

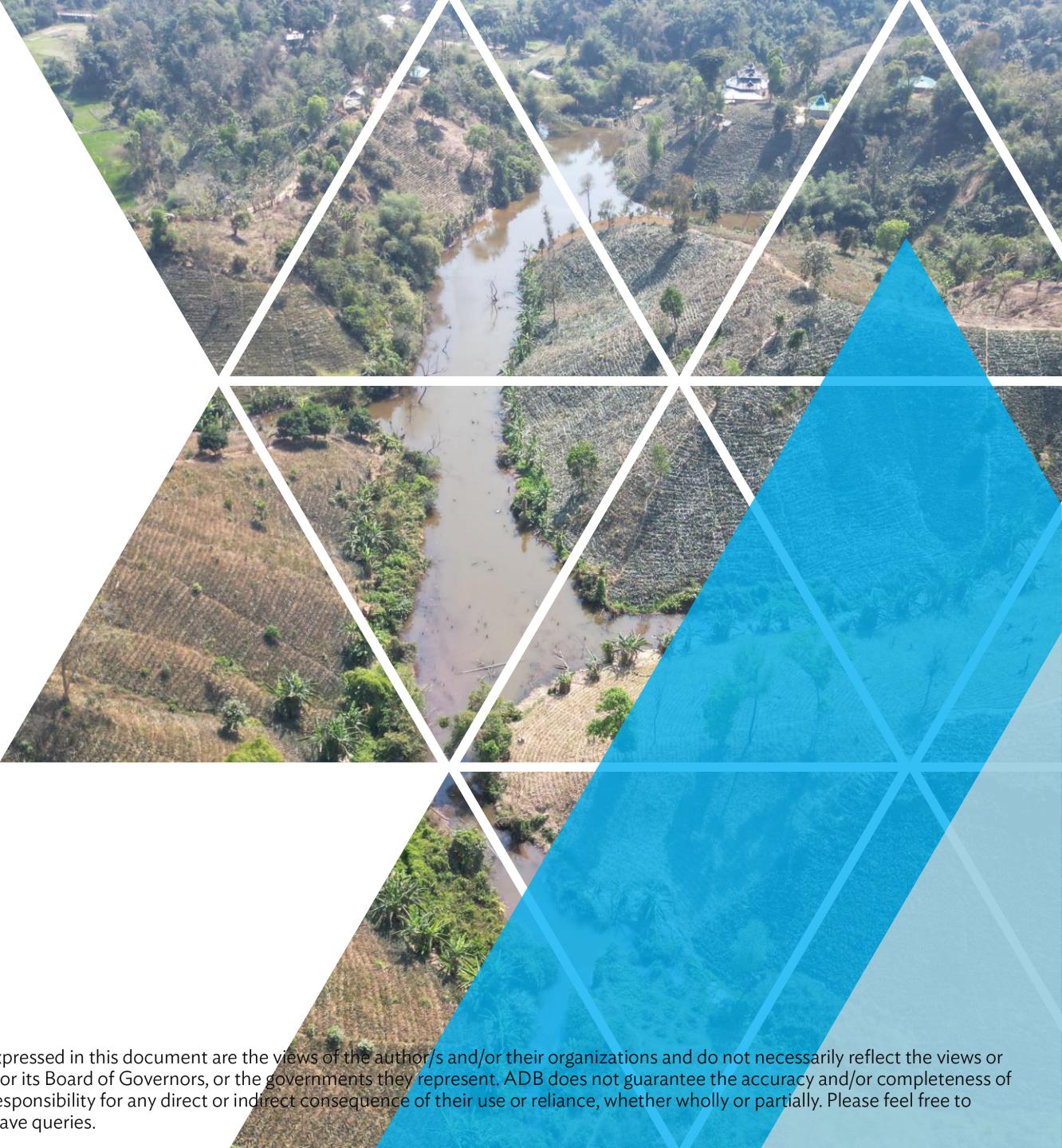


TA-6539 REG: Investing in Climate Change Adaptation through Agro-ecological Landscape Restoration: A Nature-Based Solution for Climate Resilience - Climate Change Risk and Adaptation/Restoration Option Assessment in Bangladesh

## Webinar on Agroecological Landscape Restoration

## Developing a Watershed Management Information System in Bangladesh

14 October 2025



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**A.S.M. Julker Naem**  
Water Resources Engineer, CEGIS

# Goals of the WMIS

Addressing the prevalent data scarcity and fragmentation in the Chittagong Hill Tracts (CHT) is a foundational goal of the WMIS.



