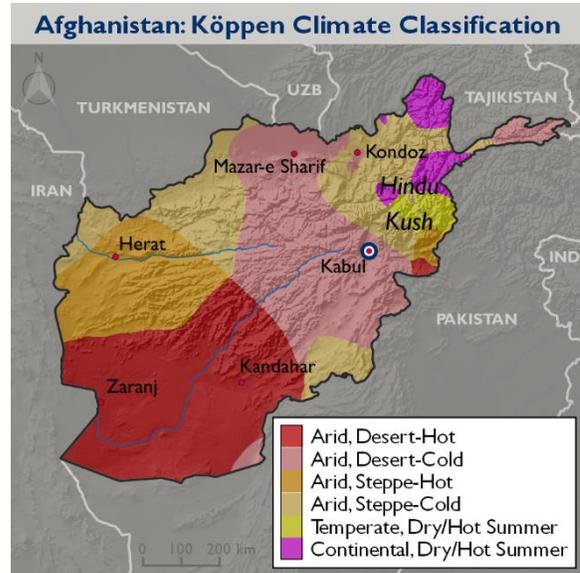




# CLIMATE CHANGE RISK PROFILE AFGHANISTAN

## COUNTRY OVERVIEW

Afghanistan's political and socioeconomic challenges in the last 40 years have curtailed its climate change adaptation capability. Impacts from the cycles of conflict, combined with population pressure, include damage to irrigation and other water systems, high incidence of malnutrition and diarrhea, deforestation and under-realized renewable energy potential. Thirty-six percent of the population live below the poverty line and 85 percent are directly or indirectly involved in agriculture. A severe drought from 1998–2006 foreshadowed the pressures that Afghanistan may confront under future climate scenarios, including addressing transboundary water management to fulfill irrigation demands across the region. Institutions face a lack of climatic data, limited manpower to analyze such data, competing demands on government and donor funding, and security restrictions that limit fieldwork to understand risks and assess adaptation options. Since 2001, however, Afghanistan has worked to strengthen its institutions and restore necessary functions and services, providing direction for climate change adaptation efforts. (1, 5, 8)



## CLIMATE PROJECTIONS



1.4°C to 4°C increase in annual average temperature by the 2060s



Generally drier conditions; increased frequency of drought



Changes in rainfall and snowmelt patterns; increased flash flood risk

## KEY CLIMATE IMPACTS

### Agriculture

Increased soil erosion  
Increased crop losses/failure  
Livestock migration/starvation



### Water Resources

Reduced river flows  
Reduced water supply  
Increased risk of flash floods



### Human Health

Increased risk of food insecurity  
Increased risk of mortality and injury from natural disasters



### Governance & Conflict

Increased competition for resources, including water  
Driver of internal displacement



### Energy & Infrastructure

Reduced hydropower potential  
Disaster-related infrastructure damage



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## CLIMATE SUMMARY

In landlocked Afghanistan, the climate is arid and semi-arid and the topography ranges from the north-central mountains to the southwestern desert. Strong winds bring winter blizzards and summer dust storms to parts of the country. Rainfall is scarce in the lowlands; precipitation (mainly snow) falls in the highlands. (8, 9)

### HISTORICAL CLIMATE

Reliable historic meteorological records are sparse, but available information suggests that since the 1960s Afghanistan has seen:

- An increase in average annual temperatures by 0.6°C, most rapid increase in Sept–Nov.
- An increase in the frequency of “hot” days and nights.
- A slight decrease in average total rainfall, namely during spring (March–May), but this is offset by small increases from June–Nov.
- More frequent drought cycle; for example 1963–64, 1966–67, 1970–72 and 1998–2006. The period 1998–2006 marked the longest and most severe drought in Afghanistan’s known climatic history. (1, 8, 12)

### FUTURE CLIMATE

Future climate projections suggest the following:

