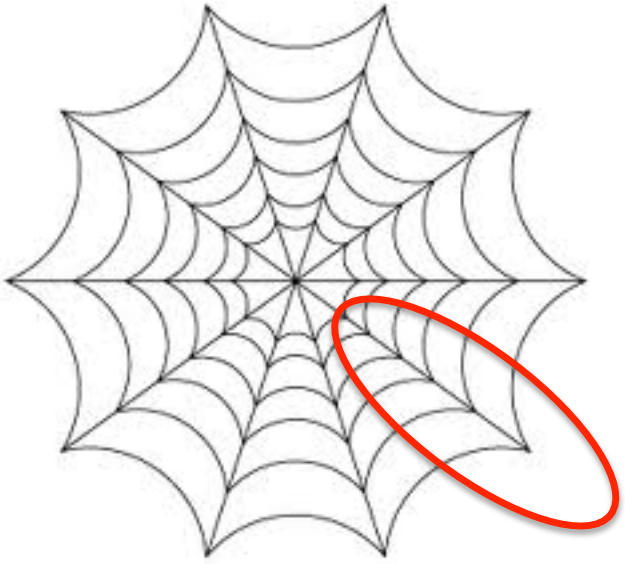
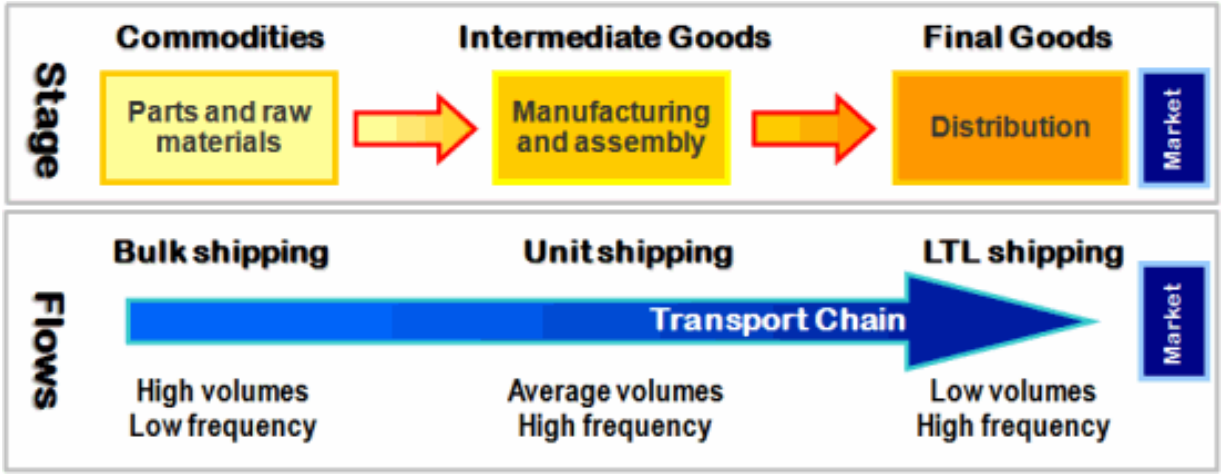
ENS commodities, commodity chains (CCs) and the environment

A note: How do footprints related to Commodity chains (CCs)?
Footprints specify the web of environmental impacts connected to a person or thing.
A commodity chain is like one strand of the web that traces the movement, value, and impact of a particular item across geographically-linked spaces.

Both are needed to understand environmental impact.
A footprint cannot be assessed without taking into account the commodity chains that make up its web
a commodity chain environmental analysis requires an examination of the webs centered on each of its nodes



Footprint



Commodity-Chains in Global Perspective

What do commodity chains give us that footprints don't?

That is, why study these things anyway?

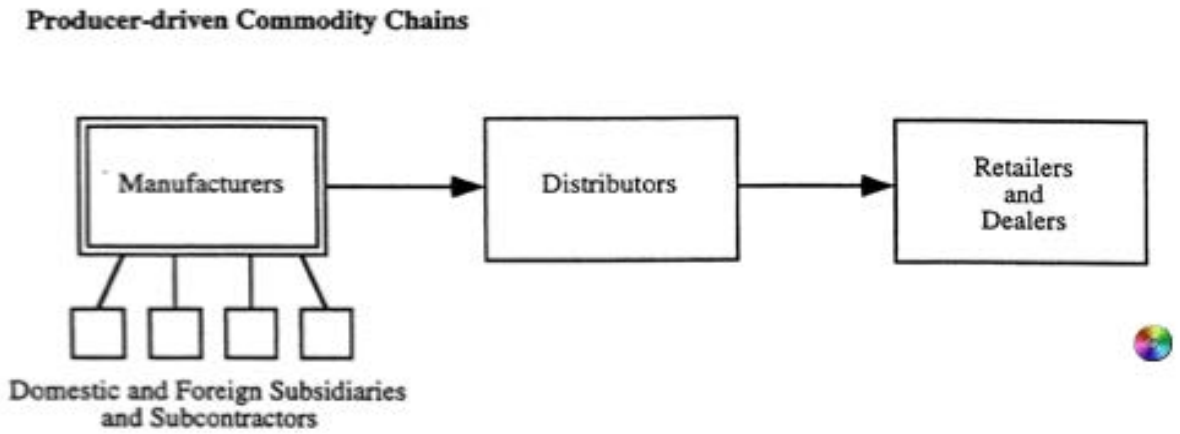
Commodity chain dynamics: Sales to the United States

a. **Source: Producers and environment in Global South**
b. **Intermediaries: Global Corporate Connections making $ from connections**
c. **Concentration of ownership, accumulation of wealth**

Power relations, who gets the $$?

Is this a boring slide or what?

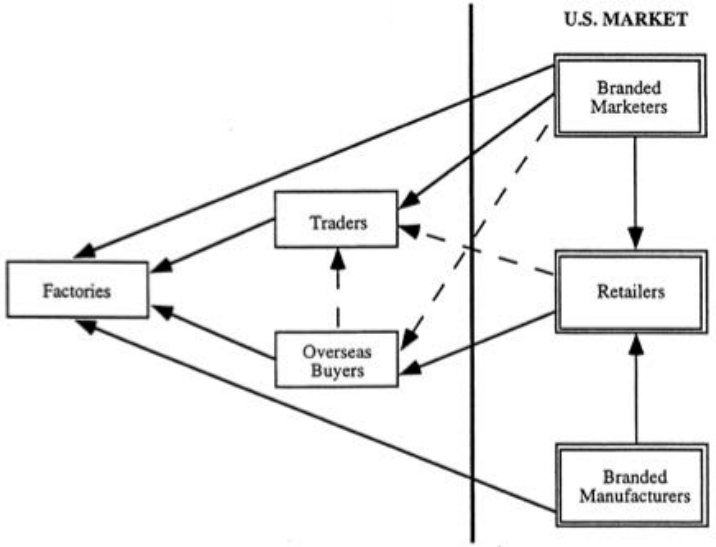
Producer-driven commodity chains managed by producers.
Retail owners have little control over chain structure: classic example—auto dealerships



Buyer-Driven Commodity Chains managed by wholesale/retail firms; classic example: apparel manufacture

1. **Commodity chains: Basic concepts**
   b. Nodes and links
   c. Each node and link has social, economic and environmental consequences

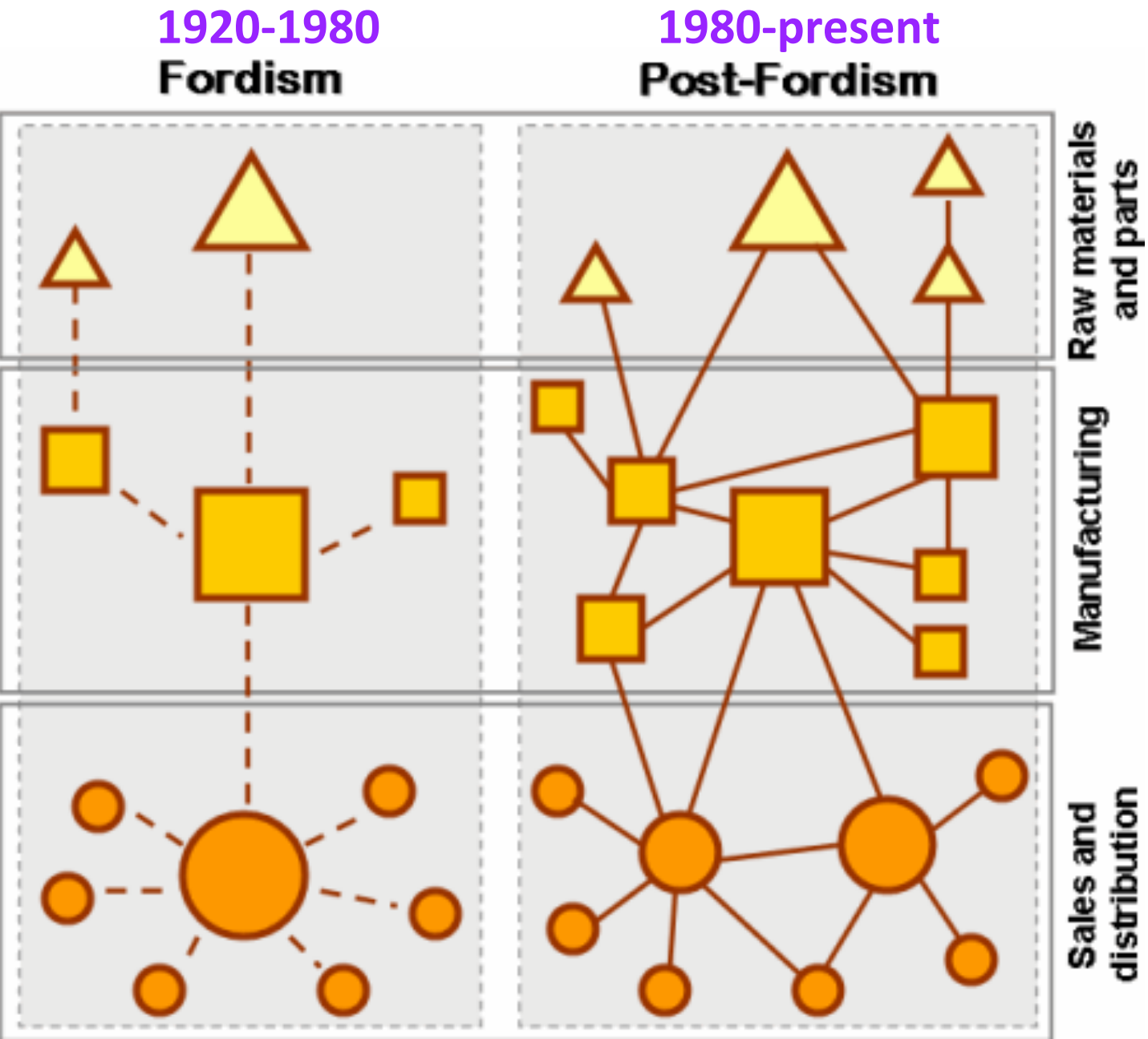
social=affects lives,
economic = wealth is accumulated,
ecological = environments affected



Notes: Solid arrows are primary relationships; dashed arrows are secondary relationships.

Fig. 1. The organization of producer-driven and buyer-driven global commodity chains.

Another perspective on commodity chains: an expression of evolving global economies



Historical Transformation of Commodity Chains: Contemporary commodity chains are 'post-Fordist', that is to say chains that involve many different sub-contractors

Commodity Chains: Who Has the Power?

Struggle: Buyer- versus producer-driven chains:

Who will wrest control of manufacturing? Manufacturing control requires both retail control and supplier control

Who will advance 'up the ladder' to brand manufacturing independence:

- **OEM** (original equipment) manufacturing, or 'full-package' manufacture,
- then to **OBM** (Own Brand) manufacture as foreign companies begin to produce their own brands.

¿Will Apple stay on top? Will it be displaced?
Wal-Mart? Amazon? How do these firms differ?

Commodity Chain Examples

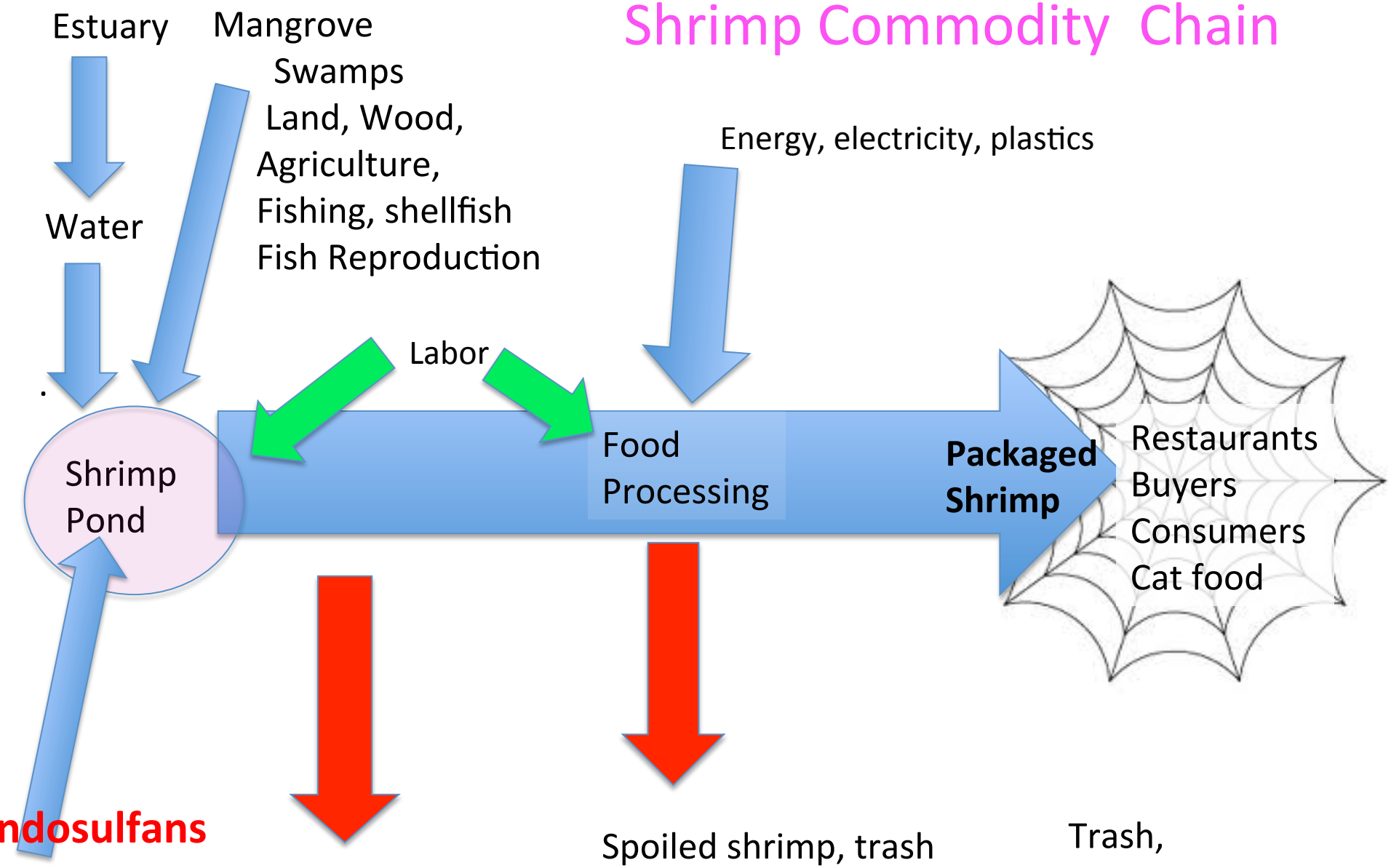
Example 1: production schemes in the Global South

