

# Climate Change and Water Management in Snow Leopard Range Areas

WWF Asia High Mountains Project  
Kangchenjunga, 8586 m



**USAID**  
FROM THE AMERICAN PEOPLE

# **Snow Leopards**

**Snow Leopards live in the high mountains of:**

**Afghanistan**

**Bhutan**

**China**

**India**

**Kazakhstan**

**Kyrgyzstan**

**Mongolia**

**Nepal**

**Pakistan**

**Russia**

**Tajikistan**

**Uzbekistan**



## **Snow Leopards**

**endangered with a total  
population of about 4000 to  
7000 individuals**



# Snow Leopards

A photograph of two ibex standing on a rocky mountain slope. The ibex in the foreground is facing left, while the one in the background is facing forward. Both have thick, brownish-tan fur and large, curved horns. The rocks are dark and jagged, with some patches of snow or light-colored rock.

Blue Sheep, Nepal

Snow Leopards are solitary and primarily prey on Blue Sheep, Ibex, and Argali that inhabit alpine grasslands

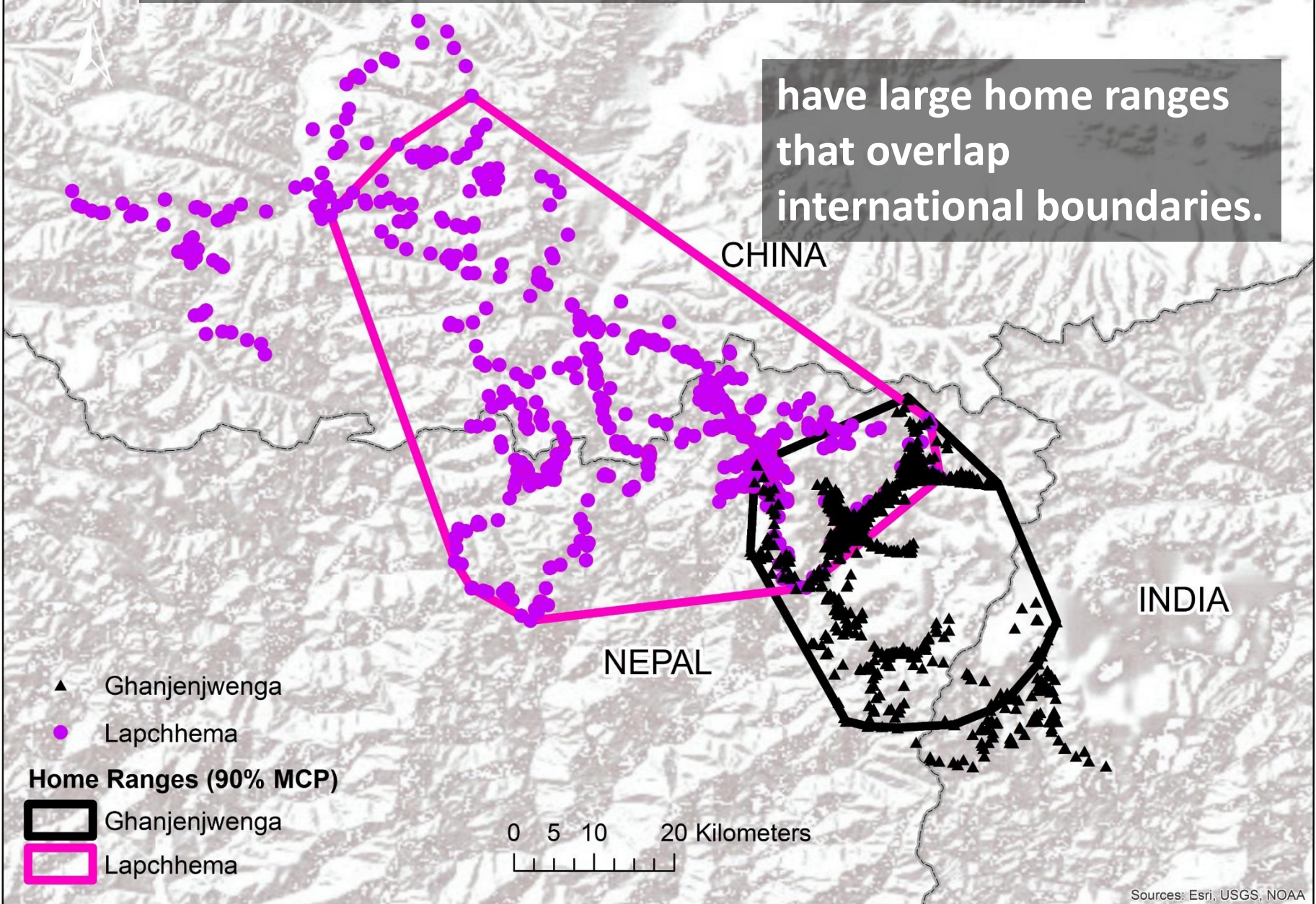
# Snow Leopards

**Apex Predator of Asia's  
Alpine Ecosystems and  
therefore are an Umbrella  
Species for the protection  
of these ecosystems**



# Snow Leopards

have large home ranges that overlap international boundaries.



CHINA

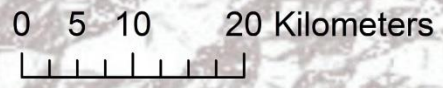
INDIA

NEPAL

- ▲ Ghanjenjwanga
- Lapchhema

### Home Ranges (90% MCP)

- ▭ Ghanjenjwanga
- ▭ Lapchhema



# Snow Leopards

live in the headwaters of Asia's Great Rivers, including the Yellow, Yangtze, Mekong, Salween, Brahmaputra, Ganges, Amu Darya, and Syr Darya

Upper Brahmaputra  
Tibetan Plateau



# Snow Leopards

Threats include

- Retaliatory Killing by Livestock Herders
- Human Encroachment
- Climate Change





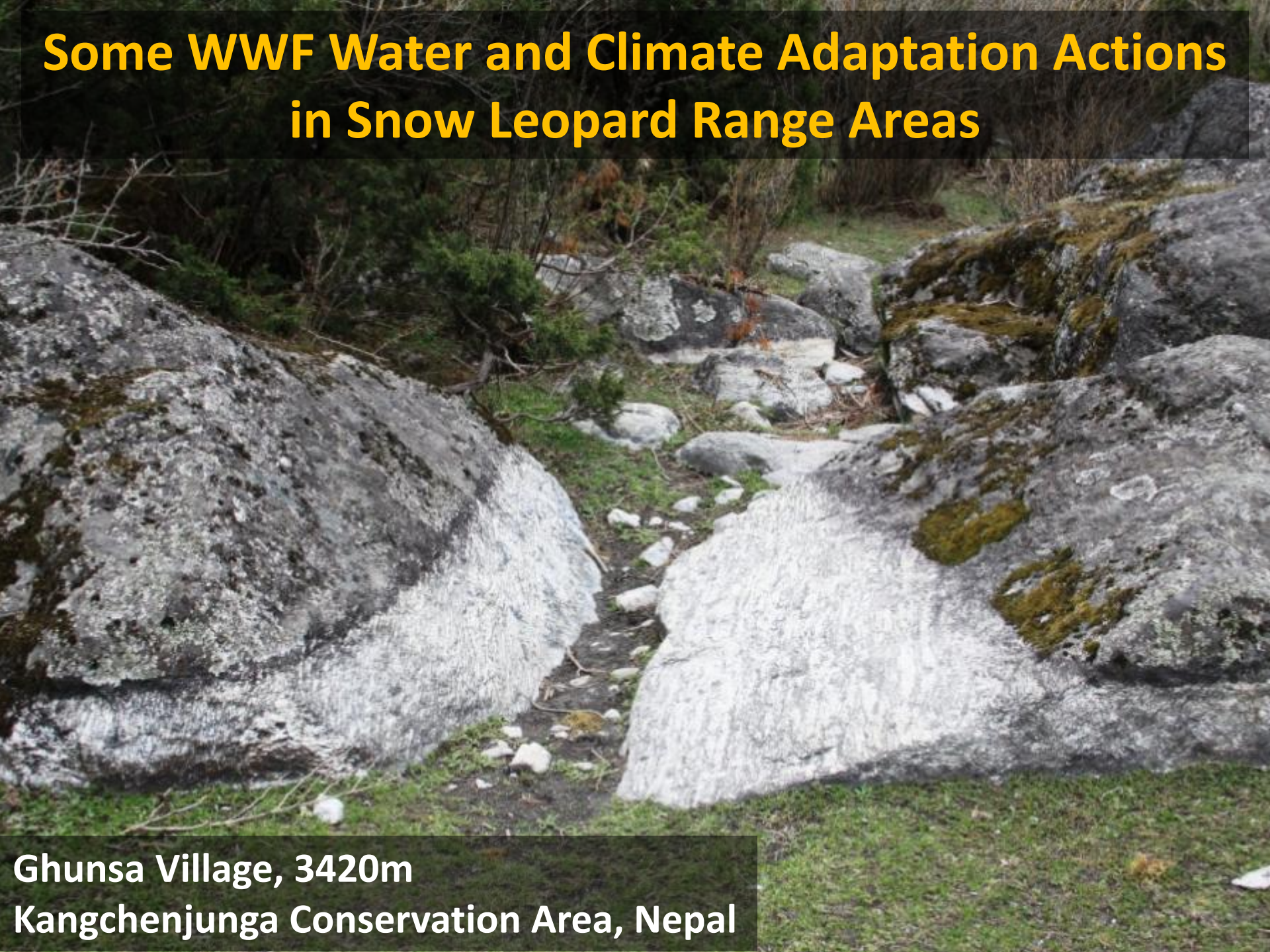
# **Some Climate Change Impacts on Snow Leopard Range Areas**

