India, China and the Environment

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ECOLOGY

China, India, and the Environment

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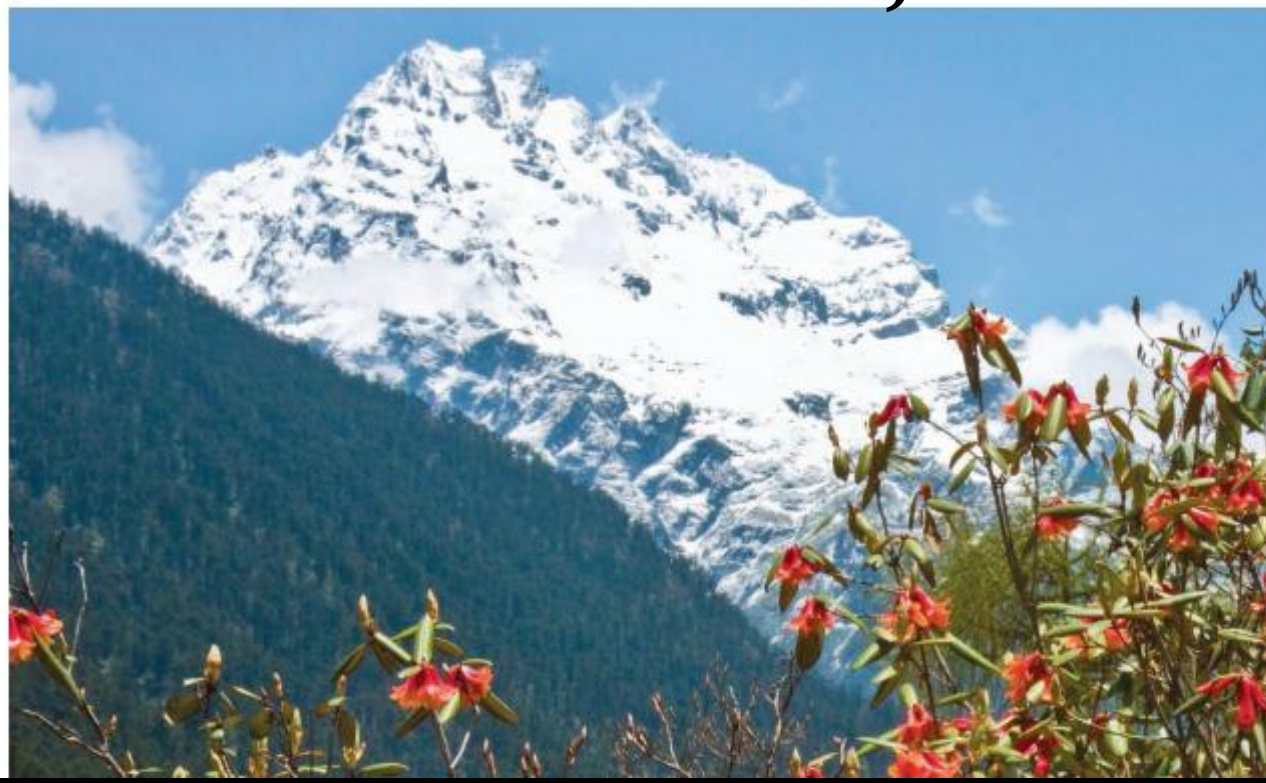
Cooperation between China and India can curtail biodiversity loss, mitigate climate change, and reduce deforestation.

Science, 2010

China and India, the emerging economic giants of the world, will play a significant, perhaps a dominant, role in shaping the environmental outcomes for our planet in the 21st century. Both countries are expected to maintain an 8 to 9% rate of economic growth over the next several years (*1*). Even when much of the world is experiencing a recession, China and India in 2009 are projected to achieve high Gross Domestic Product growth (China, 8.4%; India, 6.2%; world, –2.2%) (*1*). Development in China and India is fueled not only by the natural capital within the countries, but also increasingly by imports of raw materials, particularly from southeast Asia. Both nations import ~9 million tons of crude palm oil annually—almost one-quarter of global production—mostly from Malaysia and Indonesia (*2*). The degree to which China



