Decolonizing archaeological isotopic studies

Integration into local traditional knowledge towards climate change mitigation

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Small Island Developing States (SIDS) are at the center of the climate change debate, as they are expected to be hit the hardest. The majority of these states have a history of colonial and postcolonial policies and practices. The European invasion and colonization resulted, amongst others, in the loss of indigenous systems of knowledge, that would otherwise have been passed down to following generations to help manage the impacts of climate change [1].

Focus on the Caribbean region, where Western Sciences have been dominating the mitigation discussions and policy making for climate change.

Lately, in the context of decolonization discussions and in collaboration with the local communities, researchers are examining in which ways indigenous and local groups' knowledge of the environment can be used to inform climate change mitigation and adaptation.

Traditional knowledge

Today, indigenous communities, as users and observers of the natural environment for centuries, are in a unique position to provide monitoring data. Traditional knowledge practices have the potential to mitigate the consequences of extreme environmental phenomena.

Past human communities in the Caribbean lived through at least a 5m rise in sea level before the arrival of Columbus in 1492 [2].

Figure 2. Experimental construction of a Kalinago roundhouse at Argyle, Saint Vincent, based on archaeological data [1]

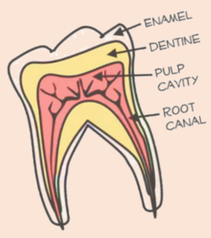
Figure 3. Examples of postholes at the site of Anse à la Gourde, Guadeloupe & Los Buchillones, Cuba, showing the excellent preservation and the resilience of building techniques [1,2]

Knowing the environmental conditions that past societies had to encounter will prepare us better for the situations that we will face in the present or near future.

Oxygen isotopes for paleoenvironmental studies

Why?

Oxygen isotopes can be used as a proxy for recording past climatic conditions. The reason for that is that oxygen isotopes values vary depending on factors related to the local climate, such as precipitation, humidity and temperature [3].



How?

The oxygen isotope composition of tooth enamel from any individual can reveal the oxygen values of the local water, since most individuals drink water from local resources. These values are fluctuating according to certain environmental conditions [3]. The method requires the measurement of the isotope values of archaeological samples of known age and the comparison with values of present-day water. Any discrepancies between the two can potentially signal a change in the climatic conditions in a region [4].

Results

Acquiring these data, will help us understand how much and in what ways climate has changed over the years. Combining that understanding with past traditional knowledge, we can interpret past human adaptation to certain environmental changes, such as rises in temperature or precipitation rates.

Combining scientific methods with traditional knowledge practices

Archaeological sciences can offer a unique perspective into the past. However, they have been proven difficult to combine with social sciences and for their significance to be communicated.

Employing isotopic analysis in the fight against climate change, is a way to bring science closer to local populations in the Caribbean.

By combining scientific methods with traditional knowledge, we can create a unique tool to combat the effects of climate change. First, by having the necessary information to explore changes in climatic conditions in the past, through archaeological sciences, and secondly to explore the way people adapted to it, through traditional knowledge, will provide the methods for a sustainable and effective mitigation for both the present and the future.

A collaboration between the latest scientific assessments and the local and indigenous knowledge, communities will create an excellent information base to enable decisions about environmental issues.

Case study: Hiwasaki et al_2014

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Further Reading
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