

The slide features a central orange-brown rectangular area containing text. This central area is flanked by six purple rectangular panels, three on each side. Each purple panel contains a stylized, light purple graphic of a leaf or branch, creating a decorative border around the central text.

# Re-imagining the role of agricultural universities in rural development

Mark Holderness, GFAR

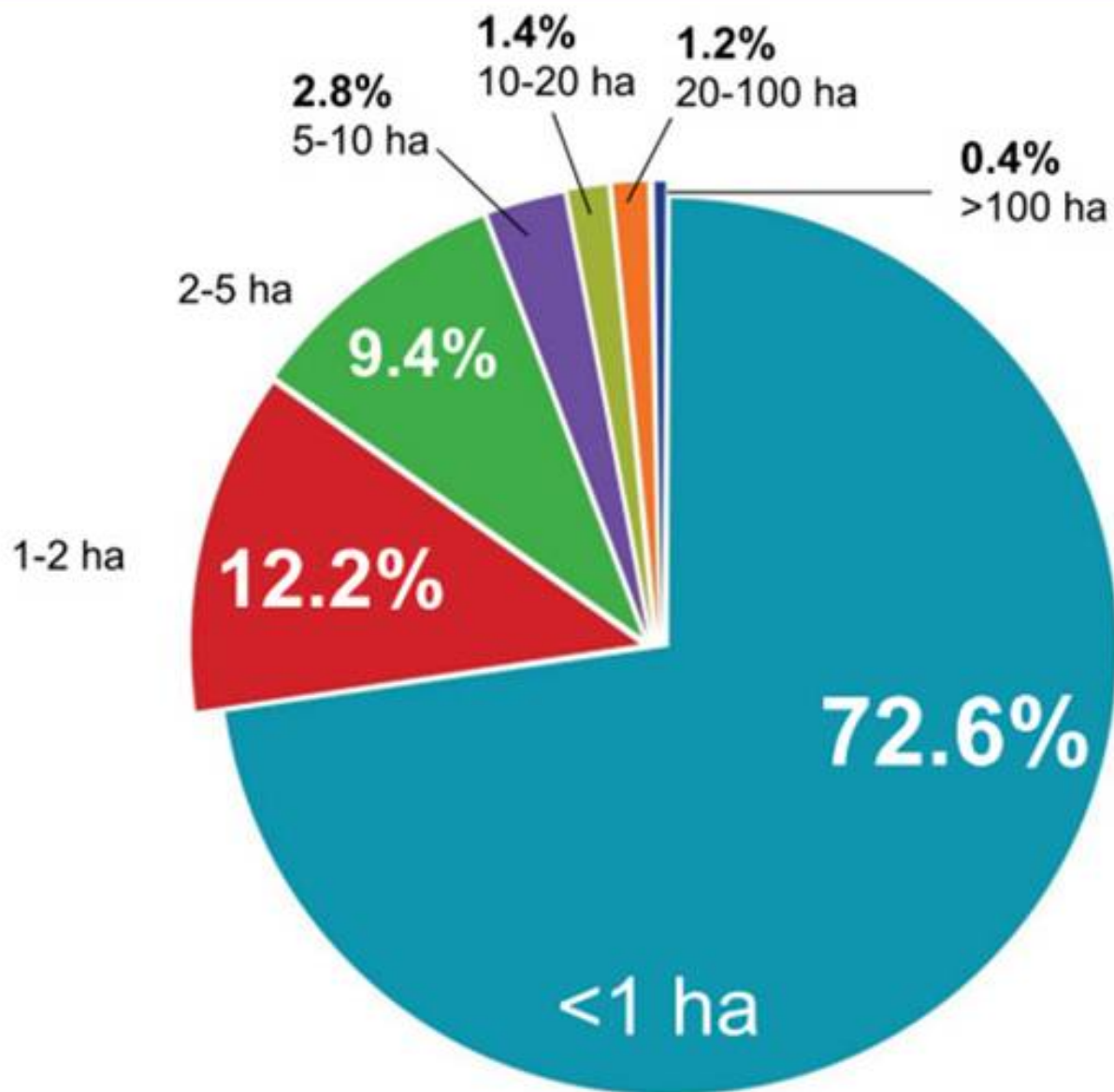


## Our Unique Global Forum: Shaping the future together

### ***Transforming agricultural research, extension, education and enterprise for development:***

- ❑ IFAD & FAO**
- ❑ CGIAR & AIRCA – the international agricultural research centres**
- ❑ Farmers organizations: 285 linked, >200 M farmers**
- ❑ Regional Fora : AARINENA, APAARI, CACAARI, EFARD, FARA, FORAGRO**
- ❑ Private sector: SAI - 55 major food companies; PanAAC SMEs - 35 countries**
- ❑ Higher Education – GCHERA : >600 universities, >1 million students**
- ❑ CSOs: Prolinnova NGOs in 17 countries, CSO-GARD >200 members**
- ❑ Advanced research : G20 MACS & BRICS: 70% of world investment**
- ❑ Advisory Services – GFRAS, networks around the world**
- ❑ Youth - YPARD - 8,000 youth members**

