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The 'Goldilocks Hypothesis': A political ecology of the Land Sparing/Wildlife- Friendly Farming Debate

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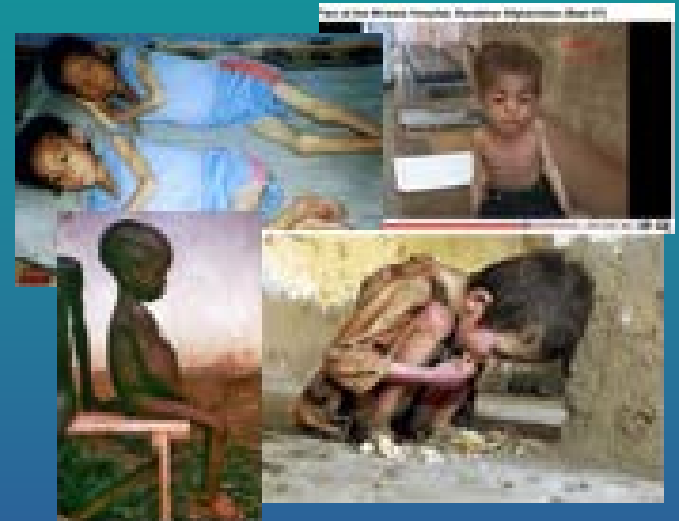
Sustainable Development

- “...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”



Two broad solutions to the “food vs. biodiversity” development problem:

*Land sparing/
“Sparing land for
nature”*



Courtesy of R. Hobbs

*Fischer et
al., 2009*



*Wildlife-
friendly
farming*

Political ecology and a “credible political economy”

- Deconstructing Land-sparing:
Misspecified hypotheses(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:

$$\text{Necessary Ag. Area} = \frac{\text{Human Pop.} \times \text{Food Demand}}{\text{Productivity}}$$

- “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)?

