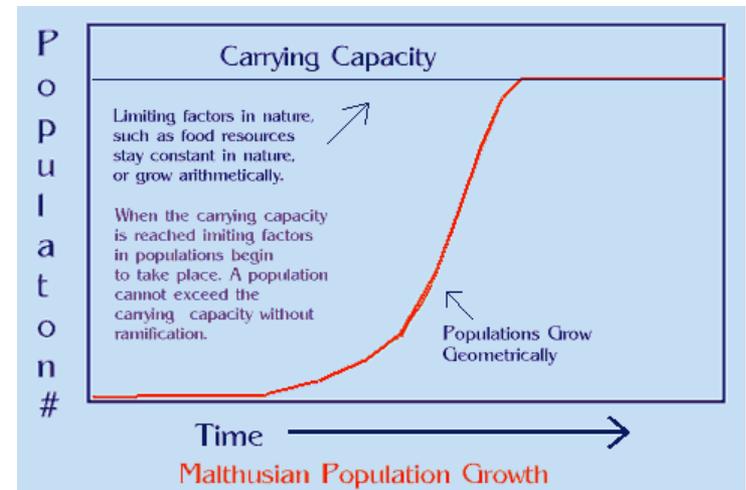


# The Conditions of Agricultural Growth

Ester Boserup

# Thomas Malthus (1766-1834)

- English clergyman & economist.
- Wrote [An Essay On the Principle of Human Population](#) (1798).
- Population increases geometrically.
- Food supply increases arithmetically.
- Tendency for population to surpass food supply.
- “Natural checks” on population take over: disease, famine, war.
- Ideas formulated *before* Industrial Revolution.



# Ester Boserup (1910-1999)

- Danish economist
- Her work led to rethinking of Malthusian theory.
- *Conditions of Agricultural Growth* (1965) was a dynamic analysis embracing *all types* of cultivation.
- Previously, agricultural economists focused only on Western world
- Overturned Malthusian assumption that agricultural methods determine population (via food supply).
- Boserup asserted instead that *population determines agricultural methods*.



The Conditions  
of Agricultural  
Growth

The Economics of Agrarian  
Change under Population Pressure

Ester Boserup

With a new introduction by Virginia Dorsey Moseley  
and a foreword by Stefano Rossetti

# *The Conditions of Agricultural Growth*

- More dense population is, more intense intensive cultivation becomes.
- Identified *5 different agricultural systems*, according to length of fallow between periods of cultivation.
- When population density is low enough to allow it, land is used intermittently, with heavy reliance on fire to clear fields & fallowing to restore fertility .
- Only when rising population density curtails use of fallowing & use of fire will fields be annually cultivated through use of fertilizers, field preparation, weed control, & irrigation.



# ***The Conditions of Agricultural Growth***

- Changes often induce agricultural innovation, but increase marginal labor cost to the farmer as well
  - Higher rural population density, is the more hours farmers must work for same amount of produce.
- Workloads ↑ efficiency ↓
- ↑ production comes at cost of ↑ more work at ↓ efficiency.
- Boserup calls process "agricultural intensification"

<u>Fallow Type</u>	<u>CroppingPeriod</u>	<u>Fallow Period</u>
<b>Forest fallow</b>	1-3 years	20 years or more
<b>Bush fallow</b>	1-8 years	6-10 years
<b>Grass fallow</b>	Several years	1-2 years
<b>Annual cropping</b>	A few months	<1 year
<b>Multi-cropping</b>	Continuous	None

# Boserup's types of agricultural systems

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<b>Bush fallow</b>	1-8 years	6-10 years
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<b>Annual cropping</b>	A few months	Less than 1 year
<b>Multi-cropping</b>	Continuous	None

# Contrasts between extensive and intensive agricultural systems

<b>Characteristics</b>	<b>Extensive Systems</b>	<b>Intensive Systems</b>
<b>Fallow length</b>	Long	Short
<b>Productivity</b>	Low	High
<b>Efficiency</b>	High	Variable but lower
<b>Population density</b>	Low	High
<b>Technology</b>	Simple	Often complex
<b>Fertilizing of soil</b>	None or little	Lots
<b>Land tenure</b>	Communal ownership	Individual/family ownership
<b>Economic systems</b>	Usually subsistence	Usually market
<b>Sociopolitical complexity</b>	Generally less	Generally greater

# Significance of Boserup's book

- *When population density is low land tends to be used intermittently, with heavy reliance on fire to clear fields & fallowing to restore fertility (i.e., slash & burn).*
- Subsequent studies have shown such methods to be favorable in terms of total workload & energy efficiency (output versus input).
- Only when rising population density curtails use of fallowing & fire will fields change to annual cultivation.

Table 9.2. Energy outputs and inputs, in megajoules

Type	Output per man-hour	Output per hectare	Input per hectare	Output: Input ratio
San bushmen*	4.50	2.90	0.37	7.80
Swidden agriculture, Congo*	30.00	15685.00	240.00	65.00
Peasant Farmers, China*	40.00	281000.00	6846.00	41.10
Wheat, UK	3040.00	56200.00	17800.00	3.35
Maize, USA	3800.00	76910.00	29850.00	2.58
Milking herd, UK		10000.00	26900.00	0.37

\*includes labour.  
After Leach<sup>2</sup>.