Shrimp farming: Malaysia

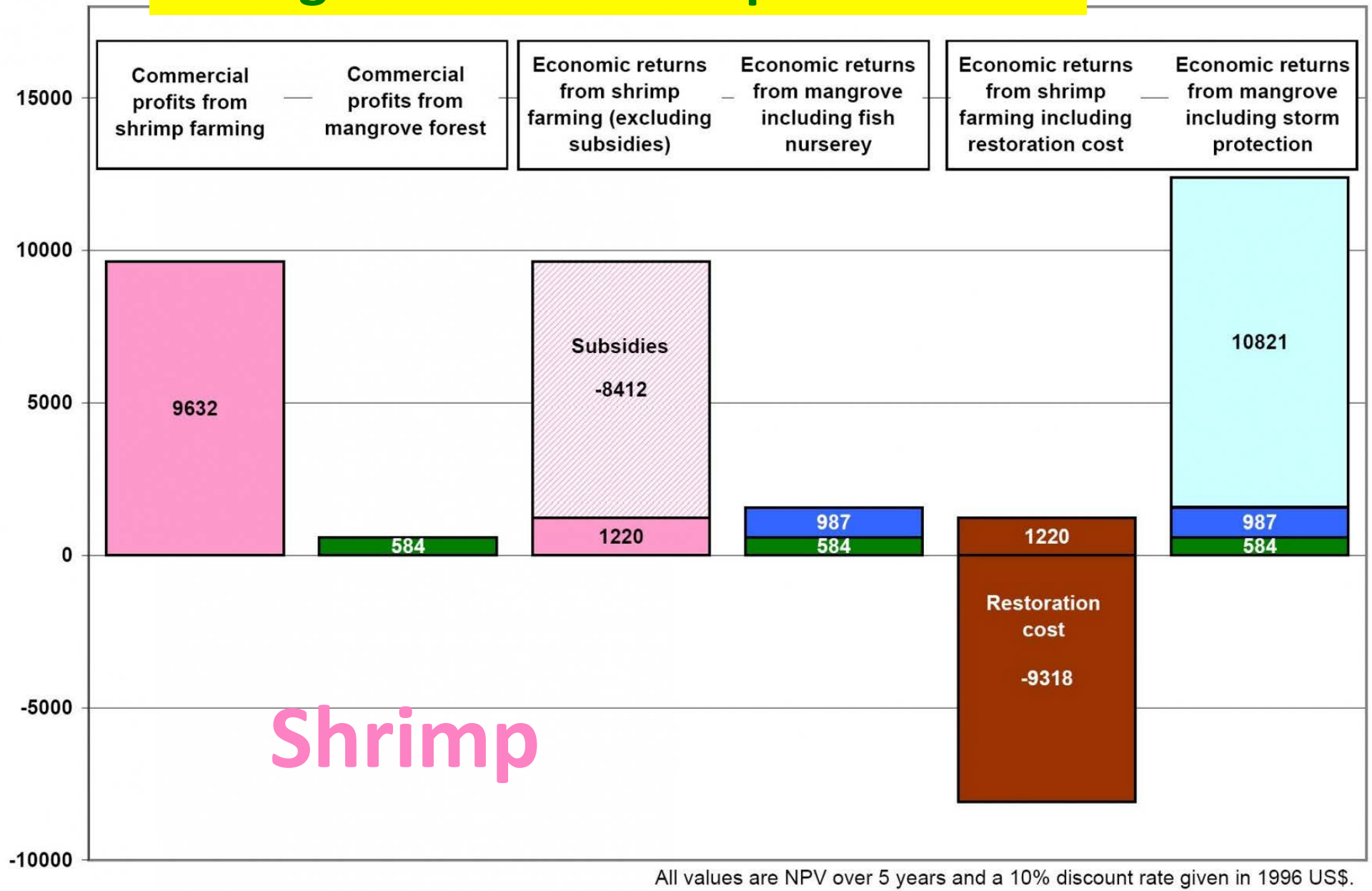
Env Justice: http://www.youtube.com/watch?v=hPJpPEH3l7o

Naturalcapital.org

Shrimp Commodity Chain



Ecological Subsidies to production!!



All values are NPV over 5 years and a 10% discount rate given in 1996 US$.

Conclusion 1.

1. Commodity chains are increasingly global in scope
2. The location of the different nodes, however, is constantly changing
3. Commodity chains embed power relations: the nodes each contain real people with interests in the location of brand name manufacture
4. Environmental Impacts depend upon Who has control over the chain

Conclusion 2: commodity chains make it possible to shift environmental destruction to new places and spaces

Process separation: The 'technical' division of labor permits industrial processes to be separated:

- **Labor intensive may be separated from capital intensive production steps**
- **Polluting processes may be separated from non-polluting (clean) production steps**

A 'global assembly line' permits the location of polluting and labor intensive processes in less well regulated areas

It becomes an issue of **environmental justice** when process separation exploits relatively less powerful people – often of disadvantaged groups such as the poor and people of color

Nature as an input into manufacturing:
Is exploitation necessary to capitalism?
Does conservation require revolutionary change?

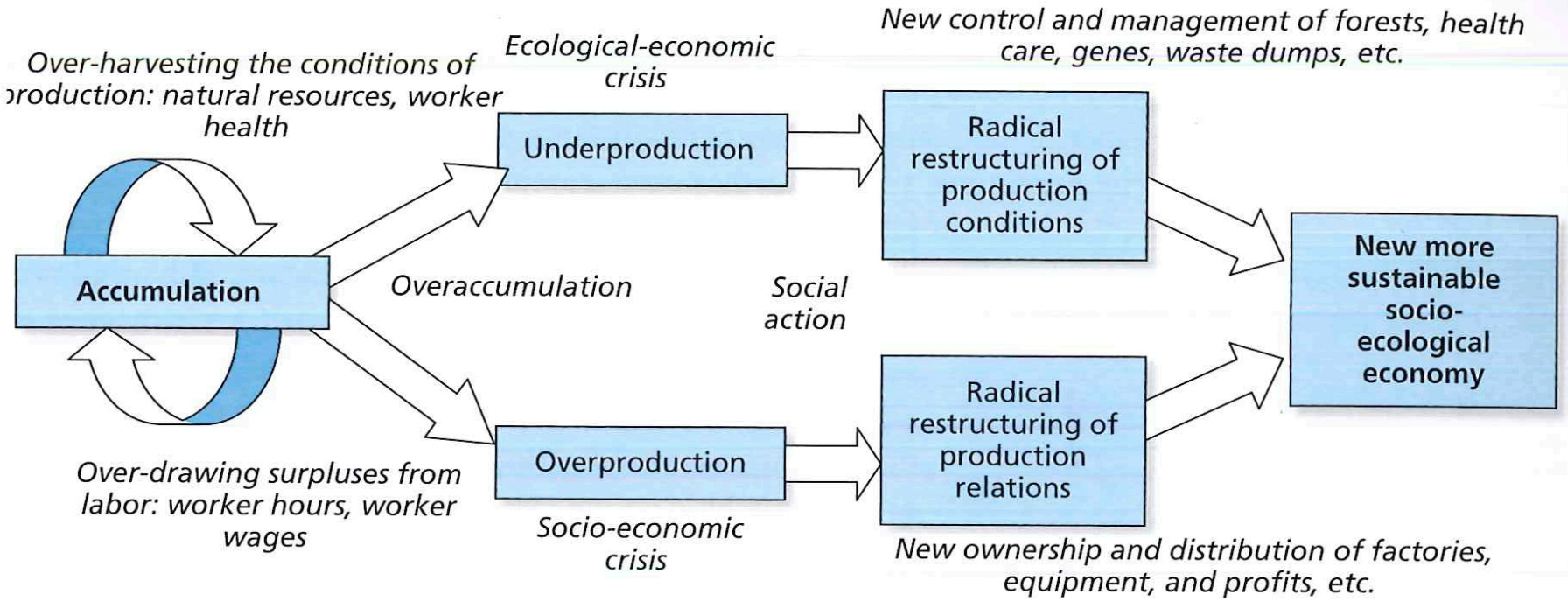


Figure 7.2 Schematic representation of the possible contradictions that capitalism produces and the social and environmental responses they engender, possibly leading the way to a more sustainable and transparent society. *Source*: Adapted from O'Connor (1988).

What is Capitalism?

Capitalism is a production system predicated on the constant increase in wealth via the appropriation of surplus value. Companies that grow less slowly than others fail or are bought out by faster growing companies

Two modes of accumulation:

1. Primitive accumulation: stripping assets from workers or nature
2. Technological change (p. 103): finding ways to increase production efficiency through improved manufacturing, distribution, etc. practices

These struggles to accumulate, this competition among capitalists, leads to crises of overaccumulation and underconsumption

Revisiting the Shrimp Commodity Chain

Shrimp farming: Malaysia

Env Justice: http://www.youtube.com/watch

Crises are a part of capitalism

What type of crisis is this?

Naturalcapital.org

Revisiting the Shrimp Commodity Chain

Shrimp farming: Malaysia

Env Justice: http://www.youtube.com/watch

Crises are a part of capitalism

What type of crisis is this?

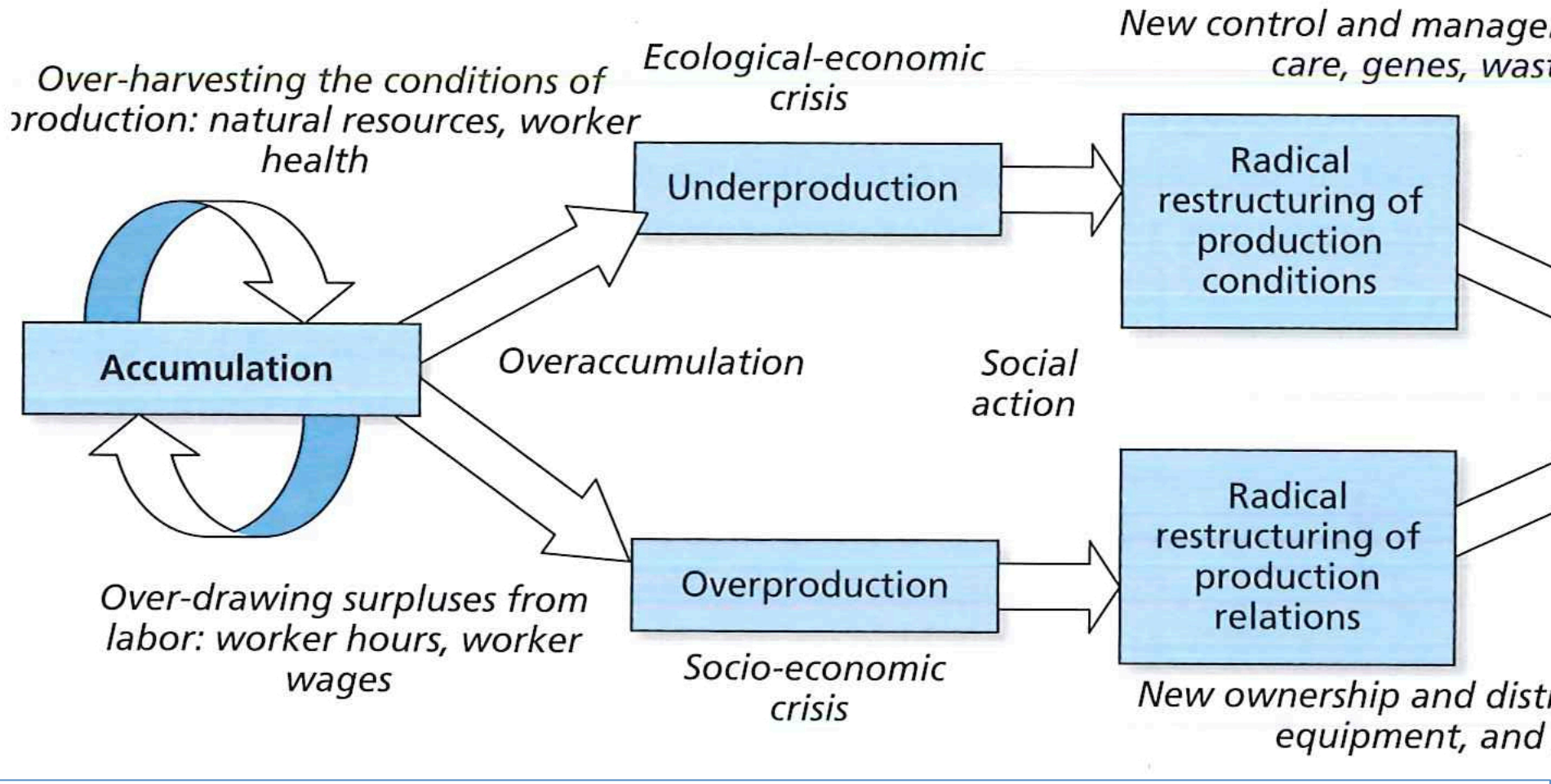
Overaccumulation?
How does that matter?

How does it lead to Crisis?
How does it lead to environmental crisis?

Naturalcapital.org

Underproduction due to over-harvesting: Global versus Local, shrimp versus food

Social Action: Fighting against Loss of Ecological/Economic Health



Local People induced to work for Shrimp Farms, Since their local sources of food and income are gone

Revisiting the Shrimp Commodity Chain

Shrimp farming: Malaysia

Env Justice: http://www.youtube.com/watch

Crises are a part of capitalism

What type of crisis is this?

Overaccumulation?

How does that matter?

Spatial Fix?

Scale?

Eco-Feminism?

Naturalcapital.org

Commodifying nature makes it an object of exchange

We view the commodity in terms of its exchange value;
we no longer think of its use-value in nature or of the labor used to produce it

How does advertising and media produce this?
How does commodity fetishism persist despite the internet etc.?

