

# Regional Technical Consultation

November 9-11, 2011

**Viewbook**

## **Strategic Initiative on Climate Change Impacts, Adaptation and Development in Mountain Regions** **Dushanbe, Tajikistan**



UNIVERSITY  
OF CENTRAL ASIA

MOUNTAIN SOCIETIES RESEARCH CENTRE



# Strategic Initiative on Climate Change Impacts, Adaptation and Development in Mountain Regions

## Dushanbe, Tajikistan

November 9-11, 2011

Dr. Michael H. Glantz, INSTAAR, CCB, CU

### Viewbook



**NOVEMBER 9, 2011**  
**Wednesday, 9:00am - 10:00am**

# Welcoming Ceremony

**8:30-9:00am .... Registration**

**9:00-9:20am .... Opening Ceremony**

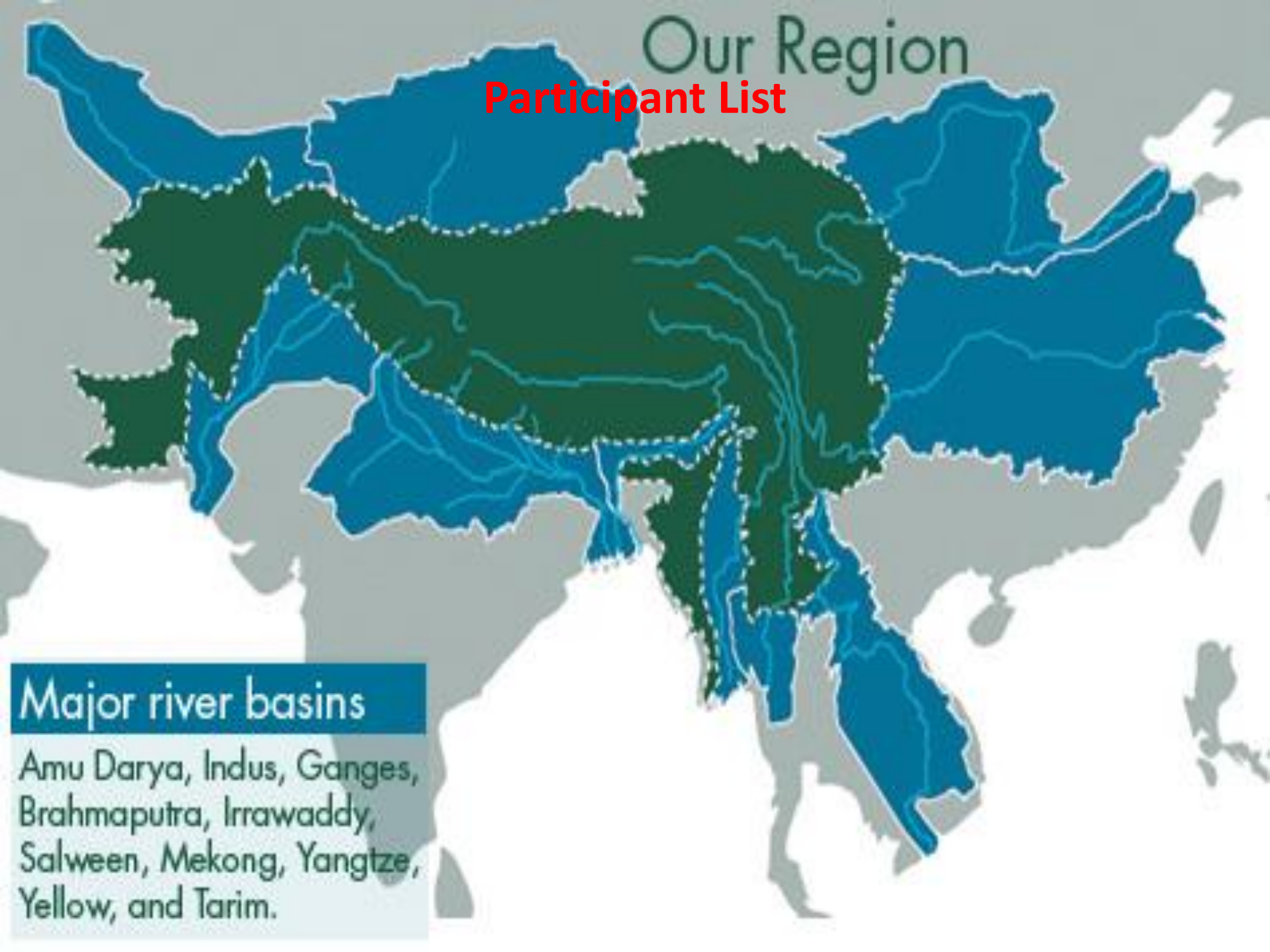
- **Welcome by Sponsors**

**9:20-10:00am .... Round-the-table Introductions**



Our Region

## Participant List



### Major river basins

Amu Darya, Indus, Ganges,  
Brahmaputra, Irrawaddy,  
Salween, Mekong, Yangtze,  
Yellow, and Tarim.



# AGENDA

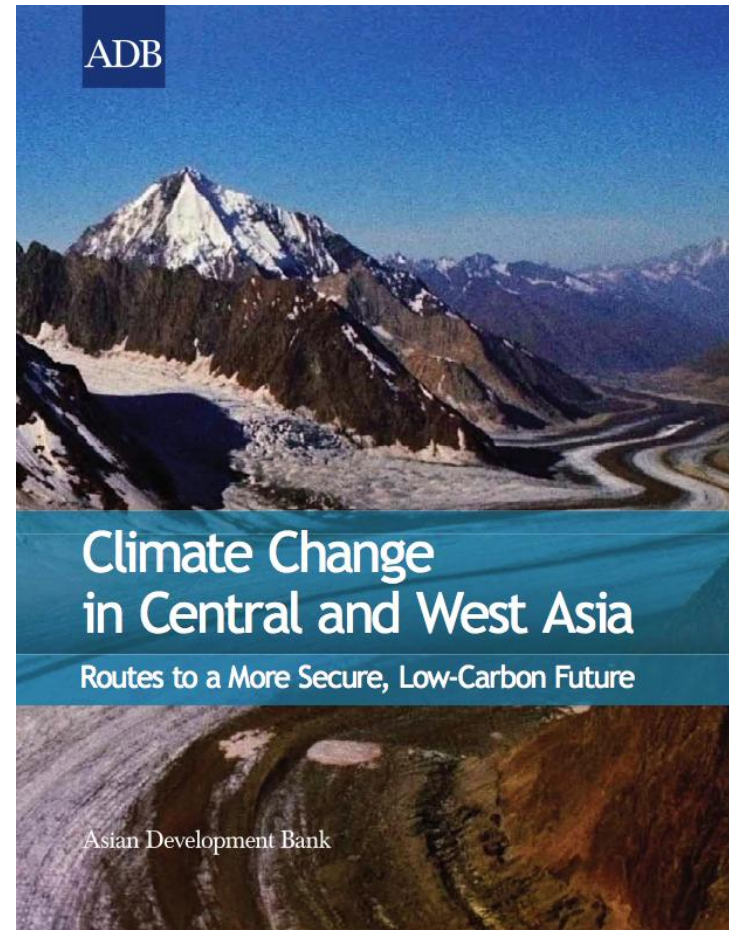
## Mountain Partnership “Networkshop” (November 9-11, 2011)

Tuesday 8	Wednesday 9	Thursday 10	Friday 11
<p><b>6:00pm-9:00pm</b> Participant Welcome Informal Reception</p>	<p><b>8:30am-9:00am</b> Registration and Coffee</p> <p><b>9:00am-9:20am</b> (FAO, UCA, Tajik Officials) Greetings by leaders of the Conference and local dignitaries</p> <p><b>9:20am-10:00am</b> Round-the –Table introductions</p> <p><b>10:00am-10:30am</b> “Why Are We Here.” (FAO, Mountain Partnership) Outline for the next 2 days.</p> <p><b>10:30am-11:00 am</b> Networking Break</p> <p><b>11:00am-12:00pm</b> “Why the mountains of the greater Central Asia region are of global concern: Key messages for negotiators.” -</p> <p><b>12:00pm -1:00pm</b> Lunch</p> <p><b>1:30pm-3:00pm</b> Country perspectives</p> <p><b>3:00m-3:30pm</b> Networking Break</p> <p><b>3:30pm-4:30pm</b> “The value of Usable Science in political negotiations.” Concepts to consider</p> <p><b>4:30pm-5:00pm</b> Desired Goals at UNFCCC Cop17 for the Mountain Partnership</p> <p><b>7:00pm</b>  BANQUET</p>	<p><b>8:30am-9:00am</b> <b>Look Back to Look Ahead: Thoughts from the previous day</b></p> <p><b>9:00am-10:00am</b> “Ecosystems and Human Goods and Services” and how to make them work for mountain countries.”</p> <p><b>10:00am-10:45am</b> <b>Inside &amp; outside the “Mountain Box”</b> * Mountain Partnership * Mountain Coalition?</p> <p><b>10:45am-11:15 am</b> Networking Break</p> <p><b>11:15am-12:30pm</b> SMALL GROUPS: SWOC assessment about how best to enhance the influence of the Mountain Partnership in global political negotiations (Arguments, strategies, coalition/partners).</p> <p><b>12:30pm -1:30pm</b> Lunch</p> <p><b>1:30am-3:00pm</b> SWOC small group present/discuss</p> <p><b>3:00pm-3:30pm</b> Networking Break</p> <p><b>3:30pm-4:30pm</b> Recap * Highlights * Key Points * Key Issues * Key Approaches</p> <p><b>4:30pm- 5:30pm</b> Next Steps? Promote inclusion of mountain development issues in international negotiations (i.e. (COP 17, Rio+20, CSD, CBD)</p>	<p><b>8:00am-6:00pm</b> Field Trip</p>

10:00-10:30am

# Why we are here

- **Conference Statement**
- **Desired Outcomes**



# The Greenhouse Effect

SUN

Some solar radiation is reflected by the Earth and the atmosphere.

Solar radiation passes through the clear atmosphere

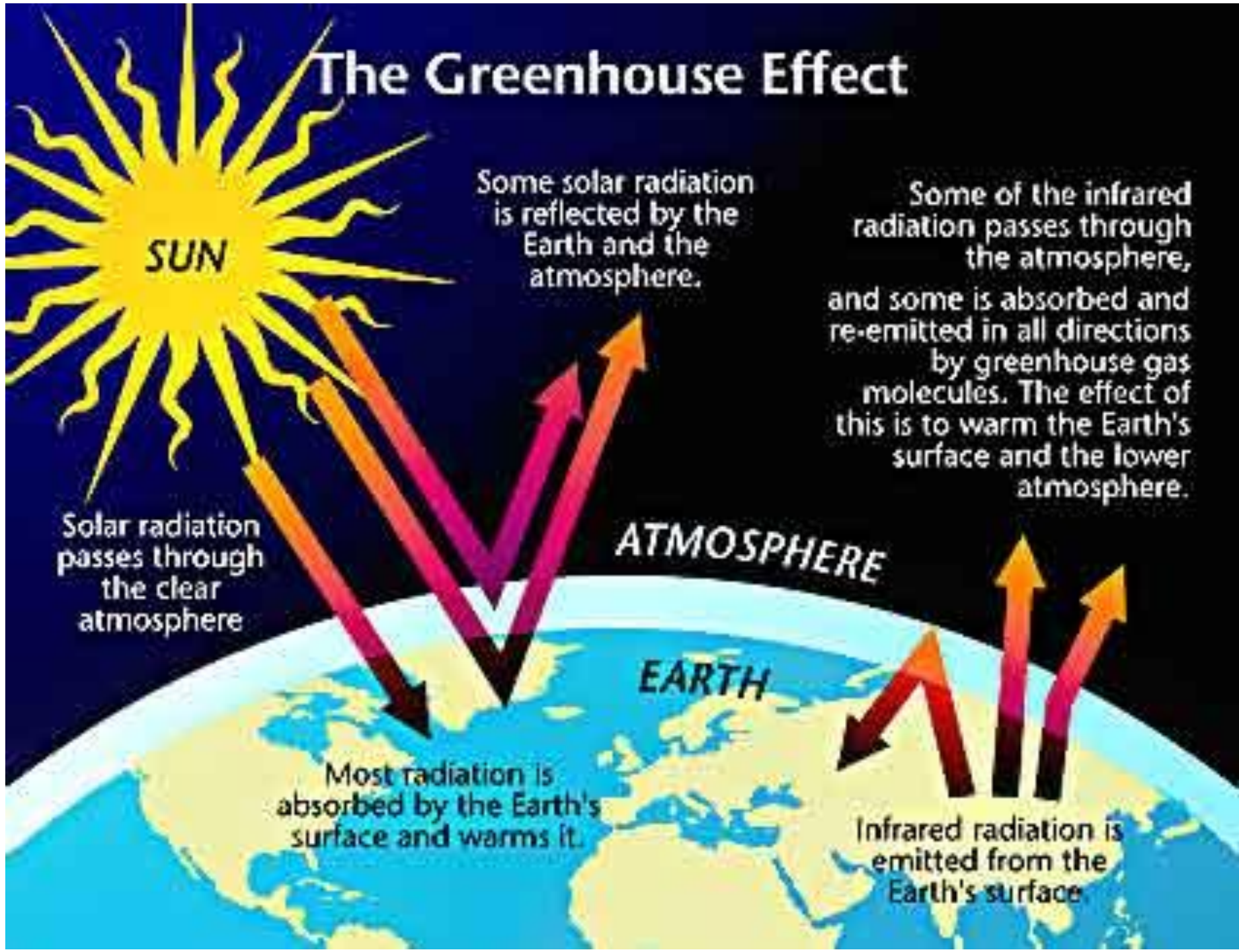
ATMOSPHERE

EARTH

Most radiation is absorbed by the Earth's surface and warms it.

