

From nature to man: Environmental anthropology in the Anthropocene

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Abstract

The dramatic changes brought by the relationship between humans and their natural environments by different human activities such as the exploitation of natural resources and use of fossil fuels threatens humanity at large. Beside considerable disagreements on when Anthropocene began, it is considered an epochal transformation linked to deterioration of global ecologies, loss of biodiversity and environmental degradation. Environmental anthropologists are contributing both theoretically and by important ethnographic insights in analyzing and understanding the consequences of climate changes in socio-ecological systems worldwide. In this article we provide an overview of main theoretical contributions during the development of environmental anthropology as a discipline. In addition, we highlight the possible Cultural Evolution theory (CE) contribution in climate changes consequences to a socio-ecological system.

Introduction

Since its first introduction by Crutzen¹ as the current geological epoch, the concept of the Anthropocene encapsulates the unprecedented planetary-scale changes resulting from societal transformations, at least since the European industrial revolution and particularly over the past 65 years of world development.² Major human alterations of Earth's environment long preceded

the 1900s: extinction of most Australian and American mammals; extensive deforestation of arable regions around the globe; creation of extensive anthropogenic wetlands for rice irrigation; and, in recent centuries, plowing of prairies and steppes for conversion to croplands.³ In this context, the onset of "Anthropocene" began with the expansion of agriculture 8,000 to 6,000 years ago; the main consequences were the replacement of original vegetation, which affected biodiversity, and the disruption of global biogeochemical cycles.⁴

The definition and meaning of "anthropocene" is largely disregarded and it is a topic of debate among scientists. They maintain it is not consistent with the practice of stratigraphy, has become a meta-narrative and neglects the fact that human is not the only factor affecting nature.⁵⁻⁷ The rise of plastic in 20th century ("technofossils") in both marine and terrestrial life is a key geological indicator of the Anthropocene.⁸ Within this context, the use of informal, flexible "anthropocene" term can be used to describe the epochal transformation in which the effects of human technological activity and their cultural systems have profoundly altered the environment.

Correspondingly, climate change involves a significant change in weather patterns around the world due to increased concentrations of greenhouse gases in the atmosphere mostly driven by human activities over the last 50 years.⁹ In this framework, anthropogenic climate change is both a physical and social phenomena. The direct and indirect impacts of global climate change entail serious consequences for global biophysical and social systems, including well-being, sustainability of communities, health challenges and social upheavals.^{10,11}

In addition, climate change impacts will bring fundamental changes to human behavior.¹² Consumerism culture and overpopulation are potential contributors to climate change with agriculture as a main contributor of methane and nitrous oxide to the atmosphere. Food production systems, including agriculture, face continued increases in demand and growing environmental pressures regarding food quality, quantity and, notably, food safety.¹³⁻¹⁵ The growth of population increases consumption, therefore it causes more emissions, which intensifies climate change.

There are different ways to address climate change from an anthropological viewpoint. For Nash *et al.*,¹⁰ climate change can be viewed in terms of human systems: the ways in which different groups perceive and understand climate change, its varying impact on people around the world and the diverse societal mechanism that drive adaptation and mitigation. Addressing the consequences of climate change requires an understanding of human-environment interaction on local and global scale from an anthropological framework. We make a brief overview of major theoretical developments in environmental anthropology, from mid-twentieth century when Julian Steward first introduced the idea of cultural ecology and underlined the possible contribution of Cultural Evolution theory (CE) in studying climate changes effects in a socio-ecological system.

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Humans-environment interaction and dynamics

As an interdisciplinary field, anthropology has always had established relationships with disciplines from various areas, such as biology, archeology, psychology, sociology and recently, communication and media studies. More specifically, ethnography is the branch of anthropology where research is conducted over extended periods of time in a single community or set of communities, gradually building relations of trust with research subjects, closely observing people's everyday activities, interactions and conversations, and conducting interviews.¹⁶ This approach is what anthropologists refer to as participant observation. Additionally, the researcher following the subjectivist view will take a different approach from that of the researcher following the objectivist view.¹⁷

While the environmental perspective goes back a long way in the history of anthropology alongside the etic/emic perspective, the theoretical developments in environmental anthropology of the mid-twentieth century are closely linked to cultural ecology idea adherents, which later transformed in ecological anthropology. The new discipline gained momentum as a consequence of the "ecology movements" of the 1960s and late 1970s, both in USA and Europe.¹⁸ Concerns regarding environmental problems constituting hazards to the lives of organisms were at the epicenter of ecological anthropology and civil society was an emerging and important protagonist with regard to environmental issues.^{19,20} Like any other organism, the interaction and dynamics between humans and their living environment has been central to their surviving; humans depend on material conditions or technology to fulfill their own needs. Most importantly, during human evolution, culture increasingly became the main way for humans to adapt and radically transform their living environment.²¹

