



Εθνικό Μετσόβιο Πολυτεχνείο
Σχολή Πολιτικών Μηχανικών

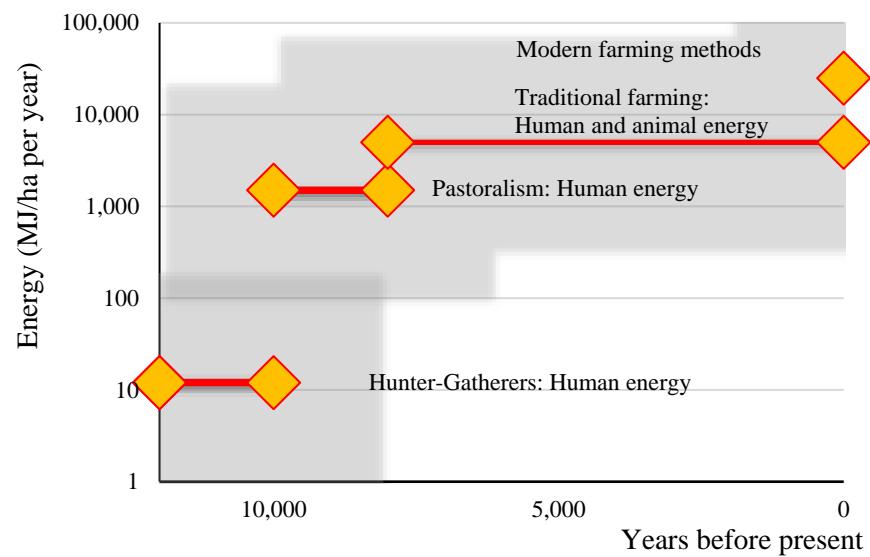
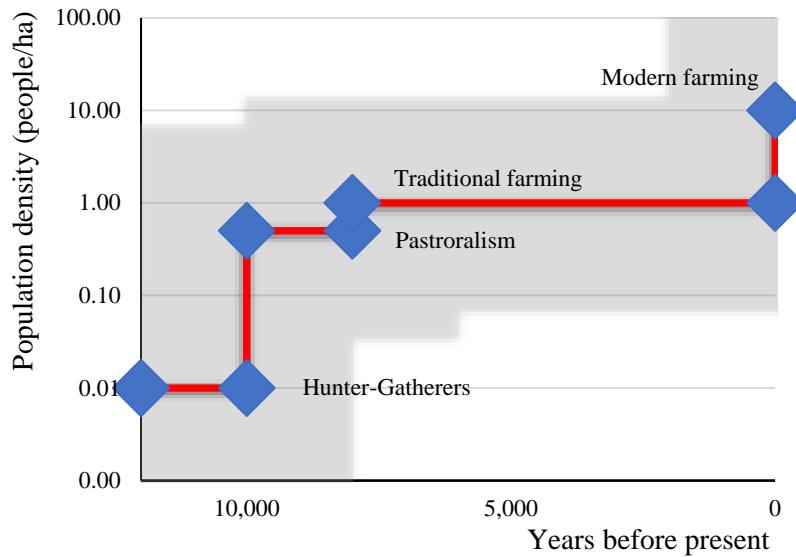
Ο ρόλος των τροφίμων στην κοινωνική ευημερία

Νίκος Μαμάσης και Γ.-Φοίβος Σαργέντης

Μάιος 2023

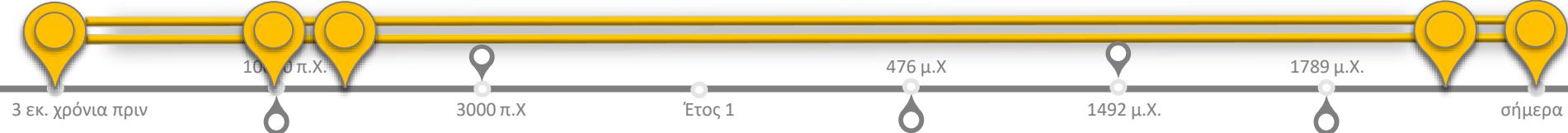
Τρόφιμα, ενέργεια και πύκνωση των ανθρώπων