Some of the infrared radiation passes through the atmosphere, and some is absorbed and re-emitted in all directions by greenhouse gas molecules. The effect of this is to warm the Earth's surface and the lower atmosphere.

Infrared radiation is emitted from the Earth's surface.





# The situation, 2011

## Global warming: Causes and effects

Earth's temperature has risen about 1 degree Fahrenheit in the last century. The past 50 years of warming has been attributed to human activity.

Burning fuels such as coal, natural gas and oil produces greenhouse gases in excessive amounts.

Greenhouse gases are emissions that rise into the atmosphere and trap the sun's energy, keeping heat from escaping.

The United States was responsible for 20 percent of the global greenhouse gases emitted in 1997.

During the past 100 years global sea levels have risen 4 to 8 inches.

Most of the world's emissions are attributed to the United States' large-scale use of fuels in vehicles and factories.

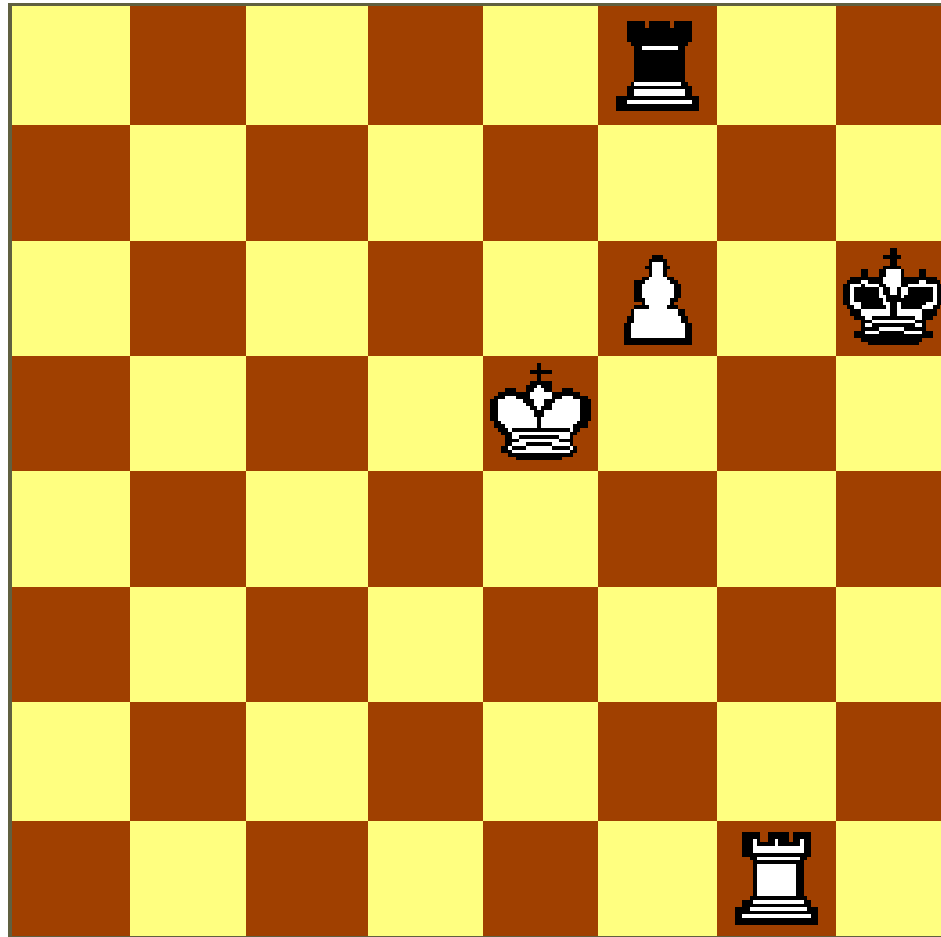
Some predictions for local changes include increasingly hot summers and intense thunderstorms.



Damaging storms, droughts and related weather phenomena cause an increase in economic and health problems. Warmer weather provides breeding grounds for insects such as malaria-carrying mosquitoes.



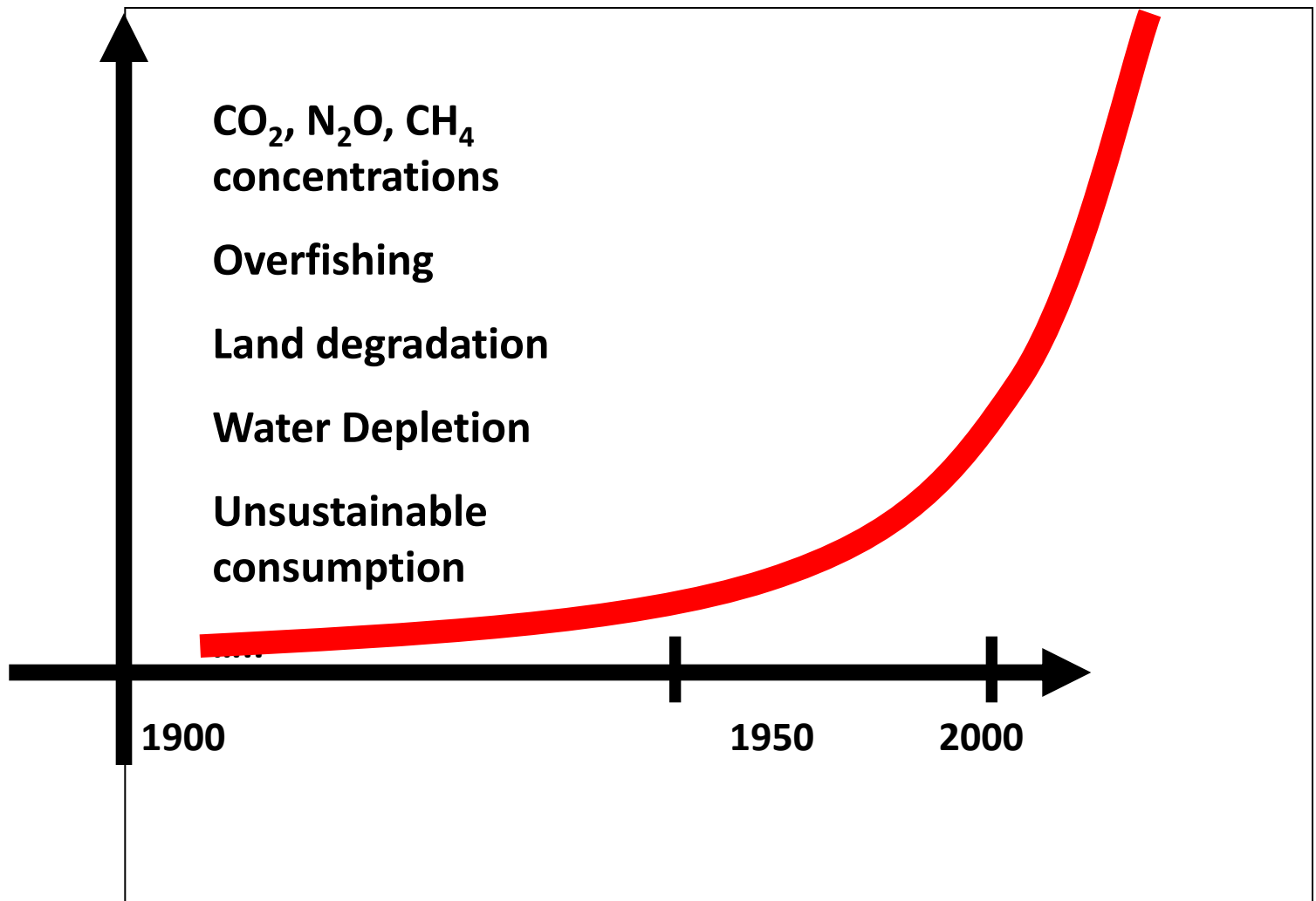
# Global warming and people: No place to hide



White to move

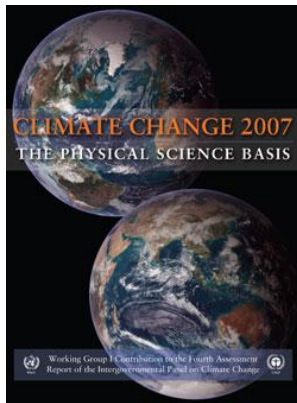
Fig. 3-26

The past 50 years has seen a dramatic  
degradation of the earth's natural  
capital



