Traditional Knowledge and the Use of Biological Diversity in Mitigating and Coping with Natural Disaster.

by
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(paper by P.Eyzaguirre, A. Jarvis, A. King, D. Astudillo)

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Many indigenous peoples and traditional societies often inhabit marginal areas with fragile ecosystems or at the boundaries between major ecosystems

- ***Desert Margins***: **Sahel in West Africa , Sonora in USS-Mexican border, Steppes of Mongolia and Central Asia, Kalahari of Southern Africa, Oases of North Africa**
- ***Mountain Ecosystems***, **Himalayas, Shan Mountains of Southeast Asia , Pamir of Central Asia, Andes**
- ***Tropical Forests***: **Borneo, Amazon Basin, Peninsular Malaysia, Dja and Congo Basin, Assam, Western Ghats,**
- ***Tidal areas and Wetlands***: **Okavango of Southwest Africa, Bixagos Mangroves of West Africa, Ojibwa marshlands of North America,**
- ***Circum Polar Region***: **North American Inuit, Greenland Inuit, northern Siberia, Lapland**

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Traditional societies use complex strategies for managing ecosystems and landscapes that create buffers that:

1. **Mitigate impacts of natural disasters or environmental change by moving between ecosystems:** for example between marine and terrestrial ecosystems in Circum Polar and Tidal Areas
2. **Maintain complex ecosystems that buffer the effects of natural disasters**, for example mangroves absorb the energy and reduce the force of tidal surges and tsunamis, they also absorb the impacts of flooding from increased erosion and severity of rainfall
3. **Use a sophisticated set of environmental indicators,**
   - behaviour of animals, migratory pattern of birds and game, insect behaviour and species interactions,
   - cycles and spread of pests and diseases affecting plants and animals that are central to their livelihoods.
   - Monitor long term cycles or changes in ecotones such as loss of ice shelves, reduction or increase in forest cover, spread or contraction of deserts, changes in salinity in tidal areas and wetlands, water quality and availability.

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Traditional societies use complex strategies for managing ecosystems and landscapes that create buffers that can:

4. **Use environmental information from one ecosystem to adopt management strategies for livelihood resource use in another ecosystem:** example, migratory patterns of birds, leaf fall in the forests can help Sahelian farmers determine or adjust planting dates or choice of crops and crop varieties, gathered foods can become more important for agriculturalists, salinisation of croplands may cause changes in water temperatures and species composition of coastal marine ecosystems and fisheries.
5. **Use species and genetic diversity to reduce risks and mitigate impacts of natural disasters and long term environmental change.** Sahelian, Andean, Himalayan farmers plant many crops and crop varieties that allow them to adjust planting dates and crop mixtures to erratic rainfall patterns, e.g. sorghum, millet fonio, floating rice African rice. Pastoralists maintain hardier crop breeds, e.g Ndama cattle that are more resistant to diseases, and less demanding in use of pastures, they also mix flocks and herds of animals

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Farmers use environmental and cultural indicators from the wild to determine planting times and manage crop cultivars in Burkina Faso

Source: Sawadogo, et.al. IPGRI, 2001

PLANTS

– Leaf fall of Tamarindus indica, Butyrospermum paradoxum (Karite)

Beginning to have leaf of Lannea microcarpa (Sabga), Sclerocarya birrea ()

– NobgaFlowering of Sclerocarya birrea (Nobga), Lannea microcarpa (Sabga), Pterocarpus lucens(Kumbrsaka),"Perperga"

– Yellowing and leaf fall of Lannea acida (Samb-nutuga)

– Appearance of Stylochiton hypogeae (Wule) in the river beds

– Maturity and fruiting of Lannea microcarpa (Sabga), Sclerocarya birrea (Nobga), Butyrospermum paradoxum (Taaga)

– Ripening, drying and souring of fruits of Lannea microcarpa (Sabga), Sclerocarya birrea (Nobga)

BIRDS

7 – Guinea fowls laying eggs

8 – Some birds (Taaba) building their nests

9 – Storks returning (migrating back) to the village

– South-North migration of Silokoe and Kilimba birds

11 – Sparrowhawk crying continuously (repeatedly)

ANIMALS

1 – Lizards shedding skin

– Toads going to the bush from ponds

– Toads croaking incessantly

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Source: Sawadogo, et.al. IPGRI, 2001

RITUALS

- Predictions of rainmakers
- Traditional lunar calendar
- Spiritual leaders, rituals at planting or harvesting

STARS AND WEATHER

- Appearance of the constellation of six stars in the west
- Change in the normal trajectory of the sun
- Wind blowing from the East
- Temperatures are warming up
- First clouds appearing
- Continuous thundering