Πηγή: Sargentis, G.-F.; Iliopoulou, T.; Dimitriadis, P.; Mamassis, N.; Koutsoyannis, D. Stratification: An Entropic View of Society's Structure. World 2021, 2, 153-174. <https://doi.org/10.3390/world2020011>



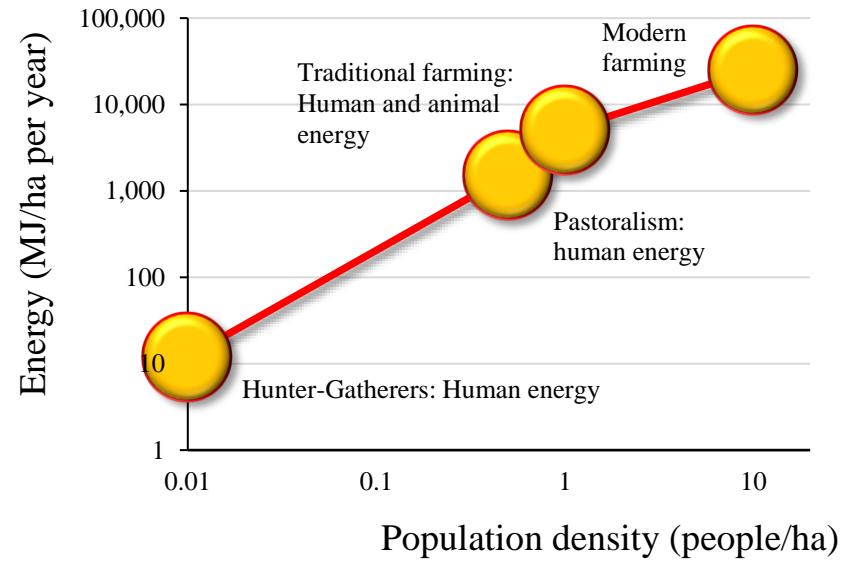
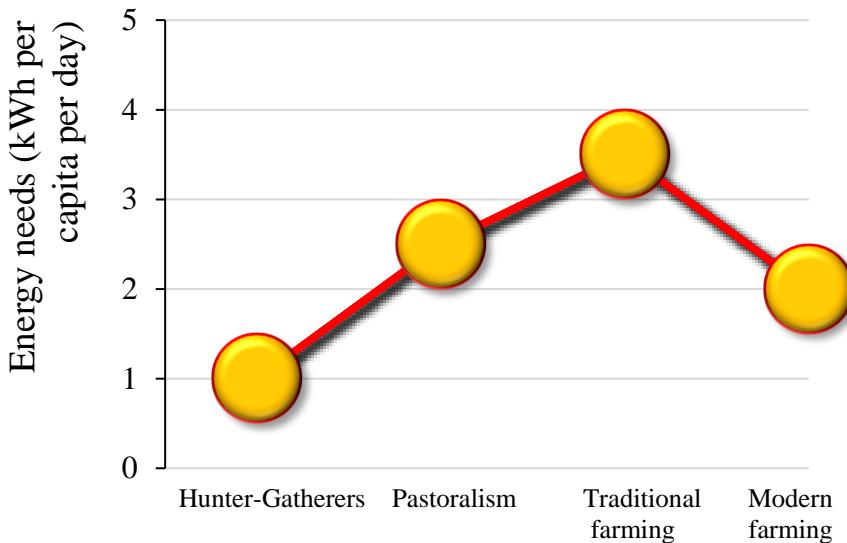
Τύποι γεωργικής καλλιέργειας, πυκνότητα πληθυσμού και ενεργειακές ανάγκες

