

Population Studies and Environment: Through New Concepts

Estudios de Población e el Ambiente: A través de Nuevos Conceptos

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Abstract

It is noted that the planet has undergone profound transformations, especially when considering the population-space-environment variables. On the one hand, human action in the environment with patterns of production and consumption based on "cheap nature" drives processes of degradation and environmental changes that, in turn, cause consequences in all society. Faced with the context of environmental changes and the challenges related to them, it's necessary debating new theoretical structures to understand these situations. In this sense, areas such as Demography should broaden the discussion of concepts such as Anthropocene and Capitalocene, seeking, through them an interdisciplinary approach, in which the relationship between environment and society is deeply debated. In this way, this work aims to contribute to the discussion about the aforementioned terms and their role in the study on populations in the contemporary world, through a bibliographical review about the topic.

Keywords: Global Environmental Change; Human Dimensions; Anthropocene; Capitalocene.

Resumen

Se observa que el planeta ha experimentado profundas transformaciones, especialmente cuando se consideran las variables población-espacio-ambiente. Por un lado, la acción humana en el ambiente con patrones de producción y consumo basados en la "naturaleza barata" impulsa procesos de degradación y cambios ambientales que, a su vez, causan consecuencias en toda la sociedad. Ante el contexto de los cambios ambientales y los desafíos relacionados con ellos, es necesario construir nuevas estructuras teóricas para comprender estas situaciones. En este sentido, áreas como la demografía deberían ampliar la discusión de conceptos como el Antropoceno y el Capitaloceno, buscando, a través de ellos, un enfoque interdisciplinario, en el que la relación entre el medio ambiente y la sociedad se debata profundamente. De esta manera, este trabajo tiene como objetivo contribuir a la discusión

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sobre los términos antes mencionados y su papel en el estudio de las poblaciones en el mundo contemporáneo, a través de una revisión bibliográfica sobre el tema.

Palabras Clave: Cambio Ambiental Global; Dimensiones Humanas; Antropoceno, Capitaloceno.

Introduction

In the 2000s, UN member states defined the eight *Millennium Development Goals* (MDGs) aimed primarily at eradicating poverty, hunger, expanding access to education, reducing social and economic inequalities, setting goals and means development and ensure environmental sustainability.

It is perceived that there is a confluence of objectives, connecting the social, economic, political and environmental sphere to a better world. While some of these goals have been promising, the challenges remain and this shows the need for scaling up agendas. In this sense and visualizing the contemporary context, based on the MDGs, the UN launched in 2015 the *Sustainable Development Goals* (SDGs): eradication of poverty; zero hunger and sustainable agriculture; health and wellness; quality education; gender equality; water and sanitation; clean and affordable energy; decent work and economic growth; industry, innovation and infrastructure; reduction of inequalities; cities and communities; responsible consumption and production; action against global climate change; life in water; terrestrial life; peace, justice and effective institutions; partnerships and means of implementation (UN, 2018).

Through the SDGs mentioned above, it is noted that at least eight of them have a direct connection to environmental preservation, and when they are all seen in a general frame, it becomes clear that survival of Humankind is deeply connected with preservation of natural resources and of the whole planet through sustainable actions.

These objectives are part or answer to a scenario taken by sudden changes in different areas, especially in the environment as a basic element of society. To corroborate this information, it is possible to draw on information from the United Nations Environment Program's annual report for 2016. In this report, the researchers concluded that 2015 was one of the hottest years, directly affecting ecosystems and the planet's biodiversity, environmental factors are predominant in the sense of prolonging and boosting resource conflicts and people displacement.

In the same report, the researchers also pointed out that there is an international tendency to spend time and economic resources in response to crises, however, a mitigation and adaptation posture to environmental and climatic changes should be adopted to avoid them. Another important fact to be emphasized is that some of the environmental and climatic

changes are influenced or driven by human action, that is, mainly by the current production, consumption and disposal patterns.