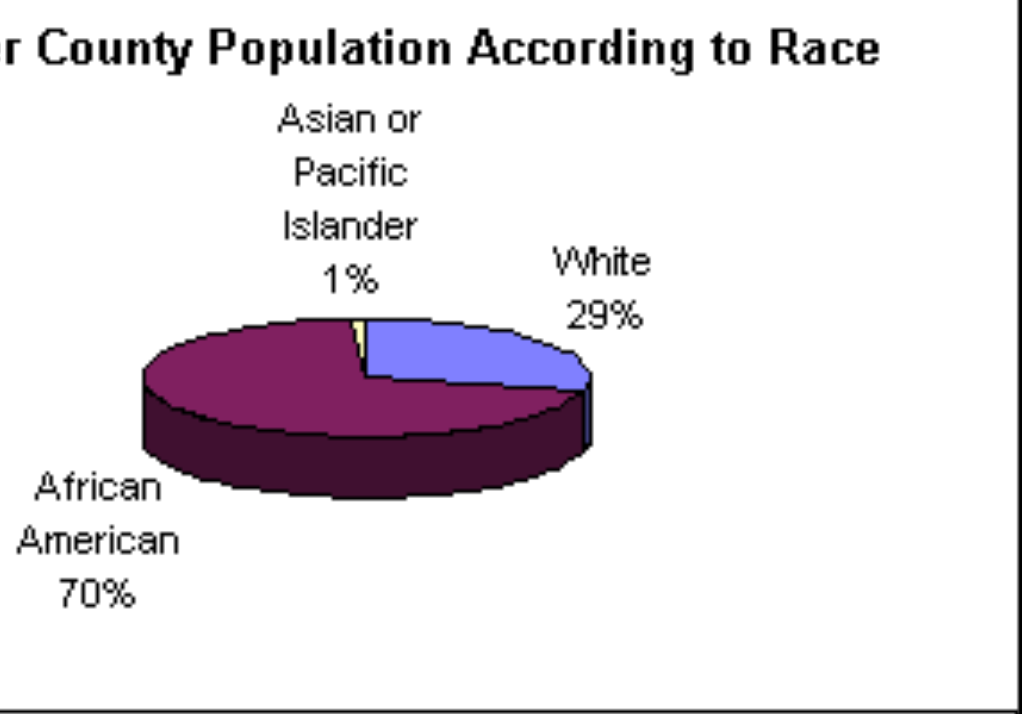
US National Context

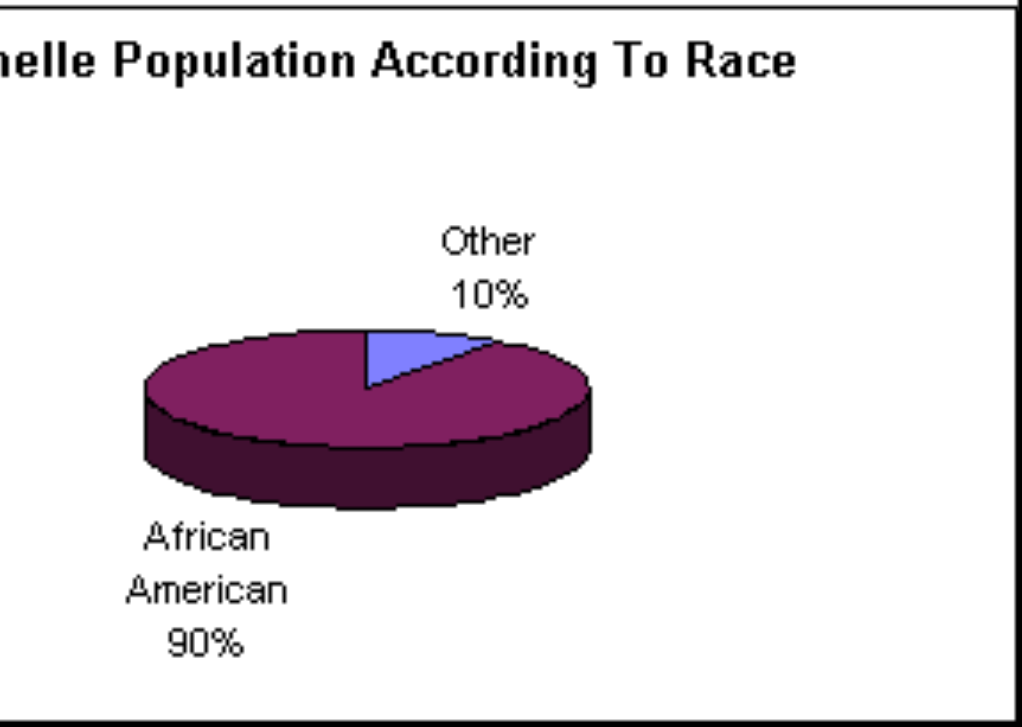
People of color live in more heavily contaminated areas

People of color receive higher workplace exposure

Global North Context

Demographics: Race and Class in a toxic waste dumping in communities of color



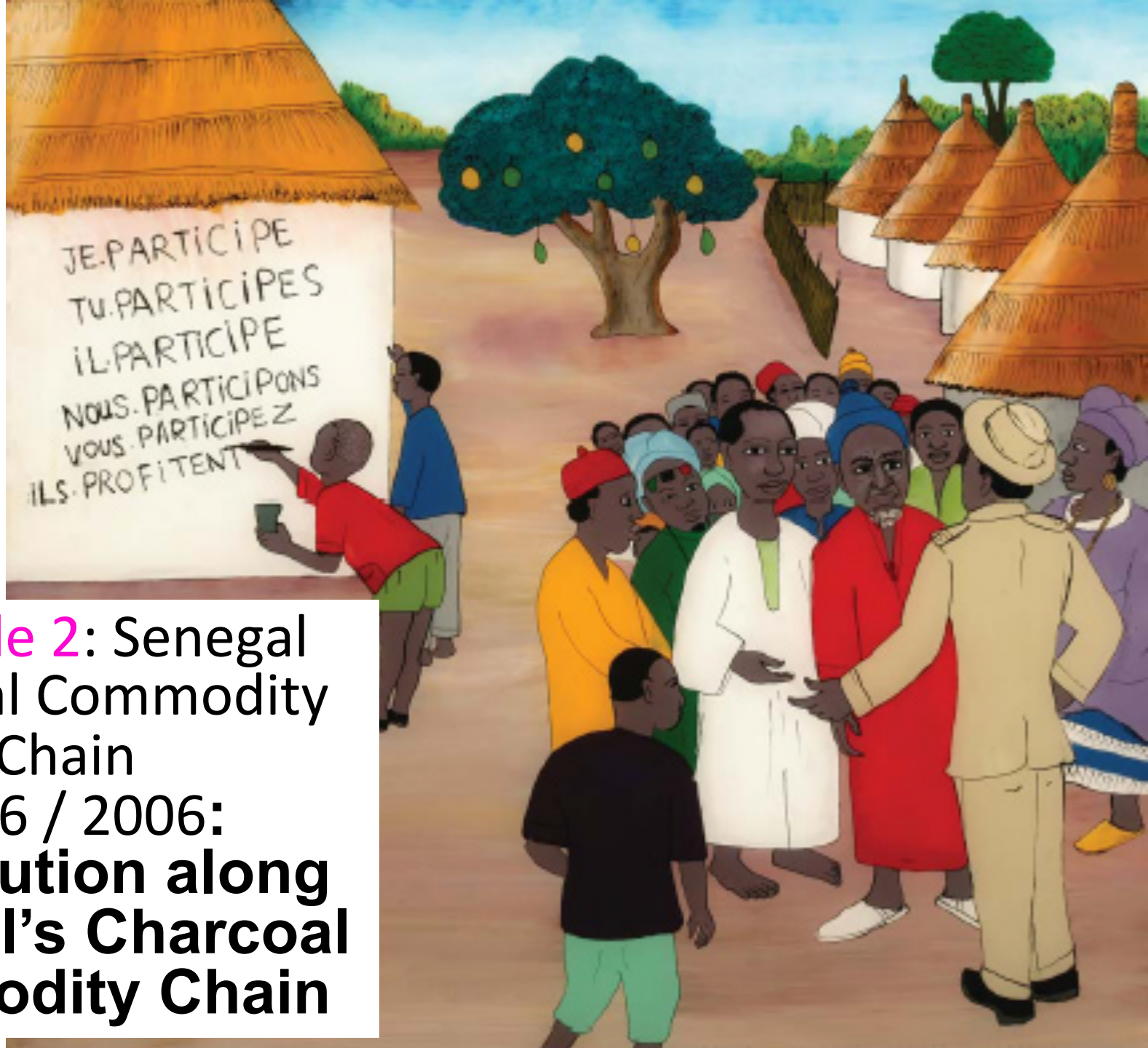


Toxic Waste Dumps/ Landfills

Black community and toxic dumps

Chester Pennsylvania

http://www.youtube.com/watch?v=5Opr-uzet7Q



Example 2: Senegal Charcoal Commodity Chain
1986 / 2006:
Distribution along Senegal's Charcoal Commodity Chain

A Commodity Chain, analyze local policies and practices

A Method of analyzing "*access*"

Who reaps the flow of benefits from things?

[Peluso and Ribot 2003]

Identify Market Actors

Urban population: consumers

Retailers

Urban wholesalers

Transporters

Co-operatives

Merchants/ Patrons

Rural Intermediaries
Kontrapalaas

Migrant Woodcutters

Forest Villages

FONT-SCALED PROFIT DISTRIBUTION

Who earns the $?
Who suffers the Cost?

Retailers
10,000

Urban Wholesalers

200

Merchants/Patrons

5000-160 active

Migrant Woodcutters
18,000

Forest Villages

Example: Summers' Memo: February 1992
Economist prints World Bank internal memo from WB head Lawrence Summers:
memo was about pollution 'exports'

Summers: Since demand for clean environment is highly income-elastic, high-income country's willingness to pay to export pollution should lead to "welfare-enhancing" trade.

Ergo: As soon as they get rich from importing toxic waste they won't want it.

Question: how does environmental conservation operate?

i. Earth is destroyed, but do people react?
ii. Is it politics? With information do people react to protect our future?
iii. Is it economics? Our ability to earn a livelihood is affected?

Commodifying Nature

Primitive Accumulation: Definition: Direct exploitation of nature or labor without any form of compensation

Narrative story: Grasshopper and the Ant

Reality: Violent expropriation of natural resources: Chicago story, Yellowstone, Serengeti

Grand Canyon of Yellowstone:
Native Americans Expelled 1870s

Teddy Roosevelt in Yellowstone

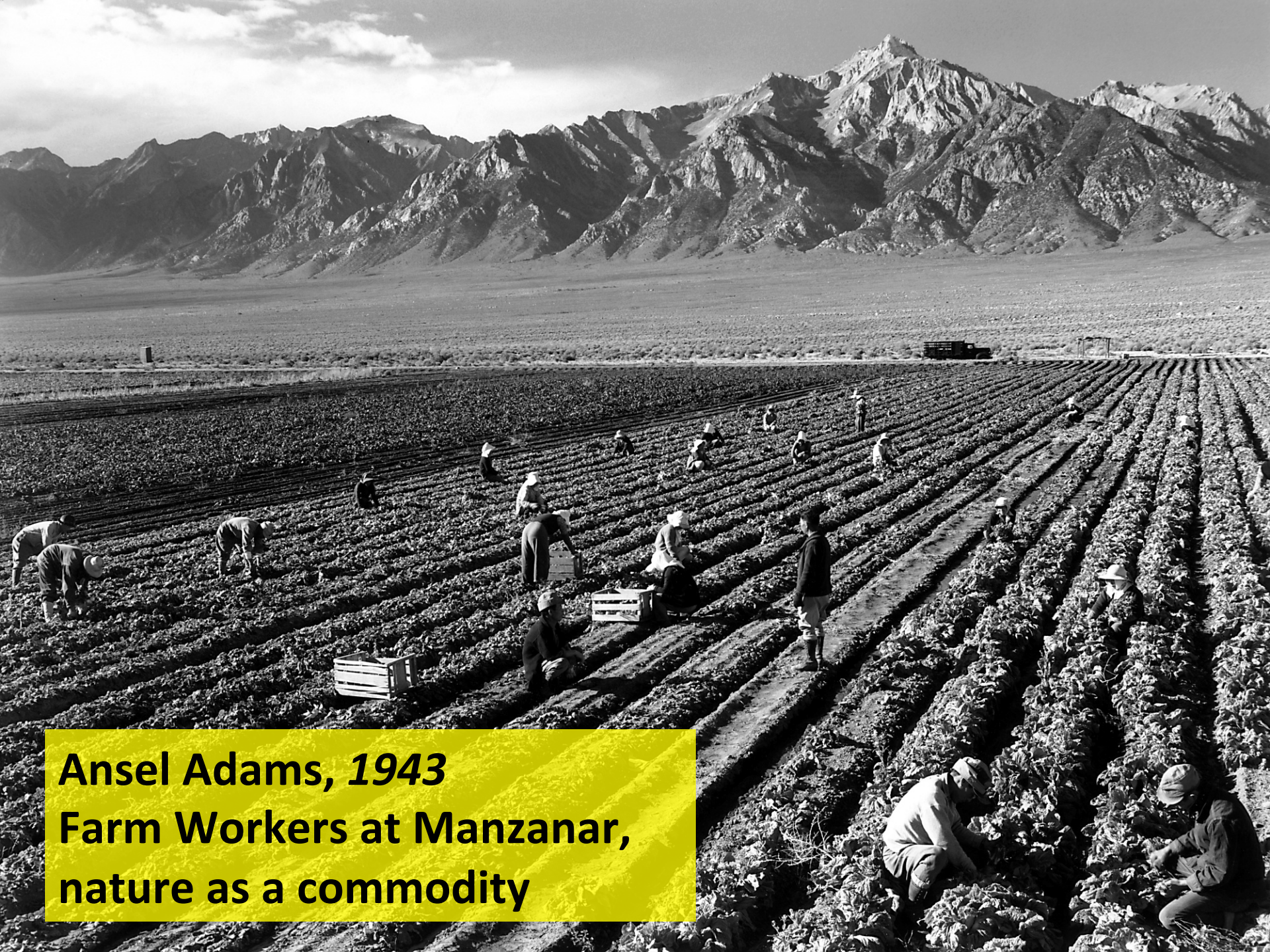
Commodity Fetishism: Does the everyday experience of commodity consumption reinforce the separation of people and the environment?

What is commodity fetishism?

Commodity fetishism may be defined as:

A representation of Exchange value (the monetary value of the product) as the ONLY form of value in a manner that masks 'labor' value and 'nature' value

Examples: ? Cocoa, piranha



Ansel Adams, *1943*
Farm Workers at Manzanar, nature as a commodity


FIN

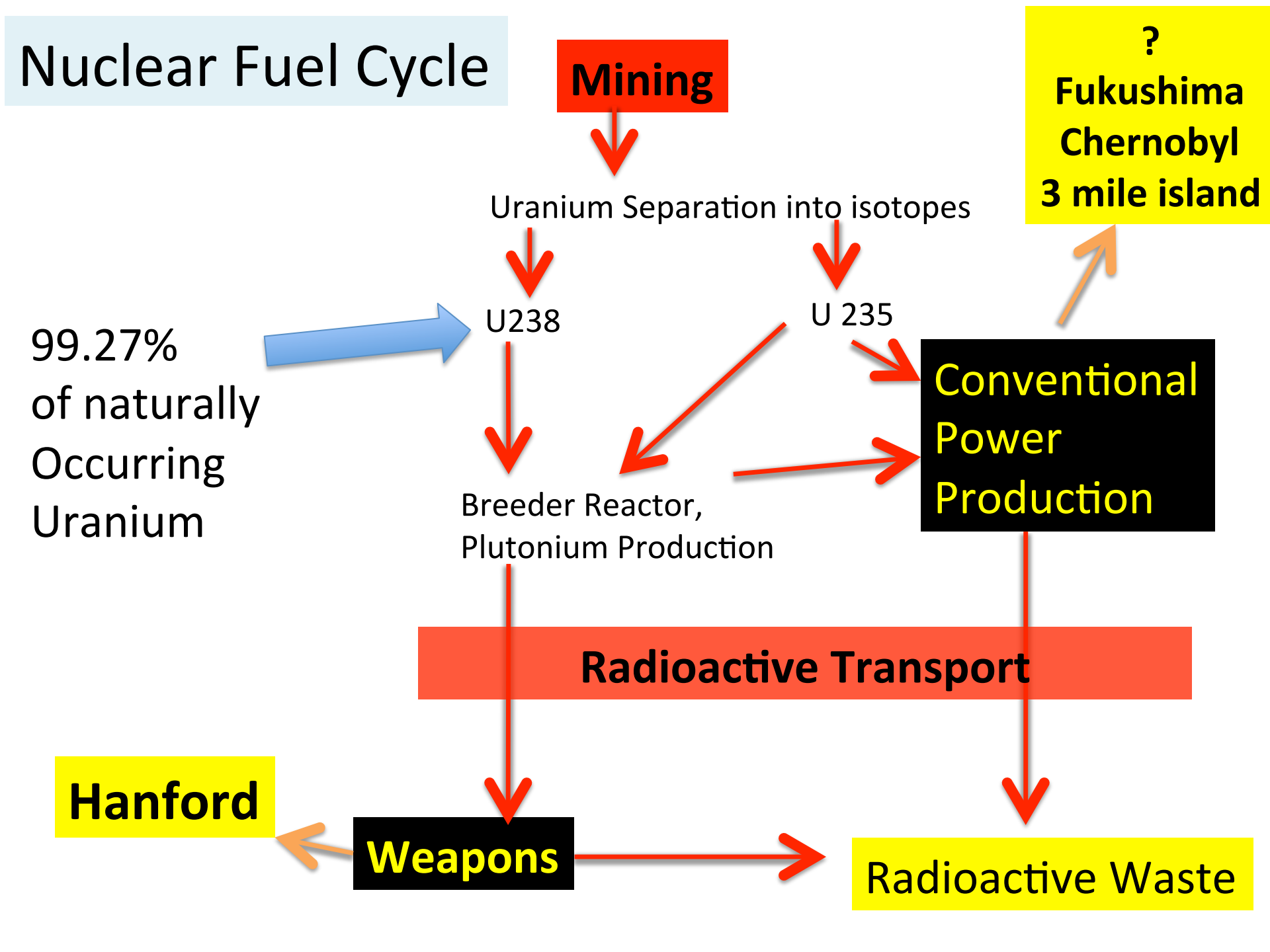
Commodity-Chain Examples

Example 2. The nuclear question

A matter for debate…

How to assess??

