Regulating animal biotech in Africa, and lessons from crop biotechnology

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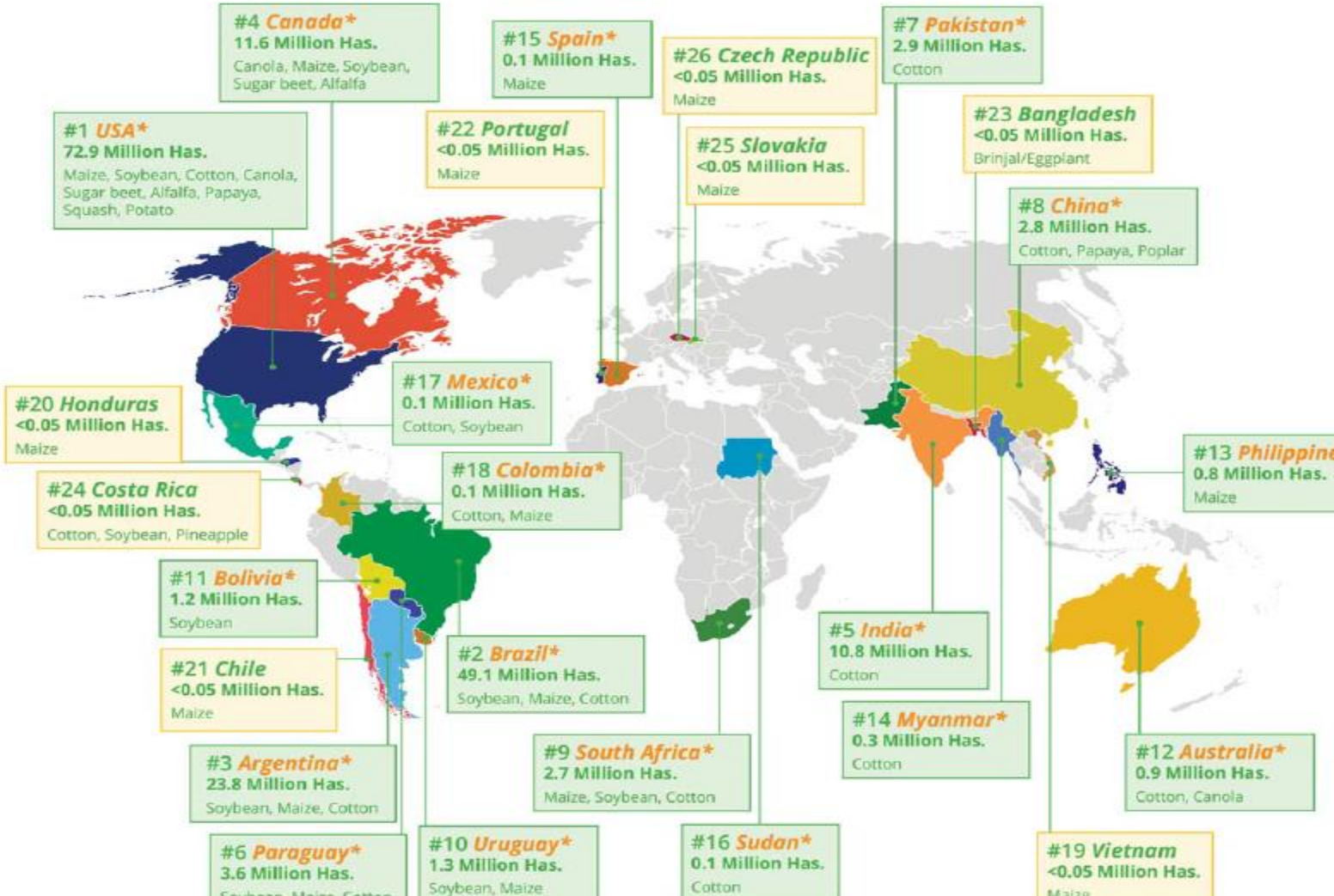
25 YEARS JOHN TEMPLETON FOUNDATION
SUPPORTING SCIENCE~INVESTING IN THE BIG QUESTIONS

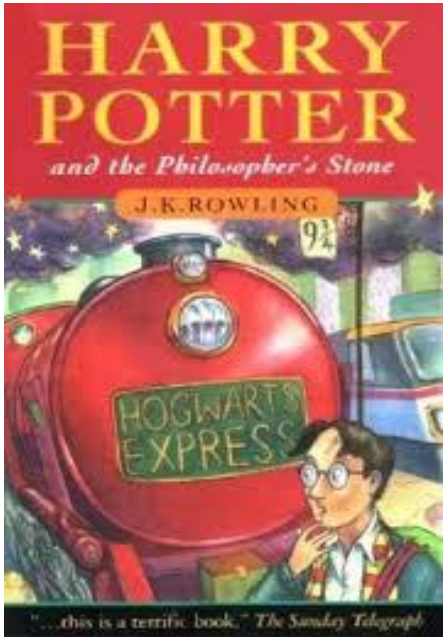
CAMBRIDGE MALAYSIAN EDUCATION AND DEVELOPMENT TRUST


