Agricultural Higher Education in the 21st Century: Non-Traditional Educational Models

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The Commonwealth comprises 53 developed and developing nations around the world.

Map Published by the Communications and Public Affairs Division, Commonwealth Secretariat
COMMONWEALTH OF LEARNING

WHAT IS IT FOR?

To help Commonwealth governments and institutions use various technologies to improve and expand learning for development
Where is it?

Burnaby, Canada
(Headquarters)

New Delhi, India
(CEMCA)
Plan

Global Context

Agricultural HE in Developing countries

What are the options?

The Way Forward
Global Context

- World population 9.1 billion by 2050.

IFAD, 2012

925 million hungry people worldwide

1.4 billion live on less than a dollar a day
The youth ‘bulge’

- In 2013, 74.5 million young people aged 15–24 were unemployed

1.2 billion youth

17% of the world’s population

74.5 million Unemployed Youth
Challenges

- Decline in contribution to GDP
- Unemployment, underemployment
- Decreased investments
Pressing Needs

- **Food production** will need to nearly double by 2050 in developing countries.
- **GDP growth generated by agriculture** is up to four times more effective in reducing poverty than growth generated by other sectors.

IFAD, 2012
AGRICULTURAL HIGHER EDUCATION IN DEVELOPING COUNTRIES
Colonial Beginnings: Asia

1871
- Department for agriculture in the Indian sub-continent formed

1893
- Agricultural colleges and veterinary colleges established

1929
- Imperial Council of Agricultural Research

1949
- Just After Independence
- Educational Commission of India recommended setting up rural universities in India on American land-grant Model
Africa

1924

- Post-secondary education in Agriculture began in Makerere University as a certificate course

1960’s-1980’s

- Around 20 universities introduced faculties of agriculture and veterinary sciences (Beintema, 1998)
Green Revolution in Asia

• Setting up of State Ag Universities (India, Pakistan, the Philippines)
• Influenced by US Land Grant Colleges system
• Not designed for very large numbers of students
## Tertiary Education and Share of Agriculture in Sub-Saharan Africa

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Enrolment in Tertiary Education</th>
<th>Total Enrolment in Agriculture/Tertiary Level</th>
<th>Share of Agriculture in Total Enrolment %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year*</td>
<td>Number</td>
<td>Annual Growth %</td>
</tr>
<tr>
<td>Ghana</td>
<td>2000-2007</td>
<td>140,017</td>
<td>22</td>
</tr>
<tr>
<td>Kenya</td>
<td>2000-2004</td>
<td>102,798</td>
<td>4</td>
</tr>
<tr>
<td>Malawi</td>
<td>1999-2007</td>
<td>6,458</td>
<td>13</td>
</tr>
</tbody>
</table>

*earliest and the latest year for which data are available

**not available**
Challenges: Africa

Public Spending
- 4% in SSA; 10% in Asia

Research
- 42 researchers per 1 million
- 276 per 1 million in Namibia

Extension Officers
- 1 per 30,000 farmers in Mozambique
- 1 per 2500: Tanzania
- 1 per 3333: Nigeria

1 IFRI, 2011
2 Davis et al, 2010
Challenges: Asia (India)

• By 2022, 20 million trained persons required. (Govt report, 2014)

• 2020, 54,000 graduates required. Number available: 24000 (Singh, 2013)

Institutional Capacity will need to double
WHAT ARE THE OPTIONS?
NON-TRADITIONAL EDUCATION MODES
Exploding demand for HE

- 2007: 150.6 million tertiary students globally
- 2012: 165 million
- 2025: 263 million
THE DEMAND

4 new universities to cater to 30,000 needed each week to accommodate children who will reach enrolment age by 2025³

³ go.nature.com/mjuzhu, Everitt, qtd Liyanagunawardena et al. 2013
Can the phenomenal growth in ICTs help?
1. The Rise of Open Universities
The philosophy of ‘open-ness’

- Open as to people
- Open as to places
- Open as to methods
- Open as to ideas

-Lord Crowther
‘Open-ness’ in Practice

- No entry qualifications
- Credit banking
- Cafeteria approach for courses
Open and distance education in mega universities

<table>
<thead>
<tr>
<th>Country</th>
<th>Institution</th>
<th>Enrolment</th>
<th>% of Campus Cost*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pakistan</td>
<td>AIOU</td>
<td>456,126</td>
<td>22</td>
</tr>
<tr>
<td>China</td>
<td>CCRTVU</td>
<td>2,300,000</td>
<td>40</td>
</tr>
<tr>
<td>India</td>
<td>IGNOU</td>
<td>1,187,100</td>
<td>35</td>
</tr>
<tr>
<td>UK</td>
<td>OU</td>
<td>203,744</td>
<td>50</td>
</tr>
</tbody>
</table>

*Unit cost per student as a percentage of the average for other universities in the country, NKC, 2004.
The Open University

- highest rated for overall student satisfaction in the 2012 National Student Student Survey
- rated fifth of 100 UK universities (2003)

Source: http://www.open.ac.uk/about/main/the-ou-explained/facts-and-figures
Agriculture Programmes in Open Universities

- School of Agriculture (started in 2005)
- Certificate and Diploma programs
- Doctoral program in Extension and Dairy Science

- School of Agricultural Sciences (started 1993)
- Certificate, Diploma and Degree programs
- Bachelor in Horticulture program
  - contributed to creation of wine industry in the region

Sources: [http://ignou.ac.in/ignou/aboutignou/profile/2](http://ignou.ac.in/ignou/aboutignou/profile/2)  
Lifelong Learning for Farmers

Every $1 invested in learning, facilitation and networking resulted in $9 worth of income and assets in India.