# Repartition of holdings by class area in the 81-country subset of FAO-WCA



Source: Pierre-Marie Bosc for HLPE, 2013



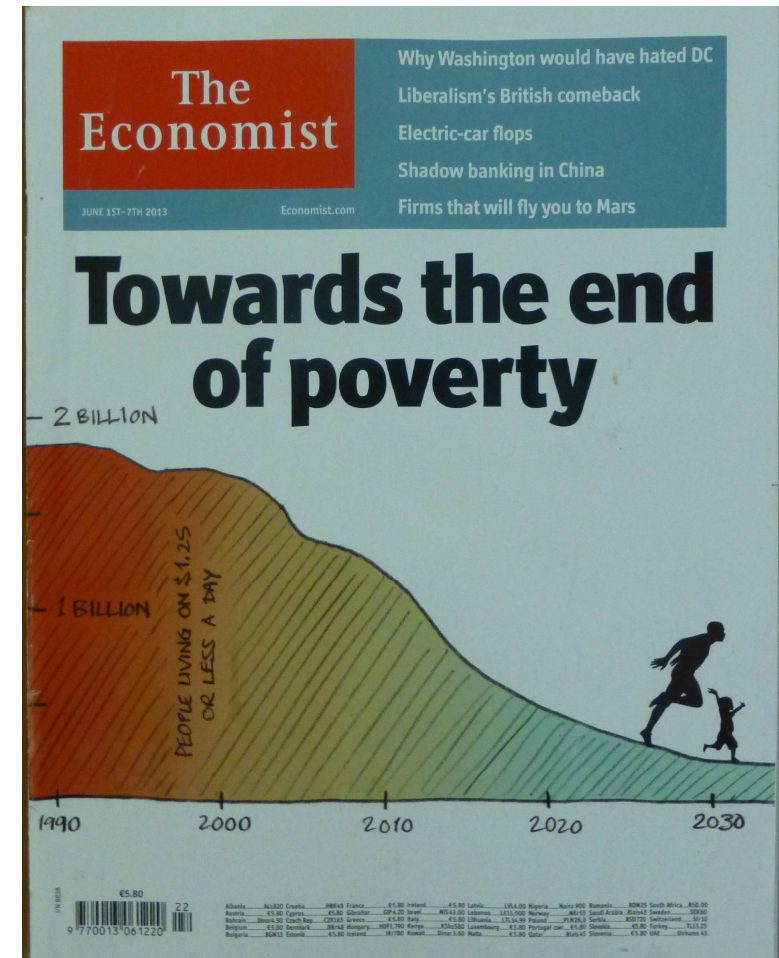
## Common agendas, with synergies...and trade-offs African Agricultural Science Agenda (FARA *et al.*, 2013)

- Increasing agricultural production and productivity**
- Food systems, nutrition, food safety and food security**
- Reducing rural poverty through agricultural diversification**
- Policy research including markets, regional integration and international trade**
- Living with climate change: New challenges for adaptation and mitigation; increasing resilience, climate smart agriculture**
- Management of natural resources: land and water, biodiversity**
- Platform technology applications including bioscience and new ICTs**



# Innovation system needs in a changing world

- ❑ **Productivity ‘yield gap’** not just a constraint of technology...  
Inputs vs returns and risk aversion
- ❑ **Reshaping demand & production value systems:** nutrition-health nexus, waste reduction
- ❑ **Who benefits from innovations? Who can be disadvantaged?**
- ❑ **Rethinking innovation from an engendered perspective...**
- ❑ **Poverty & hunger:** Future challenge is **reaching the poorest (rural) sector**
- ❑ **Impacts of disrupted systems:**  
**22 countries in protracted crises**





## Some potential “blue sky” biological solutions for societal challenges

### Some prospective technologies...

Nitrogen fixation

Perennialization

C4 rice

Microbiome technologies

Pest avoidance & disease immunity

On-farm Interoperable data use

Nutrient enhancement

Water security

### And some needs...

**Real demand** w.r.t. alternative scenarios & farmer realities

Integration of biology, chemistry, maths, computing, engineering, meteorology etc

