Public Access to Agricultural Data

Simon Liu, Ph.D.
Director, National Agriculture Library
July 22, 2013
Agenda

- Introduction
  - Public Access
  - Trends
- Opportunities & Challenges
- Approach & Strategies
- Action Plans
  - Scholarly Publications
  - Scientific Digital Data
- Q&A
Introduction

• Public access
  – RCUK
  – CISTI
  – Wellcome Trust

• Public access in the US
  – NIH (2008)
  – America COMPETES Reauthorization Act (12/2010)
  – Office of Science & Technology Policy (OSTP) Public Access Memo (02/2013)
  – Fair Access to Science & Technology Research Act (02/2013)
  – Executive Order – Making Open and Machine Readable the New Default for Government Information (05/2013)

• Public access to research results
  – Scholarly publications
  – Scientific digital data
Scholarly Publication Trends

- Growing number
- Multimedia components
- Increasing interactivity & dialogue
- Linkages to content environments
- Mobilization

Scholarly Publishing (2004-2012)

Source: Scopus
Scientific Digital Data Trends

Data Desert
- Limited Data
- Expensive to collect
- Lack of automation
- Labor intensive
- Lack of exchange mechanisms
- Without sharing culture

Data Tsunami
- Large volumes
- High velocity
- Complex variety
- Unknown value
New Research Opportunities

(1) Collect lots of data
(2) Find correlations, make nice graphs
(3) Publish a paper

(4) Data-Intensive Scientific Discovery
General Talent Shortage

Demand for deep analytical talent in the United States could be 50 to 60 percent greater than its projected supply by 2018.

Supply and demand of deep analytical talent by 2018 (thousand people):

- 2008 employment: 150
- Graduates with deep analytical talent: 180
- Others: 30
- 2018 supply: 300
- Talent gap: 140–190
- 2018 projected demand: 440–490

50–60% gap relative to 2018 supply

Other supply drivers include attrition (-), immigration (+), and reemploying previously unemployed deep analytical talent (+).

Unique Ag Data Challenges

Most agricultural data are generated & managed locally.

Unique challenges
• Data dispersion
• Data heterogeneity
• Data sharing
How to Respond?

Business as usual?
A New Approach

We need something better, Jim!
## Needs Analysis

### Capability

<table>
<thead>
<tr>
<th>Data Collection</th>
<th>Technology &amp; Expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compute/Analyze/Visualize Data</td>
<td>Domain Informatics</td>
</tr>
<tr>
<td>Integrate/Link Data</td>
<td>Domain Informatics</td>
</tr>
<tr>
<td>Collaborate &amp; Social Network</td>
<td>Tools + Administration</td>
</tr>
<tr>
<td>Share/Exchange/Disseminate Data</td>
<td>Protocols + Standards + Tools</td>
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<tr>
<td>Access/Retrieve Data</td>
<td>Web Apps + Tools + Programming</td>
</tr>
<tr>
<td>Organize/Curate Data</td>
<td>Standards + Tools + Programming</td>
</tr>
<tr>
<td>Store/Archive/Preserve Data</td>
<td>Storage Devices + Databases</td>
</tr>
<tr>
<td>Collect/Generate Data</td>
<td>Computers + Networks + Security</td>
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</table>

### Technology & Expertise

<table>
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<tr>
<th>Domain Informatics</th>
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<tr>
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NAL New Organization
Pub Ag – Scholarly Publications
Automatic Indexing

NAL Thesaurus

Abstract/Full Text

Automatic Indexing System

- Lexical Analyzing
- Natural Language Processing
- Rules
- Regular Expressions
- Pattern Recognition
- Fuzzy Logic
- Machine Learning

Enriched Abstract/Full Text
Ag Data – Scientific Digital Data

- Web Portal/Interface
- APIs
- Data Catalog

Existing Investments

To Be Built
A Practical Hybrid Approach

- Investments
  - Existing & new
  - USDA & external
- Centralized & Distributed
  - Centralized data catalog
  - Distributed data sets
- Standardized & Domain Specific
  - Standard data catalog metadata
  - Domain specific data formats
- Access – Centralized & distributed web portals/interfaces
Journey Together – IAALD
The African Centre for Crop Improvement (ACCI)
Location of ACCI

• A specialist unit at the University of KwaZulu-Natal, Republic of South Africa
Mission of ACCI

• Est. 2001 with core-funding from the Rockefeller Foundation; now funded by the Alliance for a Green Revolution in Africa (AGRA – a proxy of BMGF)

• Mission – to train PhD level African plant breeders, on African crops, in Africa, on food security crops