Himalaya: Biodiversity Hotspot

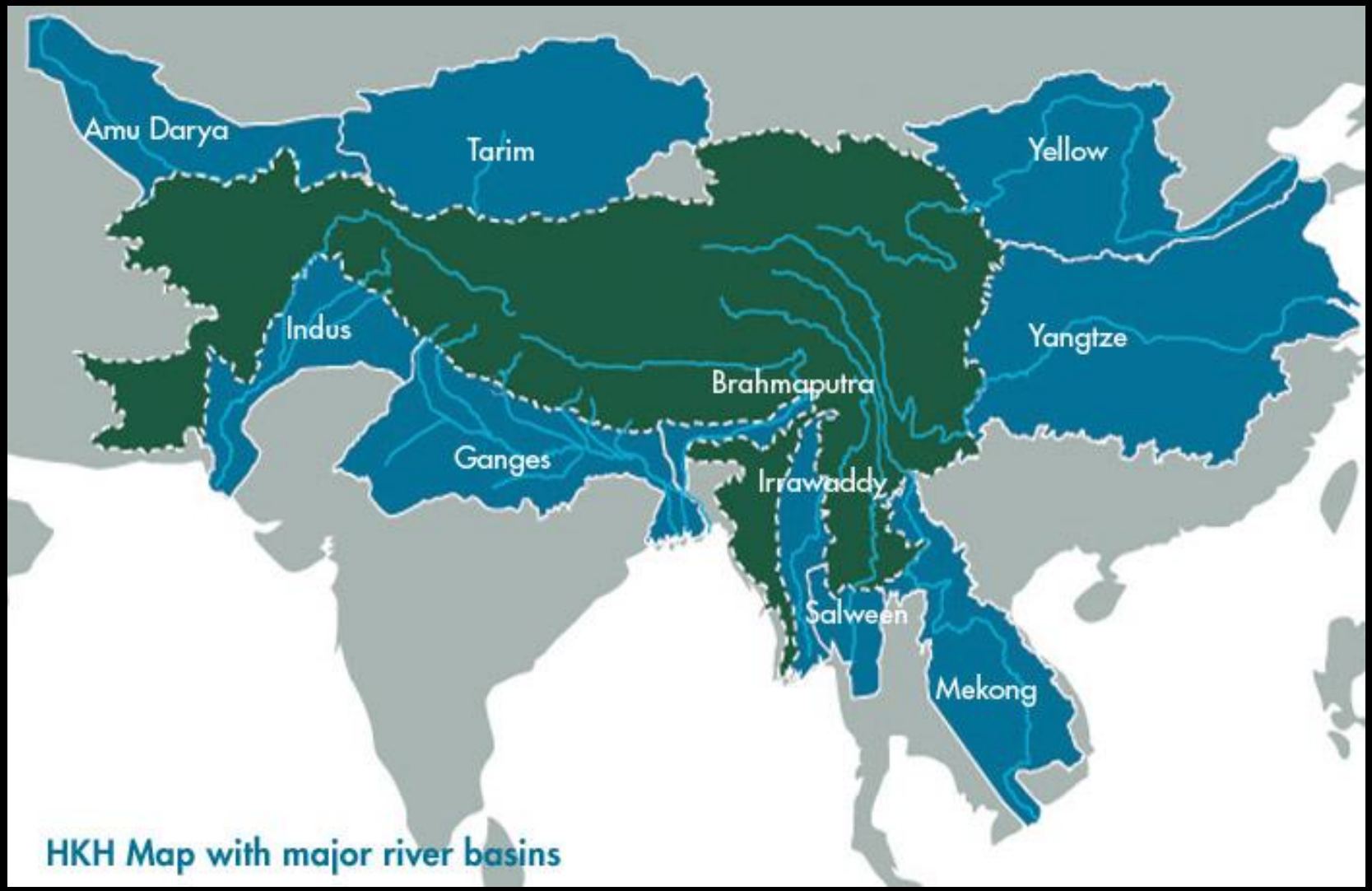
HIMALAYA

MOUNTAINS OF LIFE

KAMAL BAWA | SANDESH KADUR

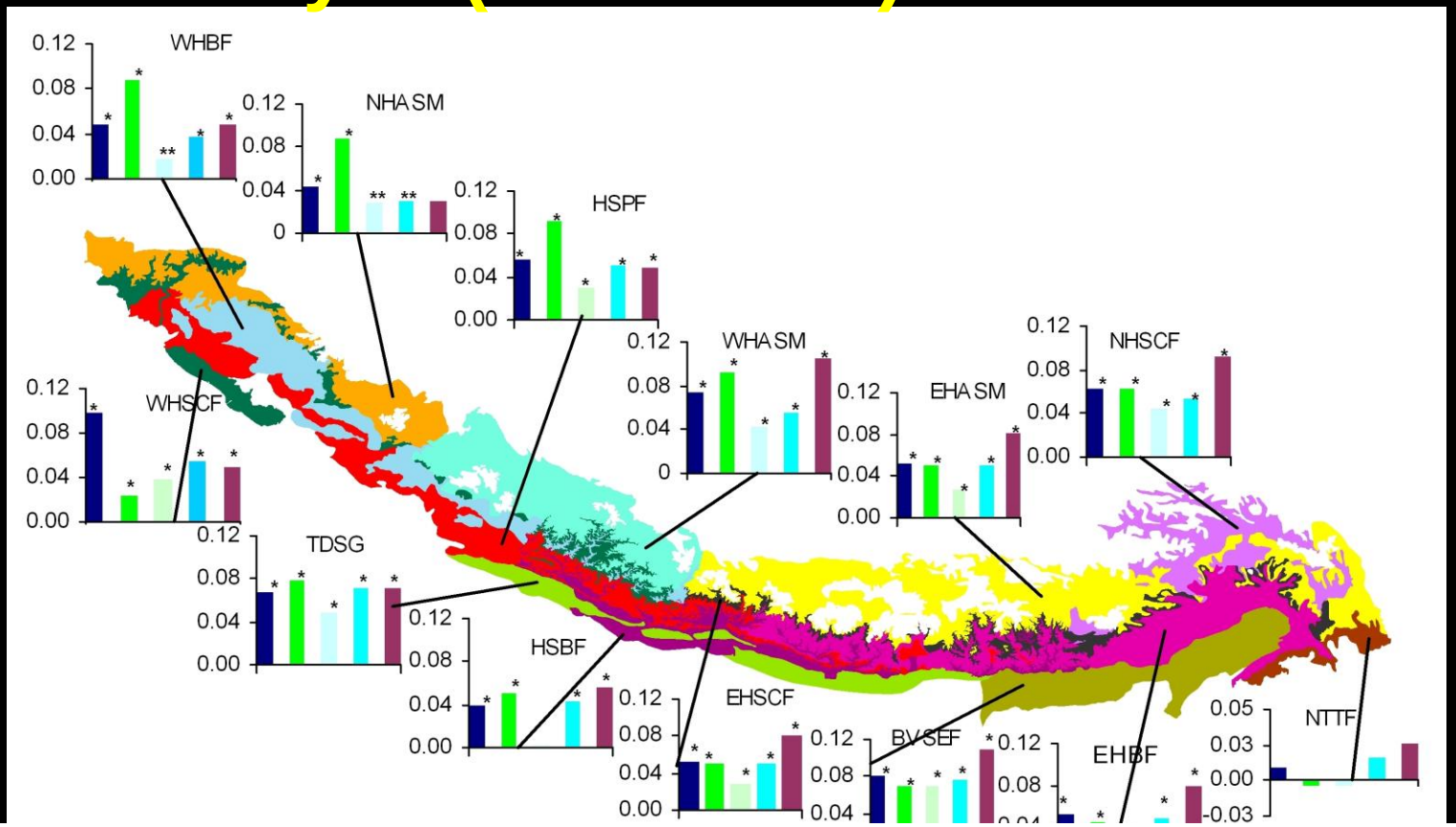
Foreword George Schaller | Peter Raven

Himalaya : Climate Change



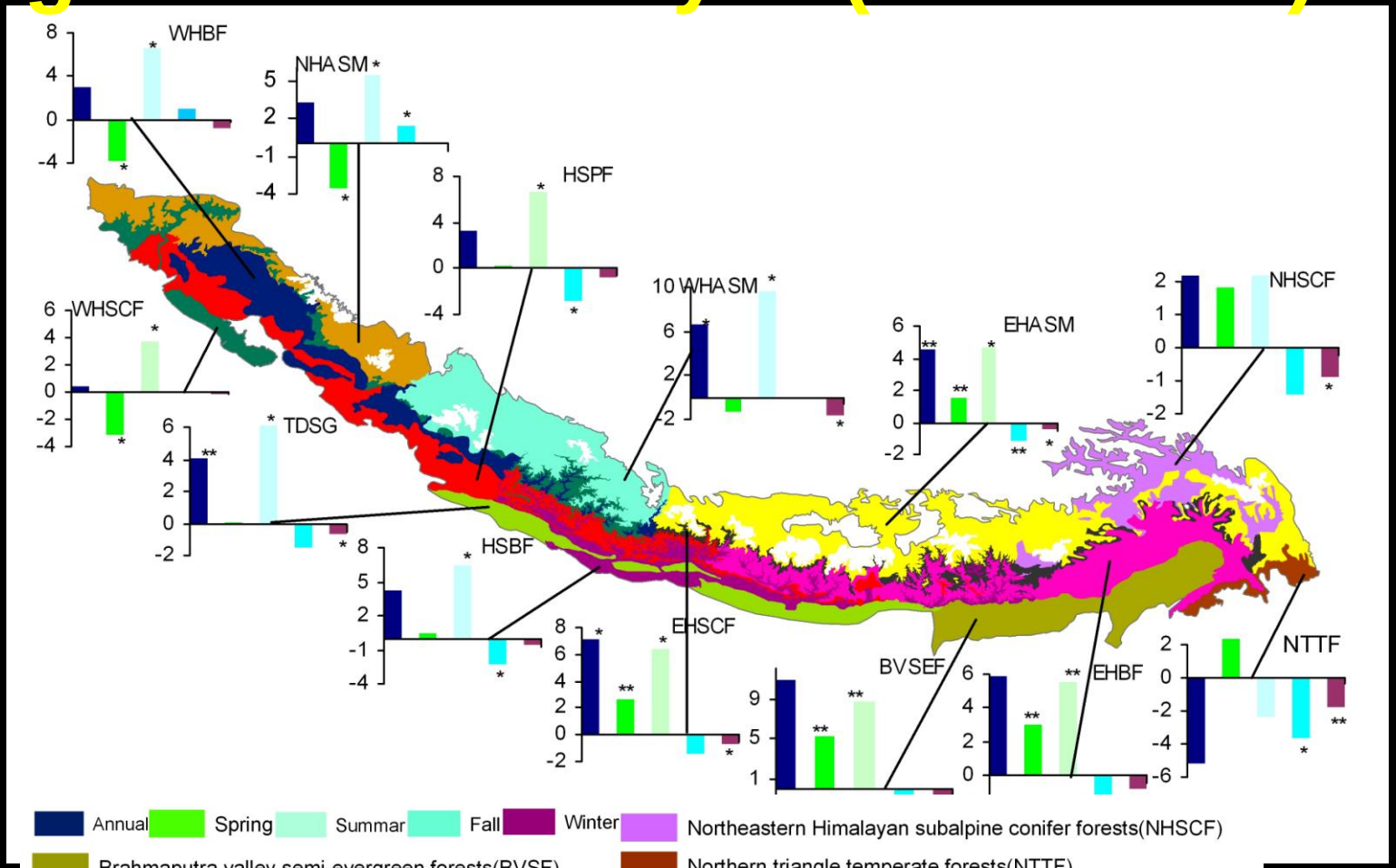
1.3 billion people are living in the Himalayas river basins rely on both meltwater and monsoon waters to sustain their livelihoods, mainly for irrigation, drinking, sanitation and industrial uses

Changes in temperature in different ecoregions of the Himalayas (1982-2006) --+1.5^0 C