Χρήση γης – Ενέργεια – Πυκνότητα πληθυσμού



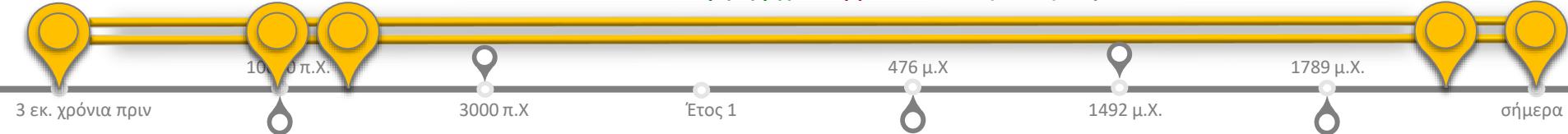
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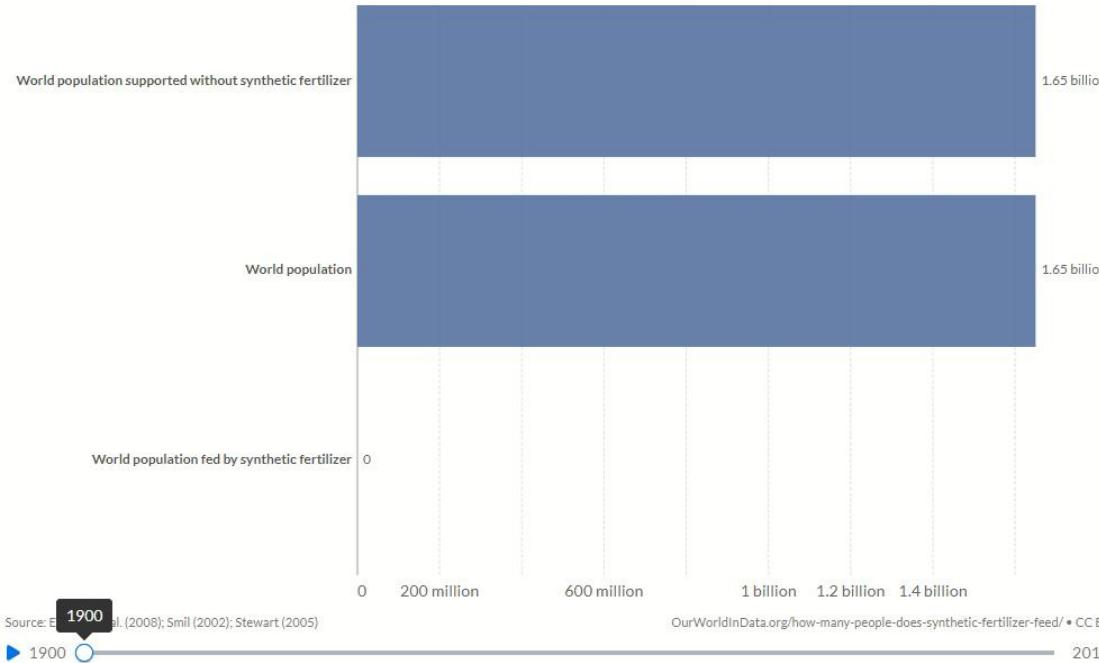
Τρόφιμα και λιπάσματα

Πηγή: <https://ourworldindata.org/grapher/world-population-with-and-without-fertilizer>

World population with and without synthetic nitrogen fertilizers, 1900

Estimates of the global population reliant on synthetic nitrogenous fertilizers, produced via the Haber-Bosch process for food production. Best estimates project that just over half of the global population could be sustained without reactive nitrogen fertilizer derived from the Haber-Bosch process.