## Informed Policy Decisions

Facilitate evidence-based integrated CHT watershed management by providing real-time data and analytical insights to policymakers and stakeholders.



## Agro-Ecological Restoration

Promote Nature-Based Solutions (NbS) and landscape restoration techniques for climate change adaptation and long-term ecological health.



## Improved Livelihoods & Resilience

Build climate resilience and enhance sustainable livelihood opportunities for indigenous communities residing within the critical watershed areas.

ADB Watershed Management Information System  
Asian Developed Bank (ADB)

**Watershed Selection**

**CHT Districts**  
Select One

**Watershed**  
Select District First

**Content**

- **Administrative**
  - **Para Boundary**
  - **Districts**
  - **Upazilla**
  - **River**
  - **Road**
- + **Watershed Resources**
- + **Watershed Situation**
- + **Climate and Climate Change**
- + **Landscape Restoration Options**

**Map Legend**

**Districts**

- Bandarban
- Rangamati
- Khagrachhari

# Scale of Intervention in CHT

**9**

## Watersheds

The system covers and monitors crucial ecological zones across the Chittagong Hill Tracts region.



## Training Modules

Structured programmes to educate local staff and community representatives on system use and data interpretation.

**180+**

## Beneficiary Para (Villages)

Direct intervention in over 180 villages ensures grassroots level impact and adaptation.



## Data Collection Tools

Providing simple, mobile-friendly tools for field agents to gather accurate and timely data from the ground.



## Demonstration Activities

Hands-on sessions showcasing the effectiveness of Nature-Based Solutions and agro-forestry best practices.

**45,000+**

## Total Population

The project aims to improve the quality of life and resilience for over forty-five thousand people.

# Key Components of the WMIS

The WMIS offers three primary functional areas, providing users with comprehensive tools for data visualization, monitoring, and knowledge access.



## Information Mapping

- **Map Viewer:** Interactive platform for viewing and analysing diverse geospatial data layers.
- **Map Gallery:** Curated repository of pre-generated maps, reports, and visualisations for quick access.



WATERSHED  
MONITORING

## Watershed Monitoring

- **Health Tracking:** Metrics and dashboards for assessing overall Watershed Health (e.g., water quality, soil stability).
- **Resilience Indicators:** Monitoring framework to track progress on Climate Resilience and vulnerability reduction.



## Reporting & Knowledge

- **Factsheets:** Concise summaries of key data, performance, and project outcomes.
- **Reports:** Comprehensive technical and analytical documents accessible on demand.
- **News and Event:** Reports on the events, workshops and training

The system uses advanced GIS technology to integrate environmental, socio-economic, and climate data.



## Data collection and Digitization Panel

This panel enable the user to collect and digitize the field level data using mobile phone or tabs

# Information Mapping

ADB Watershed Management Information System Asian Developed Bank (ADB)

Home Map View Contact About

Watershed Selection

CHT Districts: Rangamati

Watershed: Ghilachari (R114)

Content

- + Administrative
- + Watershed Resources
- + Watershed Situation
- + Climate and Climate Change
- + Landscape Restoration Options

**Administrative**

- Para Boundary
- Districts (Sub-National)
- Upazila (Sub-District)
- River
- Road

**Climate & Climate Change**

- Climate Risk Assessment
- Climate Induced Hazards
- Climatic Condition

**Watershed Resources**

- **Social** (Population, Income, Expense, Education, Literacy)
- **Natural** (Soil, Slope, Landuse, Topography)
- **Economic** (Agriculture, Fisheries, Livestock, Forestry, Agroforestry, Agroforestry Business)

