Improving the climate resilience and performance of small and medium scale irrigation

Conclusions and Framework
Findings

• Evidence of long-term climate change is masked by current variability
• Local perceptions of climate change may differ subtly from the scientific evidence
• Many changes to irrigated agriculture have occurred, and driven by multiple factors
• Dry season flows reducing – partly due to upstream land & water use changes
• Increasing problems of abstracting water and coping with flood peaks
• Improvements in one place will have impacts further downstream
Recommendations

- Sub-basin planning and management is essential in water-stressed catchments, whatever the cause of the shortage
- Climate change will make an already adverse situation worse, but solutions are similar to existing best practice
- Both flood peaks and demand for irrigation will increase
- Design parameters and physical interventions will need to be refined incrementally
- Interventions should be planned on the basis of a risk analysis (comparing cost and benefits of intervention, while considering the risks of failure)
How to build resilience and improve performance

- **Resilience**: the capacity to absorb and quickly bounce back from [climate] shocks and stresses

- Understand vulnerability (shocks and trends)
  - Climate
  - non-climatic

- Three components of resilience
  - Actors (individuals / community)
  - Systems (infrastructure)
  - Rules / Institutions
Framework for Resilience

**Vulnerability Context**

*Shocks*
- Climate Variability
  - seasons
  - extremes
- Security & Conflict
- Other

*Trends*
- Climatic
- Urbanisation / land use
- Migration
- Population

**Climate change**
- Impact on water requirements
- Impact on water resources
- Interaction with other changes

**System features**
- Safety (design criteria)
- Flexibility
- Redundancy
- Alternative sources
- River basin context

**Institutions**
- Involvement in decisions
- Rights to land and water
- Access to dispute resolution
- Access to information
- Rights for financing

**Water users / user organisations**
- Ability to absorb shocks
- Ability to adapt to new situation
- Ability to mobilise resources
- Ability to anticipate and plan
- Demand management

**Government Organisations**
*Line Ministries (national / local)*
- Understanding of climate change
- Technical support and finance

*Local Government*
- Local Enabling environment
Irrigation in the Girwari khola
## Application of framework to combining systems

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Singheghat Irrigation Management

Rainfall and Canal Flow

- Poor water control
- Modern gated structures
- Effective traditional structures
Summary - measures to enhance performance and resilience

- Infrastructure and institutional arrangements to be planned together
- Better arrangements for sub-basin management (considering all water users, and actions in the river)
- More rainfall and streamflow data
- Flood and low flow forecasting in ungauged catchments
- Risk-based approach to design – be flexible/adaptable
- Improved water management (system level and on-farm)
- Support for STW development to supplement surface irrigation
Thank You!