

# Malnutrition and Famine



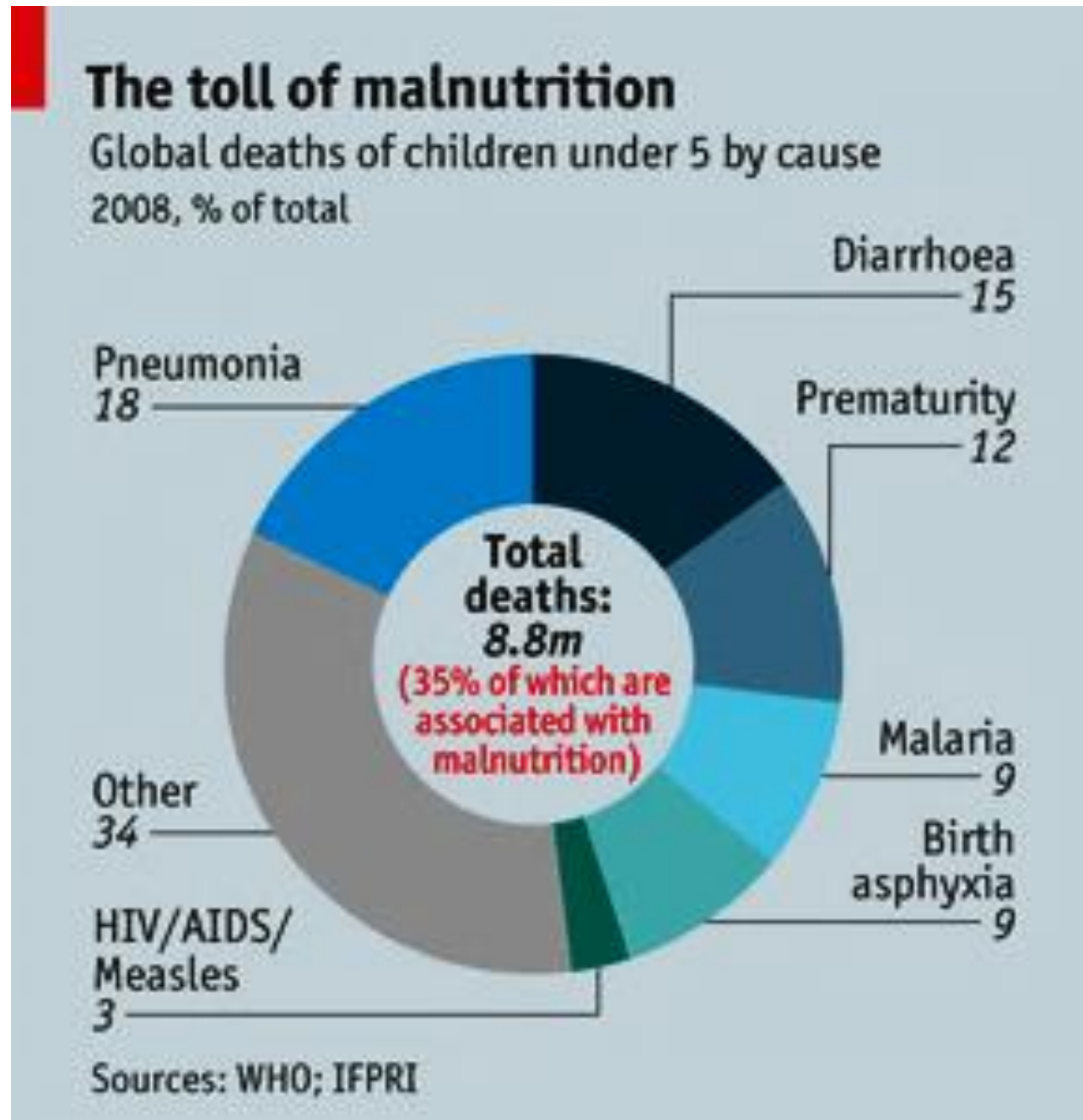
**World Poverty and Economic Development  
ECRG 3240 Fordham University NY Spring 2015**

**Photos: Sebastião Salgado's Photo Essay: Famine in the Sahel See [Wim Wenders, "Salt of the Earth"](#)**

2013 Child U5MR  
6.3 million annually  
down from 12.7M  
in 1990

[www.childmortality.org](http://www.childmortality.org)

[Unicef, 2014](#) and  
*Economist*, The  
Nutrition Puzzle,  
about 45% linked to  
malnutrition  
(graphic at right)



2013 Child U5MR 6.3 (6.1-6.7) million annually  
down from 12.7m (12.4-12.9m) in 1990

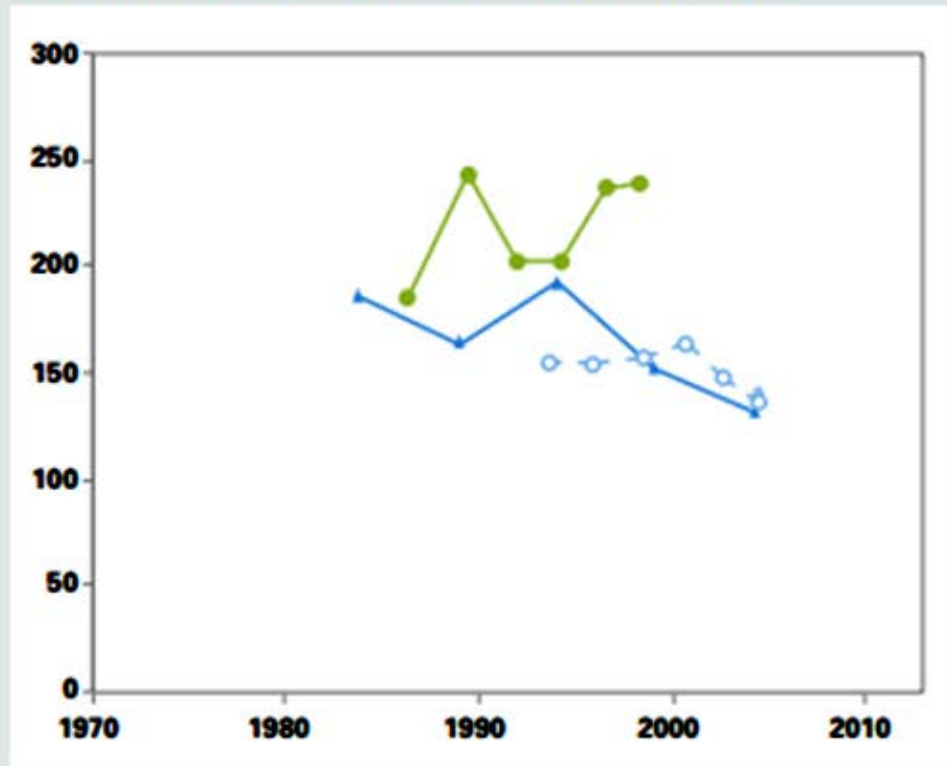
[www.childmortality.org](http://www.childmortality.org) [Unicef, 2014](#)