Our World
in Data

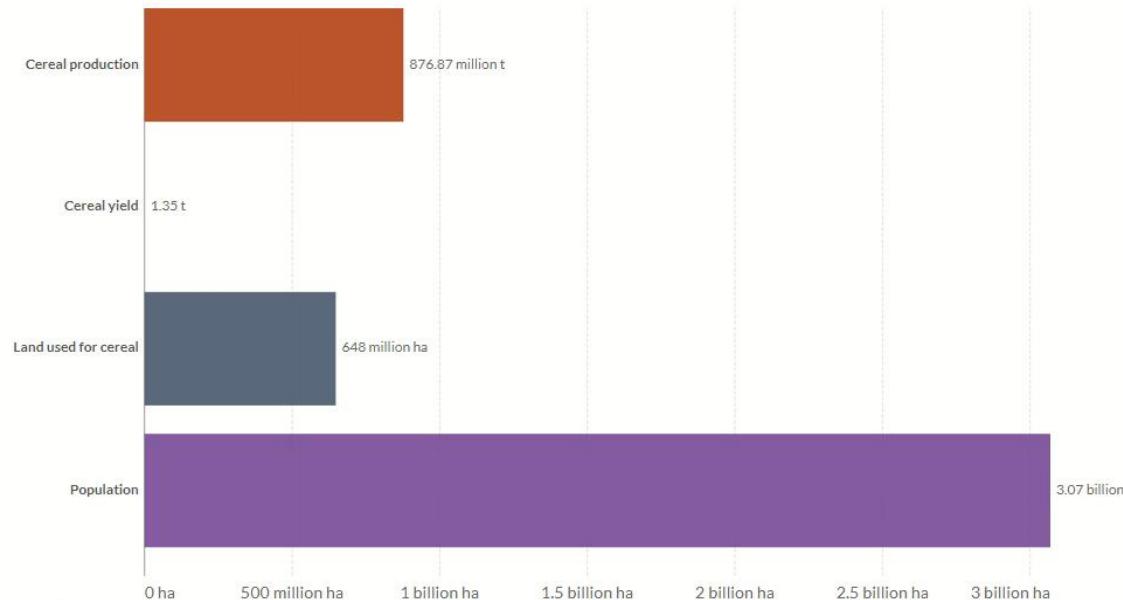


Τρόφιμα και χρήσεις γης_1

Change in cereal production, yield and land use, World, 1961

All figures are indexed to the start year of the timeline. This means the first year of the time-series is given the value zero.

Change country



Source: OurWorldInData based on World Bank; Food and Agriculture Organization of the United Nations

► 1961



Πηγές:

1. Food and Agriculture Organization of the United Nations
2. <https://ourworldindata.org/yields-vs-land-use-how-has-the-world-produced-enough-food-for-a-growing-population>

1961



3 εκ. χρόνια πριν

10000 π.Χ.

3000 π.Χ.

Έτος 1

476 μ.Χ

1492 μ.Χ.

1789 μ.Χ.

σήμερα

OurWorldInData.org/crop-yields • CC BY

2021

Τρόφιμα και χρήσεις γης_2

Has the world passed peak agricultural land?

Agricultural land is the sum of cropland and pasture used for grazing livestock.



Πηγή:
<https://ourworldindata.org/grapher/global-peak-agricultural-land>

This is shown for three sources, which use different methods of estimation. While they disagree on how much land is used for agriculture, and the exact date that it peaked, they do all agree that we have passed the peak.

All together ▾



Source: Taylor and Rising (2021); Food and Agriculture Organization of the United Nations; Goldewijk et al. (2017); OurWorldInData

