

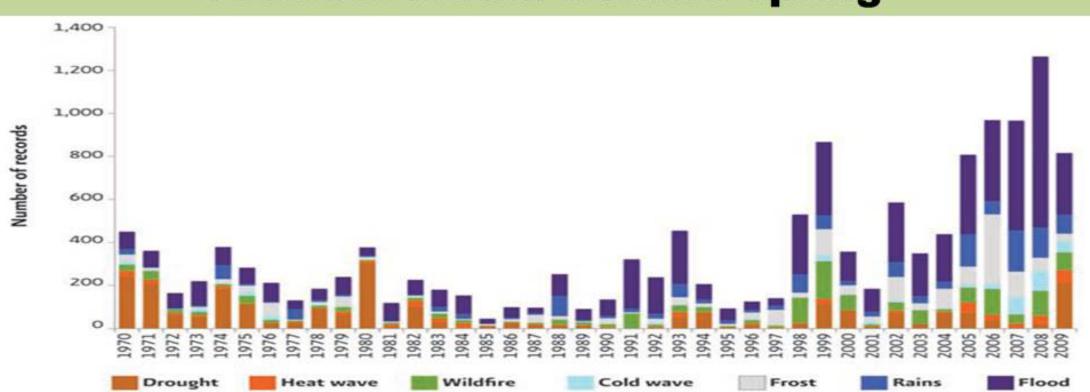


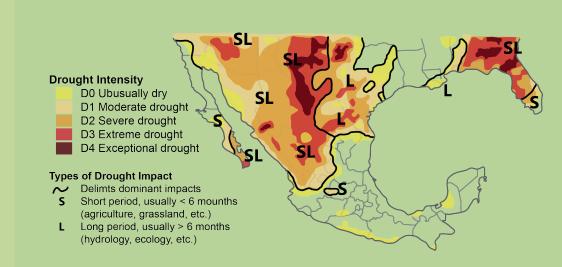




Nexus among Water, Soil, Food, and Biodiversity in Mexico

Prof. Dr. Úrsula Oswald-Spring







Soil management at risk

Of loss of topsoi

18.2 millions of nectares: national

surface of wind

4.04 millions of

hectares: national

degradation

surface with chemical

erosion

Salinization / alkalization

Chemical degradation

22.72 millions of hectares: nationa

surface of water

Waterlogging 0.2%

Diminution of water availability

10.83 millions of

hectares: national

surface with physical

Water erosion

Physical degradation

Crusting and sealing 1.9%

Research Question, WSF&B, Human security

Other types of vegetation

Other hydrophytic vegetation

Xeric scrublands

26.01%

Subhumid rainforest

Rainforest

How could human security of people be enhanced who are impacted by the nexus of water, soil, food and biodiversity (WSF&B), triggered by climate change impacts and sea water intrusion?

Human security is understood as freedom from fear, freedom from want (HSN 2003), freedom from hazard impacts (Bogardi/ Brauch 2005) and freedom to live in dignity (Annan 2005)

The WSF&B nexus addresses the feedbacks between water and soil, land-use changes and food production and their impacts on biodiversity loss. Climate change with more frequent and severe droughts and extreme storms and flash floods have increased the costs in human lives and for the economy.

Natural grassland

Temperate forest

Halophytes / Gypsophila

Stripped areas of

vegetation 0.01%

Water bodies

0.7%

Induced or cultivated grassland 9.8%

Agriculture

Urban areas and

0.8%

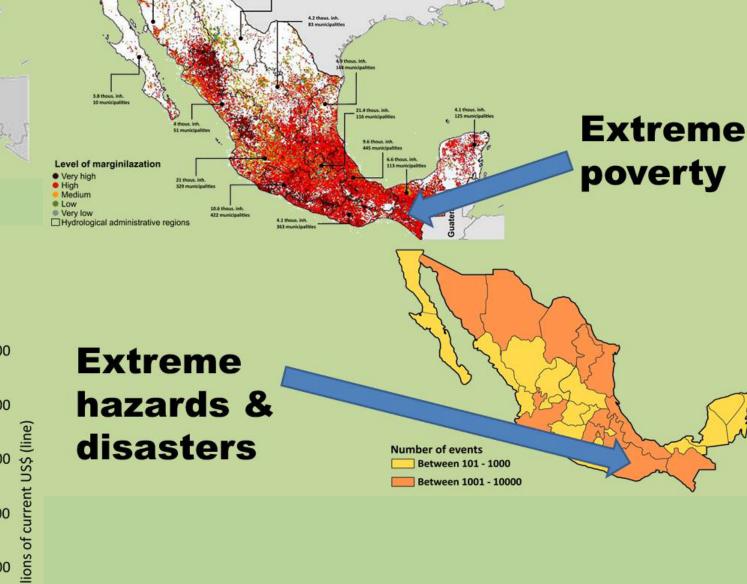
Aquaculture 0.05%

Forestry plantations 0.02%

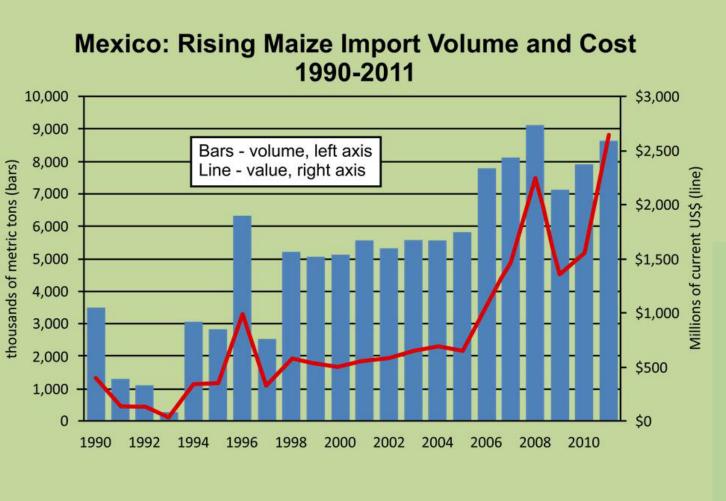
Mountainous cloud forest

South-Southeast Central-North 11,768 m³/hab/year Precipitation average 3,982 m³/hab/year Renewable Renewable Population Population Unequal water access, population distribution & **GDP** production in drylands





Land use changes & biodiversity Aquifers Aquifer overexploited Aquifer overexploited with sea water intrusion Aquifer overexploited with salinization of soils and brackish groundwater Aquifer overexploited with sea water intrusion, salinization of soils and brackish groundwater



Less precipitation and longer and more intensive droughts are affecting also the natural cover of biota, but requires also more water for irrigation (IPCC, 2014). Crop yields decline due to brackish water and soils are increasingly salinized, while the return water into aquifers raises further the amount of salt content in groundwater (Garatuza et al., 2011). Further, the neoliberal free trade policy (NAFTA) has increased subsidized food imports, what resulted in ruralurban and international migration, hunger and obesity among the socially vulnerable people.

Discussion

This WSF&B nexus has increased both the social and the environmental vulnerability of the poor and often marginalized rural and urban populations and contributes to their human insecurity (Brauch et al. 2011). Longer and more intensive droughts related to climate variability increase this dual vulnerability (Oswald, 2013).