Changes in precipitation in different ecoregions of Himalayas (1982-2006)

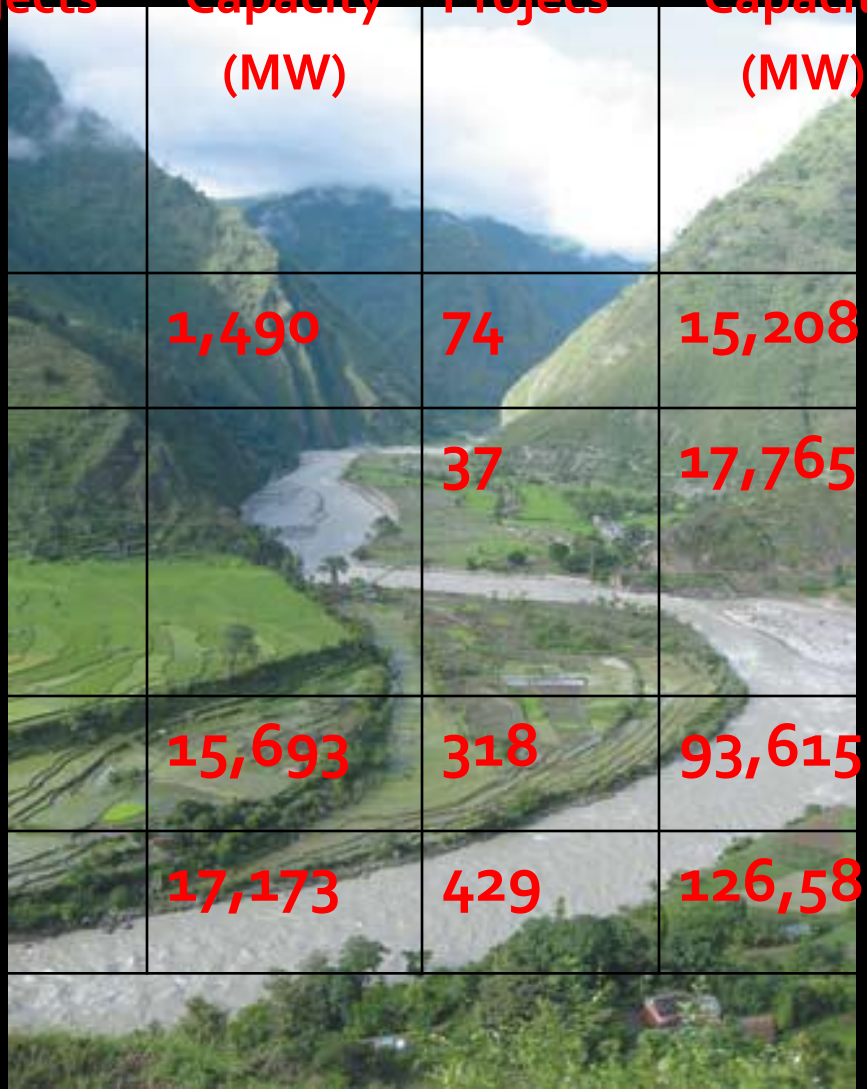
+165 mm



Himalaya: Hydropower

Himalayas :Hydropower Projects

	Nepal		Bhutan		India	
	Projects	Capacity (MW)	Projects	Capacity (MW)	Projecs	Capacity (MW)
Existing	15	545	5	1,490	74	15,208
Under construction	2	94			37	17,765
Planned	37	26,324	16	15,693	318	93,615
Total	54	26,953	21	17,173	429	126,588



Change

Causes:

Climate change

Land use-change

Development (infrastructure)

Population growth

Border conflict

Disproportionate impact on poor

Knowledge

Usable Knowledge

(Cash et al., 2003; Clark et al., 2011)

