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Rethinking the Agrarian Transition through the lens of long-term history of subsistence strategies and use of energy and resources in Cantabrian Spain

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Human-triggered climate change is widely acknowledged as a salient challenge to societal sustainability and welfare. Yet, our understanding of how human social systems may react to future change scenarios remains largely incomplete. However, human societies are the result of a long history of changes and adaptations to changing climates and environments. Understanding how individuals and their cultures have reacted and adapted to environmental changes over history and what effects these changes have had on landscapes could help us to more effectively design transition strategies towards low carbon societies. Hunter-gatherer societies in Cantabrian Spain between the Last Glacial Maximum (ca. 20,000 BP) and the Agricultural Revolution during the Mid Holocene (ca. 6,000 BP) evolved within a context of strong climate and environmental changes, as well as through societal changes via the adoption of a sedentary economy. Energy Regimes is a time-independent and functional theoretical and analytical tool of past societies, useful to identify and document past transitions. Statistical tests and analyses were used on archaeological data to document proxies such as demography, mobility, societal complexity, economy and overexploitation. The results were interpreted in the framework of Energy Regimes to better understand the changes and adaptation of human societies leading to the Agricultural Revolution and beyond in the context of changing environment and climate. Finally, quantification of energy use was extrapolated from the data and compared to the framework of social-metabolism, a quantitative approach similar to Energy Regimes. This work is part of the TERRANOVA programme. TERRANOVA is a Marie Skłodowska-Curie Innovative Training Networks (H2020-MSCA-ITN) project between Humanities and Science, which aims to map past environments and energy regimes, and to rethink human-environment interaction and designing land management tools for policy.