Agricultural Mechanization Datasets in Asia & Pacific:

Status, Issues and Expectations

10th Session of the TC of CSAM, and Regional Workshop on Establishing a Regional Database of Agricultural Mechanization in Asia and the Pacific

Session IX: Asia Forum

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Dr. Peeyush Soni
Assistant Professor; Asian Institute of Technology
Vice-President; Asian Association for Agricultural Engineering
soni.ait@gmail.com
Existing (popular) sources of data
Major International sources

- **FAO**
  - FAOSTAT
  - Country Stat
  - AMIS, Energy and fertilizer prices etc., Crop calendars
  - APCAS
- **ESCAP**
  - Statistical Yearbook of Asia and Pacific (2013)
- **World Bank**
  - World Development Indicators, The World Bank Energy consumption by Agriculture (%)
  - Agriculture & Rural Development Indicators, Ag machinery per 100 km²
- **IEA (2003)**
- **CGIAR / IFPRI**
  - ASTI, Country factsheets, Agri R&D funding and trends
  - CCAFS, CC maps, emission data on agriculture environment
  - IFPRI: Publications, Data
- **ADB**
  - Key Indicators for Asia and the Pacific (2014)
  - Basic Statistics (2014)
- **WFP**
  - Fact Sheets
...other not-for-profit sources

- (WRI) World Resources Institute
  - Earth trends
  - Insights
  - World Resource Report
  - Maps and Data, Indicators of sustainable agri, GHG emissions, Clean technology data

- Worldwatch Institute
- Global Harvest Initiative, Global Agri Productivity Report 2014
- Nation Master, Agri machinery, Tractors, Farm productivity
- CIA Factbook
- ...
- ....
Some perspectives from users...
(These are not complains)

- “we didn’t know they had these data” **Visibility**
- “they don’t want to share them” **Accessibility**
- “these data are messy” **User-friendliness**
- “this is not really what I need” **Relevance**
- “how can I ensure correctness/representativeness of data?” **Comparability**
Are we ‘data-constrained’?

- Timeliness of availability
  - After 5/10 years?
- Data Type
  - Is the current set of data adequate for the purpose?
- Data Quality
  - Machinery population estimated? Projected **linearly**?
- Accuracy / authenticity of data
  - Across various available platforms we get different (sometimes very contrasting) picture
(possible) Benefits of making ourselves ‘data-rich’

‘Data-Rich’:

... appropriate set of indicators; (accurate) Authentic, reliable, representative; Freely accessible in a timely manner; Updated & maintained at appropriate frequency

- Cross-regional, relevant R&D on mechanization
- Promote trade
- Facilitates regional exchange of mechanization technologies
- Promote a healthy competition among manufacturers (favoring the farmers)
- Assist informed-policymakers
- Evidence based decision making
Challenges / Concerns / Issues

- Confidentiality?
- Specific national trade interests & priorities?
- Lack of suitable census on agricultural mechanization indicators
- Lack of specific sharing platform?
  
  ... CSAM has a role to timely play!

- Produce a minimum set of core data – commensurate to national priorities
- Standard classification / Uniform definitions of indicators?
- Data comparability?
  
  Various agencies involved within a country
  Different frequencies and timing of updating data
(ir)Regularity in FAOSTAT data reporting 2005-2012: Machinery

32% Never reporting countries that have never reported data

32% Irregularly reporting countries that reported no more than 2 times out of 4
Tajikistan, China-Hong Kong, Republic of Korea, Bangladesh, Nepal, Pakistan, Sri Lanka, Brunei Darussalam, Cambodia, Indonesia, Singapore, Viet Nam, Bahrain, Iraq, Lebanon, Oman, United Arab Emirates, Yemen, Cook Islands, Fiji, New Caledonia, Tonga, Tuvalu, USA.

35% Frequently reporting countries that reported regularly, for at least 3 years out of 4
Kazakhstan, Kyrgyzstan, China î mainland, China- Macao, Japan, Mongolia, Afghanistan, Bhutan, Iran, Malaysia, Myanmar, Philippines, Thailand, Armenia, Azerbaijan, Cyprus, Georgia, Israel, Jordan, Occupied Palestinian Territory, Syrian Arab Republic, Turkey, Australia, New Zealand, France, United Kingdom.