• Students from 14 Eastern & Southern African countries

• Mandate to train >80 PhDs in plant breeding at world class level
Vision of ACCI

• To produce world class plant breeders, who will succeed in Africa, despite tough working environments, limited resources
• That all of the graduates will succeed in their home country, at their home research station
• That each student’s PhD study is just the start of a much bigger, long-term breeding program, conducted in their home country;

That all of students have to graduate on time & serve
The ACCI program

• Unique structure in South African context
  • Coursework in SA (1/2 years)
  • Research in-country (3 years)

• Unique supervision arrangements
  • Staff full-time supervisors
  • Supervise in RSA and in-country
  • Also In-Country Co-Supervisors

• Broad training as plant breeding leaders, & specialist research tools
Part of the network

J. Tignegre
R. Kaumunika
R. Naidoo; Alina
A. Efisue

Abalo, Nkalubo, Owere, Asio Orawu, Mukankusi, Robooni Barekye, Kagezi, Lubade, Lamo, Kagoda, Kasozi, Olupot,

Karari, Kamau, Kivuva Munga, Leley, Kwena, Odouri, Ndung’u, Ojwang, Kimani, Gichuru, Murenga

K. Mtunda, A. Mushongi, Killenga, Nyaligwa, Bucheyeke

F. Miti, M. Chiona, M. Mukanga, Chikoti, Abel

Kananji, Muzengeza, Banda, Chintu, Chamango

J. Derera, L. Machida, J. Sibiya, I. Makanda

Mariote, Fato, Chiulele, Chauque, Hilario, Amade

ACCI, UKZN
Support by Mann Library

- Library loan services
- Students conduct literature search
- Then send e-mail request to Mann Library
- Within a day or 2 they get a pdf copy or scanned copy of the paper

**CHALLENGES**: lack of funding due to budget cuts at AGRA threatens this facility
Coordination of research proposal reviews

Research proposal review through video conferences – students defend proposals

Facilitated by Vernon Gracern & Stefan Einarson

Training students in data bases & Communication by Baseema
Research proposals integrate socio-economic with plant breeding research problems
Research proposal linked with breeding program – providing solutions for Africa
Research proposals are subjected to rigorous review by international experts
Independent reviewers selected by Cornell
Students defend proposals in a Video conference with Panellists sitting at Cornell University
Challenges: publications

• >100 articles published in peer reviewed journals

• The Literature Reviews & Participatory Rural Appraisals by 4 student Cohorts published in an annual yearbook of the ACCI

• >100 abstracts in conference proceedings etc
Challenges: Access to information

- Lack of suitable/accredited local journals for students to publish “local” African information
- Limited connectivity in many research stations across Africa limit access to e-learning resources
- Situate in South Africa, the ACCI PhD program does not have access to free Teal
- 10% budget cut on library services may reduce access to information data bases & journal subscription
Opportunity for e-learning resources

• The BMG foundation is giving a grant to Iowa State University to develop e-lectures for a new MSc program in commercial plant breeding
• Proposal development still in progress
• New MSc program to be launched at 3 universities – KNUST (Ghana), Makerere (Uganda) & KwaZulu-Natal (South Africa)
Graduation – 50 plant breeders but not assured of continuity; many challenges?
Transnational Learning

A program that leverages experience and resources from Cornell University's College of Agriculture and Life Sciences to work with partner institutions, mainly in the developing world, with the aim of increasing food security.
Transnational Learning

Three program examples:

• Working with University Partners – to help support their local teaching with e-learning from Cornell

• Working with Peer Organizations – helping them to establish streaming media production platforms

• Providing a Conduit to Cornell’s Mann Library – to provide a mechanism for utilizing Mann’s extensive resources for partner institutions
Transnational Learning

The project has expanded to providing content and interactions in:

• 11 African countries
• Thailand
• Philippines
• India
• Mexico
Transnational Learning

Selected topics (over 1,000 modules):

• Mendelian, quantitative, and population genetics
• Plant reproductive biology
• Experimental design and statistics
• Molecular genetics, molecular markers, and applied genomics
• Plant pathology, entomology, and IPM
• Cell and tissue culture methods
• Transformation, transgene construction and analysis
• Variety release, registration, IPR, and distribution
Example Digital Class

Sorghum Improvement: Beyond a Feed Grain and Forage

William L. Rooney
Professor, Sorghum Breeding and Genetics
Department of Soil & Crop Science
AIP Project

Establishing e-learning centers at:

- BHU
- AAU
- SVAPUT – Meerut

Teaching them about e-learning
Helping them create e-learning platforms
Help them learn to create e-learning content
AIP Project

