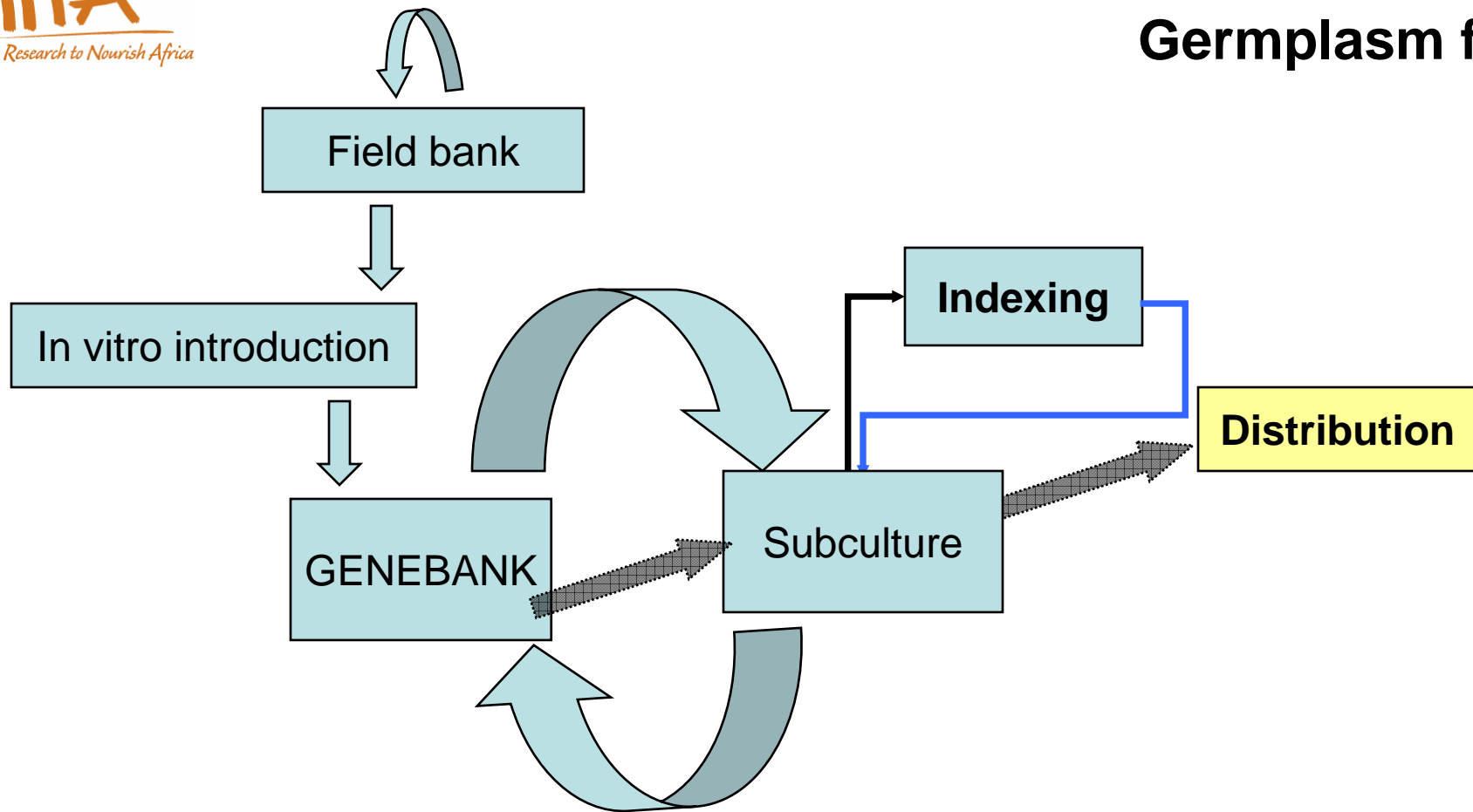
African cassava mosaic virus  
East African cassava mosaic virus  
-ELISA  
-PCR