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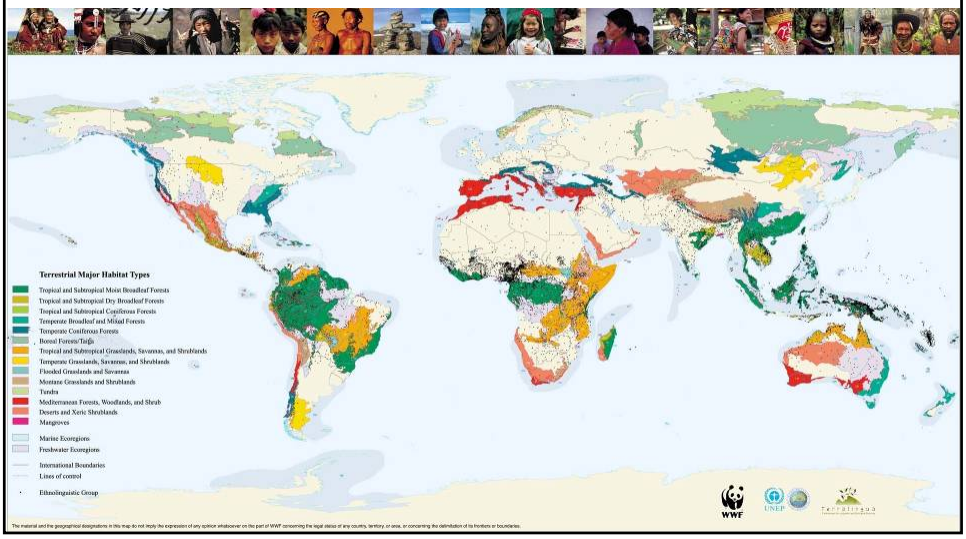
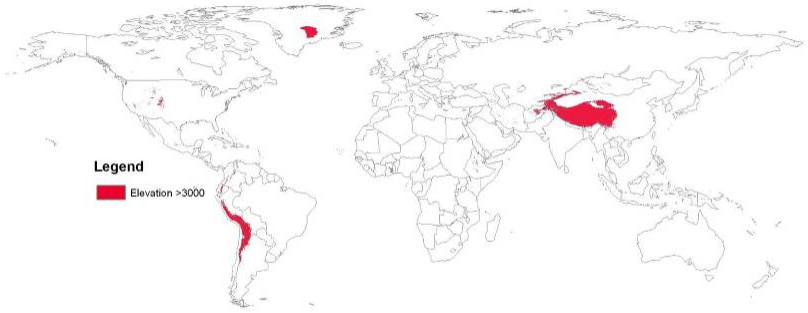
Indigenous and Traditional Peoples in the Global 200 Ecoregions



Marginal Areas: over 3000m



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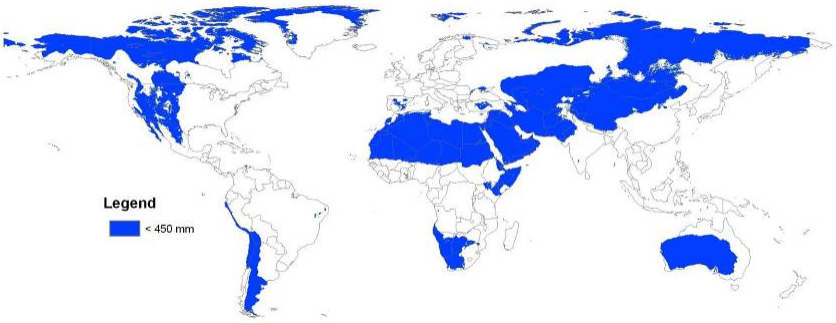
Marginal Areas: rainfall under 450mm



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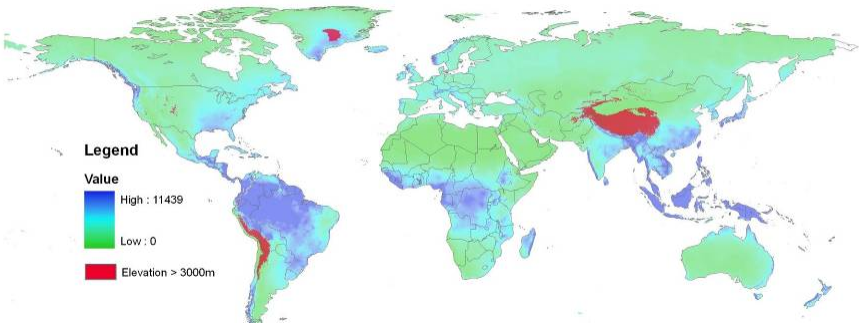
Marginal Areas: Elevation and Precipitation



