

Climate Change Impacts, Resilience and Development in Mountain Regions: why mountains people and ecosystems matter

Mountain Partnership Secretariat

Side event

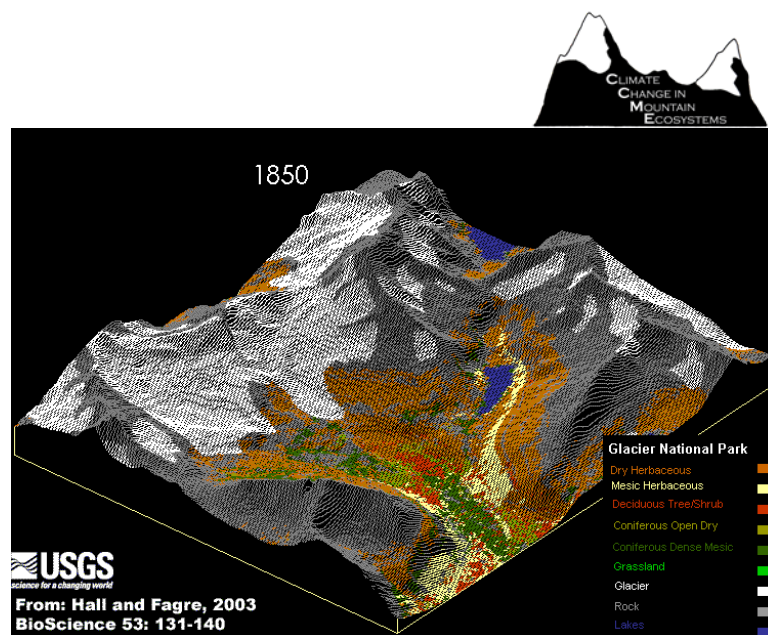
at the 7th Session OWG/SD

8 January 2014

United Nations

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www.nrmcs.usgs.gov/files/norock/research/glacier_animation.gif

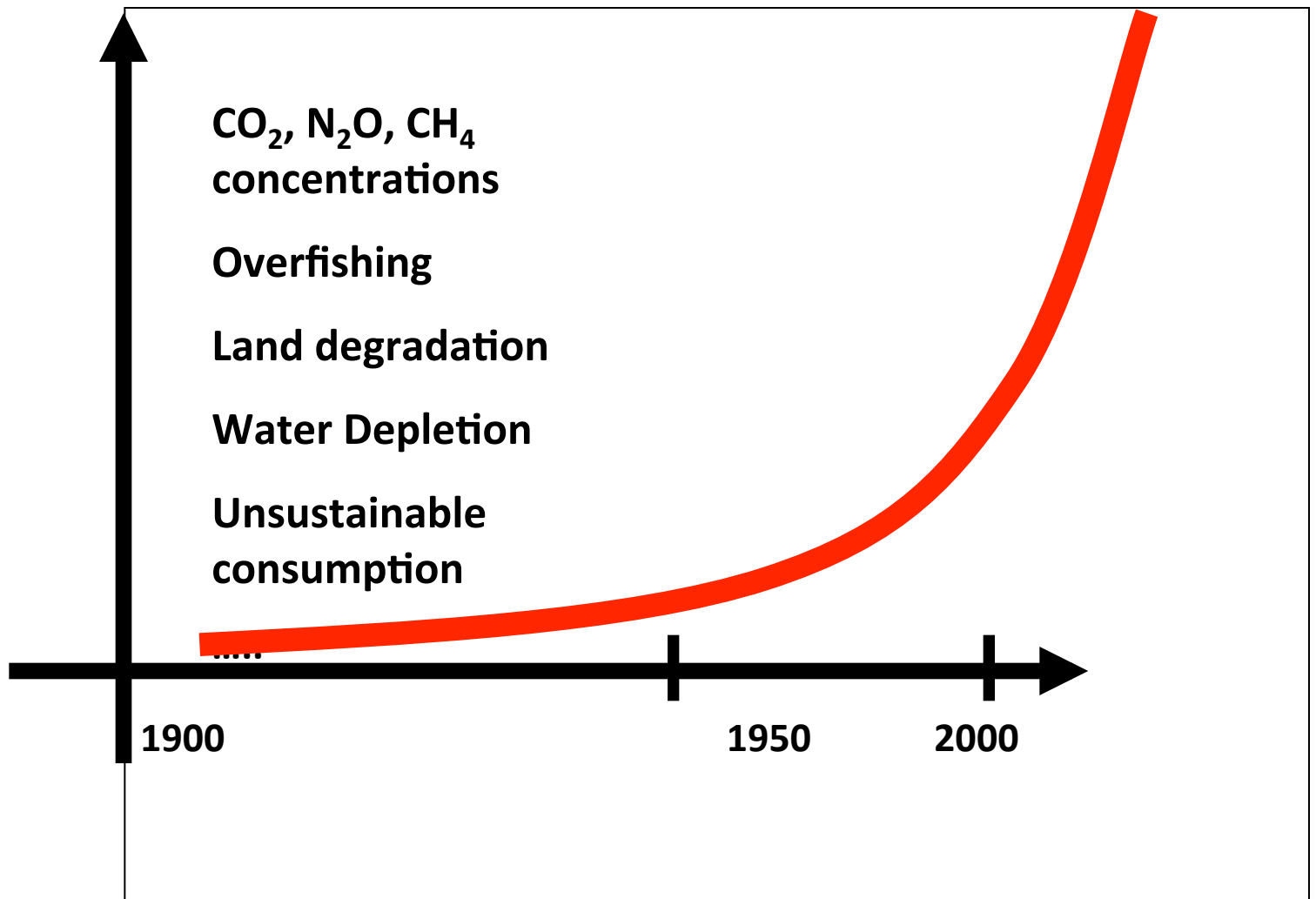
NB: This is the original version. A version of this PowerPoint shortened by the Mountain Partnership was presented
The views expressed herein are those of the presenters.