- Increased average annual temperatures (1.4°C to 4.0°C by the 2060s).
- Warming that is more rapid in spring/summer and occurs uniformly across the country.
- An increase in the number of “hot” days and nights.
- Changes in rainfall prior to 2100 are uncertain, but projections suggest generally drier conditions by the 2090s, largely due to decreased spring rainfall. Winters are expected to be significantly drier in the south.
- Increased risk of flash flooding from earlier and more rapid spring snowmelt.
- Drought conditions as the norm rather than as cyclical events by 2030. (1, 8, 12)

## SECTOR IMPACTS AND VULNERABILITIES

### AGRICULTURE PRODUCTION

Projected hotter and drier conditions will affect agricultural production by challenging water access and storage capacity. Irrigable land, which produces 70 percent of farm output, is predominantly reliant on runoff from snowmelt in the spring and summer months. Crops cover 12 percent of the total land area, with wheat a staple crop. About 45 percent of the land is used for rough grazing, and cattle are important as draft animals and for milk production. The recent prolonged drought has contributed to a marked decrease in livestock numbers. (4, 8)

### WATER RESOURCES

With projected economic and population growth, Afghanistan’s water storage limitations and reliance on snowmelt and transboundary watersheds create significant climate change vulnerability. Mountain snow feeds the country’s five major river basins, providing 80 percent of water used. Available water varies throughout the year and its location is not always near settlements and irrigable land. Low water storage capacity and conflict-damaged irrigation and water supply distribution systems render the country sensitive to the effects of floods, droughts and other changes in precipitation patterns. (1, 3, 8)

| Climate Stressors and Climate Risks<br>AGRICULTURE PRODUCTION |   |
|---|---|
| Stressors   | Risks   |
| Increase in temperatures                                      | Reduced soil moisture availability during planting                            |
|   | Less frequent rain during peak cultivation season, leading to yield decreases |
| Drier conditions and drought                                  | Crop failure due to water shortage  |
| Changes in rainfall patterns and snowmelt                     | Livestock migration, starvation and/or forced sale                            |
|   | Reduced availability of animal feed   |

| Climate Stressors and Climate Risks<br>WATER RESOURCES |  |
|--|--|
| Stressors  | Risks  |
| Reduction in glaciers and snow cover                   | Increased risk of flash flooding, amplified by effects of drought (increased soil impermeability) and land degradation |
| More rapid and earlier spring snowmelt                 | Reduced river flows  |
|  | Limited irrigation resources   |
| Drought  | Reduced water supply and hydropower potential  |

## HUMAN HEALTH

Climate change-induced stresses, especially increased vector ranges and reduced water supplies, could pose significant challenges to the sectoral gains of the last 10 years: expanded access, reduced infant mortality and improved life expectancy. Malaria is already a major risk to those living at elevations below 2000 meters. Food insecurity and severe weather events compound health risks. For example, in 2006, reduced rainfall left nearly two million people in the west and north in need of food assistance. In 2014, flash floods affected 125,000 people in the north. (2, 10, 13)

## ECOSYSTEMS

Pressures on Afghanistan's ecosystems weaken their resilience to climatic change. Overgrazing and conversion of rangelands for wheat production expose areas to wind and soil erosion. Changes in vegetation and shifts to higher ranges for grazing increase pressure on alpine ecosystems. Heavily degraded forests were converted at an annual rate of almost 3 percent from 2000–05. Also, globally significant wetlands are sensitive to temperature and precipitation changes. (6, 8)

## GOVERNANCE AND CONFLICT

Recurring conflict in Afghanistan since the 1970s has disrupted governance, interrupted basic services and diverted attention and funds from critical investments in environmental management and climate change preparedness (although their priority is slowly increasing). Conflict restricts the mobility of nomadic populations, limiting their ability to adapt migration routes. Water access is a regional pressure point in Central Asia. Four of Afghanistan's main rivers are transboundary and future water needs could heighten regional tensions. (8, 10, 11)