► 10,000 BCE 10,000 BCF 2020



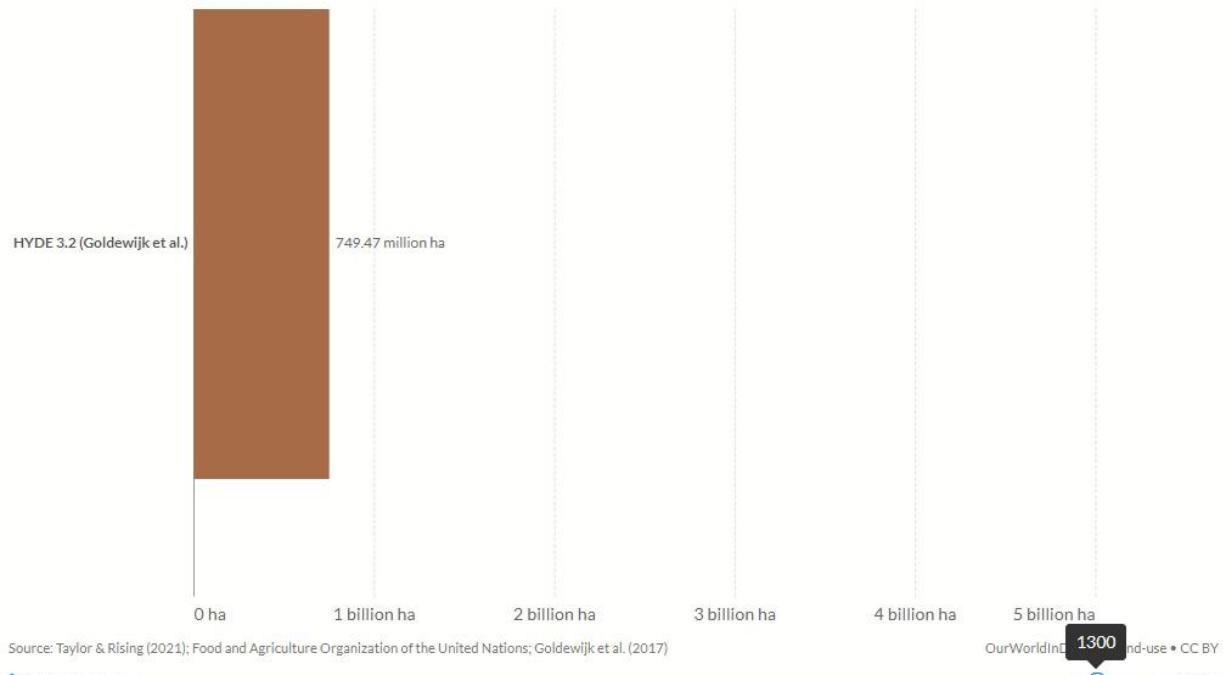
Τρόφιμα και χρήσεις γης_2

Has the world passed peak agricultural land?, 1300
Agricultural land is the sum of cropland and pasture used for grazing livestock.

This is shown for three sources, which use different methods of estimation. While they disagree on how much land is used for agriculture, and the exact date that it peaked, they do all agree that we have passed the peak.

Our World
in Data

Πηγή:
<https://ourworldindata.org/grapher/global-peak-agricultural-land>



Τρόφιμα και χρήσεις γης_3

Agricultural land use per person

This dataset is showing estimates of the total agricultural land area – which is the combination of cropland and grazing land – per person. It is measured in hectares per person.

Our World
in Data

Πηγή:
<https://ourworldindata.org/grapher/total-agricultural-land-use-per-person>

+ Add region



Source: Histo

▶ 10,000 BCE

📍 3 εκ. χρόνια πριν

1000 π.Χ.

3000 π.Χ.

Έτος 1

476 μ.Χ.

1492 μ.Χ.

1789 μ.Χ.

σήμερα

2016

C BY

Η εξέλιξη του πληθυσμού

Population, 10,000 BCE

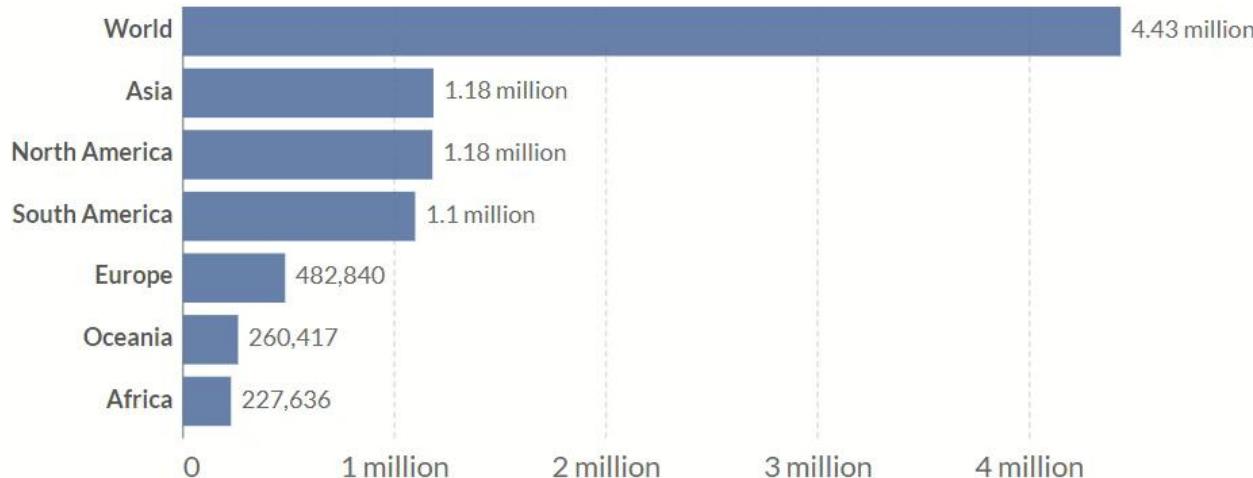
Our World
in Data

LINEAR

LOG

+ Add country

Πηγή: <https://ourworldindata.org/grapher/population>



Source: HYDE (2022); UN (2022)

OurWorldInData.org/world-population-growth • CC BY

▶ 10,000 BCE

2021

10000 π.Χ.