“H2O” Resilience ... for a Changing Climate and for Climate Change



Address synergies between mountain and lowlands development

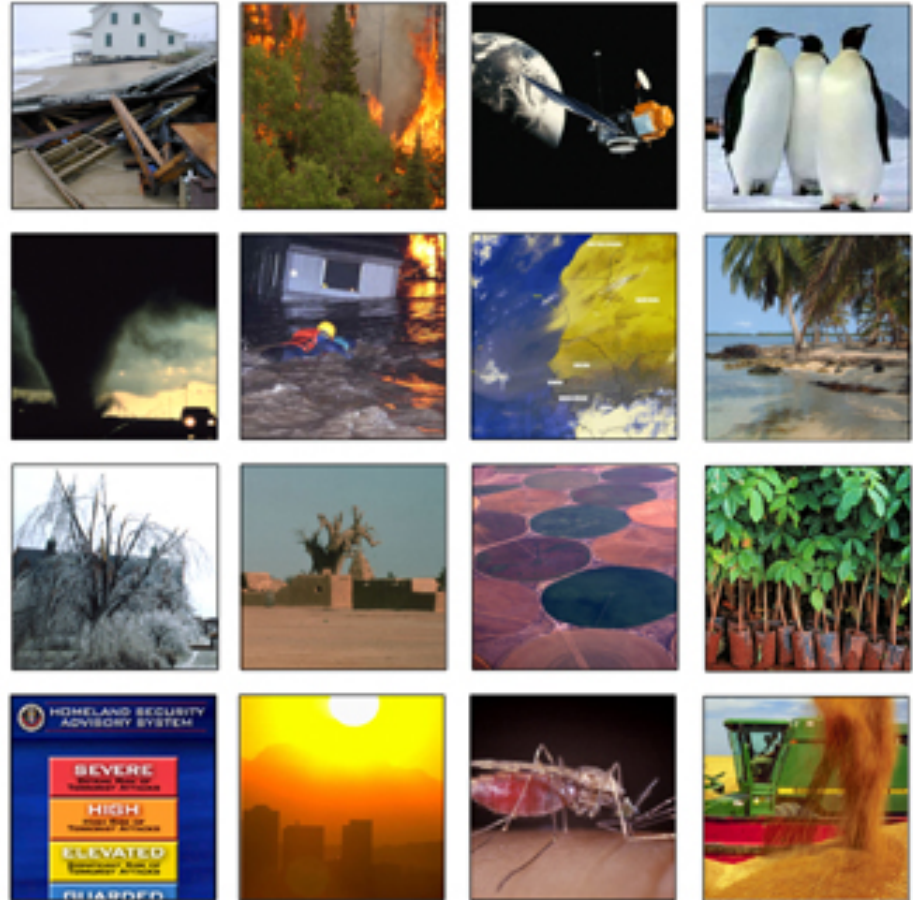
The past 50 years has seen a dramatic degradation of the earth's natural capital