**Landscape Restoration Option**

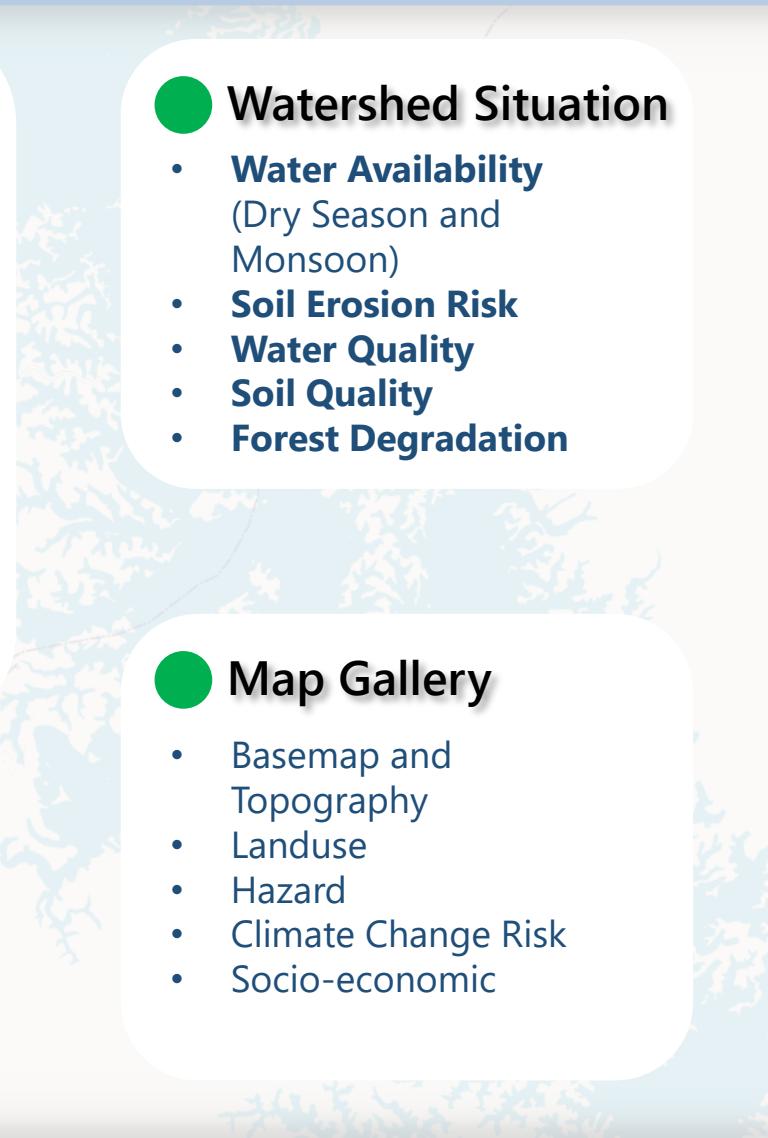
- Proposed Interventions

**Watershed Situation**

- **Water Availability** (Dry Season and Monsoon)
- **Soil Erosion Risk**
- **Water Quality**
- **Soil Quality**
- **Forest Degradation**