In this way, realizing the need to connect society and environment, as well as environmental changes in their physical and social aspects, this work aims to promote a discussion about the concepts of Anthropocene and Capitalocene as categories of analysis to broaden the understanding about the transformations, how they have occurred, some of their reasons, their impacts and how they can be a new tool for theoretical analysis for population studies.

OBJECTIVES

General objective

To review the concepts of Capitalocene and Anthropocene at the light of the Population and Environment Studies.

Specific Objectives

To built up a parallel between the two concepts and to theorize their possible uses in Population and Environment Studies.

MATERIALS AND METHODS

This work aims to undertake a comparative study of the concepts of *Anthropocene* and *Capitalocene* and their relevance to the discussion about Population and Environment field, especially in the relation among population-space-environment. A theoretical approach to the theme and its nuances is intended.

For this debate, a bibliographical review of the terms was used, especially but not exclusively, of authors such as Anthropocene (Paul Crutzen, Paulo Artaxo, Amparo Vilches and Daniel Perez) and Capitalocene (Jason Moore, Donna Haraway and Justin McBrien).

RESULTS

Anthropocene

In mid-2002, chemist Paul Crutzen suggested that mankind would be living a new age, the Anthropocene. Steffen, McNeil and Crutzen (2007) report that in the pre-Anthropocene period, about 10-12 thousand years ago, humans lived in small groups as hunter-gatherers.

These characteristics were transformed with the use of fire allowing humans also to move forward in the manufacture of tools (not available for other species) that aided in hunting, domestication of animals, and in food production (agriculture), characterizing the Holocene era.

Still though, from the Industrial Revolution scenario at the end of the eighteenth century, human action gained geological and morphological transformation potency, confirmed by the increased levels carbon dioxide and methane concentration, causing the planet to migrate from the Holocene era to the Anthropocene (CRUTZEN, 2002, 2006). Crutzen suggests Planet Earth in the Anthropocene has left its natural geological cycle, mainly, by pervasive human activities. These phenomena represent a profound change in the relationship between humans and nature as a whole

In addition to the industrial advance, the author also talks about other characteristics seen at the Anthropocene such as the population increase, an advance of the process of urbanization and the greater use of energy resources. Steffen, McNeil and Crutzen report that in the Holocene era there was already a certain process of deforestation, use of fossil fuels such as coal and CO₂ emissions, however, it is a very small rate compared to the last three hundred years. On the latter, Crutzen argues that "in a few generations mankind is exhausting the fossil fuels that were generated over several hundred million years, resulting in large emissions of air pollutants" (CRUTZEN, 2006, p. 2).

Steffen, McNeil, and Crutzen write that preindustrial societies have transformed their environments in different ways, yet what differs them from industrial societies is that

Preindustrial societies could and did modify coastal and terrestrial ecosystems but they did not have the numbers, social and economic organisation, or technologies needed to equal or dominate the great forces of Nature in magnitude or rate. Their impacts remained largely local and transitory, well within the bounds of the natural variability of the environment (STEFFEN, CRUTZEN, MCNEIL, 2007, p. 615).

According to authors cited here, the Anthropocene has three main stages, the first one is from the mid-1800s to 1945, marked by the industrialization and use of fossil fuels such as coal, oil and gas. As a result of burning fossil fuels, fertilizer use in agriculture, intensive livestock breeding and deforestation, greenhouse gases have increased substantially in the atmosphere. These are some of the examples used to understand the action potential of human activities. For this reason, Crutzen argues that,

Considering these and many other major and still growing impacts of human activities on earth and atmosphere, and at all, including global, scales, it thus

is more than appropriate to emphasise the central role of mankind in geology and ecology by using the term “Anthropocene” for the current geological epoch (CRUTZEN, 2006, p. 16).

Another important point to consider is that for Crutzen there is no definite date for the beginning of the Anthropocene, much less a prediction of end for human action. For the author, the consideration that the process gains space during the late eighteenth century is related to the fact that it was in this context that the global impacts of human activities began to be noticed, as previously stated.