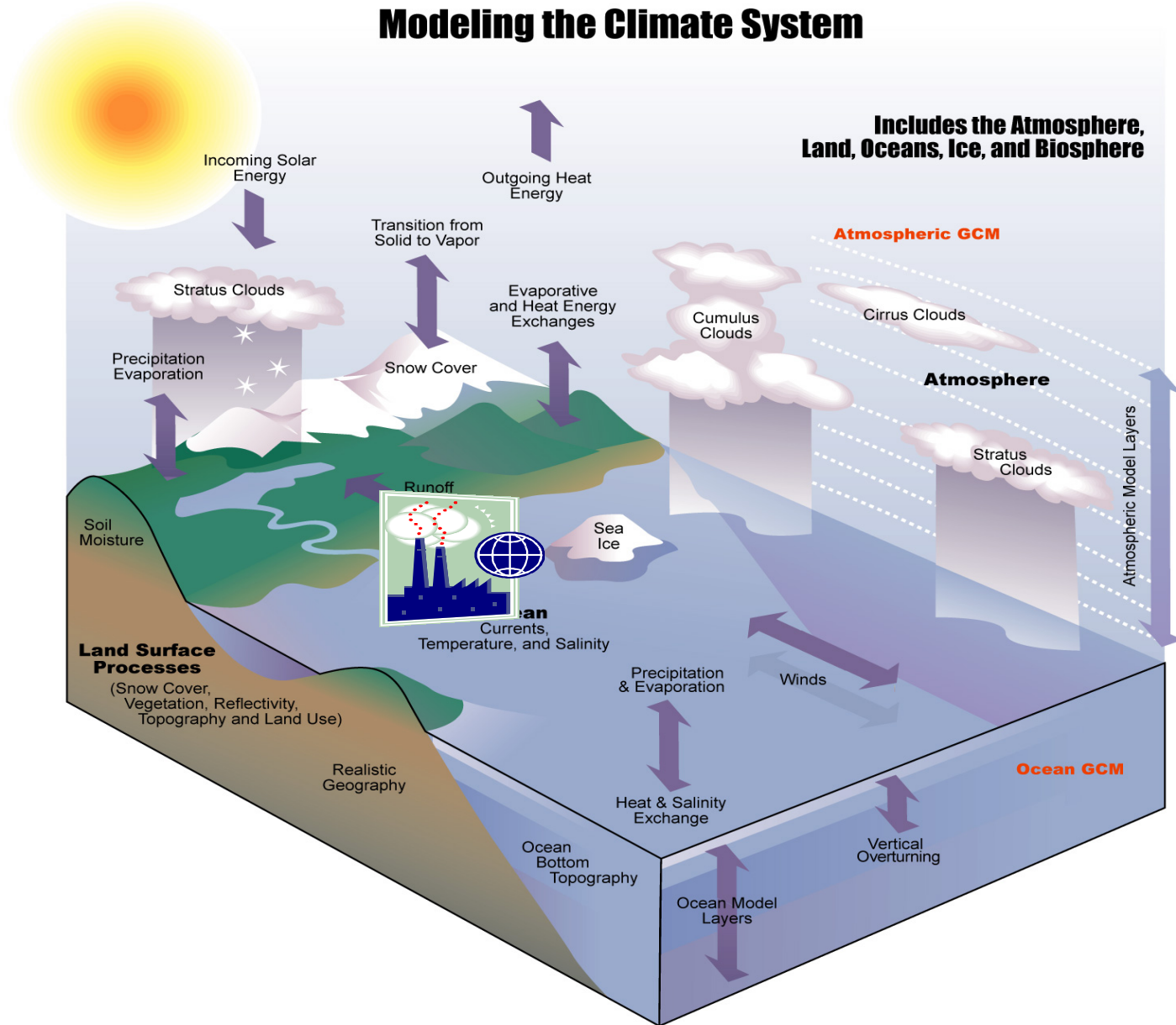
Creeping Environmental Changes

(slow, incremental and cumulative change over time)

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



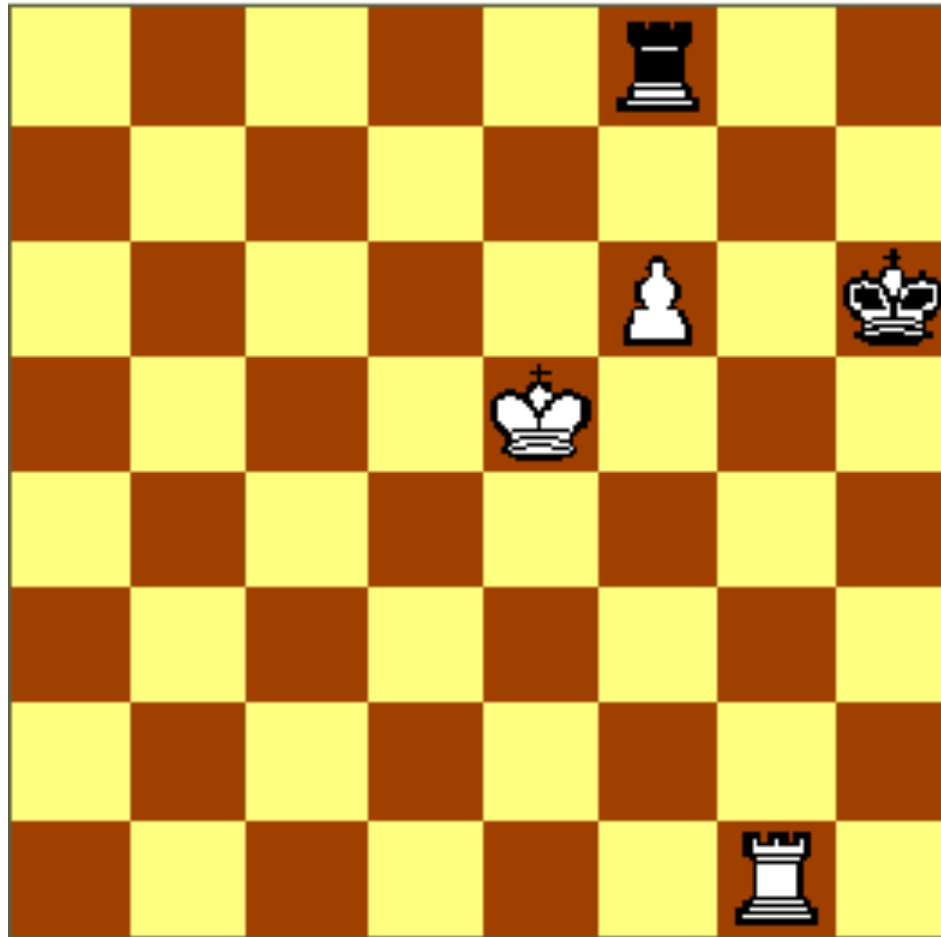
Modeling the Climate System



**Includes the Atmosphere,
Land, Oceans, Ice, and Biosphere**

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

Global warming and people: No place to hide



White to move

Fig. 3-26

Aspects of Climate

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

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



Citarum River, Indonesia

- “Water Towers of the Planet”

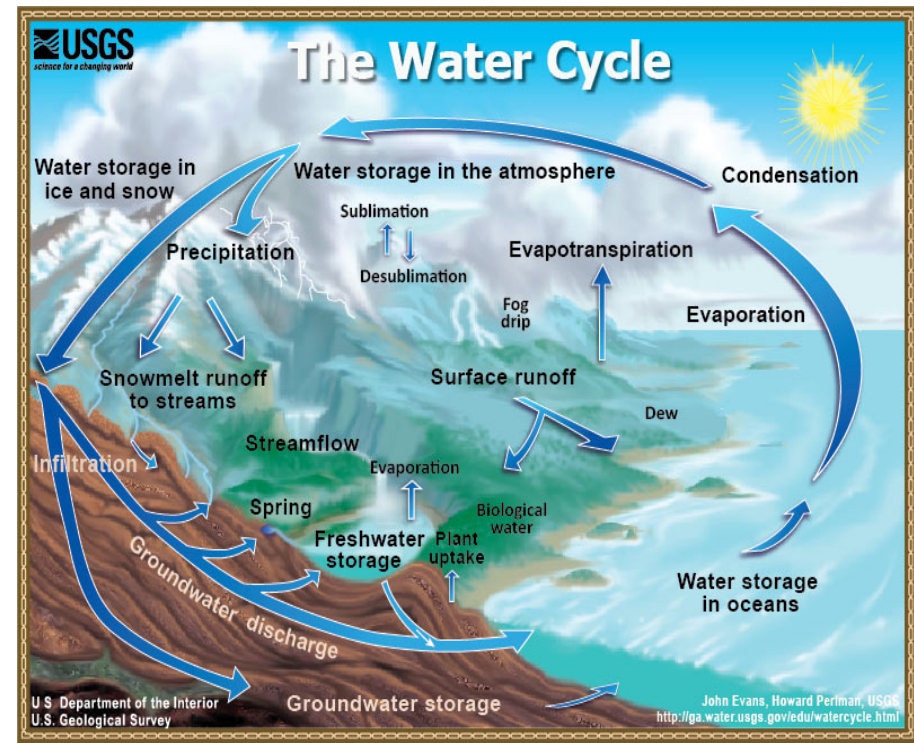
- The “Third Pole”