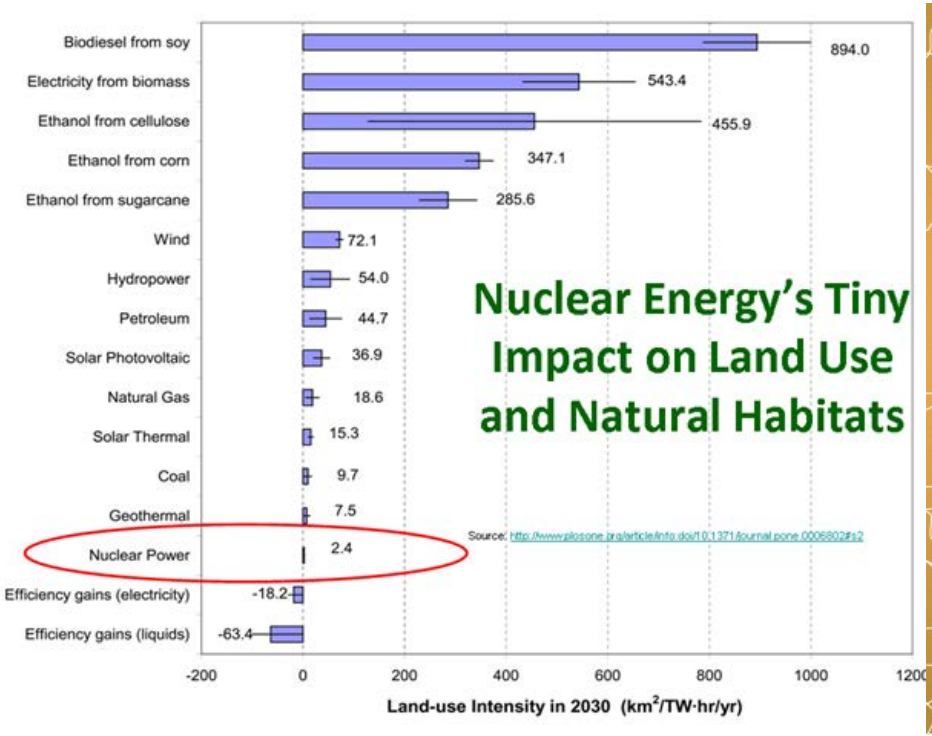
Nuclear Fuel Cycle

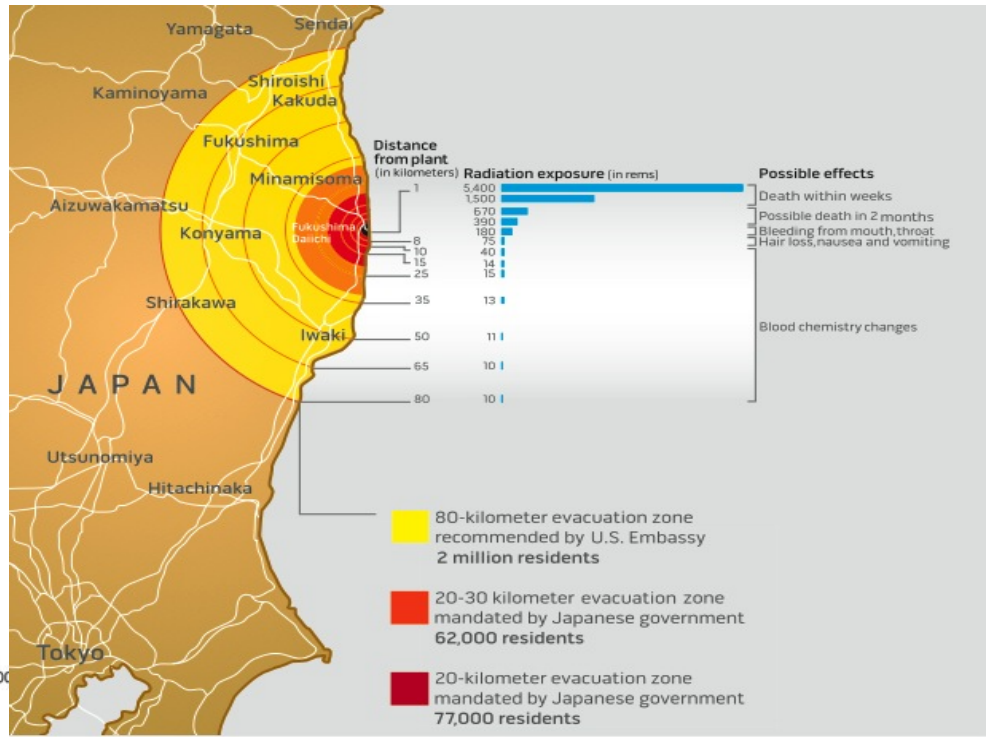


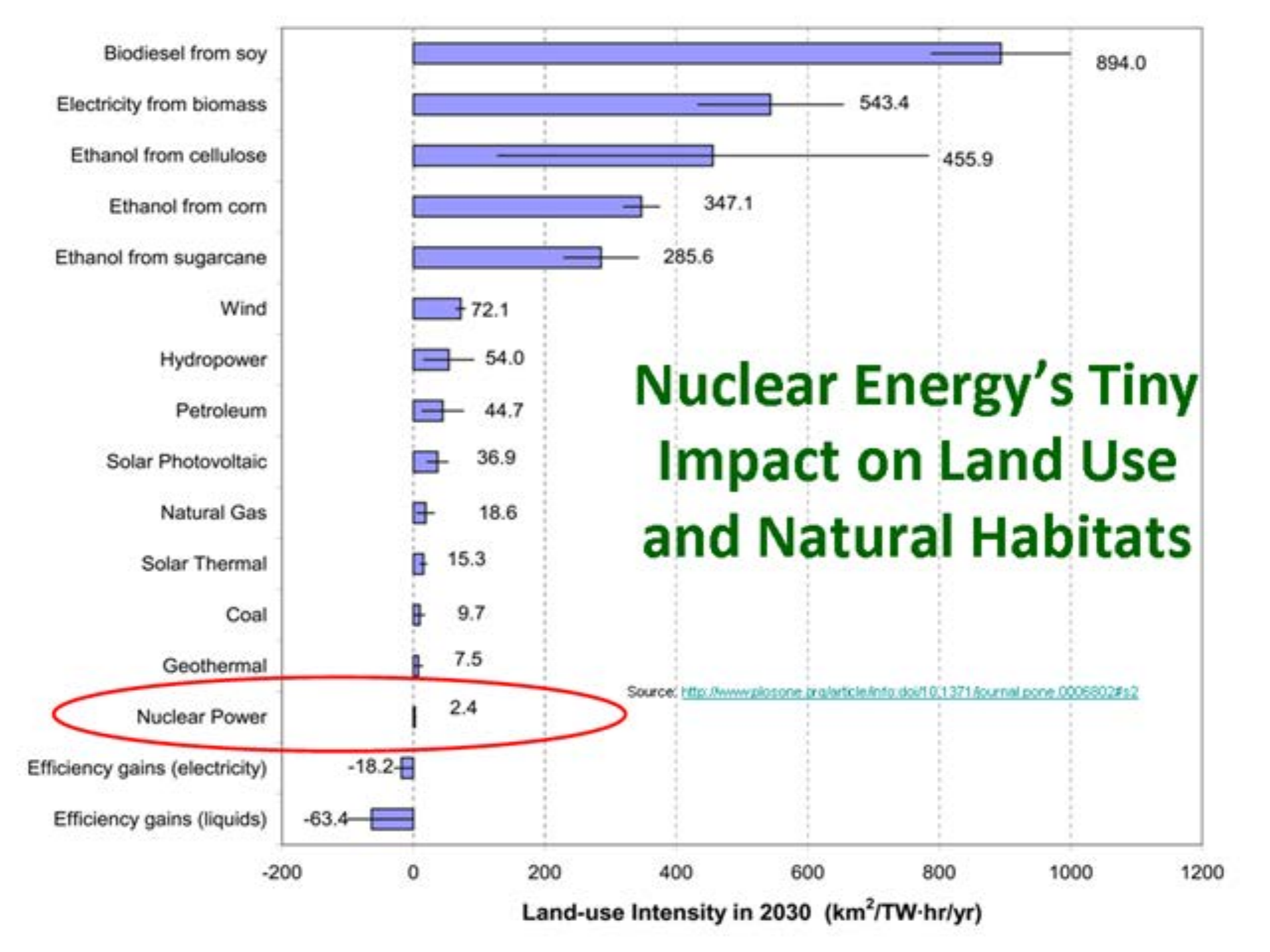
What IS the Nuclear Footprint

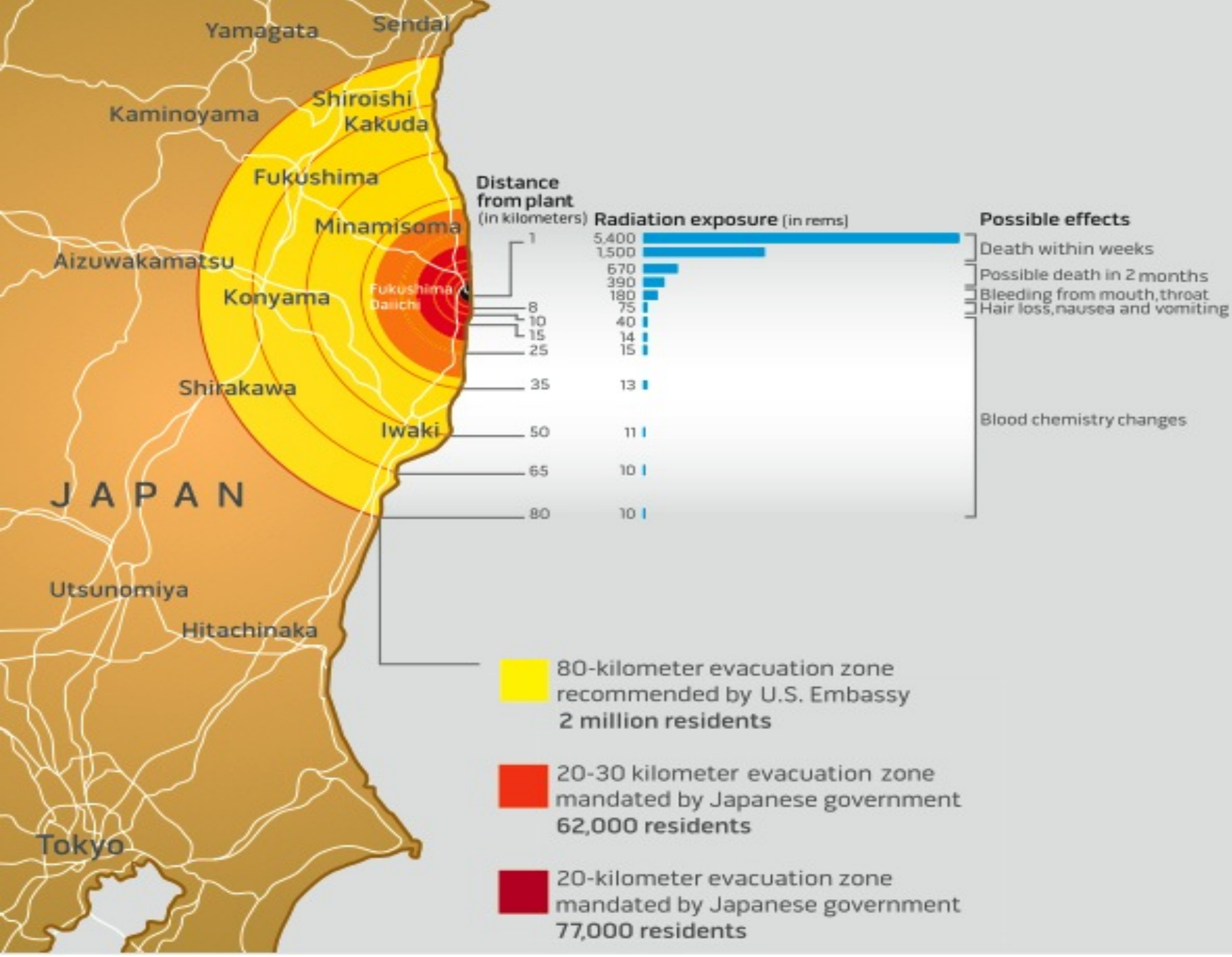
Is it?:
The Carbon Footprint?

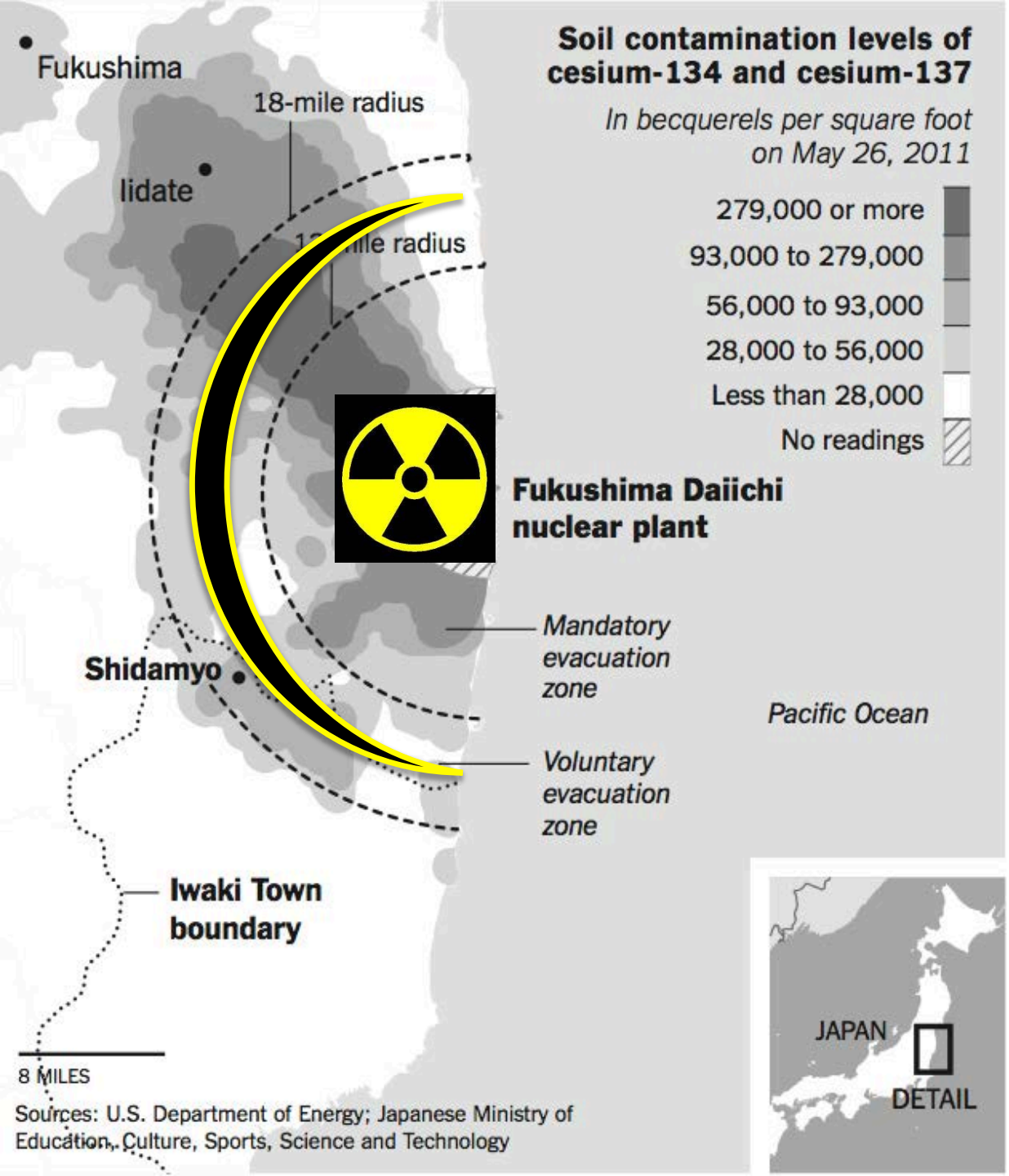
Or?:
The radioactive footprint?