**Map Gallery**

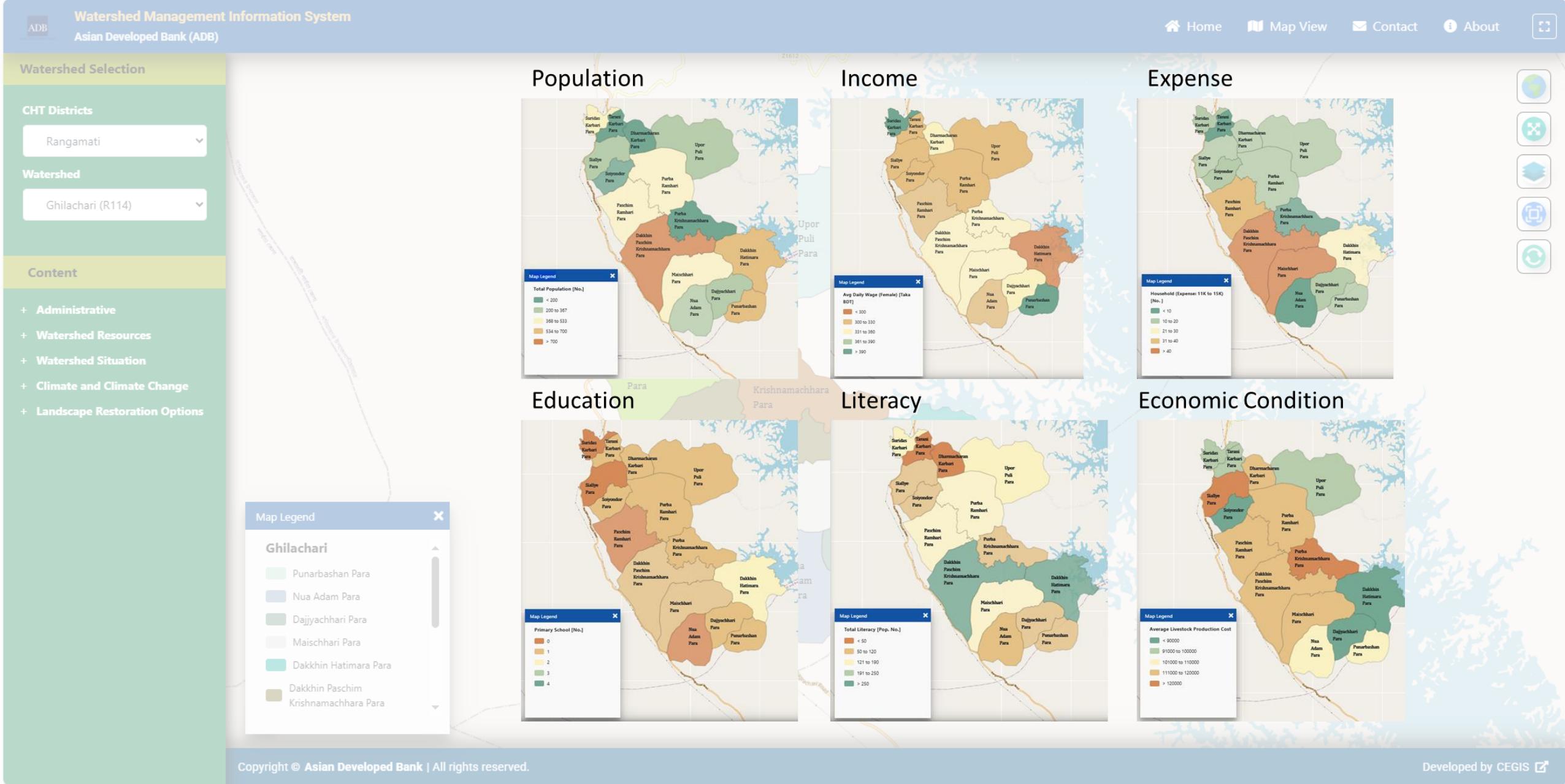
- Basemap and Topography
- Landuse
- Hazard
- Climate Change Risk
- Socio-economic



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Developed by CEGIS

# Information Mapping



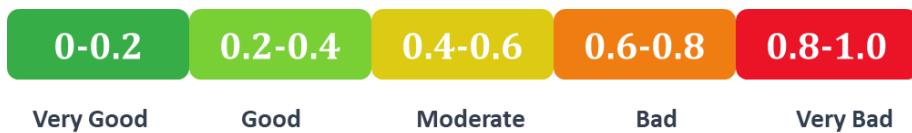
# Watershed Monitoring

## 2 comprehensive monitoring matrices

- 1) Watershed Health
- 2) Climate Resilience

- **Result-based monitoring** matrices
- **SMART** (specific, measurable, achievable, relevant and time bound) indicators
- Principles of '**Theory of Change**'
- **Web-based and dynamic**

### Composite Rating for Tracking



### Watershed Health Tracker

#### Components

- Soil and Land
- Water
- Local Climate
- Forestry/Agro-forestry
- Ecosystem & Biodiversity

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### Climate Resilience Tracker

#### Components

- Socio-economic Development
- Social Inequality
- Hazard Impact Reduction & Recovery
- Food & Nutrition Security
- Water Resources
- Ecosystem and Biodiversity
- Education and Awareness

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# Watershed Monitoring

Home Map Viewer Watershed Monitoring Major Components Capacity Building

## Climate Resilience

Select a Watershed Ghilachari

Overall Status Component Wise Status

### Overall Status Of Gilachhari (R-114)

- » Number of Para: 15
- » Area: 1897 ha
- » Total Population: 5034
- » Male: 2490
- » Female: 2544
- » Number of Household: 1168
- » Number of Community: 3 (Chakma, Marma & Tripura)

#### Watershed Health Standardized Rating

Current Status (0.5)

0-0.2 Very Good 0.2-0.4 Good 0.4-0.6 Moderate 0.6-0.8 Bad 0.8-1.0 Very Bad

Currently, standardized rating is reflecting 'Bad' condition of Gilachhari watershed in terms of watershed health.

