# COLLABORATION FOR SUSTAINABILITY AND INNOVATION

Presentation to ATPS Conference
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# SUSTAINABLE/ INNOVATION

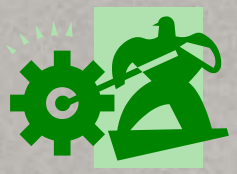
- Outline sustainable innovation
- Discuss options for growth, obstacles hindering growth
- Present vision of tapping knowledge network
  - Where and how to connect
  - Taking inventory
  - Making knowledge stick locally-absorbing, using
- Measuring success

# INNOVATION/SUSTAINABILITY CAN APPEAR TO BE AT ODDS

- Innovation is new product, process, or idea, or an existing entity applied in a new way
- Useful for economic and/or social welfare
- Inherently de-stabilizing, creates temporary inequities
  - *Public policy is needed to address this question*
- Can be difficult to apply sustainability principals
  - "Creative destruction of technological change"
- Overall growth come from reliable knowledge applied in transparent and transformative ways

# UNDERSTANDING STI

- **Technology**
  - Technology in use (products, processes, designs)
- **Human Resources**
  - Trained workers available
  - Training opportunities available
- **Institutions**
  - Standards organizations
  - Research institutes and research funds
  - Incubators and finance
- **Collaborative Capacities**
  **Communication, coordination, cooperation**
  - Extension Services
  - Professional societies
  - Conferences and workshops
- **Knowledge Resources**
  - Technical reports and scientific papers
  - Regulations and laws
  - Indigenous know-how



# STEPS TOWARDS KNOWLEDGE BASE

- Where are we coming from with S&T?
  - *Existing capacity*
- Where do we want to go?
  - *Improved efficiency and productivity*
- Do we know how to get there?
  - **THICK**
- How will we know when we have arrived?
  - In industry – *sell products, processes, services*

# FOSTERING COLLABORATION

- C = Linkages (e.g., extension services, ICT access, collaborations, S&T communication in government, media, business associations, professional societies, public awareness, etc.)

- Findings regarding knowledge flows:
  - Industry-university-policy links weak
  - *Example: Metrology, Standards, Testing, Quality*
  - Pieces in place; but insufficient interaction and feed-back
  - Cross-sectoral linkages
  - User- and producer-driven?
  - Stakeholder involvement

# MAKING KNOWLEDGE STICK LOCALLY

Are appropriate **incentives** in place to encourage communications?

