

D-Lab Development

2009.12.04

Benjamin Linder / Sustainability

What is this project doing to the environment?

Graph from WWF, Living Planet Report, 2006

Human Development and Ecological Footprint

Income - standard income vs purchasing parity
Health



Our quality of life is linked to our environmental impact

It is not completely linear

The last 20% of human development
makes a large difference

Definitions of Sustainability

Bruntdland Commission Definition - has been quoted endlessly

People, Profit, Plant - John Elkington

Widely adopted by business

Both have serious flaws associated with them



Environment > Society > Market

The market has to pass through society to interact with
the environment

Meadows, Randers and Meadows, Limits to Growth, 2004 (Figure)

Sources or Sinks

Hopenhagen - marketing ploy to surge around Copenhagen

Successful? Maybe not (poll in class shows little awareness)

350 - 350 ppm carbon in the atmosphere

We are currently growing at 2ppm/yr

Gives us 20 years to sort this out

Natural Capital

Talking about the resources of the environment and
the services they provide

16-54 trillion US\$ (when global value of market
was 30 trillion)

raises questions, are we creating
value as humans with technology?

Around the world, a big natural resource is fuel
(in various forms)

Gas / biomass /
Species Extinction
25% by 2050

Carrying Capacity of Resources

1. Measure carrying capacity
(hard to do in dynamic system)
2. Have to stay under carrying capacity
3. Have to be well adapted

Example of collapse of Atlantic cod in the pacific

Resource Footprint

Example of London needing more land than has land for
have to go and extract resources from
elsewhere (ie developing countries)
WWF living Plant Report

(Fig 20)

Ecological Footprint and bio capacity by region, 2003

Increasing a standard of living is not the same as an increase in consumption

There are examples of high standards of living that don't have the impact of the US

(WWF Living Planet Report fig 22)

Energy Consumption and relation to Population (US)

When wood was main source, population was very bound to natural resources

Gas and fossil fuels have decoupled the relationship

Law of the Minimum

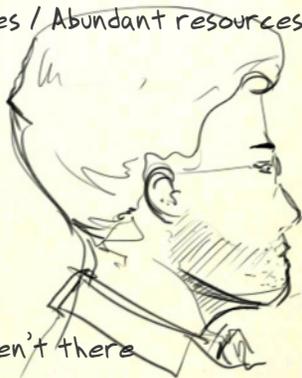
Globalization & trade, allows us to maximize our use of carrying capacity

Not a lot of room for error

Artificially sets a population limit

Define Context

- Need to define a context to characterize resource consumption
- Population / resources / carrying capacity
- Can't talk in the abstract
- Manage to this context and what is available
- Define Resources
- Use fewer resources / Use better resources / Abundant resources
- High quality resources
- Managed resource



Selco & Envirofit examples

Solar lighting where other fuels weren't there made sense in rural India

Retrofitting 2-stroke engines to improve fuel use and decrease environmental impact

Both Selco and Envirofit are going towards stoves

The stove represents an Energy Challenge

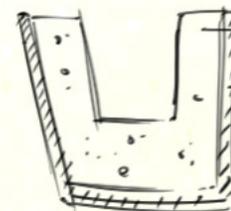
In Class Energy Challenge

How long before ceramic liner in a stove pays for itself?

20kg Steel / Ceramic Liner 5kg

To Act, you have to come up with a number yourself that you feel confident in.

30% more efficient



6kg ceramic

10kg steel

STOVE

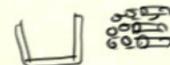
EE
10MJ/kg

24.4 MJ/kg



FUEL

WOOD



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