## Germplasm flow

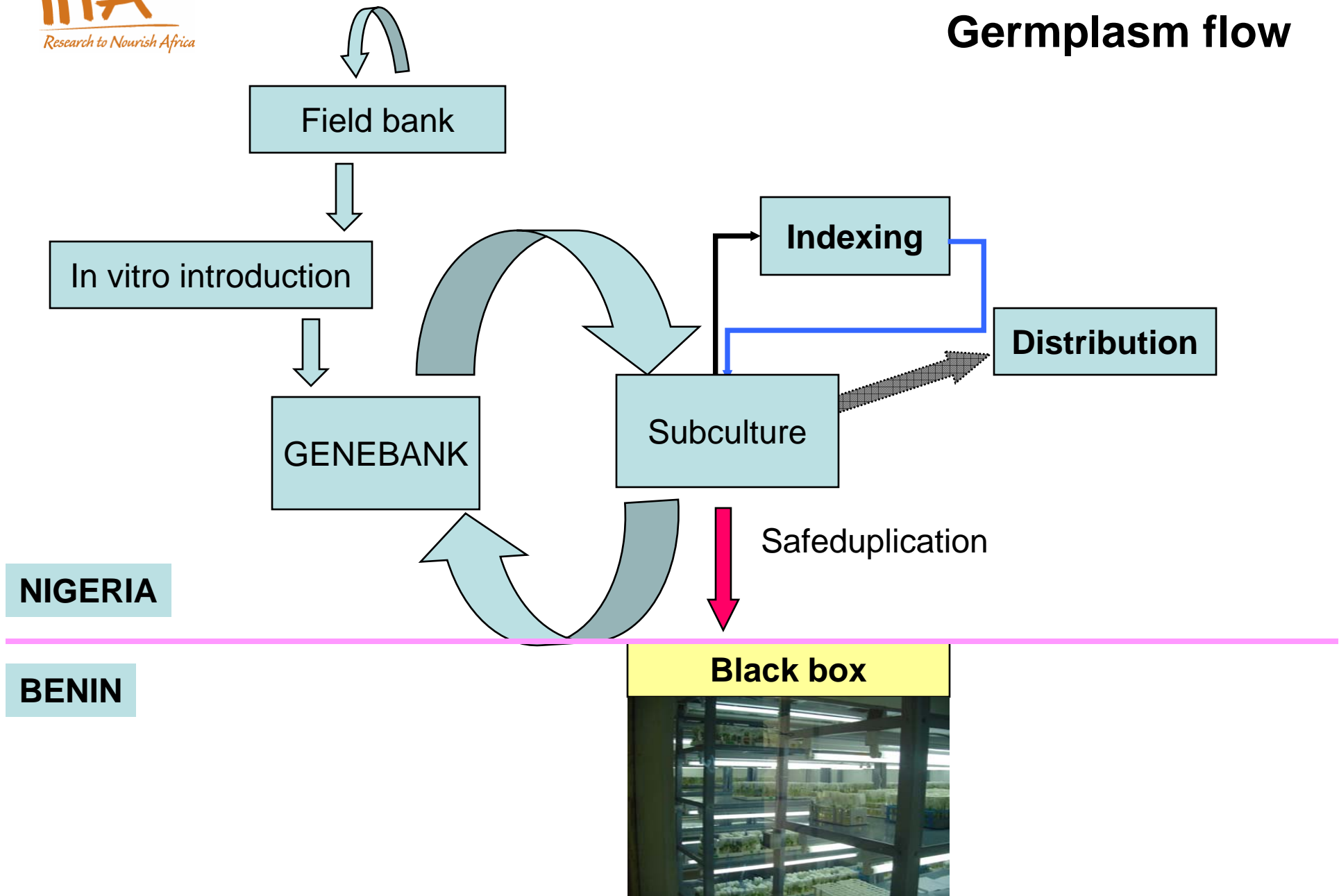


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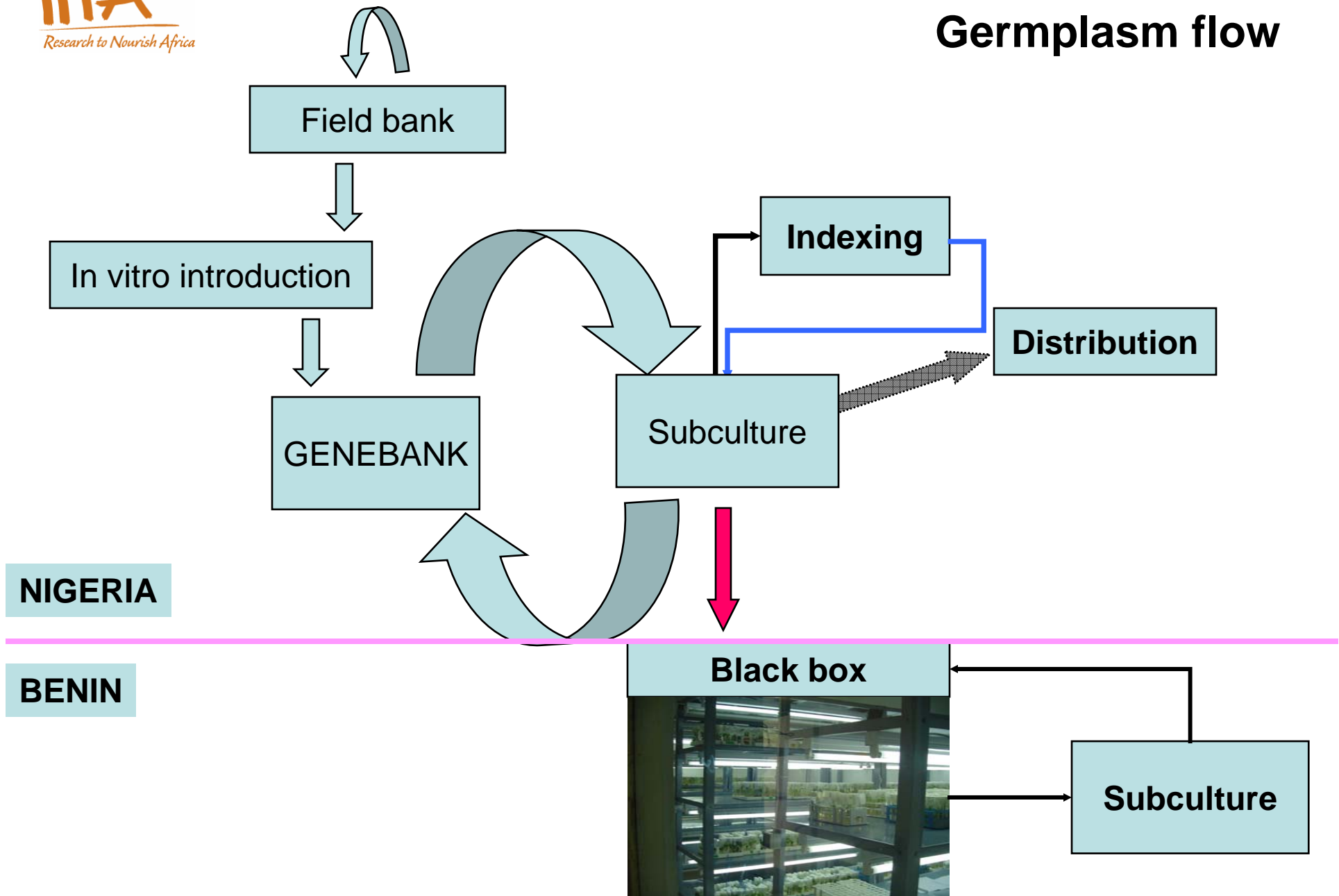
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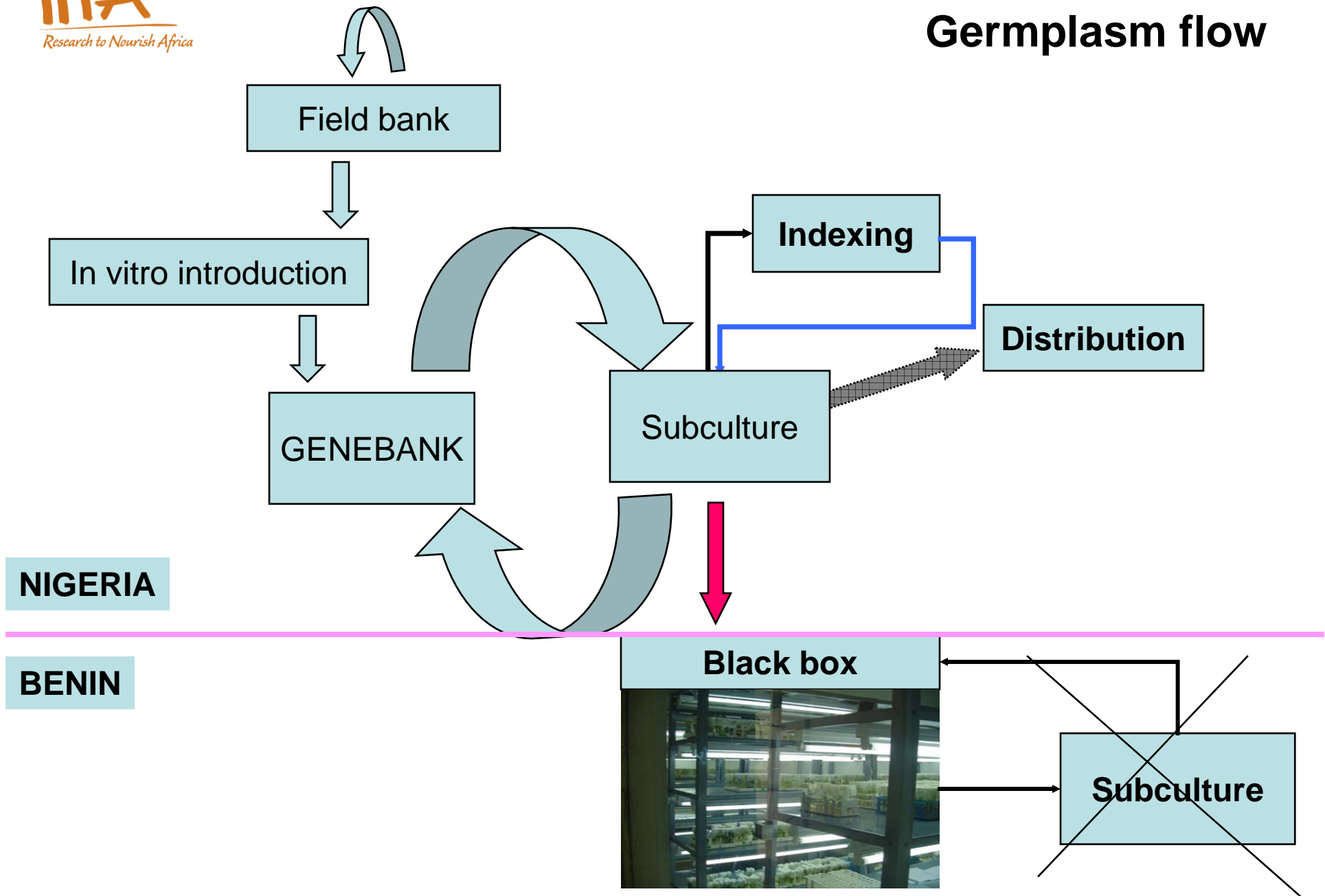


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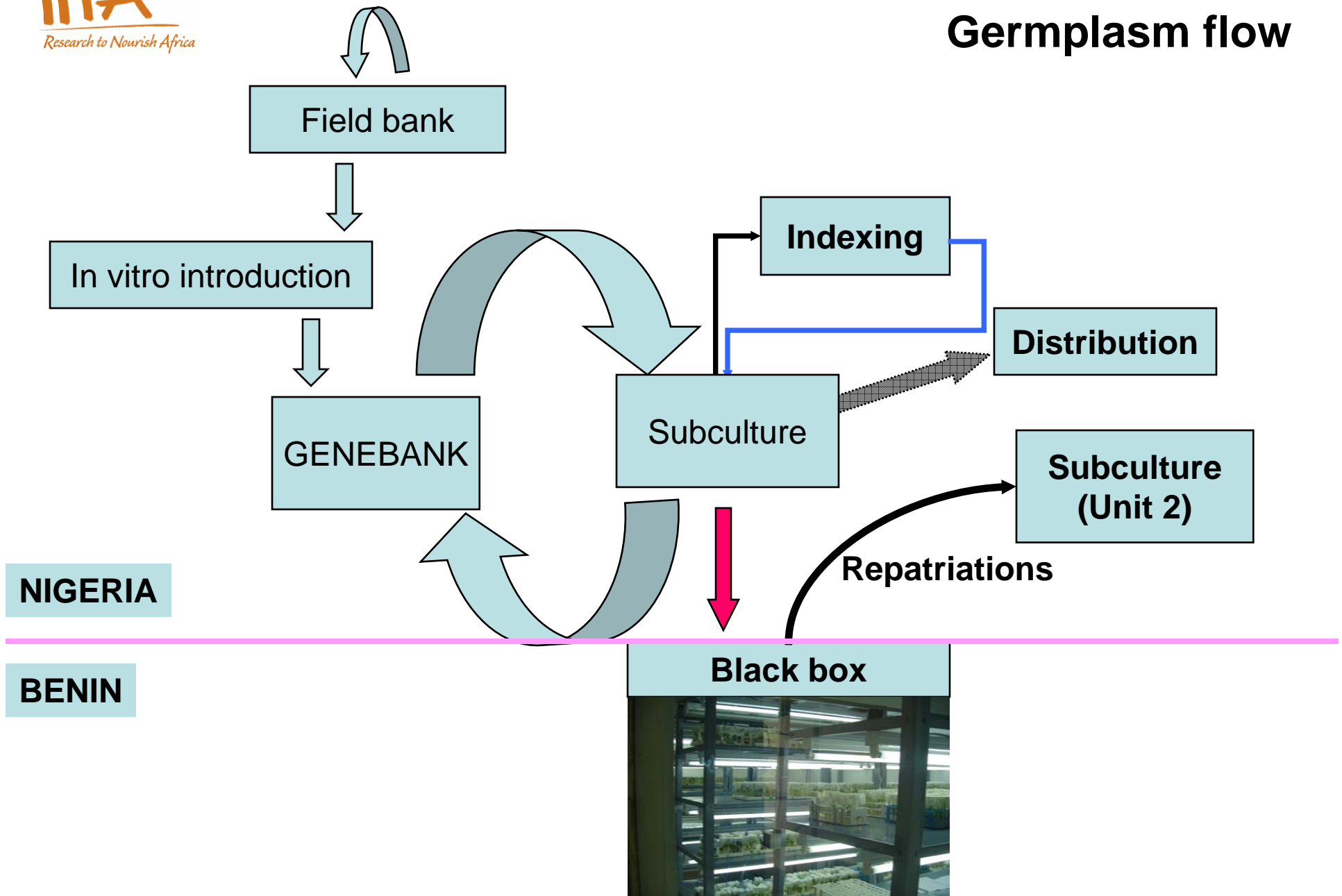