### Examples of country data sources

*Countries with sparse and no recent data*

**Somalia**

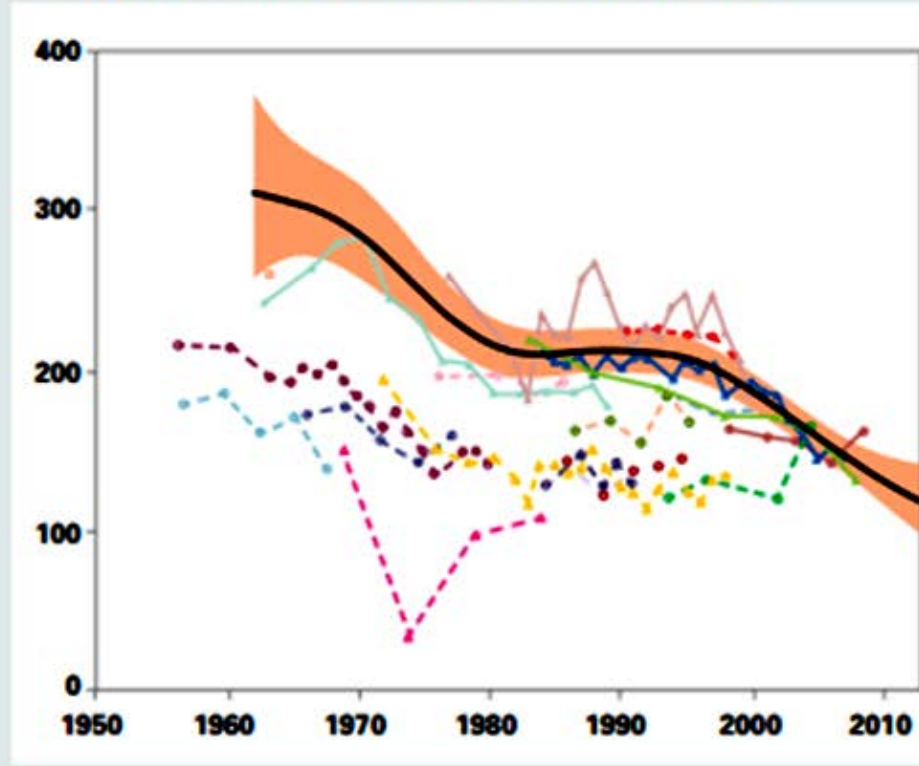
Under-five mortality rate (deaths per 1,000 live births)



*Countries with abundant data but wide variations*

**Nigeria**

Under-five mortality rate (deaths per 1,000 live births)



**MDG 4:**  
*reduce U5MR by 2/3\* between 1990 & 2015: hard to do, but we have good data for some ctys*

*\*that is 5% annually*

<http://www.childmortality.org/>

**Table M-4: MDG 4: Annual rate of reduction in U5MR**

Country	ISO Code	ARR 1990-2013		
		Lower bound	Median	Upper bound
Bangladesh	BGD	4.9	5.4	6.0
Bolivia	BOL	3.7	5.0	6.3
Cambodia	KHM	2.2	4.9	7.4
China	CHN	5.6	6.3	7.0
El Salvador	SLV	4.0	5.8	7.6
Ethiopia	ETH	3.9	5.0	6.4
Haiti	HTI	2.2	3.0	3.7
Honduras	HND	3.4	4.3	5.1
India	IND	3.3	3.8	4.3
Indonesia	IDN	4.0	4.6	5.2
Malawi	MWI	4.4	5.6	6.8
Nigeria	NGA	1.8	2.6	3.4
Rwanda	RWA	3.2	4.7	6.0
Uganda	UGA	3.3	4.3	5.3
Vietnam	VNM	2.5	3.3	3.8

Source: UNICEF-WHO-WB-UN [www.childmortality.org](http://www.childmortality.org)

# Nutritional Status = Gross caloric Intake minus claims

## **Claims include: Basal Metabolic Rate or BMR**

depends on height and weight, a typical South Asia male: 5'4" tall 120 lbs has a BMR of about 1375 calories. So a **survival diet** =  $1.27 * \text{BMR}$  (note that  $1.27 * 1375 = 1750$  calories or about  $.75 * 2250$  meaning about 75 cents a day covers only a survival diet whereas a \$1/day buys about 2250 calories...

• **Physical Activity**– hard physical work consumes about 2 BMRs a day or 300-400 calories per hour.

• **Morbidity**– illness saps energy (calories), it takes extra calories to fight disease.

# Is there a malnutrition poverty trap?

## B&D, 2012 *Poor Economics*, Chapt 2

- Perhaps there are not a billion hungry people? Even for \$1/day poor, food is cheap, 21 cents a day adequate (so why don't poor eat more?)
- Poor workers do not buy food when you they get extra money, perhaps they don't realize extra food with make them healthier.
- Spending on food is falling in some regions
- Micro-nutrients make a big difference, deworming, subtle changes in diet have big impacts on life (early childhood)
- Still striking evidence of malnutrition, especially in South Asia, see p. 29-32

# Is there a malnutrition poverty trap?

## B&D, 2012 *Poor Economics*, Chapt 2

Yet, striking anthropomorphic evidence of malnutrition especially in South Asia,

*“indeed, **everything suggests that children are very badly nourished in India.** The usual measure of how well a child has been fed through the childhood years is **height, compared to the international average height for that age.** By this measure....**Roughly half the children under five are stunted, which means that they are far below the norm. One-fourth of them are severely stunted, representing extreme nutritional deprivation. The children are also extraordinarily underweight given their height: About one in five children under three is wasted, which means they fall below the international definition of severe malnourishment. What makes these facts more striking is that the stunting and wasting rates in sub-Saharan Africa, undoubtedly the poorest area of the world, are only about half those in India.**”*

*Banerjee, Abhijit; Duflo, Esther (2012, 29-30). Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty Perseus Books Group*

# A Malnutrition poverty trap?

## Meet the Hassans, Bangladesh 2003

- The Hassan household includes a husband of 59, a wife of 44, two sons ages 14 and 11, and a 7-year-old granddaughter. An elderly invalid aunt also lives with them...
- “Three plots total *less than half an acre* (0.45 acres) or 0.18 hectares. They depend on these parcels for enough rice, wheat, and vegetables to meet most of their daily food needs. During the monsoon season, the plots are subject to flooding. Their home has a floor of packed earth and a thatched roof.
- Mr. Hassan *pulls a rickshaw* in a nearby village market (a job for only the poorest and most uneducated men in Bangladesh). This is the family’s main source of income; there is no surplus from the farm. Mr. Hassan works an average of nine hours a day, 25 days a month, and earns the equivalent





# Many options for breaking out of a Malnutrition Poverty trap

- Raise income or reduce the cost of food (Green revolution did both in Asia)
- Factory jobs work amazingly well: Chinese factories feed their workers and provide them with medical care, movies, etc. no factory owner wants malnourished workers, See *Factory Girls* chapter 5, 70,000 workers at the Taiwanese owned Yue Yuen factory in Dongguan (in 2005 1/3 of the world's shoes were made in Guangdong Province...)
- **Unicef: low cost health care** methods can also reduce malnutrition and improve labor market performance. For example *Oral Rehydration Therapy (ORT)* reduces illness and U5MR reducing the birth rate falls and family calorie requirements (we put ORS in sugary drinks, gator aid and pedia light for infants). The sugar tricks the body into absorbing the salts....

