

Understanding Austrian farmers' perception of climate change: local observations, influences from the media and adaptive strategies

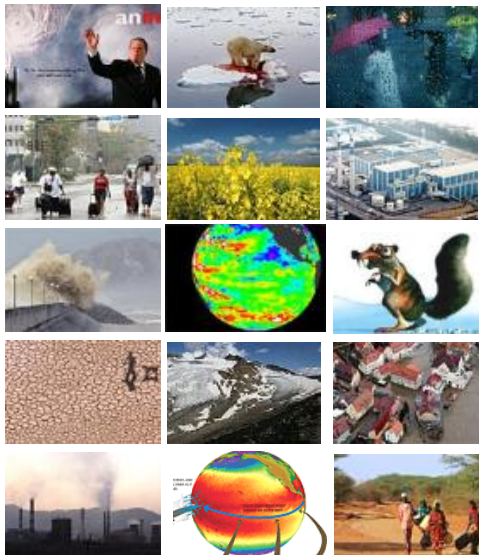
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Global climate change: Short cuts



Increase in globally averaged temperatures since the mid-20th century is “*very likely*” due to the increase in anthropogenic greenhouse gas concentrations

Long-term changes in climate (changes in Arctic temperatures and ice, widespread changes in precipitation amounts, wind patterns etc.)

Developing countries are more vulnerable to climate change damages than developed countries

(IPCC 2007)

Climate change in the European Alps

Rote Wand Glacier (Vorarlberg, Austria)
~1980



Rote Wand Glacier (Vorarlberg, Austria)
2005



Since the year 1950, the snow line in the Alps has risen by about 100m.

During the last 100 years, alpine glaciers have lost about 50% of their ice because of altered temperature and precipitation patterns.

➤ Decrease of estival water resources

➤ Decrease of duration of snow cover in winter by 50% in altitudes between 700 and 1000m.a.s.l.

Increase of frequency of climate change-related hazards such as mud- and landslides, rock falls or avalanches.

(Agrawala 2007, Seiler 2006)

Global climate change and local perception

Research questions

How do farmers in Austria perceive climate change?

What impact has cc on their livelihood and their environment?

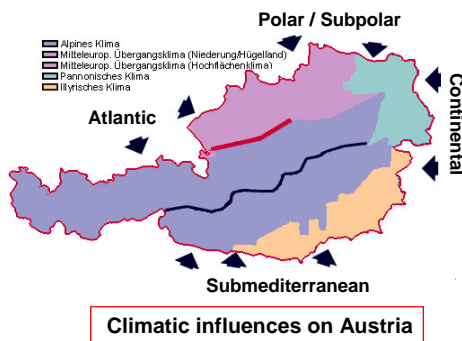
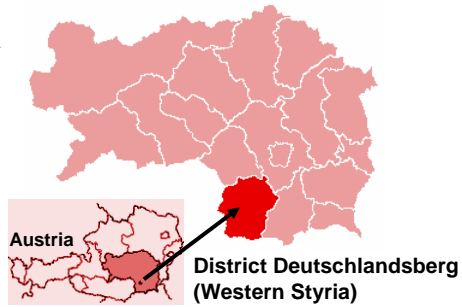
How do the farmers react to these changes?



Study area (1)

Western Styria, Austria

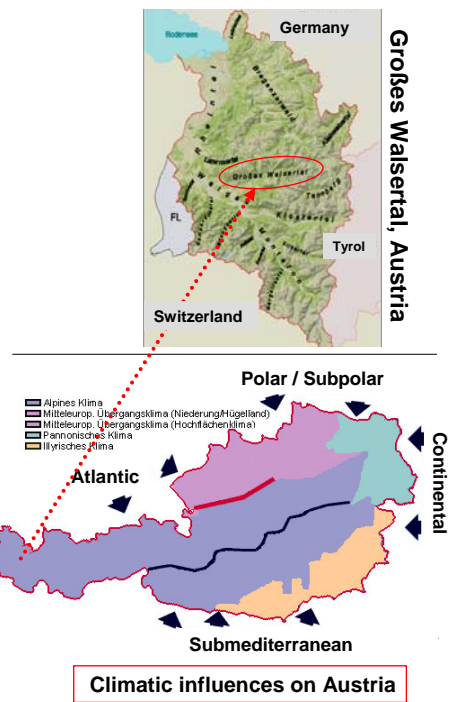
- 10 communities within district Deutschlandsberg
- Altitude: 300 – 2000 m.a.s.l.
- Illyric (mediterranean-continental) climate
- Average annual precipitation: 1091 mm; Annual mean temperature 9.7° C



