

**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**

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# 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

# Change in Crop Types and Crop Varieties...

Crop Type	Varieties/ Cultivars grown 15-20 years ago	Varieties grown/ cultivated now
<b>Paddy</b>	Kala Namak, Basmati, Sathari, Kane jeera, Santha (60 days maturity), Karangi, Rato Anadi, Jhinua, Ekle, Jethobudo, Marshe dhan, CH-45, Bindeshwori	<b>Sama mansuli</b> , <b>Gorakhnath</b> , <b>Khumal-8</b> , <b>Sabitri</b> , Taichung, Radha-4, <b>Radha-7</b> , Sarju-49 and hybrids like 1561, Puja, Mithila, <b>Loktantra</b> , Swarna Sub -1, <b>Barkhe -2014</b> , <b>Barkhe 1027</b> , <b>Hardinath-2</b> , Lalka Basmati
<b>Wheat</b>	Achyut, Rohini, UP-262, Nepal 297, Annapurna-4, BL – 1022	<b>Bhrikuti</b> , <b>Gautam</b> , <b>Bijaya</b> , Improved number lines Nepal 971, BL -1473, WK 1204

\* **Resilient, adaptable** \* **Suitable in Rainfed area, Terai/Inner terai** \* **Early Maturing**

# Change in Crop Types and Crop Varieties...

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



# 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**