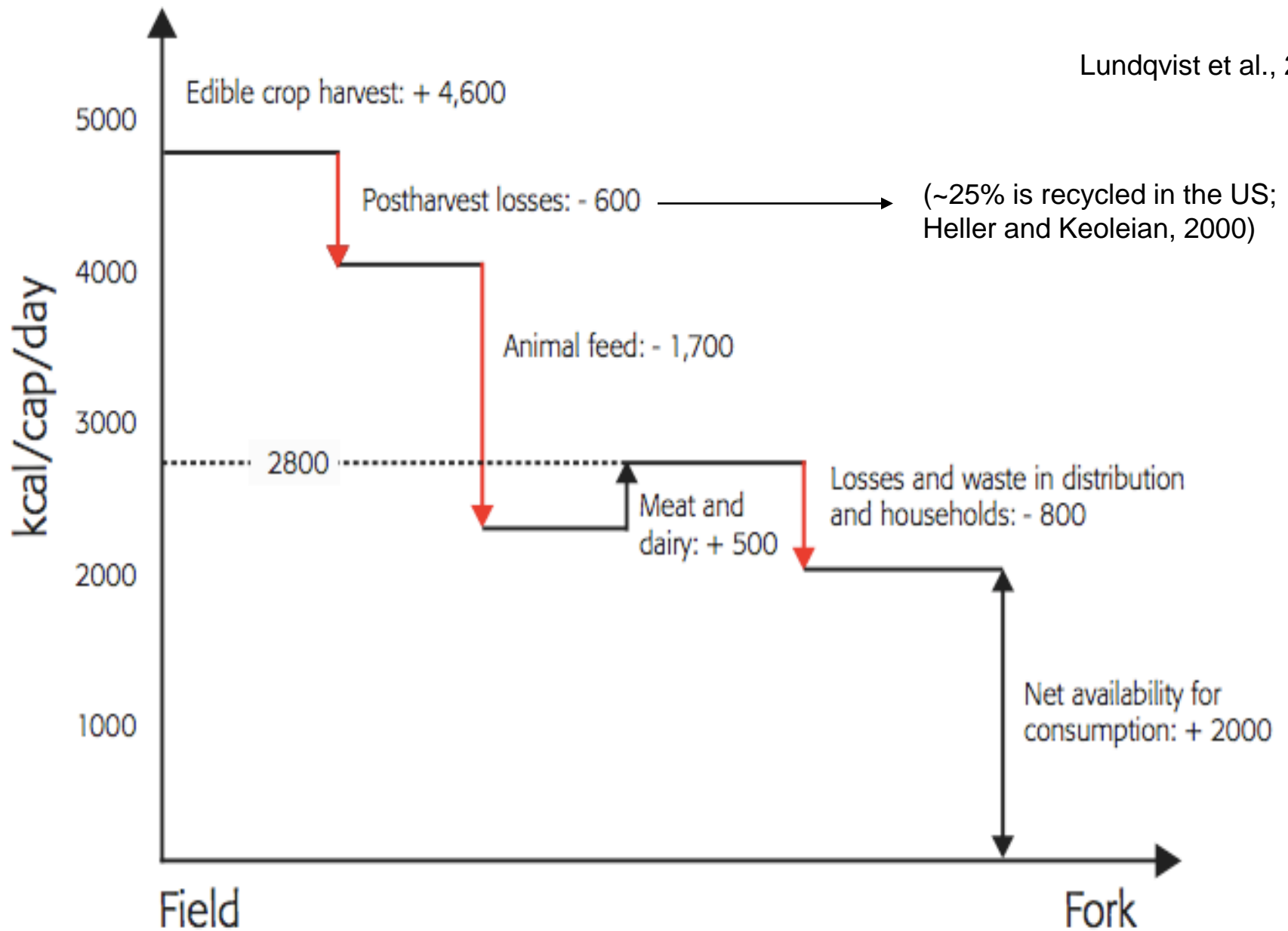


Figure 1. A schematical summary of the amount of food produced, globally, at field level and estimates of the losses, conversions and wastage in the food chain. Source: Smil (2000). Illustration: Britt-Louise Andersson, SIWI.

Food Supply Isn't Necessarily the Problem

•

The screenshot shows the top portion of the New York Times website. At the top left, it reads "The New York Times" in a serif font, followed by "Thursday, December 4, 2008". To the right, the word "World" is displayed in a large, bold, sans-serif font. Below this is a horizontal navigation bar with several tabs: "WORLD", "U.S.", "N.Y. / REGION", "BUSINESS", "TECHNOLOGY", "SCIENCE", "HEALTH", and "S". The "WORLD" tab is selected and highlighted. Below the navigation bar is a news banner. On the left side of the banner is a small photograph of a man in a dark suit sitting at a desk with his hands clasped. To the right of the photo, the text "think that currency r" and "think again!" is written in a blue, sans-serif font. Below the photo is a red bar with the text "BREAKING NEWS!" in white, and to the right of that is a blue bar with the text "US de" in white. Below the banner is the main headline of the article: "Poor in India Starve as Surplus Wheat Rots" in a large, bold, serif font. Below the headline, it says "By AMY WALDMAN" and "Published: December 2, 2002".

The New York Times
Thursday, December 4, 2008

World

WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY SCIENCE HEALTH S

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BREAKING NEWS! US de

Poor in India Starve as Surplus Wheat Rots

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Amartya Sen, 1981

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**

*FAO 2006, 2008; Holt-Giménez 2008;
Smith et al. 2000*

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



Karen Apricot 2007

- *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



Agricultural Technologies and Tropical Deforestation

Edited by
A. Angelsen and
D. Kaimowitz



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?

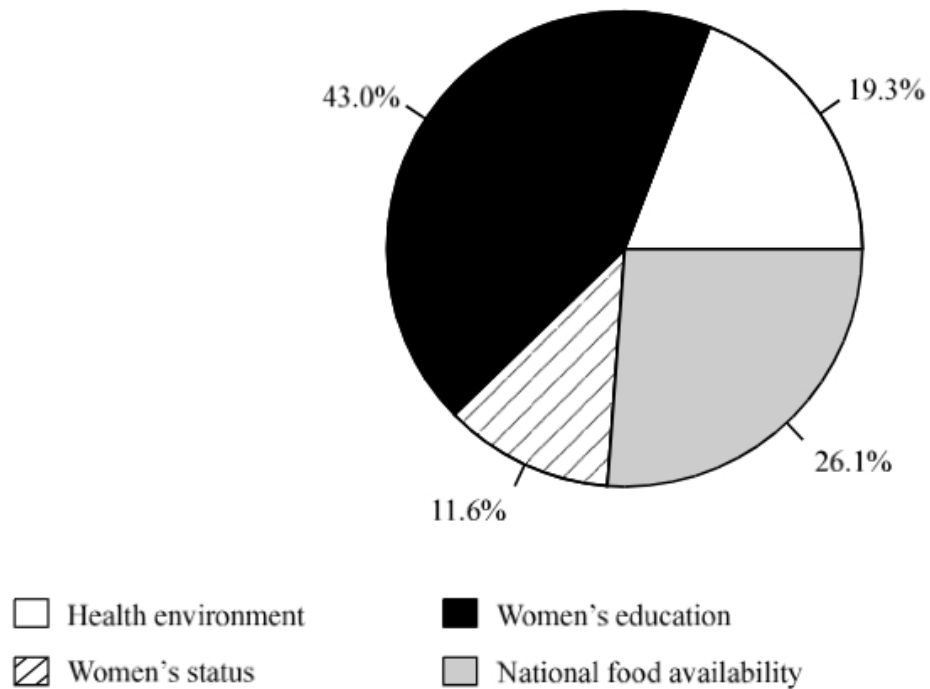
- Effects of economic and policy levers on pertinent phenomena: the dietary transition, consumption, waste, ecological footprint...

But regarding hunger--What are the alternatives?

- How has hunger been fought in the past?

Fighting hunger 1970-1995

Figure 12—Estimated contributions of underlying-determinant variables to reductions in developing-country child malnutrition, 1970–95



Source: IFPRI Cross-Country Child Malnutrition Determinants Data Set, 1997/98.

Smith and Haddad 2000

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