Study area (2)

Großes Walsertal, Austria

- 6 communities within the district Bludenz
- Altitude: 600 – 2704 m.a.s.l.
- Alpine climate area
- Average annual precipitation: 1.883mm; Annual mean temperature: 6.7° C



Agricultural production:
Animal husbandry (cattle, sheep, goats, pigs and poultry), cheese production, landscape management

Methods: Data survey

- **2004-2006: Research project on local ecosystemic knowledge about soil, weather and climate**
- **15 months of field work**
- Structured, semi-structured, unstructured, informal interviews
- Participant and non participant observation
- 137 farmers, 10 key experts
- **In-depth interviews on perception of climate change with 38 farmers in Western Styria and 36 farmers in Großes Walsertal (snowball sampling)**



During an interview ...



Visiting a farmer's family

Methods: Data analysis

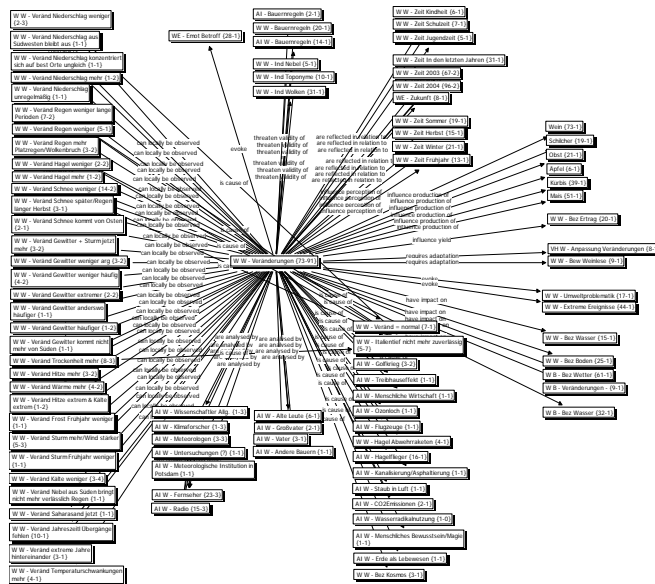
Atlas.ti

Step 1:
Reading &
Coding

Step 2:
Frequencies of
Codes

Step 3:
Co-occurring
Codes

Step 4:
Network
illustration



Data analysis with Atlas.ti of the answers to: Did you observe weather and climate changes in the last years? IF YES, what changes did you observe?

Farmers' observations on changes in precipitation

Snow

- Less snowfall in the last winters
 - > Absence of permanent snow cover in Western Styria
 - > Shorter period of permanent snow cover in Großes Walsertal
- Postponement of the first snowfalls

Consequences for agriculture & ecosystems

- Decreasing soil moisture
- Later plowing in autumn



Farmers' observations on changes in precipitation

Rain

- Decreasing rainfalls
- Shorter rainfall periods
- More heavy downpours

Consequences for agriculture & ecosystems

- Less ground water
- Decreasing water-level of local rivers
- Decreasing soil moisture
- Soil erosion: Avulsion of fertile humus soil

„We will probably not live long enough to see it, but our children will experience that the forest suffers (from water shortages).“

(Farmer of Western Styria)



Farmers observations on
changes in wind patterns

Heavy storms and gales

- More frequent storms
- Stronger winds
- Thunderstorms more frequently combined with heavy gales



Consequences for agriculture & ecosystems

- Soils drying up faster
- Uprooted trees
- Bark beetle infestation of storm-damaged wood



Farmers' observations on **more extreme weather conditions**

- Changes in insolation: „Strength of the sun“

"This is not a sun as in the past, that's another sun, so harsh, so direct. This wouldn't have existed in the past."