- “The roof of the world”

- Eurasian snow covers influence on global and regional climates

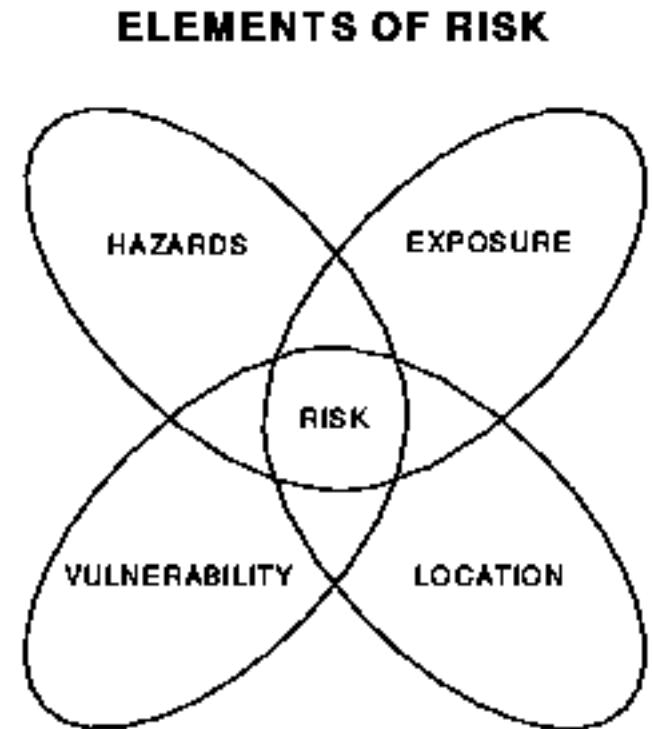
- Upstream countries are the “Guardians” of water upstream

**Mountains are a global concern:
They need a ‘social invention’**



Regional Climate-related Issues: Changing Hazards

- Floods & Flash floods
- Temperature increases
- Changes in seasonality
- Droughts
- Landslides, fires
- Changes in monsoon regime
- Increasing rate of melting
- Increasing risk of GLOFs
- Out-Migration
- Changes in agricultural and grazing landuse
- Vector borne diseases
- Conflicts



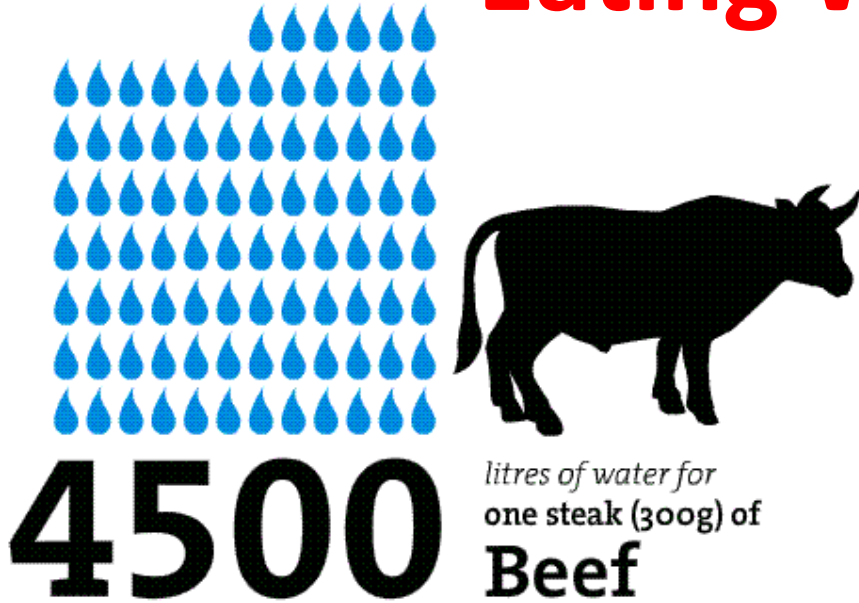
Goods provided by mountain regions to people in these regions and to lowland populations

- **Water (for consumption, irrigation, energy production for upstream to downstream people);**
- **Food (crops, domesticated and wild animals, fish);**
- **Wood (for energy and construction);**
- **Non-timber forest products (fibres, foodstuffs, medicinal plants);**
- **Minerals**

