Wrap up Workshop
Increasing the Resilience of
Small and Medium Irrigation Systems in Nepal

Climate Change and its Impact on Agriculture

Analysis
and
Summary of Findings

December 13, 2016, Kathmandu

Suresh Sharma,
Agriculture Expert
Observations of Agriculture from Irrigation Perspective

• The following slides present agriculture status in three locations: Sindhuli, Nawalparasi and Kapilbastu districts

• Agriculture was reviewed from the perspective of rainfall, temperature and irrigation water availability and changes.

• Observations and lessons learnt are presented in the following slides
Key observations during Field visits
From Climate Change perspective

Sindhuli District: Foothills of Chure Region, Kauchhe

- Farmers cultivate two crops of paddy – Monsoon paddy and Spring Paddy.
- Lowland farming (92-95%); Upland farming (5-8%)
- Prolonged dry season in recent years (4-5 months)
- Sudden short burst of rain shower in some area but completely dry in other nearby regions
- Erosion, landslides & deforestation of fragile chure region
- Flash floods during monsoon damage farmer-constructed irrigation canals
Key observations during Field visits
From Climate Change perspective

Nawalparasi District : Julphe Irrigation System,

• High dependency in rain water during paddy season
• During winter only 40% of land is brought under cultivation
• Lack of reliable irrigation water.
• Hybrid seeds mainly used (especially paddy and vegetables)
• Traditional open-pollinated cultivars mostly being replaced
• Farm mechanization replaced bullocks in farms (10 -12 years)
• Water scarcity in branch canals and at tail end.
• No coping mechanism or strategy in place to combat climatic uncertainty
• Village youth not interested in farming activities
• Overall impact of irrigation on agriculture practices
Key observations during Field visits
From Climate Change perspective

Kapilvastu District : Singeghat Irrigation System

- Erratic and unreliable rainfall, patchy or segmented rainfall.
- Emergence of new pests – due to hotter summers and mild winters.
- Better wages from non-farm work (construction, factory job).
- Agriculture labour force shifted from farming occupations.
- Farm labor shortage during the peak growing season.
- Increase in Farm mechanization (Tractors, land levelers, harvesters).
- Lands left fallow during the winter months.
- Illegal felling of trees – forest area decreasing.
- Reduced dependency on agriculture for livelihood support.
Common Changes in Agricultural Practice in Three Field Sites (before 15 years and Now)

- Changes in land-use => land plotting for housing
- Increase in commercial poultry, goat and fish farming
- Increase in off-season vegetable cultivation using plastic houses
- More dependency in commercial fertilizers use.  
  (Low use of Organic manures and FYM in farms)
- Increase in commercial agricultural ventures – e.g. banana cultivation, citrus cultivation, papaya cultivation, potato
- Increased use of chemical pesticides in farming
- Increased temperature in recent times has favored cultivation of tropical crops in sub-tropical zones, e.g. papaya, pineapple
<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Varieties/ Cultivars grown 15-20 years ago</th>
<th>Varieties grown/ cultivated now</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Paddy</strong></td>
<td>Kala Namak, Basmati, Sathari, Kane jeera, Santha (60 days maturity), Karangi, Rato Anadi, Jhinua, Ekle, Jethobudo, Marshe dhan, CH-45, Bindeshwori</td>
<td><strong>Sama mansuli,</strong> Gorakhnath, Khumal-8, Sabitri, Taichung, Radha-4, Radha-7, Sarju-49 and hybrids like 1561, Puja, Mithila, <strong>Loktantra,</strong> Swarna Sub -1, Barkhe -2014, Barkhe 1027, Hardinath-2, Lalka Basmati</td>
</tr>
<tr>
<td><strong>Wheat</strong></td>
<td>Achyut, Rohini, UP-262, Nepal 297, Annapurna-4, BL – 1022</td>
<td><strong>Bhrikutii, Gautam, Bijaya,</strong> Improved number lines Nepal 971, BL -1473, WK 1204</td>
</tr>
</tbody>
</table>

* Resilient, adaptable  *Suitable in Rainfed area, Terai/Inner terai * Early Maturing
### Change in Crop Types and Crop Varieties...

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Varieties/ Cultivars grown before 15-20 years</th>
<th>Varieties grown/ cultivated now-a-days</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cauliflower</strong></td>
<td>Kathmandu Local, Dolpa snowball, Sarlahi Dipali</td>
<td>F1 Hybrid Lines – NS 60N, NS 106, Fuliyama, White snow, Manaslu, Super White Top, Silvermoon, Snow Queen, Kasmire, Snow Krown, Anna Cup</td>
</tr>
<tr>
<td><strong>Cabbage</strong></td>
<td>Copenhagen Market</td>
<td>New F1 Hybrid lines – Nepa Round, Nepa Green 777, Green Koronet, Green Chalenger, Golden Ball, Asia Cross, Zenith, Futoski</td>
</tr>
<tr>
<td><strong>Carrot</strong></td>
<td>Nantes Forte</td>
<td>New Korudo (OP), F1 Hybrids – Sigma, Nepa Drim, Kuroda Mark IT, Maskade</td>
</tr>
</tbody>
</table>
Changes in Cropping Pattern over the years

**Terai (irrigated lowland)**

**Traditional Cropping Pattern (15 years ago)**
- Traditional Rice – Wheat + Lentil/Beans – Maize
- Rice – Potato + Lentil – Vegetables
- Rice – Mustard – Summer Vegetables

**Current Cropping Pattern (Now)**
- Improved Rice – Wheat + Lentil/Beans – Maize
- Hybrid Rice – Potato/Lentil/Local Pea – Hybrid Maize+Beans
- Improved Rice – Winter Vegetables – Summer Vegetables
- Cucurbits + Beans – Winter Vegetables - Sesame
- Commercial Banana ............ ............
- Commercial Fish Farming ............ ............
Adaptation Strategy & Coping Mechanism to increase Farmer resilience

• There are a number adaptation measures available in crop choice, cropping pattern, diversification of farming practices & water conservation techniques (Use of drought tolerant & lodging resistant cultivars, diverse, integrated farming, Rainwater harvesting, practice of Zero/conservation tillage, Adoption of SALT & Agro-forestry, drip irrigation, Hugelkultur, etc.)

• The strategy has to be developed keeping in view of the local condition in consultation with the local farmers in line with LAPA approach & Priority Framework for Action (2011-2020) of MoAD.

Thank You