Biodiesel from soy
Electricity from biomass
Ethanol from cellulose
Ethanol from corn
Ethanol from sugarcane
Wind
Hydropower
Petroleum
Solar Photovoltaic
Natural Gas
Solar Thermal
Coal
Geothermal
Nuclear Power
Efficiency gains (electricity)
Efficiency gains (liquids)
894.0
543.4
455.9
347.1
285.6
72.1
54.0
44.7
36.9
18.6
15.3
9.7
7.5
2.4
-18.2
-63.4
-200
0
200
400
600
800
1000
1200
Land-use Intensity in 2030 (km²/TW·hr/yr)
Nuclear Energy's Tiny Impact on Land Use and Natural Habitats
Source: http://www.plosone.org/article/info:doi/10.1371/journal.pone.0005802#s2


Yamagata
Sendai
Shiroishi
Kaminoyama
Kakuda
Fukushima
Minamisoma
Aizuwakamatsu
Konyama
Fukushima Daiichi
Shirakawa
Iwaki
JAPAN
Utsunomiya
Hitachinaka
Tokyo
Distance from plant (in kilometers)
Radiation exposure (in rems)
Possible effects
1
8
10
15
25
35
50
65
80
5,400
1,500
670
390
180
75
40
14
15
13
11
10
10
Death within weeks
Possible death in 2 months
Bleeding from mouth, throat
Hair loss, nausea and vomiting
Blood chemistry changes
80-kilometer evacuation zone recommended by U.S. Embassy
2 million residents
20-30 kilometer evacuation zone mandated by Japanese government
62,000 residents
20-kilometer evacuation zone mandated by Japanese government
77,000 residents



20 kilometer radius X 1ft of topsoil = $\Pi (12.4)^2/2 = 240$ square miles =
6.7 billion cubic feet =
187 million cubic meters

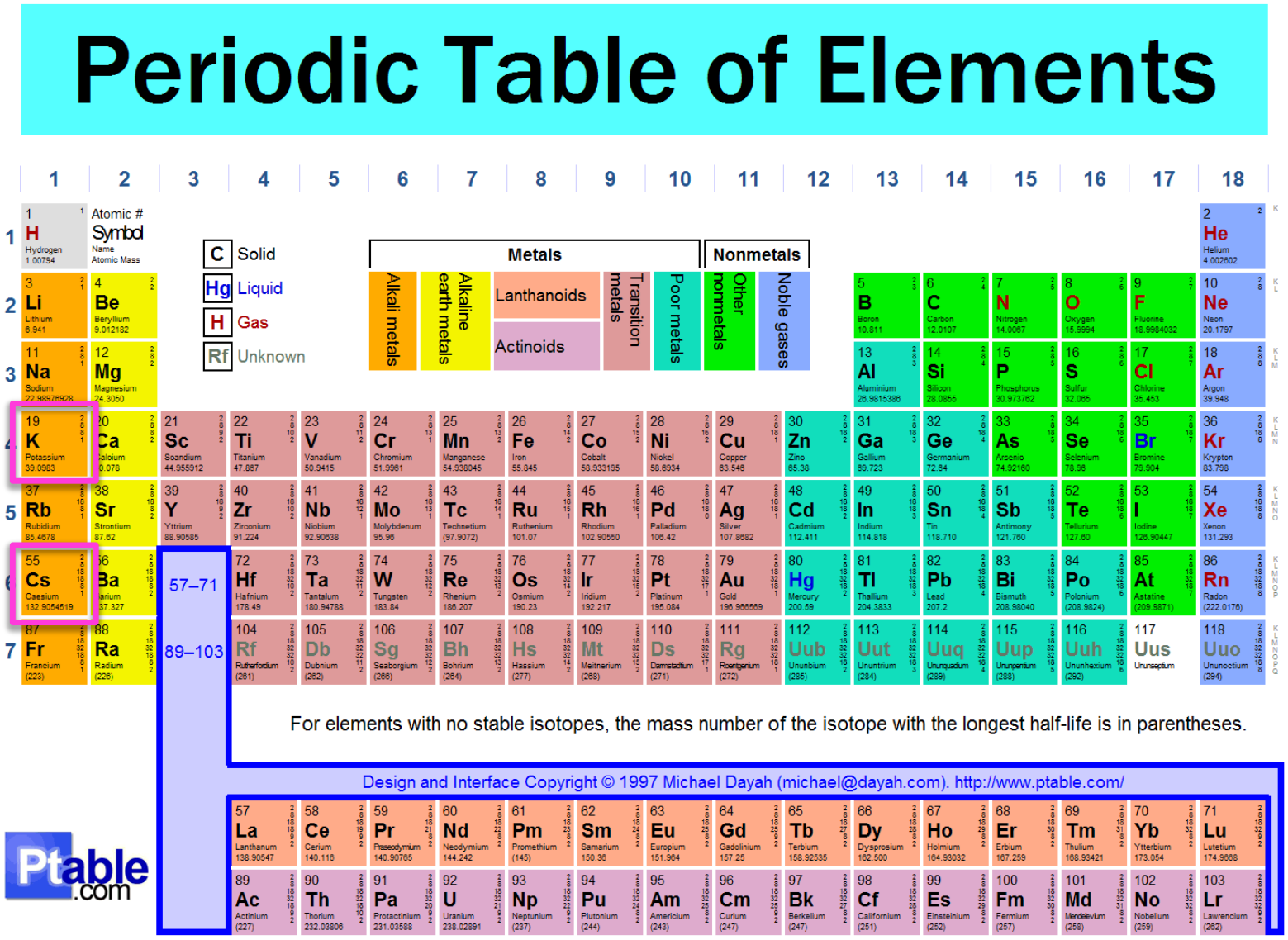
BUT, How to remove contamination without destroying the complex agrarian environment and destroying wildlife?

Fukushima officials estimate **only** 31 million cubic meters will be removed, also power wash orchards, strip bark from trees… But where to put it?

Not to mention ocean contamination!!

"Japan's decontamination efforts are focused mostly on the radionuclides caesium-134 and caesium-137, which…have half-lives of two and 30 years respectively." – Environment 360

Chemically similar to potassium, cesium accumulates mainly in the reproductive organs and muscles.



Carbon Intensity of Nuclear Power?

Radioactive Waste

High Level versus Low Level
- Gamma emitters, alpha emitters
- intensity (rapidity) of decay

Civilian versus Military
- Nuclear Power and Medical equipment
- decommissioning warheads etc.

1. Production and Fuel Cycle

2. Health effects

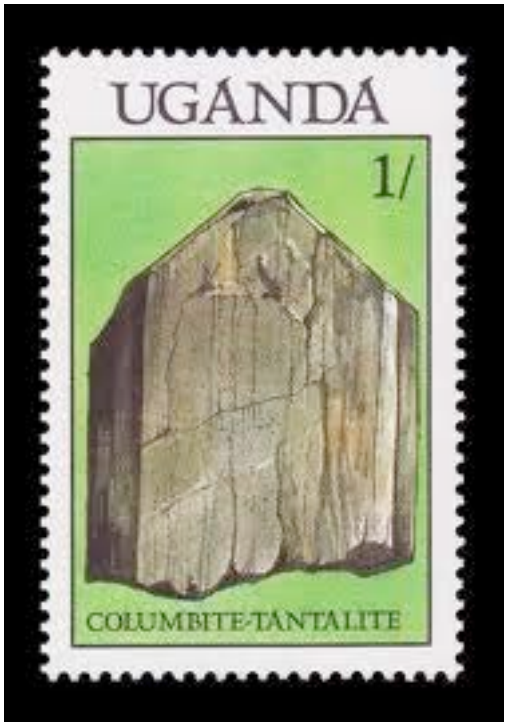
3. Disposal and Dispersion

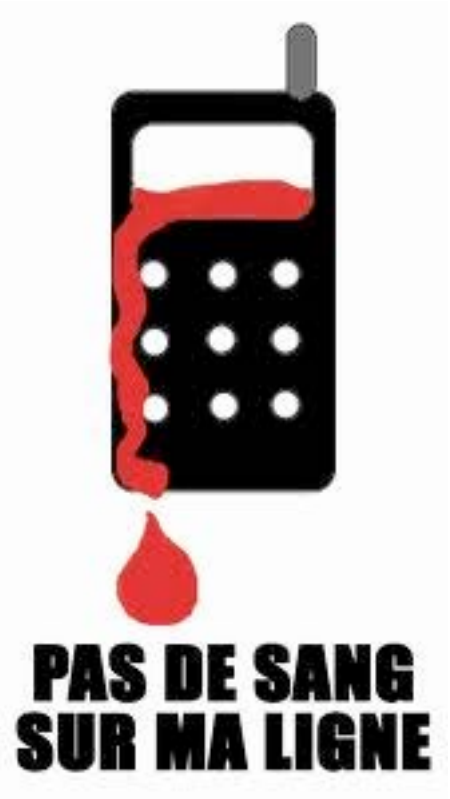
Radioactive Transport

Discussion Questions

1. **What is the difference between a buyer-driven and producer-driven commodity chain?**
2. **Draw a diagram of the factory shrimp CC (commodity-chain), showing how other CCs intersect the factory-shrimp CC**
3. **Do you think that the factory shrimp CC is primarily buyer-driven or producer-driven? Why?**
4. **What about the nuclear power CC? (buyer- or producer- driven?)**

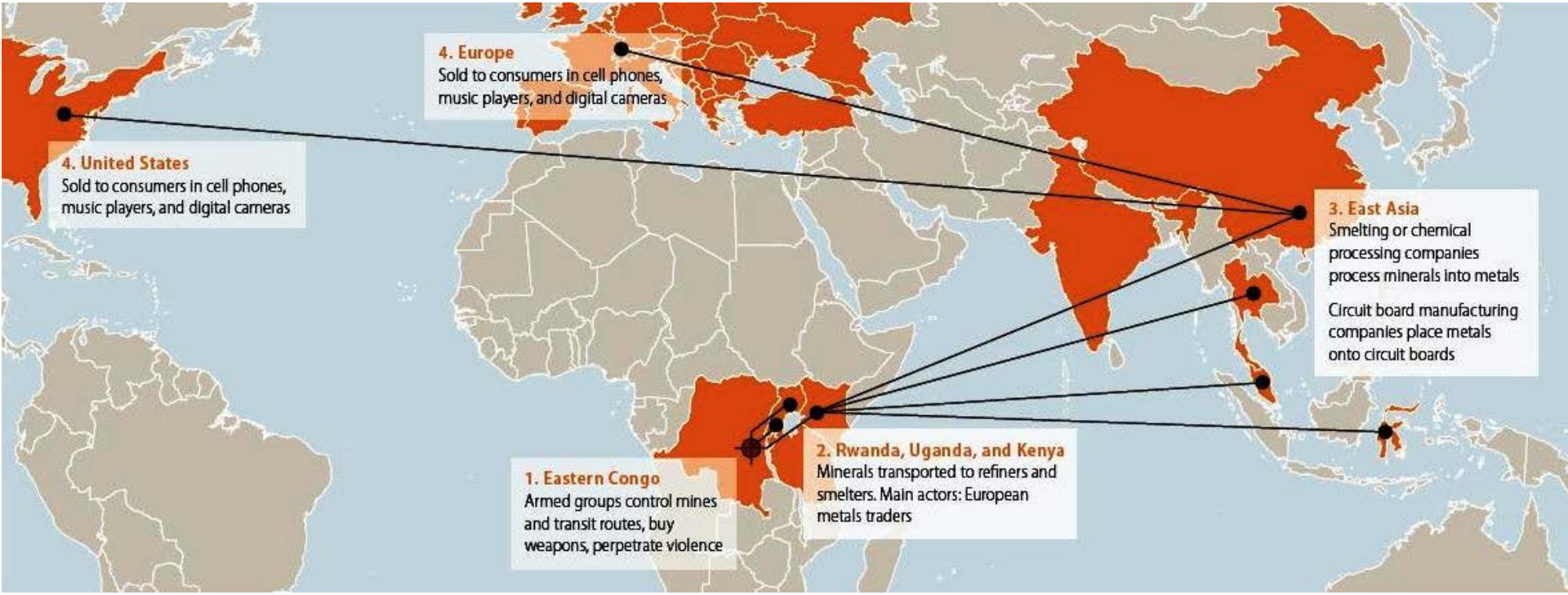
Example 3: Coltan





No Blood on My Line

Coltan (Columbite-Tantalite
Congo Basin: vast majority of world reserves
Used in condensers in electronic equipment



Commodities MAP approach

Geography of the Trade:
Global and Local

Coltan Mining: Other Global Sources: Australia, Ethiopia, Mozambique
Conflict: Congo DRC


Mvemba Phezo Dizolele – www.dizolele.com
Mining
http://www.youtube.com/watch?v=3OWj1ZGn4uM

Environmental Destruction: Forest Clearing, Habitat destruction, Reserves invasion, Sluice Mining and water contamination

Gorilla habitat disappearing because of coltan mining:

http://www.youtube.com/watch?v=7gCuLuwoovk

What to do? Recycle?

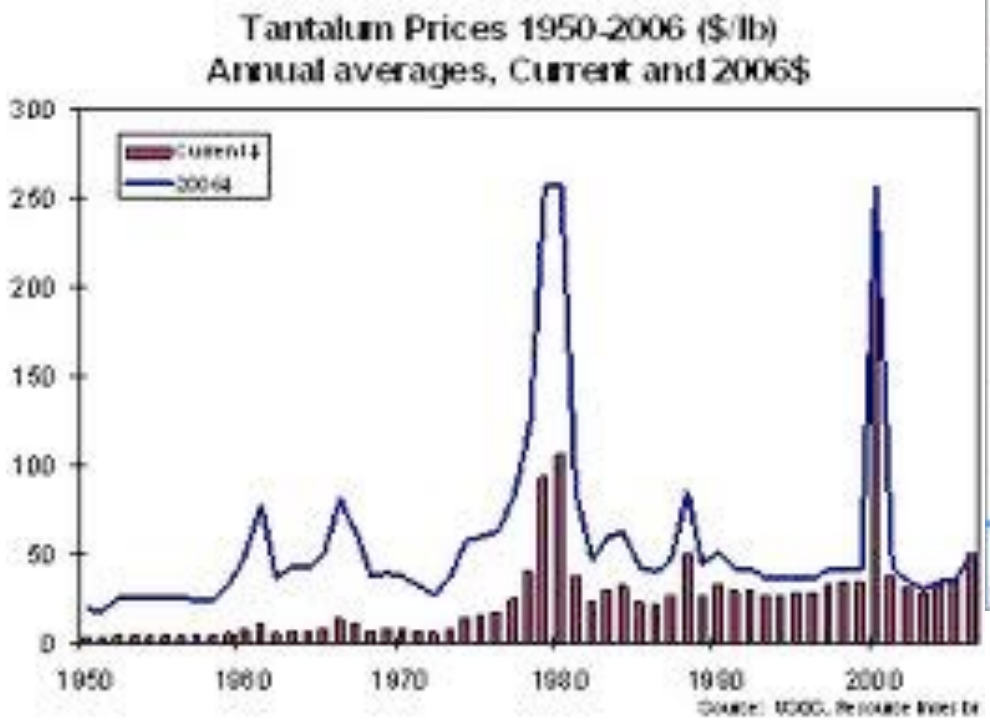
What to do? Identify contributors?