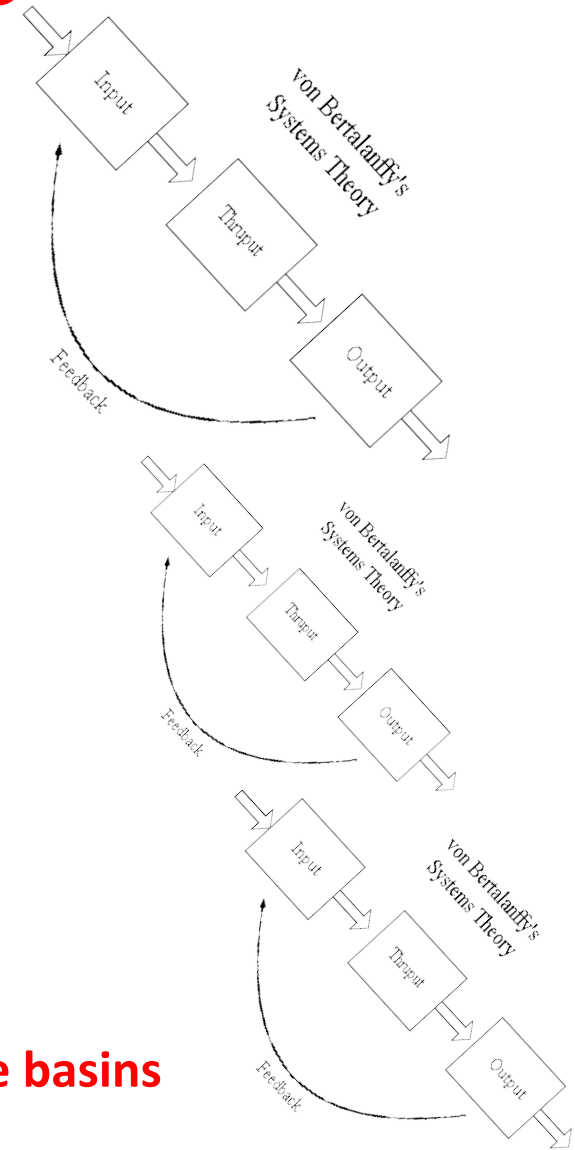
Services provided by mountain ecosystems include:

- **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);**
- **Protect landscape as amenity benefit to extra-regional tourists ... but also to ... 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 global scale).**

Eating Water (virtual water)



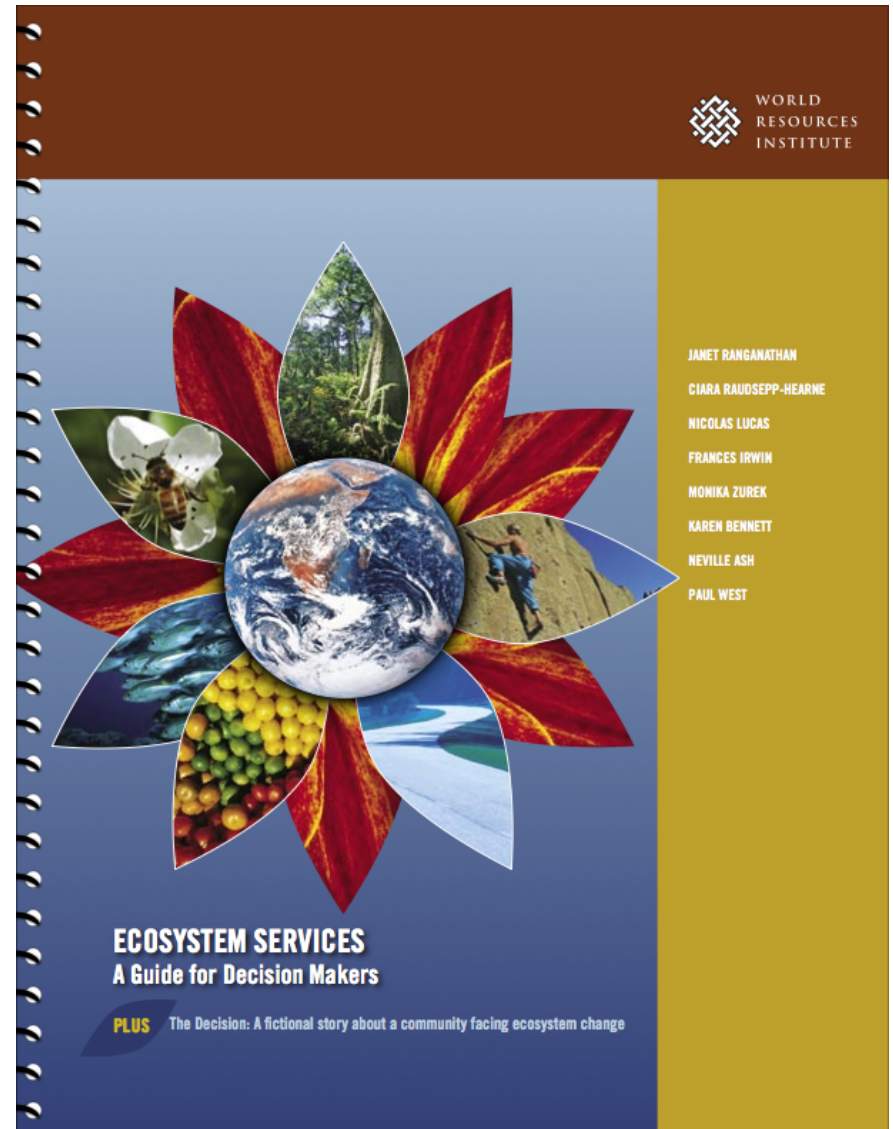
The mountain's cascade of goods & services



Streamflow from glaciers to coasts or inland drainage basins

Millennium Ecosystems Assessment: “Ecosystems goods & services for human well-being”

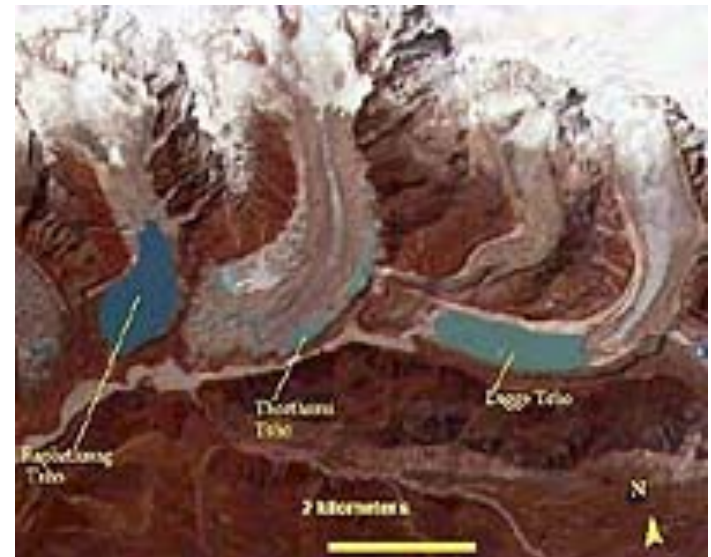
- It should also be:
- Human goods & services for ecosystems well being.
- Societies need Ecosystems more than Ecosystems need societies.