Capacity and infrastructure

Open data access

Enabling policies & sustained investments

Large-scale data handling

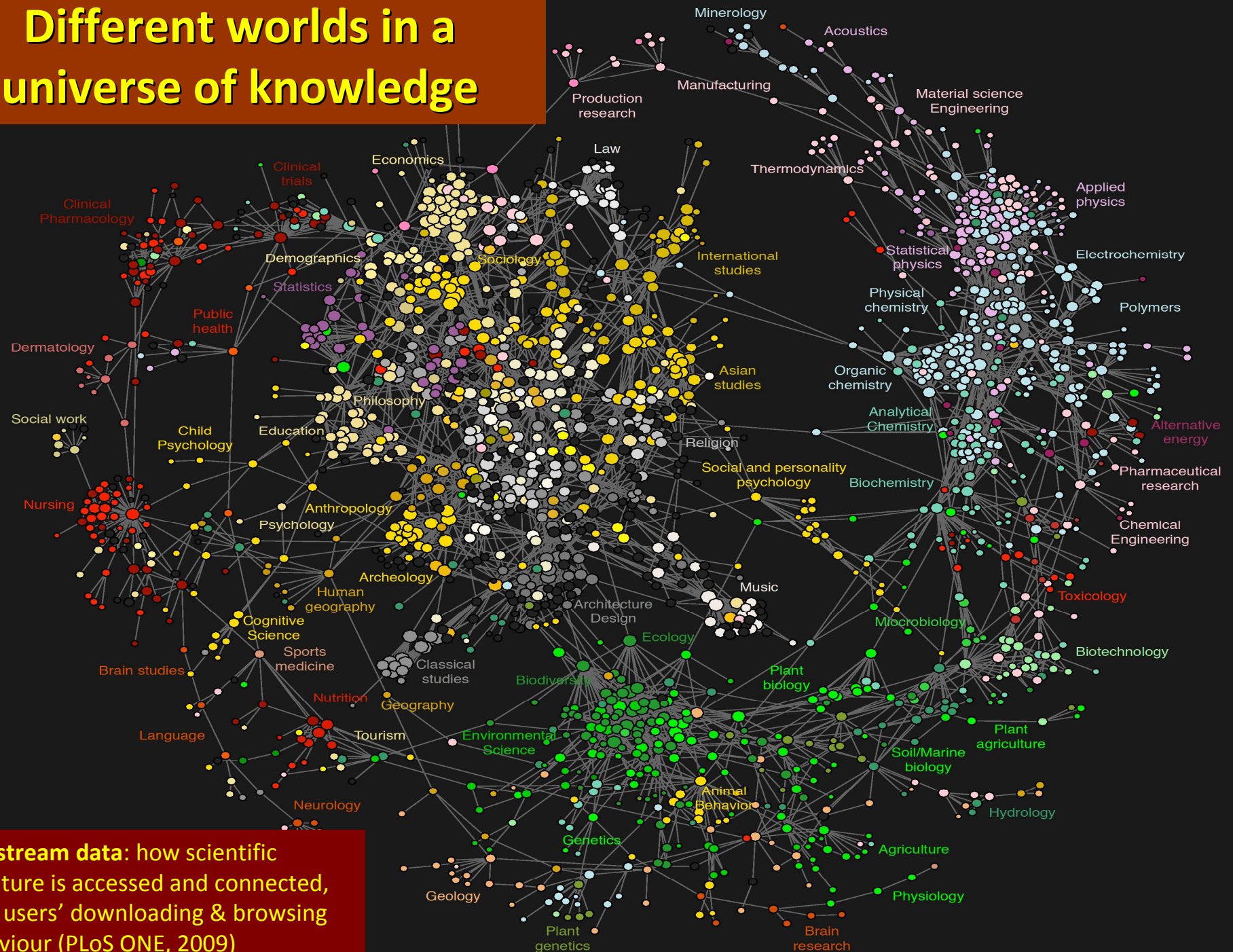
**Public trust:** consumer & environmental concerns

Public understanding and value

Safety nets for the poorest



# Different worlds in a universe of knowledge



Clickstream data: how scientific literature is accessed and connected, from users' downloading & browsing behaviour (PLoS ONE, 2009)

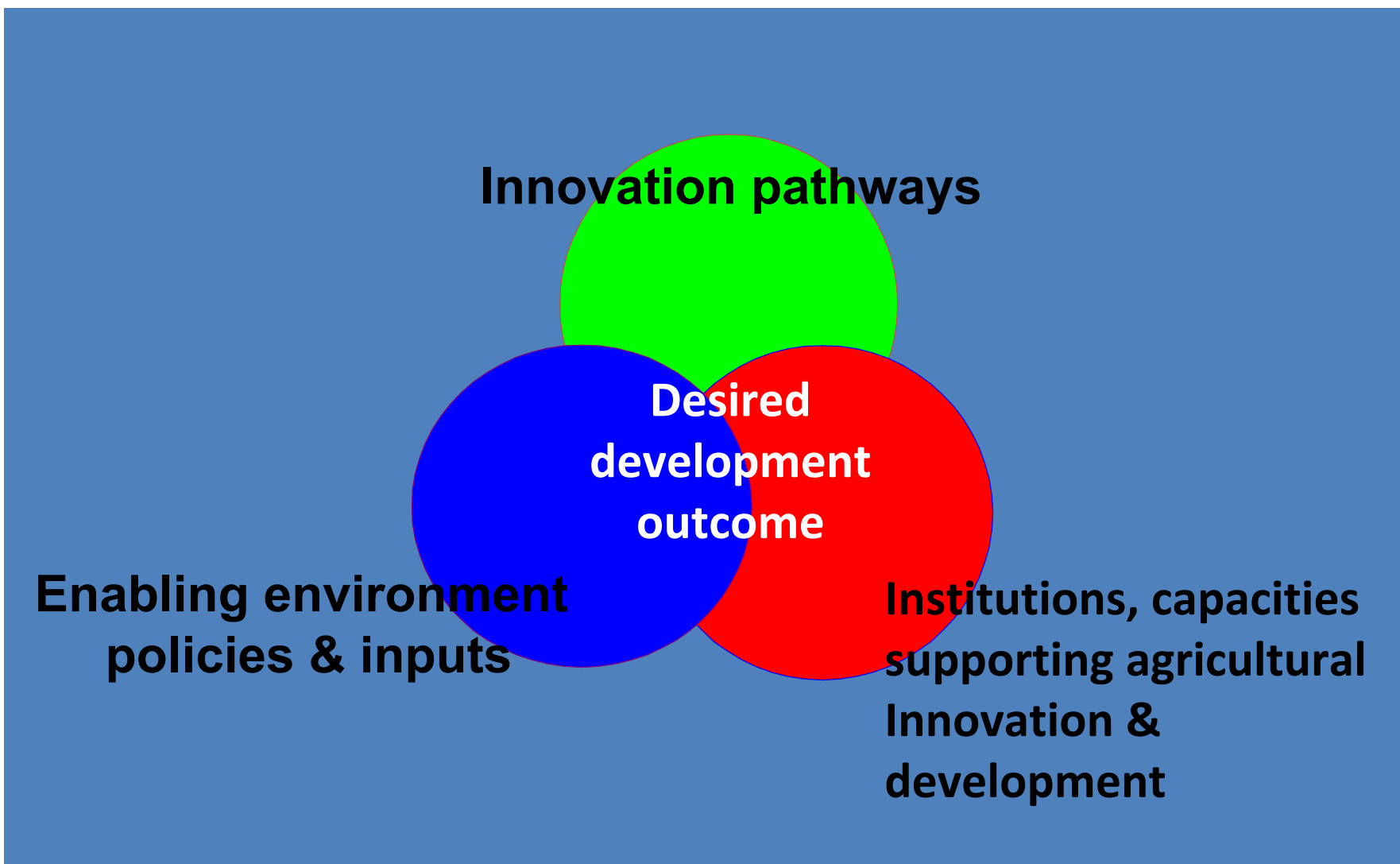
# Partnership in innovation: all knowledge has value