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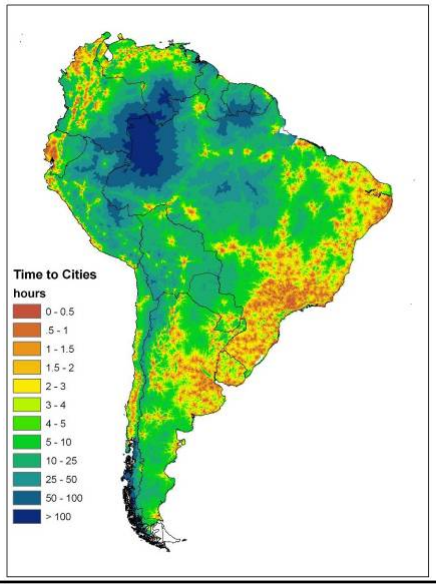
Marginal Areas: Accessability



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Changing livelihoods of traditional communities coincide but do not always correlate with effects or impacts on climate change

- Economic enterprises and new technologies allow for movement into more fragile areas with inadequate knowledge of long term processes
- Economic policies and infrastructure induce movements away from margins or traditional livelihood strategies that straddle ecosystems or ecotones
- Reinforcing of the role of traditional communities with long term biocultural relationships with their environment, thus able to monitor and better adapt to climate change and disasters is inked to identity, governance and resource rights
- Will those with decision making roles listen to traditional peoples and respect heir knowledge

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New technologies and the opening of new markets allow people to move into marginal areas previously less populated.

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Forest communities now at the margins: the Wahau-Berau corridor in East Kalimantan, Indonesia

Twenty years of road building, immigration and land-clearing for plantations have transformed a river-based forest economy into a road-based wage economy, fundamentally reconfiguring the relationships among people and places.

Decentralization, though incomplete, has left rural villages competing with each other for development interventions by the district government and NGOs.

District governments are bringing forest societies into decentralized forest management arrangements for conservation, but elsewhere still give plantation companies virtually free rein.

Contrary to some conventional expectations, forest conservation initiatives have taken greater hold in relatively poor villages than they have in relatively rich ones

Wehea identity politics have articulated with The Nature Conservancy's local "inauthenticity" and a new role for tradition.

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Ethnobiological Research Areas

- Bixagos Tidal Zone: Mancanha farming communities; Bixagos fishing, gathering, swiddens; Bolama: horticulture, fishing, trade
- Mountain agriculture in Himalayas, Andes, Pamir
- Desert margins: Sahelian farmers in Mali, Burkina Faso, Niger;Gobi; High pampas; Sonora
- Siberia, Lapland, Circum Polar Americas
- Tropical forests and agricultural systems Thailand, Indonesia, Bolivia, Cuba

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Ethnobiological Research Principles

- Indigenous and traditional communities should be supported in their unique adaptation to marginal areas and ecosystem boundaries
- Access to biodiversity necessary for survival and adaptation of indigenous peoples and traditional communities in these environments should be enhanced and protected, Complex ecosystem buffers that also provide livelihoods, sacred spaces, and pathways of traditional peoples should be respected and maintained
- Recognise rights of indigenous and traditional societies in marginal areas, and support their role as a global monitoring and early warning system on environmental change and natural disasters.
- Indicators of environmental changes and portents of natural disasters can be improved by equitable partnerships with local communities

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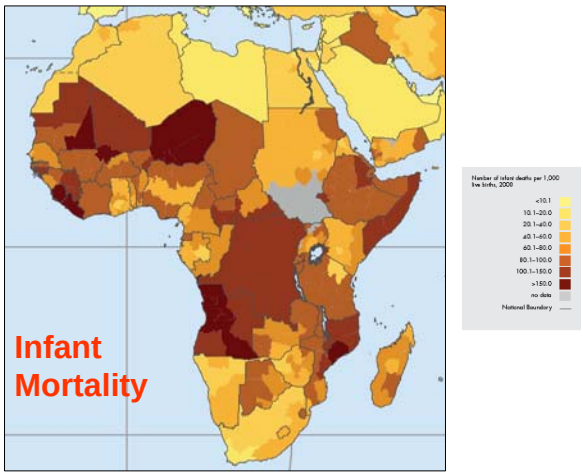
What measures do we consider?

