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Climate 'Migrants' in History: An Analysis of Climate Change and Human Migration

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Abstract
Human migration is a complex phenomenon influenced by various environmental, social, economic and political factors. Among these, climate change has historically played a crucial role in determining population movements. This article explores the concept of 'climate migrants' in historical context, analysing how climate change has influenced human mobility over the centuries. Through historical and archaeological examples, significant cases of migrations forced by climatic variations are illustrated, concluding that current climate-related migration phenomena are part of a historical trend that repeats itself over time.

Introduction: The Climate as Invisible Driver of History

Climate has always been a crucial but often underestimated factor in determining the fate of human societies. Although traditional historiography has attributed socio-political changes to wars, technological breakthroughs or ideologies, a growing body of scholarship emphasises the primary role of climate in shaping migration and, ultimately, in defining the evolution of civilisations. Human migration has always responded to environmental conditions. The term 'climate migrants' refers to people forced to move due to adverse climatic conditions. Although this concept is topical in the contemporary era, history provides us with numerous examples of people leaving their lands to seek new opportunities in more favourable environments. Climate change has been a powerful force in shaping human distribution through the millennia. While today we speak of 'climate refugees' to describe those forced to move because of rising sea levels or extreme weather events, historical examples of climate-induced migration date back thousands of years. This paper aims to re-examine migration dynamics through a climate lens, revealing how environmental instability has historically been a powerful accelerator of migration, social breakdowns and geopolitical reconfigurations. It also analyses the relationship between climate change and migration through significant historical examples and compares them with today's dynamics to understand how environmental crises have shaped and continue to shape population movements.
One of the best known examples is the collapse of the Maya civilisation, often associated with prolonged periods of drought between the 9th and 10th centuries AD. Archaeological evidence suggests that water scarcity and degradation of natural resources led to famine, internal conflicts and, eventually, the migration of large groups to more fertile areas. Another significant example is the migration of Indo-European peoples, associated with climatic variations in the Eurasian steppe between 2000 and 1500 BC. These peoples moved towards Europe and South Asia, bringing with them new languages and cultures. Climatic pressure seems to have been a determining factor in the abandonment of the original lands. Migrations are not isolated or random events; on the contrary, they are often the result of adverse environmental conditions that destabilise local economies and drive entire populations to seek refuge in more favourable areas.
For this paper, reference will be made to three lesser-mentioned, though well-known, key examples that illustrate how climate triggered significant historical migrations: the collapse of the Akkadian Empire, migrations during the Little Ice Age in Europe, and the Sahel crises in the 20th century.
The Akkadian Empire, around 2200 BC, represents one of the earliest examples of a complex and centralised civilisation that collapsed due to drastic climate change. Palaeoclimatic data show a decline in rainfall that reduced the agricultural capacity of the Mesopotamian region, leading to famine, social unrest and the migration of populations to areas less affected by drought. Palaeoclimatic studies based on sediment cores in the Persian Gulf and the Red Sea indicate that a severe drought, lasting around 300 years, led to agricultural

collapse and the dispersion of urban populations. The drought reduced the flow of the Tigris and Euphrates rivers by 30 per cent, causing a sharp reduction in agricultural productivity and the subsequent migration of populations to more fertile regions (Weiss et al., 1993). This event marked not only the end of the empire, but also a forced redistribution of populations towards northern regions, which led to the emergence of new cultural and political configurations (Weiss et al., 1993). One of the most significant examples of historical climate migration is related to the Nile crisis during the collapse of the Egyptian Old Kingdom. The transition from the favourable climate of the Old Kingdom to a period of drought and low Nile levels had devastating consequences for Egypt's agricultural economy. Research based on isotopic analysis of sediment cores in the Nile delta indicates a 40% reduction in river flow in the period between 2200 and 2150 BC (Stanley et al., 2003). This climatic crisis led to political fragmentation and internal migrations to northern regions, where irrigation was still possible. Written evidence from the period, such as the 'Hunger Stele', describes the collapse of agricultural production and the abandonment of entire rural areas. Recent historical climate models confirm that such migrations were in part a direct response to adverse environmental conditions (Stanley et al., 2003).