- **Rising Temperatures**
- **Melting of Glaciers**
- **Melting of Permafrost**
- **More Erratic Precipitation**
- **More Extreme Weather Events**
- **Disappearance of Surface Springs and Streams**
- **Degradation of Alpine Grasslands**
- **Declining Water, Food, and Livelihood Security**
- **Increased Potential Human Threats to Wildlife**



# Some WWF Water and Climate Adaptation Actions in Snow Leopard Range Areas

Ghunsa Village, 3420m  
Kangchenjunga Conservation Area, Nepal



# Bhutan



**Gangkhar Puensum, 7570m**

# Model Climate Smart Village



Shawa Village, 2280m  
Lhuntse Province

# Solar-Powered Electric Fence



**Shawa Village,  
Lhuntse Province**

# India



**Khangchendzonga Biosphere Reserve  
Sikkim**

# Sustainable Cordyceps Harvesting



Lachen Village, 2700m  
Sikkim



1

Do not leave your garbage in the forest areas. It will harm wildlife.  
 Always carry a garbage bag and bring back everything and dispose responsibly.  
 Organise cleanliness campaigns regularly

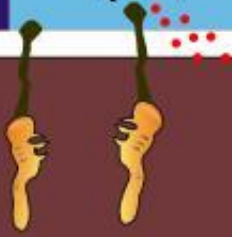
ཉག་ཉིག་མོག་མ་ཚགས་ཚལ་དུ་དོར་མི་རུང་ཚགས་ཀྱི་མེས་མ་ཚན་  
 རྒྱུ་མཉམ་ལ་གནོད་སྐྱོན་ཡོད། དེ་སྲིད་ཉག་ཏུ་ཉག་  
 ཉིག་མོག་མ་བླུག་པའི་རྗེས་ལུང་རེ་མ་སྐྱོད་སྐྱོད་བྱེད་དགོས།



2

After extraction of the cordyceps, pat soil back into place and leave the area undisturbed.

དེ་བརྗོད་པ་མ་སྲིད་མ་རྒྱུ་མ་ལུན་ལྷོན་ཆག་སྟེ་མ་འོངས་སྐྱེ་ས་རྒྱ་  
 ལ་བར་ཆད་བྱུང་གི་ཡོད།



Remember, next year's harvest depends on the spores of this year's fungus. So make sure everything is not harvested.