- Relevance
- Credible
- Salient

Deficit of Usable Knowledge

- Institutions
- Production of knowledge

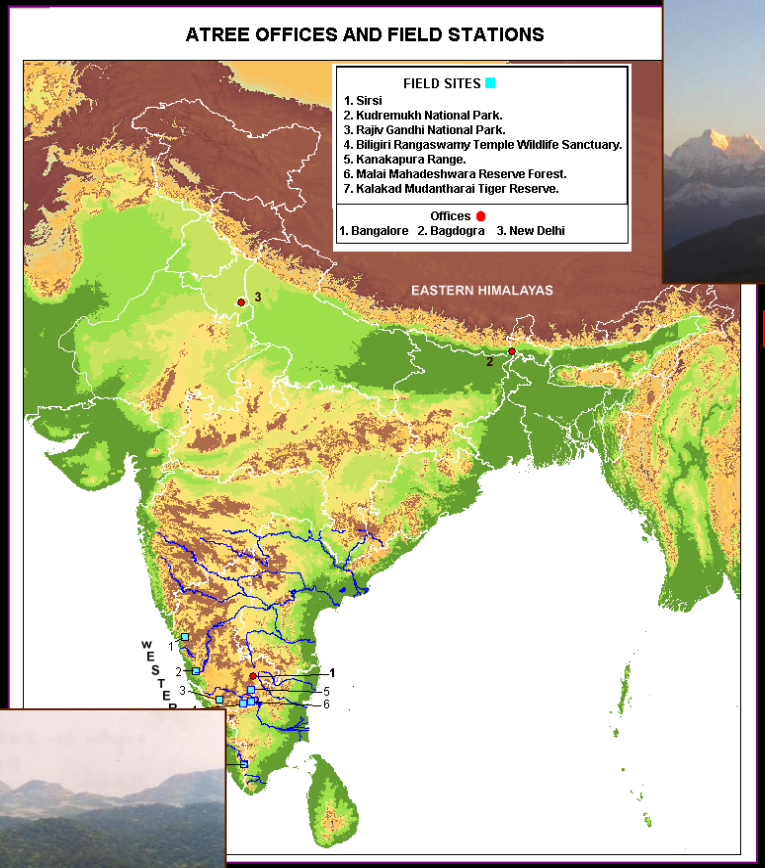
ASHOKA TRUST FOR RESEARCH IN ECOLOGY AND THE ENVIRONMENT (ATREE)

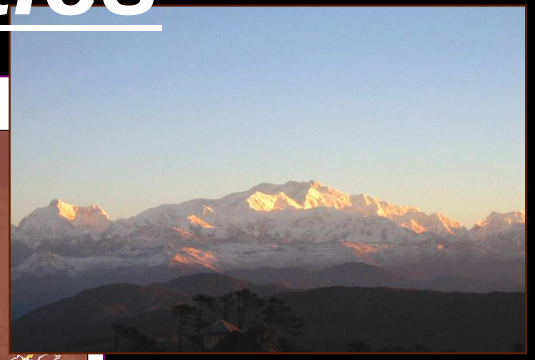
Bangalore, India (www.atree.org)

Mission

Promote socially just environmental conservation and sustainable development generating rigorous interdisciplinary knowledge engages actively with academia, policy makers, practitioners, activists, students and wider public audiences.

Staff and Facilities





Eastern Himalayas

Offices

- Bangalore
- Darjeeling
- Gangtok
- New Delhi

Western Ghats

Staff

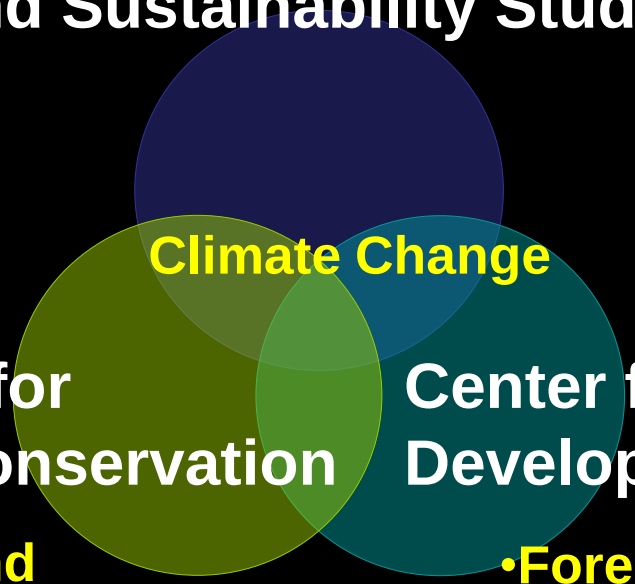
- 22 Fellows (Faculty)
- 15 Honorary Fellows (Faculty)
- 90 Professional staff
- 10 Executive staff
- 30 Support staff

Field Sites

6 Community Conservation Centers+ Long -term Ecological Research Sites

Organization

Academy for Conservation Science and Sustainability Studies



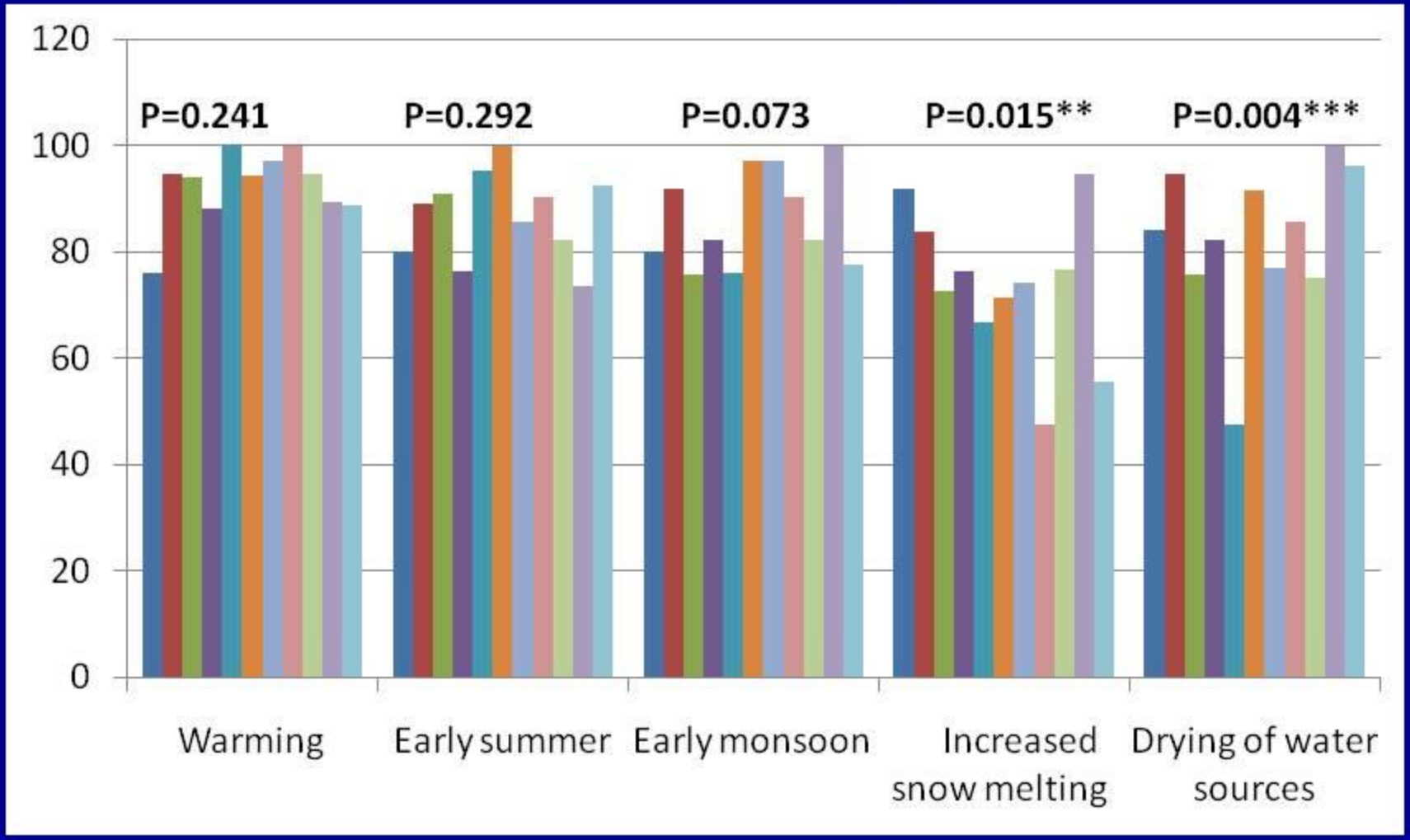
Suri Sehgal Centre for Biodiversity and Conservation