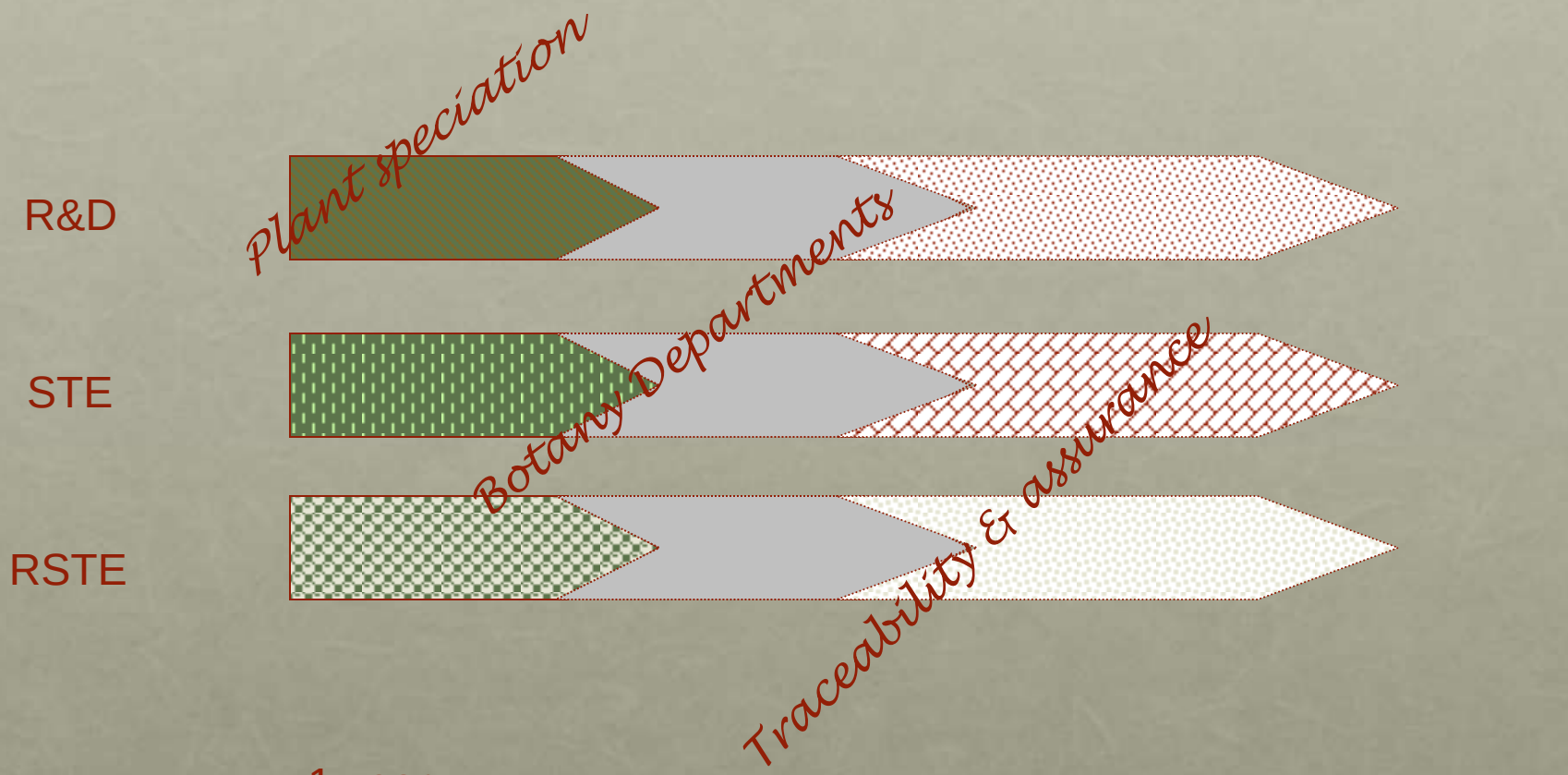
- *Fish sector recovery in Uganda*
  - *Awareness of European market standards*
- *Energy sector development in Uganda*
  - *Possibility of producing oil and natural gas for world market*
- *Public health research in Mozambique*
  - *Working together with local communities to identify needs*
- *Cashew nuts in Mozambique*
  - *Role of processors in improving producers' technology*
- *Pharmaceutical manufacturing in Uganda*
  - *Connections between local workers and global training*
- *Maputo corridor logistics initiative*
  - *Improving a wider network infrastructure around corridor*
- *Biotechnology cluster initiative*
  - *Funding to solve local health problems, creating local connections*

# CONCLUSIONS

- Positive capabilities need to be nurtured
- Investment strategies should build on existing strengths
- Communications strategies should look globally, across the continent, and regionally
  - Where to stick locally
- Extension services should include local stakeholders
- Coordination should occur in research capacity building with other countries

# TIME LINE OF INVESTMENTS

Field or Sector: __Agro-processing_



# CHANGING LANDSCAPE

- 1990 ➔ 6 countries contributed 90 % R&D
- 2008 ➔ 13 countries (not inc. EU)
- Global $ on R&D ➔ 2 % world GDP ~$1.1 trillion
- Developing countries doubled R&D spending
- Number of researchers - 5.7 million (2002) to 7.1 million (2007)

# CONTINUING RISE IN SCIENCE

| Year | Unique documents in SCI | Addresses in the file | Authors for all records | International-ly co-authored records | Addresses, international-ly co-authored records | Percent of international-ly co-authored records |
|---|---|---|---|---|---|---|
| 2011 | 1,042,654 | 2,708,877 | 6,107,758 | 361,761 | 1,359,068 | 34.7 |
| 2005 | 986,831 | 1,696,042 | 3,301,251 | 171,402 | 618,928 | 17.4 |
| 2000 | 778,446 | 1,432,401 | 3,060,436 | 121,432 | 398,503 | 15.6 |
| 1990 | 590,841 | 908,783 | 1,866,821 | 51,596 | 147,411 | 8.7 |