Home Map Viewer Watershed Monitoring Major Components Capacity Building About CRIIWM-CHT Sign In

### Climate Resilience

Select a Watershed Ghilachari

Overall Status Component Wise Status

#### Component Wise Status

Socioeconomic

Hazard Impact

Agro forestry and Food Security

Water Resources

Ecosystem and biodiversity

Education and Awareness

Average income of household

List of Parameters

Average monthly income of household (BDT)

Household expenditure- income ratio

Literacy rate

Gender and Social inclusion

People living under poverty line

Health and medication expense reduction

#### Climate Resilience Monitoring

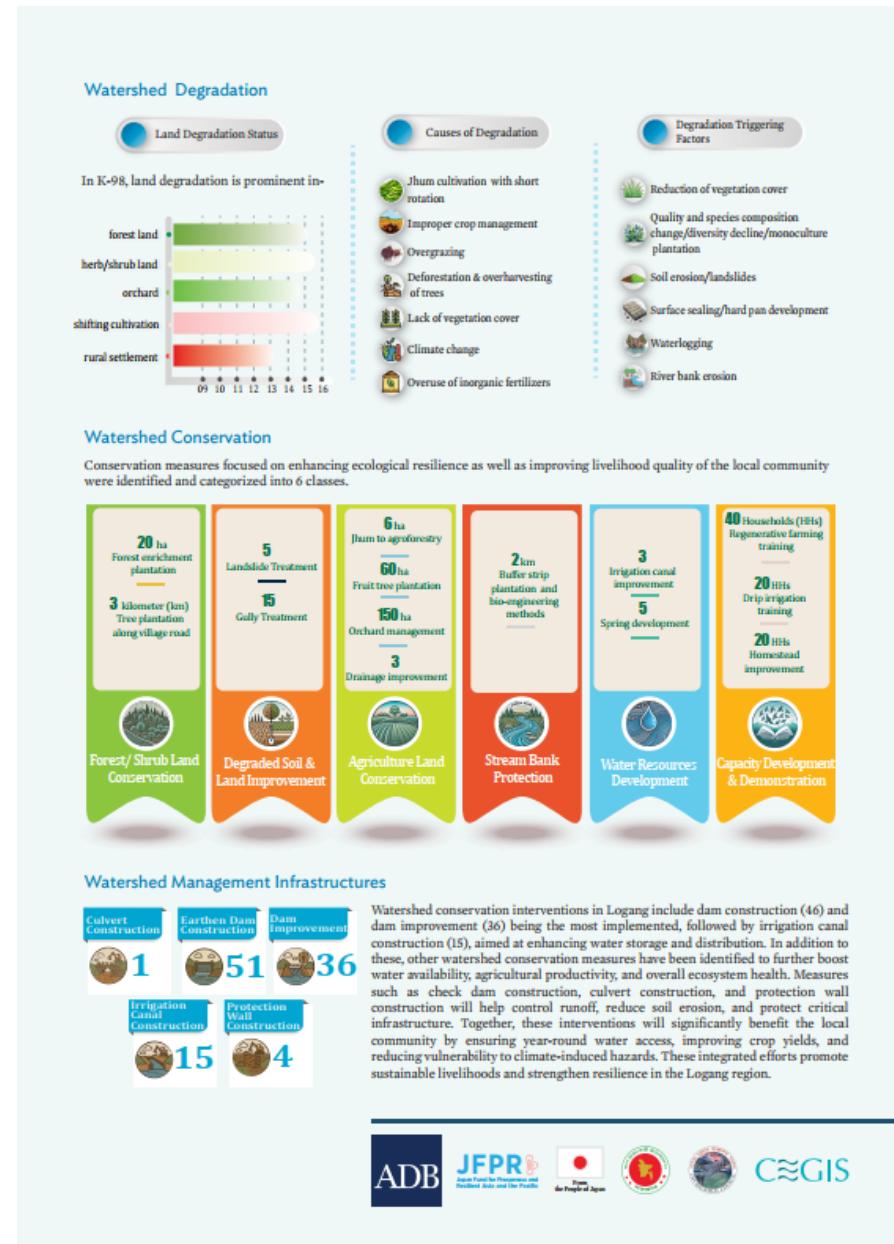
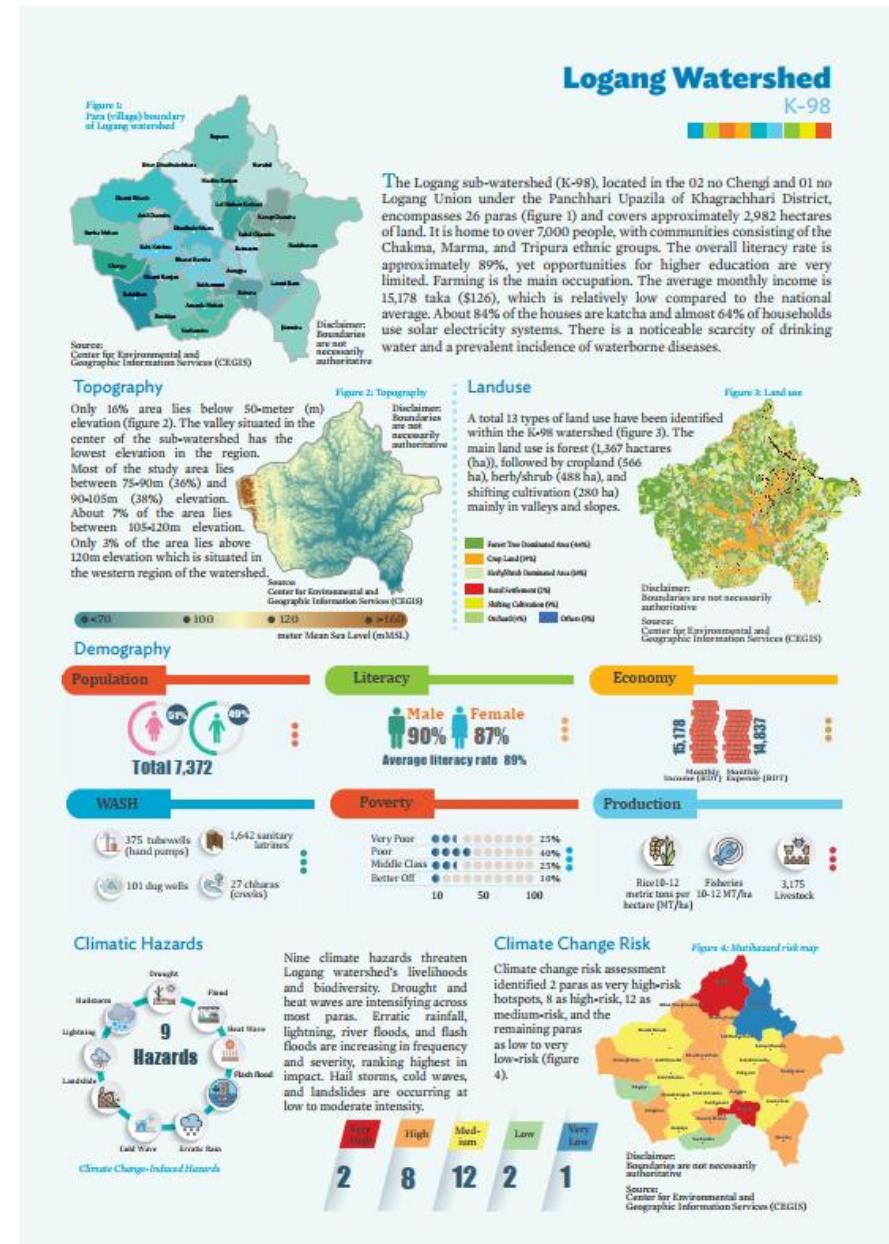
Year	Baseline (2024)	Target
2025	12,950	12,950
2030	17,500	17,500
2035	25,000	25,000
2040	35,000	35,000
2050	50,000	50,000

Highcharts.com

Unit	Baseline (2024)	Target			
		2030	2035	2041	2050
BDT	12950	17500	25000	35000	50000

# Watershed Factsheet

- Topography
- Landuse
- Demography
- Climatic Hazards
- Climate Change Risk
- Watershed Degradation
- Watershed Conservation
- Watershed Management
- Infrastructure



# Data Digitization Platform

## Enhanced Operational Efficiency

- Centralized and structured survey forms drastically **reduced manual data entry time**.
- Minimized errors at the source

## Superior Data Integrity

- Built-in validation rules and **automated error checking**.
- Mandatory manual review steps.

## Real-time Access and Intervention

- Provided **instant, on-demand data visualizations**.
- Enabled targeted interventions and **faster, evidence-based decision-making** in the field.

## Streamlined Project Operations

- Automated **reporting and monitoring processes**.

## Visualising Progress: The CEGIS Dashboard

**Para Wise  
Information Entry**

**VCF Wise  
Information Entry**

**LULC and Landscape  
Degradation Entry**

**Water Quality Test  
Data Entry**

**Soil Test  
Data Entry**

**Business Model and  
Value Chain Entry**

Thank You