# Global Warming's “Tipping point”

- **IPCC 4th Assessment (2007)**
- **Nobel Prize (2007)**



**From WG 1 IPCC SCIENCE  
to**

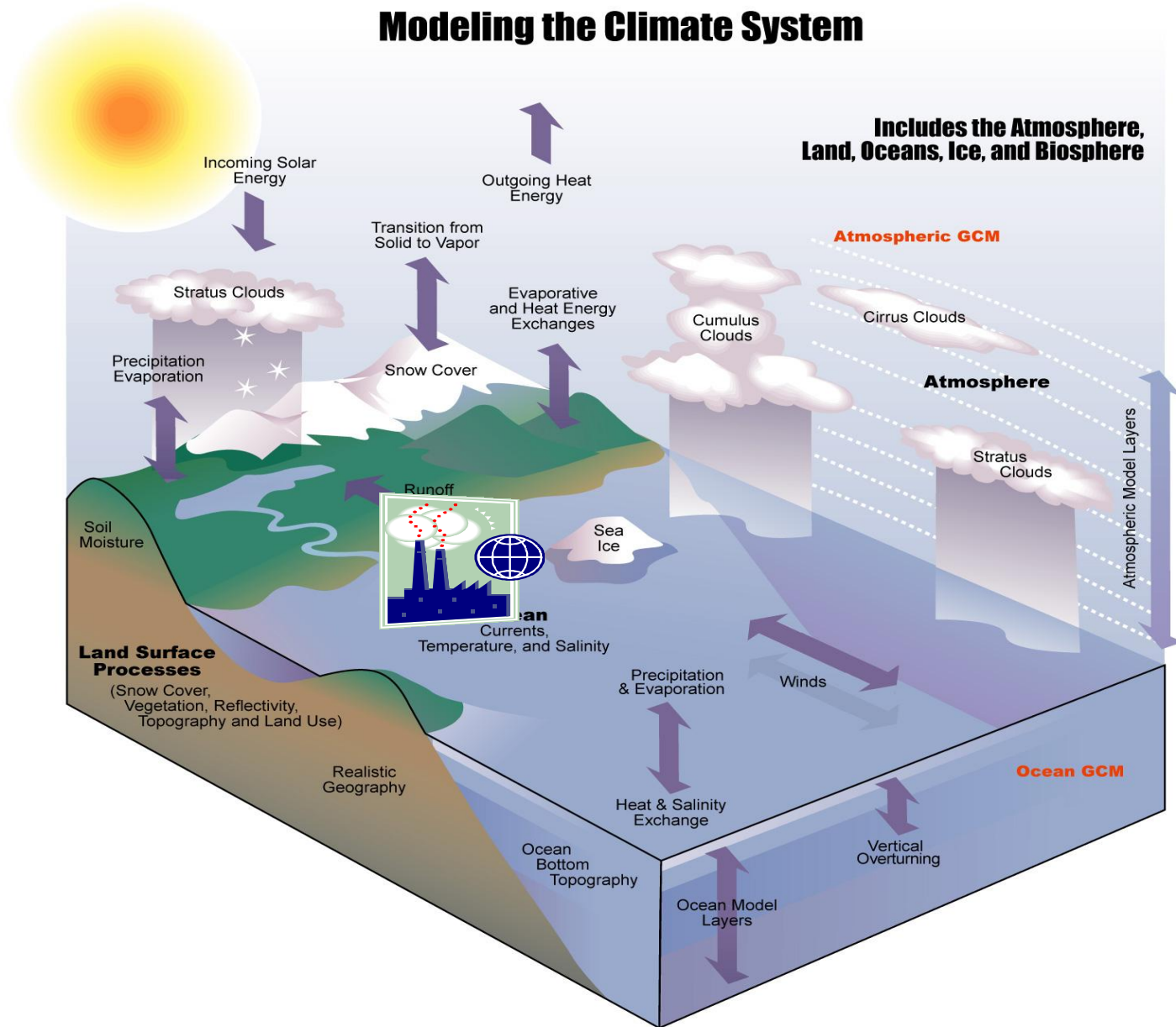
**WG 2 IPCC IMPACTS**



# Aspects of Climate

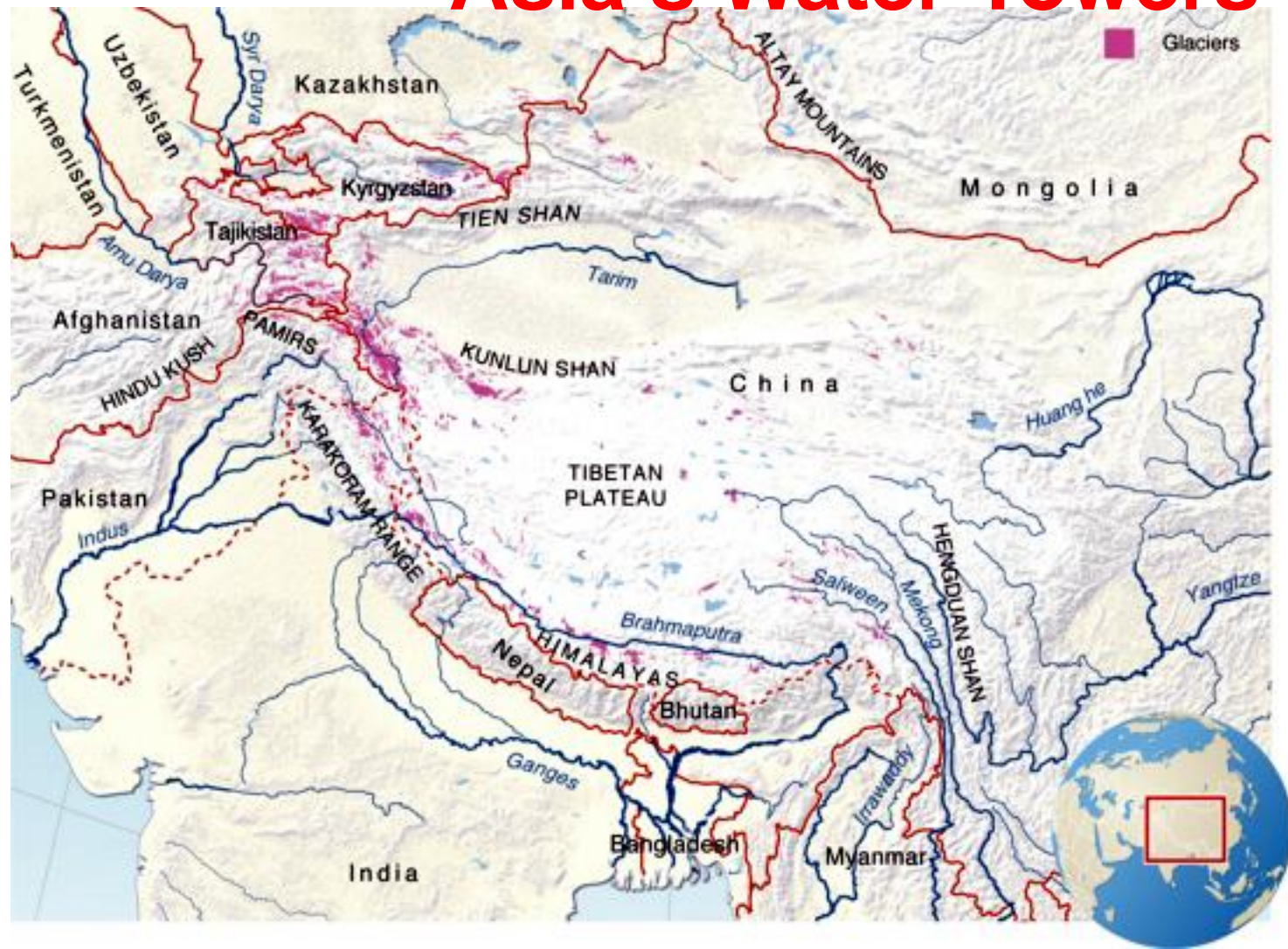
- **Climate variability**
  - **Seasonal to inter-annual**
- **Climate fluctuations**
  - **Decade scale**
- **Climate change**
  - **“Deep” climate change**
    - **New global climate state**
- **Extreme meteorological events**
- **Seasonality**

# Modeling the Climate System



**Societies  
are now an  
integral  
part of the  
climate  
system**

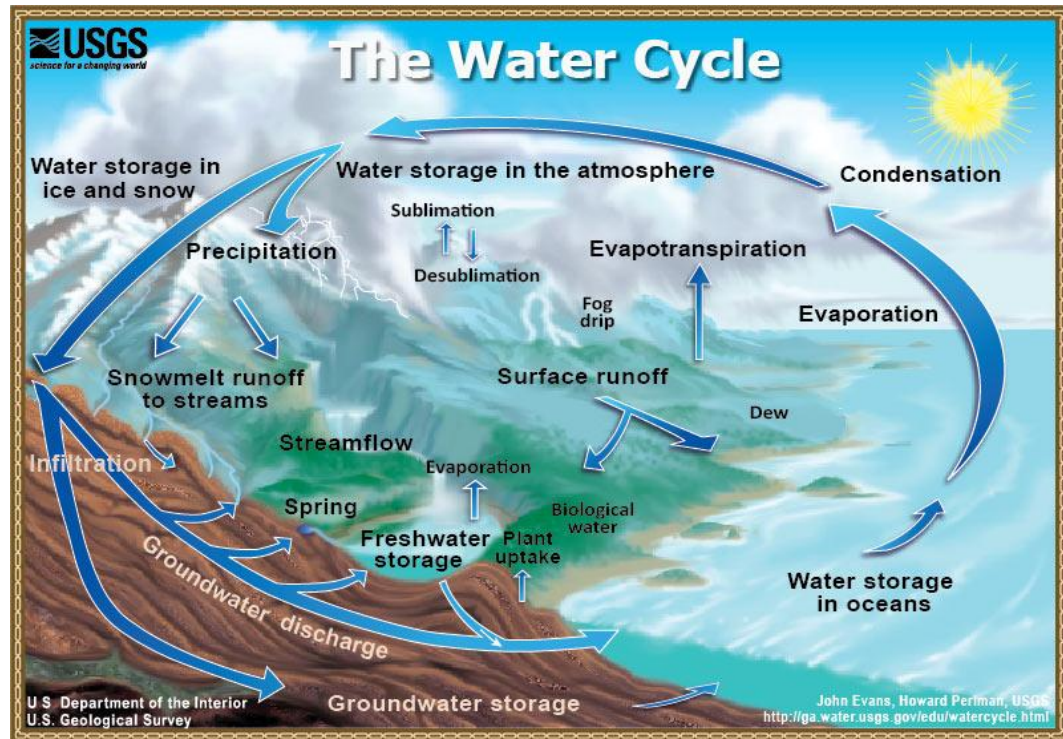
# Asia's Water Towers



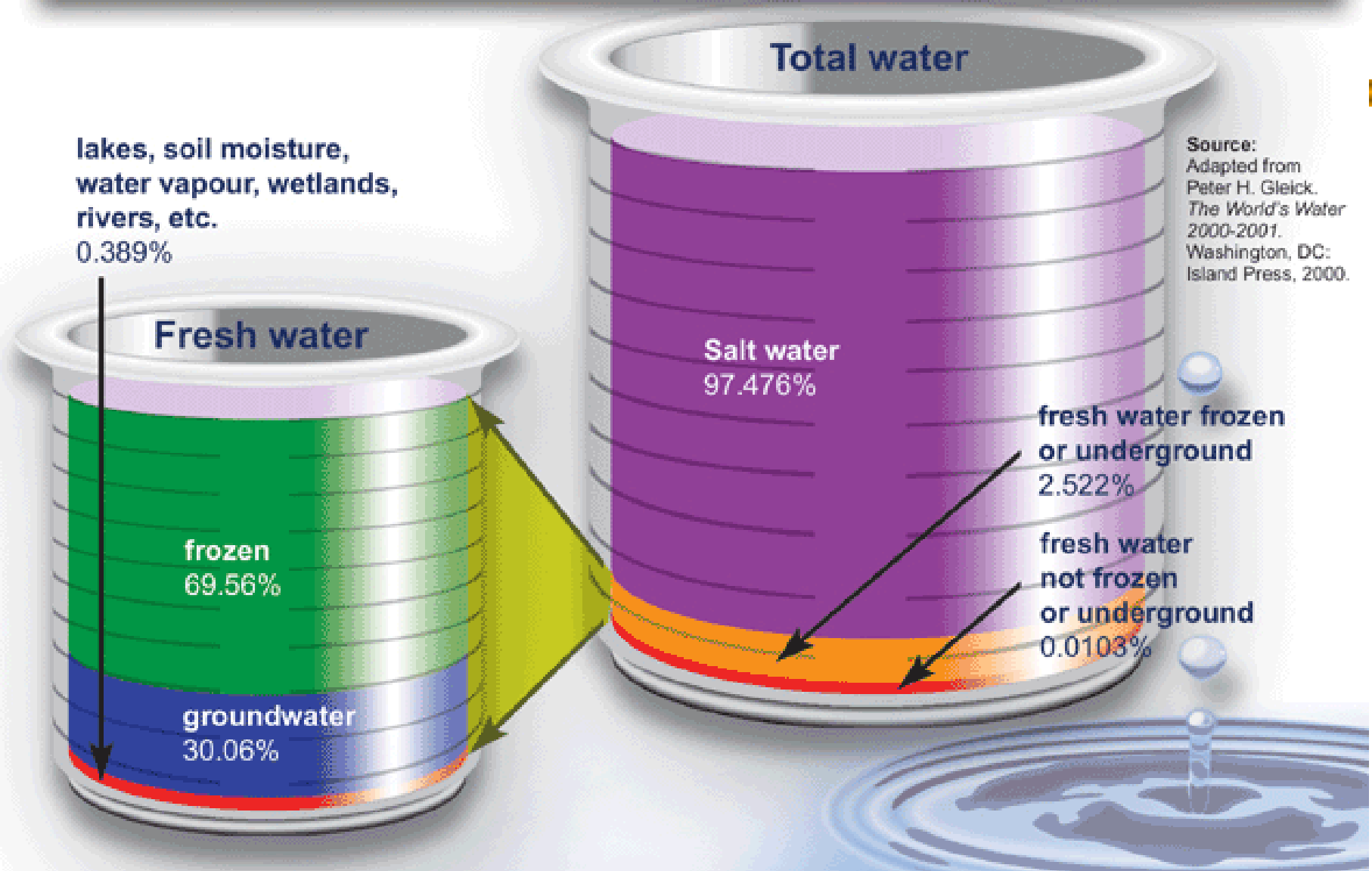


# Greater Central Asia mountains are a global concern: key messages for negotiators

- “Water Towers of the Planet”
- The “Third Pole”
- “The roof of the world”
- Keeper of the “commons”
- Eurasian snow covers influence on global and regional climates
- Upstream countries are the “Guardians” of water upstream