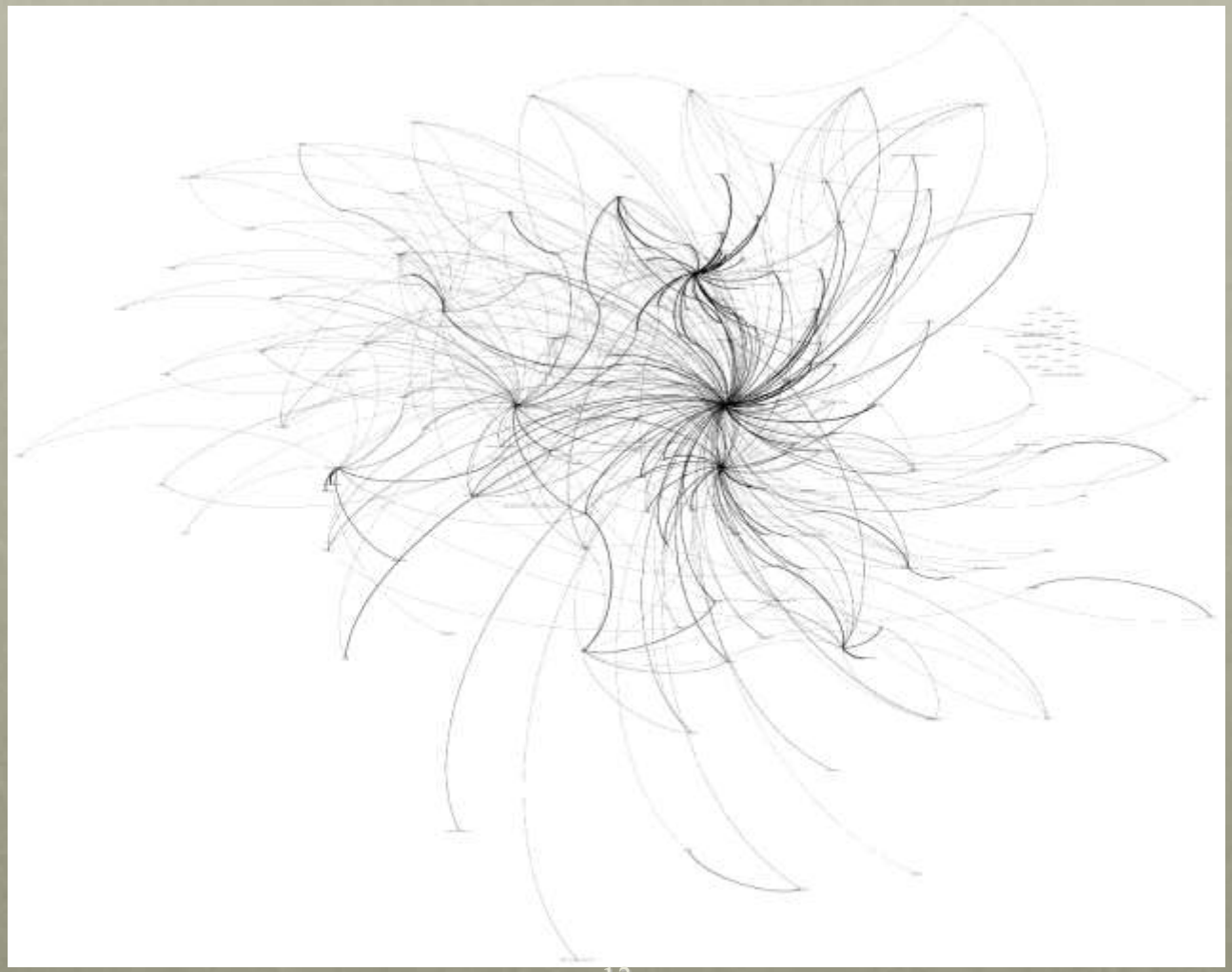
# SCIENCE KEEPS GROWING

- Scientific research publications growing in number
- Sources are proliferating
  - Open source journals
  - E-journals
  - National, disciplinary sources
- Pre-publication venues (e.g., arXiv)
- Data to fuel science is also growing spectacularly!
- Growth in itself now new… variety of sources is new