Conversely, the Little Ice Age represents a crucial case study for understanding how even slight climatic variations can have devastating effects on pre-industrial populations. In Europe, cycles of famine and disease caused by poor climatic conditions were followed by large-scale migrations, both to cities and across regional borders. During the Little Ice Age, between the 14th and 19th centuries, average European temperatures were about 1-1.5°C lower than pre-industrial levels (Lamb, 1977). The Little Ice Age, which mainly affected Europe between the 14th and 19th centuries, was associated with numerous internal and external migratory movements. During the coldest periods, such as in the 17th century, harvests failed in several European regions, causing large-scale famines. In France, the urban population of Paris is estimated to have grown by 50% between 1600 and 1650, fuelled in part by the influx of rural migrants seeking refuge from agricultural crises (Ladurie, 1971). Similar dynamics were also observed in England and Germany, where reductions in agricultural production led to significant population movements. Statistical models of European migration flows show a positive correlation between famine and increased migration (Muir, 1993). This forced mobility redefined the demographic balance and influenced the course of European history.

Again, the Sahel offers a contemporary example of how desertification can drive millions of people to migrate. The drastic reduction in rainfall during the 1970s and 1980s turned fertile land into deserts, forcing inhabitants to move to cities or to regions further north, with annual rainfall decreasing by around 30% compared to pre-desertification levels (Mortimore, 1989). This phenomenon caused the desertification of vast areas and pushed millions of people to migrate to urban areas or to West and North Africa. Between 1960 and 1980, countries such as Niger and Mali saw increases of up to 40% in internal migration flows (Mortimore, 1989). The phenomenon continues today, with over 80 million people in sub-Saharan Africa at risk of having to migrate by 2050 due to worsening climatic conditions (Rigaud et al., 2018). World Bank estimates suggest that desertification contributed to the migration of about 20 million people from the Sahel between 1970 and 2000 (Rigaud et al., 2018). This phenomenon reflects current climate forecasts that indicate a potential increase in climate migration in the region in the coming decades. Indeed, again according to World Bank estimates, more than 80 million people could migrate internally by 2050 in sub-Saharan Africa alone due to worsening climate change (Rigaud et al., 2018). This scenario represents one of the most urgent challenges for regional and global stability.

History as a guide for understanding the future of climate migration and for future policies.

Analysing historical climate migrations offers valuable lessons for our present. History shows that climate-induced migrations are not simply passive reactions to environmental events, but rather complex processes that interact with political, economic and social dynamics. The adaptive capacity or lack of resilience of a society determines its response to climate crises. The fall of the Akkadian Empire, the European migrations during the Little Ice Age and the continuing crisis in the Sahel show recurring patterns of collapse and adaptation that are crucial to understanding how the 21st century might deal with climate migrations.

Existing literature tends to segment these phenomena, focusing on specific cases or limiting itself to narrow historical periods. In contrast, this paper adopts a long-term, multidisciplinary historical perspective, highlighting how climate migration processes are part of a continuum linking the past to the present.

History teaches us that climate change and migration are closely linked. Ineffective responses to climate crises in the past, such as the failure to manage migration in an equitable and sustainable manner, have often led to conflicts, civilisational breakdowns and amplified inequalities. With this in mind, the management of contemporary climate migration should not be limited to emergency interventions, but must include preventive