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**



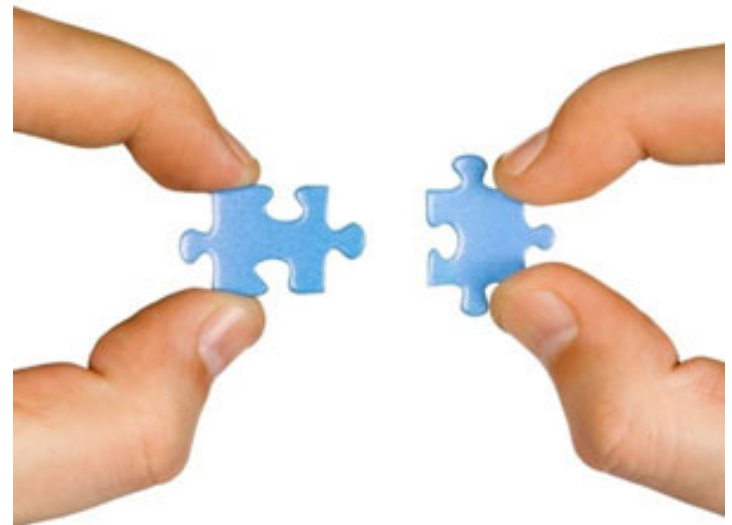
Food security needs



Indigenous knowledge loss

The Mountain Partnership's Purpose

- **Generate awareness**
- **establish clear commitments and benchmarks**
- **develop prioritized plans of action**
- **enhance cooperation among its members**



Next step... Highlands to Oceans Initiative?

“Mountain Reciprocity: lowland people have vital needs for the resources of the mountains and should compensate and work with Mountain people to ensure the long-term provision of these resources, with benefits to both Lowland and Mountain communities.

Mountain Restitution for Goods and Services: ... establish their rights to be compensated for goods and services they contribute downstream ... and compensatory mechanisms (eg, compensatory funds and investment subsidies, royalties, taxes)”

Martin Price et al. , 2013. “Mountain Geography”)



Tourism (mountaineering); aesthetic character; religious and cultural resources

5000 m

Pastoralism; mining

4000 m

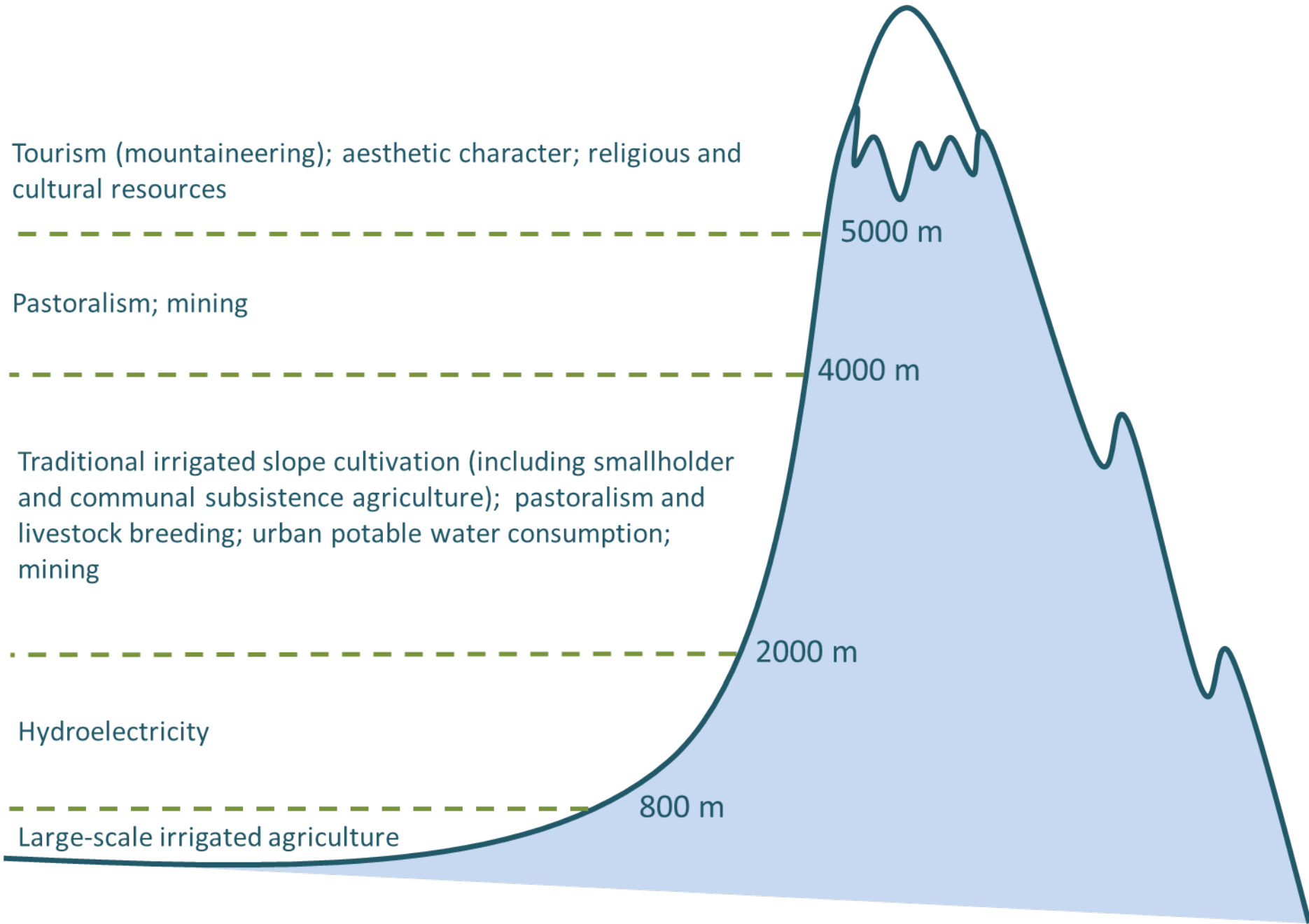
Traditional irrigated slope cultivation (including smallholder and communal subsistence agriculture); pastoralism and livestock breeding; urban potable water consumption; mining