# The world's water supply



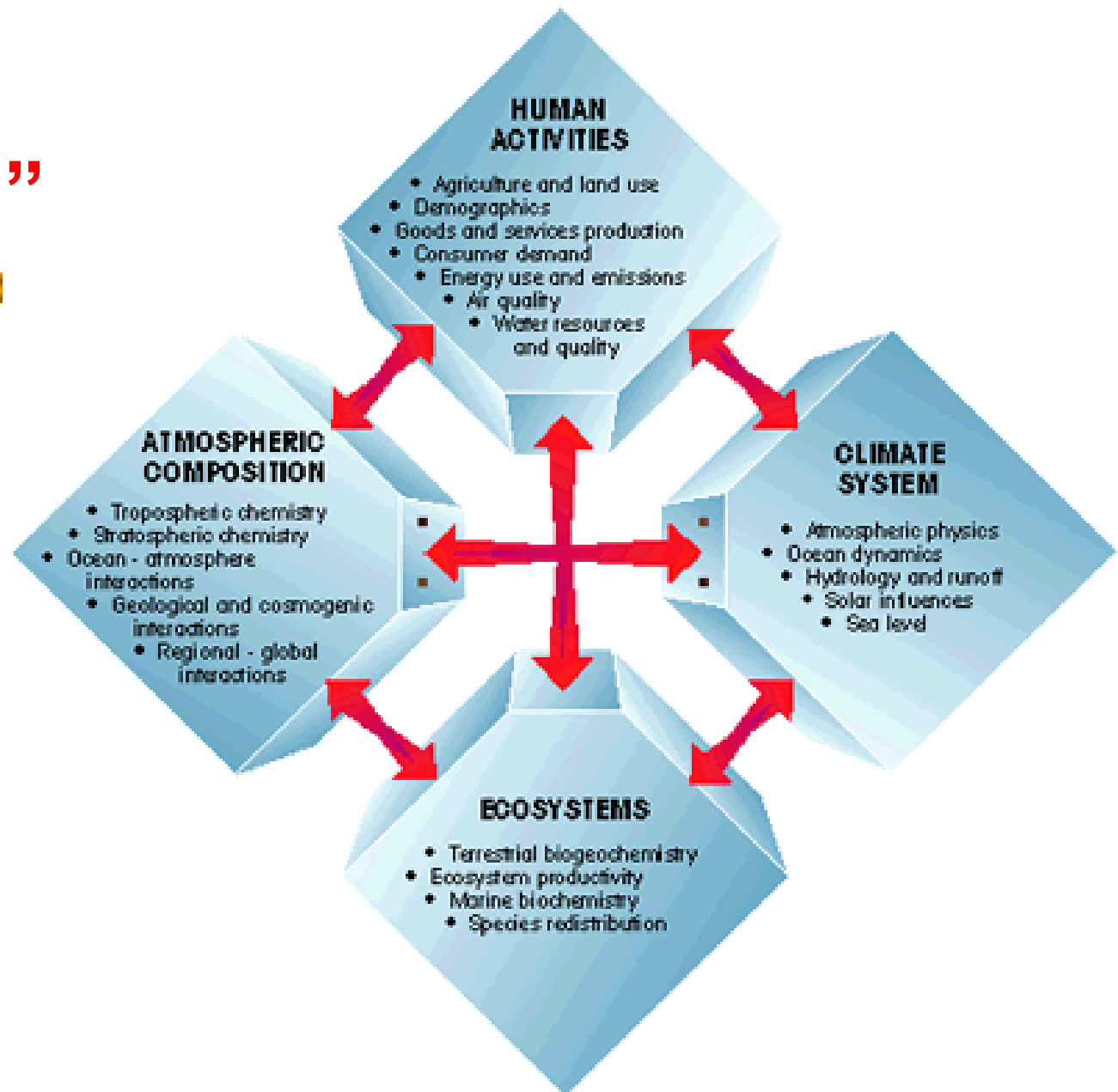
# “We All Live Downstream”

But, what does it *really* mean?

And ...

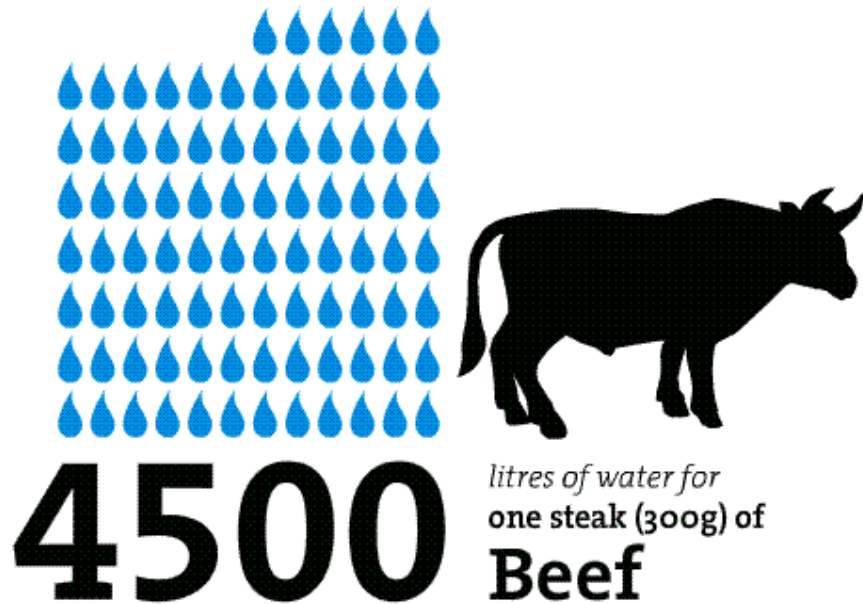
What's going on upstream?

Why care?





# Eating Water



# Commoner's “4 Laws of Ecology”

1. **Everything is connected to everything else.**
2. **Everything has to go somewhere or there is no such place as away.**
3. **Everything is always changing.**
4. **There is no such thing as a free lunch.**

[rekkerd.org/img/random/citarum\\_pollution.jpg](http://rekkerd.org/img/random/citarum_pollution.jpg)



Citarum River, Indonesia

1:30-3:00pm

# Brief Presentations



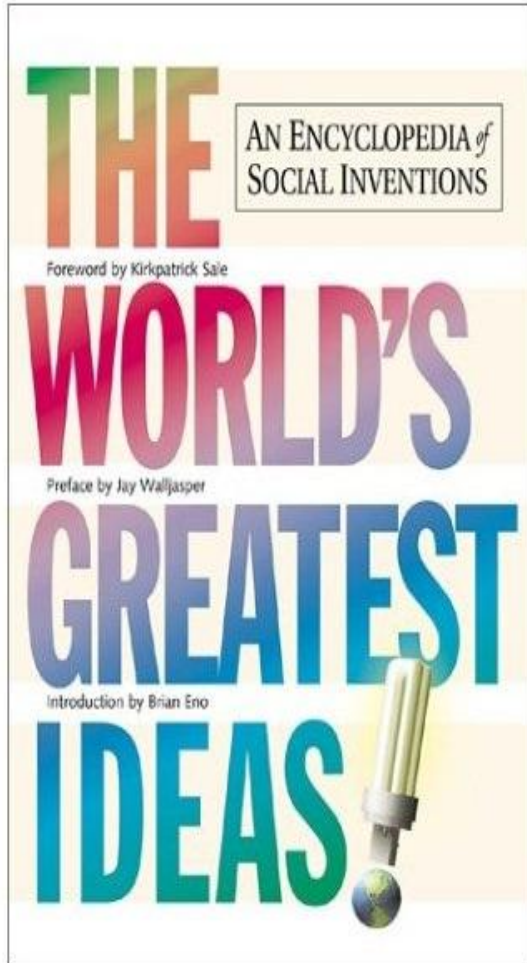
Countries, hydrologic boundaries, lakes, glaciers, rivers, elevation

# The Value of “usable science” in political negotiations

- 
- A blue and white grid-patterned bowl filled with water sits on a dark brown surface. Above the bowl, numerous disaster-related terms are written in a light blue, slightly blurred font, appearing to rise from the water. The terms include: FLOODS, HEAT, FIRES, EPIDEMICS, DROUGHTS, ADVERTISING, LAND & WATER, WATER & SANITATION, TRANSPORT, EQUIPMENT & INFRASTRUCTURE, KITCHEN, EXCHANGE RATES, FUEL, HEALTH CARE, EDUCATION, STORAGE, RADIO TV & NEWSPAPERS, RESEARCH & COMMUNICATION, EMPLOYMENT, DISTRIBUTION, INCOME, PREPARED FOR, FAMILY & CULTURE, PROCESSING, and POLITICAL STRUCTURES.



# Social inventions

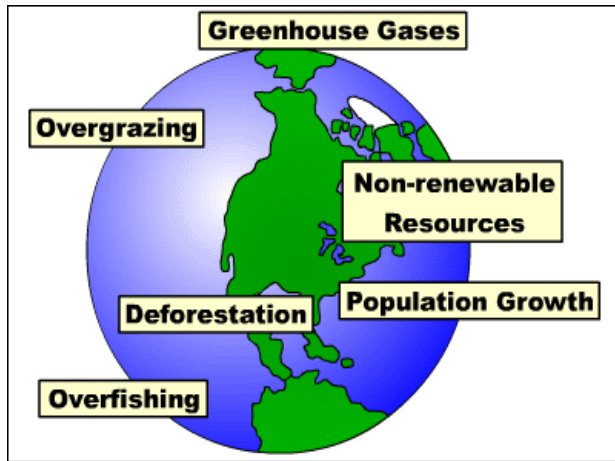


**Ideas and concepts  
that change human  
behavior.**

*“The major principle in the study  
of invention is that all invention is  
fundamentally social.”*

# Social Invention Examples

<http://clairewaghorn.wordpress.com/>



TRAGEDY OF THE GLOBAL COMMONS

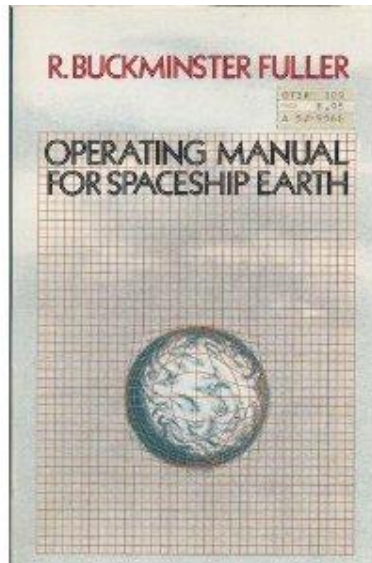
## The Blue Marble



## Global Change



## Spaceship Earth



## The Space Age



## Social e-networks



# Foreseeability

To stop or not to stop at a stop sign?



- **Foreseeability**
  - to see beforehand, to foreknow
  - use of the concept to determine responsibility for damage
- **Foreseeable risk** -- a risk whose consequences a person of ordinary intelligence would expect might occur
- **Foreseeability** -- differs from predictability or forecasting because it neither depends on nor implies the quantitative description of the probability of harm
- **“Foreseeability** -- encompasses not only that which the defendant foresaw, but that which the defendant ought to have foreseen”

Don'ts: October 20-23, 2003, Shanghai,  
China



# Creeping Environmental Changes

(slow, incremental and cumulative change over time)

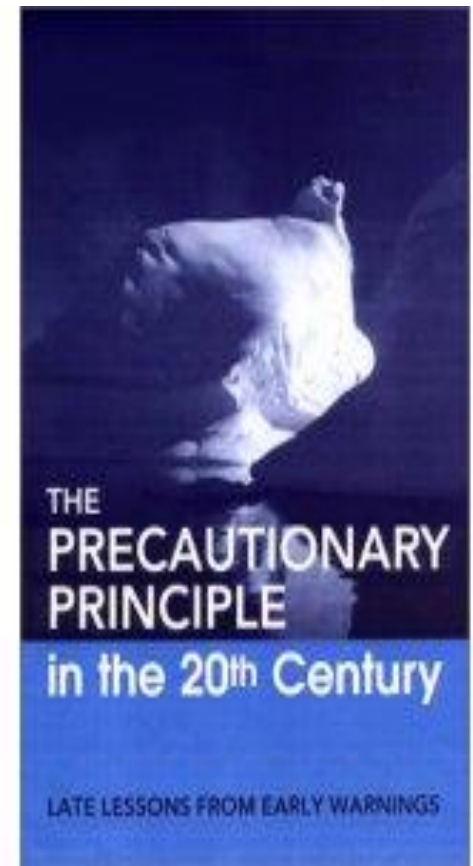
- Air pollution
- Acid Rain, Global warming
- Ozone depletion
- Tropical deforestation
- Soil erosion
- Water quality & quantity
- Glacier retreat
- Sea level rise
- Waste disposal/landfills
- Infectious disease spreading
- Nuclear waste
- Marine pollution, etc.