- **Global Change and Ecosystems**
- **Ecosystem Services and Human Well-being**

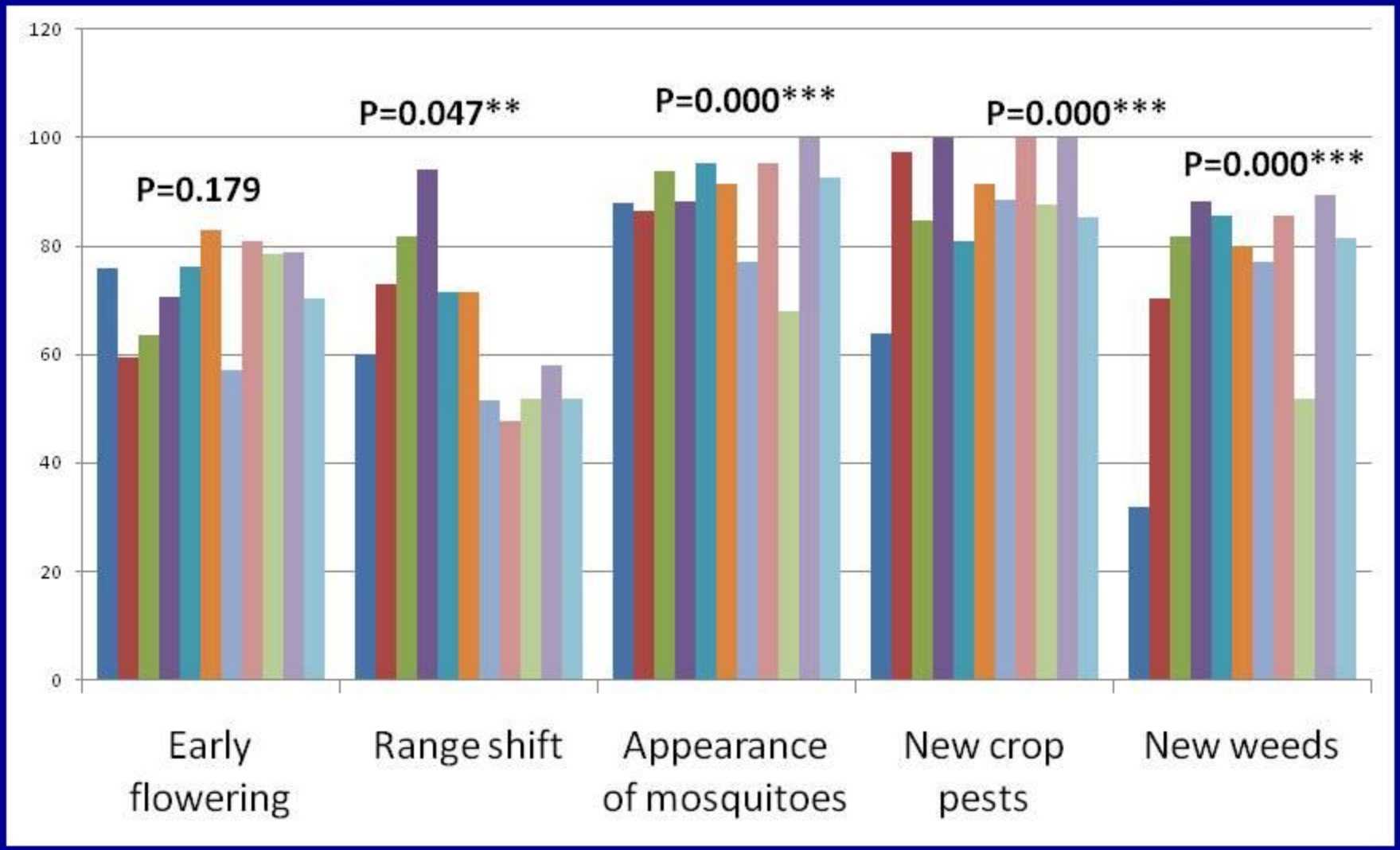
Center for Environment and Development

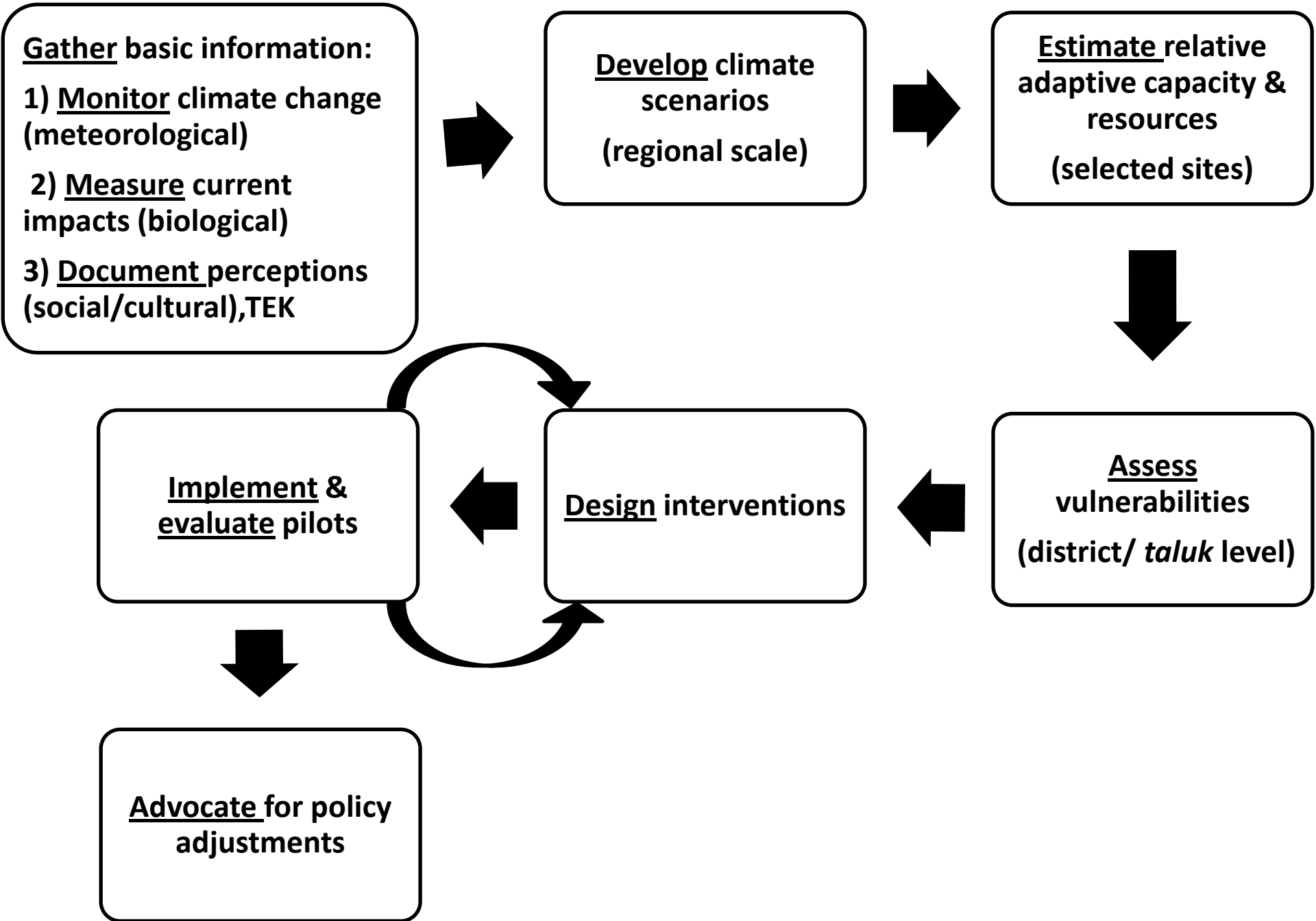
- **Forests and Governance**
- **Land , Water and Livelihoods**

Consistency in perceptions about climate change



Consistency in perceptions about consequences of climate change




Gather basic information:
1) Monitor climate change (meteorological)
2) Measure current impacts (biological)
3) Document perceptions (social/cultural),TEK
Develop climate scenarios
(regional scale)
Estimate relative adaptive capacity & resources
(selected sites)
Assess vulnerabilities
(district/ taluk level)
Design interventions
Implement & evaluate pilots
Advocate for policy adjustments

Framework for Future

-- Sustainable landscapes—resilient to change, confer livelihoods security, and social equity

--Integration of knowledge across disciplines, knowledge systems, and geographical scales

-- New institutions for generating usable knowledge and for linking action research with policies and governance