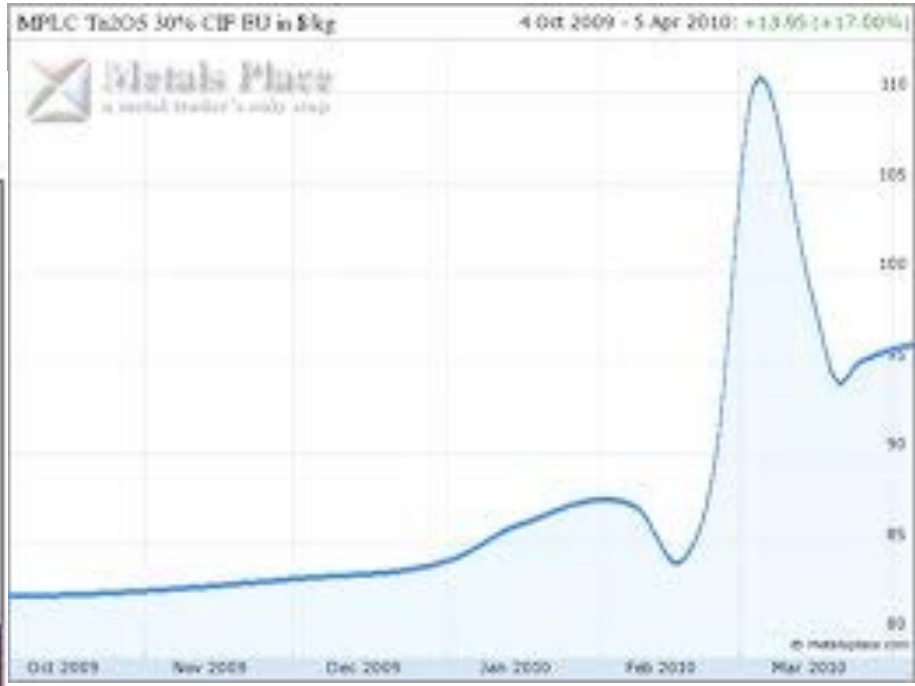
Olli-Pekka Kallasvuo

Victor Bout

General Laurent Nkunda

What to do: Manage Prices?





PRICE SPIKES DRIVE COMMODITIES RUSHES, DESTABILIZE INSPECTIONS

Commodity-Chain economic dynamics:

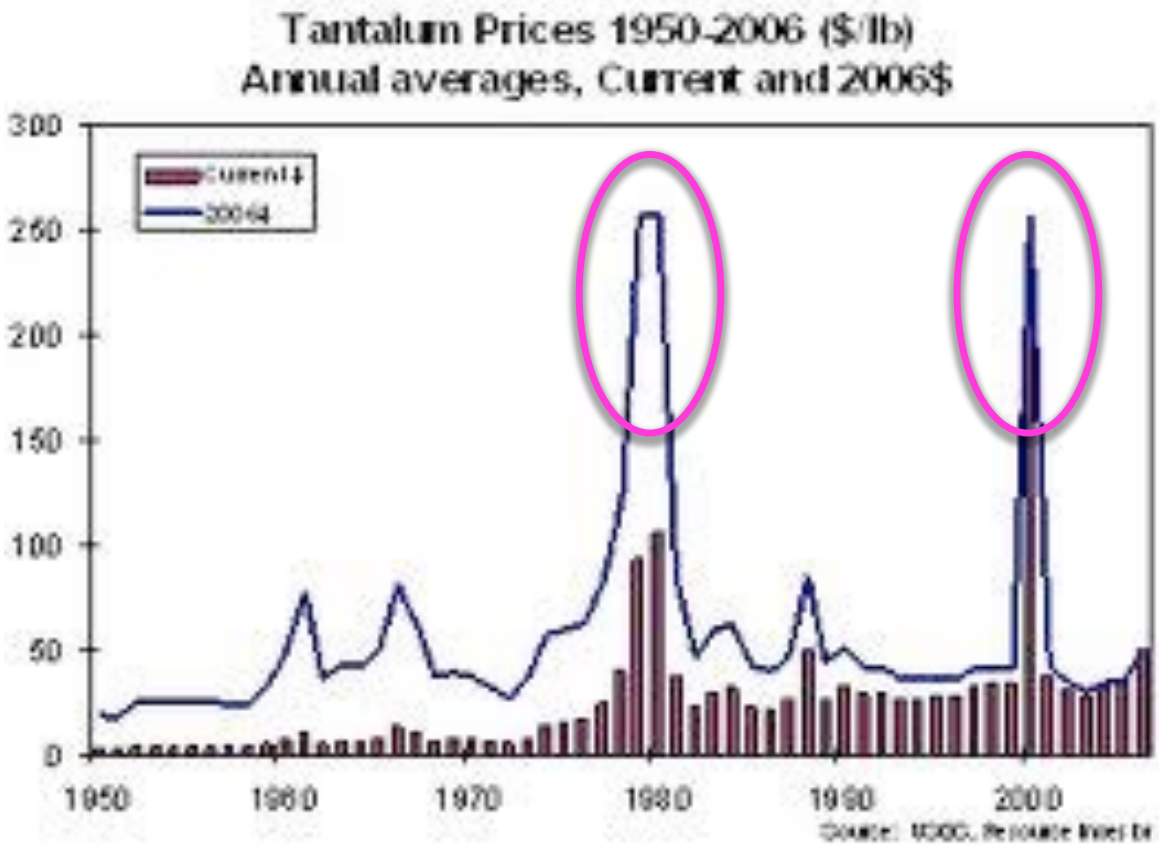
- **Commoditization is linked to Financialization**
  IN GLOBAL MARKETS

Key questions:

1. **how does money $$ *move through* a commodity chain?**
2. **What environmental effects can monetary shifts have?**

Example A:

1. Tantalum and $:
The cell phone,
Price spikes and
Environmental/human exploitation



Year	Cassiterite (in tonnes)	Coltan (in tonnes)	Value in USD / cassiterite and Coltan
2003	938.0	26.0	815,400.00
2004	4,672.0	42.0	3,821,600.00
2005	3,599.0	26.0	6,774,200.00
2006	2,904.0	39.0	7,190,100.00
2007	10,175.0	74.0	28,098,181.39
2008	13,311.0	85.0	83,240,574.57
2009	10,543.0	280.0	79,514,538.31

Source : North Kivu Division of Mines

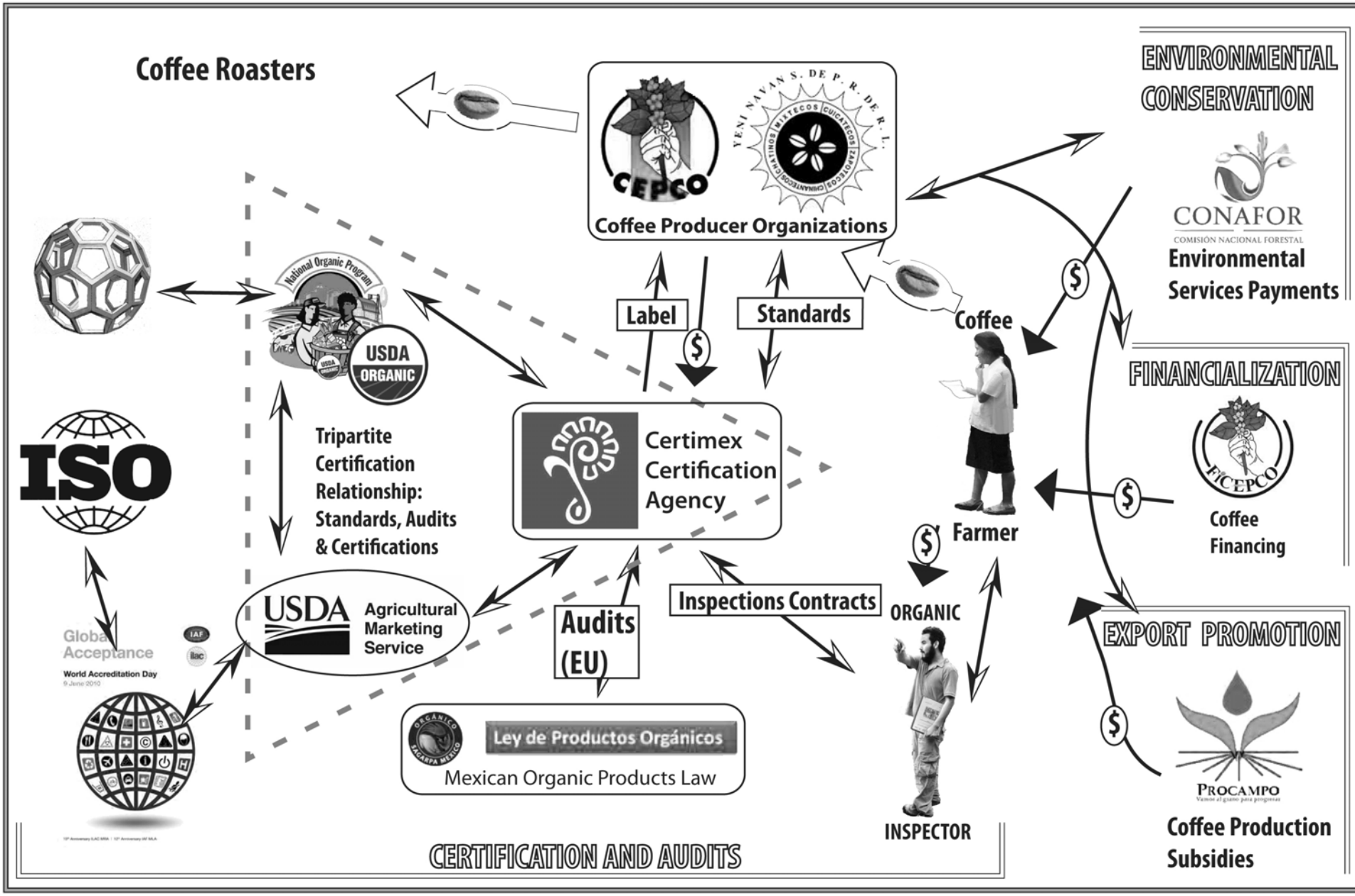
Source: Pole Institute, Congo DRC

Issue: Mineral mining a major source of income for the government of the Congo:
How to crack down on environmental destruction while allowing the Congo to earn important foreign exchange income?

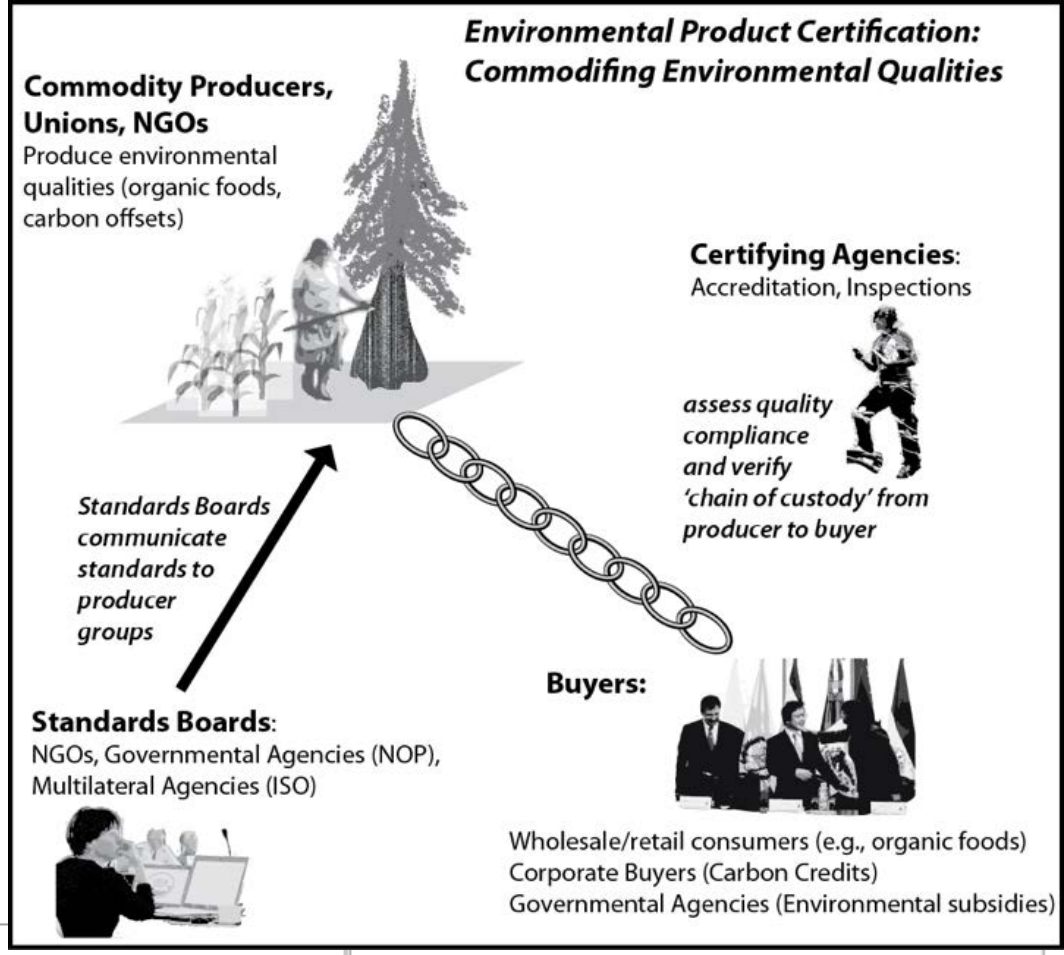
What to do? Certification via the Kimberley Process?
Also used for 'blood' diamonds, etc.
An European Union certificate of 'conflict free' product: critique, really too concerned with protecting the high price of diamonds (which are actually really abundant)

Critique: Voluntary Self-Regulation
German CTC (Certified Trading Chains): German and Congolese Govt Partners
English: ITRI (Tin Supply Chain Initiative): cassiterite, also voluntary
World Bank: local market initiatives to work with artesanal mining
Alternative: Organic Food style governmental certification?