(Older farmer of Großes Walsertal)

- Loss of slow transitions between seasons

„The weather was more beautiful in former times, because it was clearly recognizable through the four seasons. There was springtime, summer, autumn and winter. [...] It was not like today, where we have summer from one day to the other.“

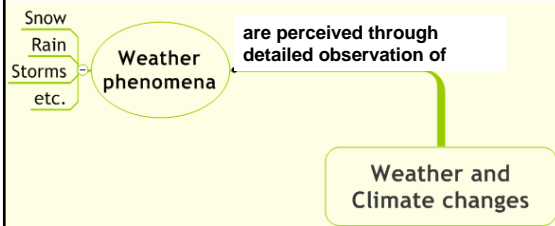
(Farmer of Western Styria)

- Weather is “uneven”, “extreme” or “one-sided”

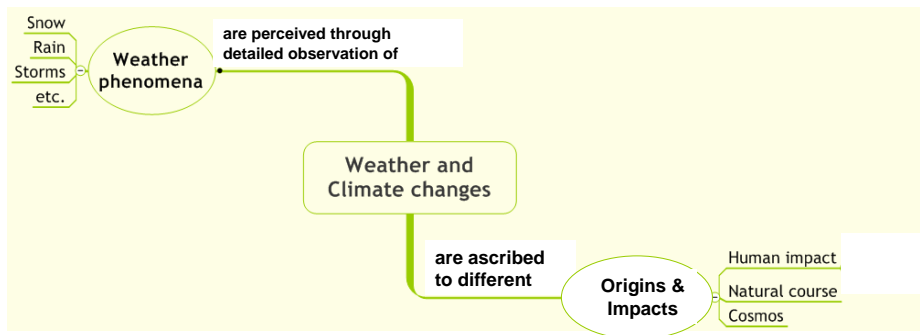
„The weather changes more frequently and more rapidly, suddenly flipping from a hot period to a cold one.“

(Farmer of Western Styria)

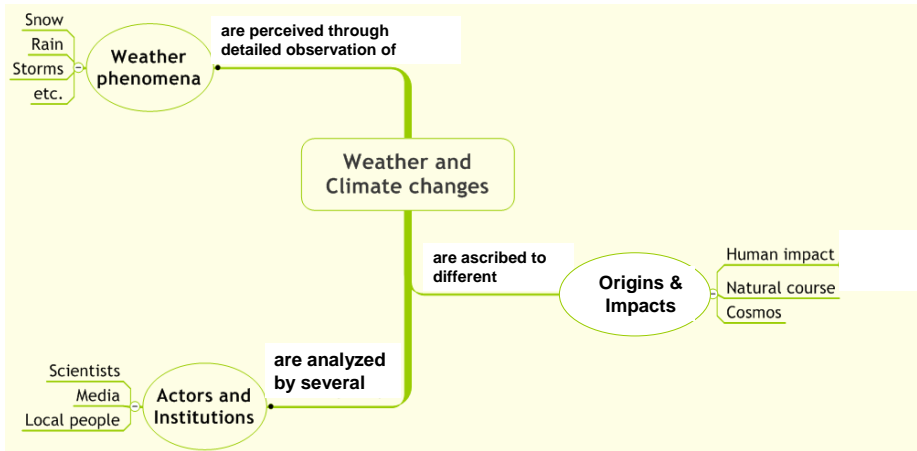
Patterns of local perception on climate change