- **Scientific knowledge is reductionist, trusted & validated by its method**
- **Local knowledge is holistic, risk-aware, trusted & validated by experience**
- **Need to link & reconcile these knowledge & trust bases**
- **Sustainable development must value & capitalize on both**





**GCARD Roadmap: Knowledge & innovation are *essential*,  
but are not themselves *sufficient***





## The GCARD Roadmap – GFAR & CGIAR

Transforming agricultural research & innovation FOR development

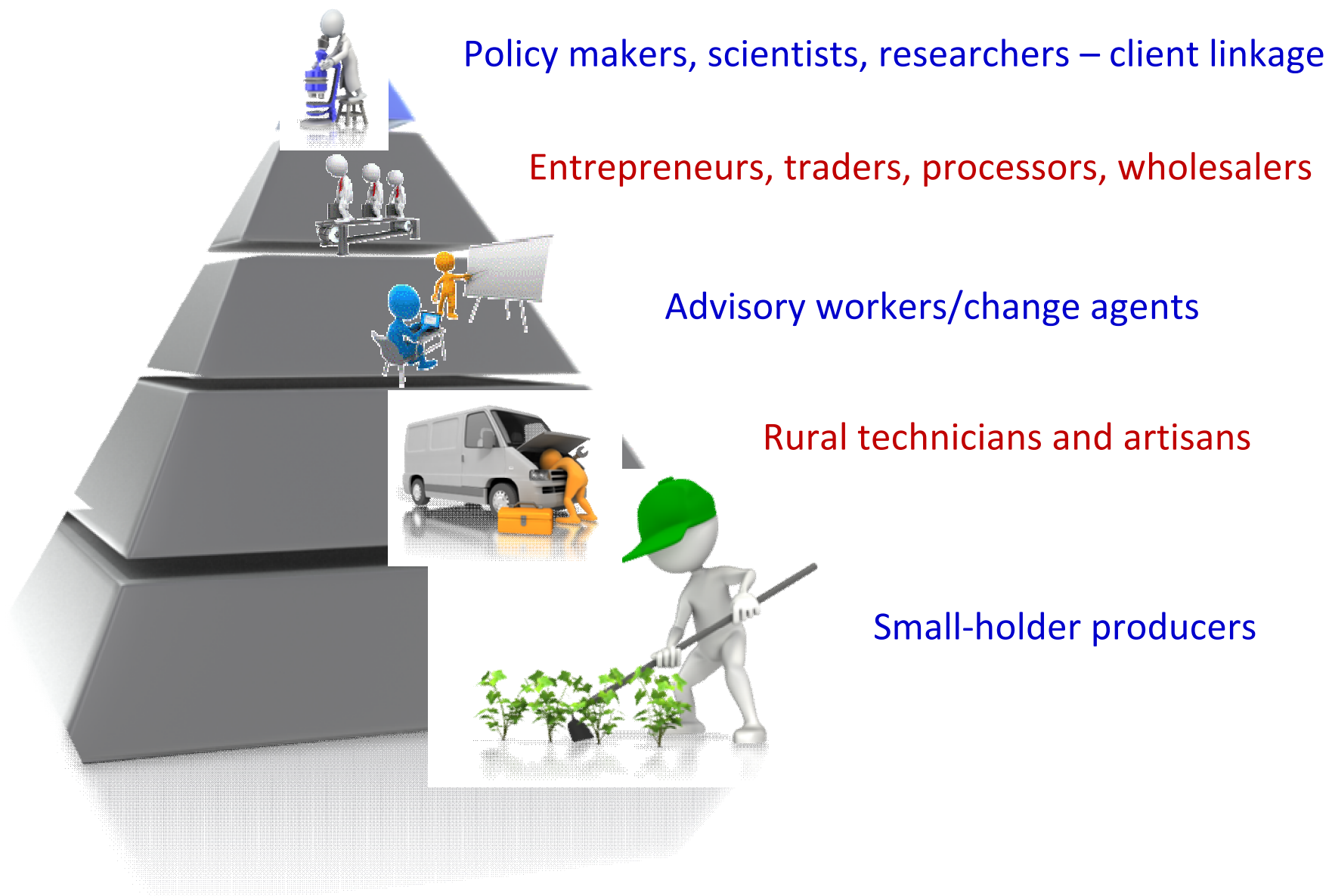
- 1. Improving foresight on future needs and priorities - determined and shaped by science & society**
- 2. True, effective partnership between research and those it serves**
- 3. Increased investments to meet huge challenges ahead**
- 4. Greater capacities to generate, share and make use of agricultural knowledge**
- 5. Effectively embed research in wider development contexts and processes**
- 6. Better demonstration of development impact and returns from agricultural innovation**



