11-19-2010

The 'Goldilocks Hypothesis' : A Political Ecology of the Land-sparing/Wildlife-friendly Farming Debate

M. Jahi Chappell
Washington State University

Follow this and additional works at: https://pdxscholar.library.pdx.edu/systems_science_seminar_series

Part of the Agricultural and Resource Economics Commons, and the Environmental Policy Commons

Let us know how access to this document benefits you.

Recommended Citation
https://pdxscholar.library.pdx.edu/systems_science_seminar_series/24

This Book is brought to you for free and open access. It has been accepted for inclusion in Systems Science Friday Noon Seminar Series by an authorized administrator of PDXScholar. For more information, please contact pdxscholar@pdx.edu.
The ‘Goldilocks Hypothesis’: A political ecology of the Land Sparing/Wildlife-Friendly Farming Debate

M. Jahi Chappell
School of Earth and Environmental Sciences, and The Center for Social and Environmental Justice
Washington State University Vancouver
Sustainable Development

• “...development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” (WCED 1987)

• So what is development per se?

• Provision of basic human rights:
  – *Food*, health and well-being, clothing, housing, medical care, necessary social services
A Problem of “Sustainable Development”:

How can we supply food for a large, and growing human population…

-and-

Address the significant and increasing rate of loss of biodiversity?
Hunger and Malnutrition

• 1 billion people presently suffer from malnutrition

• 6 million children die from hunger each year

• Over 2 billion people suffer from “hidden hunger”
Species are being lost to extinction at a rate between 1,000 and 10,000 times the background rate. Hanski et al. 1995, Gaston and Fuller 2007, Lawton and May 1995.
Two broad solutions to the “food vs. biodiversity” development problem:

- **Land sparing/**
  - “Sparing land for nature”

- **Wildlife-friendly farming**

*Fischer et al., 2009*
Political ecology and a “credible political economy”

• Deconstructing Land-sparing: *Misspecified hypothes(es)*
  – Omission of important dynamics of political economy constrains solutions and approaches considered
  
  – This has implications for both the natural environment and human welfare
Misspecifications

• “Axiomatic” (and “apolitical”) relationship between population, food requirement, and productivity:

\[ \text{Necessary Ag. Area} = \frac{\text{Human Pop. x Food Demand}}{\text{Productivity}} \]

• “Population is increasing, intake is increasing, so to minimize (ag. area), maximize productivity”

• BUT: this omits the political economy of hunger
Misspecifications

• We’ve already created two problematic simplifying assumptions:
  
  – “Necessary Ag. Area” has a complicated relationship with Actual Agricultural Area
  
  – Food Demand may not be a useful proxy for Food Security
Misspecifications

• Aggregate food demand (a usual basis for land-sparing rationale):

  • I.e., estimates for the year 2050:

    ~8000 kcal/person/day (MDCs)  
    ~6000 kcal/person/day (LDCs)  
    Balmford et al. 2005

    ~3500 kcal/person/day (MDCs)  
    ~3100 kcal/person/day (LDCs)  
    FAO 2006
Implications: Obscured Questions

• Discourages question of *need* vs. *demand*

  – Why not define need now & in 2050 as ~2300 kcal?

  – Why not work to reconnect need & demand?

  – How do we disaggregate disproportionate demand of the wealthy vs. disproportionate need of the poor (within and between countries)?
Figure 1. A schematic summary of the amount of food produced, globally, at field level and estimates of the losses, conversions and wastage in the food chain. Source: Smil (2000). Illustration: Britt-Louise Andersson, SIWI.
Food Supply Isn’t Necessarily the Problem

- Hunger and starvation are very rarely the result of insufficient food availability. They are usually caused by an inability to access food, with poverty being a primary reason.

Amartya Sen, 1981

Poor in India Starve as Surplus Wheat Rots

By AMY WALDMAN
Published: December 2, 2002
Food Supply Isn’t Necessarily the Problem

- Malnutrition increased from ~850 million to 1 billion in past several years
  - Numerous factors contributed to this; absent from them was an equivalent 17% increase in population or 17% drop in world food production

- US average daily per capita intake is ~3,800 kcal/person; 12% of Americans cannot consistently ensure daily minimum food requirements

- In 1995, 80% of malnourished children lived in countries with food energy surpluses

Stakes of Land-sparing’s proposed trade-offs:

- 1 billion each of the “Stuffed and Starved”:
  - Increased production -- concurrent with 15% of people malnourished, 15% obese
  - 30% food waste, 30% lost in conversion to animals
  - And some level of negative effects on biodiversity
Misspecifications

• We’ve already created two problematic simplifying assumptions:
  
  – “Necessary Ag. Area” has a complicated relationship with *Actual Agricultural Area*
  
  – Food Demand may not be a useful proxy for Food Security
Misspecifications in Agricultural Area

• Equivocal empirical evidence for land-sparing
Recent Negative Results

- DeFries et al. 2010: Deforestation rates in 41 tropical countries tied to agricultural exports and increase in city population sizes.

- Rudel et al. 2009: no evidence that intensification is generally accompanied by land sparing from dataset of 161 countries; importance of imports & exports (and policy programs) in 34 countries.
Is there anything to land-sparing?

• Key questions for study and modeling:
  – Does this Goldilocks ever find her “Just Right”?
  – That is: What is the degree of sensitivity of land expansion rates in relationship to yield, per capita production, and prices?
  – And what about spared land quality with regards to biodiversity?
Further Misspecifications or Omissions

- Major economic and policy actors (industry groups, companies, governments) have explicit agenda of continued economic growth
  - Economic footprint *and level of inequality* have strong correlations to biodiversity loss (Mikkelsen et al. 2007; Holland et al. 2009)
  - Common Sense! Or: *Mistaking the costs of marginal losses as representing the implications of the process* (“The Mad Riveter”)
    - Cf. Ghazoul et al. 2010
Is Another Way Really Possible?

• Parsimony of Expectations

  – *Most* indicators are going the wrong way

  – Land-sparing research *already* implies necessary break with “parsimony”: 
“Avoid ad-hoc and unregulated intensification… intensification without conservation planning is a major threat to biodiversity” -- Fischer et al. 2009

“Future projections of cropland abandonment and ensuing environmental services cannot be assumed without explicit policy intervention” -- Rudel et al. 2009

“Our analyses suggest that the mechanisms by which land use policy influences the persistence of natural habitats will need to change if the potential gains are to be realised” -- Ewers et al. 2009
But regarding hunger--What are the alternatives?

• Effects of economic and policy levers on pertinent phenomena: the dietary transition, consumption, waste, ecological footprint…
But regarding hunger--What are the alternatives?

• How has hunger been fought in the past?
Figure 12—Estimated contributions of underlying-determinant variables to reductions in developing-country child malnutrition, 1970–95

If we’re pushing for a policy discontinuity anyway…

• Greater equality, education, health access, and land reform help productivity and nutrition, and slow population growth

• Unlike above, productivity _qua_ productivity is irrelevant