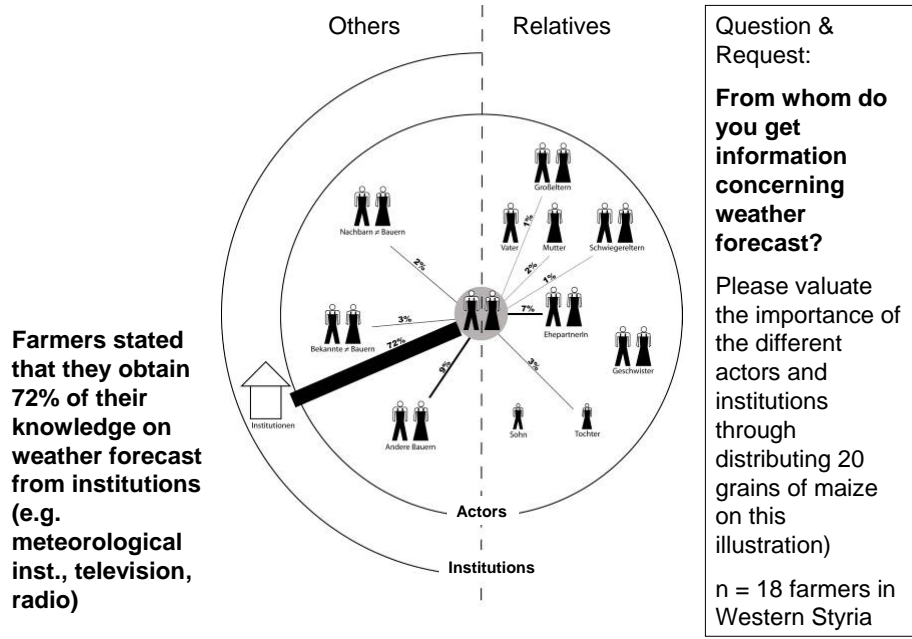
Patterns of local perception on climate change



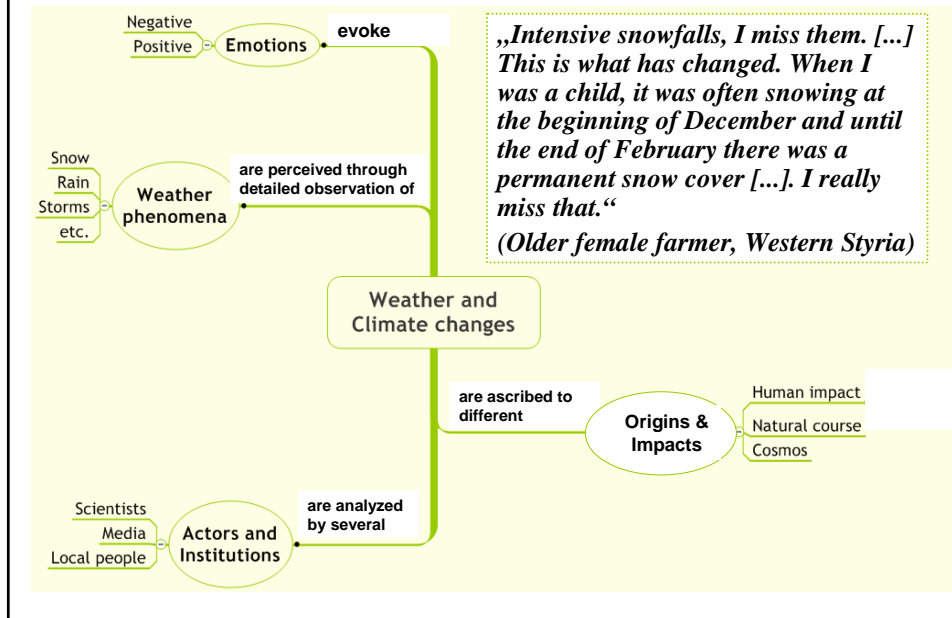
Patterns of local perception on climate change