## Better Foresight: Reconciling diverse perspectives Developing common visions for the future

- ❑ Not just *projecting* what the world may become but deciding *what kind of world* we would like to see in future
- ❑ And **what innovations we need** to get to **desired scenarios**
- ❑ **Trends are products of our behaviour – and can be changed**
- ❑ **Smallholders** must have a say in envisioning their own future
- ❑ Need to **inform** policy **choices** about their implications
- ❑ Societies decide for themselves, **on their own terms – can be dramatic choices e.g. China urbanization**
- ❑ **Universities a vital role in free-thinking**

# Building the Human Capacity Pyramid







# Delivering research products through seed is rapidly consolidating the private input sector

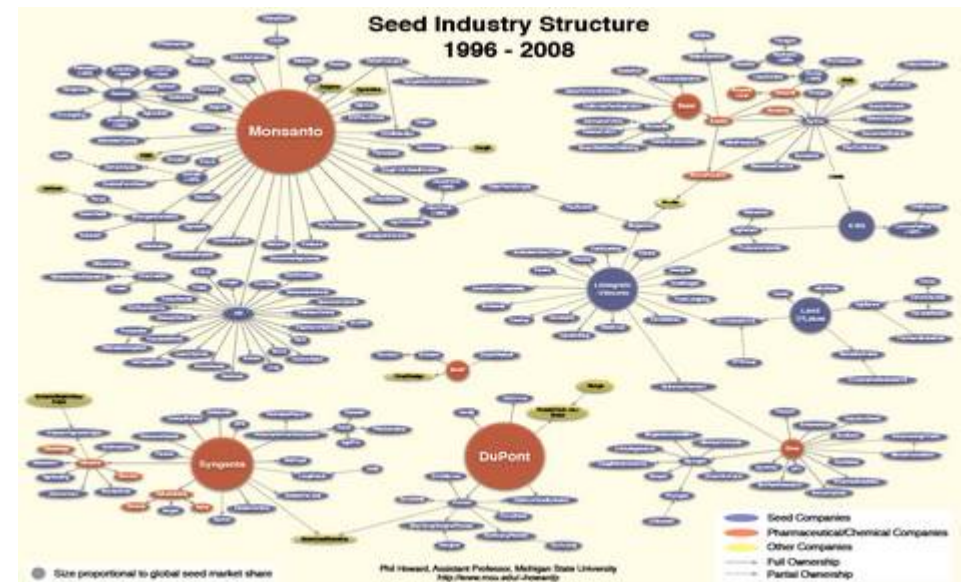
Evolution in international seed trade



Iowa State Univ. 2012

- Cheap fast transportation
- Development of hybrids
- Higher speed of breeding
- Counter-season production
- IP protection

- Top 5 companies share of world market:  
**1995: 9.4% 2011: 45.9%**
- Changes driven by: market value & nature of research investments costs & scale of returns, economies of scale, regulatory procedures & costs





## For resource-poor family farms, turning innovation into enterprise requires new policies & support:

**Under-represented & vulnerable: lack of productivity and market gain, high cost of inputs and transport, competing needs**