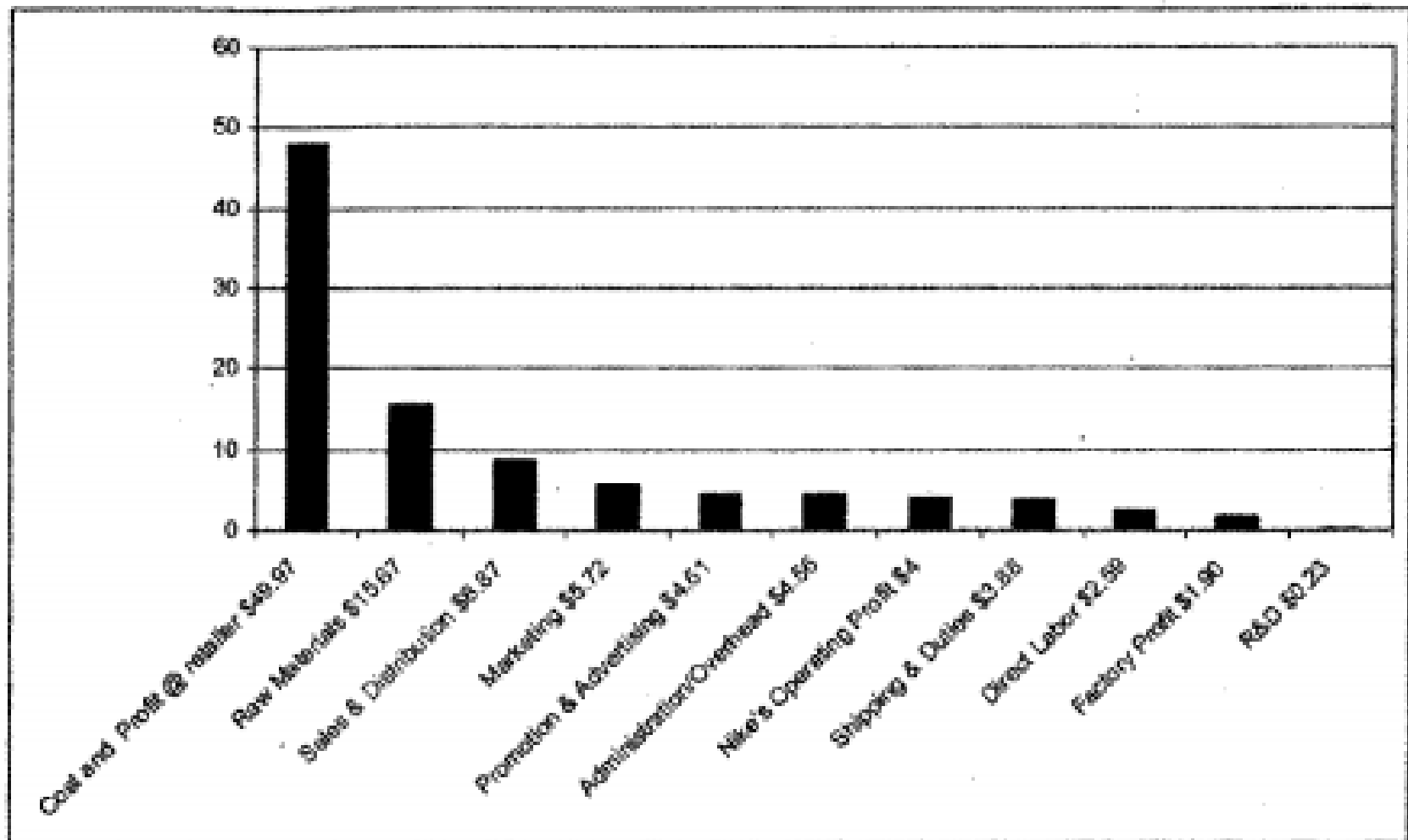
# The efficiency-wage hypothesis:

- Unlike wheat or cement, the quality of labor varies with price – high wages result in **greater work effort, loyalty, fear of being fired**, etc.
- People work harder and produce more per hour (**productivity rises**) when they are paid more—above average wages elicit above average effort as workers strive to keep a good job.
- **Turnover rates fall** as people value their jobs more (the pay is better relative to other jobs) the cost of being fired and unemployment go up for the worker, so **less supervision** is needed by employers (doors can remain unlocked, because employers worry less about theft)

# Striking implications of the efficiency wage hypothesis (EWH) for low wage jobs

- Raising sweatshop wages will not increase **prices for consumers** or reduce Walmart or reduce Nike's profits (in the long run, perhaps yes initially).
- Higher pay leads to higher productivity, more machines (*look at a modern auto plant— no workers*) more loyal & productive workers, fewer jobs but better jobs, **lower turnover**.
- **Who loses from higher sweatshop wages?** Only those who do not yet have jobs (the \$1/day poor) those who employers prefer not to hire, women immigrants, less educated workers.
- .

FIGURE 8.1 Nike Cost Structure per Pair of Shoes



# Striking implications of the efficiency wage hypothesis (EWH) for low wage workers

- Global poverty reduction slows: In his “In praise of cheap labor” [Krugman, 1997](#) argues raising wages preserves “less visible” severe rural poverty (Kristof makes similar arguments, for poor working conditions— but see the ILO better factories reply.

***Krugman argues turning low wage factory jobs into good jobs increases severe (\$1/day) poverty but makes student activists feel better because then they have no connection to this poor (whereas if these same workers make their shoes or shirts they feel “unclean”). He asks (as economists do, see A&R, 2012, What is your alternative poverty reduction machine to replace low wage manufacturing?<sup>1</sup>***

*1/ Krugman says “You may say that the wretched of the earth should not be forced to serve as hewers of wood, drawers of water, and sewers of sneakers for the affluent. **But what is the alternative?** Should they be helped with **foreign aid**? Maybe--although the historical record of regions like southern Italy suggests that such aid has a tendency to promote perpetual dependence. Anyway, there isn't the slightest prospect of significant aid materializing. Should their **own governments** provide more social justice? Of course--but they won't, or at least not because we tell them to. And as long as you have no realistic alternative to **industrialization based on low wages**, to oppose it means that you are willing to deny desperately poor people the best chance they have of progress for the sake of what amounts to an aesthetic standard--that is, the fact that you don't like the idea of workers being paid a pittance to supply rich Westerners with fashion items. In short, my correspondents are not entitled to their self-righteousness. They have not thought the matter through. And when the hopes of hundreds of millions are at stake, thinking things through is not just good intellectual practice. It is a moral duty.*

