

ENVISIONING A CLIMATE CHANGE-PROOF FUTURE

An integral view of change

Tsimane' identify the simultaneous impact of different drivers of change and the cascade effects by which certain changes negatively impact other elements. An integral view of change offers a politicized view of the environment which emphasizes that impacts are not only biophysical but also social-ecological.

A culturally grounded view of change

Tsimane' holistic view of environmental change incorporates cultural representations of the world, too often underrepresented in science. Tsimane' cosmology and spiritual beliefs play a prominent role in their understanding of how and why the world changes, and thus should be acknowledged in any attempt to bridge knowledge systems and transmitted between generations.

Biodiversity and cultural loss are entangled

Tsimane' knowledge is directly related with their territory and its biodiversity. Land use change for agriculture and pastures, increased clearing of the primary forest, and hunting pressure over wild fauna is drastically changing their environment and eroding Tsimane' holistic knowledge of their territory. Promoting biocultural conservation is a means to simultaneously maintain biological and cultural diversity.

THE NEED FOR A HOLISTIC CHANGE

Tsimane' understand environmental change as resulting from multiple factors, some of which are linked to a historical process leading to the appropriation and fragmentation of their lands. Local policies to tackle the negative effects of environmental change in the area should equally address simultaneous drivers of change and acknowledge Tsimane' cosmological understandings of change.

CO-CREATING NEW KNOWLEDGE

Indigenous and local knowledge understandings of the complex relations between different elements of the system could contribute to the co-generation of new knowledge about impacts and adaptations. This process requires to build researchers' and decision makers' competence and capacity to receive, comprehend, and value insights from Indigenous and local knowledge, both at the individual and institutional levels.

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LICCI is a European Research Council (ERC) funded project aiming to bring Indigenous and local knowledge to climate change research. Visit the project website for more details and research results.
www.licci.eu

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Credit: A. B. Junqueira

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Local Indicators of
Climate Change Impacts



Tsimane', Department of Beni Amazonia, Bolivia

Tsimane' Indigenous Peoples in Bolivian Amazonia report increasing temperature and decreasing and variable precipitation. These changes affect soils and rivers with cascading effects in flora, fauna and crops. Tsimane' argue that climate change interacts with resource extraction, deforestation and the presence of traders and loggers on their lands in impelling environmental change. Environmental changes are often interpreted in cosmological and/or spiritual terms by the community.

Credit: A. B. Junqueira

THE TSIMANE' PEOPLE

Horticulturalist and foraging community of approximately 15,000 people living in the Dept Beni, Bolivia.

Tsimane' villages are mostly settled around the Maniqui and Secure rivers, in titled communal lands.



ACTIVITIES



Practice hunting, gathering, fishing and small-scale shifting agriculture.



Increasingly depend on cash cropping rice and plantain, sale of fish and thatch palm, and wage labor in logging camps and cattle ranches.

TERRITORY AND CLIMATE

Equatorial CLIMATE



25.8°C avg (episodic southern cold winds in May)



1,750 mm/year
(October to April)

Changes in the climate

Records from the local weather station reveal that since the 1960s the area has experienced a steady increase in temperature, a pronounced decrease in rainfall in the rainy season, and an increase in the length of the dry period.

ACCESS TO NATURAL RESOURCES



Rainforests are at the basis of Tsimane' livelihood. They provide food (game, wild edible plants), materials (for houses, canoes, etc), medicine, and sense of belonging.



Rivers provide water and food (fish) and connect the territory.

Changes in the territory

From 1986 to 2009, forest cover increasingly fragmented, due to the clearance of old-growth forests by logger companies, cattle ranchers, and agriculturalists. A decrease in plant, game, and fish abundance has been documented, and local extinctions reported. Rivers are polluted by several mercury-dependent artisanal gold miners operating in the area.

VOICES OF LOCAL KNOWLEDGE

The Tsimane' people have rich, temporal, place-based knowledge about their environment. This knowledge allows them to observe change and deduce drivers of these changes. Their way of talking about changes reflects their understanding of the processes leading to change.



Credit: A. B. Junqueira

"Our grandparents did small agricultural plots. Now people do large ones. They cut large trees, and that's why the ground gets hotter, because the large trees maintain the moisture in the soil."

"Now there are many more people. They finish with the fish and animals."

"Many animals have disappeared because they [loggers] hunt more. They kill too many animals."

"Now there are less fish because we don't use arrows anymore. We now use hooks, nets, diving, and barbasco [a fish poisoning technique]."



Credit: A. B. Junqueira

Land use
change

Climate
change

Cultural
change



Credit: A. B. Junqueira



Drivers of change

"Plants 'cook' on the ground. The ground is hot, it rains, and then it is hot again, and this 'cooks' the plants."

"During tsunedye (the dry season) there used to be some episodes of rain. Now there are no rains in that season."



Credit: A. B. Junqueira

"People are not hunting respectfully anymore. I found one tapir that was shot, but nobody went to get it. Jājābā [the spirit who guards animals according to Tsimane' cosmology] gets angry and takes animals away."

"Game and fish are disappearing because they go to the other side. The 'muñeco' [a forest spirit] takes care of the animals and takes them somewhere else [to protect them]."

IMPACTS ON LIVELIHOODS AND CULTURE



Credit: A. B. Junqueira

From forests to crops and pastures

The opening of roads in the 1970s facilitated the arrival and establishment of cattle ranchers and highland colonists, which has progressively transformed forested areas into pastures and large scale agricultural fields.



Credit: A. B. Junqueira

Growth and wilderness don't mix well

Population growth, technological innovations, and the increased presence of loggers and traders in Tsimane' lands puts more pressure on hunting and fishing and leads to decrease in wild animal population.



Credit: Á. Fernández-Llamazares

Unwritten norms passing down wisdom

For the Tsimane', the use of inappropriate, abusive, or culturally disrespectful hunting, fishing, and gathering techniques awakens the anger of the guardian spirits of nature who punish Tsimane' with resource scarcity.