# **“Precautionary Principle”**

- **“Governments should not use the lack of full scientific information as a reason to postpone action to prevent serious irreversible environmental damage.”**
  - » World Lake Vision Committee



# Adaptation

**no recommendations without ramifications**

**Recommendations are just suggestions.**

**To increase the chance they will be implemented, identify the potential consequences of not acting on them.**



# **“Resilient Adaptation”**

**A process that is a flexible, incremental approach to adjusting to and coping with foreseeable adverse (or beneficial impacts) of an uncertain changing climate.**

# **We must consider mitigating the impacts (ripple effect) of adaptation**



- **Adaptation is an on-going process, not just a one-time event.**
- **Each adaptive strategy or tactic will generate its own set of impacts.**
- **Societies must identify second- and third-order impacts of adaptation (downstream impacts).**

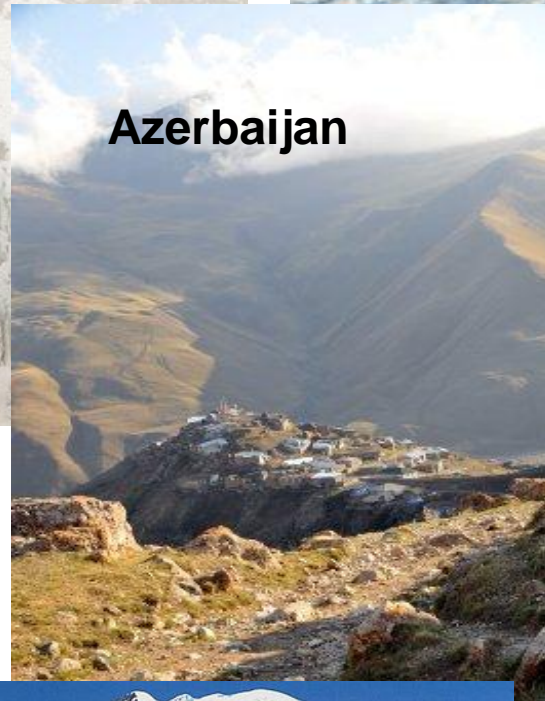




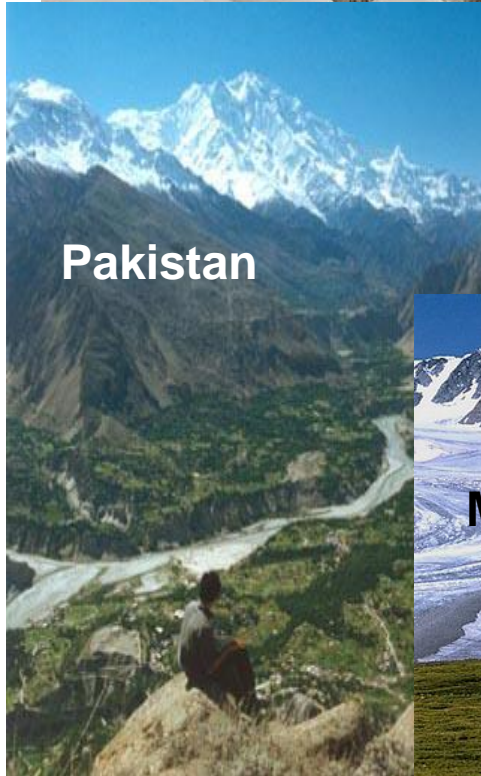
**Iran**



**Armenia**



**Azerbaijan**



**Pakistan**



**Mongolia**



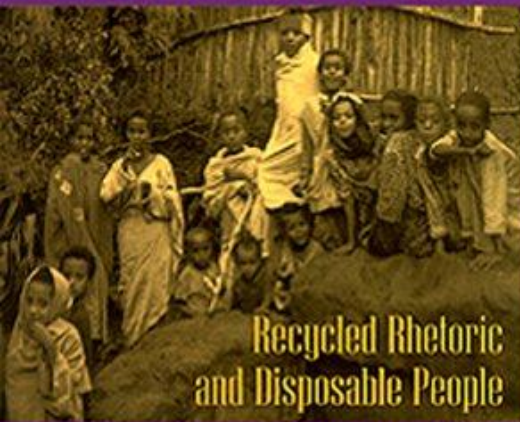
**Iran**





Source: Danish Center for Biofuels

# INEQUITY in the GLOBAL VILLAGE



Recycled Rhetoric  
and Disposable People



Jan Knippers Black



**4:30-5:00**

# **Desired Goals at UNFCCC COP 17 for the Mountain Partnership**

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Thursday  
November 10  
8:30-9:00am

# Thoughts from the previous day

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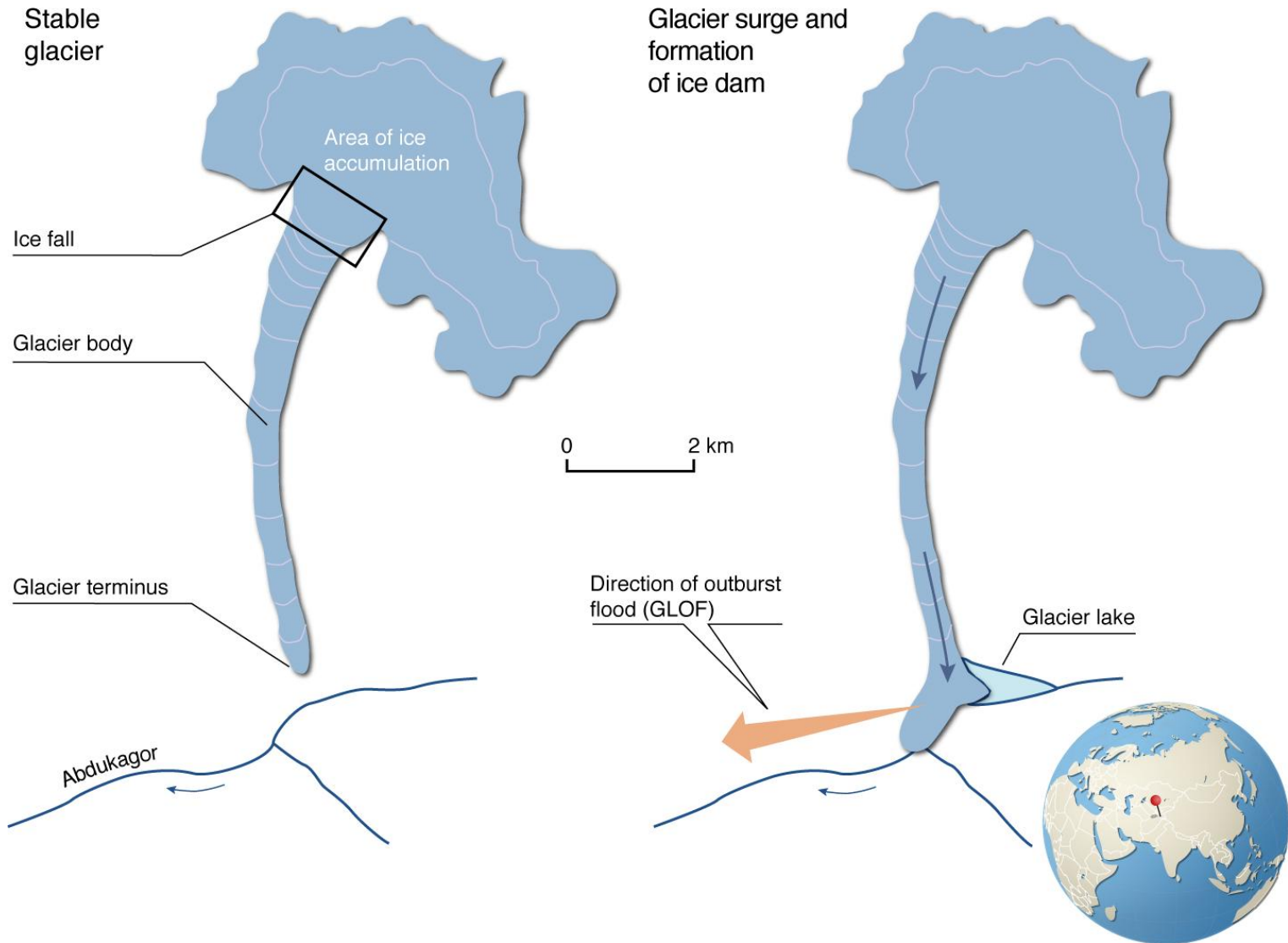
# Regional Issues: Changing Hazards

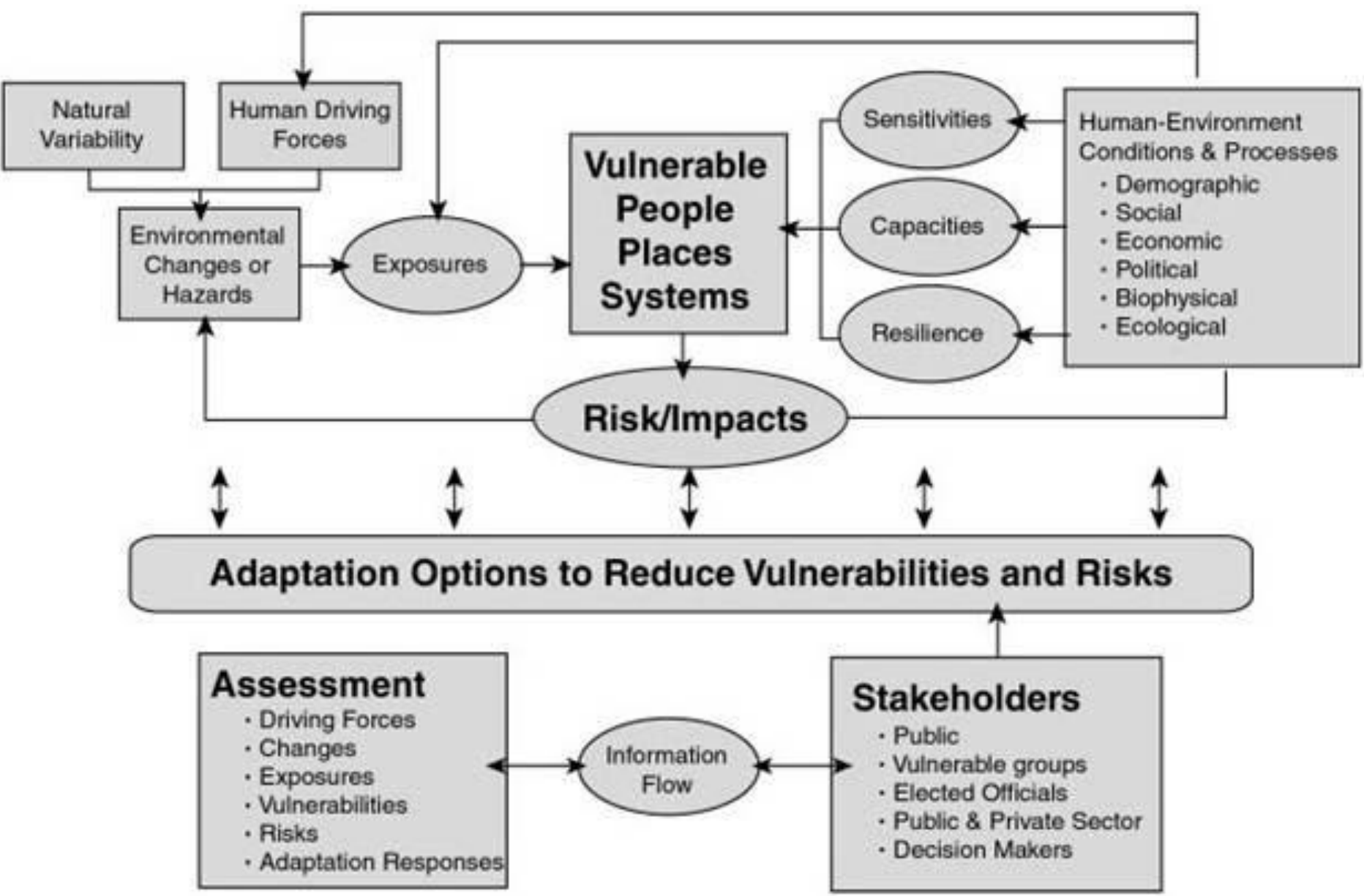
- **Floods**
- **Flash floods**
- **Temperature increases**
- **Droughts**
- **Landslides, fires**
- **Changes in seasonality**
- **Changes in monsoon regime**
- **Glacial melt**
- **Increasing rate of melting**
- **Increasing number and risk of GLOFs**
- **Migration**
- **Changes in agricultural and grazing land**
- **Vector borne diseases**
- **Conflicts**