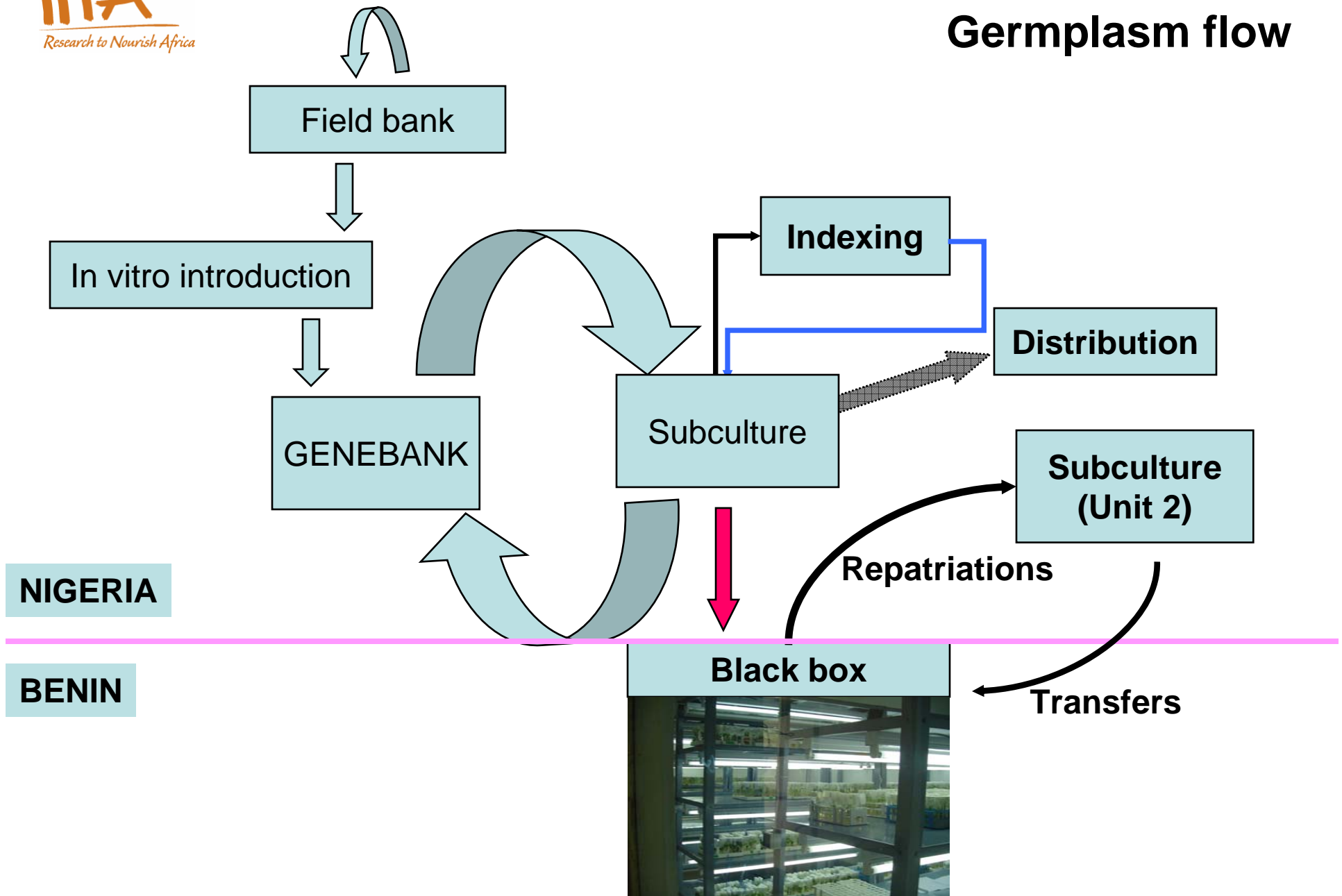
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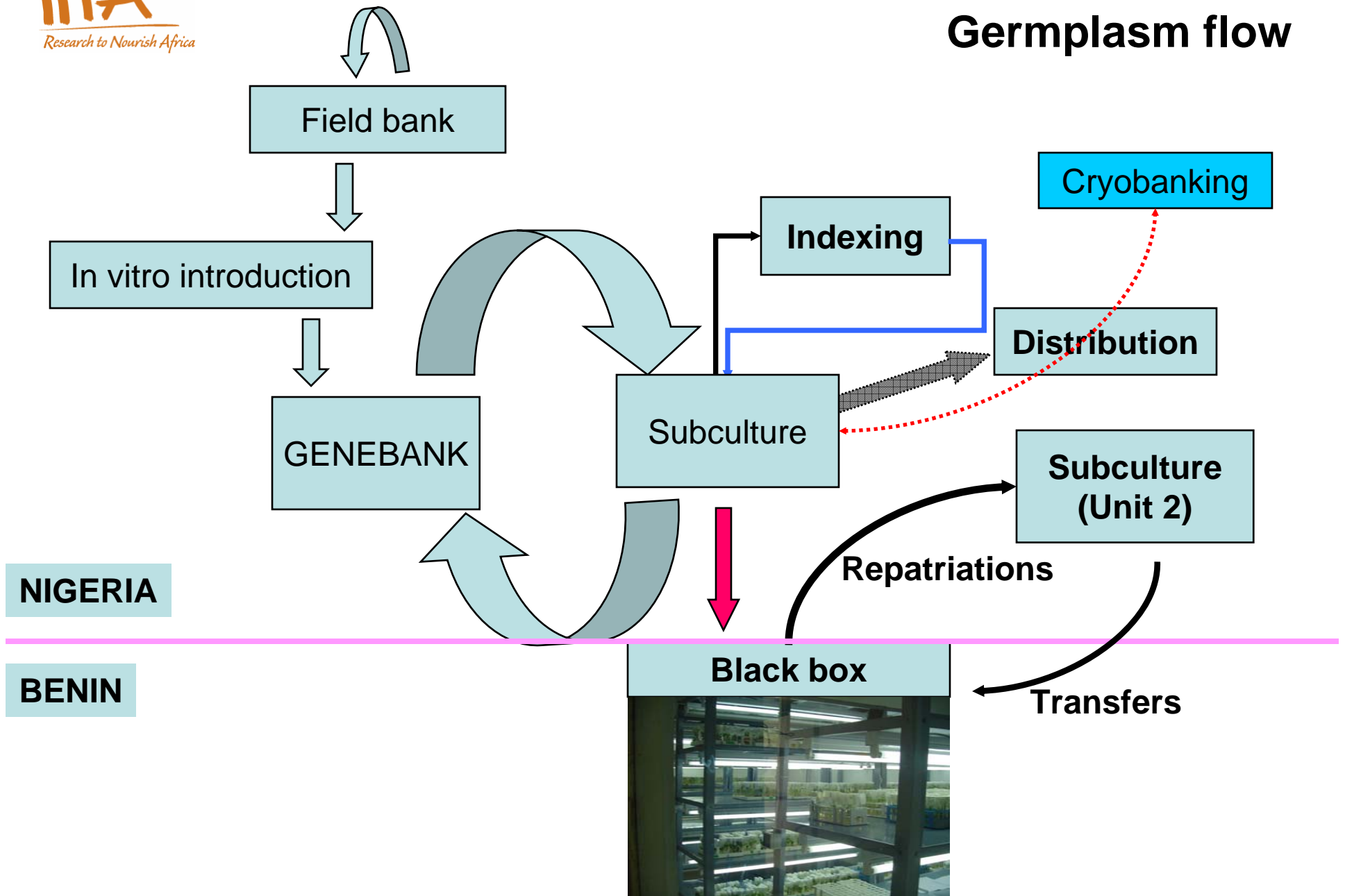
# Germplasm flow



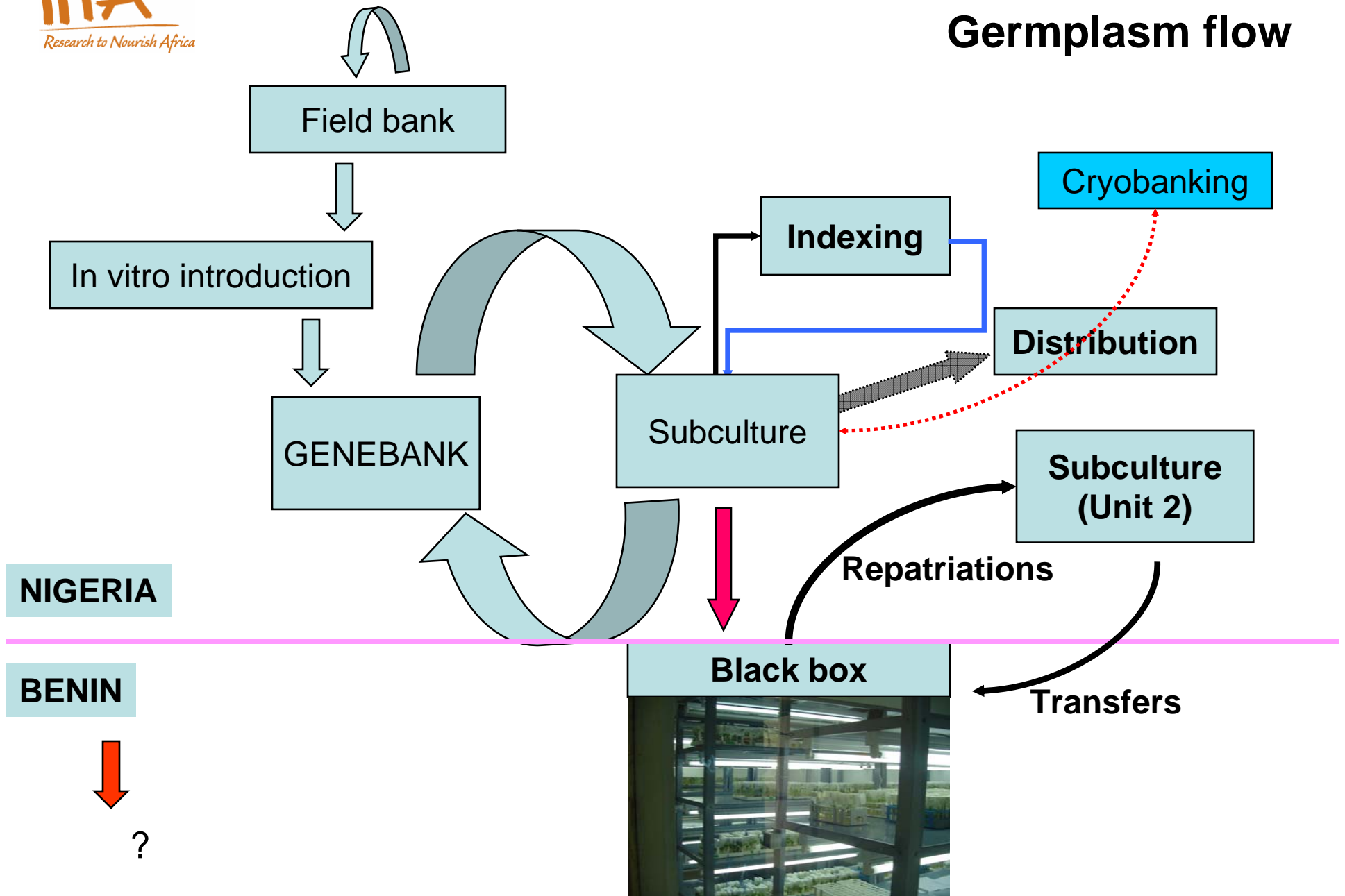
# Germplasm flow



# Germplasm flow



# Germplasm flow



## Conservation and safe duplication

Collections replicates	Before 2003	2004-2005	2006-2007	2008	Close Future
Field bank Ibadan	<b>Main</b> (complete)	<b>Main</b> (complete)	<b>Main</b> (complete)	<b>Main</b> (complete)	<b>Duplicate 1</b> (partial)
Field bank Ubiaja	<b>Duplicate</b> (Complete)			<b>Duplicate</b> (revigorate)	<b>Occasional?</b>
In vitro Ibadan		<b>Duplicate</b> (partial)	<b>Duplicate 1</b> (partial)	<b>Duplicate 1</b> (partial)	<b>Main</b> (complete)
Cotonou in vitro			<b>Duplicate 2</b> (partial)	<b>Duplicate 2</b> (partial)	<b>Duplicate 2</b> (complete)
Cryobank				<b>Duplicate 3</b> (partial)	<b>Duplicate 3</b> (complete)

Ibadan rainfall: 1322 / Ubiaja rainfall: 1656

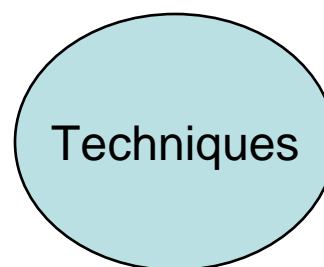
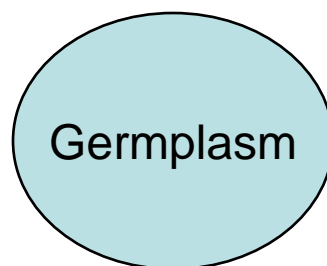
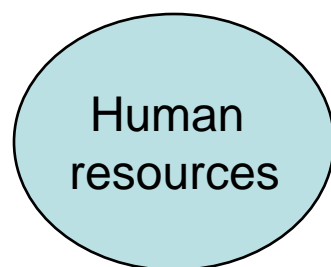
## Conservation and safe duplication