**Why do people take “sweatshop” jobs?  
because rural wages are so low (see the  
NBEW argument below).**

OP-ED COLUMNIST

## **Where Sweatshops Are a Dream**



NICHOLAS D. KRISTOF Published: January 14, 2009 **PHNOM PENH, Cambodia**

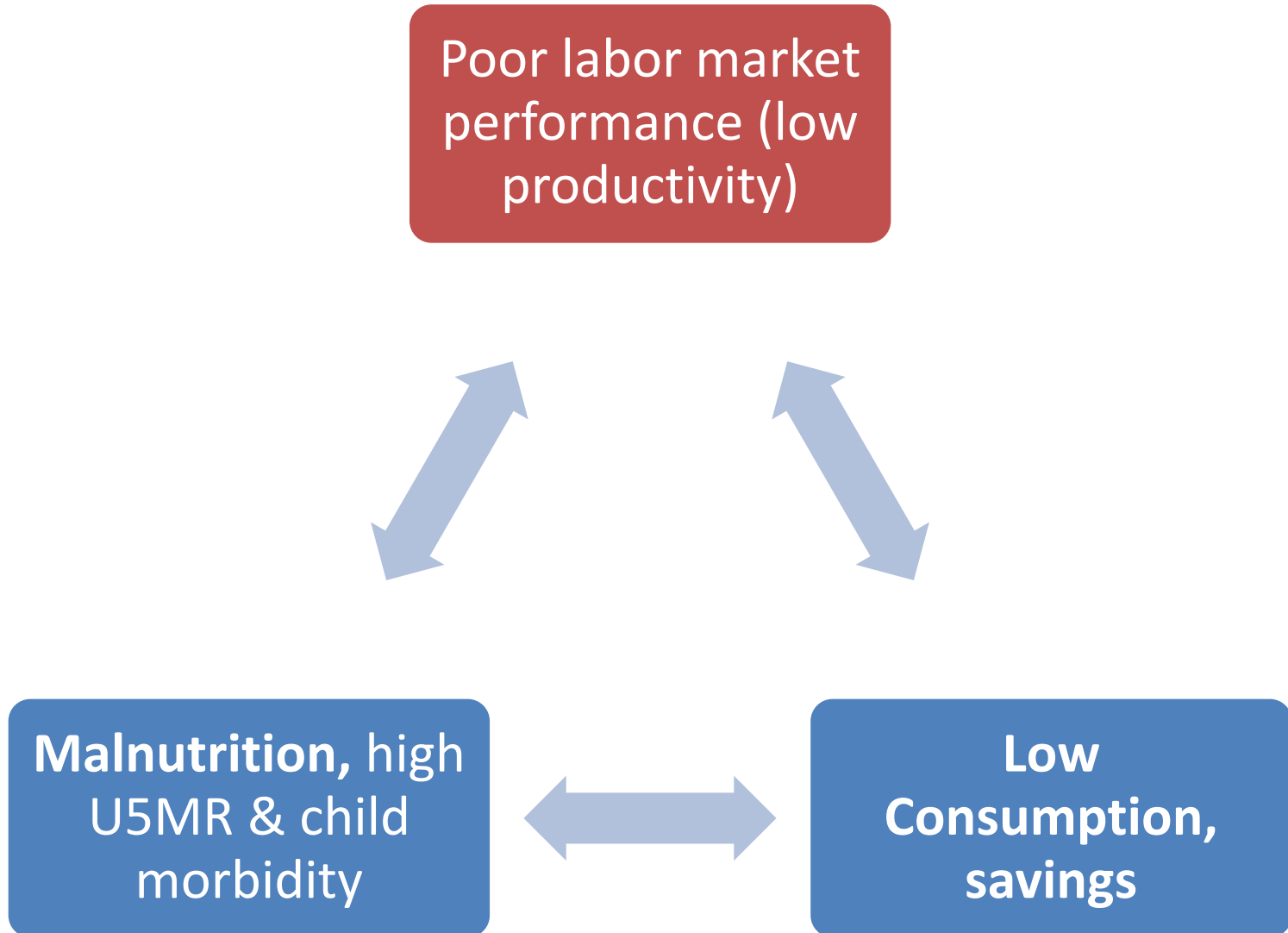
# Striking implications of the Nutrition-based Efficiency wage process

- Unfettered **market forces** lead to malnutrition—government intervention warranted but tricky...
- **Landless workers (50 cents a day)** are **vulnerable** group not due to big plantations or export agriculture, in fact food crop production may makes malnutrition worse.
- **Supply-Side (what B&J, 2012 call supply-wallas\*\*)**: Reducing malnutrition or severe poverty via land reform or food subsidies increases the effective labor supply.

(\*\*[Lunchbox](#) is a 2014 movie about “dabba wallas”