## ELEMENTS OF RISK



# Glacier Lake Outburst

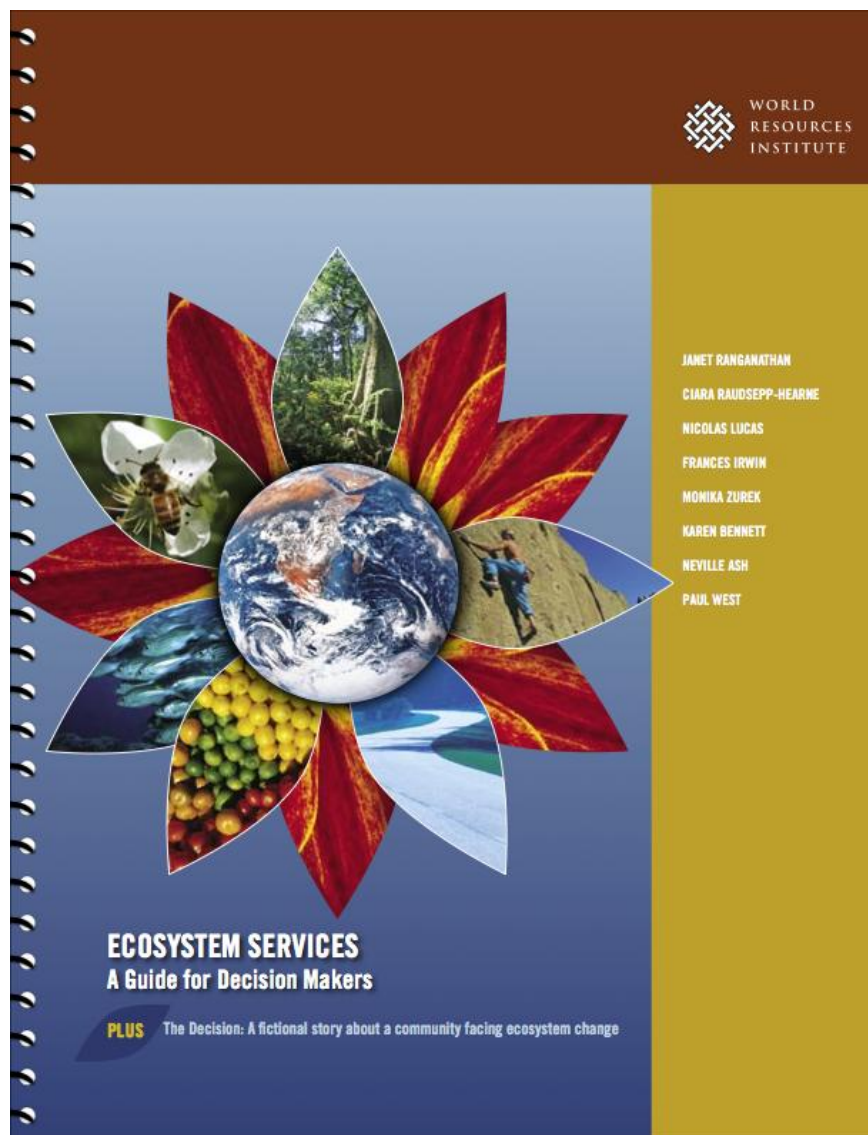




9:00am-10:00am

# Ecosystems goods & services for human well-being

**How to make  
them work for  
sustainability  
in mountain  
ecosystems  
and countries**

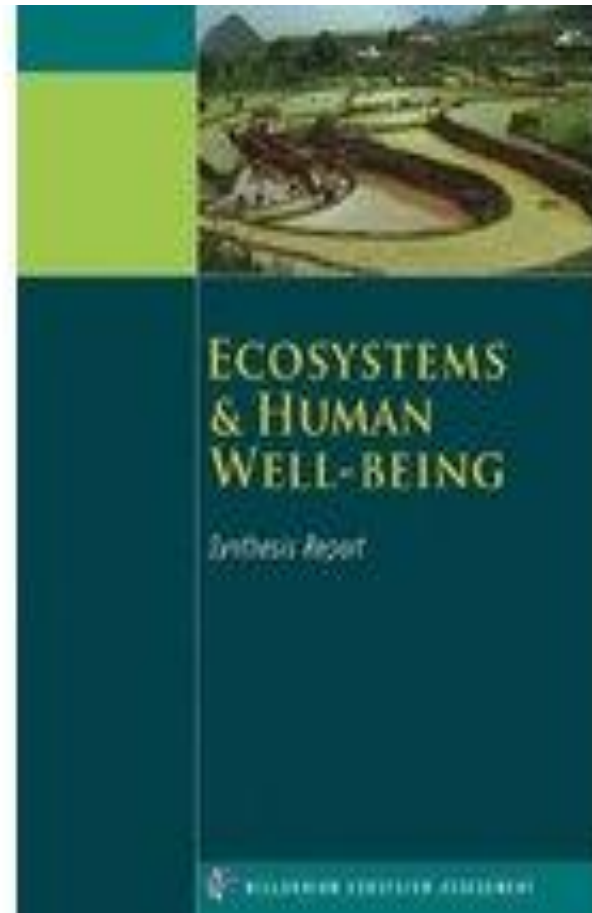




# Human good & services ...

## for environmental well being

- The Millennium Assessment calls for ecosystems goods and services for environmental well being.
- This suggests that ecosystems have little value if not of use to society.
- It should be reversed: Human goods & services for ecosystems well being.
- Societies need Ecosystems more than they need societies.



# Goods and services provided by mountain regions\*\*

Goods provided by mountain regions to those living in these regions as well as to populations in lowlands include:

- Water (for consumption, irrigation, energy production);
- Food (crops, domesticated and wild animals);
- Wood (for energy and construction);
- Non-timber forest products (fibres, goodstuffs, medicinal plants);
- Minerals

Services provided by mountain ecosystems include:

- Maintenance of soil fertility and structure , and associated limitation of soil erosion (particularly of local benefit);
- Downstream movement of soil nutrients (upstream loss, downstream gain);
- Avoidance/mitigation of damaging impacts of disastrous events, such as floods, landslides, avalanches (of both local and downstream benefit);
- Provision of landscape as amenity (mainly of benefit to extra-regional tourists and recreationists, but also to local amenity migrants and those depending on the tourist economy);
- Biodiversity (of local benefit, but also of extra-regional value in terms of existence value and genetic potential);
- Cycling and storage of carbon and soli nutrients (of importance at the global scale).

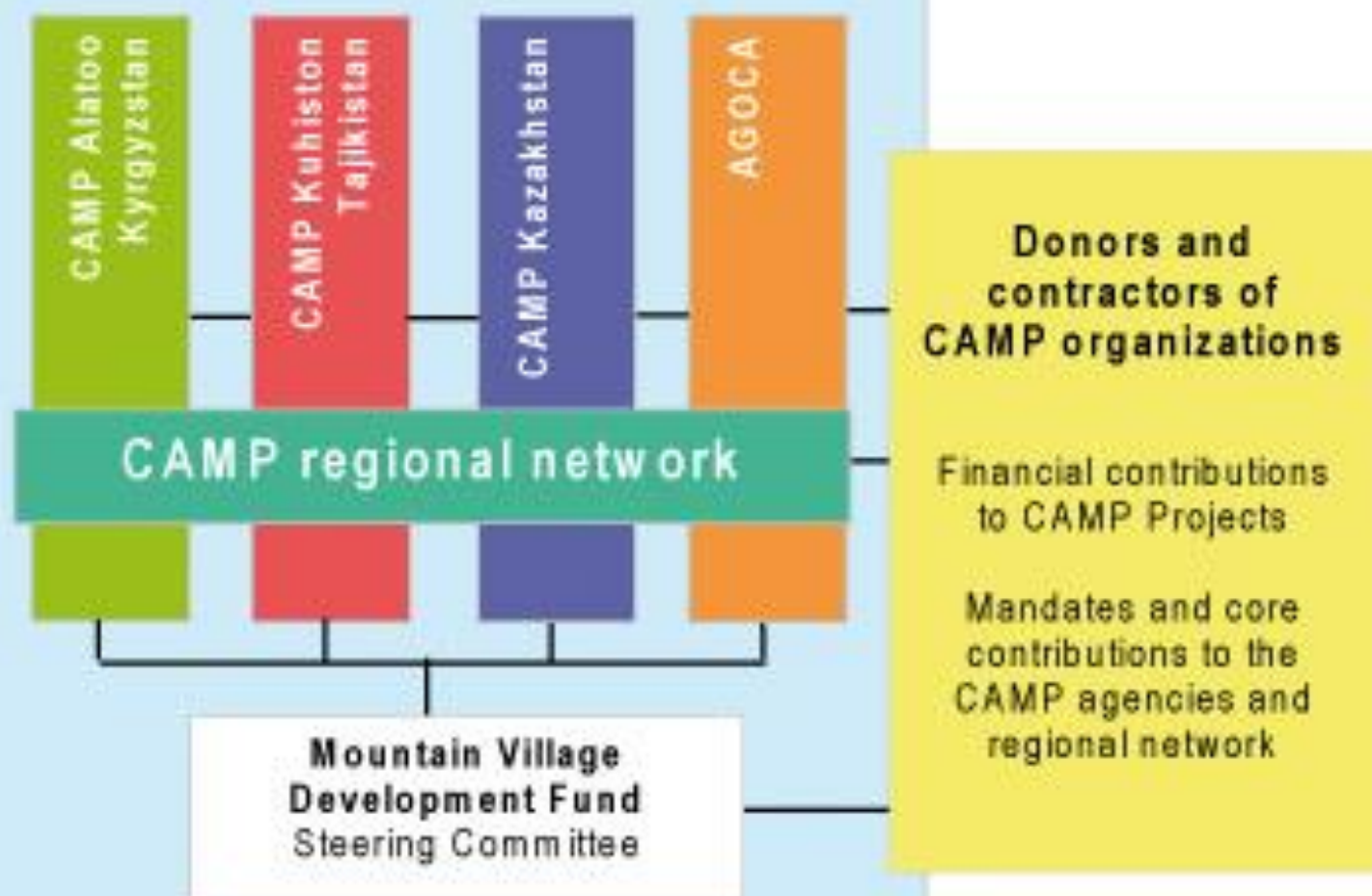
\*\*From: Becker, A. and H. Bugmann (eds), 2001. Global Change and Mountain Regions: The Mountain Research Initiative. IGBP Report #49, p.17.

10:00am-10:45am

## **Inside and outside the “Mountain box”**

- **Inside the Mountain box**
  - **The Mountain Partnership**
- **Outside the Mountain box**
  - **A mountain coalition?**

## Central Asian Mountain Partnership Network

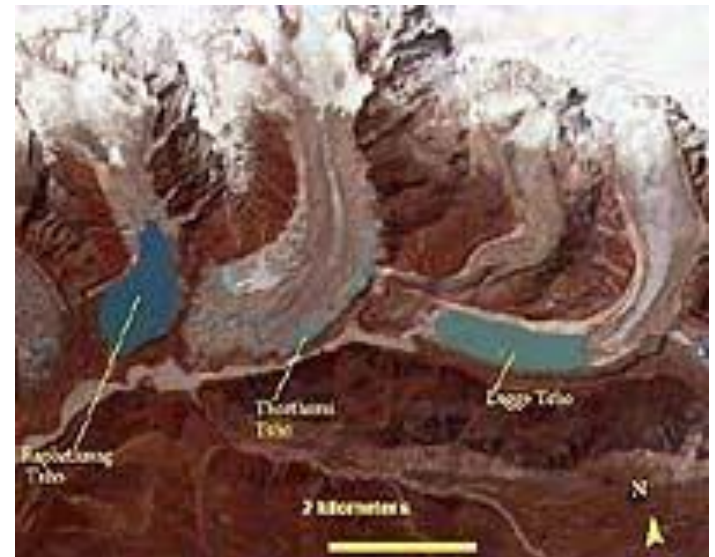




# Thinking inside the mountain box

## Mountain problems: environmental

- Sensitivity to variable and changing climate
- Glacier retreat and melting
- Fragile highlands ecosystems
- Changes in seasonality
- GLOFs
- Accelerated soil erosion
- Landslides
- Rapid habitat loss & genetic biodiversity



# Thinking inside the mountain box

## Mountain problems: societal

- Widespread poverty
- Indigenous knowledge loss
- Growing demands for water and other natural resources
- Expanding tourism
- climate change effects
- Increase of incidence of natural disasters
- Greater rates of out-migration
- Conflicts
- The pressures of industry mining and agriculture
- Food insecurity
- Gender issues
- Coping with a changing climate
- Climate change adaptation
- Land degradation
- Deforestation, woodcutting