In relation to the second stage of the Anthropocene, Steffen, Crutzen and McNeil understand that the period between 1945 and 2015 represents the great acceleration of this era. They describe that during that period the population practically doubled, making possible that in demographic aspects the number of births surpassed the number of deaths in addition, there was also the economic development with the ample flow of capitals and commerce in general, the increase of consumption of oil, acceleration of the urbanization process and the advent of new technologies.

To complete, they describe the third stage of the Anthropocene and its transition to the business-as-usual phase that began in the mid-1960s, when issues such as high CO₂ emissions and global warming were recognized and debated as consequences driven by human activities. The business-as-usual phase, however, concerns the fact that economic institutions are still predominant in the world's decision-making processes and from an economic point of view, the environmental problem is not so huge since they are guided by the premise that market-oriented economic system and technologies could deal autonomously with environmental changes (STEFFEN, CRUTZEN, MCNEIL, 2007).

Finally, since human processes characteristic of the Anthropocene will still occur for thousands or even millions of years, Crutzen says that mankind's greatest task is to build a global strategy for the sustainable use of resources and that this will be done with an adequate use of knowledge and the use of technological opportunities, such as the use of alternative energies, for example.

Through the reading of Crutzen's texts, it is perceived that the author adopts a posture more connected to the context of the natural sciences, constantly alluding to chemical-physical elements of the environmental transformations. However, other authors, based on the studies of Crutzen and the idea of the Anthropocene, extend the theme, relating it with social aspects and structures.

Following this idea, Bruno Latour (2014) wrote a text in which he criticizes those who believe that science and politics should be separate areas because, for the author, they only have to lose with this closed dynamic. In this way, in the age of the Anthropocene, they must be treated and studied together. This is mainly because the problems have reached a very large scale, as well as the number of individuals affected, by this reason it is necessary building an integrated approach to the problem.

It is important to highlight that the Earth is surpassing the planetary boundaries, that is, as put by Artaxo (2014, p.17), would be "safe operating limits for humanity ". Thus, the planetary boundaries represent human survival itself.

The fact is that, as Artaxo puts it in graphs representing the "Great Acceleration", the socioeconomic system and the planetary system are so associated that the models of production and consumption of natural resources cause serious consequences in the planetary limits, in addition, overcoming these limits has a dramatic effect on society, such as coastal flooding (with at least 40% of the world's population living in that area), water scarcity and extreme climatic and environmental events, altering a whole structure in relation to agriculture and the means of population lives, for example.

Therefore, in order to mitigate environmental changes, it is necessary to connect areas and measures regarding living standards, the use of energy sources and governmental choices and policies, demonstrating the need for an international regime on changing the planet in an effective way.

Amparo Vilches and Daniel Gil Pérez (2008) in an article conceived within the framework of the Decade of Education for Sustainable Development of the UN (2005-2014), put in debate the idea that the Anthropocene demonstrates a planet at risk driven, mainly, by the human actions, however, it is also a context of opportunity to review human behavior in relation to the future.

According to the authors, the planet has always gone through "natural" and unnatural disasters throughout history, indeed, they note that in the anthropocene era, contemporary risks represent a "planetary emergency" (VILCHÉS, PEREZ, 2008, p. 4). This is due to the fact that the risk is no longer located in specific places, but rather in the planet as a whole, because it affects ecosystems, systems and societies.

The authors also demonstrate the interaction of systems, ie, environment, politics, economy and society through the explanation of problems. As already stated, one of the most

important features is of "borderless" consequences, as risks are no longer localized, everyone can be affected in some way, especially the most structurally vulnerable groups; depletion of natural and energy resources through unrestrained use and contamination, leverage problems such as access to food and drinking water; degradation of ecosystems which affects the livelihoods of all species, and finally, a very complex point is social imbalances driven by environmental changes, such as poverty, hunger and resource conflicts (VILCHÉS, PÉREZ, 2008) .

The authors' thesis presents the social aspect of the Anthropocene, on the other hand, they discuss the premise that the world bet on continuous growth, especially in the second half of the twentieth century. Although growth has brought advances to societies, it is necessary to consider the wide inequality of access and the imbalance caused in the environment (MELLO; SATHLER, 2015)³.