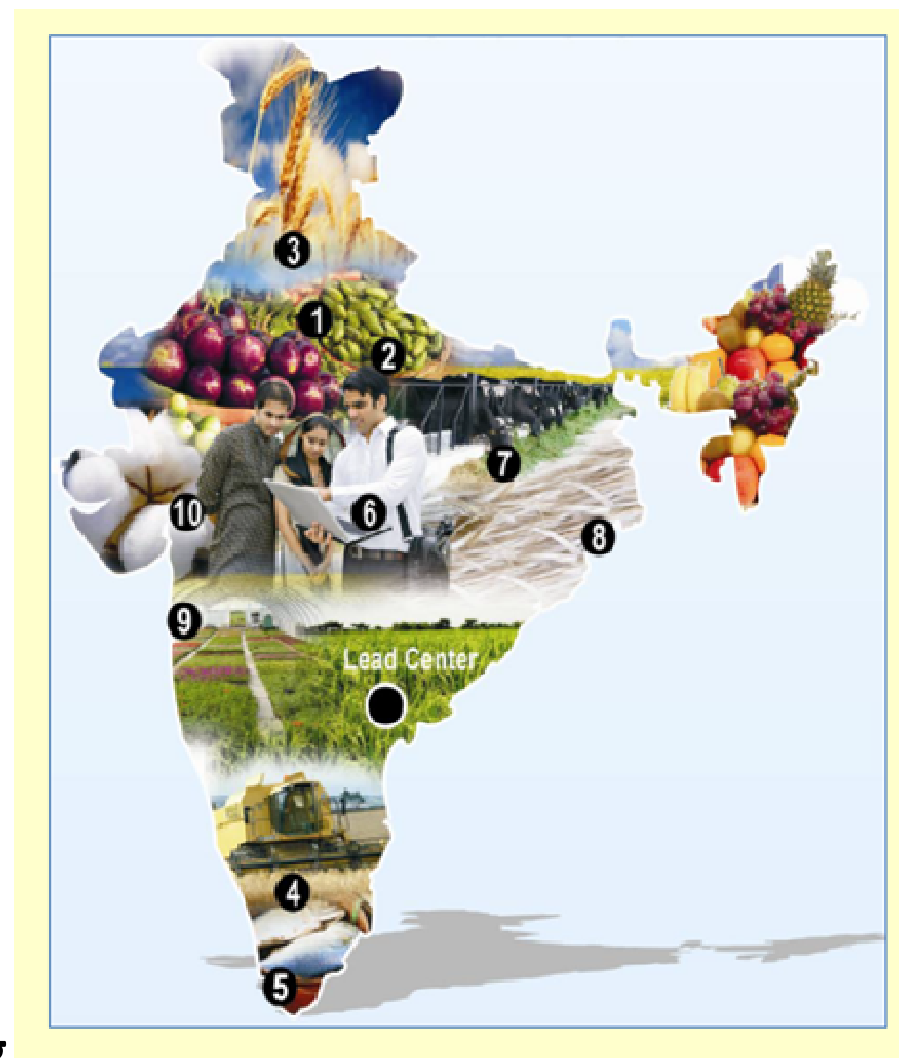
- ❑ Need enabling business environment, Business Development Services, start-up finance**
- ❑ Multi-stakeholder innovation platforms, direct linkages on the ground**
- ❑ Modern cooperatives/producer companies**
- ❑ Access to credit, insurance, land tenure**
- ❑ New forms of innovation investment empowering farmers, AMI etc**
- ❑ Greater value-add, beyond production**





## From public sector research to enterprise incubation in PPPs: e.g. ICRISAT innovation platforms

- ❑ Incentivize scientists for technology transfer
- ❑ Entrepreneur internships
- ❑ Rural enterprise management support and services
- ❑ Shared risk management
- ❑ Simpler IPR procedures & clearances
- ❑ Certified training for quality
- ❑ Work with multiple sectors
- ❑ South-South linkages & learning





## Women & Youth as entrepreneurs

- Almost 50% of farmers are women, yet receive 10% of income and 5% of technical assistance in agriculture
- Women farmers, given equal access to inputs, are as productive as men
- Research and innovation often totally miss women's needs
- Worldwide, average farmer age is around 60
- Young farmers need access to credit, land, inputs, knowledge
- ICTs revolutionize opportunities
- Training curricula need urgent reform with entrepreneurial skills and internships







## Re-inspiring Youth

- ❑ Half of Pakistan's population is <18 years old. Egypt has 40% youth unemployment and a chronic need for increased agricultural production
- ❑ Average age of an Ashanti cocoa farmer and of a Cumbrian hill farmer is **58**. Upland sheep farmer earns UKP 6,000 p.a., 60,000 new farmers needed in next decade...
- ❑ Urgent need to attract farmers and young professionals
- ❑ Needs education reform, new incentives, new opportunities in innovation & enterprise, ICTs
- ❑ Need diversity of roles: service sector & value-addition. UK: 466,000 in farming etc, 1,488,000 in food
- ❑ Agro-enterprise support, land reform, value addition





## Setting the scene – Africa (from CIPCAD)

- ❑ 2 – 3 decades of inadequate attention to higher education in agriculture since Structural Adjustments
- ❑ Food crisis highlighted the importance of agriculture
- ❑ Political commitment by African leaders (CAADP) to 6% per annum agricultural growth and 10% of public expenditures
- ❑ External partners committed to support
- ❑ Requires concerted actions from African Universities



## Practical actions in Africa

- 1. Establish a coordination mechanism at continental level for re-engineering of universities: TEAM-Africa**
- 2. Mainstream Agricultural Education into CAADP processes**
- 3. Strategic reforms**
  - Redefine new skill set(s) from existing initiatives
  - Reformulate Curricula with robust flexibility.
  - Supply of graduates and trainees must be pulled (demand driven), not pushed into the job market
  - Governance of universities to include external stakeholders (business, development partners & agencies, farmers organisations)