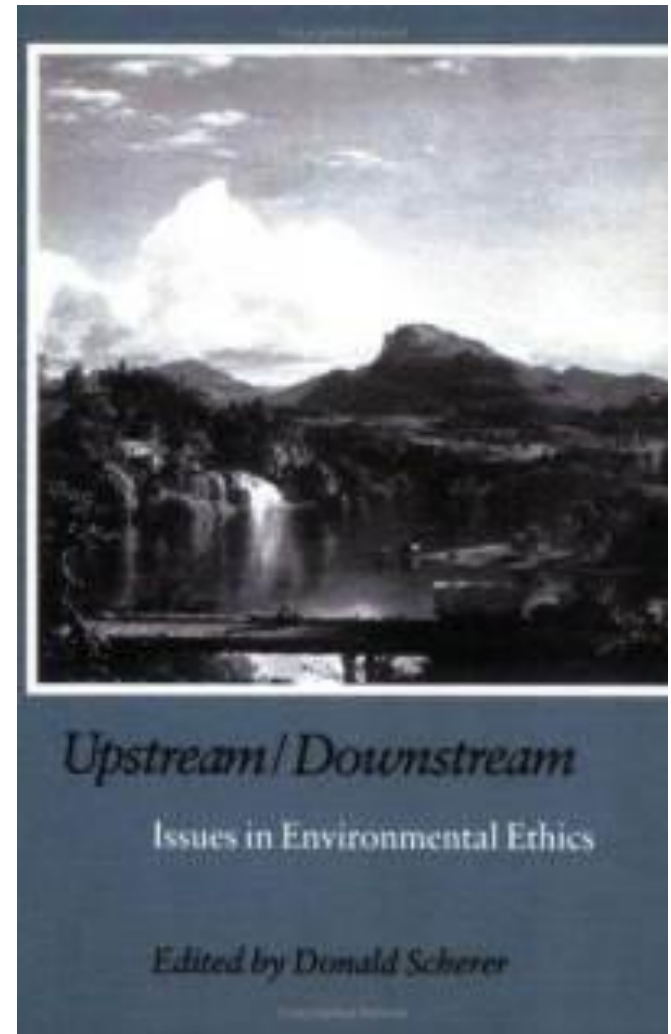
**Food security needs**



**Indigenous knowledge loss**

# Thinking “outside the Mountain box”

- Highlands-lowlands
- Upstream-downstream
- Integrated watershed development
- Highlands to oceans (H2O)
- Mountain slope (many ecosystems)
- Hindu Kush-Himalayas







**Water management in Central Asia: state and impact**


This map illustrates the water management challenges in Central Asia, focusing on the Syr Darya and Amu Darya river systems. Key features include:

- Rivers and Canals:** The Syr Darya flows from the north (Russia) through Kazakhstan and Uzbekistan. The Amu Darya flows from the south (Afghanistan and Tajikistan) through Uzbekistan and Turkmenistan. Major canals shown include the Karakum Canal and the Irtysh-Karagandy Canal.
- Lakes and Reservoirs:** The Aral Sea is shown with its 1950s shoreline. Other significant water bodies include Lake Balkhash, Lake Issyk-Kul, Lake Sarygamysh, and Lake Zaisan.
- Water Management Projects:**
  - Plan for diverting Irtysh and Ob rivers to Aral Sea:** Indicated by a red box and arrow in the north.
  - Rogun (1) and Sangtuda (2) dams and hydroplants projects:** Marked with red boxes and numbers in Tajikistan.
  - Projected increase of water use demand from Amu-Darya by Afghanistan:** Indicated by a red box and arrow in the south.
- Water Flow and Impact:** Green arrows show the flow of water from the Syr Darya towards the Aral Sea and towards the Caspian Sea. A red arrow points towards the Caspian Sea, labeled "Toward Western Europe and America".
- Geographical Context:** The map shows the borders of Russia, Kazakhstan, Uzbekistan, Turkmenistan, Afghanistan, Tajikistan, China, and Pakistan. Major cities like Astana, Almaty, Tashkent, Bishkek, and Dushanbe are marked.
- Scale and Source:** A scale bar at the bottom left indicates distances up to 600 km. The source is cited as "PHILIPPE BEAUCOURT, UNEP/FAO/UNEP, MAY 2001".

 Rivers and canals  
 Lakes  
 Groundwater

-  Former bed of the Aral Sea, uncovered area entirely desertified and saline
-  Areas directly affected by the consequences of the shrinkage of the Aral Sea (toxic salts), leading to salinization and desertification
-  Migration from environmentally degraded areas

 Areas of intensive and inefficient irrigated agriculture practices with potential to sterilize soil and threaten human health

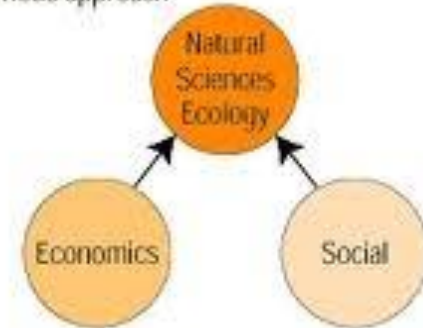
 Projected water infrastructure or management plans that could lead to international tensions or conflicts



# Climate dimension of social change: what's driving what?

- A popular pursuit is “the social dimension of climate change.”
- Yet, society is also changing and many aspects of its changes affect the global climate.
- It is also necessary to pursue “the climate dimension of social change.”

A. Previous approach



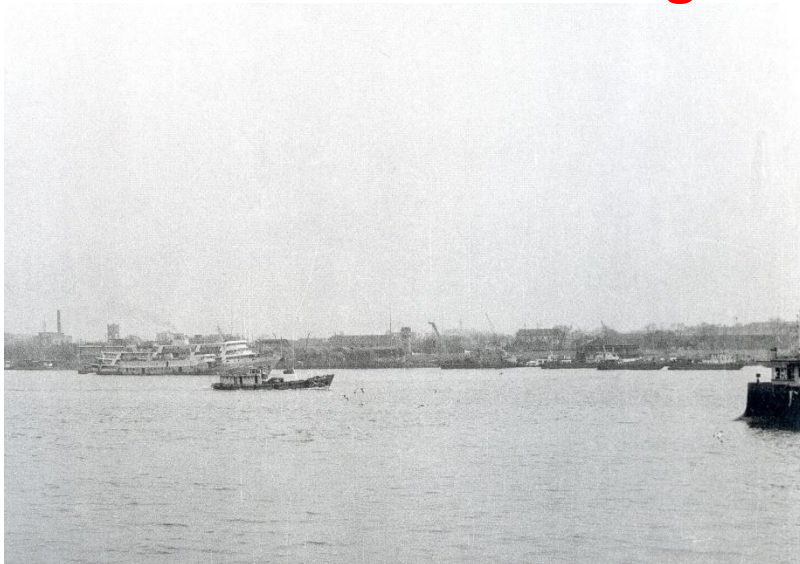
B. Revised approach



# Drivers and Pressures (of change)

- Climate change reports talk about ‘drivers of change.’
- Physical and societal Climate ‘drivers’ are targeted for attention.
- But, there are underlying “pressures” on policy makers as well as on the land though less obvious than drivers.

## Shanghai Changes

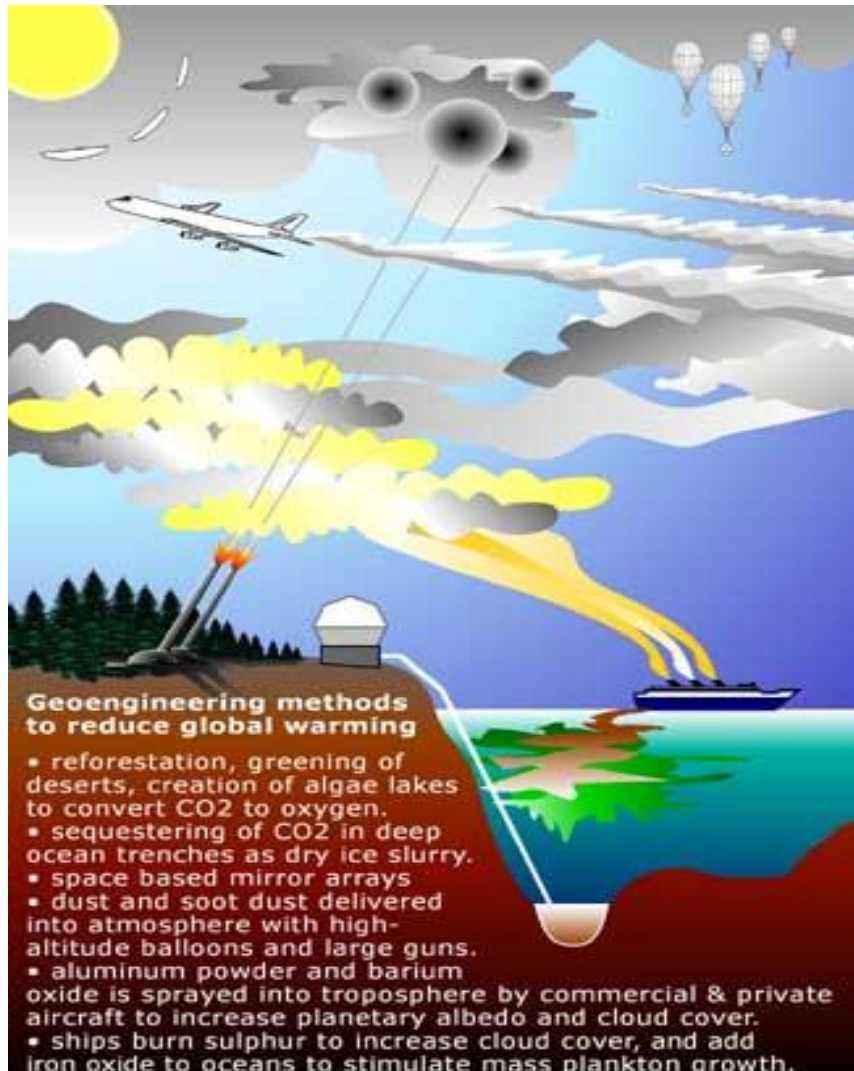


1987



2004

# Geo-Engineering the Earth to Meet our Needs or our Wants?



While there are many Plans B to cope with climate change ...



# The Mountain Partnership's Purpose

**The idea behind the Mountain Partnership is to establish clear commitments and benchmarks for mountain work, develop prioritized plans of action and enhance cooperation among its members on these issues.**





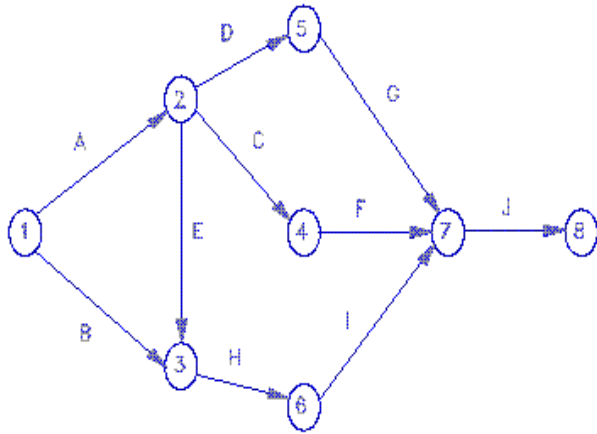
# Is there value in a Mountain Coalition?

- The reason for suggesting a Mountain Coalition is to establish clear common interests and commitments for mountains-to-lowlands issues, develop prioritized plans of action and enhance cooperation among coalition members on these issues.



