Challenges in Climate Information Services (CIS) Provisioning in Philippine Agriculture: Results of a Baseline Survey

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Key Messages

• Rainfall patterns have changed; farmers’ indigenous knowledge (IK) is not enough to guide them in their production decisions

• Climate information infrastructure for a localized CIS needs improvement.

• Capacity building is needed for municipal extension personnel to be able to integrate climate information in their local advisory services
Introduction

• Due to changes in rainfall patterns which drives farmers’ IK, climate information services (CIS) provisioning in agriculture is necessary in improving overall risk management in agriculture (Klopper, et al., 2006)

• But necessary hard and soft infrastructure are sometimes not adequate for climate forecast delivery to farmers.

• Mainstreaming the delivery of CIS underscores necessary innovations for agriculture’s adaptation to climate change
Objective

• Using data from a project sponsored by the Adaptation and Mitigation Initiatives in Agriculture (AMIA) of the Dept. of Agriculture, this paper discusses issues in integrating CIS in agricultural extension by assessing:

1) the hard infrastructure needs; and
2) the capacity building needs.

Methods:
1. Physical inspection of a sample of AWS
2. Survey of AWS operators
3. Survey of Municipal Agricultural Officers
Study Sites

Region I: Ilocos Norte
Region II: Isabela
Region III: Tarlac
Region IVA: Quezon
Region V: Camarines Sur
Region VI: Iloilo
Region X: Bukidnon
Region XI: Davao
Region XII: North Cotabato
Region XVIII: Negros Occidenta
Population and Sample of weather instruments
Climate Data Generated

- Rainfall Amount, Duration, and Intensity
- Air Pressure, Temperature, and Humidity
- Solar Radiation
- Soil Moisture and Temperature
- Wind Speed and Direction
- Sunshine Duration
- Evaporation
CIS Provisioning in Agriculture

Analytical Framework

2018 Disaster Risk Governance Academic Seminar
CIS Provisioning in Agriculture

Institutional Flow of weather data from AWS to the end users
### Results of operators’ survey on the functionality of the AWS

<table>
<thead>
<tr>
<th>Particulars</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the <strong>equipment functioning smoothly?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>20</td>
<td>55.6</td>
</tr>
<tr>
<td>Is it <strong>well-maintained?</strong></td>
<td>11</td>
<td>55.0</td>
</tr>
<tr>
<td>Does the AWS undergo <strong>regular maintenance work?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>31</td>
<td>86.1</td>
</tr>
<tr>
<td>Kind of maintenance done</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleaning of equipment</td>
<td>24</td>
<td>77.4</td>
</tr>
</tbody>
</table>

### Results of the AWS operators’ survey on problems encountered and solutions done

<table>
<thead>
<tr>
<th>Particulars</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Problems</strong>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stability of power source</td>
<td>7</td>
<td>43.8</td>
</tr>
<tr>
<td>Hardware wear &amp; tear due to pests</td>
<td>7</td>
<td>43.8</td>
</tr>
<tr>
<td>Internet connection</td>
<td>6</td>
<td>37.5</td>
</tr>
<tr>
<td><strong>How problems were resolved</strong>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact technical staff</td>
<td>7</td>
<td>43.8</td>
</tr>
<tr>
<td>Clean equipment</td>
<td>7</td>
<td>43.8</td>
</tr>
</tbody>
</table>

*Multiple response
## Results of Municipal Agricultural Officers Survey

<table>
<thead>
<tr>
<th>Particulars</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>How do you formulate climate forecast advisories?</strong>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on climate information from PAGASA through radio/TV</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>Based on <em>info from DA</em></td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>Based on local knowledge</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td><strong>Use of information from locally installed AWS/rain gauge for forecast advisory?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11</td>
<td>36.7</td>
</tr>
<tr>
<td>No</td>
<td>19</td>
<td>63.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>30</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Reasons for not using data from local AWS/rain gauge?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No access to data</td>
<td>8</td>
<td>42.1</td>
</tr>
<tr>
<td>Incomplete data</td>
<td>2</td>
<td>10.5</td>
</tr>
<tr>
<td>Lack of knowledge of processing data</td>
<td>1</td>
<td>5.3</td>
</tr>
<tr>
<td>No response</td>
<td>8</td>
<td>42.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>19</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Multiple response
### Results of Municipal Agricultural Officers Survey

