

Atlas of Climate Adaptation in South Asian Agriculture (ACASA)

Interconnections between climate risks, practices, technologies, and policies

There is an urgent need to identify strategies to manage increasing climate risks in agriculture. The Atlas of Climate Adaptation in South Asian Agriculture (ACASA) is a digital platform that comprehensively consolidates spatially explicit data on climate hazards, assessing their impact on smallholder populations, farms, crops, and livestock systems. By evaluating the vulnerability of these populations, impact on region's critical commodities, and the evidence around the effectiveness of gender informed adaptation options, ACASA empowers decision-makers with valuable insights through a comprehensive adaptation portfolio to guide strategic investments and policy formulations.

Climate Risks, Reimagined for Action



Covers **15 crops & 6 livestock species**



Open access with downloadable data, codes, and scripts



High-resolution risk profiles at approx. 25 sq. km (~group of 4-5 villages)



Interactive, user-friendly platform, co-developed with NARS of the region



Location & context-specific, **expert-validated** adaptation options



Use-case guidance for government, agri-food, insurance, banking, civil society, and donors

Inside the Platform

ACTIVITIES



Climate Risk Assessment

Assessment of the current and future climate by integrating climate hazards, exposure, and vulnerability layers.

Tools & data: Historical agri-climate data, climate scenarios, systematic literature review, statistical models, meta-analysis, and remote sensing.



Impact measured through changes in productivity, resilience, and value of production.

Tools & data: Historical production and prices data, crop growth modelling, machine learning, remote sensing, and stakeholder validation.



Assessed through land-climate suitability, economic viability, yield benefits, and gender suitability.

Tools & data: Socioeconomic data, heuristic models, econometrics, crop growth modelling, and gender analytics.

OUTPUTS



NEXT USERS

- Government Departments
- Multi-lateral Agencies
- Agri-food Companies
- Financial Institutions
- Insurance Companies
- Academics
- NGOs

OUTCOME

Effective decision-making on adaptation priorities and investments by next users

1. National and sub-national climate adaptation plans
2. Resilient Agri-supply chains
3. Improved agricultural insurance products and schemes
4. Prioritised sectors and regions for climate finance.



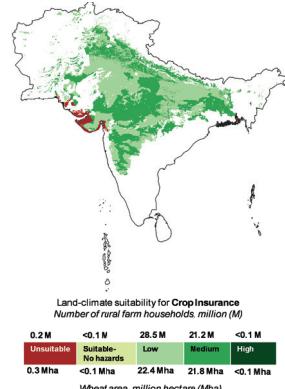
IMPACT

Millions of small-scale producers in South Asia become resilient to climatic vulnerability and change

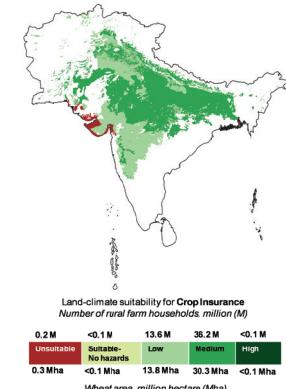
Illustrations of Risk and Adaptation in ACASA

The hazard index for wheat in South Asia indicates that ~13 million rural farm households will be exposed to increased climatic hazards (from lower to higher classes) in the projected conditions for the 2050s under the SSP5-8.5 scenario*.

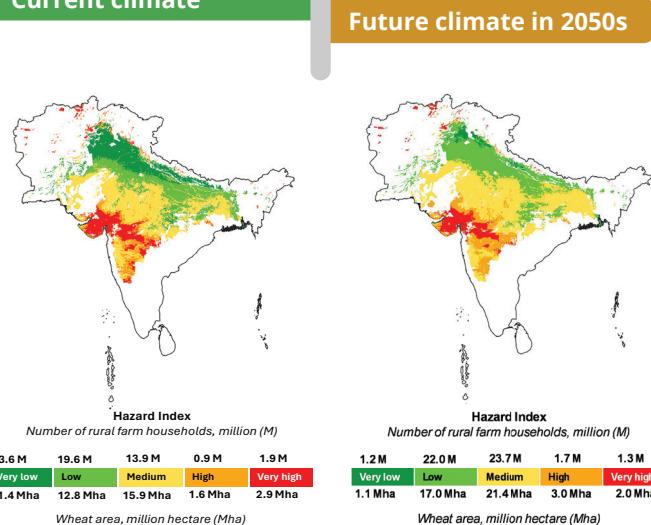
Current climate



Future climate in 2050s



Current climate



Biophysical suitability of insurance for wheat indicates that 15 million rural farm households will transition from the lower to medium classes due to climatic hazards, necessitating increased insurance support.