# Linking or Sinking

link scientific concerns about the future with local societal concerns today



## Communicating with civil society

about the importance of awareness of climate change and its foreseeable impacts is a central factor in making climate change science research findings science that is usable by society, eg, usable science



# SWOC Worksheet

Strengths	Weaknesses	Opportunities	Constraints	notes

# **A SWOC Assessment about how best to Enhance the influence of the Mountain Partnership in global political negotiations: small groups**

**11:15 – 12:30pm**

- **Approaches**
  - **Linking?**
  - **More scientific research?**
- **Arguments**
  - **Keeper of the Water Towers**
  - **Glaciers: more than a photo opportunity**
- **Constraints**
- **Identification of coalition partners and issues**



1:30-3:00pm



# Groups present and discuss

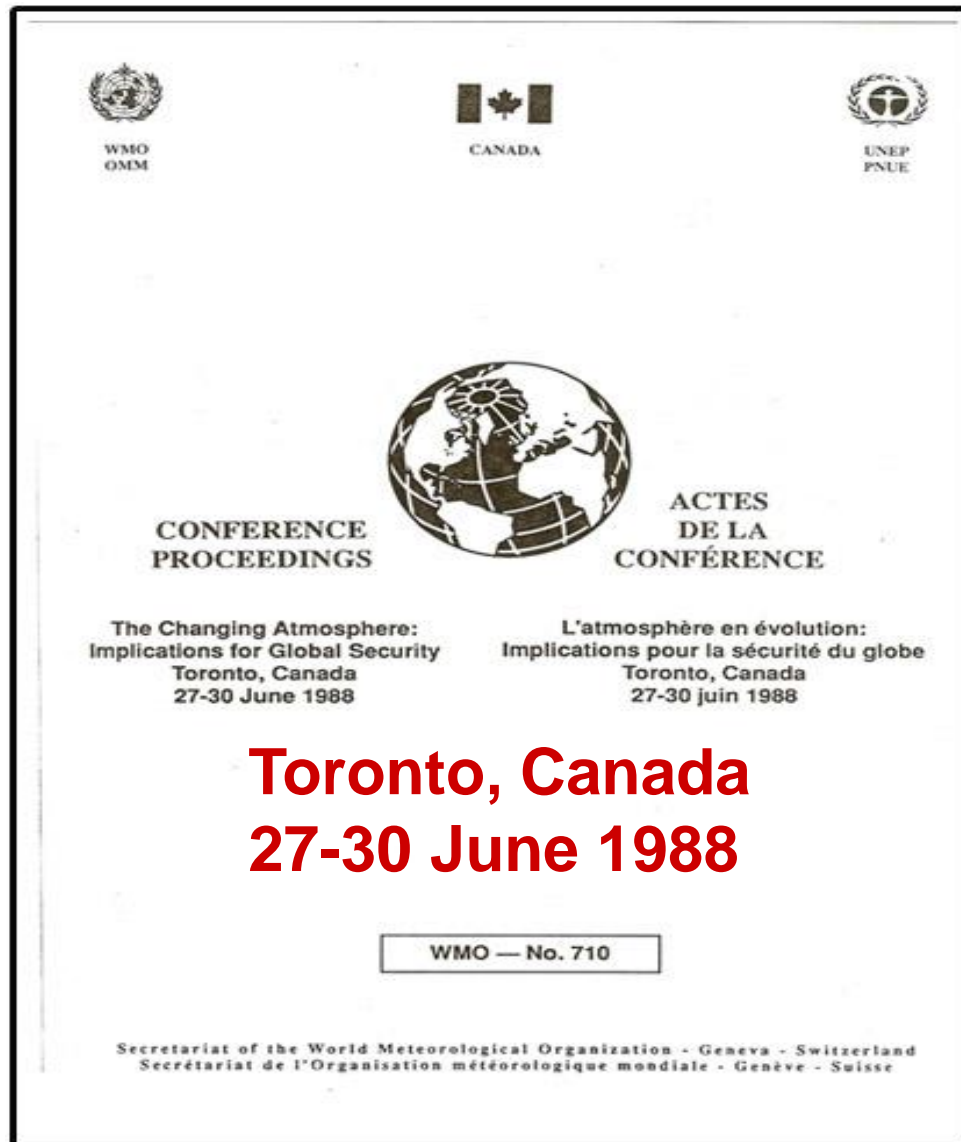
Strengths, weaknesses, opportunities and constraints

**3:30-4:30pm**

# Recap

- Highlights
- Key issues
  -
- key talking points
- key Approaches

# The Changing Atmosphere : Implications for Global Security



Called for ...

- global pact to protect the atmosphere
- ‘**world atmosphere fund**’ financed by tax on fossil fuels used by industrialized countries
- **20% cut** in 1988 global carbon emissions
- “**International Law of the Air**”

4:30-5:30pm

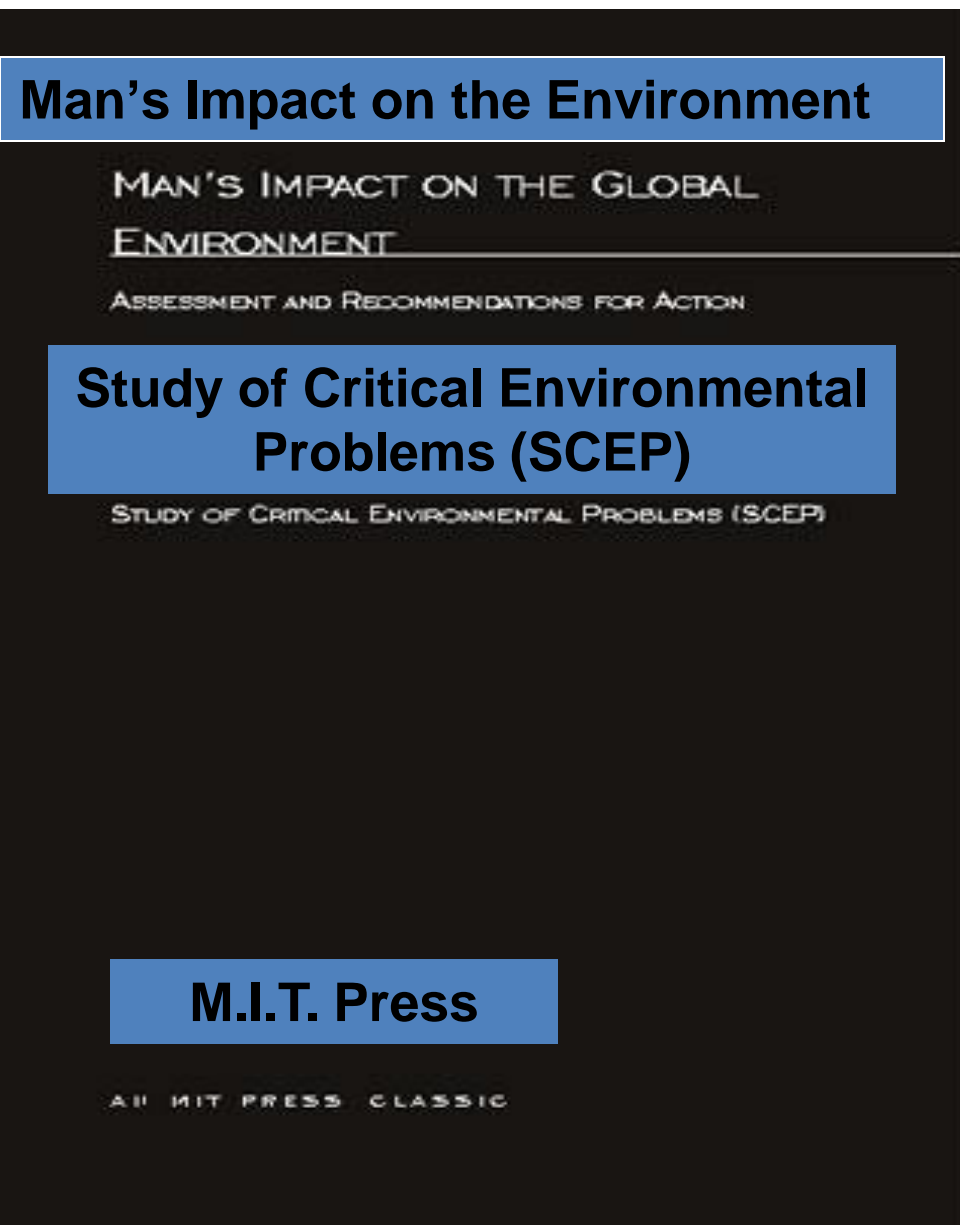
## Next steps

**Promote mountain  
environment and  
development  
issues in  
international  
negotiations**





# SCEP 1970 --- Some History



- Focused on global atmospheric problems
- “Global problems do not necessarily need global solutions.”
- “In the foreseeable future advanced industrial societies will probably have to carry the major burden of remedial action.”

# SMIC 1971 ---

## More History

**“We recognize a real problem that a global temperature increase produced by man’s injection of heat and CO2 ... may lead to dramatic reduction even elimination of Arctic sea ice.”**

**“This exercise would be fruitless if we did not believe that society would be rational when faced with a set of decisions that could govern the future habitability of our planet.”**

**Inadvertent Climate Modification**

### **Report of the Study of Man’s Impact on Climate (SMIC)**

**Edited by SMIC**

EDITED BY  
SMIC

**M.I.T. Press**

AN MIT PRESS CLASSIC

## A message from youth of COP 15 to negotiators at COP 17

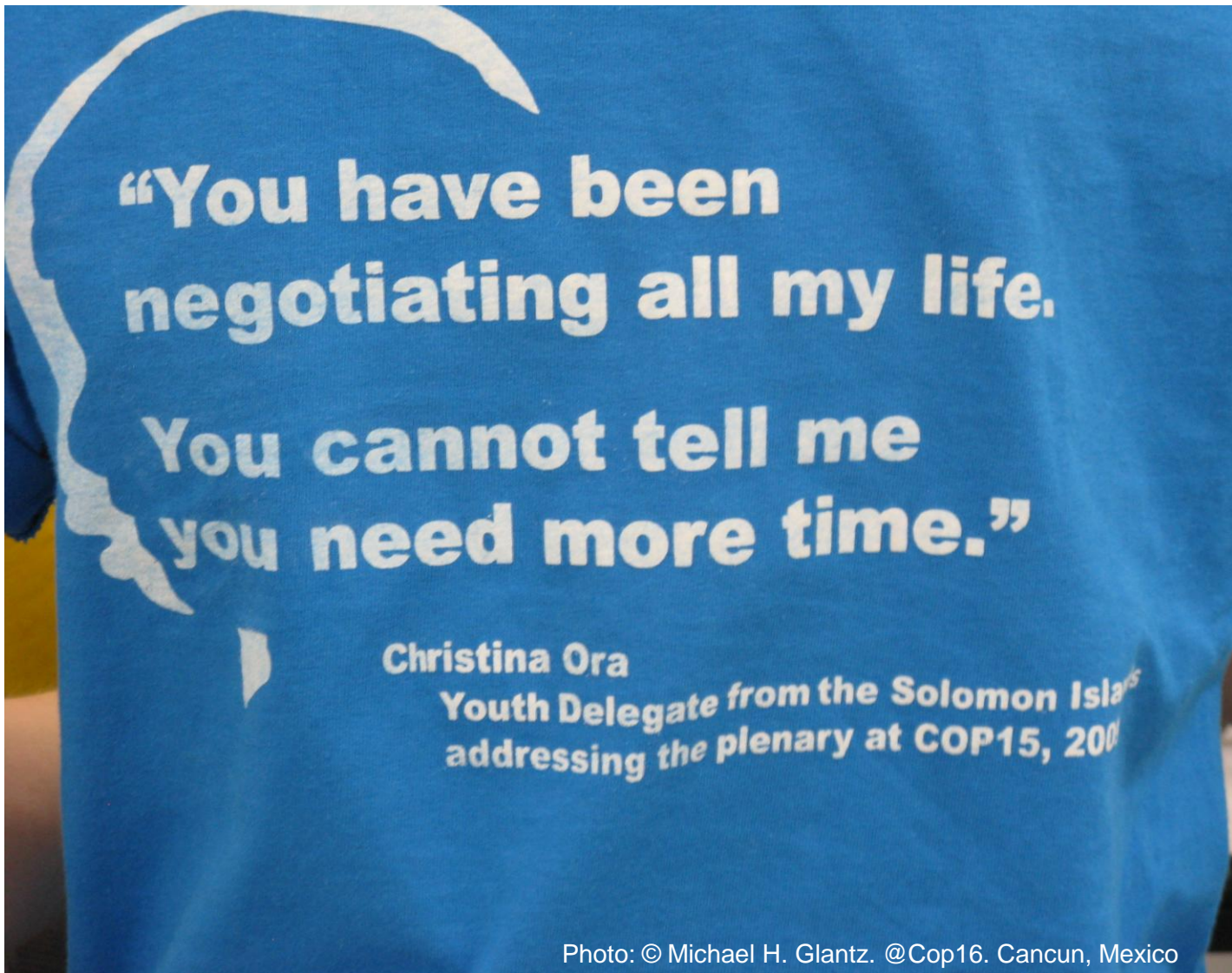


Photo: © Michael H. Glantz. @Cop16. Cancun, Mexico