The grass is always
greener…

Biotech Crop Countries and Mega-Countries*, 2016



By way of contrast…

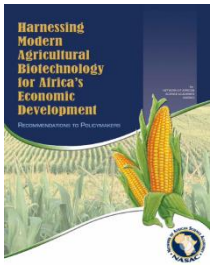


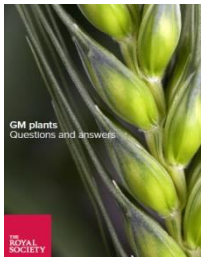
So what we're saying…

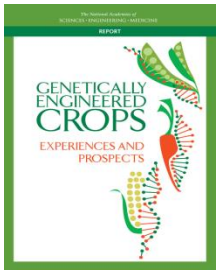
2016 Quidditch World Cup – 26 countries

We came from crops side

- Royal Society, Networks of Science Academies







- Biosciences for Farming in Africa
  - Media, regulators, policymakers…
  - Agricultural biosciences generally: basic breeding, hybrids, tissue culture, marker-assisted breeding, mutagenesis, GM
  - Scientists & breeders, long-term engagement

Biosciences for Farming in Africa

STI4D

15 Engagement Workshops

> 70 African scientists

> 50 African centres

>12,000 books

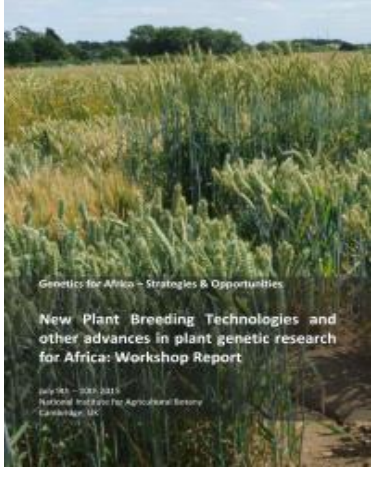
> 160 media

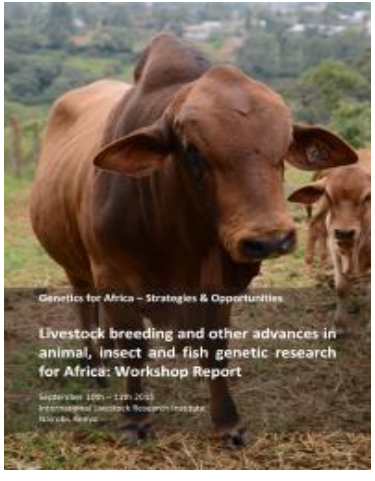
> 80 field trips

> 1,800 pieces

Dialogue

What about other areas?





USDA Foreign Agricultural Service
United States Department of Agriculture

Genetics for Africa – Strategies & Opportunities", 2015-2017

sti4d.com

Findings: NPBTs & health

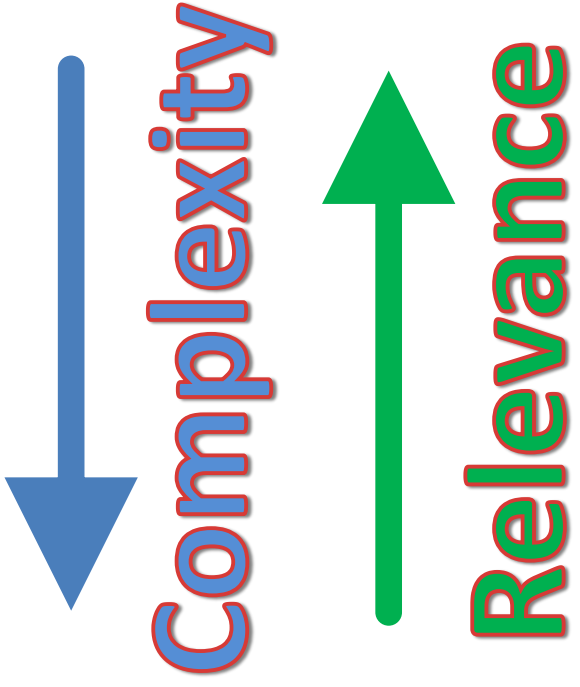
- Lack of awareness, understanding & uptake
- Over-regulation makes higher-tech inaccessible for locally relevant work
- Activism has driven public agenda and (reactive) outreach efforts
- Medical genetics, genetic counselling and other services rare
- Poor funding for research, outreach & collaboration
- Specific genetic knowledge of medical/other regulators, IRBs etc