Collections replicates	<b>Before 2003</b>	... ... ... ... ....	<b>Close Future</b>	..... ..... .....	<b>Far future?</b>
<b>Field bank Ibadan</b>	<b>Main (complete)</b>		<b>Duplicate 2 (partial or occasional)</b>		<b>Occasional/partial?</b>
<b>Field bank Ubiaja</b>	<b>Duplicate (Complete)</b>		<b>Occasional?</b>		<b>Occasional/partial?</b>
<b>In vitro Ibadan</b>			<b>Main (complete)</b>		<b>Duplicate1 ? (Partial)</b>
<b>in vitro Cotonou</b>			<b>Duplicate 1 (complete)</b>		
<b>Cryobank Ibadan</b>			<b>Duplicate 3 (complete)</b>		<b>Main? (complete)</b>
<b>Cryobank Cotonou</b>					<b>Duplicate 3 (complete)</b>

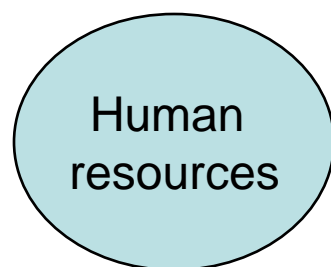
- Develop Management tools (germplasm identification, stability)
- Collect new germplasm
- DNA banking
- Optimize the use (quality, visibility and access to information)
- Capacity development