Thus, it is necessary to construct a debate in which the Anthropocene leaves aside its exact side, to disentangle its characteristics from the social environment, the Anthropocene being a transformation in the human patterns and behaviors, it does not only change the physical environment , but the politics, economy, culture and identities of society.

Finally, as previously stated, the first uses of the concept of anthropocene were mainly related to their physical characteristics. However, authors of so-called "social sciences" have tried to associate the term with their areas. Despite the difficulty of implementing it and the conflict with negationists of "environmental changes", the anthropocene has now been one of the means of promoting a broader debate, so it is imminent the need for experts to seek through it to adopt a multidisciplinary and dynamic approach to the challenges of the 21st century.

Capitalocene

Donna Haraway wrote a text in 2015 describing the rise of new terms to the understanding of contemporaneity. In her opinion the Anthropocene is in fact much more a frontier or limiting event than a specific era. In this sense, Jason Moore, professor of sociology at Binghamton University in the USA, a researcher of history and environmental geography created the concept of "Capitalocene".

³ Mello and Sathler note that the post-World War II is based on consumer society and rampant consumerism as if the planet's resources were infinite.

Jason Moore makes clear his criticism about the Anthropocene because it is, in his view, a narrow concept. For Moore, the authors associated with the idea of anthropocene emphasize the Industrial Revolution as the origin of modern flows, focusing mainly on the environmental consequences generated by such process and hiding the deep relations of capital and power. For this reason, Moore presents the capitalocene, or era of capital, as a counterposition to the use of anthropocene (MOORE, 2014)

One of the essential characteristics to understand the perception of capitalocene is to place it as a dynamic and multidisciplinary concept, in which capitalism-in-nature and nature-in-capitalism are part of each other, making capitalism being understood as a world-ecology, in which capital accumulation, power-seeking and co-production of nature are seen in unity and in many areas, not only physical-ecological but also historical, geographical, and philosophical.

To explain his theory, he constructs the first part of his texts with the demystification of the Anthropocene, that is, he says that despite varying interpretations, the dominant version says that the modern world has its origins in nineteenth-century England with the Industrial Revolution, mainly due to the use of coal and steam. For Moore, through this vision, he forgets to discuss the motor forces behind this process, the relation among capital, culture and society, limiting the idea only to the *Anthropos*, that is, humanity as unity without differences between them.⁴

In this way, believing that the anthropocene focuses on the consequences, Jason Moore suggests an interpretation that begins in the origins and conditions of the rapid and fundamental transformations in the biosphere of the planet, that is, the decisive changes that occurred in the relations of power and production and, for that, he centralizes his debate on historical and political issues.

Moore emphasizes that capitalist civilization incorporates in its personality the relations of value. For him, each society prioritizes different value relations regarding wealth, power and production. For this reason, he mentions that during the medieval period the production of land was privileged while the capitalist system favored the production of labor after 1450 (MOORE, 2014, p.6).

⁴ Moore thus describes "the Anthropocene makes for an easy story. Easy, because it does not challenge the naturalized inequalities, alienation, and violence inscribed in modernity's strategic relations of power and production "(MOORE, 2014, p.2).

To understand these questions, he describes that the relation of capitalism to and within nature is of exploitation (produces abstract social work) and appropriation (produces abstract social nature). It is a fact that human work, besides becoming a commodity of this system, is the central point in the reproduction of wealth, indeed, it is important to understand that the system is not defined by this but by the world market and the necessary conditions for its reproduction, such as the appropriation of the "four cheap natures".

Cheap nature would be an unpaid work of extra-human nature⁵, separated into four main categories: workforce, food, energy and raw material. Moore says capitalism has the strategy of "cheap nature" as central, as well as cyclical movements for nature to become even cheaper (MOORE, 2014). The idea implied here is that capitalism is a system of organization of nature, in which all human activity is simultaneously the producer and product of the web of life.