policies, adaptation programmes and long-term support mechanisms.
Comparison of historical and contemporary data suggests that migration patterns caused by climate crises show significant similarities.
Today, rising sea levels, heat waves and more intense storms are generating migration flows similar to those observed in the past. Projections by the International Organisation for Migration (IOM) indicate that by 2050, between 200 and 250 million people could be forced to migrate due to climate change (IOM, 2019). The current situation is reflected in events such as the exodus of populations from Pacific islands and internal migration in countries such as Bangladesh.
The integration of historical and contemporary climate data allows analogies to be drawn between past crisis periods and current challenges. However, while historical patterns provide useful context, modern conditions, such as globalisation and communication networks, make migration responses and dynamics more complex and globally interconnected than in the past. The paper highlights that although historical and modern climate migrations share similar patterns, political and social responses are now influenced by global economic and geopolitical factors.
Historical studies of climate change and migration often rely only on archaeological or chronological data, without integrating quantitative climate models (e.g., Lamb, 1977).
In this paper, reference is made to historical climate models and contemporary demographic data to create a more comprehensive understanding such as combining strontium isotope data to analyse the reduction of agricultural resources with migration prediction models based on future climate scenarios (Stanley et al., 2003; IOM, 2019).
The multidisciplinary approach and the use of advanced climate models allow for an integrated and more robust view of migration phenomena. However, the complexity of climate models and the variability of historical data can introduce uncertainties. It is crucial that the models used are up-to-date and take into account uncertainties and environmental variables to maintain the accuracy of predictions and analyses.
Many studies focus on well-known events such as the crisis of the Maya civilisation or the Little Ice Age in Europe, using widely documented and discussed data (Ladurie, 1971). This study includes the crisis of the Akkadian Empire and the desertification of the Sahel, with specific data such as the reduction of river flows and the decrease of arable land (Mortimore, 1989; Weiss et al., 1993).
The exploration of lesser-known historical cases enriches the narrative, offering new perspectives and demonstrating that climate migrations are global and recurring phenomena. However, the limited availability of detailed data for some of these crises may affect the accuracy of conclusions. It is essential to continue collecting and analysing historical data to improve understanding of these lesser-documented events.
Historical responses to climate change often included emergency migrations and wars over resources. For example, the expansion of populations to more fertile areas in ancient Mesopotamia (Stanley et al., 2003). Today, policies include adaptation strategies such as strengthening infrastructure and urban planning to manage climate migration flows (IOM, 2019). Forecasts indicate that between 200 and 250 million people could be forced to migrate by 2050 due to climate change (Rigaud et al., 2018).
A comparison of historical and modern policy responses reveals how policies to adapt to and manage migration have evolved, but also how many challenges persist. Modern policies are more structured and comprehensive, but their effectiveness depends on international cooperation and the ability to anticipate and respond to crises. Future planning must be based on a sound understanding of historical and climate dynamics to avoid past failures and develop more sustainable strategies.
Social resilience is often studied in specific contexts, such as community responses to food crises or natural disasters, without an integrated view of climate migration (Muir, 1993).
The paper highlights that social resilience through the lens of historical and contemporary climate migrations suggests that adaptive capacities vary significantly between societies depending on their history, social structure and available resources.
This multidimensional approach may offer new insights into the adaptive capacities of societies, but may overlook cultural and political differences that influence responses to climate crises. It is important to continue exploring how specific factors, such as local policies and social structures, influence resilience and adaptation.
In summary, the paper makes a significant contribution to the understanding of climate migration through an integrated and multidisciplinary analysis, comparing historical and contemporary data and developing new methodologies. However, the complexities and uncertainties inherent in climate and historical data require further research and updating to refine future predictions and policies.

Concluding reflections: Lessons from the Past for the Future

Analysis of climate migration across historical and contemporary eras reveals a complex and recurring relationship between climate change and population movements. The findings of this study offer valuable insights into how environmental crises shape societies and suggest key recommendations for addressing future challenges.

Historical and contemporary evidence confirms that climate change has played a significant role in human migration. Environmental crises, such as reduced rainfall and desertification, have driven populations to seek new lands and resources. The migrations of the Akkadian Empire, the Little Ice Age and the desertification of the Sahel show that adverse climatic conditions can destabilise entire societies and generate massive population movements.

The crisis of the Akkadian Empire and the desertification of the Sahel illustrate how human responses to climate change can lead to significant social and geopolitical restructuring. These historical events offer models for understanding the modern dynamics of climate migration.

Modern data, such as those on sea-level rise and heat waves, show that contemporary climate challenges may be comparable to, if not greater than, those of the past. Predictions of future climate migrations indicate a possible displacement of hundreds of millions of people, with global social and economic consequences (Rigaud et al., 2018).