## ENERGY AND INFRASTRUCTURE

Only 43 percent of the country's population is estimated to have access to electricity, and hydropower generates 79 percent of total supply. Renewable energy – including wind, solar and hydropower – is a sector with large growth potential. Infrastructure damaged during conflict includes the country's meteorological monitoring system; stations were destroyed or are no longer operational. Infrastructure improvements such as efforts to rehabilitate and build road networks in recent years may aid disaster response in the future. (8)

| Climate Stressors and Climate Risks<br>HUMAN HEALTH |  |
|---|--|
| Stressors   | Risks  |
| Increased temperatures                              | Increased food insecurity, malnutrition and dependence on food aid                                   |
|   | Increased casualties due to natural disasters, such as floods, flood-induced landslides and droughts |
| Drought   | Expansion of altitudinal range of mosquito vectors, increasing the at-risk population                |
| Changes in precipitation patterns                   | Increased incidence of waterborne illnesses such as diarrheal disease and cholera                    |

| Climate Stressors and Climate Risks<br>ECOSYSTEMS |   |
|---|---|
| Stressors   | Risks   |
| Increased temperatures                            | Reduced ecosystem services including soil filtration and water quality      |
|   | Increased desertification   |
| Drought   | Increased stress on habitats for migratory birds (wetlands)                 |
|   | Reduced snow pack and increased vulnerability of high mountain biodiversity |

| Climate Stressors and Climate Risks<br>GOVERNANCE AND CONFLICT |   |
|--|---|
| Stressors  | Risks   |
| Increased temperatures   | Competition for use of scarce productive rangelands   |
|  | Increased internal displacement   |
| Drought  | Exacerbated regional tensions or conflict   |
| Extreme climatic events  | Increased poppy (opium) production, a drought-resistant crop, despite poppy eradication efforts |

| Climate Stressors and Climate Risks<br>ENERGY AND INFRASTRUCTURE |  |
|--|--|
| Stressors  | Risks  |
| Changes in precipitation patterns                                | Reduced availability of water for hydropower generation, especially for small impoundments and run-of-the-river facilities |
|  | Heat stress on thermal power plants  |
| Extreme climatic events  | Infrastructure damage from flooding and avalanches   |

## POLICY CONTEXT

### INSTITUTIONAL FRAMEWORK

Afghanistan's lead regulatory agency for environmental management and climate change is the National Environmental Protection Agency (NEPA). Due to decades of conflict, environmental management and governance have been a low priority for the government and donors. Through increased institutional capacity building over the years, NEPA's role is now recognized by other sectoral development ministries, although environmental issues are not fully mainstreamed throughout development initiatives and attention to environment and climate change is not adequate.

Three other key institutions mandated to address the impacts of climate change are the Ministry of Agriculture, Irrigation and Livestock for implementation of response measures, the Afghanistan National Disaster Management Authority (ANDAMA), which has a coordinating role in developing an early warning system and disaster risk reduction strategy, and the Afghanistan Meteorological Authority, the lead agency in collecting, processing and reporting weather data.

At a regional level, Afghanistan is member of two important organizations – ECO Member States and South Asian Association of Regional Cooperation (SAARC) – which enhance regional partnerships and cooperation in response to climate change. (8)

### NATIONAL STRATEGIES AND PLANS

Afghanistan completed its [National Adaptation Programme of Action \(NAPA\)](#) in 2009, and the highest priority identified was improving water management and use efficiency. Afghanistan submitted its [Initial National Communication \(INC\)](#) under the United Nations Framework Convention on Climate Change (UNFCCC) in 2012, and is currently preparing its Second National Communication (SNC) for submission in 2016. At present, Afghanistan is finalizing its national Climate Change Strategy and Action Plan (ACCSAP) as well as its National Adaptation Plan (NAP). (6)

The current national development strategy does not emphasize climate change, nor does Afghanistan have a climate change strategy or policy to date. However, some noteworthy examples of policies and plans have successfully and explicitly integrated climate change. (6)

- [Afghanistan National Renewable Energy Policy \(ANREP\)](#); 2013
- National Water and Natural Resource Management Priority Programme
- [Strategic National Action Plan for Disaster Risk Reduction \(SNAP\)](#); 2011
- National Environmental Action Plan (NEAP)
- [National Biodiversity Strategy and Action Plan \(NBSAP\)](#); 2013