Establishing OLAT as a learning platform

- Assignments
- Readings
- Chat with professors
- Quizzes
- Extra materials for independent learning
- Forum for students to help each other
- Calendar for when things will happen
Summary of E-Learning Africa Report 2013

Survey:
• 42 African countries
• 413 respondents
• Targeted at practitioners involved in e-learning
Summary of E-Learning Africa Report 2013

Technologies to Support Learning

- Laptop: 83
- Mobile Phone: 71
- Standalone PC: 67
- TV: 34
- Radio: 31
Summary of E-Learning Africa Report 2013

Top constraints in the use of digital technologies for learning

- Lack of training: 31
- Limited Electricity: 37
- Lack of political will: 38
- Bandwidth Constraints: 40
- Lack of appropriate Hardware: 43
- Lack of Financial Resources: 54
Summary of E-Learning Africa Report 2013

Over 50% said that they had experienced some form of failure with respect to e-learning
Summary of eLearning Africa Report 2013

What effects does technology have on learning outcomes

- Outcomes Primarily Positive: 71
- Outcomes unknown: 11
- No Effects on outcomes: 9
- Outcomes Negative: 8
- Not Applicable: 1

Outcomes Primarily Positive: 71
Outcomes unknown: 11
No Effects on outcomes: 9
Outcomes Negative: 8
Not Applicable: 1
Gartner Group Technology Hype Cycle - Education

- Technology Trigger
- Trough of Disillusionment
- Slope of Enlightenment
- Plateau of Productivity
- Peak of Inflated Expectations

TIME
Gartner Group Technology Hype Cycle - Education

- Peak of Inflated Expectations
- Plateau of Productivity
- Slope of Enlightenment
- Trough of Disillusionment
- Technology Trigger
- TIME
- 802.11n
- Lecture Capture and Retrieval Tools
- Student Enrollment CRM

Cornell University
Gartner Group Technology Hype Cycle
- Education

- Peak of Inflated Expectations
  - Mobile Learning with mid and low range Handsets
  - Mobile Learning Smartphones
  - Lecture Capture and Retrieval Tools

- Plateau of Productivity
  - 802.11n
  - Student Enrollment CRM

- Slope of Enlightenment

- Trough of Disillusionment

- Technology Trigger

TIME
Gartner Group Technology Hype Cycle - Education

- Technology Trigger
- Trough of Disillusionment
- Slope of Enlightenment
- Plateau of Productivity
- Peak of Inflated Expectations
- Digital Preservation of Research Data
- Mobile Learning with mid and low range Handsets
- Mobile Learning Smartphones
- 802.11n
- Lecture Capture and Retrieval Tools
- Student Enrollment CRM

Cornell University
Gartner Group Technology Hype Cycle
- Education
IAALD World Conference
July 2013

Cornell University

International Programs
College of Agriculture and Life Sciences
1963-2013
MOOCs
Social Networks for Livelihood Development
Social Networks: Targeting | Empowering | Connecting
Social Networks: Targeting | Empowering | Connecting
Member  Member  Member  Member

Location  Time

Activist

Social Networks: Targeting | Empowering | Connecting
Social Networks: Targeting | Empowering | Connecting
Social Networks: Targeting | Empowering | Connecting
<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
<th>Message</th>
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<tbody>
<tr>
<td>Sermila Devi</td>
<td>09 Feb 2012</td>
<td>Key Super Bag Hawa aur nemi dono se bachata hei</td>
</tr>
<tr>
<td>Anju Devi</td>
<td>12 Feb 2012</td>
<td>Super Bag Ke Sath ek Dusra bora key dalte hei ?</td>
</tr>
<tr>
<td>Bina Devi</td>
<td>12 Feb 2012</td>
<td>Super Bag kaha milta hei ?</td>
</tr>
<tr>
<td>Cghakkhen Singh</td>
<td>17 Feb 2012</td>
<td>Conoweeder Kaha milta hei ?</td>
</tr>
<tr>
<td>Laxmikant Singh</td>
<td>04 Feb 2012</td>
<td>Supar Bag Ko Key Nukila nehi lagana he ?</td>
</tr>
<tr>
<td>Chote Lal Singh</td>
<td>06 Feb 2012</td>
<td>Supar Bag kaha Milta Hei</td>
</tr>
<tr>
<td>Renu Devi</td>
<td>07 Feb 2012</td>
<td>Key supar Bag me Sifr Anag hi Rakhte hei</td>
</tr>
<tr>
<td>Bharuwa Singh</td>
<td>25 Feb 2012</td>
<td>supar Bag me koi v Saman rekh sakthe hei key</td>
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</tbody>
</table>

