

# Farmers slowed down by hunter-gatherers: Our ancestors' fight for space

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(PhysOrg.com) -- Agricultural – or Neolithic – economics replaced the Mesolithic social model of hunter-gathering in the Near East about 10,000 years ago. One of the most important socioeconomic changes in human history, this socioeconomic shift, known as the Neolithic transition, spread gradually across Europe until it slowed down when more northern latitudes were reached.

Research published today, Friday, 3 December 2010, in *New Journal of Physics*, details a physical model, which can potentially explain how the spreading of Neolithic farmers was slowed down by the [population](#) density of hunter-gatherers.

The researchers from Girona, in Catalonia, Spain, use a reaction-diffusion model, which explains the relation between population growth

and available space, taking into account the directional space dependency of the established Mesolithic population density.

The findings confirm archeological data, which shows that the slowdown in the spreading of farming communities was not, as often assumed, the result of crops needing to adapt to chillier climates, but indeed a consequence of the struggle for space with prevalent hunter-gatherer communities.

In the future, the researchers' model could be used for further physical modeling of socioeconomic transitions in the history of humanity. As the researchers write, "The model presented in this work could be applied to many examples of invasion fronts in which the indigenous population and the invasive one compete for space in a single biological niche, both in natural habitats and in microbiological assays."

**More information:** The researchers' paper can be downloaded for free here: [iopscience.iop.org/1367-2630/12/12/123002/fulltext](https://iopscience.iop.org/1367-2630/12/12/123002/fulltext)

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