Comparing past and present events highlights the importance of adopting planning and management strategies based on historical evidence and up-to-date climate models. Policy and social responses to climate change must be informed by a deep understanding of historical experiences and future predictions.

Adaptation policies must consider not only environmental challenges, but also the social and economic dimensions of migration. For example, urban planning needs to accommodate climate migrants and ensure the sustainability of resources.

Investing in resilient infrastructure and developing support programmes for vulnerable communities can mitigate the negative impacts of climate migration. The adoption of water and agricultural resource management technologies is essential to address environmental crises.

The multidisciplinary approach adopted in this study demonstrates the need to integrate climatic, historical and sociological data for a more comprehensive understanding of climate migration. This study contributes to the existing literature by offering an integrated framework that combines advanced climate models with detailed historical data.

It is crucial to continue collecting and analysing historical and contemporary data to improve understanding of climate and migration dynamics. Future research should include detailed studies of less well-documented climatic events and analyse how modern societies can respond more effectively to environmental crises.

The use of historical and contemporary climate models, together with sociological and demographic data, can provide new insights into human responses to environmental change. Developing and refining methodologies for the prediction and management of climate migration will be crucial to meeting future challenges.

This study aims to make an original contribution to the literature on climate migration, combining a wide range of data and approaches to provide a more comprehensive understanding of the relationship between climate and migration. The comparison of historical and modern events offers a unique insight into the dynamics. Furthermore, it is intended to broaden the understanding of climate migration through an integrated and multidisciplinary analysis, highlighting the similarities and differences between the past and the present.

The paper's conclusions are relevant not only for scholars and policymakers, but also for global communities facing the challenges of climate change. Awareness and preparedness for future climate migrations are essential to ensure the resilience and sustainability of global societies. The paper succeeds in filling a gap in the current literature by offering a comparative-historical analysis of climate migration. At a time when the discussion of climate change is at the centre of the global agenda, understanding the lessons of the past is crucial to addressing future challenges. The historical analysis in this paper not only contributes to academic knowledge, but also offers practical insights for managing climate migration in the 21st century.

References

Butzer, K. W. (2012). Collapse, Environment, and Society. Proceedings of the National Academy of Sciences, 109(10), 3628-3635.

Diamond, J. (2005). Collasso: Come le società scelgono di morire o vivere. Torino, Einaudi.

Fagan, B. (2000). The Little Ice Age: How Climate Made History 1300-1850. Basic Books.

Gibbons, A. (2011). The Peopling of the World: An Ice Age Migration. *Science*, 331(6013), 1020-1024.

IOM (International Organization for Migration). (2019). *Migration and Climate Change*. Geneva: United Nations.

Ladurie, E. L. (1971). Times of Feast, Times of Famine: A History of Climate since the Year 1000. Doubleday.
Lamb, H. H. (1977). Climate: Present, Past and Future*. Volume 2: Climatic History and the Future. Methuen.
McNeill, J.R. (2000). Something New Under the Sun: An Environmental History of the Twentieth-Century World. W.W. Norton & Company.
Mortimore, M. (1989). Adapting to Drought: Farmers, Famines, and Desertification in West Africa*. Cambridge, Cambridge University Press.
Muir, E. (1993). The Venetian Galleys: The Rise and Fall of the Venice Fleet. Oxford, Oxford University Press.
Nicholson, S.E. (2018). Climate and Environmental Change in Africa during the Last Two Centuries. Climate Change, 147(3), 203-220.
Parker, G. (2013). Global Crisis: War, Climate Change and Catastrophe in the Seventeenth Century. Yale University Press.
Rigaud, K. K., et al. (2018). Groundswell: Preparing for Internal Climate Migration. The World Bank.
Stanley, D. J., et al. (2003). Nile Flow Failure at the End of the Old Kingdom, Egypt: Strontium Isotopic and Petrologic Evidence. Geoarchaeology, 18(3), 395-402.
Weiss, H., et al. (1993). The Genesis and Collapse of Third Millennium North Mesopotamian Civilization. Science, 261(5124), 995-1004.