3000 π.Χ.

Έτος 1

476 μ.Χ.

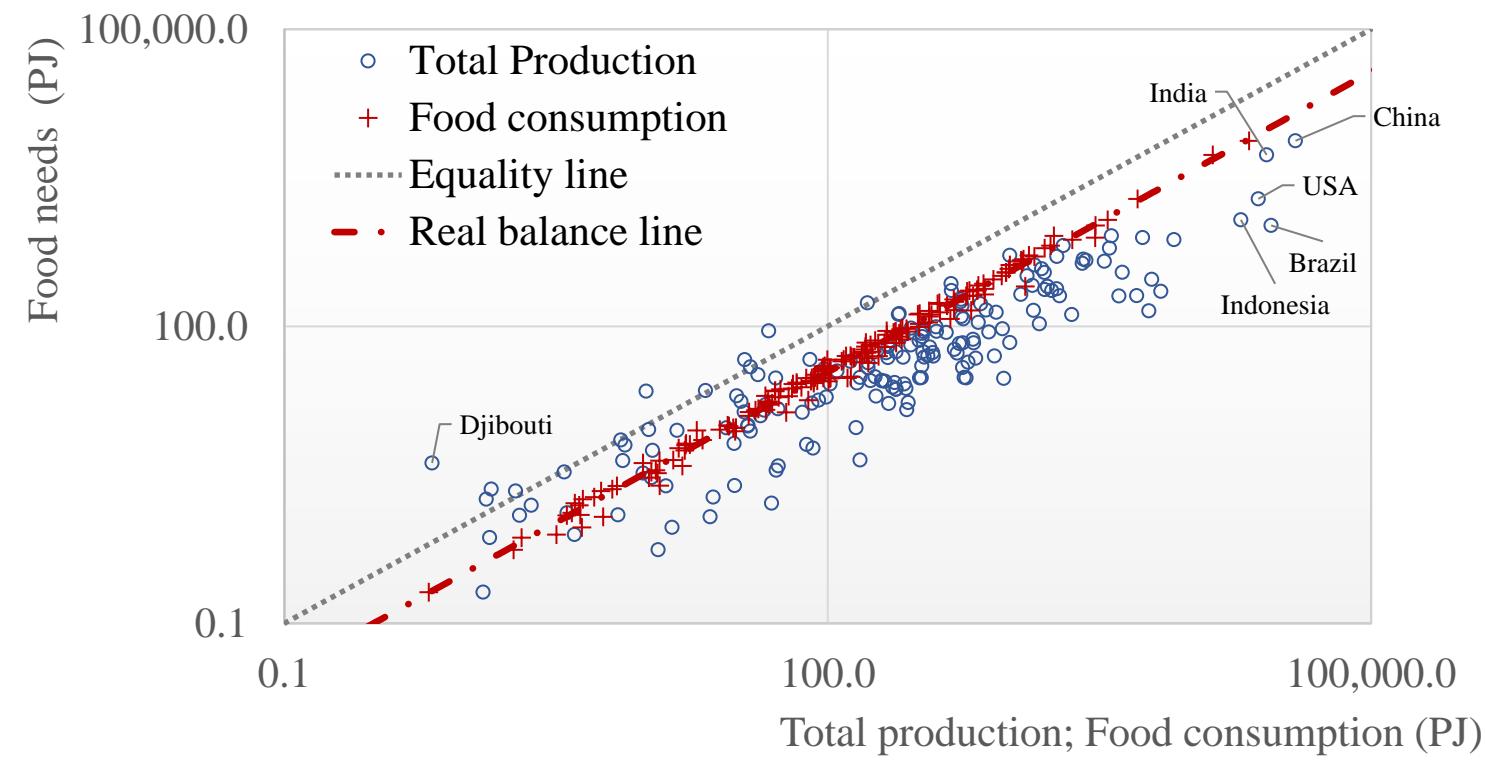
1492 μ.Χ.

1789 μ.Χ.