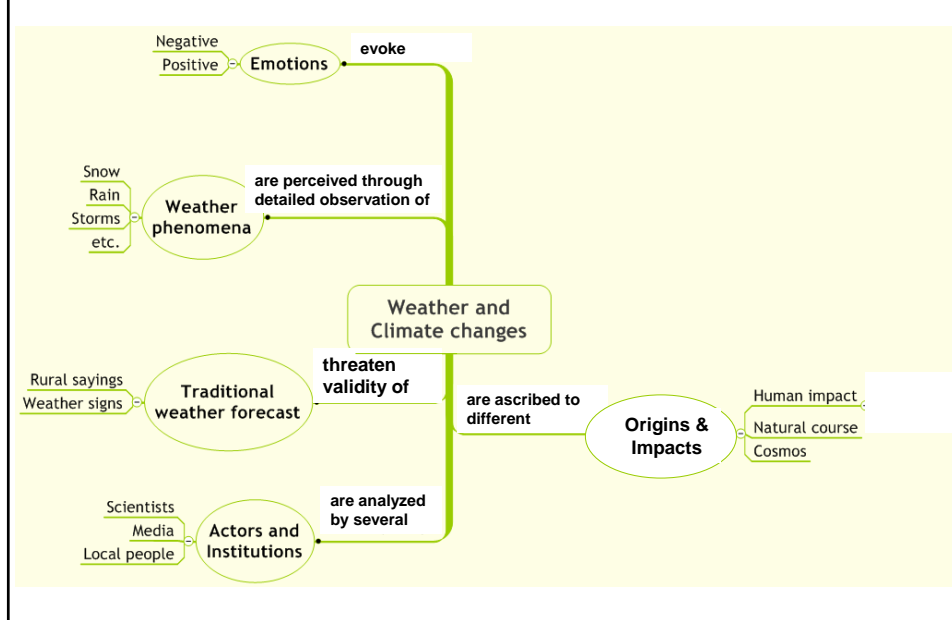
Acquisition of weather knowledge by local farmers



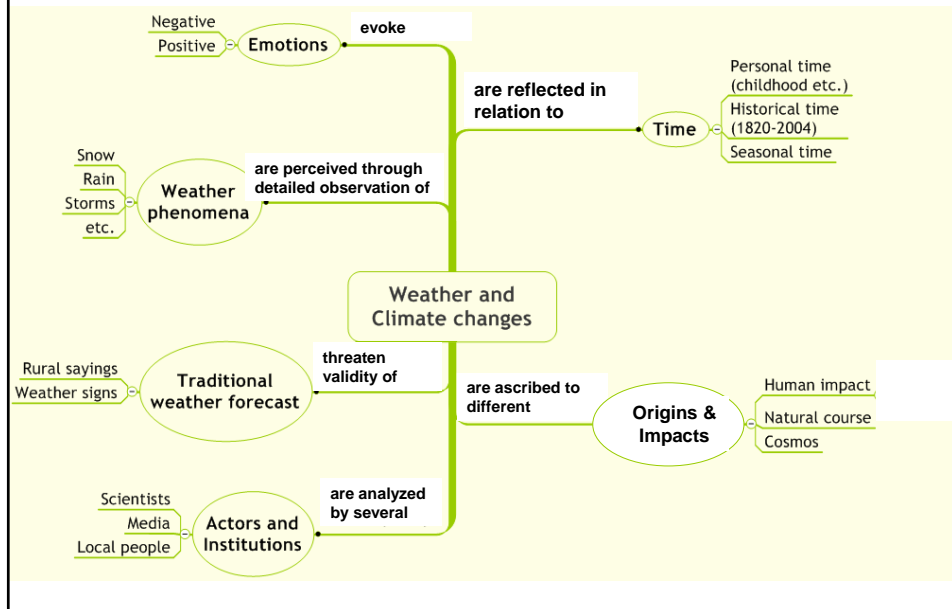
Patterns of local perception on climate change



