



ASIA-PACIFIC NETWORK FOR  
GLOBAL CHANGE RESEARCH

FINAL REPORT

Building capacities for  
climate resilient water  
resources development  
under climate uncertainty



CBA2022-04SY-Shrestha

2023



नेपाल विकास अनुसन्धान प्रतिष्ठान  
Nepal Development Research Institute



**Project Reference Number:** CBA2022-04SY-Shrestha

**Project Duration:** 1 October 2022 to 30 September 2023 (1 year) + 1 October 2023 – 31 March 2024 (6 months)

**Funding Awarded:** APN Grant

**Grant DOI:**

**Date of Publication:** 30 April 2024

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**Recommended Citation:**

(Not yet decided)



Asia-Pacific Network for Global Change Research (APN)

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## 1. Summary

Climate Risk Assessment (CRA) is an integral to sustainable and climate resilient water resources (WR) development. It is even more so in warmer and wetter future with increase in climatic extremes, given the uncertainties on their cumulative impacts on the hydrological processes that influence WR systems performance. Motivation behind this project was to provide easy and accessible platform to WR practitioners to perform CRA, linking science to practice.

This project facilitated climate risk assessment process by upgrading the existing “WEather generator and Climate Change Scenario Generator” (termed as WECCS-Gen here-after). The tool was initially developed by Nepal Development Research Institute (NDRI) and this project allowed to upgrade this tool with climate downscaling capabilities commonly known as Bias Correction and Spatial Disaggregation (BCSD). This tool provides a platform for the user to perform pre-processing of the climate data like generation of climate scenarios, downscaling of the global circulation models results as per spatial scale required by the user which is a necessary step for climate risk assessment.

In addition, the workshop- ‘Capacity Building Workshop on Climate Risk Assessment for Water Resources Management’ was conducted on 5-8<sup>th</sup> February, 2024 in Lalitpur, Nepal in on order to build capacity of water resources practitioners at national and international level. Participants were provided a comprehensive detail on methodology and tools for climate risk assessment followed by the on-session practice exercises. Besides, this project also provided support for Fulbright Specialist Program - Science, Technology, Engineering, and Mathematics (STEM) Education and Research workshop. The workshop aimed at enhancing the skills and knowledge of the STEM students providing insights into ways to perform world-class research. In order to promote and build awareness about the climate risk assessment (CRA) to the decision makers in water resources sector, the dissemination workshop at national level was organised in 15<sup>th</sup> March 2024.

The project also emphasized on building the capacity of the young researchers hence thereby supporting the research assistants and young enthusiastic water research practitioners /students. The latter group (total 4 in number) was provided with the research grant in order to develop case study with regards to climate risk assessment. The results of the case studies are being incorporated into the research findings as part of journal article.

## 2. Objectives

Major objective of the project was to facilitate climate risk assessment (CRA) for water resources practitioners. Specific objectives were:

- (A) To facilitate CRA through upgrade of existing WECCS-Gen tool with climate downscaling capabilities;
- (B) To build capacity of WR practitioners (national and international) on conducting CRA, using upgraded state-of-the-art tool, into their professional practices;
- (C) To promote CRA into existing practices at organisational and national level

## 3. Outputs, Outcomes and Impacts

The following table provides the outputs, outcomes and impacts of the project:

<b>Outputs</b>	<b>Outcomes</b>	<b>Impacts</b>
WECCS-Gen tool upgraded with downscaling capability (BCSD approach)	Platform provided for carrying for processing of the climate data needed for climate risk assessment	Bridge the gap for climate risk assessment though the access to the tool
Completed Capacity building training	27 workshop participants learnt about the climate risk assessment process and used the WECCS-tool.	Increase in the awareness and application of climate risk assessment in their daily practices
Supported 4 young water practitioners / students	Utilisation of the knowledge and skills learnt about the climate risk assessment in the workshop in their own case studies or uses	Application of climate risk assessment in various type of water resources project
Supported Fulbright Specialist Program	Participants learnt and enhanced the skills and knowledge in conducting scientific research in STEM	Expected increase in quality scientific researches
Completed dissemination workshop	Increased awareness of the climate risk assessment specially at the organisational level	Expected changes in the policy regarding the development of water resources

#### **4. Key facts/figures**

Key facts/figures from the project are listed below:

- Software WECCS-tool upgraded and available publicly.
- 1 capacity building training held, 1 dissemination workshop held, 1 – STEM workshop held
- 27 early-career professionals trained in climate risk assessment
- 4 young students/ early-career professionals (who participated in the capacity building training workshop) were research grant to develop the case studies with application of the WECCS-Ge tool.
- Journal article (Ongoing, expected to completed soon).

#### **5. Publications**

1. The WECCS-Gen tool is publicly released in the Github. Link:

[https://github.com/np-ndri-org/WG\\_CRA\\_tool](https://github.com/np-ndri-org/WG_CRA_tool)

(Note: Technical document and manuals are in docs folder)

2. [Capacity Building Workshop on Climate Risk Assessment for Water Resources Management Report](#)

3. [Dissemination Workshop Report](#)

## **6. Media reports, videos and other digital content**

Resources for dissemination on the APN website:

### **1. Capacity Building Workshop (Feb 5-8, 2024)**

1.1 [Capacity Building Workshop on Climate Risk Assessment for Water Resources Management Report](#)

1.2 [Capacity Building Workshop on Climate Risk Assessment for Water Resources Management Photos](#)

1.3 [Capacity Building Workshop on Climate Risk Assessment for Water Resources Management – NDRI Website Coverage](#)

### **2. STEM Workshop**

2.1 [STEM Workshop – SEN Website Coverage](#)

### **3. Dissemination Workshop**

3.1 [Dissemination Workshop Report](#)

3.2 [Dissemination Workshop Photos](#)

3.3 [Dissemination Workshop - NDRI Website Coverage](#)

3.4 [Dissemination Workshop Video \(Recording\)](#)

### **4. APN Website: Building capacities for climate resilient water resources development under climate uncertainty**

## **7. Pull quotes**

- “WECCS-Gen aids in climate risk assessment through both a top-down approach and a bottom-up approach.”
- “Policy interventions are needed for integrating CRA into policy frameworks.”
- “Widespread dissemination and promotion of developed CRA tools are necessary to ensure their acceptability and sustainability.”

## **8. Acknowledgments**

We would like to thank all the resource persons, the guests and the national / international participants that participated in the ‘Capacity Building Workshop on Climate Risk Assessment for Water Resources Management’ conducted on 5-8th February, 2024 in Lalitpur, Nepal; the ‘STEM Education and Research: building new generations’ workshop conducted on 18<sup>th</sup> February 2024 in UN House; and the ‘Dissemination workshop’ conducted on 15<sup>th</sup> March, 2024. Use this section to acknowledge any parties engaged in the project activities 15<sup>th</sup> March, 2024.

## **9. Appendices**

1. [Capacity Building Workshop on Climate Risk Assessment for Water Resources Management Report](#)

2. [Dissemination Workshop Report](#)