Deficit of Usable Knowledge

- Institutions
- Production of knowledge

Dokpas- 3800 m to about 7000 m

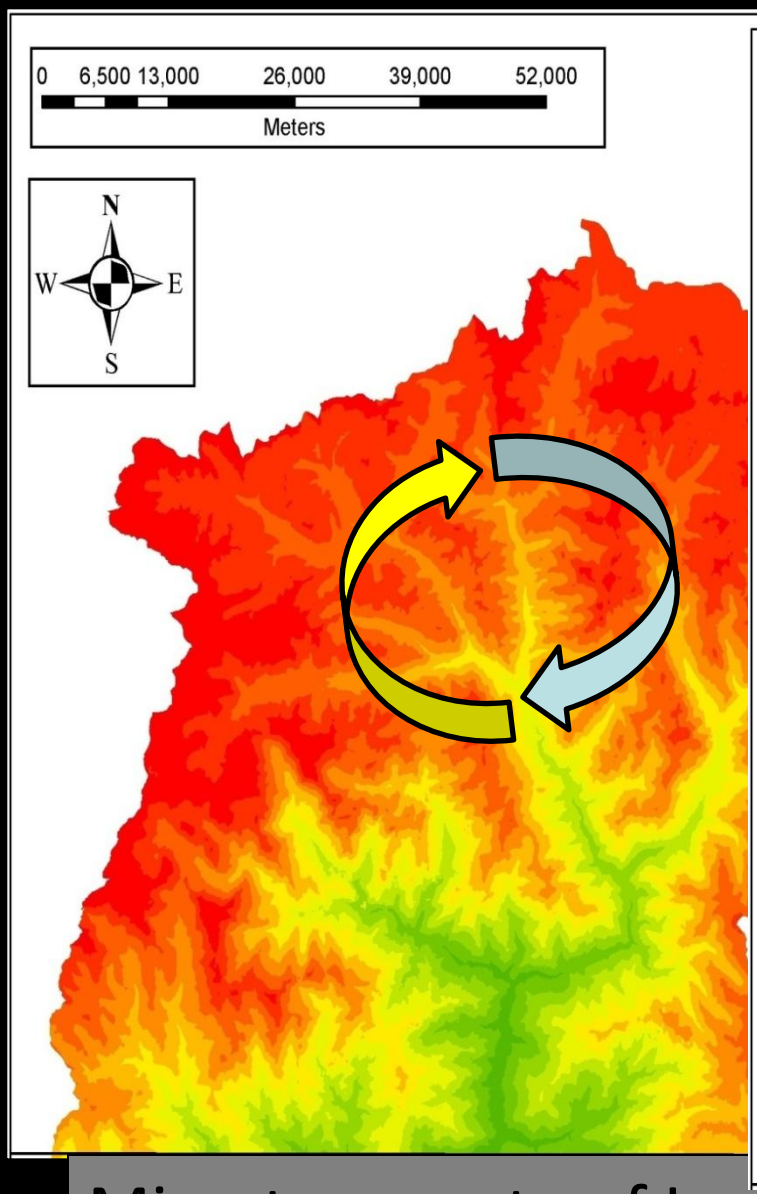
Lachenpas-2000m to about 3800m

The Dzumsa

- Recognized by the Government of India in 1985

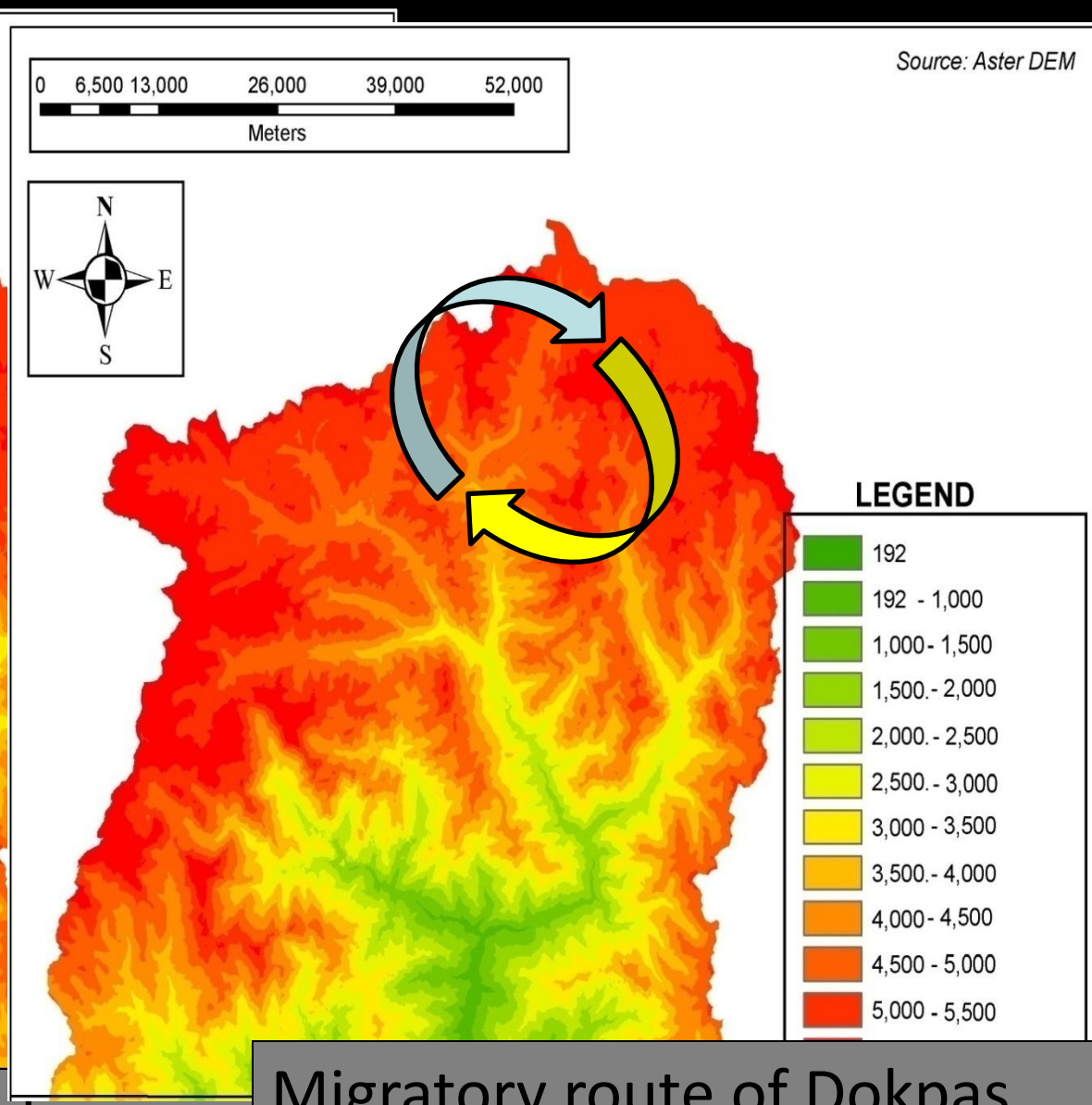
- Annually elected body

- 12 village representatives
  - 2 Pipons (headmen)
  - 6 Gembos (advisors)
  - 2 Tsipos (accountants)