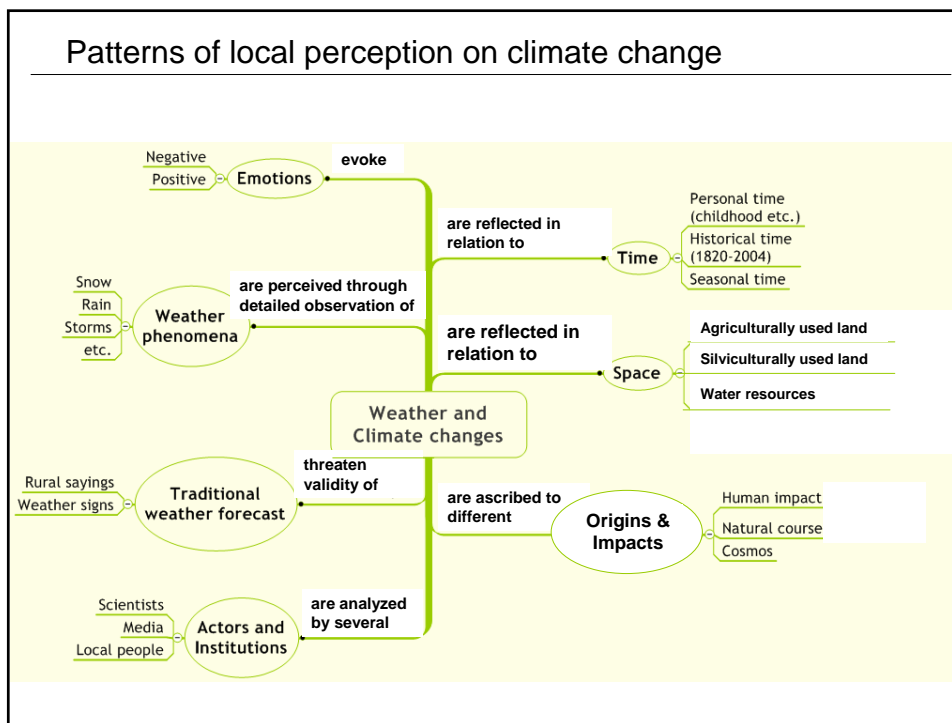
Patterns of local perception on climate change



Patterns of local perception on climate change



Patterns of local perception on climate change



Discussion

- Farmers of both study areas have observed several changes of weather and climate in their respective environments over the last decades.
- Farmers' **explanations** for climate change are **dominated by prevailing scientific discourses represented in the media** and rarely base on the farmers' conclusions drawn from their own (local) observations.
- Farmers often see climate change in their regions as a consequence of global actions (e.g. emissions of carbon dioxide), but **without directly relating it to their own actions.**
- Even though farmers are aware of the impact climate change has on agricultural land and local ecosystems, **farmers rarely react through adaptive actions or changes in the local agricultural production.**

Hypotheses for further research

Lack of adaptive strategies to climate change due to ...

Hypothesis 1:

Media, policy-makers and agricultural consultants have (until recently) failed to communicate expected effects of climate change on Austrian agriculture in the future and to discuss potential ways of adapting agricultural practices to the expected changes.

Hypothesis 2:

There is a lack of adaptive actions for want of urgency. Until now, in both study areas, there have not been any climate change-related hazards that agricultural or private insurances or the support of the Austrian government would not have compensated or which would have seriously endangered the farmers' economy and livelihood.

Conclusions

>> Climate change = (at present) not perceived by the farmers in Western Styria and Großes Walsertal as a real threat to their own livelihood