དེ་ཉིད་སྐྱེར་ཡང་དེར་སྐྱེས་པེས་མེད་དེ།  
 ས་བོན་བཞག་སྟེ་ཞིང་གར་ལོ་ཉོག་བཏང་བ་ལྟ་བུ་མིན་པ་སྟེ།

3

4

Do not burn rhododendrons and other high altitude plants for fire. It takes more than 200 years for them to become mature.

ལ་མཐོ་བའི་ཤིང་རིགས་ཨ་ཉོག་མེ་ཉོག་མོག་མ་མེའི་ཕྱིར་  
 དུ་སྐྱོད་སྐྱོད་མི་རུང་། ཅིའི་ཕྱིར་ཞེ་ན། དེ་རྒྱུ་མ་སྐྱེར་  
 སྐྱེས་པར་ལོ་གཉིས་བརྒྱ་ཙམ་འགོར་གྱིན་ཡོད།



Be careful of where you are stepping. Do not trample plants/ flowers rampantly.

འགོ་དུས་ཟབ་ཟབ་བྱེད་དགོས། མེ་ཉོག་ག་  
 དང་རྒྱལ་རིགས་རྒྱུ་མ་སྐྱེར་རྒྱུ་ལ་གནོད་ཚུལ་  
 ལྗེས་ལུང་བཏང་མི་ལོགས།