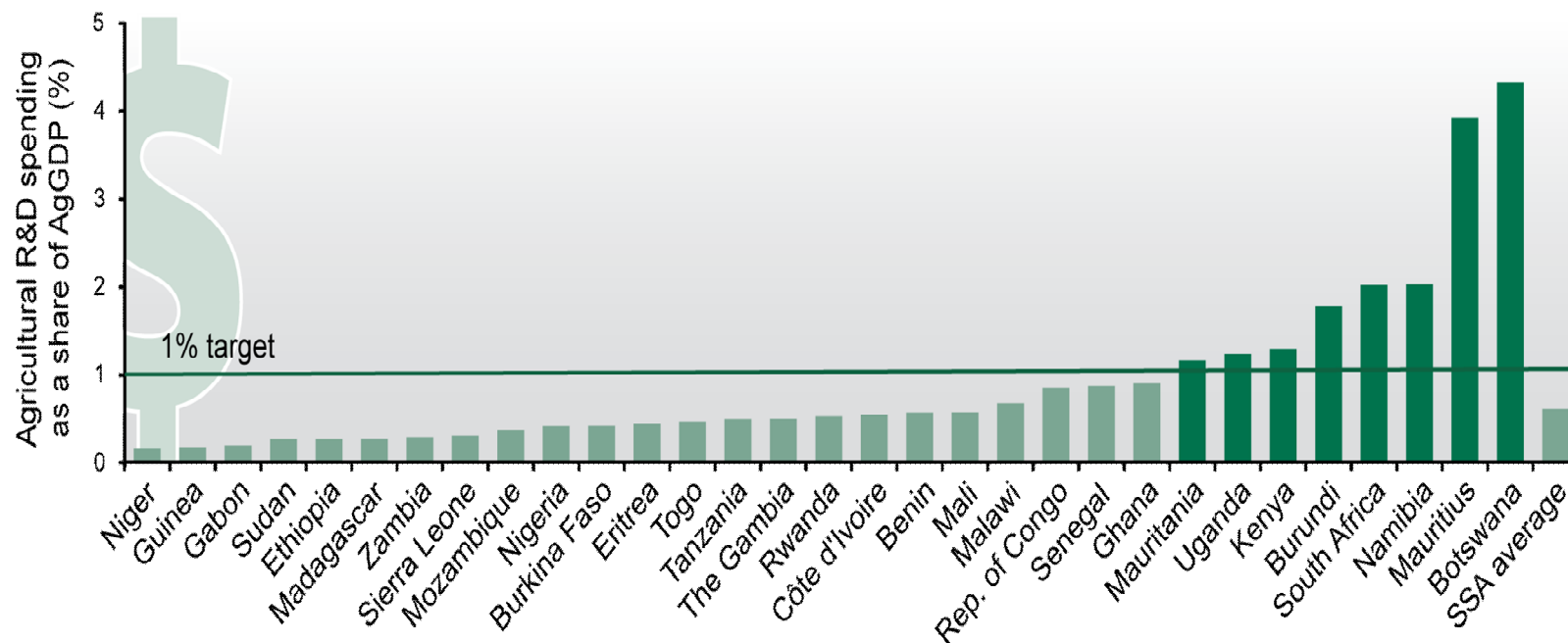


## Practical Actions in Africa

4. **Address quality *versus* quantity**  
Graduates with systemic and integrated vision and problem solving skills
5. Embrace both publication and alternative incentives & values
6. Incorporate enterprise & placements directly into curricula
7. Harmonise training systems and facilitate mobility **within Africa** (language, standards etc)
8. Link training and enterprise - UniBrain