Increased Food Security among 5000 women learners in Kenya and Uganda
Because L3F Uganda adapts its educational tools to fit farmers’ lifestyles and technological capacities, rather than imposing costly or time-intensive educational programs on farmers, the project can make real advances in empowering farmers and improving their livelihoods.
Pedagogic Innovations

- Self-instructional Materials
- Extensive use of Media
- Flexible learning
2. Online Courses Offerings: USA, 2013
Increasing Access

- The proportion of higher education students taking at least one online course now stands at 33.5 percent for a total of 7.1 million (Babson Survey, 2014)
Quality

- More than 80% students consider online learning outcomes comparable with face-to-face, with over a quarter considering superior (Babson Survey, 2014)
Online education “bend the cost curve” in higher education

(Deming et al, 2015)
Developing countries

The adoption rate of eLearning in Asian region's higher education segments is astonishing.

- OUM: 90,000+ students, Mumbai University: over 78,000 online students.
- Non-academic certificates: e.g. IT sector- Microsoft, Cisco, Oracle: significant enrolments- industry recognised.
GUELPH UNIVERSITY

Online courses leading to certificates

- Agricultural economics
- Animal sciences
  - Equine behavior and health
Pedagogic Innovations

- Learning Management Systems
- Wider use of web resources
- Online self-tests
- Interactivity
3. Open Education Resources (OER)
What are Open Education Resources (OERs)?

Materials that are:

- Free and freely available
- Suitable for all levels
- Reusable
- Digital
Why OER?

Reduces costs

Enhance access

Improve quality
OER and Textbooks

USA: Utah Open Textbooks project: $5 per printed and zero for online content

- Students who used open textbooks scored 0.65 points higher on end-of-year state standardized science tests than students using traditional textbooks (Robinson et al, 2014)
Examples of Online Content in Agriculture

- **China**
  - Jinpingke portal, “National Top Level Courses” Project (2007-2014)
    - 258 courses in agriculture (in Mandarin)

- **India**
  - National Ag Innovation Project
    - 475 UG courses, 14600 hours equivalent
    - In English
Implications for Pedagogy
(Meta Analysis by Bernard et al.)

COL’s experience: Ag students are generally less familiar with online coursework
Pedagogic Innovation

- Connectivism: student-content
  (T. Anderson, 2010)
- Learner not just a consumer but also a producer
- Collaboration rather than competition
4. Massive Open Online Courses: MOOCs
Of 3600 MOOCs how many on agriculture?
MOOCs in the developing world

- ‘democratising access to higher education..by leveraging on new technologies such as Massive Open Online courses (MOOCs)’.
  - Y.B Dato’ Seri Idris bin Jusoh, 2014

- ‘set up Massive Open Online Courses (MOOCs) ..to make it convenient for working class people and housewives to further their knowledge and qualifications’.
  - BJP Manifesto, 2014
MOOCs in Ag

- Mobiles for Development
- Audio MOOC for Gardeners
- AgMOOCs Consortium
Pedagogic Innovations

- Shift from teacher moderation to learner responsibilities
- Social construction of knowledge
- Move from small group teaching to offer eLearning to masses
How learning takes place is changing:

**Traditional Classroom**
- Instructor prepares material to be delivered in class.
- Students listen to lectures and other guided instruction in class and take notes.
- Homework is assigned to demonstrate understanding.

**Flipped Classroom**
- Instructor records and shares lectures outside of class.
- Students watch/listen to lectures before coming to class.
- Class time is devoted to applied learning activities and more higher-order thinking tasks.
- Students receive support from instructor and peers as needed.

Dynamic pedagogy: Learning analytics

- Predictive Systems can be developed
  - An Early Warning System: an upcoming drop out can be noticed

- Recommender Systems can be built
  - Tutor/Coach can observe frequent attempts and failures in a particular activity and recommend remedial activities
Distance and Online Learning can:

- Enhance access and equity by reducing costs
- Improve quality by providing free world class resources
- Provide flexible learning opportunities using appropriate technologies
THE WAY FORWARD
Horizon Report 2015

TRENDS

SHORT-TERM

- Increasing Use of Blended Learning
- Redesigning Learning Spaces

1-2 years in each direction

MID-TERM

- Growing Focus on Measuring Learning
- Proliferation of Open Educational Resources

3-4 years in each direction

LONG-TERM

- Advancing Cultures of Change and Innovation
- Increasing Cross-Institution Collaboration

5+ years in each direction
Addressing Challenges

- Transform the **curriculum** to make it relevant to the C21
- Harness appropriate **technologies**
- Facilitate the **convergence** between education, the labour market and the learner
1. Adopt ODL/online provision

- Agricultural universities can adopt ODL and online provision to expand access and cut costs.
- Offer dual mode provision
- ODL can supplement and complement rather than replace existing institutions and models.
2. Develop policy

- Enabling policy frameworks
- Robust systems esp for QA
- Build the capacity of staff
ODL and online provision can contribute to the ongoing professional development of the agriculture community and institutional personnel as well as provide opportunities for lifelong learning in this critical sector.
4. Embrace openness

Agricultural universities need to embrace openness in a systematic manner. This would include adopting and adapting OER as well as open access policies for sharing and collaborating on research locally and globally.
GOAL 2

END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE

SUSTAINABLE DEVELOPMENT GOALS
More at sustainabledevelopment.un.org/sdgsproposal
THANK YOU

www.col.org