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Revisiting the 75% Farmland Reduction Hypothesis: A Critical Evaluation of Global Veganism Land Use Models

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Abstract: ***The widely circulated claim that global farmland use could be reduced by 75% through a universal shift to veganism is critically reassessed in this paper. Drawing on datasets from OWID, USDA FAS, and FAO, the author challenges the underlying assumptions regarding land categorization and economic allocation of agricultural byproducts. The analysis reveals that much of the land attributed to animal feed is actually used for crops primarily grown for human oil consumption, rendering the projected land savings misleading. Upon excluding non-arable pasture land and correcting for byproduct economics, the study finds that the net change in cultivated land under a global vegan diet is negligible-and in some cases, marginally increases. This analysis calls for more rigorous evaluation of global dietary models before advocating them as universal environmental solutions.***

Keywords: Farmland Use, Animal Farming, Oilseed Production, Byproduct Misrepresentation, Veganism

1. Introduction

The relationship between dietary patterns and land use has been the subject of global debate, particularly with the rise of veganism. Popular sources, including Our World in Data (OWID), suggest that global farmland could be reduced by up to 75% if the entire world adopted a vegan diet (Ritchie & Roser, 2019). While the hypothesis appears environmentally promising, its methodology lacks clarity on data classification, inclusion criteria, and byproduct economics.

This paper aims to critically analyze the data foundation of the "75% farmland reduction" hypothesis, emphasizing crop production for human use versus byproducts utilized for animal feed. A data-driven correction is applied to determine realistic land-use impacts under a hypothetical global vegan transition.

2. Literature Review

Existing vegan land-use studies often aggregate "pasture land" and "cropland" into a single metric of agricultural land. However, pasture land—constituting approximately 2.89 billion hectares globally—is largely non-arable and cannot support conventional crop production (FAO, 2023).

Furthermore, the OWID methodology attributes significant portions of oilseed cultivation to animal feed production. Yet, oilseed meal (the animal feed component) is a byproduct of oil extraction—an industry primarily serving human consumption. This economic allocation, rather than physical cultivation purpose, introduces distortions in the representation of cropland use.

3. Methodology

Data were sourced from:

- Our World in Data (OWID) – Global agricultural land-use dataset
- USDA FAS – Oilseed, oil, and meal production data (2015–2025 projections)
- FAO Statistical Database – Global cropland distribution and yield data

The analysis excludes pasture land (2.89 billion ha) and considers only cultivated cropland (~1.24 billion ha). Land attributed to animal feed was recalculated based on actual human oil consumption of Soyabeans, rapeseed, Sunflower seed and other oil seeds, excluding Palm Oil based on USDA data.

4. Data and Analysis

Table 1: Oilseed Production and Byproduct Distribution (2024–2025 Projections)

Commodity	Oil Production (MMT)	Meal (Byproduct, MMT)	Total Crop Output (MMT)	% of Crop Used for Oil (Human Use)
Soybeans	68.69	278.63	424.2	81.87%
Rapeseed	34.1	49.01	85.73	96.94%
Sunflowerseed	20.07	21.06	52.43	78.45%
Other Oilseeds	27.1	40.04	119.72	56.08%
Total	149.96	388.74	682.08	78.97% (Avg.)

Interpretation:
Oil meal used for animal feed is a byproduct of oil extraction. Hence, the land used for cultivating these oilseeds primarily serves human oil consumption, not direct animal feed production. The meal's utilization by livestock is a secondary economic optimization. Hence, the entire land utilized for

cultivation of these crops for the 149.96 Million Metric Tonnes of oil shall be fully considered under Land Use for Human Consumption.

5. Re-Evaluating the 75% Land Reduction Hypothesis

According to OWID, total agricultural land is estimated at 4 billion ha, of which:

- Pasture land = 2.89 billion ha (unfarmed, non-arable)
- Cropland = 1.24 billion ha (actively cultivated)

The 75% reduction hypothesis implicitly assumes both pasture and cropland are interchangeable, which is agriculturally inaccurate. Excluding pasture, the true cropland available is 1.24 billion ha.

If the world becomes vegan:

- The land for animal feed (538 million ha) is primarily derived from byproducts of crops for human oil consumption based on economical value of the byproducts and not real land use specifically used for growing direct animal feed.
- Excluding byproducts, the effective cropland use for human food remains the same, as byproducts are not cultivated separately.
- To meet global nutritional demand (protein, fats, essential amino acids) through plant sources alone, additional cropland expansion would likely be required due to yield limitations and nutrient diversity constraints.

Table 2: Recomputed Land Use under Vegan Scenario

Category	Current (Bha)	Vegan Scenario (Bha)	Remarks
Pasture Land	2.89	0	Non-arable, excluded
Cropland	1.24	1.24	Realistic farming area
Net Change	—	0	

Result:
Even with a complete vegan transition, the actual reduction in farmed land is negligible. In fact, increased demand for oilseeds, pulses, and specialty crops for balanced vegan diets could increase cropland needs by 5–10%.

6. Discussion

This analysis demonstrates that the "75% farmland reduction" narrative stems from an overgeneralization that merges non-arable pasture with cultivated cropland and misclassifies byproduct economics as primary land allocation.

The actual cropland used for oilseed cultivation predominantly serves human consumption. The animal feed component is secondary, meaning that removing livestock production does not liberate equivalent cropland area.

Furthermore, plant-only diets necessitate higher diversity and volume of crop production, which may strain available arable land and soil fertility cycles.

7. Conclusion

The popular claim that global veganism would free 75% of agricultural land is not supported by empirical data when examined under realistic farming parameters. By excluding unfarmed pasture and correcting for byproduct economics, the net cropland change under a universal vegan diet is negligible or slightly positive.

This finding underscores the need for rigorous data validation before promoting global-scale dietary models as environmental solutions. Agricultural sustainability depends more on integrated land use efficiency than on categorical diet-based assumptions.

8. Conflict of Interest and Funding Statement

The author declares no conflict of interest.

This research received no external funding and was conducted independently.

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