*Just how big is "science"?*

# GLOBAL LINKS 1996-2003

7 years





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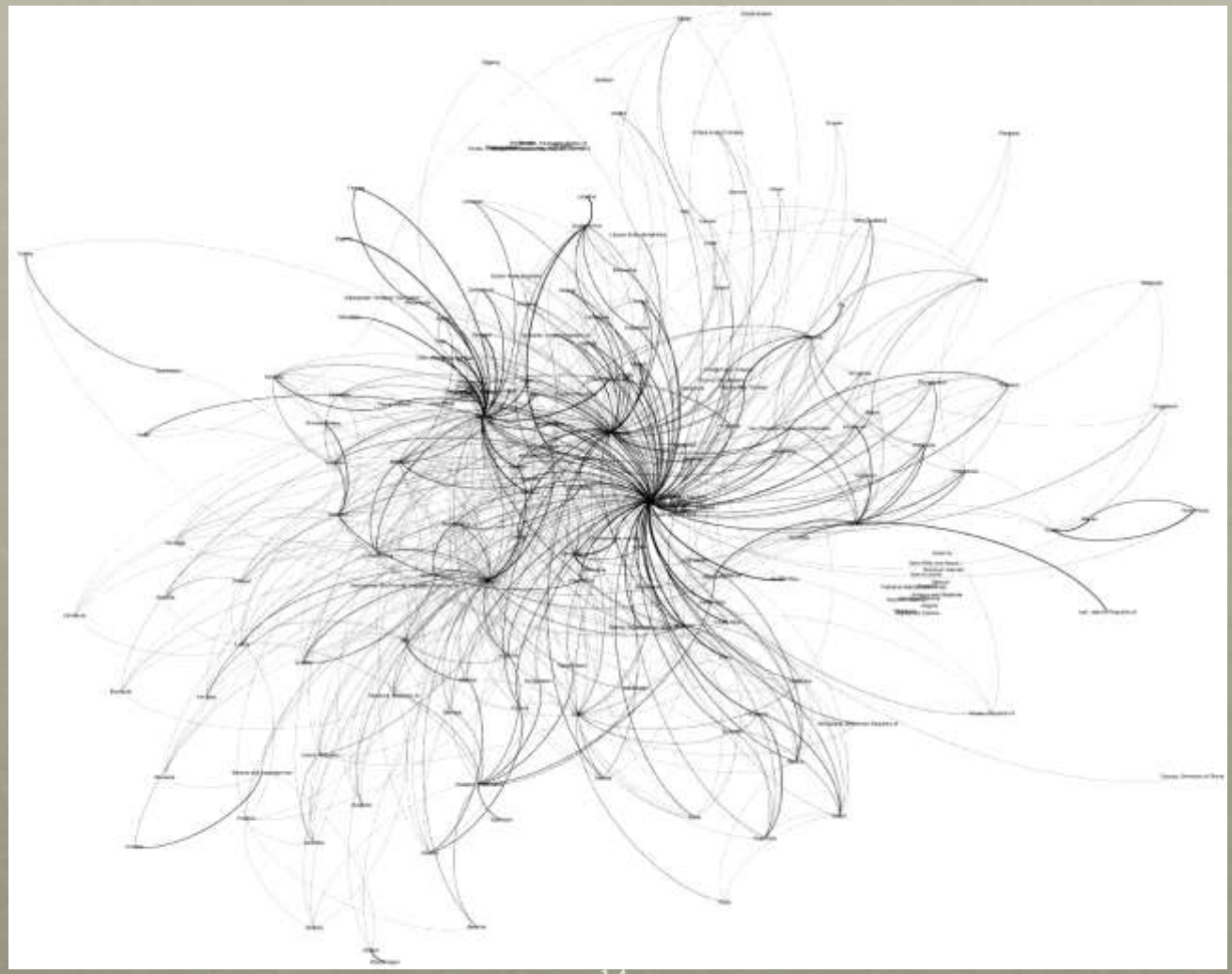
# GLOBAL LINKS 2, 2004-2008

4 years





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# COLLABORATION, NETWORKING

- S&T shifted to global system
  - System is open – in true sense of open systems
- New venues for collaboration, knowledge transfer
- Networks augmenting institutions
- Link and sink knowledge, creating collaborative teams
- Find each other using Internet, organizations like Global Knowledge Initiative