σήμερα

3 εκ. χρόνια πριν

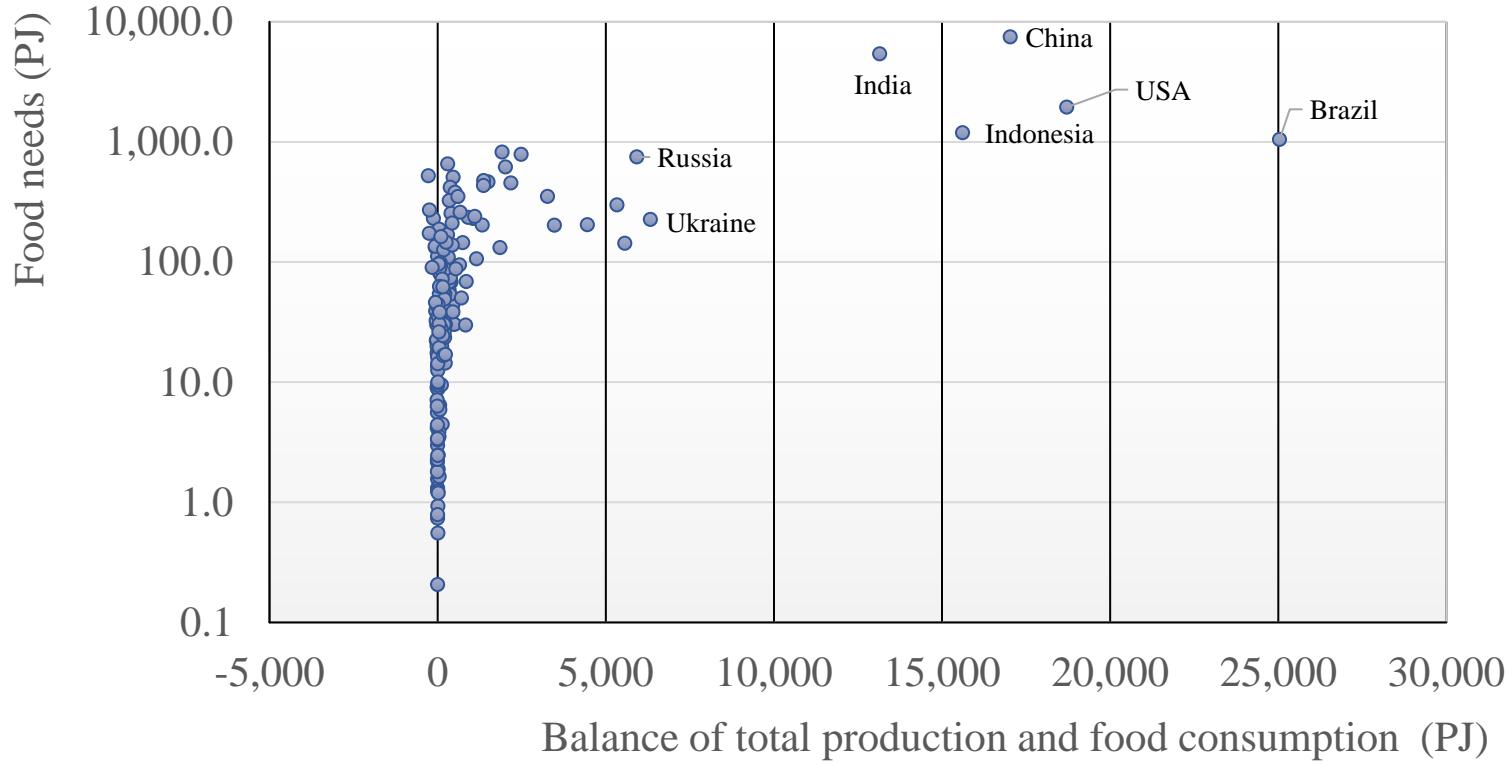
Διαθεσιμότητα των τροφίμων_1



3 εκ. χρόνια πριν
10000 π.Χ.
3000 π.Χ.
Έτος 1
476 μ.Χ.
1492 μ.Χ.
1789 μ.Χ.
σήμερα

Πηγή: Sargentis, G.-F.; Koutsoyiannis, D. The Function of Money in Water–Energy–Food and Land Nexus. *Land* 2023, 12, 669.
<https://doi.org/10.3390/land12030669>.