  - 2 Gyapons (messengers)



Migratory route of Lachenpas

- Summer Migration
- Winter migration



Migratory route of Dokpas

- Summer Migration
- Winter migration

Impacts on grazing pastures and the response

Impacts on agriculture and the response

Dzumsa

1. Slaughter or sale of sheep banned for three years.

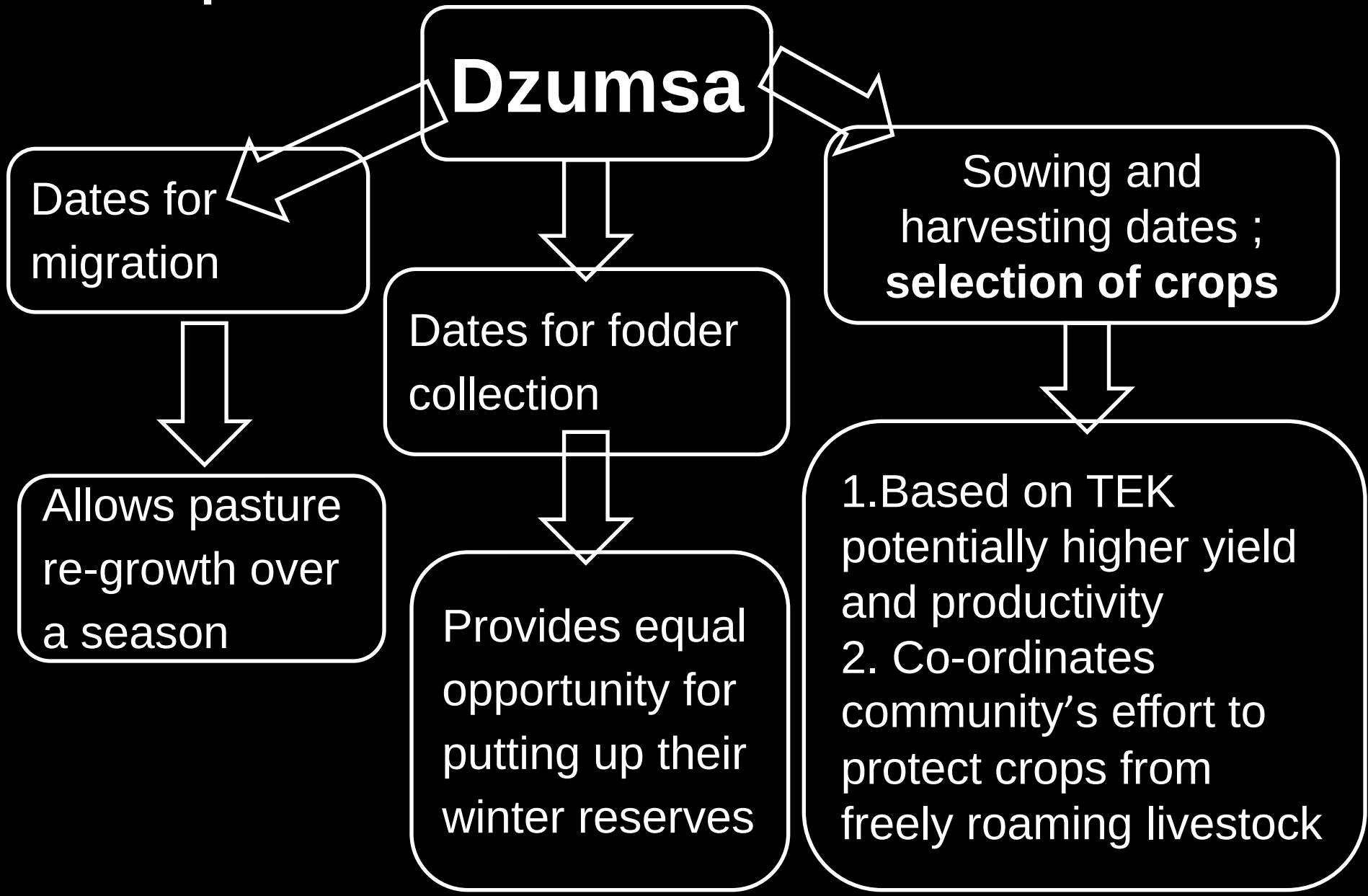
2. Prayer flags believed to decrease snowfall have been banned.