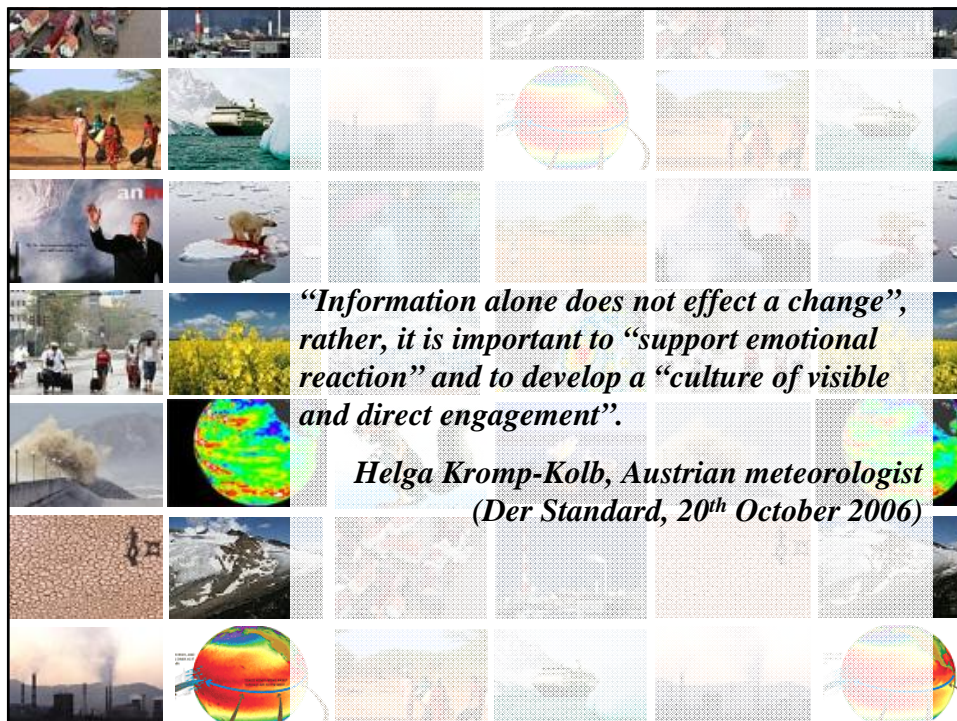
= difference to studies in developing countries, where local people daily face drastic consequences of climate change

Further perspectives for stronger involvement in climate change research

- Exploring local people's concept of climate change to get a better understanding how the phenomenon of global climate change can be successfully communicated
- Studying locals' risk perception concerning climate change to gain insights into coping mechanisms or survival strategies and a further understanding of human behavior towards nature in general (Howell 2003, Vedwan and Rhoades 2001)
- Analyzing motivations and constraints of actors in politics, economy, energy companies, etc. to achieve better understanding of the structures and mechanisms of climate policy (Henning 2005)

Further perspectives for stronger involvement in climate change research

- Doing research on climate discourses in the media by analyzing how climate change is communicated and what aspects are highlighted to evoke public consternation and what aspects have been neglected so far
- Studying how the information transmitted by the media is received and interpreted by local people to better understand the influence of global knowledge on local knowledge, i.e. to get a better understanding of the way global knowledge is locally transformed and made useful for local purposes



Acknowledgments

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Thank you for your attention!

References

- Agrawala, S. Editor. 2007. *Climate Change in the European Alps: Adapting Winter Tourism and Natural Hazards Management*. OECD Publishing.
- Der Standard. 2006. "Klimawandel nicht mehr zu verhindern," in *Der Standard*. Vienna. Print edition, 20.10.2006
- Henning, A. 2005. Climate change and energy use. *Anthropology Today* 21:8-12.
- Howell, P. 2003. "Indigenous Early Warning Indicators of Cyclones: Potential Application in Coastal Bangladesh," in *Disaster Studies Working Paper 6*: Benfield Hazard Research Centre: 1-10.
- IPCC. 2007. *Climate Change 2007: The Physical Science Basis - Summary for Policymakers*. Paris: Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.
- Seiler, W. 2006. "Der Klimawandel im Alpenraum: Trends, Auswirkungen und Herausforderungen," in *Klimawandel im Alpenraum. Auswirkungen und Herausforderungen*. Edited by Lebensministerium, pp. 7-20. Vienna: Lebensministerium (BMLFUW).
- Vedwan, N., and R. E. Rhoades. 2001. Climate change in the Western Himalayas of India: a study of local perception and response. *Climate Research* 19:109-117.