2000 m

Hydroelectricity

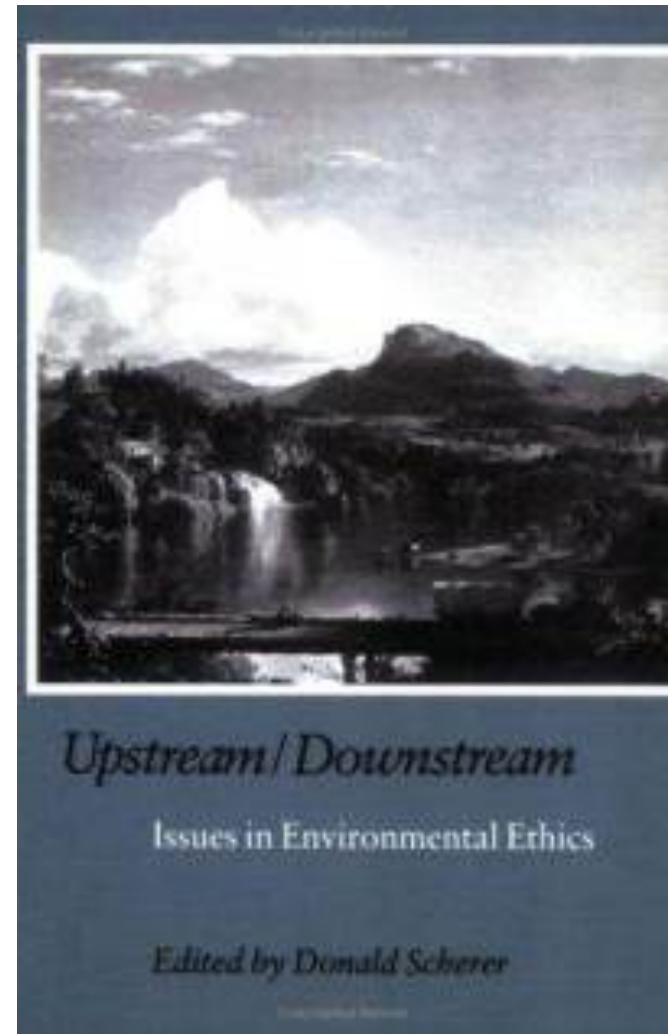
800 m

Large-scale irrigated agriculture



Thinking “outside the Mountain box”

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



Value of a Mountain Coalition

WHY a Mountain Coalition:

- to establish clear common interests and commitments for mountains-to-lowlands issues,
- develop prioritized plans of action
- enhance cooperation among coalition members.



Linking or Sinking: Link Highlands to the Lowlands ... or else?



No Mountain is an Island

H2O (highlands to lowlands) Initiative

Tourism (mountaineering); aesthetic character; religious and cultural resources

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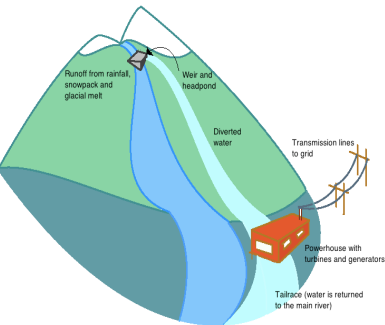
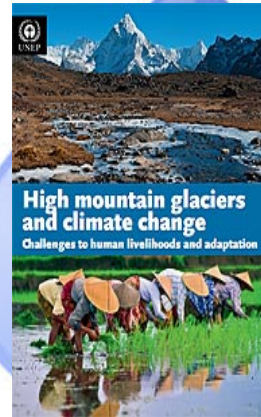
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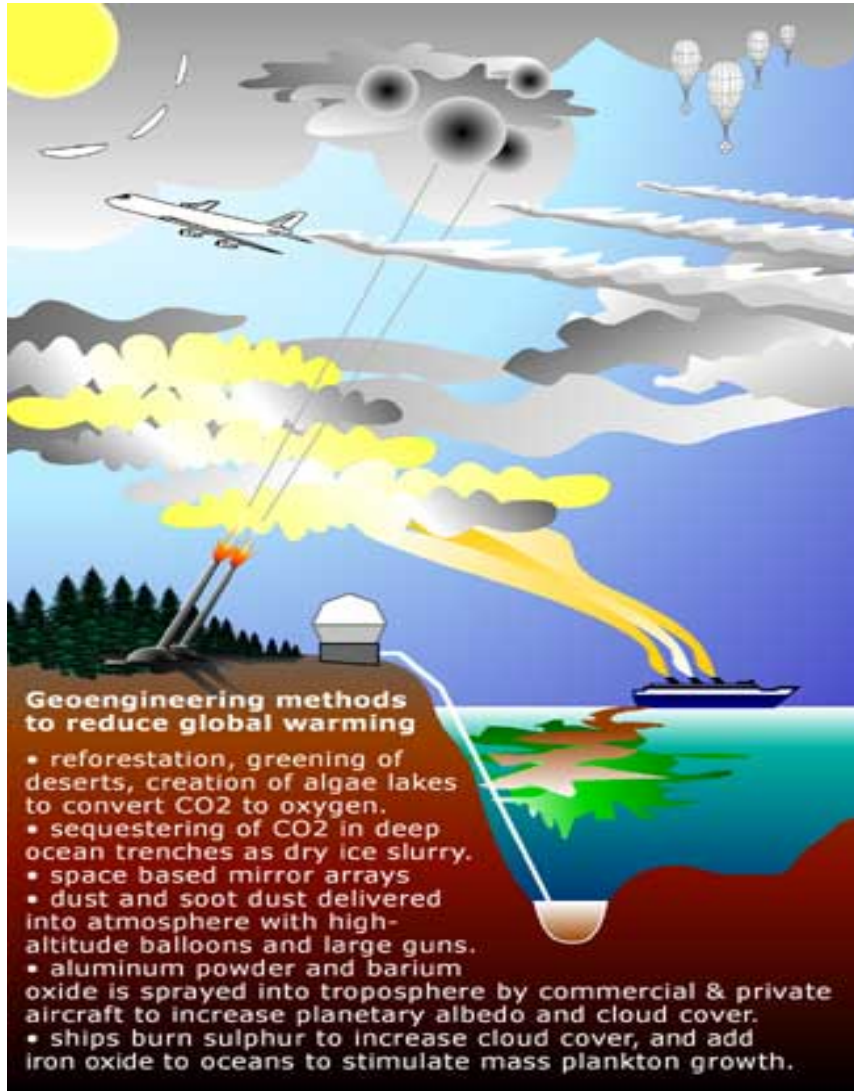
800 m