5

6

**MAINTAIN SILENCE** in forest areas  
 རྒྱུ་མ་སྐྱེར་ཚལ་ལ་གནོད་མེད་ལ་ཁུ་སིམ་མས་ཀྱང་གནས་དགོས།

# Sustainable Cordyceps Harvesting Brochure

# Kyrgyzstan



Terskey Ala-Too, Issyk Kul Province

# Drip Irrigation



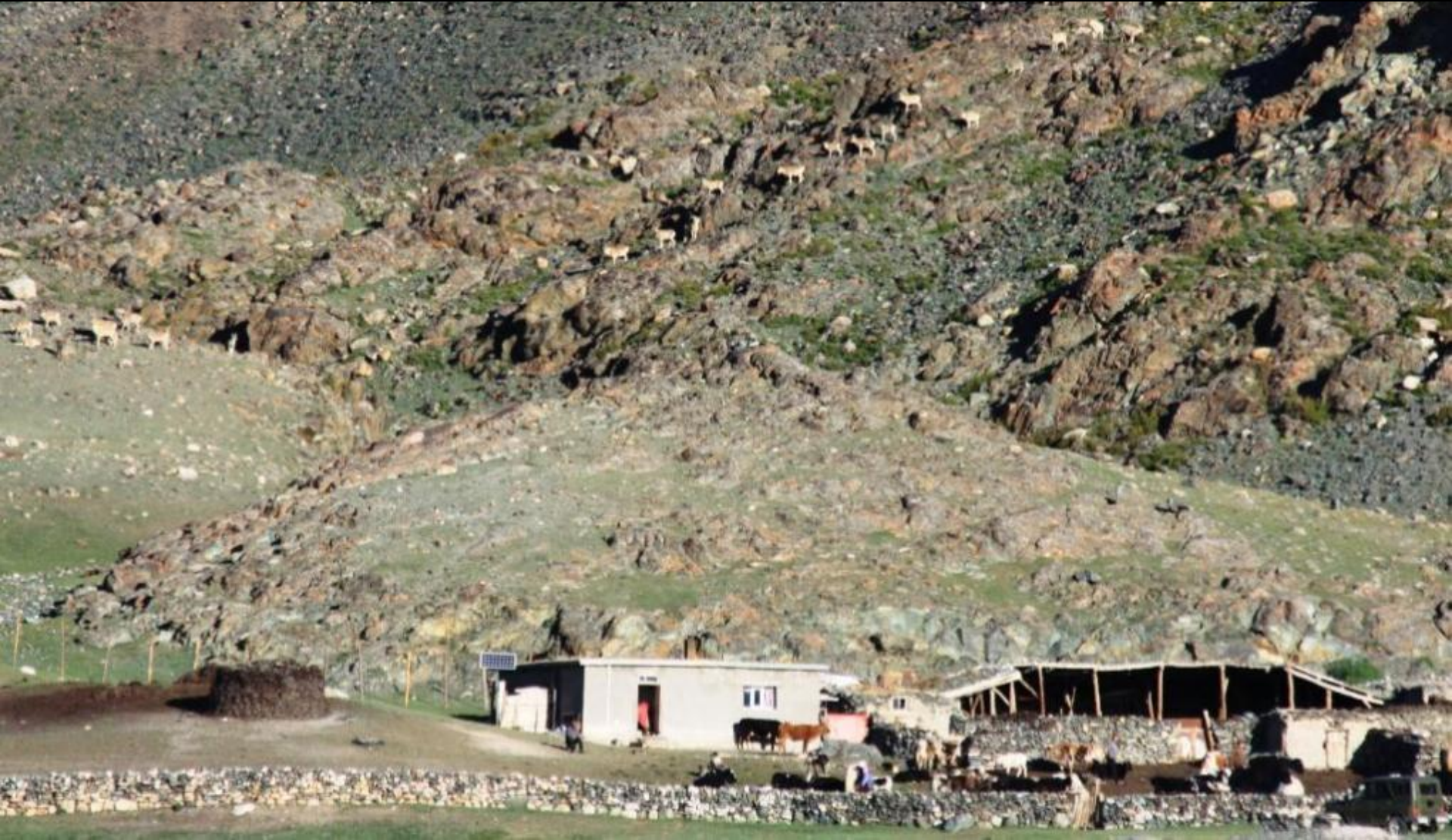
Kyzyl Suu Village,  
Issyk Kul Province

# Mongolia



**Ibex**  
**Sair Mountain, 3955m**  
**Bayan Olgii Aimag**

# Sair Mountain Local Protected Area



# Nepal



**Kangchenjunga, 8586 m**

# High Altitude Greenhouses



Ollanchung Gola Village, 3180m  
Kangchenjunga Conservation Area