### KEY RESOURCES

1. DFID. n.d. [Socio-economic Impacts of Climate Change in Afghanistan: Executive Summary](#).
  2. FEWS NET. n.d. [Afghanistan](#). Accessed 5 April 2016.
  3. FAO. 2012. [Afghanistan](#). Aquastat.
  4. FAO. 2006. [Country Pasture/Forage Resource Profile](#).
  5. Islamic Republic of Afghanistan. 2015. [A Summary of Afghanistan's Progress on Climate Change Adaptation](#). Prepared by Afghanistan for the UNFCCC.
  6. Islamic Republic of Afghanistan. 2015. [Intended Nationally Determined Contribution](#). Submission to the UNFCCC.
  7. Mohd Malikyar, G. n.d. [The Impacts of Climate Change in Afghanistan. National Environmental Protection Agency](#).
  8. National Environmental Protection Agency. 2013. [Initial National Communication](#).
  9. NOAA. 2008. [Climate of Afghanistan](#).
  10. ReliefWeb. 2015. [Before the Paris Conference: The state of Afghanistan's climate and its adaptation capability](#).
  11. UNEP, NEPA, GEF. 2009. [National Capacity Needs Self Assessment for Global Environmental Management and National Adaptation Program of Action for Climate Change](#).
  12. World Bank. 2016. [Afghanistan Dashboard](#). Climate Change Knowledge Portal.
  13. World Health Organization. 2014. [World Health Statistics](#).
- Map Source: adapted from Peel, M.C., et al. 2007. [Updated world map of the Köppen-Geiger climate classification](#); data accessed from [SDAT](#).

## SELECTED ONGOING EXPERIENCES

| Selected Program   | Amount         | Donor                                   | Year      | Implementer   |
|--|----------------|---|-----------|---|
| <a href="#">Building Adaptive Capacity and Resilience to Climate Change in Afghanistan</a>   | \$6 million    | GEF                                     | 2013–2017 | UNEP and National Environmental Protection Agency (NEPA)          |
| <a href="#">Strengthening the Resilience of Afghanistan's Vulnerable Communities against Natural Disasters (SRACAD)</a>  | Unknown        | DFID                                    | 2015–2019 | Afghanistan Resilience Consortium (ARC)                           |
| <a href="#">Building Environmental Resilience in Afghanistan</a>   | Unknown        | UNEP                                    | 2013–2017 | UNEP  |
| <a href="#">Northern Flood-Damaged Infrastructure Emergency Rehabilitation Project</a>   | \$46.6 million | ADB                                     | 2014–2018 | ADB   |
| <a href="#">FEWS NET</a>   |                | USAID                                   | Ongoing   | Chemonics International   |
| <a href="#">Climate Change Adaptation</a>  | \$10 million   | GEF (LDCF Fund)                         | 2014–2019 | UNDP  |
| <a href="#">Preserving Biodiversity in Afghanistan</a>   | \$7.4 million  | GEF                                     | 2014–2018 | UNDP and Wildlife Conservation Society                            |
| <a href="#">Disaster preparedness in the province of Badakhshan, Afghanistan</a>   | Unknown        | Government of Germany                   | 2014–2015 | GIZ   |
| <a href="#">Analysis on Water Availability and Uses in Afghanistan River Basins</a>  | \$316,000      |   | 2012–2015 | FAO   |
| <ul style="list-style-type: none"> <li>• Communication System Strengthening Program</li> <li>• Agro-Meteorology Program</li> <li>• Aeronautical Meteorology Program</li> </ul> | Unknown        | World Meteorological Organization (WMO) | 2012–2015 | WMO and Afghanistan Meteorological Agency (AMA)                   |
| Strengthening Watershed and Irrigation Management  | TBD            | USAID                                   | 2016–2021 | TBD   |
| <a href="#">SERVIR-Himalaya</a>  | \$3 million    | USAID                                   | 2015–2020 | International Centre for Integrated Mountain Development (ICIMOD) |