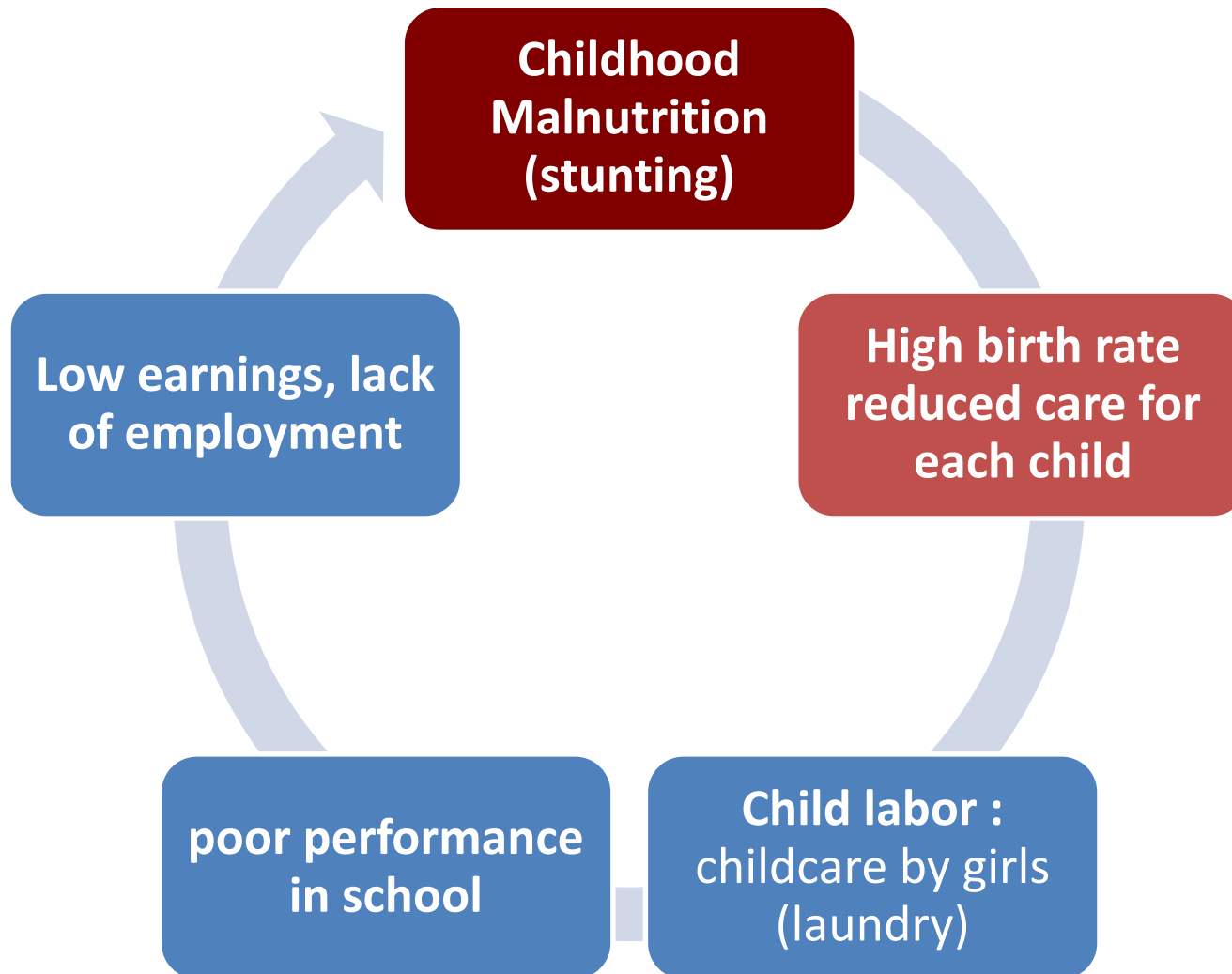


# Malnutrition poverty trap





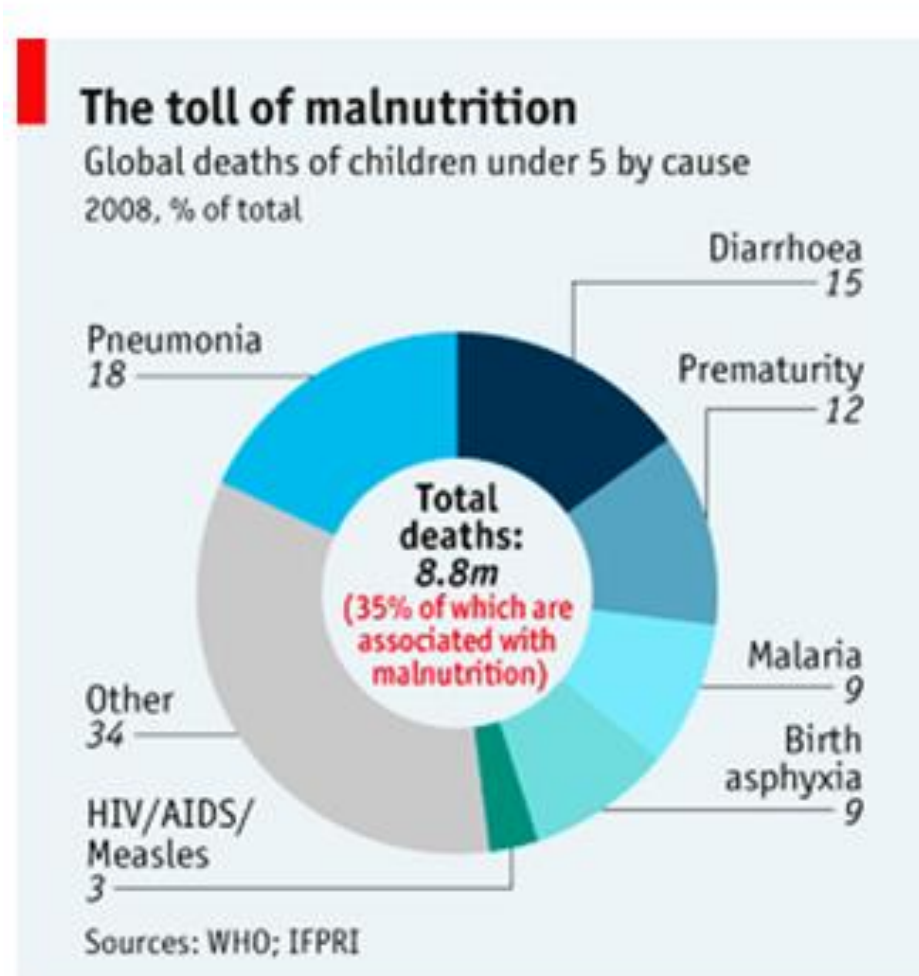
# Child labor-malnutrition & high population growth



# Low-cost methods of reducing malnutrition and under 5 mortality:

Nearly 18,000 children under five die daily— that is 6.6 million per year in 2012 down from 12.9 million in 1990—about 35% from malnutrition related in 2008 most highly preventable illnesses (see [www.childmortality.com](http://www.childmortality.com))

- 28% from dehydration due to diarrhea inducing disease (down to 15% in 2008, see Figure)
- 21% from viral disease: tetanus, measles etc. (vaccines)
- 15% from respiratory infections (antibiotics) up to 18% in 2008 (viral gas)



*How could employers ever pay less than the calories consumed by their workers?*

- **Answer:** it can happen: *blind, anonymous market forces can drive wages below the biological minimum—causing workers to expend more calories than their earnings can buy, leading to “wasting” and illness...*
- *How can this happen?* *They compete with workers who have food, but are need cash.*
- *Tragically, we see this happening to the Hassans, Mr. Hassan is ill and can no longer “drive” his rickshaw*

# NBEW: Key Assumptions

- At very low wage rates, performance improves with better nutrition— well fed workers take fewer sick days & have more energy to work— aka as the **Nutrition Based Efficiency Wage (NBEW)**
- Work effort increases with nutrition, up to a point: hard manual labor burns up to 300 calories/hour.
- For landless workers— with no other source of food-- calorie requirements create a *biological minimum* **reservation wage**
- But, landless workers often compete with other workers who have access to some land.
- If workers are abundant and jobs scarce, the market wage may fall below the reservation wage of landless workers -- result: malnutrition & illness.

# Three low-cost methods of reducing malnutrition and under 5 mortality:

- 1. Oral re-hydration salts:** 10 grams of glucose, 2.5 grams potassium chloride and 3.5 grams bicarbonate of soda, costs “a few cents” per dose Deaton quotes the Lancet to the effect that ORT is “potentially the most important medical advance this century.” Deaton, Angus (2013). *The Great Escape: Health, Wealth, and the Origins of Inequality* (p. 104). Princeton University Press. Kindle Edition. ).
- 2. Vaccines, oral antibiotics: cost less \$1 per treatment.**
- 3. Birth-spacing to allow breast feeding: Brazil <2 year spacing U5MR 138 per 1000, >2 years 58 per 1000.**

These are what B&D, 2012 Chapter 3 call “low hanging fruit” see also the 2014 Gates letter part 2 and Deaton, chapter 3 & 4.