Lachen-9000ft (amsl)
Maize, cabbages, pumpkins

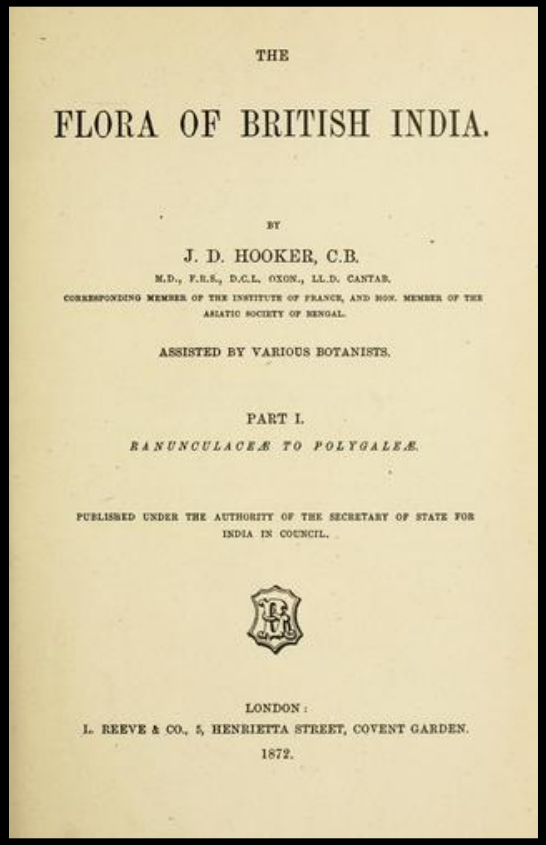
Thangu (4000m)
Carrots

Gochung-(4500m)
potatoes

Some of the resource management strategies and their implications



Traditional Ecological Knowledge



THE

FLORA OF BRITISH INDIA.

BY

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M.D., F.R.S., D.C.L. OXON., LL.D. CANTAB.

CORRESPONDING MEMBER OF THE INSTITUTE OF FRANCE, AND HON. MEMBER OF THE ASIATIC SOCIETY OF BENGAL.

ASSISTED BY VARIOUS BOTANISTS.

PART I.

RANUNCULACEÆ TO POLYGALEÆ.

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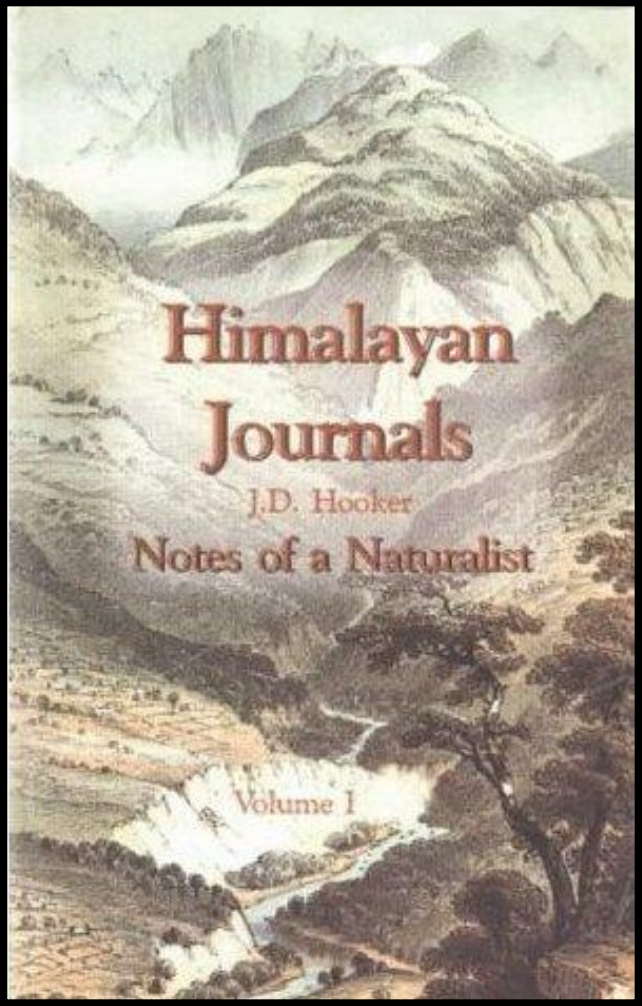
1872.

Flora of British India by Sir J.D. Hooker 1850- 1872 A.D.



Himalayan Journals Notes of Naturalist by Sir J.D. Hooker- 1850 A.D

Change and Livelihoods

- **Small land holdings (< 0.5 ha)**
- **Low income**
- **Poorly defined tenure**
- **Lack of credits and markets**

- **Reliance on local ecosystems for livelihoods**

Livelihood Challenges

- **Economic**
- **Social**
- **Ecological**

Climate Change

Small land holders -interventions

- **Green Micro-enterprises (economic gains)**
- **Village level bodies, cooperatives (social gains)**
- **Stewardship of local ecosystems (ecological gains)**

Key: Institutions

Economic Gains: Green enterprises

Economic Gains: Federations, Corporations

Social gains

Self-help Groups

Resource User Groups

Village Elected Bodies

Rights, Tenure

Ecological Gains

Reduced Resource Use

Restoration

Participatory monitroing

Stewardship