Large-scale irrigated agriculture



Geo-Engineering the Earth to Meet ... WHAT?

... Our Needs or our Wants?



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



SMIC 1971

“We recognize a real problem ... a global temperature increase produced by man’s injection of heat and CO2 ...”

“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

(SMIC)

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

Edited by SMIC

M.I.T. Press

What about a Mountain & Climate Affairs program?

Mountains & Climate Science

Mountains & Climate Impacts

Mountains & Climate Policy & Law

Mountains & Climate

Mountains & Climate Economics

Mountains & Climate Engineering

Mountains & Climate Ethics and Equity

MOUNTAIN &

CLIMATE

AFFAIRS



A P R I M E R

Michael H. Glantz

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

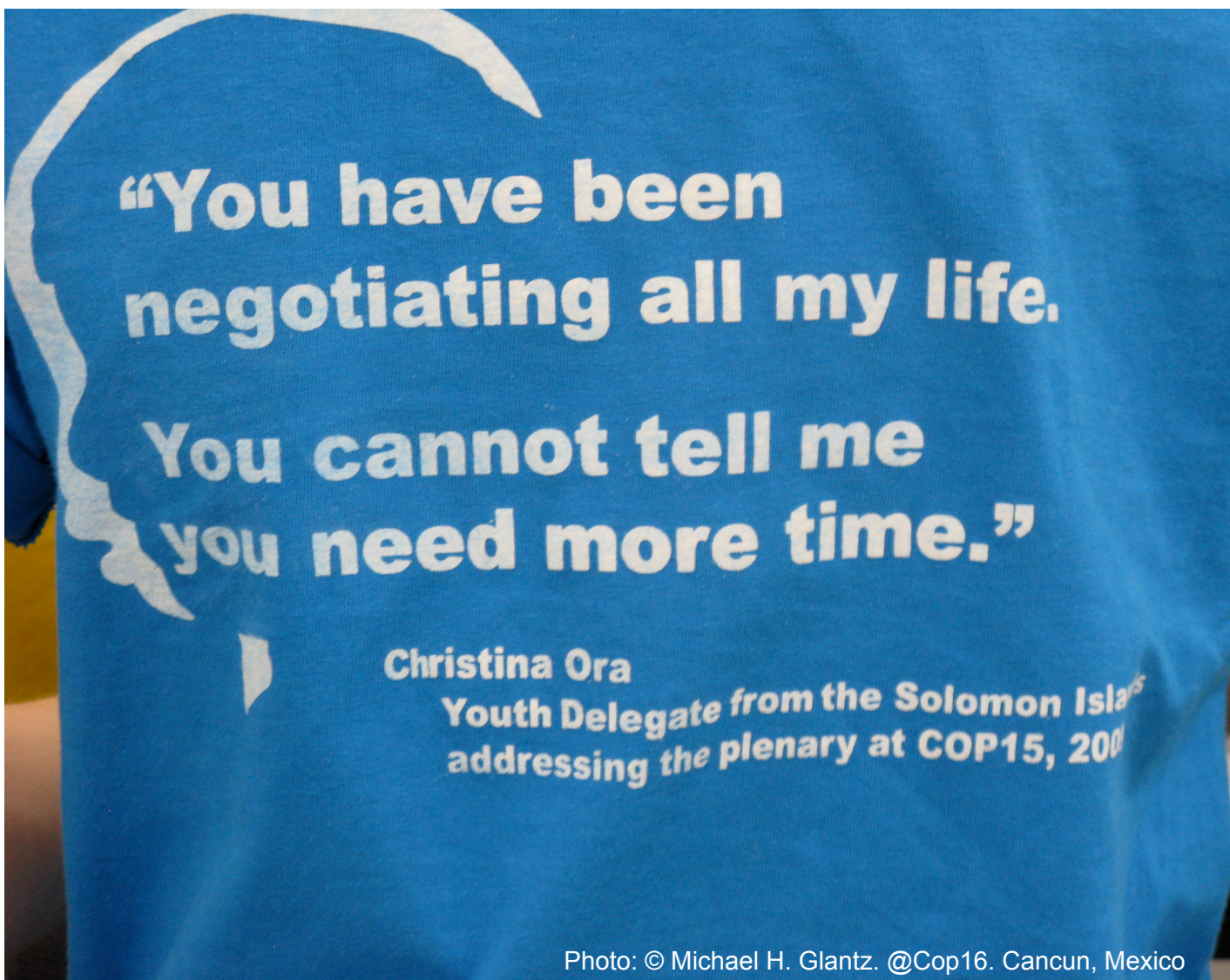


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