# The Nutrition based efficiency wage

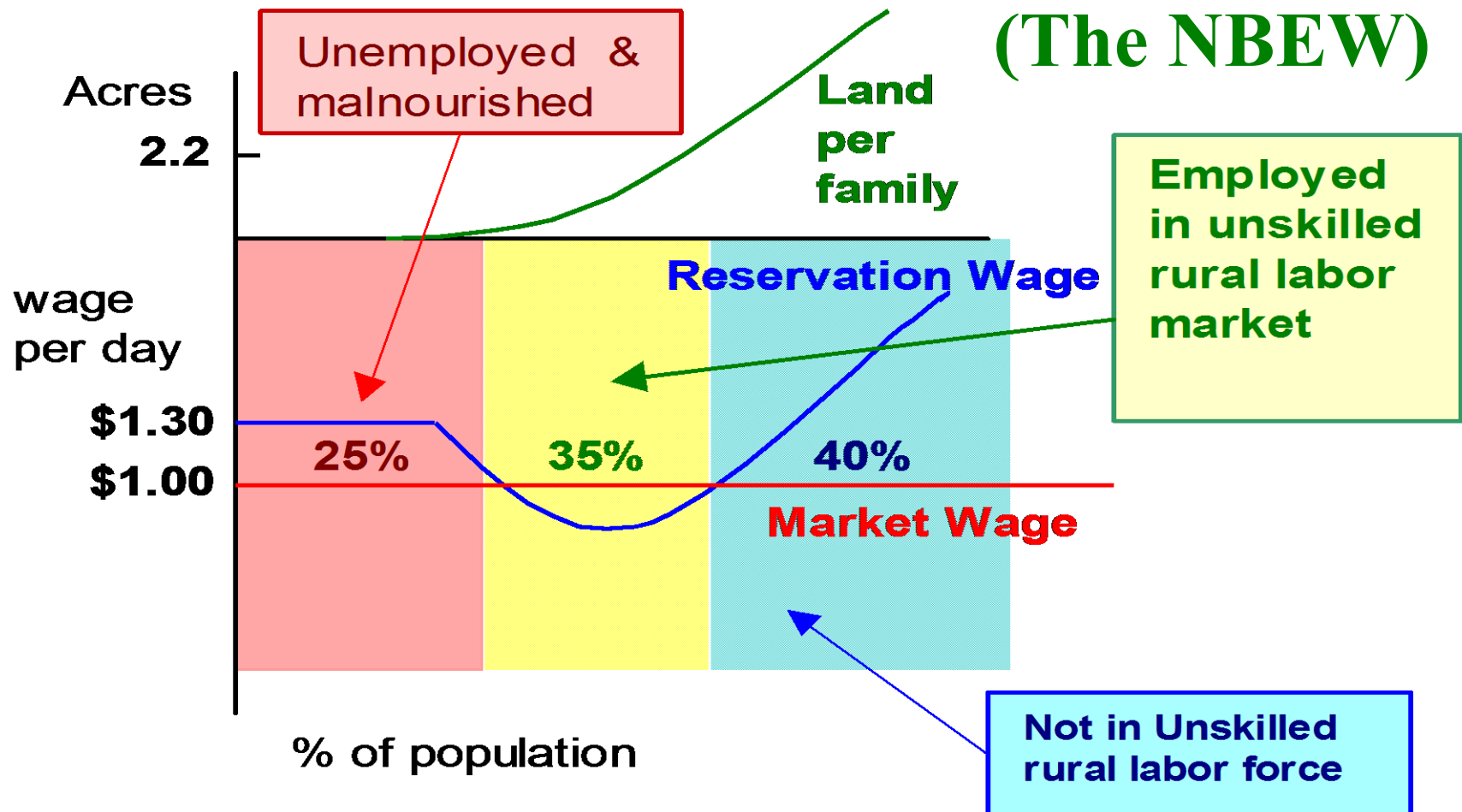
## NBEW poverty trap: preconditions

- **Landless workers**: unskilled labor account for 15-25% of typical village.
- **Smallholders** have some land, but not net sellers of food, often 25-30% of community.
- Net sellers of food– **small landholders** or farmers (20-25% of village population).
- **Larger landowners**, skilled crafts people, professionals, government officials (10-20%)

# Definition: the reservation wage

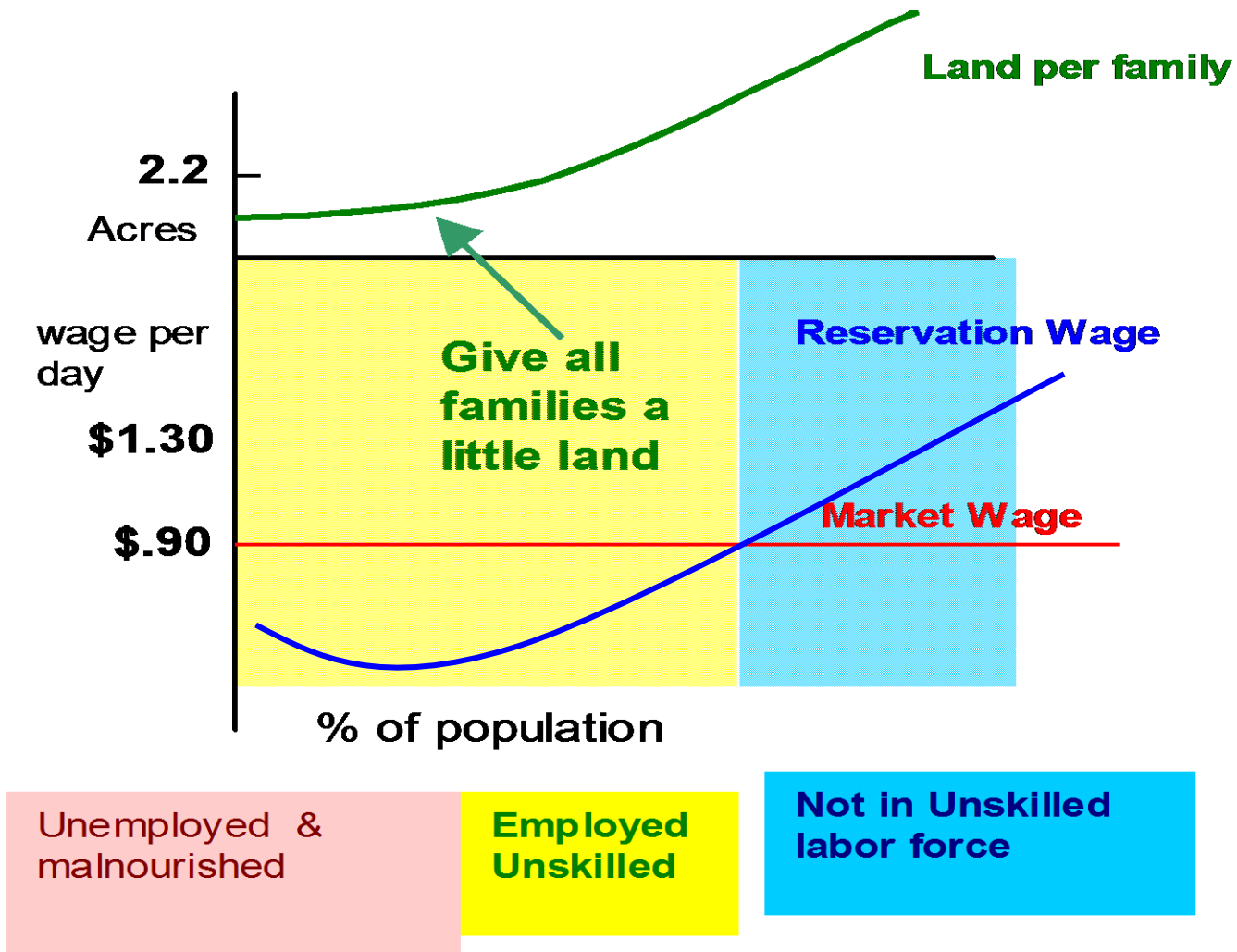
- The minimum (personal) wage one is willing to accept for their work – may vary over time if one really needs a job.
- **Rule:** if the offered “market” wage is greater than your reservation wage at that moment, you take the job, and start work... If the market wage is lower than your reservation wages, wait– look for a better job.
- Typically this is wage at which you are willing to work, but at very low wages your reservation wage may be the minimum need to buy the calories to do the work– under **Nutrition Based Efficiency Wage (NBEW)** the floor on the reservation wage may be the minimum at which a landless worker can work.