Welfare indicators



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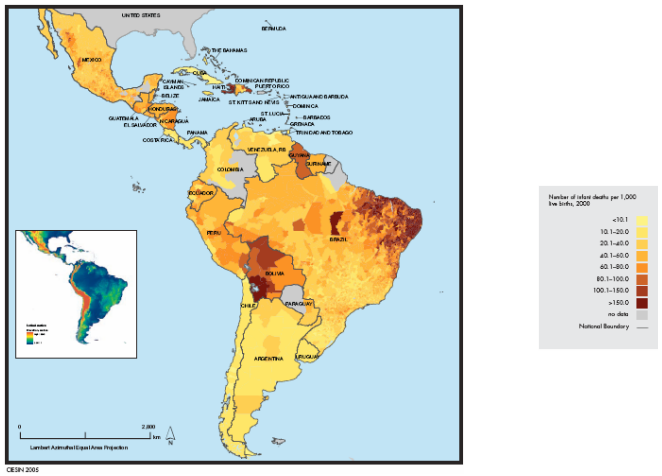
Latin America Infant Mortality



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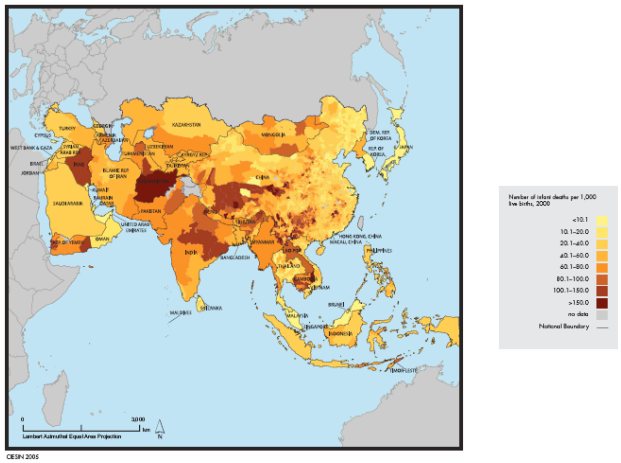
Asia Infant Mortality



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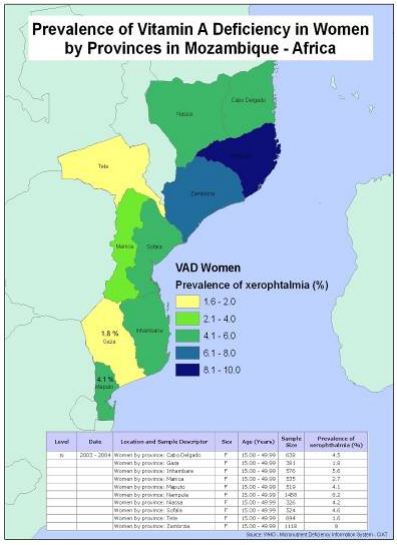
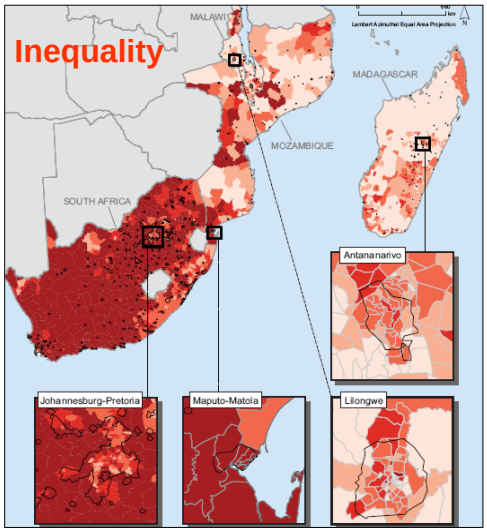
Micronutrient Deficiencies

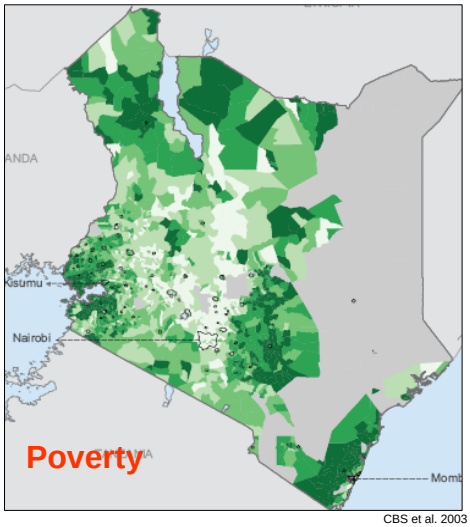


Inequality Mapping



Alderman et al 2002

Poverty Mapping



CBS et al. 2003

Thank you.