UI/UX Development

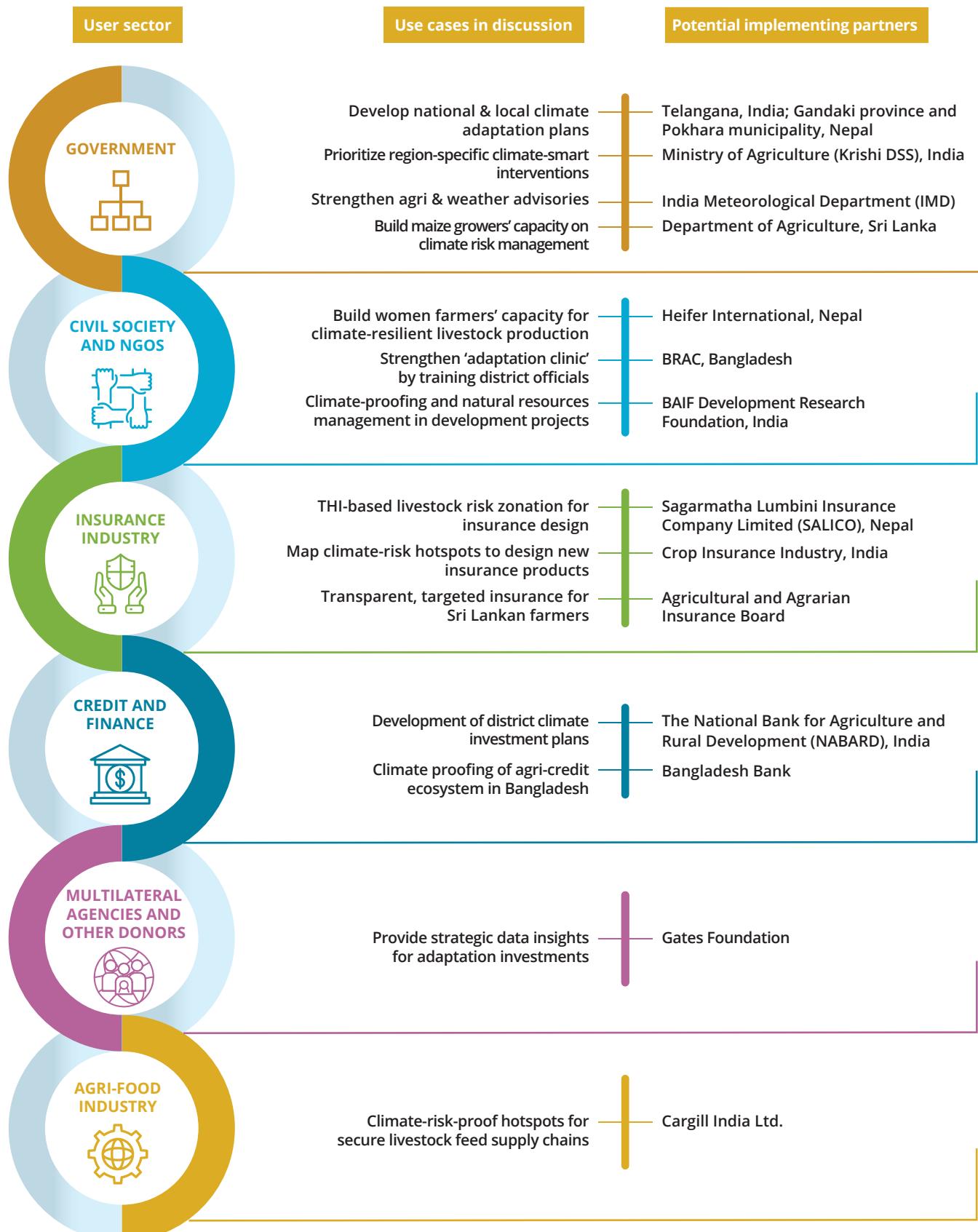
Integrating the visualization of key climatic hazards, risks, impacts, and adaptation options through an open source, web-enabled, interactive, and dynamic Atlas.