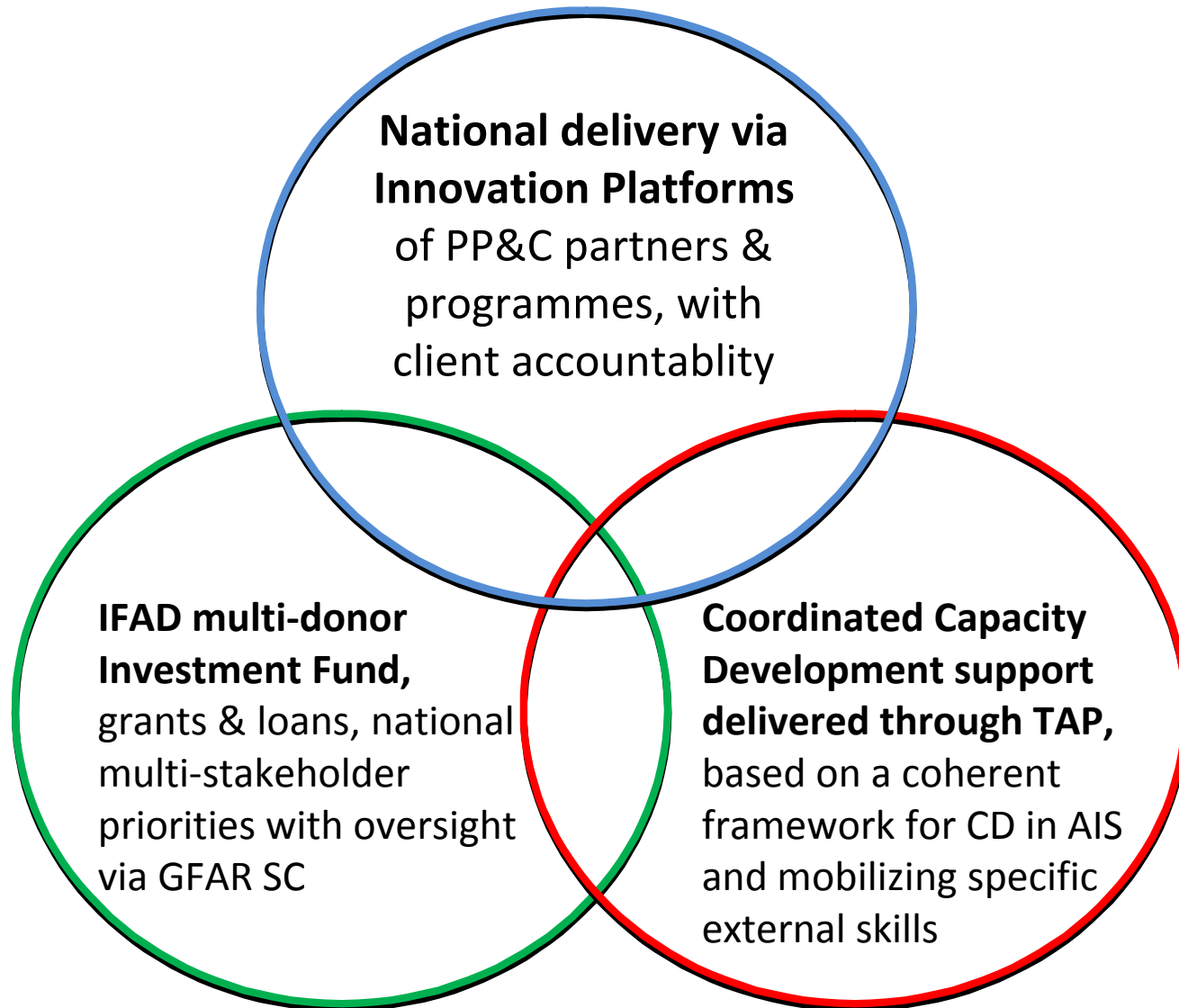
# The Investment & Capacity Challenge



- ❑ G20 is >75% of all public AR4D investments
- ❑ Africa under-invests in agricultural R&D, constrained budgets & aid project dependent. NEPAD target: at least 1% of GDP to R&D
- ❑ 22% global increase (\$5.6 billion) in last decade, but \$3.2 billion was China, India & USA
- ❑ Private sector is 21% of total \$40 billion, 54% on food, 46% agriculture



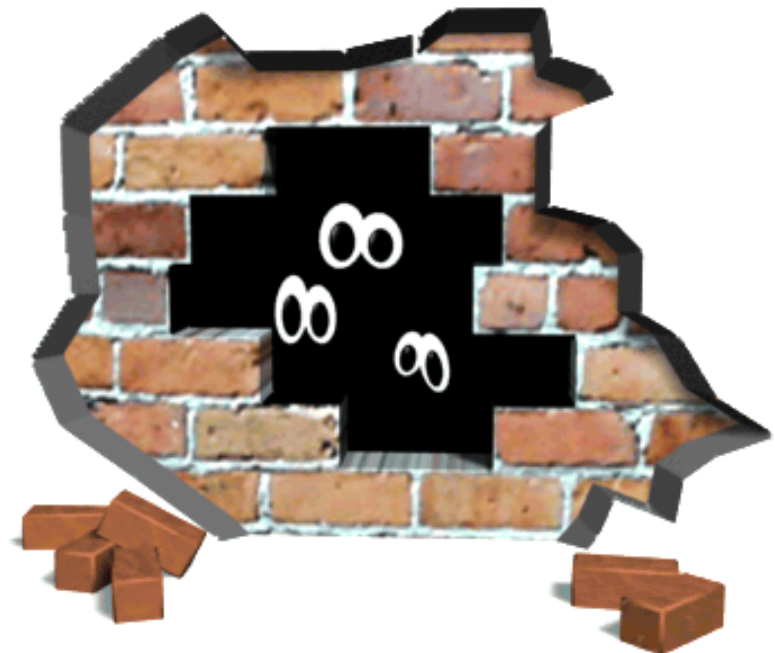
## Structure of the Integrated Investment and Innovation Facility for Innovation & Growth and roles of GFAR





## Breaking down the sectoral walls: some implications for innovation systems

- Private and public partners must ‘own’ the objectives from the outset, framed by societies
- Sustainability & resilience require equitable access & use of innovation, on-farm/local value addition
- Link upstream science into use through viable uptake pathways
- ICTs empower farmers for input regimes quality/supply assurance, market info
- More effective cooperatives/producer companies for market access & support
- Need for multi-stakeholder innovation platforms & incubators
- Empower women and youth to become the new entrepreneurs





GFAR



# Thank You

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