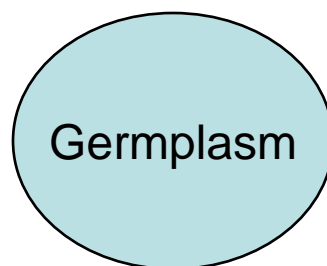
## Conservation challenges



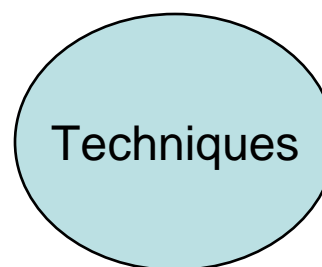
## Conservation challenges



Training  
Retention

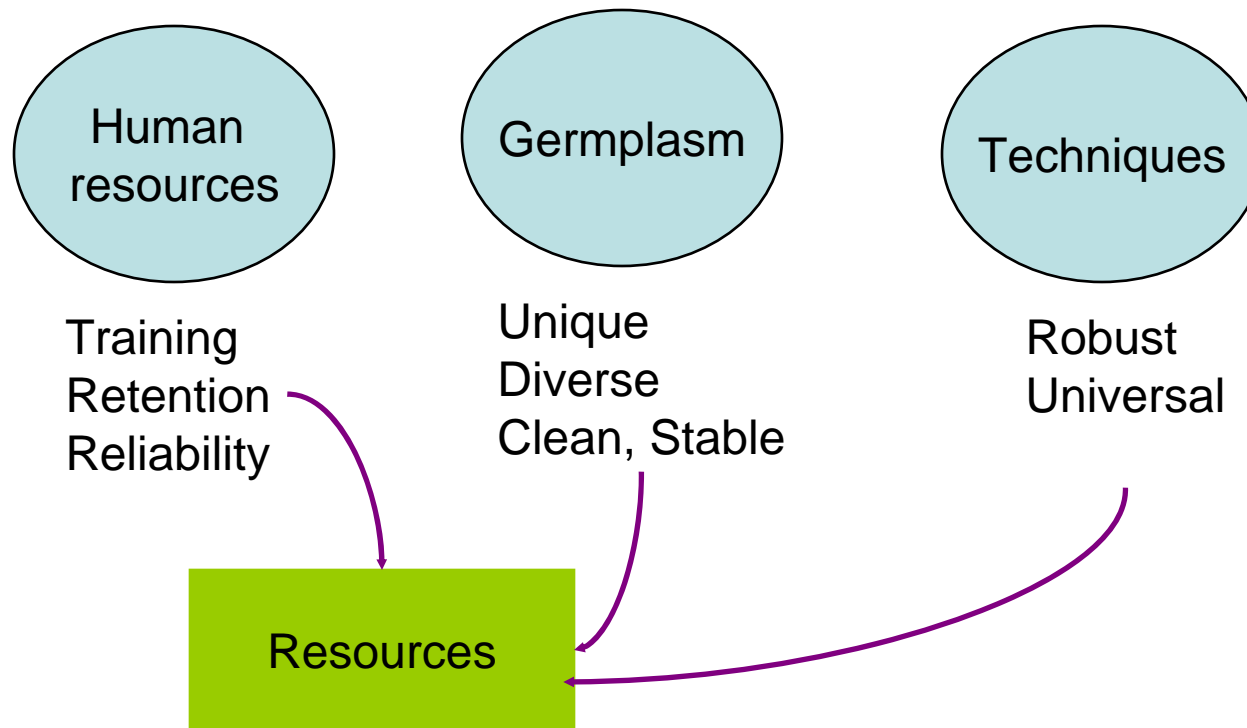


Unique  
Diverse  
Clean, Stable

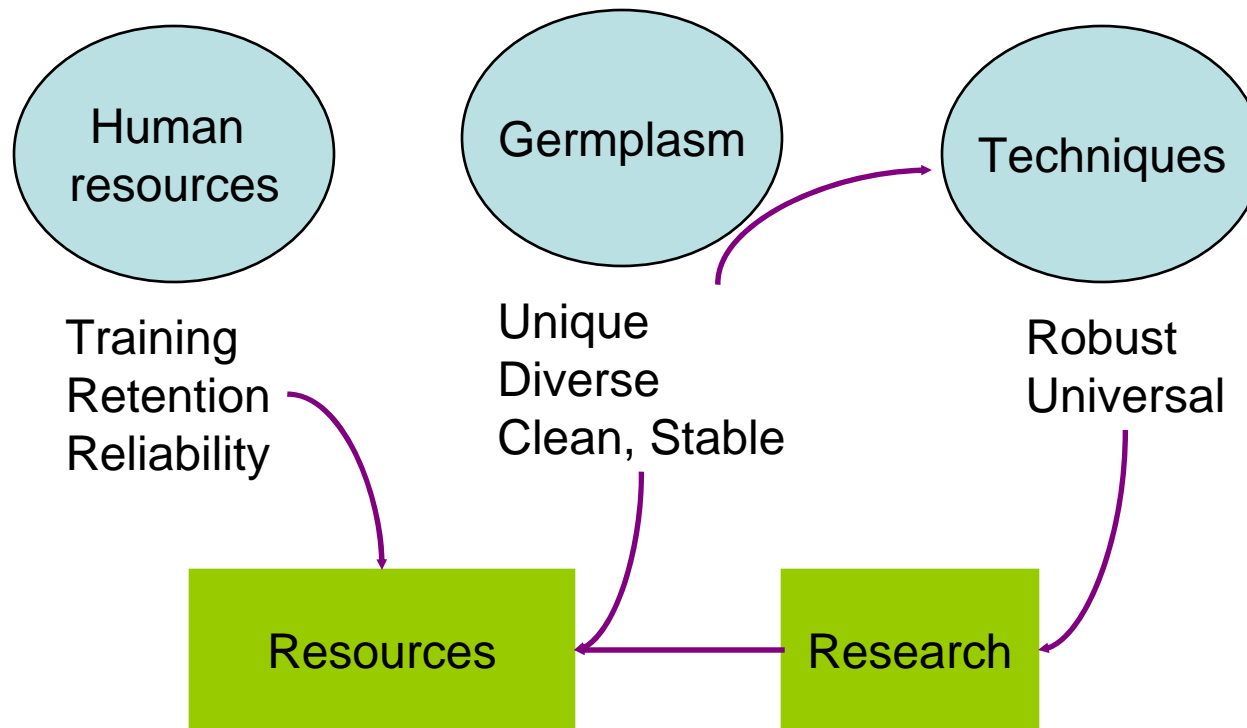


Robust  
Universal

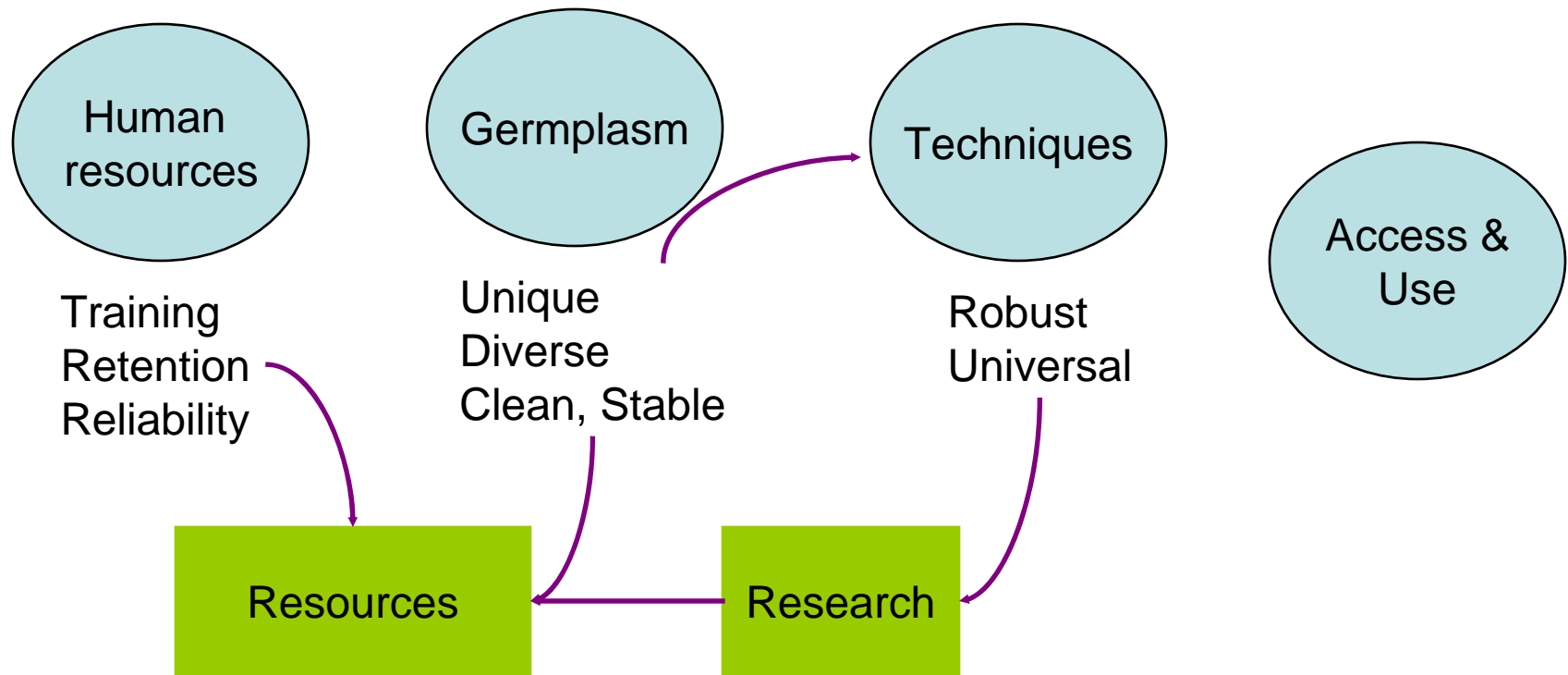
# Conservation challenges



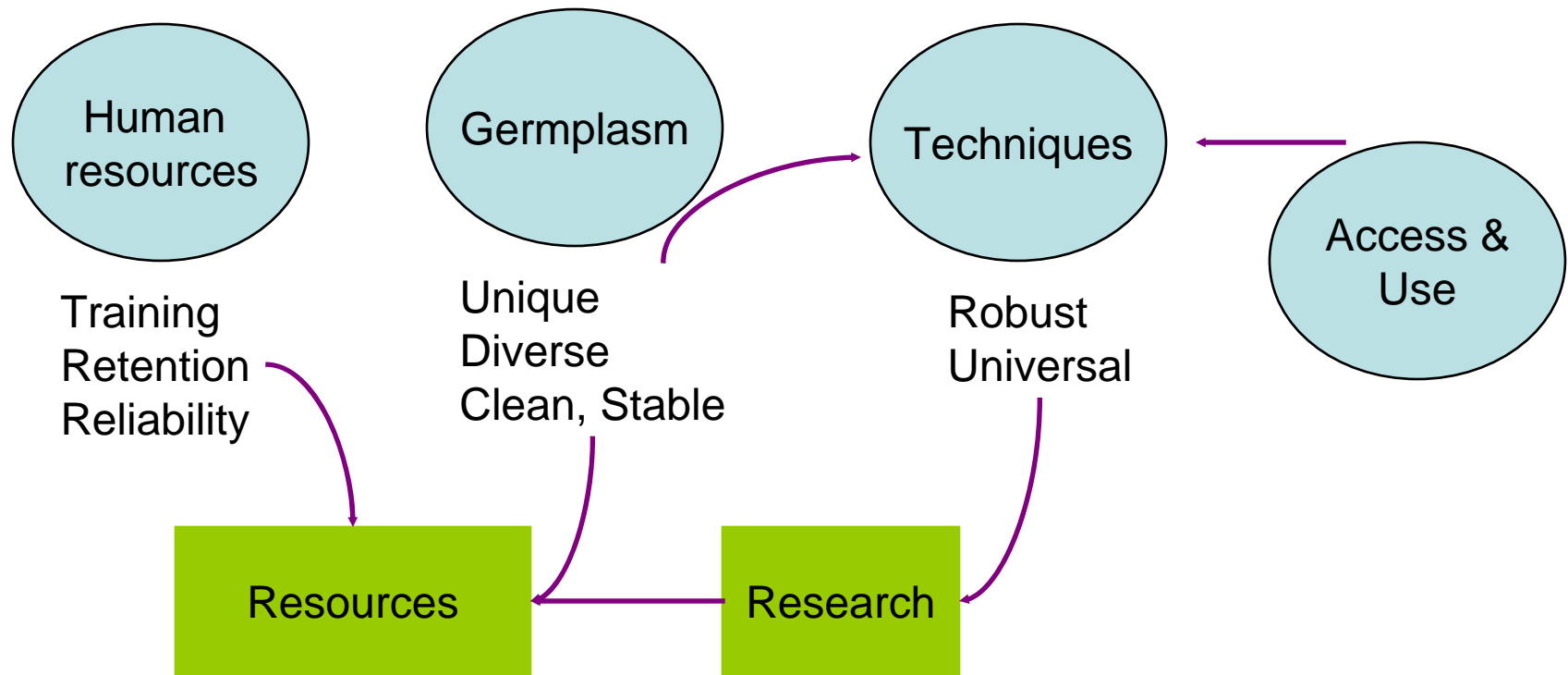
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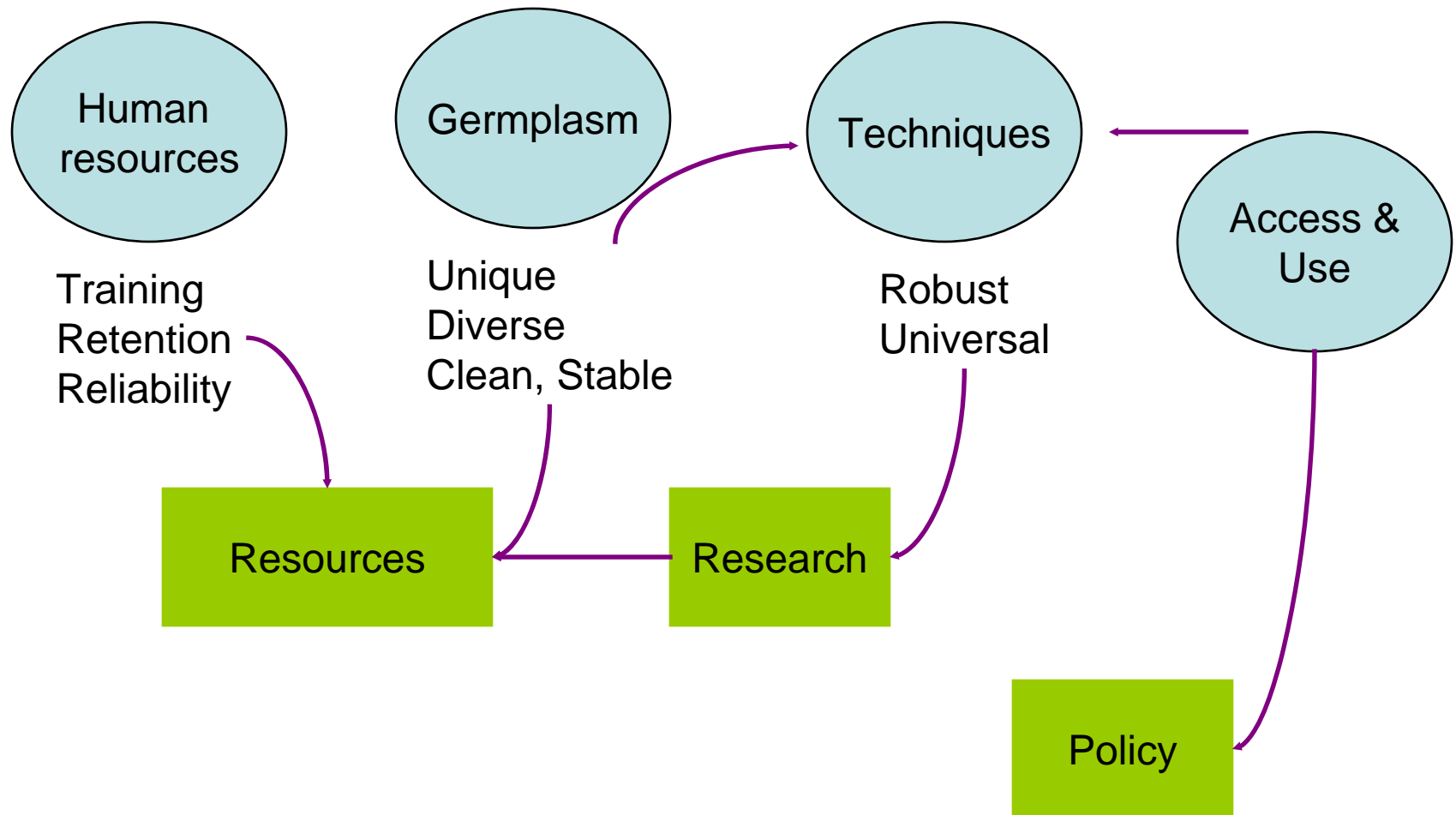
# Conservation challenges