# Cardamom Irrigation



Tapethok Village, 1430m  
Kangchenjunga Conservation Area



**Cardamom  
Sprinkler  
Irrigation**

# Pakistan



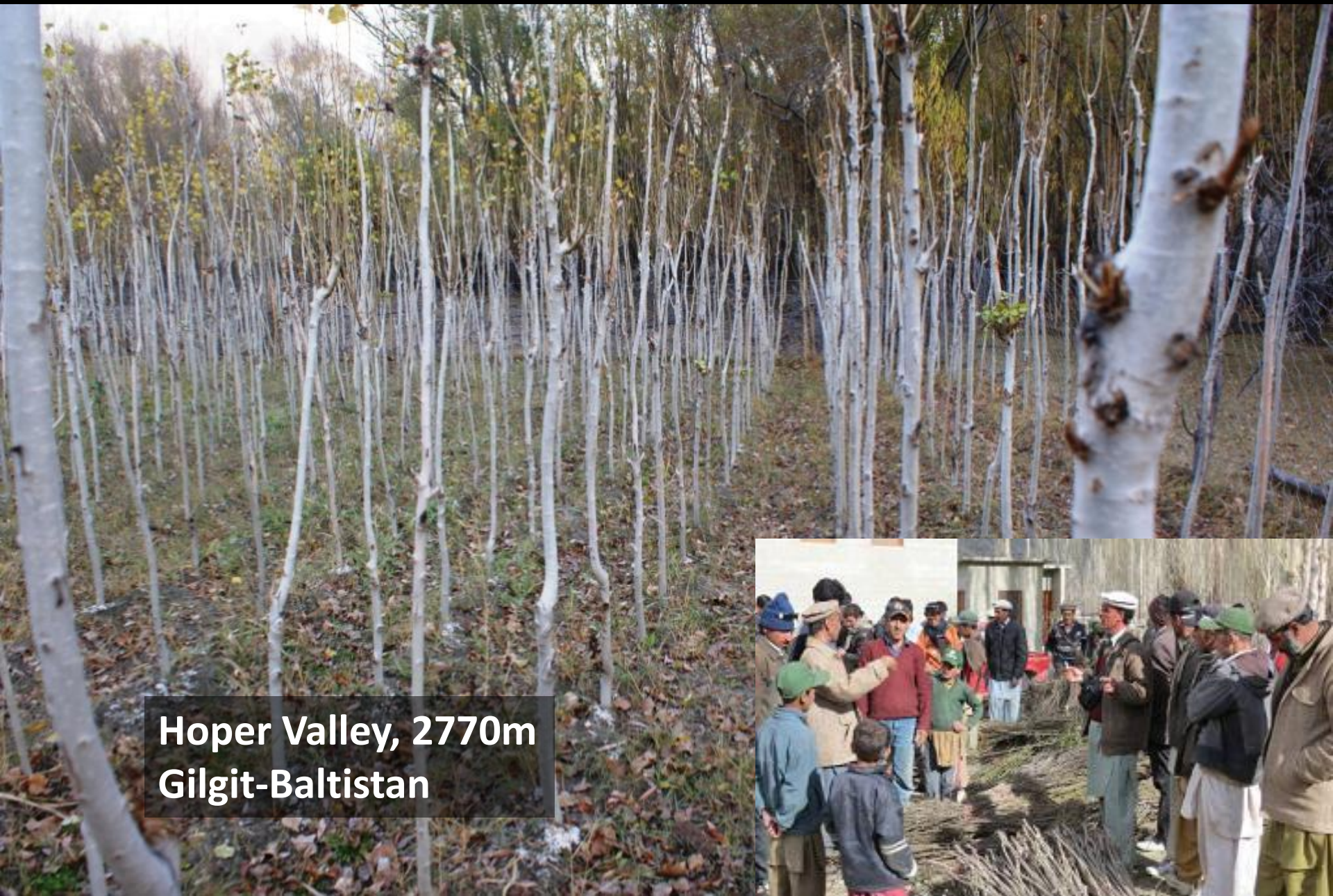
**Meir Glacier,  
Gilgit-Baltistan**

# Alfalfa Fodder Crop Planting



**Hoper Valley,  
Gilgit-Baltistan**

# Tree Planting



**Hoper Valley, 2770m  
Gilgit-Baltistan**

# Participatory Watershed Management Planning

The WWF Asia High Mountains Project has also launched participatory watershed Management Planning Processes at Project Sites in:

- Bhutan
- Kyrgyzstan
- Mongolia
- Nepal
- Pakistan

Nikka Chu River, Wangchuck Centennial Park, Bhutan

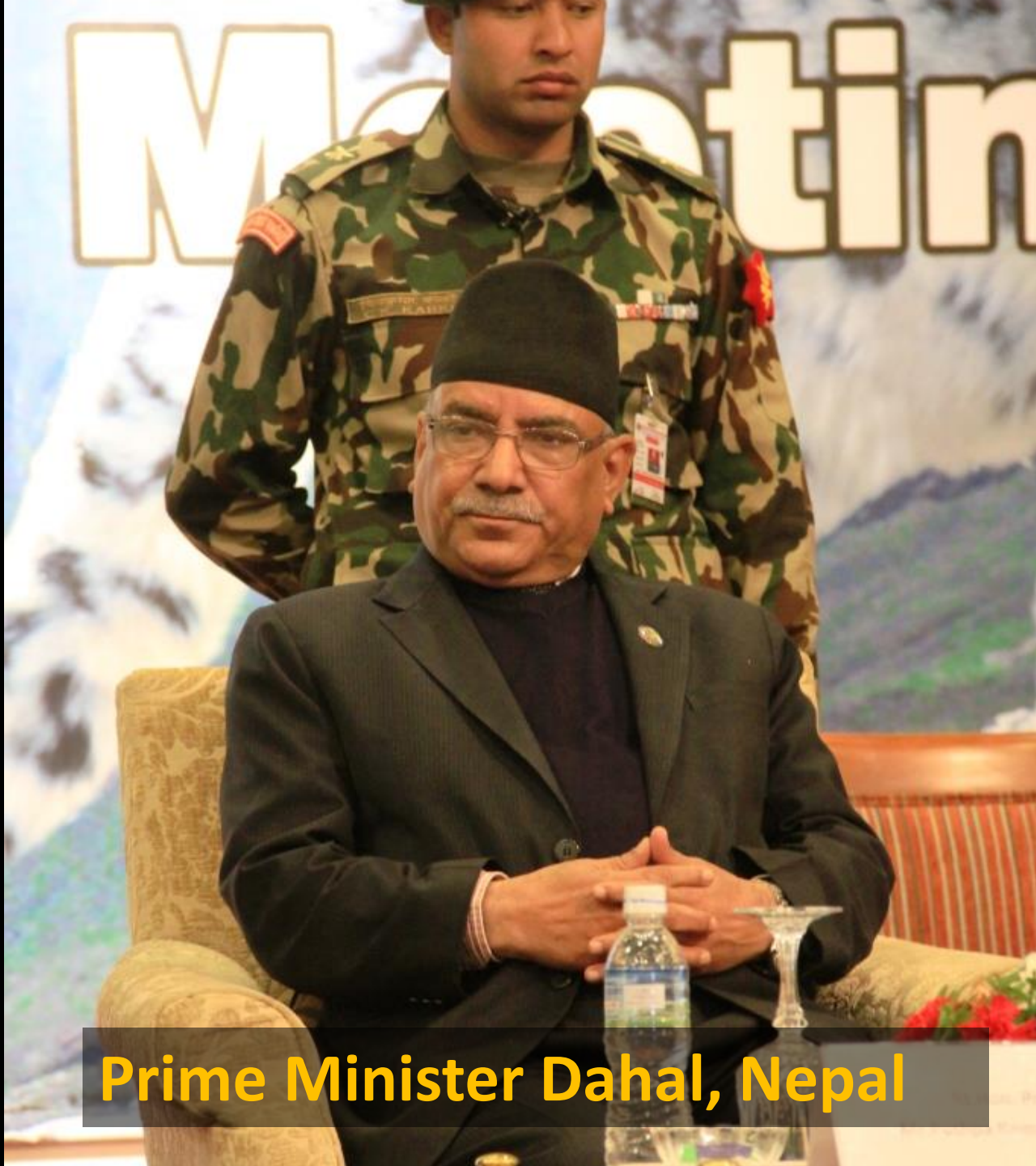
# **Global Snow Leopard and Ecosystem Protection (GSLEP) Program**

- **Launched in 2013**
- **12 Member States**
- **Funding Partners: WWF, SLT, UNDP, GEF**
- **Goal: Protect 20 Snow Leopard Landscapes by 2020**
- **Strategy: Develop and Implement 20 Climate-smart Snow Leopard Landscape Management Plans**
- **GSLEP is opening a dialogue on shared environmental issues among the 12 member states**