Thus, in historical aspects, Jason Moore understands that the rise of capitalism as a system happened after the Black Death (around 1450). It is noted that from this period characterized with the maritime expeditions, the speed and scale of deforestation was five to ten times greater than the medieval era. As already mentioned, what has changed is the way of exploiting labor and the global appropriation of the so-called unpaid work, as well as the introduction of new techniques and technologies of appropriation. To complete his idea, Moore says that the above-mentioned transformations are part of a time of transition, not only of change in techniques, but also of mentality, that is, "proliferation of knowledges and symbolic regimes that constructed nature as external, space as flat and geometrical, and time as linear "(MOORE, 2014, p.22).

Summing up, it is clear that capitalism is not only a process of accumulation, because it brings with it a whole spectrum of transformation based on cheap nature, that is, in the use of natural resources as if they were unlimited and at a low cost (MOORE, 2014, 2016). Following the idea of cheap nature, in the era of the Capitalocene there is not only a threat of biological extinction, but it is a process of cultural extinction, since one of the basic premises of capitalism would be to advance through exclusion and inequality. He points out that one of the greatest secrets of capitalism is its unique nature, "capitalism was built upon excluding humans from Humanity" (MOORE, 2016, 79).

⁵ Historical aspects of physical, biological, and geographic activities.

On the transformations in the environment, Moore says that the Capitalocene accelerated the changes as never seen before and it happened with a variety of technologies, which allowed a wide process and access to the appropriation of cheap nature.

To conclude, he points out that the capitalist system is in a phase of exhaustion, leading the planet to increasingly intense environmental changes and the most devastating economic crises, stating that the planet is not going through an Anthropocene march, but is coming to Capitalocene ending, since the cheap nature strategy is depleting on an ever larger and faster scale.

In addition to Moore's ideas, authors like Justin McBrien broaden the understanding of the concept and its characteristics.

Justin McBrien describes Necrocene or New Death as an adjective for the time of the Capitalocene, stating that the accumulation of capital implies the accumulation of extinction potential, and this potential has been boosted especially in the last decades. Thus, he describes that,

This becoming extinction is not simply the biological process of species extinction. It is also the extinguishing of cultures and languages, either through force or assimilation; it is the extermination of peoples, either through labor or deliberate murder; it is the extinction of the earth in the depletion fossil fuels, rare earth minerals, even the chemical element helium; it is ocean acidification and eutrophication, deforestation and desertification, melting ice sheets and rising sea levels; the great Pacific garbage patch and nuclear waste entombment; McDonalds and Monsanto (MCBRIEN, 2016, p.116-117).

Conclusions

As described before, it is unquestionable planet has undergone profound transformations, as well as the consequences of such changes as forced displacement and the pushing of existing problems such as poverty, hunger and access to survival items like drinking water and food.

Reality shows up severe processes of desertification, oceans acidification, rising temperatures and changes in rainfall patterns, influencing the incidence of severe weather disasters, soil degradation, pollution and epidemics, scarcity of resources. Given this conjuncture, it is essential to construct theoretical approaches examining the problem, its origins and consider possible solutions for the future.

With the objective of incorporating the theoretical debate, this work brings the concepts of Anthropocene and Capitalocene. Through discussion, it is noted that the terms bring similarities and oppositions.

Anthropocene suggests that the planet passed through a new Geological Age and that the driving force of transformation was the Anthropos (human action). It is noticeable that the term carries characteristics related to its more physicochemical aspect and its tendency to periodization of consequences.

On the opposite side, the Capitalocene launches a critical perspective to the Anthropocene. The term was created by Jason Moore who is a sociologist, so its connotation is more focused on the social personality of environmental transformations as they would be driven by economic and political choices based on the cheap nature. In addition, Moore's proposal is to understand the origins of environmental change, considering that the capitalist era as we know may be coming to an end and planet needs to be prepared for the future.

Each perspective brings a point of view more towards an area of knowledge, however, both demonstrate the necessity of connection among disciplines, in the search to promote an interdisciplinary, dynamic and integrating construction understanding the relationship between natural and human systems in order to produce alternative solutions for the transformations of the planet, both now and in the future.

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