The adaptive nature of culture was a concept first coined by Julian Steward, with cultural ecology as an extensions and refinement of the old evolutionist paradigm where culture, not persons, represents the unit of evolutionary selections.²² Following the idea of cultural ecology and weighting culture as primary unit of analysis, and adopting some biological concepts, a new theoretical stage was set for ethnographic work in the 1970s. This first stage is characterized by the work of Julian Steward and Leslie White, while a second stage takes the name neo-functionalism and neo-evolutionism.²³ During local months of field work among the Tsembaga, one of many local groups of Maring speakers living in New Guinea, Roy Rappaport²⁴ reasoned that religious rituals do not only symbolize, validate and intensify the relationship that integrate the social unit, but also serve to maintain an environment. In addition, Marvin Harris theory of cultural materialism prioritizes the material condition over ideological ones and is composed of infrastructure, structure, and superstructure. He described the infrastructure as the principal interface between culture and nature, the boundary across which the ecological, chemical and physical restraints to which human action is subject interact with the principal socio-cultural practices aimed at overcoming or modifying those restraints.²⁵

Developments in ecological anthropology since the late 1970s have included a focus on social diversity; anthropological approaches to the environment were focused less on how a local population or community will behave in relation to the physical environment and more on how different actors and interest groups within these communities interact with both their social and physical environment.²⁶ It was only 20 years ago that the concept of Socio-Ecological System (SES)²⁷ was turned into a framework for the study of intertwined human and natural sys-

tems²⁸ and socio ecological system concept has been widely used in both the environmental and social sciences.²⁹ SES lacks a unified or detailed definition, and is more a descriptive framework dealing with environmental knowledge systems and practice in a certain environment.

In 1980s a new concept emerged: niche construction.³⁰ Niche construction refers to the process whereby organisms actively modify their own and each other's evolutionary niches and is to be regarded as a fundamental evolutionary process.³¹ The niche construction perspective was brought to prominence through the writings of the Harvard biologist Richard Lewontin,³² who pointed out that organisms do not passively adapt to the conditions in their environment, but they actively construct and modify environmental conditions that may in turn influence other environmental sources of selection.³³ The niche construction perspective maintains that human activities direct human evolution. A clear example are agricultural practices or domestication of livestock, which first occurred during Neolithic Revolution.³⁴ In addition, CE theory suggests that the behavioral adaptations that explain the expansion of our species are — at least partially — cultural, in the sense that they are cumulative and transmitted by social learning.³⁵⁻³⁷ Importantly, CE theory offers an integrative approach to studying the dynamics of cultural change based on causal models of the mechanisms through which individual and population processes interact.³⁸

Although early climate and culture studies were mainly founded in archaeology and environmental anthropology, with the advent of climate change anthropology's roles have expanded to engage local to global contexts.³⁹ After decades of research on human-environmental interactions, beginning from a merely utilitarian perspective, passing on to the establishment of an emic and later in the light of the functionalist-adaptationist approach, environmental anthropology today deals mainly with people's responses to mitigate climate change and conservation practices, bridging the social and natural sciences.⁴⁰⁻⁴²

Conclusions

According to Brondizio and Moran,⁴³ three main themes help organize the broad array of theories and approaches in environmental anthropology: environmental determinism, cultural determinism, and human-environment interaction, that concerns the processual relationships between people and environment as grounded in historical, social, and ecological contexts. As in all scientific explorations, a clear definition of the terms, concepts and theories of this scientific endeavor is difficult. The term and concept of Anthropocene is under fervent debate, as the time of the onset of Anthropocene in human history as a formal official unit of geological time and the political and economical implications. Its definition and meaning is under scrutiny and probably will depend on the future development related to technology and human survival due to climate change. Climate changes as a result of human activities and their cultural systems has gained attention in academia and set the agenda for many environmental anthropologists. Anthropology could play a central role, by offering methods to access the social, cultural and political processes that shape climate debates. That is because the evolution of genetic mechanisms, ecological processes, and socio-cultural mechanisms all influence resource use, and social conditions often change more quickly than ecological conditions, making cultural evolution more rapid than genetic evolution.⁴⁴

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