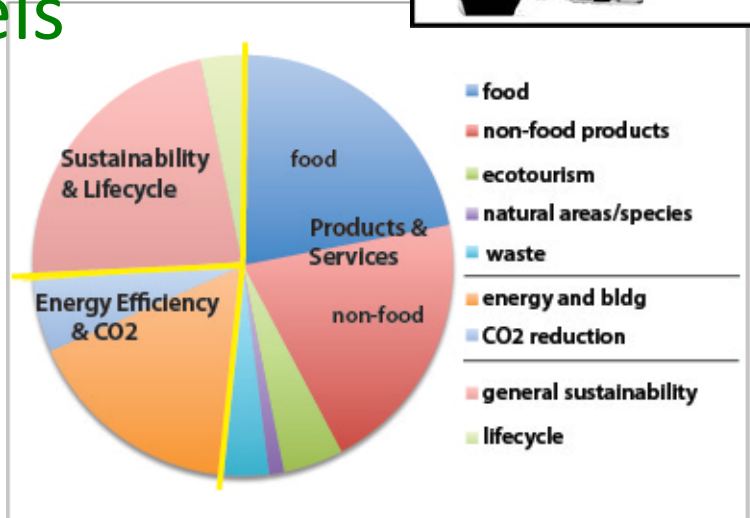
Expanded certification network

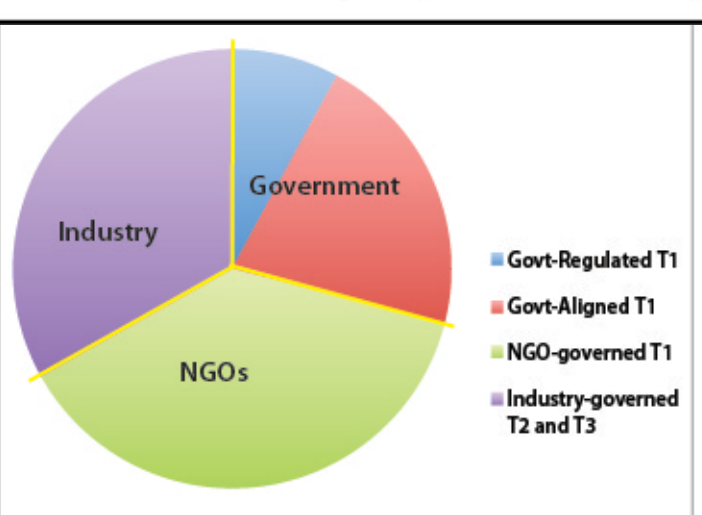


Certification Relations



Ecolabels



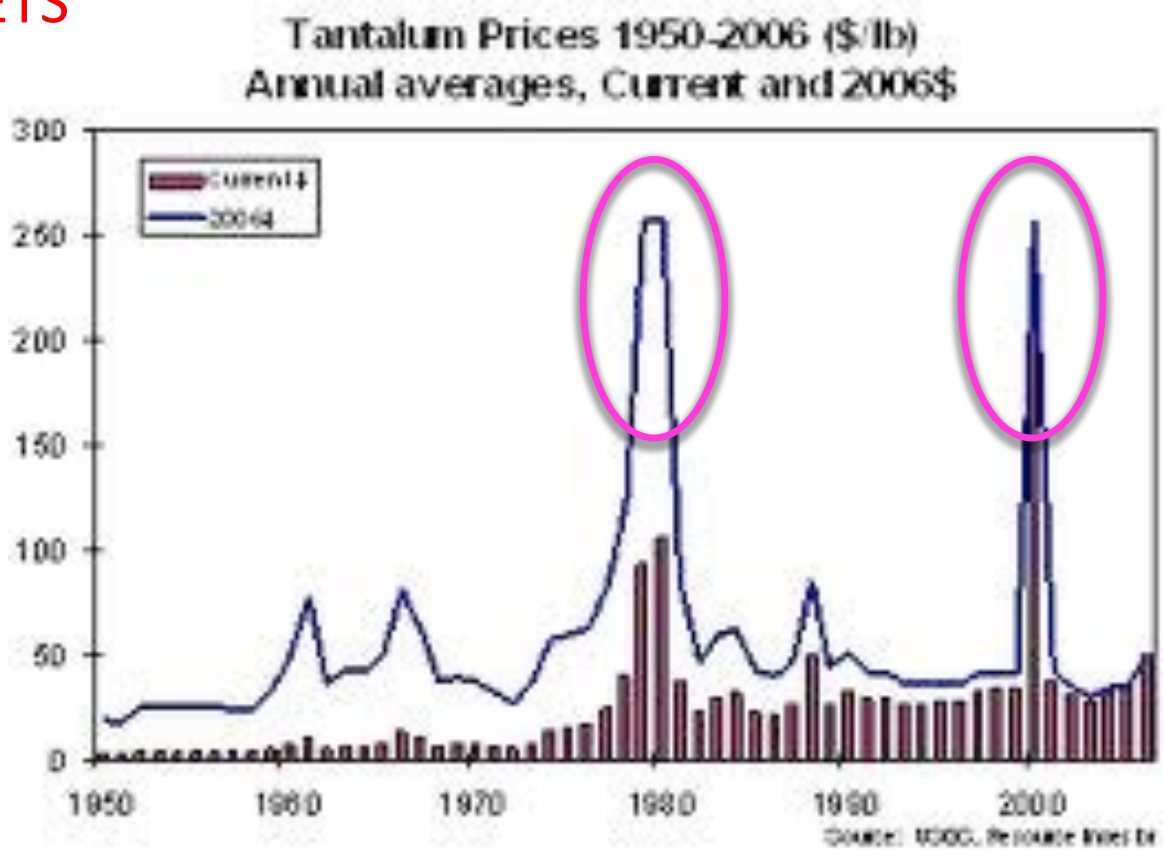


A few thoughts on financialization in commodity-chains:
A problem of our times, perhaps unique in the rapidity of environmental transformations?

Commodity-Chain economic dynamics:

- **Commoditization is linked to Financialization**
  IN GLOBAL MARKETS

Tantalum and $:
The cell phone,
Price spikes and
Environmental/human exploitation



Making the connections:

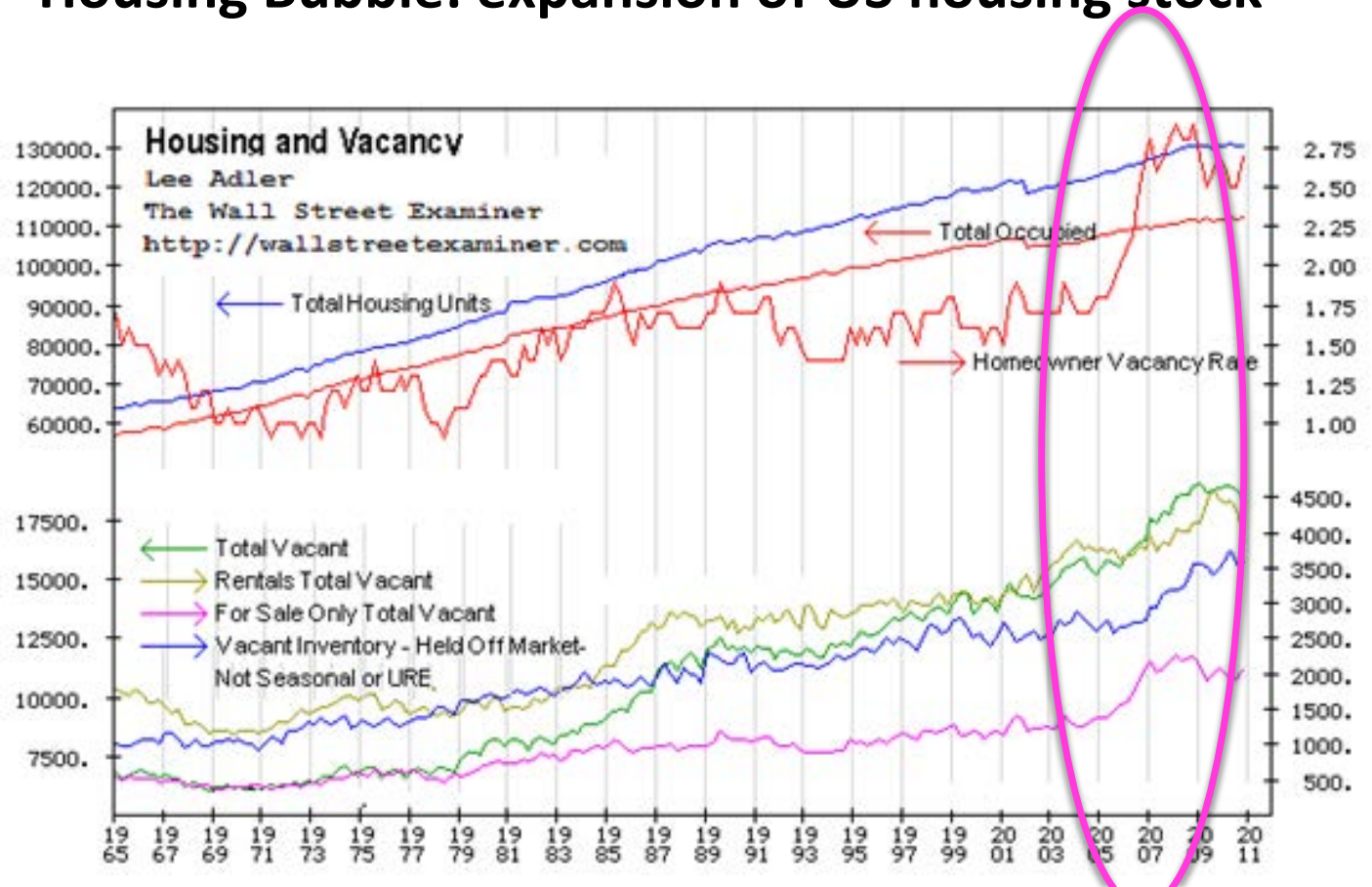
a. mortgage crisis in the US: suburbanization and wholesale environmental replacement – (are recessions good for the environment?)

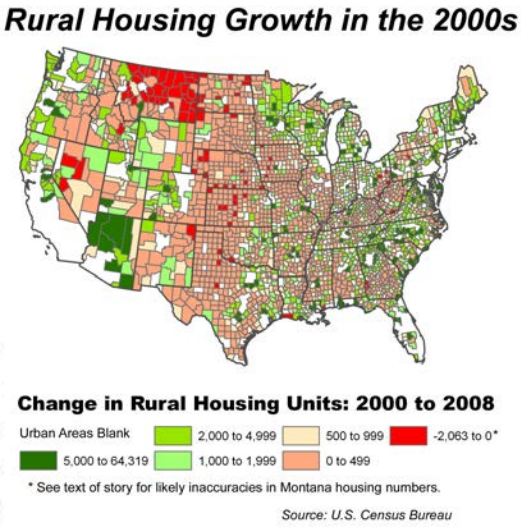
b. Vast use of wood, with knock-on environmental effects

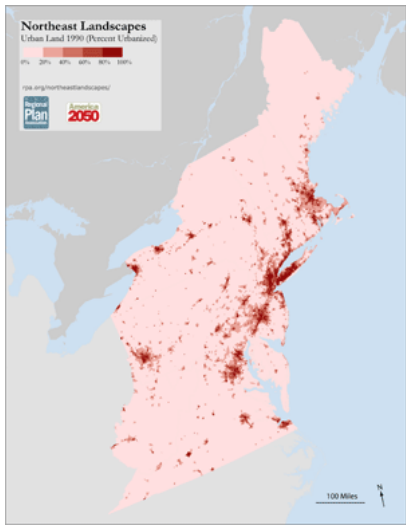
c. How was the housing bubble financed?

- Lax financial regs, debt swaps
- Chinese purchases of US debt

Housing Bubble: expansion of US housing stock







Chicago 19th C. Lumber District

Michigan North Woods

McMansions

Transport CO2

Lawn Chemicals

Sarawak: World's oldest rainforest, gone in 11 years at current rate of destruction

Timber-cutting around the clock

For?

Home construction in US (and around the world, to be clear!)

So, In what ways can the 'financialization' of natural resources — the transformation of a commodity into a traded asset subject to:

1. **market-based 'portfolio' investment (e.g., in shares)**
2. **'direct foreign investment' (DFI) —**

affect environmental degradation?

Potential Environment effects:

1. **Habitat Replacement, wholesale destruction of entire biological communities (suburban expansion)**
2. **Degradation and elimination of other, source communites (timber from forests)**

EXTRA EXAMPLE

Apple: electronics supply chain and environmental contamination

Figure 1: Mapping of some suspected Apple suppliers

Pollution and the supply chain: analysis

Figure 3: Overspill outlet adjusted over the pool

Find point of contamination

'point-source' pollution

Figure 4: Wuhan Meiko Electronics, Discharge Channel, Nantaizi Lake, Dongfeng Sluice Gate Google Earth Satellite Image

Trace pollution to site of environmental impact

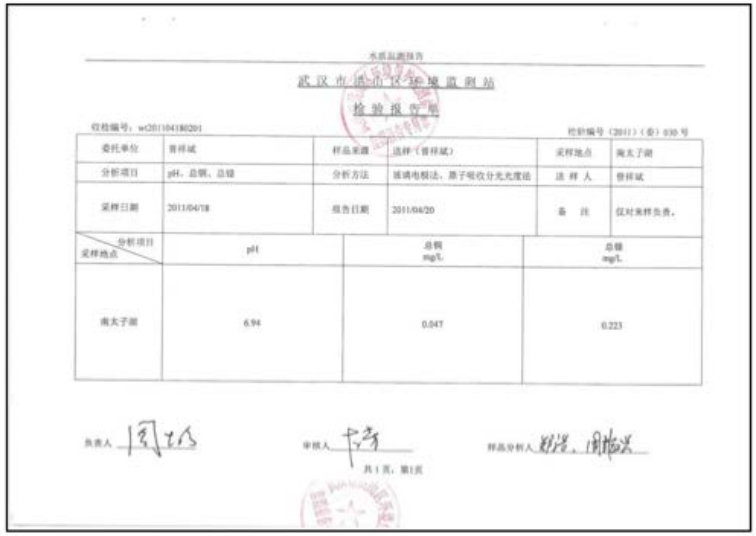
Figure 5: On-site Investigation, Photo: Ma Jun

On-Site Investigation

Figure 6: Leading to Nantaizi Lake Discharge Channel, Photo: Ma Jun

Measure Discharge

Figure 7: Discharge Channel's Wastewater Sample Inspection Results



水质监测报告

武汉市[illegible]环境监测站

检验报告单

委托单位	普样城	样品来源	选样（普样城）	采样地点	南太子湖
分析项目	pH、总钒、总铬	分析方法	玻璃电极法、原子吸收分光光度法	选 样 人	普样城
采样日期	2011/04/18	报告日期	2011/04/20	备 注	仅对来样负责。

分析项目 / 采样地点	pH	总钒 mg/L	总铬 mg/L
南太子湖	6.94	0.047	0.223

负责人 [illegible]　　审核人 [illegible]　　样品分析人 [illegible]

共 1 页，第 1 页

Commodity-Chains: Reviewing… What should I know about them?

1. **Organization:**
   a. **The Source: Producers? in the Global South?**
   b. **The Intermediaries: Global Corporate Connections? Small producer networks?**
   c. **Where are the nodes?**
   d. **How are the links made?**
2. **Commodity chain dynamics: Power**
   a. **Concentration of ownership**
   b. **Struggle over Rents: Buyers versus Producers**
3. **Commodity logic:**
   a. **Consumer spaces: Retail giants in the West**
   b. Environmental Impacts: What is left behind? What trace is left by their passage?

Shifting our focus:

- From: Using personal or national calculators to examine carbon footprints
- To: Using Commodity chains to examine 'direct' effects, such as resource depletion or toxic contamination

It is important to remember that each commodity-chain has both a carbon footprint *and also a* more general, much more extensive, 'ecological' footprint

A war

A Footprint: Analyze the whole of a social enterprise:

690 million tons CO_2e a "limited" nuclear exchange of fifty 15-kiloton[15] warheads

250 to 600 million tons CO_2e Iraq, 2003–09

> The Iraq war up until the start of 2010 probably racked up a carbon footprint roughly equivalent to the whole of the U.K. economy for between 3 and 8 months and rising.

Commodity Chains, More Examples!!

Analyzing Power in COMMODITY-CHAINs?

1. **A method of analyzing factors shaping the distribution of benefits from a given product from its origin to end use**
2. **A Method of analyzing "*access*"**
   Who reaps the flow of benefits from things? **[Peluso and Ribot 2003]**
3. **A means to discover and manage environmental consequences from activities**
4. **A way to examine questions of environmental justice – how our consumption choices may harm others less fortunate**

Government attempted to Decentralize forestry control, but this did not Increase Local Benefits

- Progressive new laws
  - Elimination of quota
  - Transfer of decisions to rural council
- Implementation blocked by foresters and merchants

- National Policy Dialogue
  - → wrote and produced play
  - Made it into film

- Campaign to leverage decentralization.