# An Explanation for Malnutrition: Nutrition-based Efficiency Wage Hypothesis

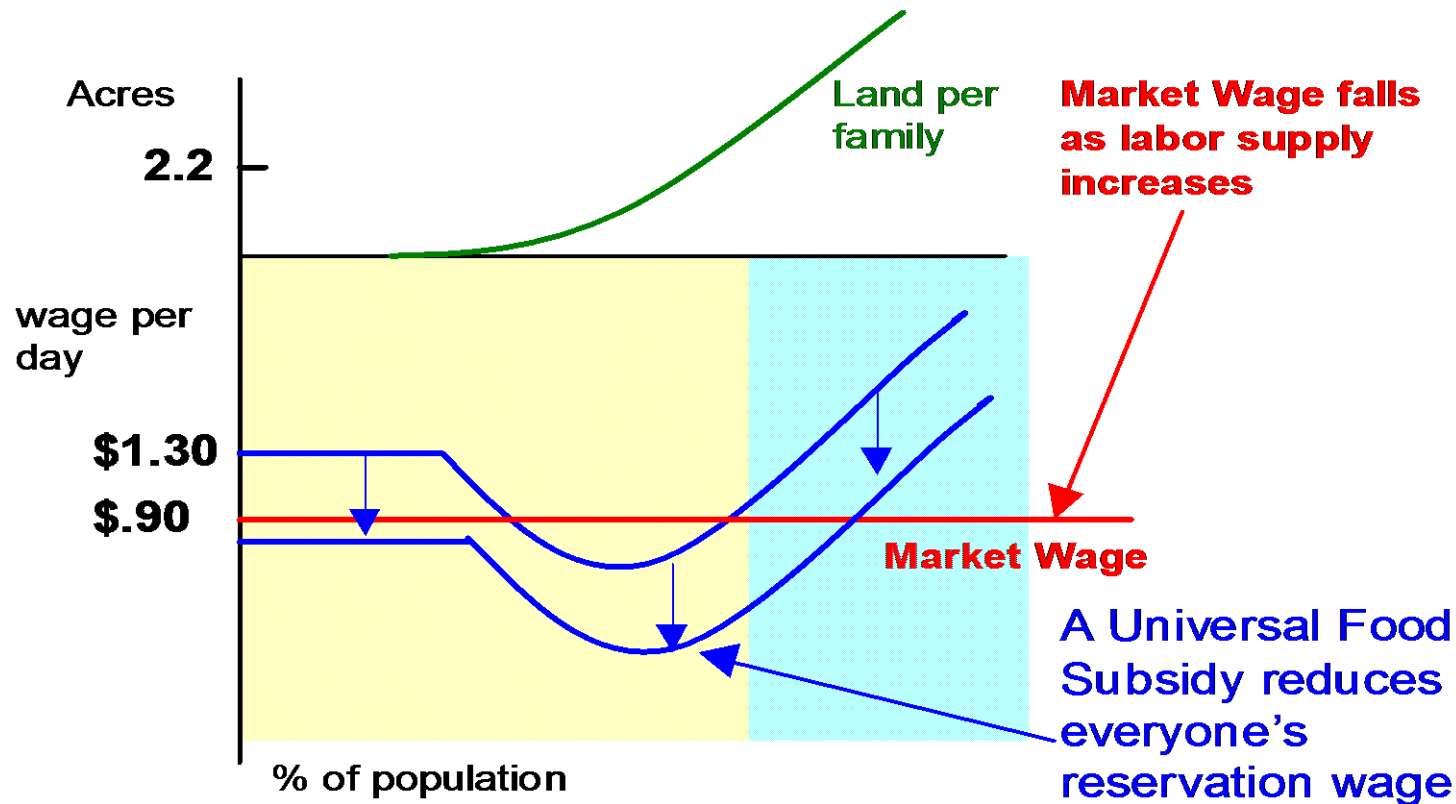




# Land Reform ends Malnutrition



# A Universal Food Subsidy also works, but is often expensive

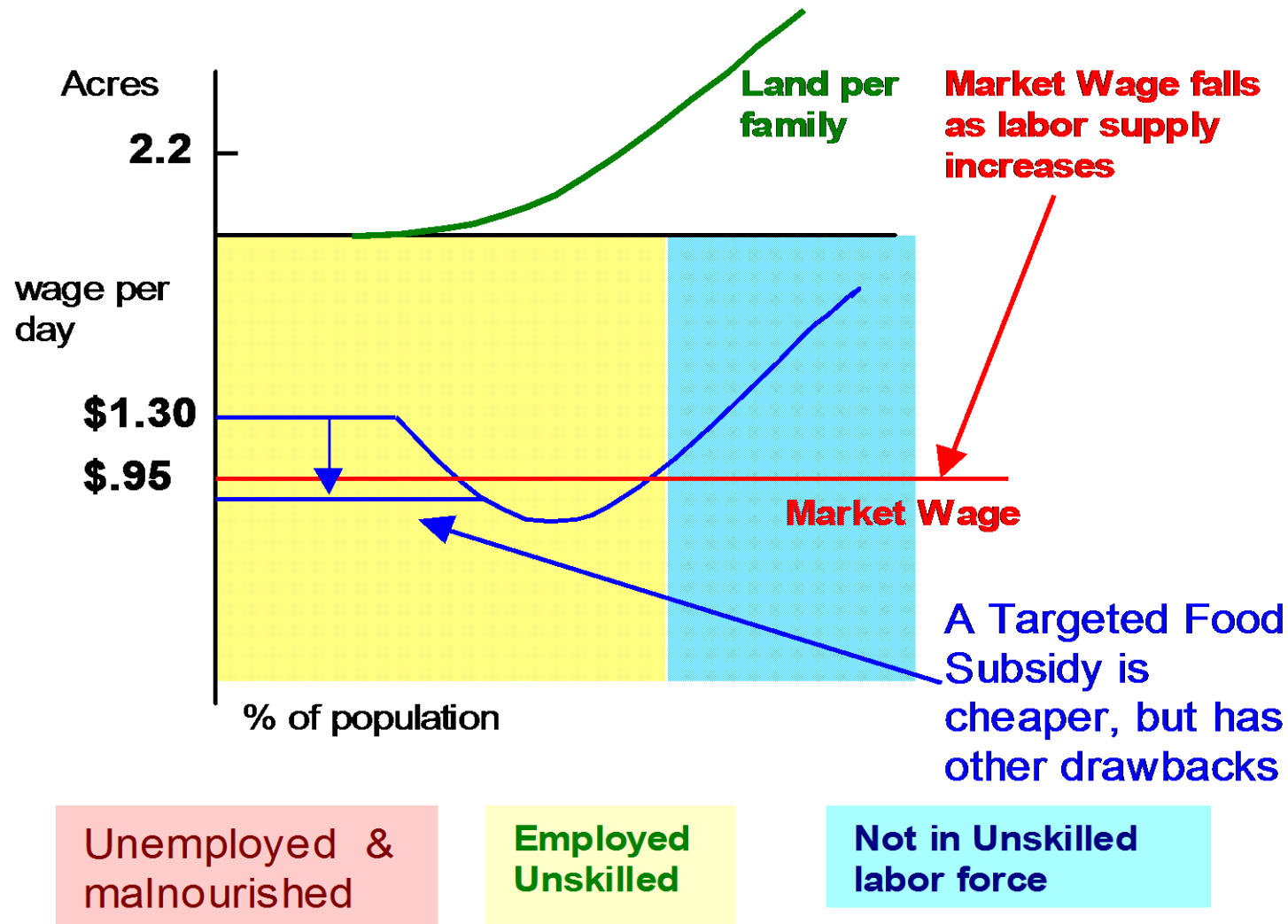


Unemployed & malnourished

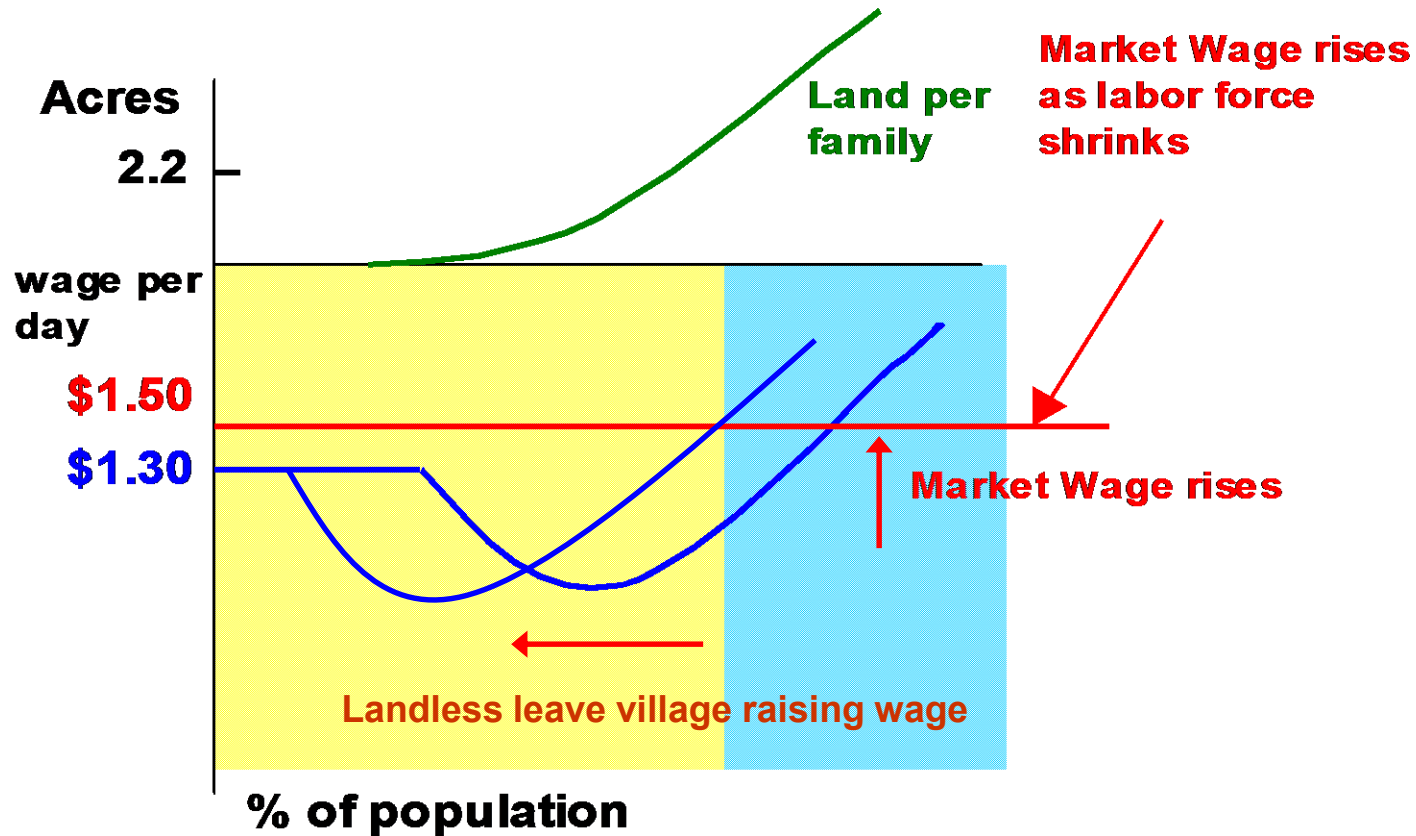
Employed Unskilled

Not in Unskilled labor force

# A Targeted food subsidy is cheaper, but can be problematic politically



# Typically best solution: migration from rural to urban labor market



Unemployed & malnourished

Employed Unskilled

Not in Unskilled labor force

# Targeting Food Transfers can reduce costs, but ....

- **Means Tested Transfers** -- food stamps, ration shops, expensive to check -- no social security #s in LDCs
- **Indicator Targeting:** certain groups are more vulnerable such as children or the elderly in rural areas, certain geographic areas, etc. Ration shops in bad neighborhoods.
- **Self-Targeting:** poor select themselves-- food only the poor eat-- e.g. coarse corn tortillas, or baladi bread in Egypt or most popular: food for work programs.
- **Universal or no targeting** for basic food products-- e.g. food, grain, certain oils, etc.

# Malnutrition: comparing explanations

	<u>NBEW</u>	<u>Food-First/Oxfam</u>
• Export crops divert food abroad	<b>no</b>	<b>yes</b>
• Unequal land dist.	<b>yes</b>	<b>yes</b>
• competition from small-holders	<b>yes</b>	<b>no</b>
• free competition in rural labor market	<b>yes</b>	<b>?</b>
• Big landowners the problem?	<b>no</b>	<b>yes</b>

# Causes of famine





# What Causes Famine?

- **Amartya Sen's** book *Poverty and Famines* (1973) argues *famines are rarely* due only to natural disasters— though government committees almost always claim a “food availability decline” (FAD) caused their most recent famine.
- More often, famine is due to loss of *income* or *entitlement by vulnerable groups, especially landless workers*- food prices rise too high for the poor to afford as was the case during the 1946 Bengal “boom famine”...
- **Government policy mistakes or neglect are also a common cause:** e.g., India vs. China's great famine in the 1950s is blamed on the poor lack of political power.



# Some debate the causes of famine:

- **Food availability decline (FAD)**, Natural Disasters, wars cause famine by reducing the supply of food.
  - **Solution: increase the food supply– food aid?**
  - **FAD and Entitlement** approach overlap when a natural disaster deprives of the poor of assets/income.
  - **Entitlement Failure** (Sen, 1981) argues cause of famine is typically loss of purchasing power or other means of accessing food.