# President Atambayev, Kyrgyzstan

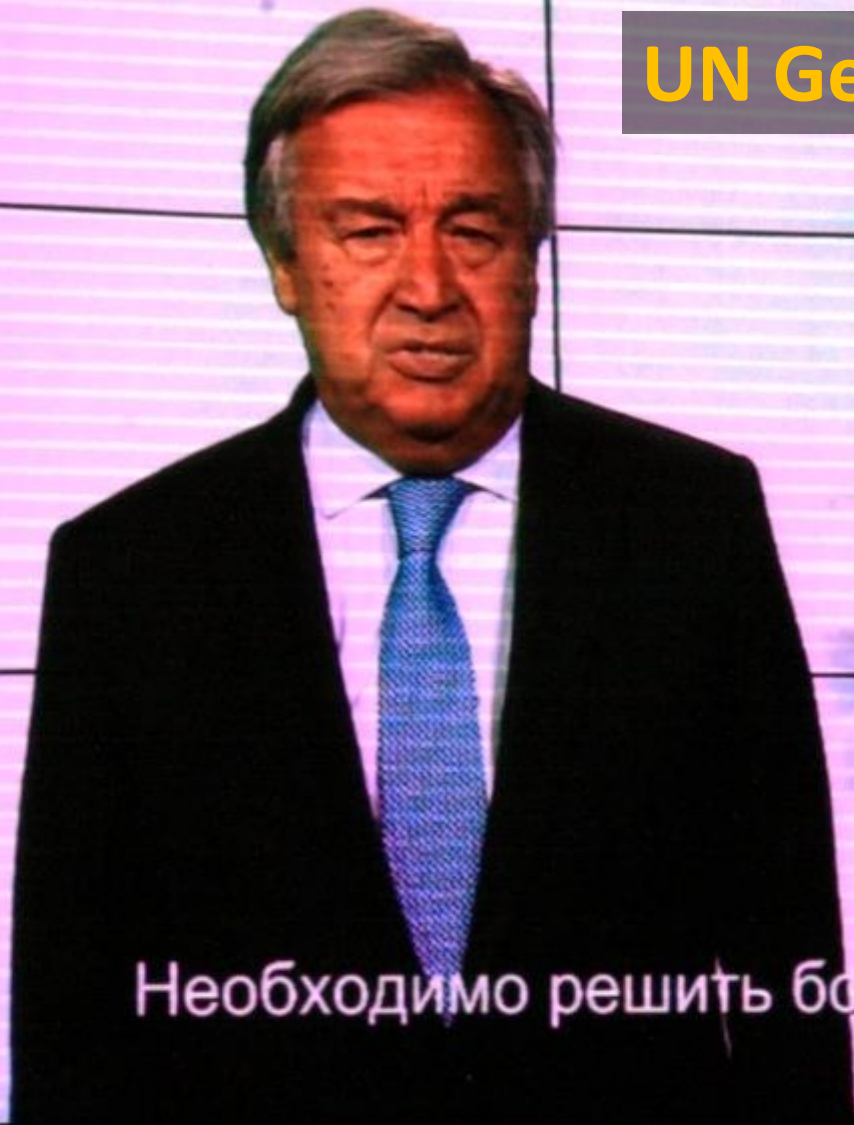






**Prime Minister Dahal, Nepal**

## UN General Secretary Guterres



Необходимо решить более насущные проблемы



**202,349**

people have signed the call to

**#SaveSnowLeopards**

24 - 25 August 2017  
International Snow Leopard &  
Ecosystem Forum  
Bishkek, Kyrgyz Republic

WWF Snow Leopard Trust NABU

# Conclusions

- Climate change impacts are leading to **declines in the water, food, and livelihood security** of mountain peoples.
- These **impacts are only expected to worsen in coming decades**, increasing threats to Snow Leopards and downstream water resources.
- These **high mountain regions are also being rapidly developed**. Still, critical data gaps in climate and hydrology. CHARIS is making inroads on filling some of these.
- WWF is helping communities adapt through innovative interventions **that benefit both people and local ecosystems** - improving water, food, and livelihood security in the process.

# Conclusions

- Through the GSLEP, WWF is supporting snow leopard range states to develop and implement **landscape management plans** that integrate conservation, development, and climate risks.
- CHARIS and the WWF AHM Project have shown that **snow leopard habitat provides vital ecosystem services** for millions well beyond the remote mountain peaks of high Asia.
- **We hope to make a contribution to improving water security for millions** downstream who depend directly on mountain rivers for their livelihoods and economic well-being.
- Still, **more effort is needed** to demonstrate how upstream conservation can best benefit lowland peoples.

# WWF Asia High Mountains Project

[www.worldwildlife.org/initiatives/asia-high-mountains](http://www.worldwildlife.org/initiatives/asia-high-mountains)



Akshyrak Village, 3150m, Issyk Kul Province, Kyrgyzstan



**USAID**  
FROM THE AMERICAN PEOPLE



**Khan Tengri, Kyrgyzstan, 6995m**  
Photo by Pavel Van-Yu-Tsai