Response rates are **systematically low** in **Machinery** and **Pesticides** data domains

**Agricultural Machinery, 2006-2010**

Response rate for questionnaires requested (%)

<table>
<thead>
<tr>
<th></th>
<th>Countries</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Asia</td>
<td>5</td>
<td>40%</td>
<td>40%</td>
<td>60%</td>
<td>40%</td>
<td>0%</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Eastern Asia</td>
<td>8</td>
<td>86%</td>
<td>71%</td>
<td>57%</td>
<td>29%</td>
<td>43%</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Southern Asia</td>
<td>9</td>
<td>44%</td>
<td>56%</td>
<td>44%</td>
<td>22%</td>
<td>44%</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>South-Eastern Asia</td>
<td>11</td>
<td>27%</td>
<td>55%</td>
<td>27%</td>
<td>45%</td>
<td>9%</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Western Asia</td>
<td>18</td>
<td>44%</td>
<td>56%</td>
<td>67%</td>
<td>56%</td>
<td>39%</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Asia, Total</td>
<td>51</td>
<td>46%</td>
<td>56%</td>
<td>52%</td>
<td>42%</td>
<td>30%</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Oceania</td>
<td>20</td>
<td>15%</td>
<td>20%</td>
<td>25%</td>
<td>15%</td>
<td>10%</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Asia and Pacific, Total</td>
<td>71</td>
<td>37%</td>
<td>46%</td>
<td>44%</td>
<td>34%</td>
<td>24%</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>WORLD</td>
<td>227</td>
<td>n.a.</td>
<td>37%</td>
<td>37%</td>
<td>37%</td>
<td>36%</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

Regional Network

- Centralizes, harmonizes, standardizes, integrates and validates data on **key Ag Mech indicators**
- Integrates national statistical products into a harmonized template
- Adds value to data (key analyses?)
- Ensures long-term sustainability of system

- Going beyond conventional census-stat? Multi-agency cooperation?
  - Remote sensing images
  - Geoinformatic datasets
(partial) Wish List of Ag Mechanization Dataset

Mechanization level
- Mech Index
- Constraints to mech
  Crop-wise, Operation-wise, AEZ-wise

Prime movers
- Tractors
- Powertillers
  #, Type, Size, R&M, Production origin

Crop care
- Chemical fertilizers
- Pesticides
- Equipment
  Quantity

OHS
- Health hazards to farmers
- Farm accidents
- Anthropometric data
- Isometric strength

Production
- Major crops
- Crop calendar
- Avg yields
- Yield gap
  AEZ-wise, Crop-wise

Policy
- National priorities
- Roadmap for AM
- Supporting policy
  AEZ-wise, Crop-wise

Land
- Distribution of farm holdings
- Land tenure & ownership

Water
- On-farm water availability
  Surface/GW AEZ-wise
- Irrigation pumps
  #, Type, Size, R&M
- Engines

Maps
- Land suitability maps
  AEZ-wise, Crop-wise
- Soil health / fertility maps
- Agro-meteorology maps

Energy in Ag
- Electricity consumption in Ag
- Rural electrification
- NRE, alternative energy usage

Economics
- Ag input prices
- Machinery prices
- Total cost of production
  Crop-wise, AEZ-wise
- Market price
  Crop-wise

PHT / Processing
- Harvesting, Threshing
  #, Type, Size, R&M, Production origin
- Drying, Milling
- Storage
- Losses

Crop - wise, Operation-wise

AEZ - wise
Way forward!

- Draft a wish-list of dataset
- Provide uniform definitions
- Justify its specific use / intended benefit / target beneficiary

TC workshops

National workshops

- Establish a multi-agency dialogue (through CRs)
- Review which dataset can be contributed by whom
- Summarize relevant existing datasets, its quality, frequency

Review, Review, Review, ...

Revise

Adopt

Existing databases: National & International repositories

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Thank you

soni.ait @ gmail.com