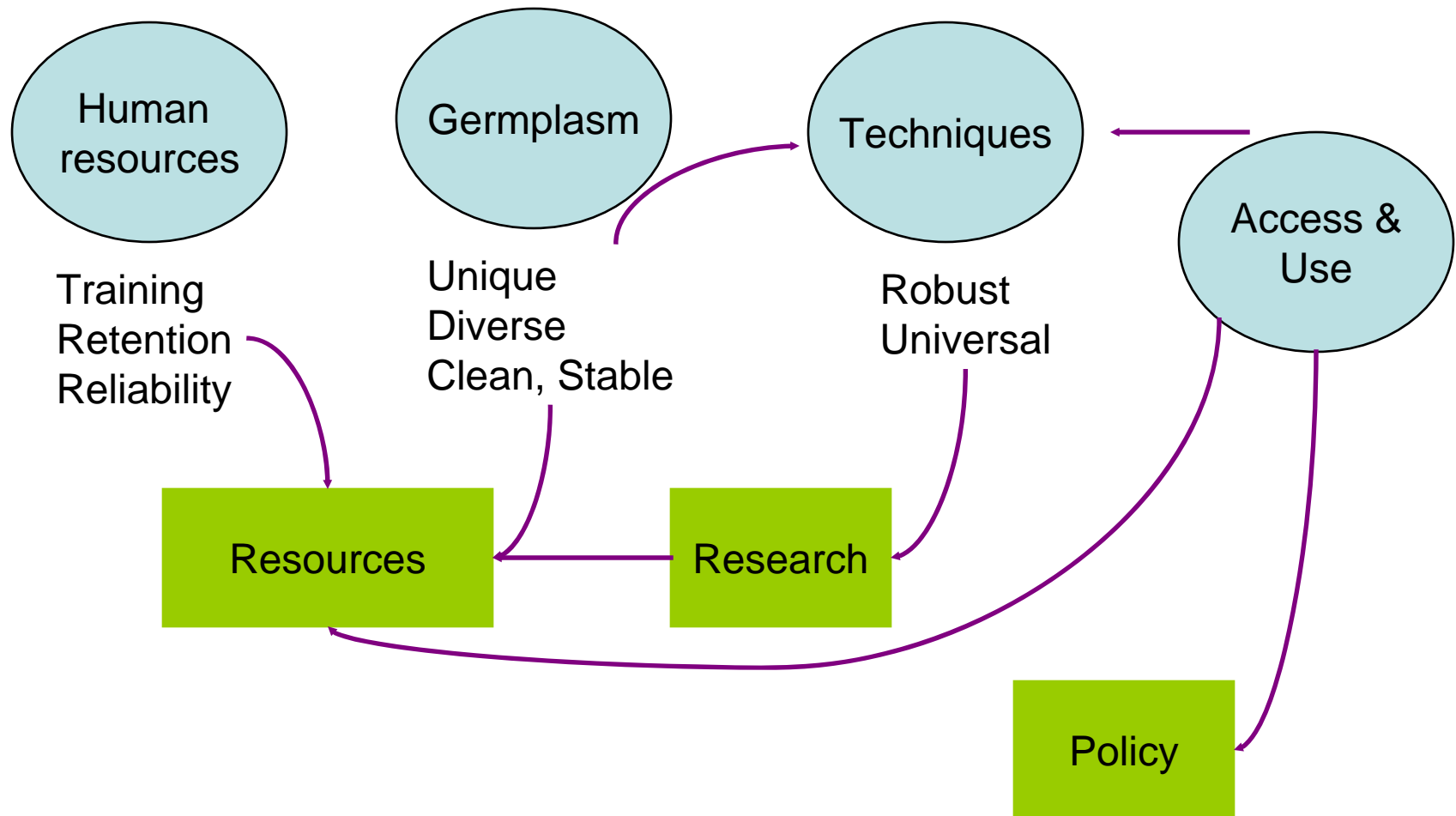
# Conservation challenges



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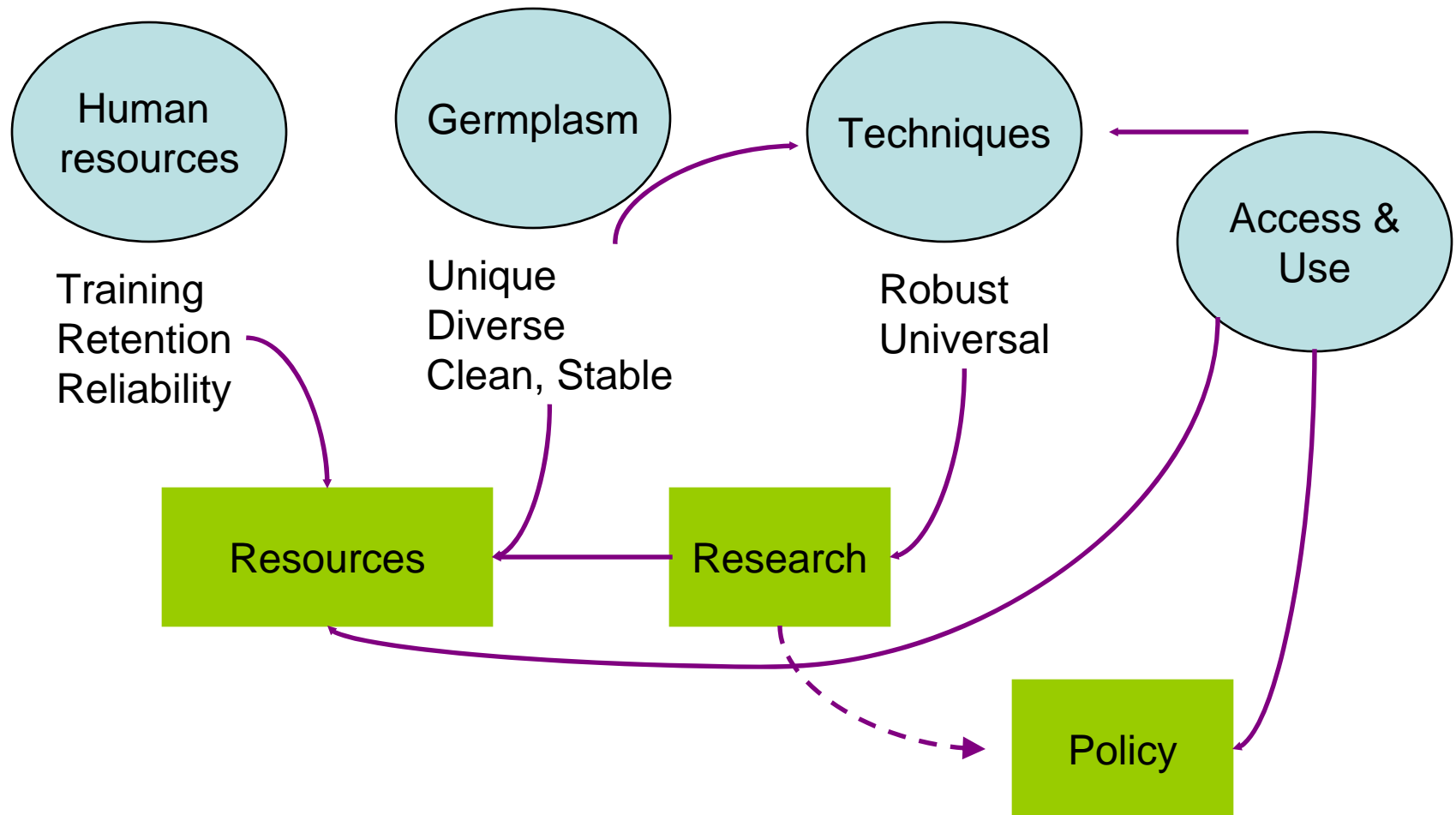