<table>
<thead>
<tr>
<th>Particulars</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Responsiveness of farmer to climate information-based extension advisories?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very responsive</td>
<td>17</td>
<td>56.7</td>
</tr>
<tr>
<td>Responsive due to experience and awareness</td>
<td>8</td>
<td>26.7</td>
</tr>
<tr>
<td>No response</td>
<td>5</td>
<td>16.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>30</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Farm household decisions influenced by such advisories?</strong> *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planting decisions</td>
<td>21</td>
<td>70.0</td>
</tr>
<tr>
<td>Crop insurance decisions</td>
<td>10</td>
<td>33.3</td>
</tr>
<tr>
<td>No response</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>13.3</td>
</tr>
</tbody>
</table>

*Multiple response*
Prospects and Challenges

- More AWS is needed to capture the micro climate.
- More funds will be needed to maintain the equipment.
- More capacity building will be needed to maintain the equipment.
- Capacity for municipal agricultural officers to package the CIS into timely extension advisories.
PS: Further Activities Implemented

• Training of 32 scientists on climate crop modelling
• Training of 114 municipal agricultural officers for preparation of extension materials
• Training of 2,700 farmers to increase awareness of climate forecast and use of extension advisory
SEASONAL CLIMATE FORECAST AND EXTENSION ADVISORY (CLEA)

CLIMATE FORECAST AND EXTENSION ADVISORY
JUNE 2016 - NOVEMBER 2016 (CLEA 06-14-2016, WET SEASON, POLANGUI, ALBAY)

RAINFALL COLLECTED, MM (BAWP, POLANGUI) & FORECAST RAINFALL, % (PAGASA)

EXCEPTIONAL CLIMATE FORECAST AND EXTENSION ADVISORY

The following Good Practice Options (GPOs) are suggested by the Department of Agriculture RFO 5 and MAO-Polangui for the project sites in Polangui, Albay.

GOOD PRACTICE OPTIONS (GPOs) IN IRRIGATION WATER MANAGEMENT FOR RICE

RAINFALL FORECAST
LAND PREPARATION
SEEDLING
VEGETATIVE
REPRODUCTIVE
MATURE

Good Practice
Forecast
Way Below Normal
Below Normal
Neutral
Above Normal

Forecast
Way Below Normal
Below Normal
Neutral
Above Normal

Dry land preparation
Mechanical dry land preparation
Adaptive for land preparation
Dry bed method
Dry bed method

Irrigate only every other day on or as needed
Irrigate every other day when the PAGASA rain index is above 29%
Irrigate every other day on or as needed
Irrigate only when the PAGASA rain index is above 29%

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Irritate only when the PAGASA rain index is above 29%
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Always open the paddy outlet
Always open the paddy outlet
Always open the paddy outlet
Always open the paddy outlet

GOOD PRACTICE OPTIONS (GPOs) FOR RICE, OTHER CROPS, LIVESTOCK & FISHERIES

RICE
OTHER CROPS
LIVESTOCK
FISHERIES

Rain or water systems including wells as the source and along the tree
Use early water/drought tolerant varieties.

Prepare a task or pond near the crop for water
Plan crops such as cassava, taro, or water chestnut

Plant indigenous cover crops or practice crop rotation, follow period and use much grass, rice, maize, etc., to keep soil healthy and conserve soil moisture.

Provide drinking water to livestock
Feed livestock better, use higher-quality feed, and limit feed intake

Anticipate and augment supplemental feed provides. Improve housing design using available materials as to sustain effects of changing weather.

Reduce stress during wet season and help lead to social link fish to

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THANK YOU