*Shared Socioeconomic Pathways (SSPs) are climate change scenarios of projected socioeconomic global changes up to 2100 as defined in the IPCC Sixth Assessment Report on climate change in 2021

From Data to Decisions: Real-World Use Cases of ACASA

ACASA offers a unique opportunity for diverse stakeholders to address their specific needs in the broader domains of climate risk management and agricultural adaptation. As an open-access platform, the Atlas encourages wide knowledge sharing and unrestricted use across research, policy, and practice. Based on extensive consultations with potential users, the following key use cases have been identified.



Commodities Currently Considered by ACASA

15
Crops



Cereals: Rice, wheat, maize, sorghum, barley, millets

Pulses: Chickpea, pigeon pea, lentil

Oilseeds: Soybean, rapeseed/mustard, groundnut

Others: Potato, cotton, jute

6



Livestock Species

Cattle, Buffalo, Pig, Goat, Sheep, Chicken



Region-specific analysis with a non-commodity focus is also available on ACASA. Moving forward, the platform will expand to include other important commodities in South Asia such as fruits, vegetables, other industrial crops, and fisheries.

The Atlas is co-developed and co-owned by the Borlaug Institute for South Asia (BISA), Bangladesh Agricultural Research Council (BARC), Indian Council of Agricultural Research (ICAR), Nepal Agricultural Research Council (NARC), and Natural Resources Management Centre (NRMC), Sri Lanka. It is financially supported by Gates Foundation and technically supported by the University of Florida, Columbia University, and University of Washington. To know more about the platform, visit ACASA version 1.0: <https://acasa-bisa.org/#/>



ACASA Management

Scientific Advisory Committee

Prof. Leigh Anderson, University of Washington, Seattle, USA;
Prof. Miranda Meuwissen, Wageningen University, Netherlands;
Prof. Geetha Lakshmi, Tamil Nadu Agriculture University, India;
Dr. Alex Ruane, NASA Goddard Institute for Space Studies, USA;
Ms. Michiko Katagami, Asian Development Bank, Manila, Philippines;
Dr. Pramod Joshi, Ex Director-International Food Policy Research Institute, India; Dr. Tess Russo, Gates Foundation, USA; and Dr. Pramod Aggarwal, BISA-CIMMYT, Delhi, India.

Project Leader

Pramod Aggarwal, Regional Program leader, BISA-CIMMYT, Delhi, India

Country Team Leads

Hasan Md. Hamidur Rahman, BARC, Bangladesh; CA Rama Rao, ICAR-CRIDA, India; Roshan B Ojha, NARC, Nepal; AG Chandrapala, NRMC, Deptt. of Agriculture, Sri Lanka.

Project Funding

Gates Foundation

Contact Us

acasa@cgiar.org

Pramod Aggarwal

(p.k.aggarwal@cgiar.org)

Borlaug Institute for South Asia (BISA), CIMMYT CG Block B, NASC, DPS Marg, Pusa, New Delhi -10012, India

Riya Gupta

Communication Officer, ACASA, BISA-CIMMYT, India,

(r.gupta@cgiar.org)

About BISA

BISA is an international research institute established through a joint initiative between CIMMYT and ICAR, New Delhi, India, to implement the vision of the Nobel laureate Norman E. Borlaug. It aims to harness the latest genetic, digital, and resource management technologies and use research for development approaches to invigorate the region's agriculture and food systems to meet future demands. Know more about BISA [here](#).



Gates Foundation



UF UNIVERSITY OF FLORIDA



Evans School Policy Analysis and Research (EPPAR)
UNIVERSITY OF WASHINGTON