# Conservation challenges

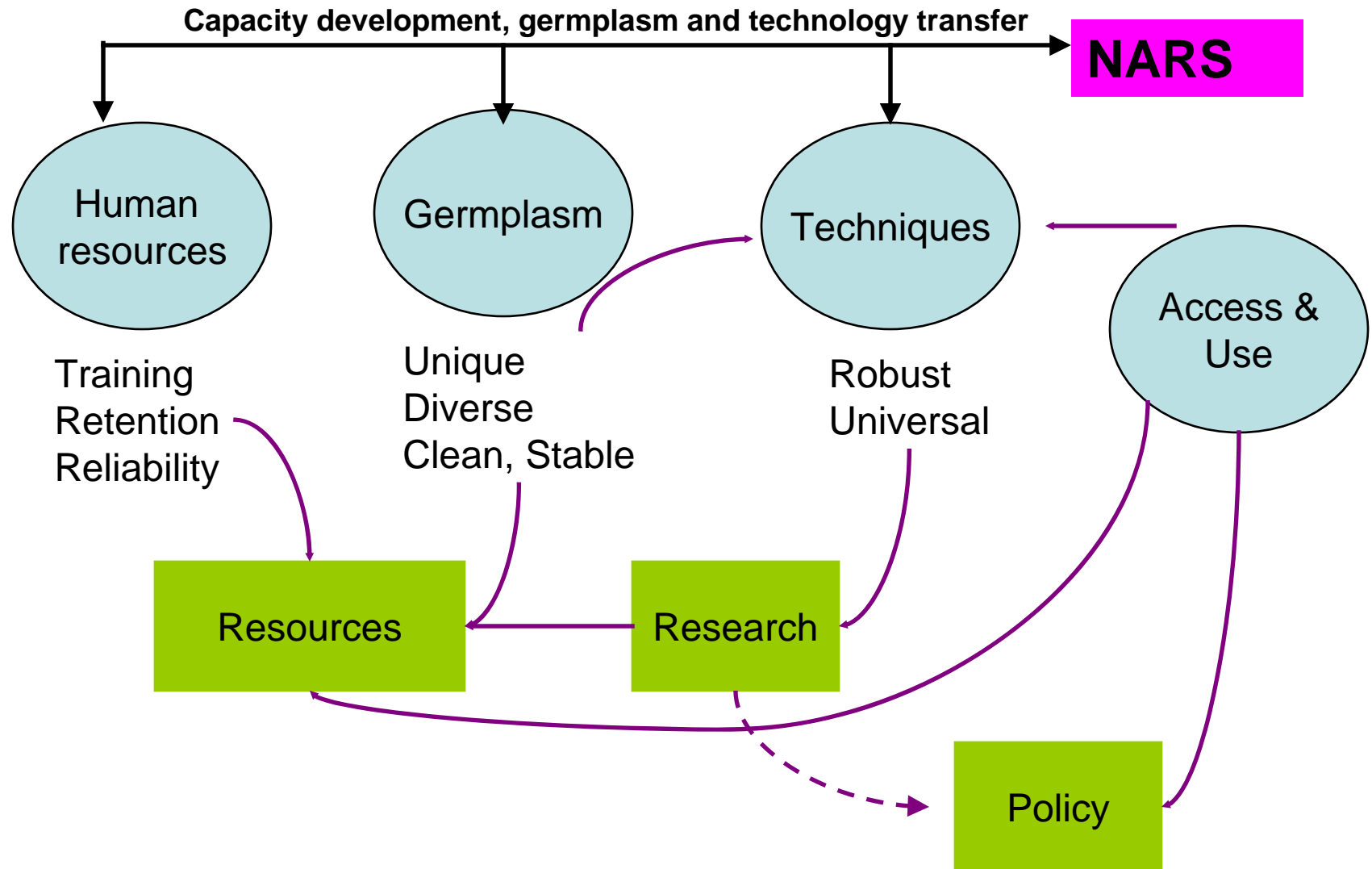




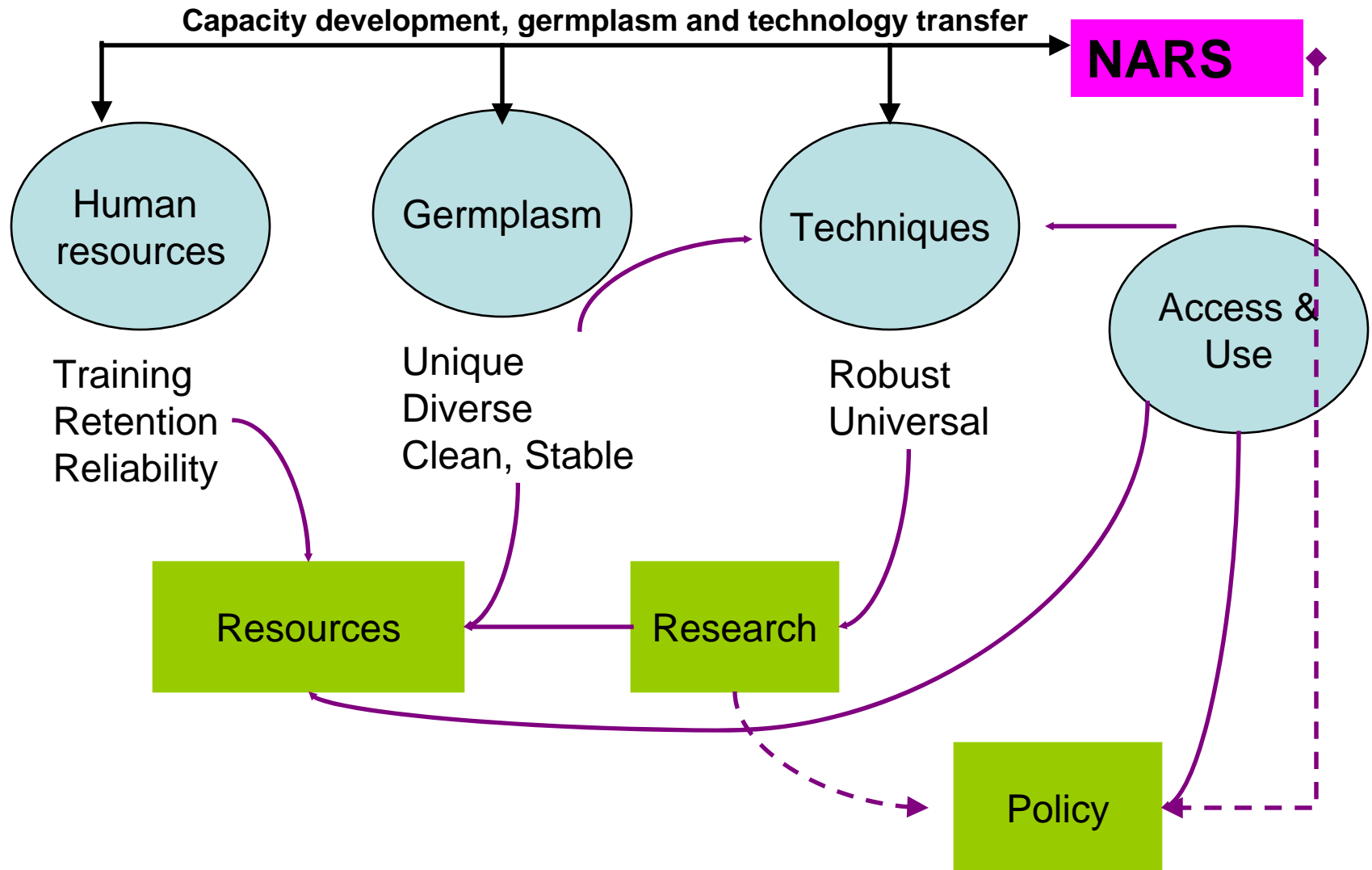
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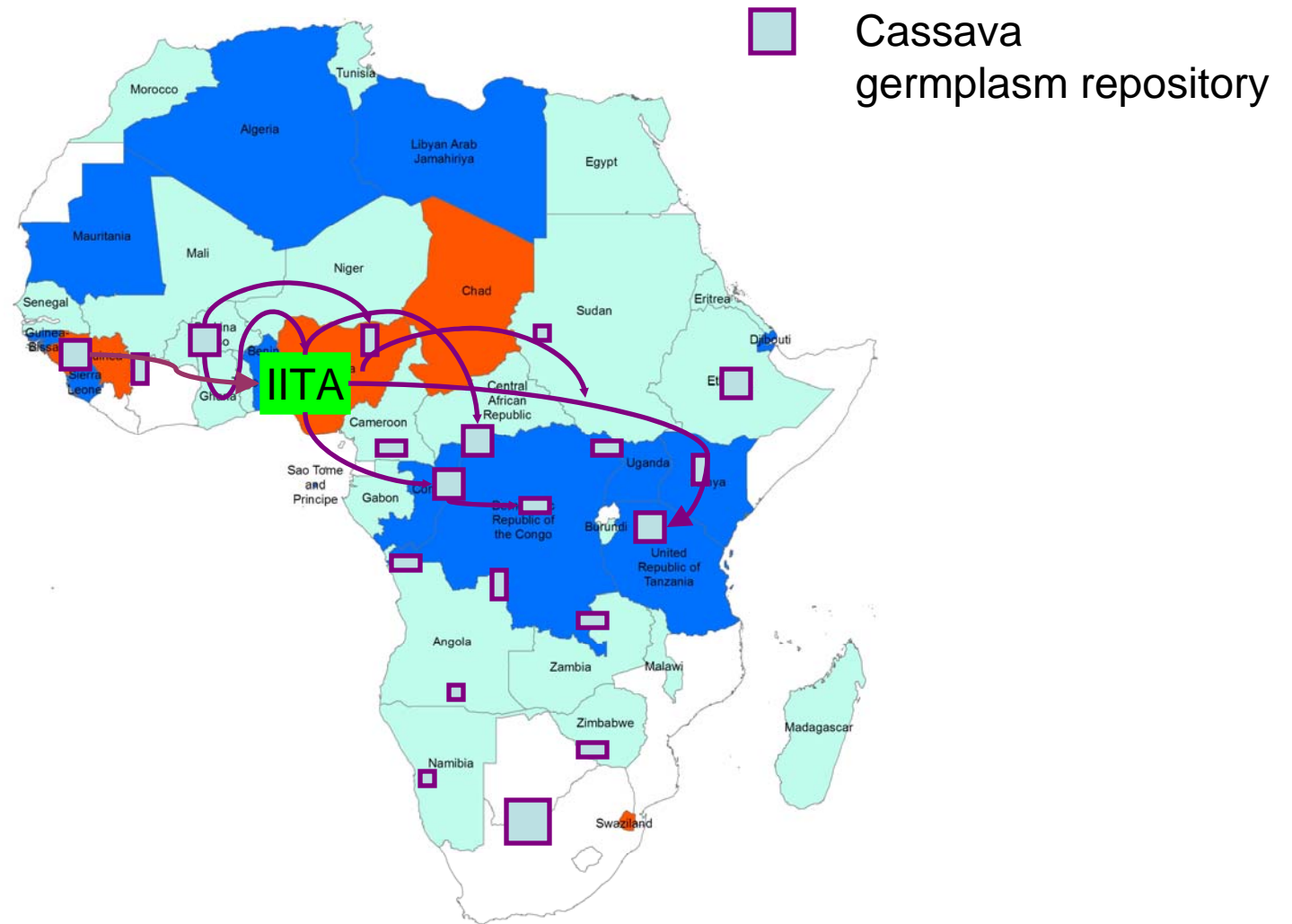


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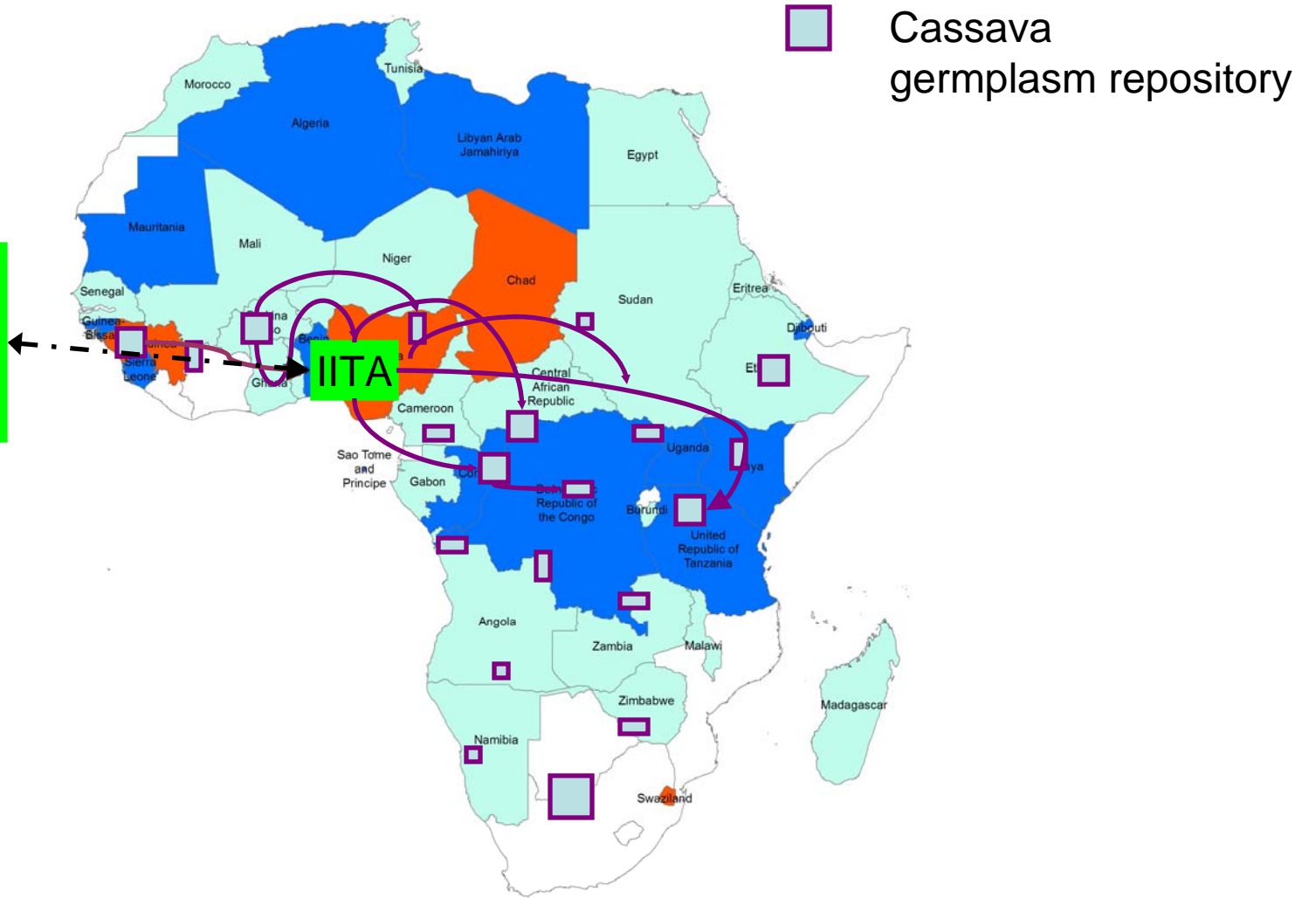
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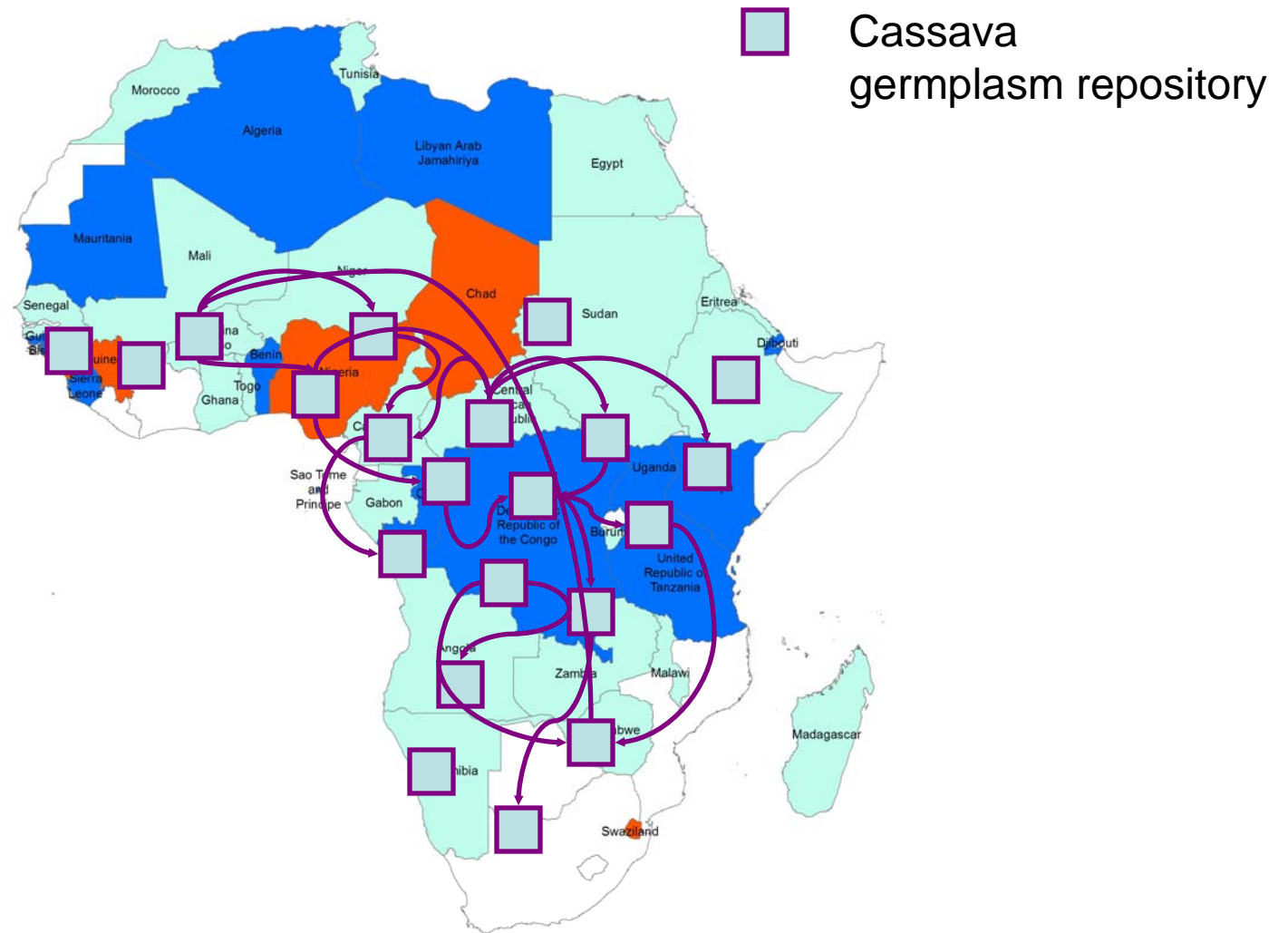