CONCLUSION:
Commodity-chains are governed by politics

Without dismantling the "Environmental" *policies* that concentrate market access control with urban merchants, there is no economic decentralization

Deforestation in Brazil?

Compare with Indonesia:

- Indonesia, primarily logging
- Brazil, primarily cattle ranching

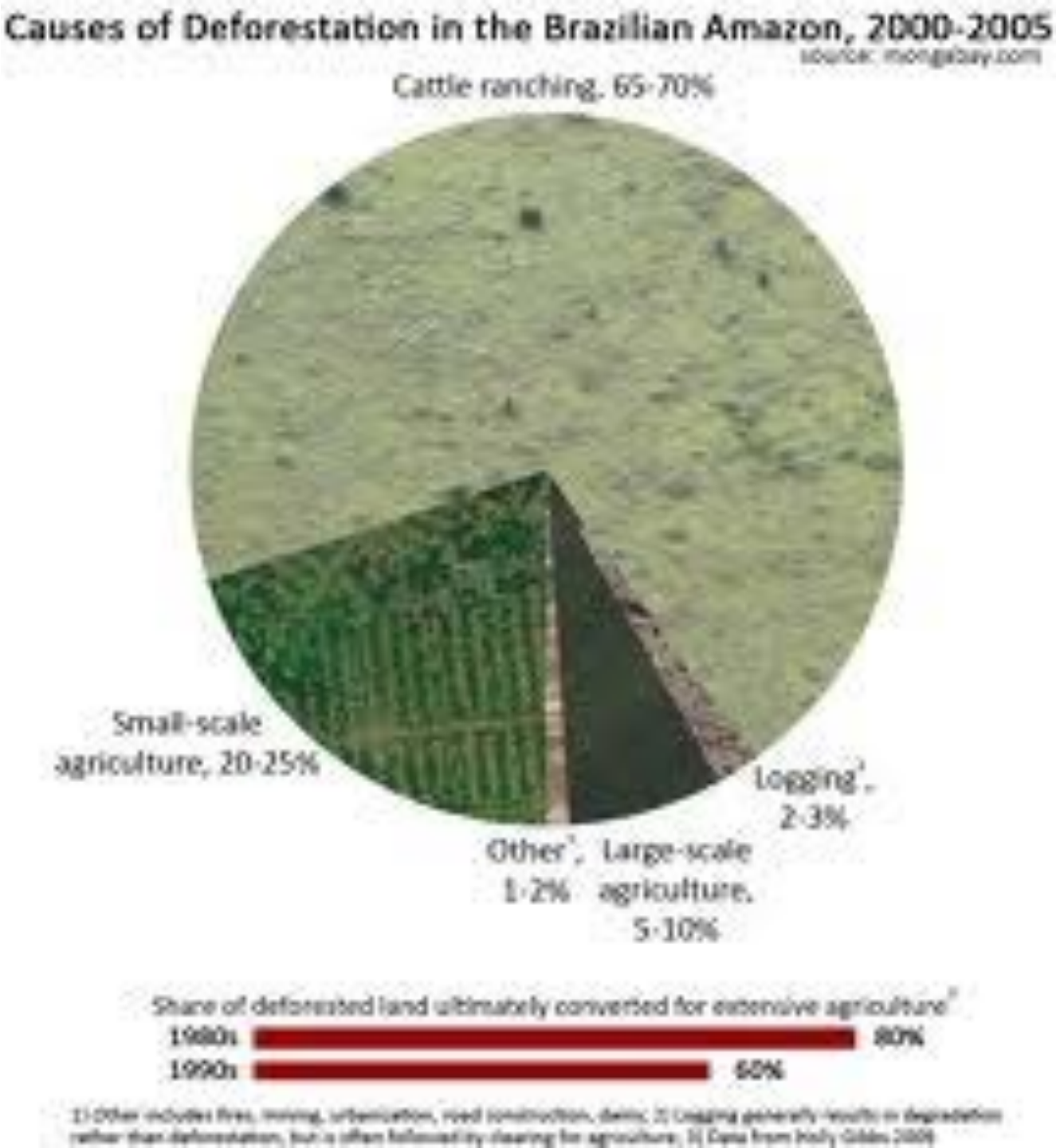
Sarawak

http://www.youtube.com/watch?v=s7qbm6T6b0I

Brazil

http://www.youtube.com/watch?v=hllU9NEcJy

Why?


Causes of Deforestation in the Brazilian Amazon, 2000-2005
source: mongabay.com
Cattle ranching, 65-70%
Small-scale agriculture, 20-25%
Logging[2], 2-3%
Other[1], 1-2%
Large-scale agriculture, 5-10%
Share of deforested land ultimately converted for extensive agriculture[3]
1980s
80%
1990s
60%

Brazil- a few Facts

Foreign Debt $310 billion

(only 15% of Gross Domestic Product, though)

Highly successful economic development

BUT

1 (Poorest 20% of Pop.)	**Top 10%**
2.1%	**51.3%**

Land Clearing Process:

Vast expansion of large landowners and ranchers

Process:

- **Small farmers open frontier**
- **Large ranchers buy them out, often under threat**
- **Small farmers move on to new areas**

Brazilian Deforestation: (see Hecht for details)

Why? Possible Explanations

#1. The 'Burger King' Thesis: Beef is an Income earning Opportunity:

But: Pastures are largely unproductive, degrade after a few years

cattle herds are thin on the ground

#2. Population Growth?:

BUT: as we saw in the video a few weeks back, Brazil's population is not growing

#3. Financialization – Cash flows into land assets (in this case):

World Bank Stimulates cash availability

Inflation

ERGO: Cash Flows result in 'green grabbing'

- **Land is good investment value during hyper-inflation (land is relatively Inflation-proof)**
- **Land cleared to 'stake a claim' to the asset**

Green Grabbing: Taking control of land – usually in other countries – for the purposes of profit or national security

1. Biofuels: Palm Oil, the unexpected consequences of 'green energy' policies
   - Ecuadoran activists, in a play on words, term in "CO2-lonialism"
   - Biodiesel: EU commits to 10% biofuel target
2. Food production: Saudis, India
3. pharmaceuticals: Madagascar

Brazil: http://www.youtube.com/watch?v=9eNn03PiTb8

Malaysia: http://www.youtube.com/watch?v=I1G2nTigFuA&playnext=1&list=PL2D378EC4D27F2CB0&feature=results_main

A text message

0.014 g CO_2e one message

32,000 tons CO_2e all world's texts for a year

A banana

Zero g CO_2e grown in your own garden

80 g CO_2e imported from the other side of the world (or 480 g per kilo/240 g per pound)

> To answer the question in the title of this book, bananas aren't bad at all. They're brilliant! To emphasize the point, I'm eating one as I write.

A 500 mL (16 oz.) bottle of water

110 g CO_2e locally sourced and using local distribution

160 g CO_2e average

215 g CO_2e traveling 600 miles by road

> A bottle a day would add up to 0.6 percent of the 10-ton lifestyle.

A red rose

Zero CO_2e picked from your garden, no inorganic fertilizer used

350 g CO_2e grown in Colombia and flown by air

2.5 kg (5.5 lbs.) CO_2e grown in a heated greenhouse in the Netherlands and then flown

> A single red rose could have the same impact on climate change as about five kilos (11 pounds) of bananas.

A burger

1 kg (2.2 lbs.) CO_2e veggie burger

2.5 kg (5.5 lbs.) CO_2e 4-ounce cheeseburger

> If you eat a cheeseburger each day, that's a massive 910 kg (2,000 lbs.) CO_2e per year—the same as driving 1,500 miles in a fairly efficient car and just over 1 month's worth of ration in the 10-ton lifestyle.

Using a cellular phone

47 kg (103 lbs.) CO_2e a year's typical usage of just under 2 minutes per day

1,250 kg (2,760 lbs.) CO_2e a year's usage at 1 hour per day

125 million tons CO_2e global cell phone usage per year

> A minute's cell-to-cell phone chatter comes in at 57 g,[10] about the same as an apple, most of a banana, or a very large gulp of beer. Three minutes have a similar impact to sending a small letter (written on recycled paper) by regular post.

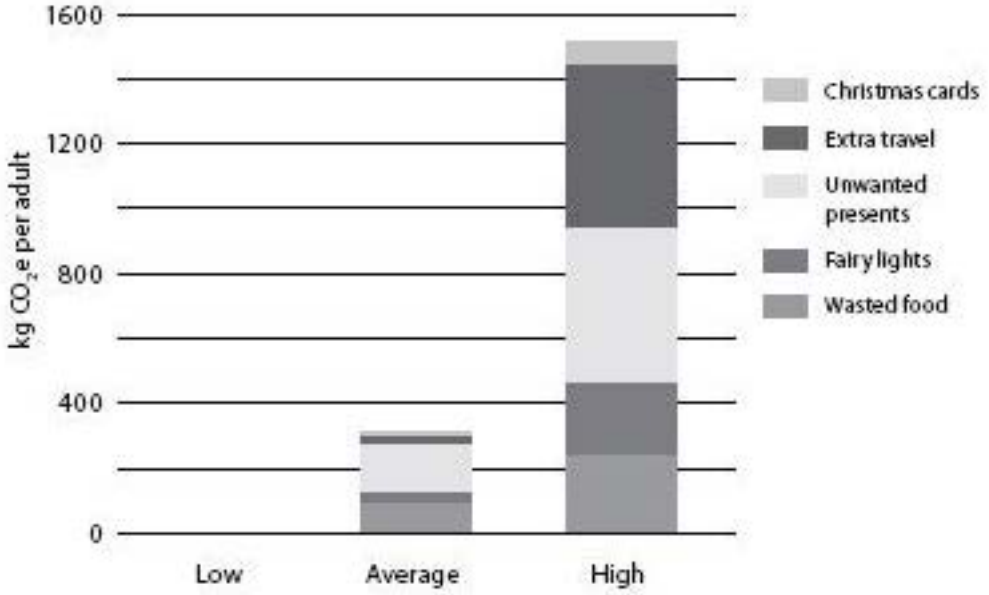


FIGURE 7.1: The footprint of Christmas waste in the three scenarios.

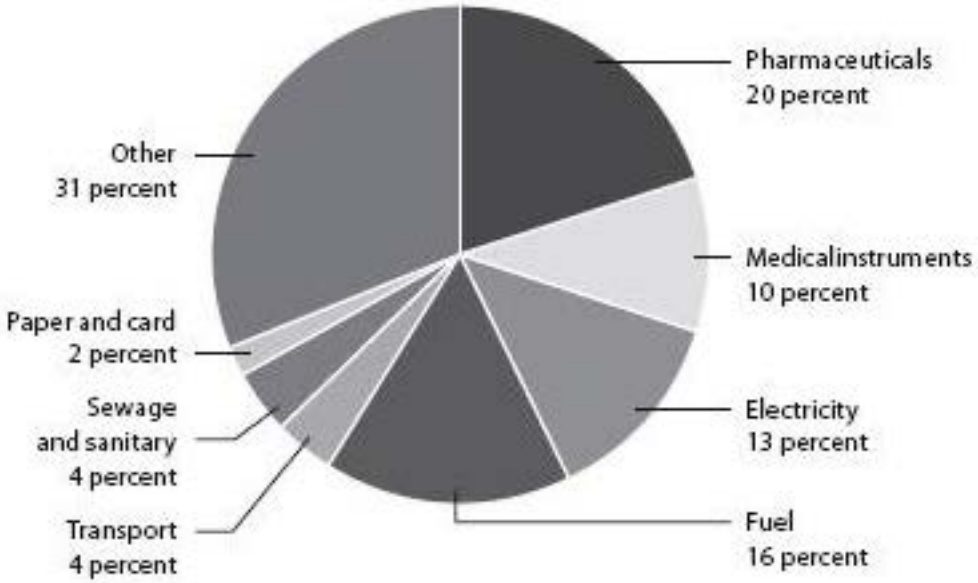
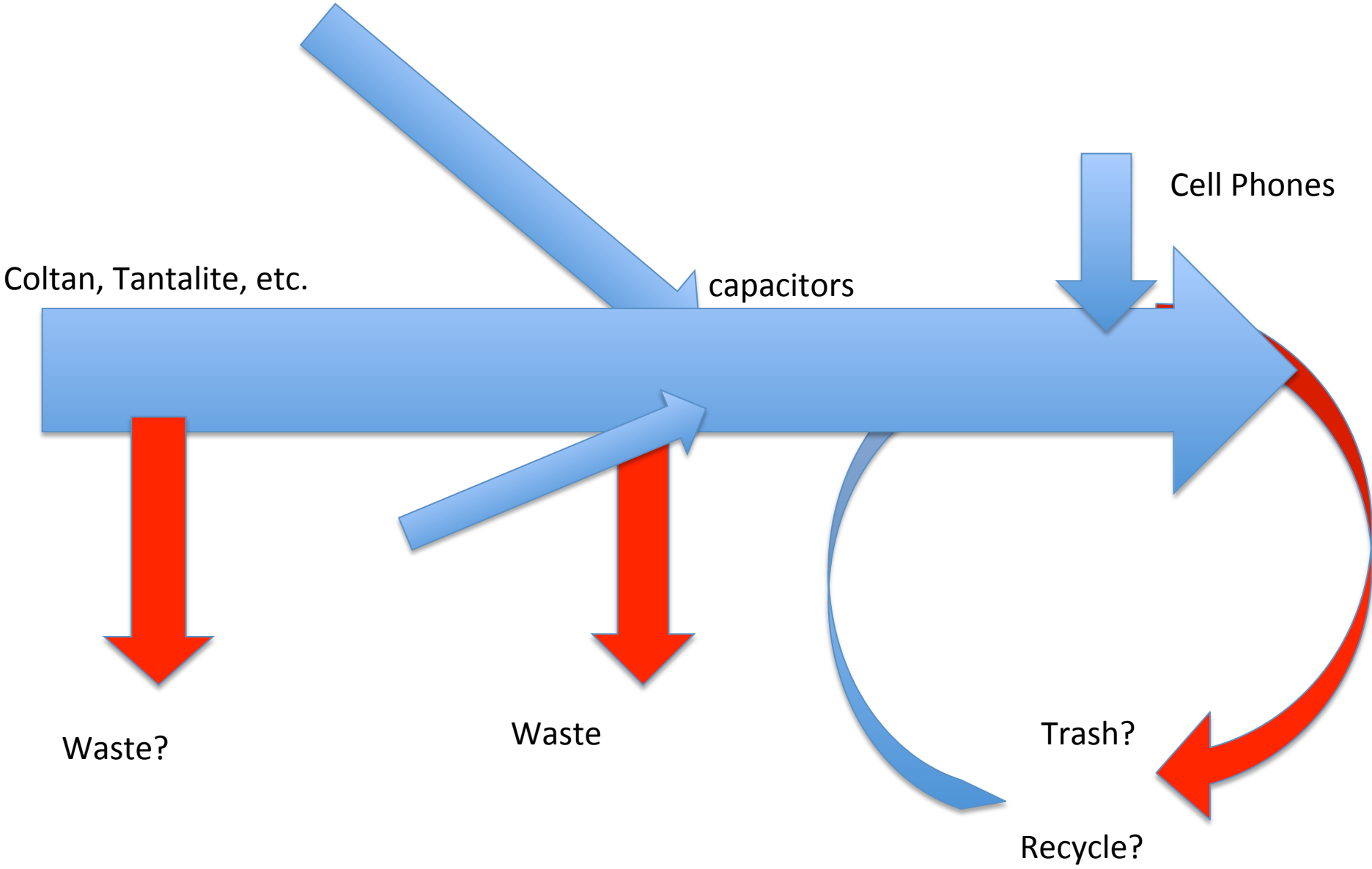


FIGURE 8.1: Emissions per person and an estimate of footprint per person.

Commodity Chains



THE END