Animals, insects, fish

- Research outcomes to transform livelihoods and health are around the corner
- Regulatory regimes largely untested
- Regulatory regimes largely designed for plants
- Ethical/additional considerations
- Interaction with plant & human genetics
- Animal research massively underfunded, poor public understanding

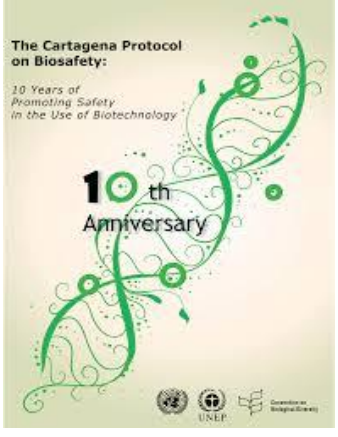
Lesson 1: technology continuum

- Crops: F1 hybrids = GMOs?
- Animal bioscience needs to include:
  - Basic breeding
  - AI
  - ABT
  - Marker assisted breeding
  - Sex control
  - Cloning
  - …
  - GM



#2: Well-intentioned regulatory frameworks

- Based on Cartagena Protocol
- Precautionary principle
- Unusually strict interpretation



- Based on crops
- Heavily influenced by activism, EU

- Biosafety laws/regs can apply to animals

#3: Animals are not plants!

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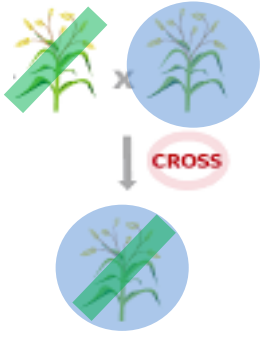
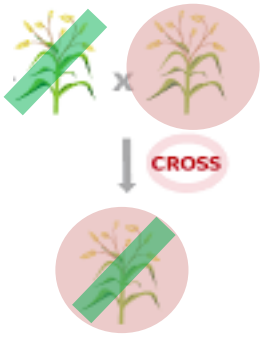
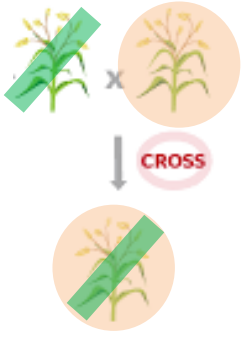
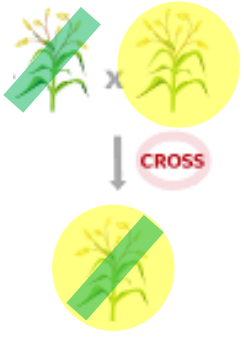
- Regulatory complexity/diversity
- Breeding time
- Breeding cost
- Mobility/confinement
- Ethical/welfare issues
- Heterogeneity
- Post-commercialisation management practices
- etc

Shortcuts harder…









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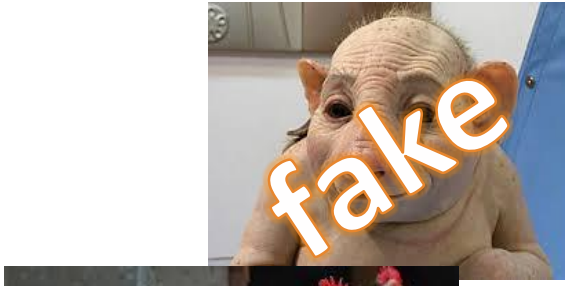
What are we protecting?

#4: Don’t forget the activists

- Public psychological impact of animal technology is greater than plants
- Opportunities to force slower/cautious approach to letter of regulations
- Each new regulatory actor, Ministry etc is a new opportunity



Sooooo?

c.f. Red Flag laws

- (UK) one … person, while any locomotive is in motion, shall precede [it] on foot by not less than sixty yards, and shall carry a red flag constantly displayed, and shall warn the riders and drivers of horses of the approach …..

- (PA) all motorists piloting their "horseless carriages", upon chance encounters with cattle or livestock to
  1. immediately stop the vehicle,
  2. immediately and as rapidly as possible ... disassemble the automobile,
  3. conceal the various components out of sight, behind nearby bushes until the equestrian or livestock is sufficiently pacified

- 100 years later we are approving driverless electric Tesla sports cars…

We have a unique opportunity

- NPBTs are currently forcing reflections on regulations anyway
- Hi-end animal biotech for Africa is still > 5 years away

- Do what we didn't do for crops: **start early!**
- Outreach and capacity building around broad spectrum of animal biosciences, especially to media, decision-makers and community leaders
- Regulatory dialogue and support

Regulatory dialogue

- Based around >40 years experience of GMOs, the NPBTs, the distinction of animal biotech
- Engage regulators from around the continent

- trait, not organism; product, not technology?
- regional harmonisation/alignment?
- accept data/approvals from neighbours?

Thank you

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