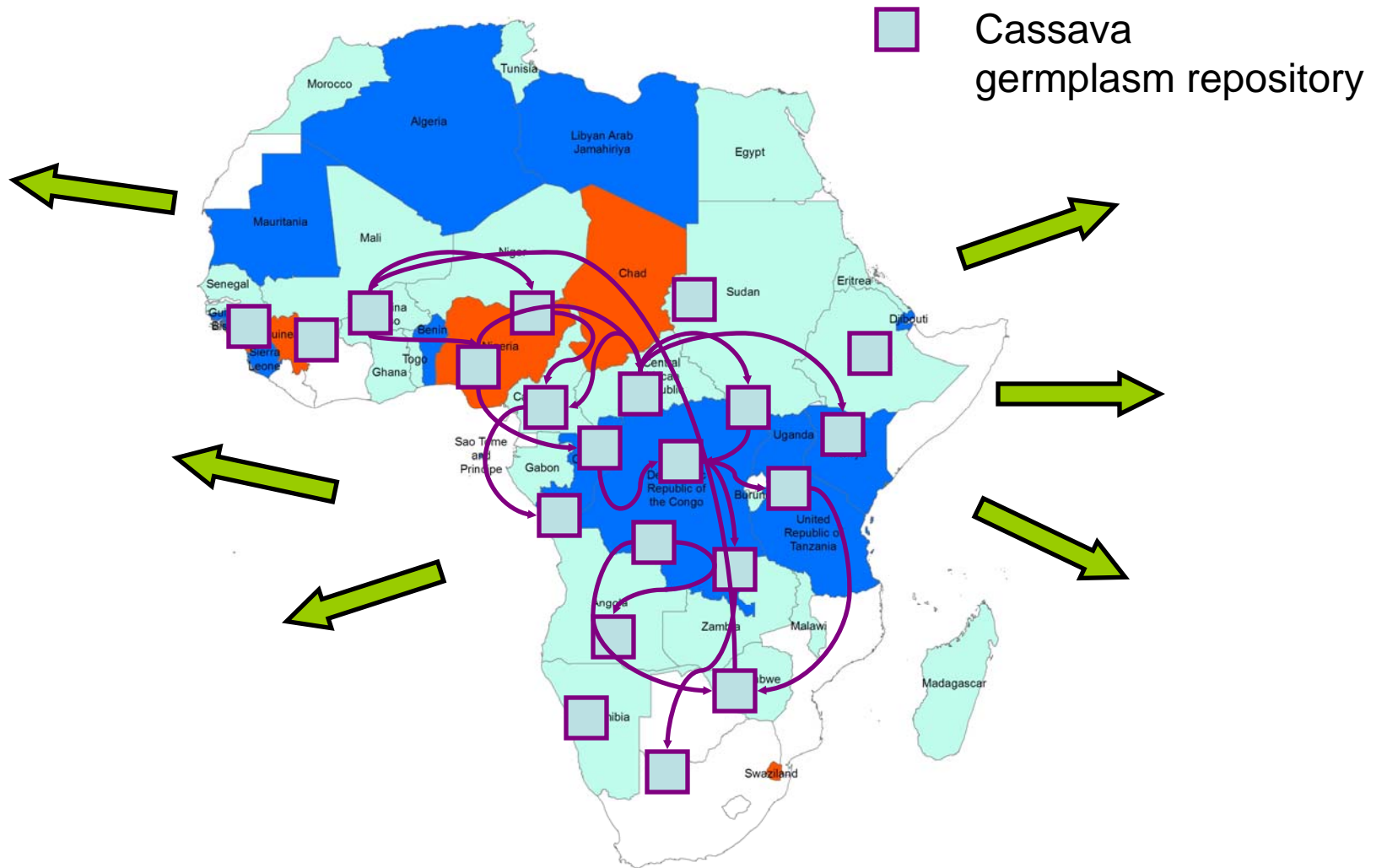
Complementarity network

CIAT, Bioversity  
EMBRAPA  
Other National  
programmes...





**Complementarity network .....Exit strategy**



Complementarity network

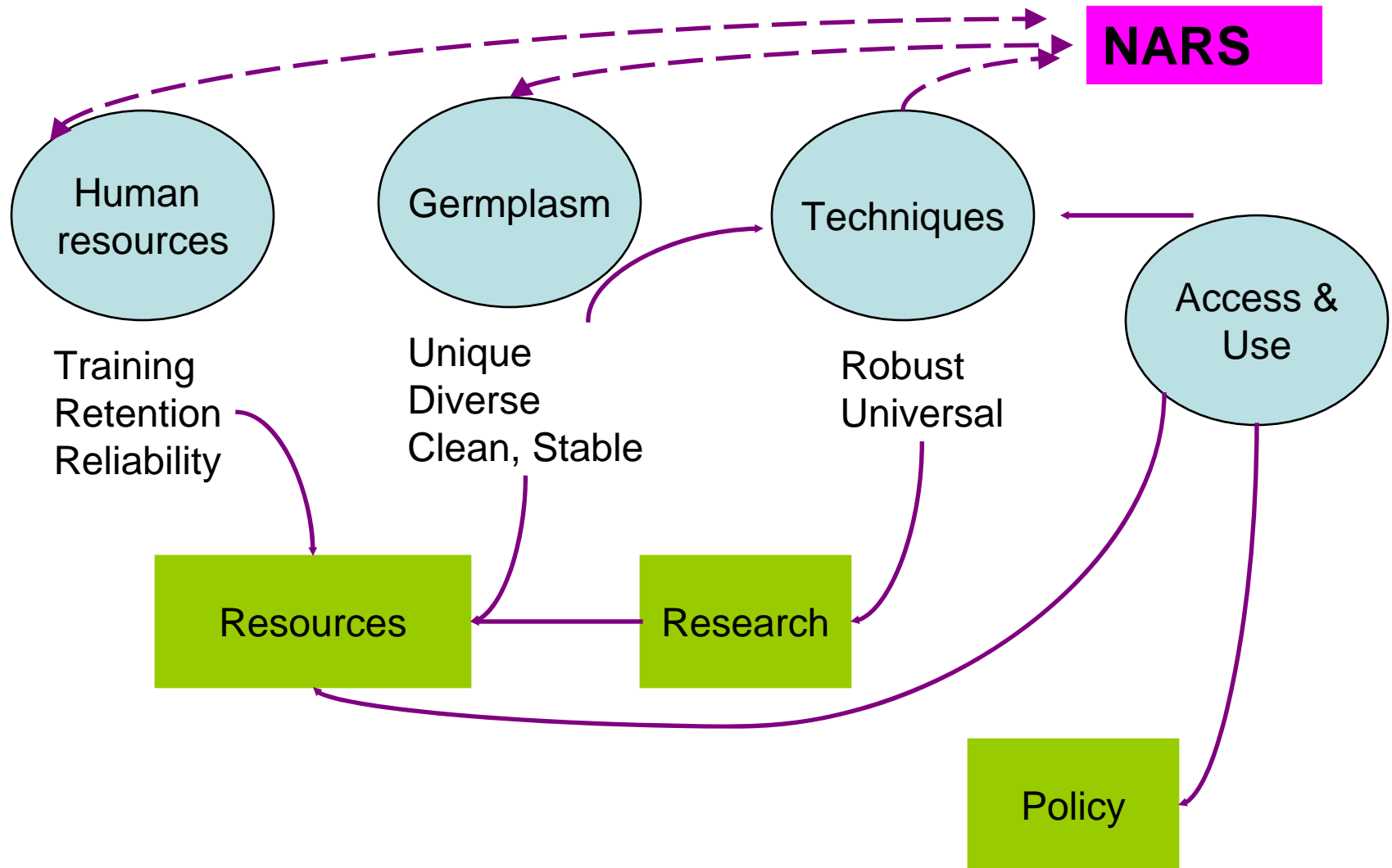


**Thank you**





# Conservation challenges



# Conservation challenges