Social Networks: **Targeting** | **Empowering** | **Connecting**
Social Networks: Targeting | Empowering | Connecting
Social Networks: Targeting | **Empowering** | Connecting

- **Members**
  - Farmers
  - Service Providers

- **Activists**
  - URDHAB DORA
    - facilitated 314 screenings and
    - 1,471 adoptions.
  - DAITARI NAIKAM
    - facilitated 303 screenings and
    - 1,218 adoptions.
  - Chandrasen Khara
    - facilitated 388 screenings and
    - 1,485 adoptions.
  - Ramesh Chandra
    - Bad... facilitated 76 screenings and
    - 271 adoptions.
Rikin Gandhi shared a link.
Yesterday at 7:53am via DigitalGreen

Farmerbook
Abanti Sethy
Adopted Planting technique of Little gourd on Apr 2011.
Village Gurus

Village gurus work with you to make industries and buildings run faster

Member

Learn More about this guru

Request Help

Social Networks: Targeting | Empowering | Connecting
Technology magnifies human intent and capability.

Successful use of technology require support from well-intentioned, competent people or organizations.
Thanks!
CHALLENGES AND OPPORTUNITIES?

• THE FUTURE ROLE OF LIBRARIES

• THE OPENNING OF ACCESS TO SCIENTIFIC LITERATURE

• THE INTENSIVE USE OF ICT FOR AGRICULTURE
Articulated the Challenges

- **CHALLENGE 1:** The future of specialized agricultural Libraries.
- **CHALLENGE 2:** Access to free relevant content, preservation of institutional memories and better agricultural publishing.
- **CHALLENGE 3:** Better use of Information, Communication and Technology in Agriculture.
THE STATE OF INFORMATION LITERACY POLICY: A GLOBAL PRIORITY

Sharon Weiner, EdD, MLS
Professor, W. Wayne Booker Chair in Information Literacy
Purdue University, USA
Vice-President, National Forum on Information Literacy

IAALD, 7/22/2013
Outline

W. Wayne Booker Chair in Information Literacy

The State of IL Policy: A Global Priority:

Developing a Common Understanding
  What is Information Literacy (IL)?
  What is Information Policy?

Information Policy and Global Challenges

International IL Policy

Taking Action: Addressing the Issues!
W. Wayne Booker Chair in IL

W. Wayne Booker

Opportunities and challenges…

• Advocacy for IL, outside of libraries and academia

• Research on IL, organizational and policy aspects, integration into teaching and curricula, IL outside libraries

• IL Handbook Series (Purdue University Press)

• International collaborations

• Workforce and everyday life

• Mentoring, consulting, writing, program development and assessment
What is IL?

Information Literacy

- Lifelong Learning
- Informed Learning
- Information Fluency
- Critical Thinking
- Problem-solving
- Competitive Intelligence
- Evidence-based Practice
- MIL
- Digital-Health-Financial, etc. Literacies
What is IL?

NARROW CONCEPTION OR BROAD CONCEPTION?

Teaching skills—course success

Teaching range of competencies—life success
What is IL?

*Information literate people are those who have learned how to learn.* They know how to learn because they know how knowledge is organized, how to find information, and how to use information…They can always find the information needed for any task or decision at hand.

ALA 1989
A critical competency

Information Literacy

Educational Success

Workforce Readiness

Everyday Life
What is information policy?

**Encompasses**
- Laws
- Regulations
- Doctrinal positions
- Other societal decisions

**Related to**
- Info Creation
- Processing
- Flows
- Access
- Use
Information policy

• Involves technology, communications, law, government, medicine, education, business, economics

• Complex and multi-dimensional

• Information policies can facilitate access to and use of information or they can restrict it
**Information policy**

Weiner’s categories…

<table>
<thead>
<tr>
<th>Information Infrastructure</th>
<th>Information Resources</th>
<th>Information Literacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>• technologies that allow for access to information</td>
<td>• knowledge content</td>
<td>• competencies to effectively and efficiently find, use, manage, and communicate information for specific purposes</td>
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<tr>
<td></td>
<td>• accessibility through open access</td>
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<tr>
<td></td>
<td>• legal and ethical use</td>
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Information policy

• Varies considerably from one nation to other, and even within nations

• May be inconsistent; over-regulated; or completely lacking

• Develop as needed or as problems arise, rather than in coordinated, cohesive manner with all major stakeholders participating
Information policy and global challenges

How well an individual, an organization, and an entire society can harness, access, share, and make use of available information will ultimately decide their ability to generate economic growth and to enhance the quality of life for all.