  - **Solution: restore incomes of the poor**– redistribute food and purchasing power is more important than food supply– social capital and assets protect the poor.
- \***See [Ravallion \(1997\) pp. 1207-09](#) for a summary of this debate.**

# Famine Prevention Policy

## Implications of Sen's theory:

- **Famines are generally preventable**– e.g., in England 1600-1640 Stuart & Tudor Kings James I & Charles I stopped periodic famines for 40 years by storing grain and regulating grain prices during famines.
- **Botswana**– used food for work and targeted distribution of grain to increase access of poor to grain– did not just increase supplies.
- **Self-Targeting Food For Work programs** restore access of landless poor during crises or off-season months.

# Famine in a typical Medieval Village

The Effect of a 5% Crop Shortfall (35% price increase)  
by Social Group in a Rural English Village 1830-1860

Village Group:	Food Budget Share	Normal Grain Share	Food Shortage Share	Decline in Consumption Per Person
Landlords, Servants	15%	18%	20%	-1%
Farmers and Small landowners	17% (40% grain)	39%	44%	-1%
Shopkeepers craftsmen	35% (60% grain)	11%	11%	-12%
Landless Labor and the unemployed	70% (90% grain)	33%	25%	-28%

Fogel (1989) "Second Thoughts on the European Escape from Hunger.



**Photographs are from Brazilian economist/photographer Sebastião Salgado's photo essay on the Sahel (see also his essay on migrant workers) Bio:** Sebastião Salgado was born on February 8th, 1944 in Aimorés, in the state of Minas Gerais, Brazil. He lives in Paris. Having studied economics, Salgado began his career as a professional photographer in 1973 in Paris, working with the photo agencies *Sygma*, *Gamma*, and *Magnum Photos* until 1994, when he and Lélia Wanick Salgado formed *Amazonas images*, an agency created exclusively for his work. He has travelled in over 100 countries for his photographic projects. Most of these, besides appearing in numerous press publications, have also been presented in books such as *Other Americas* (1986), *Sahel: l'homme en détresse* (1986), *Sahel: el fin del camino* (1988), *Workers* (1993), *Terra* (1997), *Migrations and Portraits* (2000), and *Africa* (2007). Touring exhibitions of this work have been, and continue to be, presented throughout the world. Sebastião Salgado has been awarded numerous major photographic prizes in recognition of his accomplishments. He is a UNICEF Goodwill Ambassador, and an honorary member of the Academy of Arts and Sciences in the United States.

# Salt of the Earth: Wim Wenders