Διαθεσιμότητα των τροφίμων_2



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3 εκ. χρόνια πριν
10000 π.Χ.

3000 π.Χ.

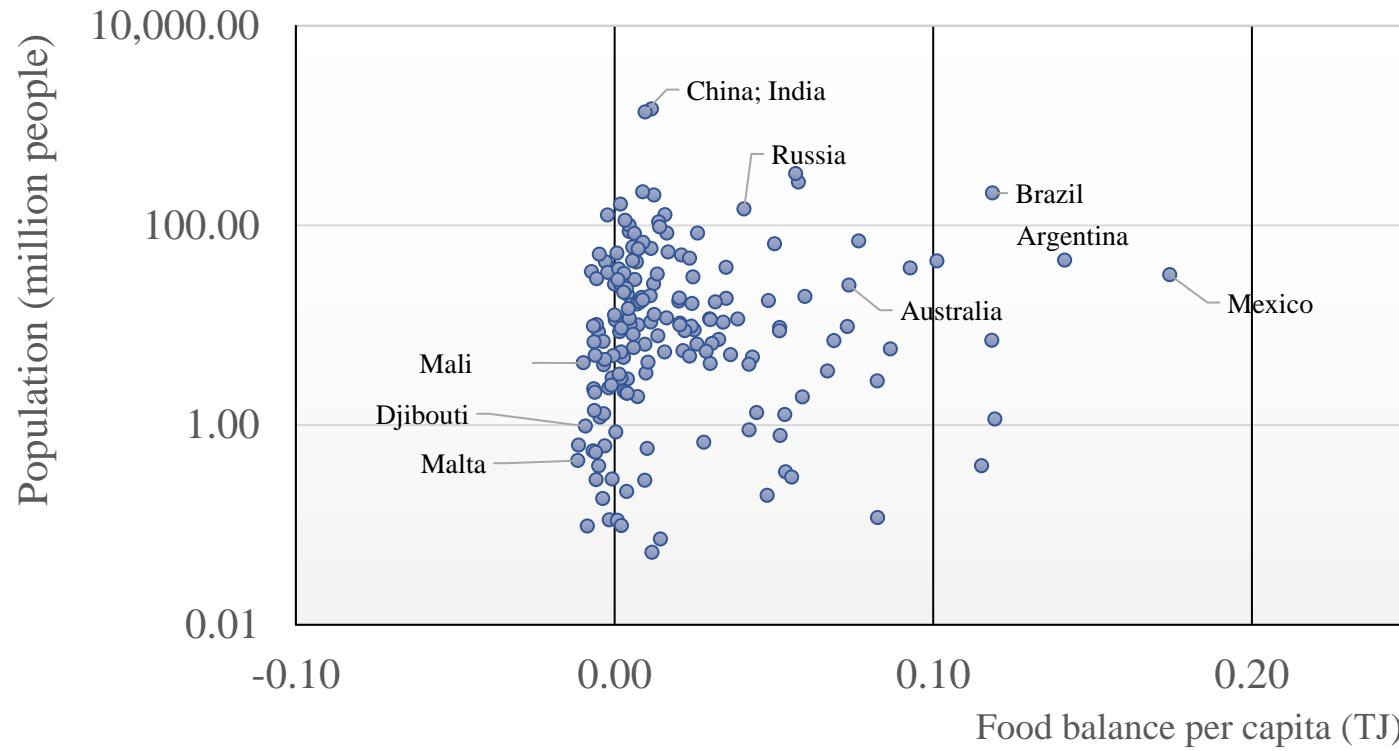
Έτος 1

476 μ.Χ.
1492 μ.Χ.

1789 μ.Χ.

σήμερα

Διαθεσιμότητα των τροφίμων_3



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Πηγές

Sargentis, G.-F.; Siamparina, P.; Sakki, G.-K.; Efstratiadis, A.; Chiotinis, M.; Koutsoyiannis, D. Agricultural Land or Photovoltaic Parks? The Water–Energy–Food Nexus and Land Development Perspectives in the Thessaly Plain, Greece. *Sustainability* 2021, 13, 8935. <https://doi.org/10.3390/su13168935>.

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<https://ourworldindata.org/>