Gwang-Jo Kim
Director of UNESCO Bangkok (Karan, 2011)
Information policy and global challenges

All can access, find, use info

Collaboration among stakeholders, communities, societies

Effective and sustainable solutions to global problems
Information policy and global challenges

Inequity in access to information and inadequate training in how to use information worldwide hampers the collective problem-solving that could lead to dynamic, innovative results.

Weiner 2013
Information policy and global challenges
Information policy and global challenges
Information policy and global challenges

Teach to the needs and challenges of the 21st century?
International IL policy
Many issues…

- Lack of recognition of relevance of info in development

- ICT is not enough! Does not ensure that people can effectively find and use information

- Limited capacities, resources, and infrastructure

- Restricted access to information
  - Restrictions on access to info in some locations and sectors
  - Limited info in the public domain
International IL policy
What are the issues?

• Better organization for existing resources needed
  • DataBib

• Insufficient libraries and databases of industrial, scientific and statistical information

• Opinions on who should be responsible for information literacy vary: Govt? Education? Workplace? Personal responsibility?
International IL policy
What are the issues?

- Need for respect for cultural and linguistic diversity
  - English-speakers have access to more info in most fields

- Lack of awareness of long-term preservation of info

- Lack of cross-sector and interdisciplinary stakeholder collaboration

- Changes of personnel in policymaking positions
International IL policy

- NGOs have long history of developing recommendations related to information policy

- Most countries do not have a coordinated, well-planned strategy involving multiple stakeholders, prioritization, and sufficient funding to address ICT, creation of relevant information resources, or IL
International IL policy
A sampling...USA

- No central coordinating body for info policy
- Different organizations, agencies, states create policies that can be incompatible, redundant, or conflicting
- Many educational institutions and accrediting organizations include IL as a standard
International IL policy
A sampling... USA

- Information Literacy Proclamation Project
  - Encourage IL advocates in each state and territory to request proclamation from governor on October as IL Month
  - Recognize IL as societal issue, not just library or school issue
  - Increase visibility of IL outside of libraries
  - Give policymakers notice about emerging issue
The ability to seek, find, and decipher information can be applied to countless life decisions, whether financial, medical, educational, or technical.
International IL policy
A sampling…Wales

• Information Literacy Framework for Wales

  • Unified approach to embedding IL in education and training
  • U.K. Seven Pillars model: identify, plan, scope, gather, evaluate, manage, present
  • Mapped IL to national curriculum
  • Credit and Qualifications Framework for Wales—throughout life
International IL policy
A sampling...Africa

- Francophone Africa, ICT and digitization not well developed, so IL training covers the use of print resources.

- No national info policy, but govt recognizes importance for problem-solving and economic development
International IL policy
A sampling…Latin America

• Postsecondary institutions, though not usually part of curriculum

• Little IL activity in schools and none in public libraries or the private sector
International IL policy
A sampling…Europe

- European Network on IL posts links to policy info for countries

- U.K. incorporated info policy functions into Cabinet Office

- Departments address developing citizens’ skills, promoting media literacy, and libraries, museums, and broadcasting
International IL policy
A sampling…Finland

- Leading knowledge-based economy since 1990s

- Occurred because of strong educational system and institutions for formation of national consensus

- Leaders attended programs in economic policy management and national strategy issues-helped to conceptualize and implement change

- PM chaired Information Society Council that included key representatives of public administration, private sector enterprises, interest groups, and organizations
Addressing the issues…

• Think about what you can do…

• Professionally, societally, personally
Addressing the issues…

• Education policy

  • Consider education a progressive continuum through life rather than as segmented courses, modules, learning outcomes to be mastered and forgotten

  • Include expectation of IL in teacher education, for teachers-in-training, for teachers-of-teachers, students, throughout lifespan
Addressing the issues…

- Communicate importance of IL to stakeholders
- Work with communities
- Need stories of how IL affects decisions and problem-solving, lack of IL hinders it
Addressing the issues…

• Need data on the cost of lack of IL

  • Standard of living related to financial resources + financial literacy

  • Lower health literacy = difficulty controlling chronic illnesses, less likely to participate in disease prevention programs, more likely to be hospitalized, greater mortality
In conclusion…mixed success

Conference theme:
Emerging Priorities for Scientific Information, Food Security
In conclusion…concerted effort needed

- What are the emerging priorities for scientific information?
  - Creation and organization of digital resources
  - Information literacy—how to find and use information (in all of its forms) for a specific purpose

- What can you influence your professional organizations to do?

- How can you influence your communities, societies, governments?
Thank you!

Questions and comments…
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Tăbușcă S. The Internet access as a fundamental right.


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UN. Millennium Development Goals.
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UNESCO Constitution. 1946.


Welsh Information Literacy Project.