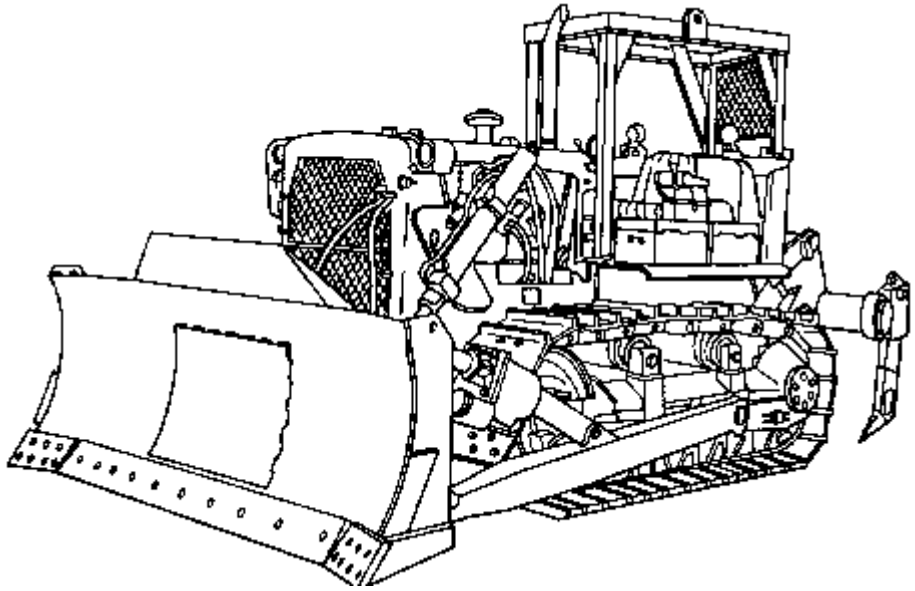
Development of Input indicators based on extraction equipments

Workshop Quo vadis MFA? Wuppertal, Germany, 9-10 October 2003



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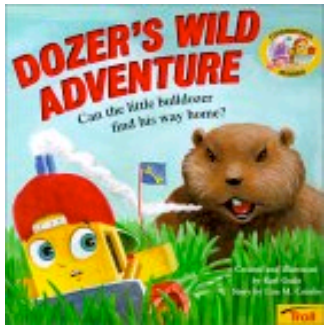
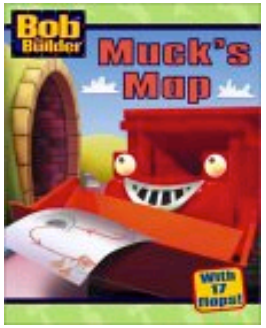
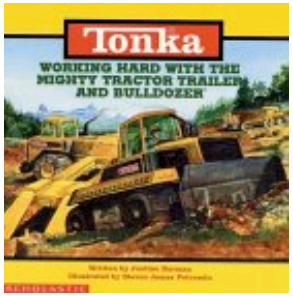
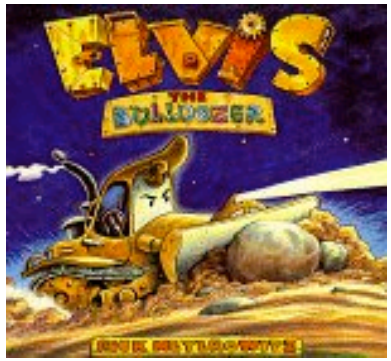
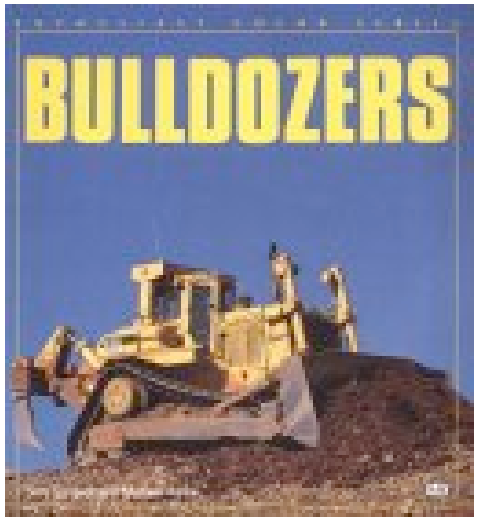


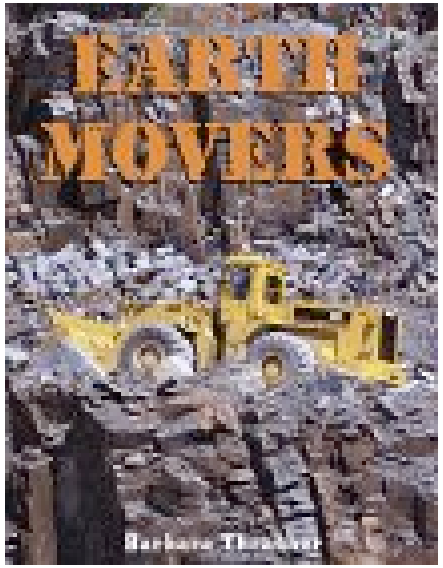


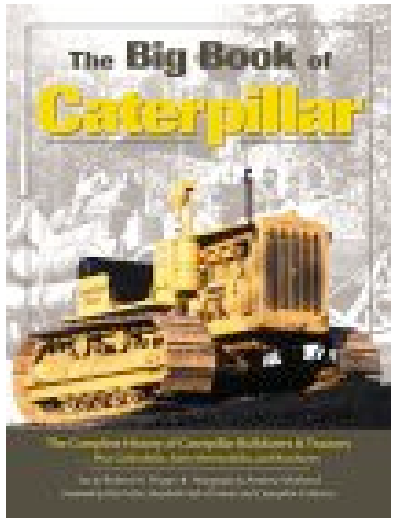


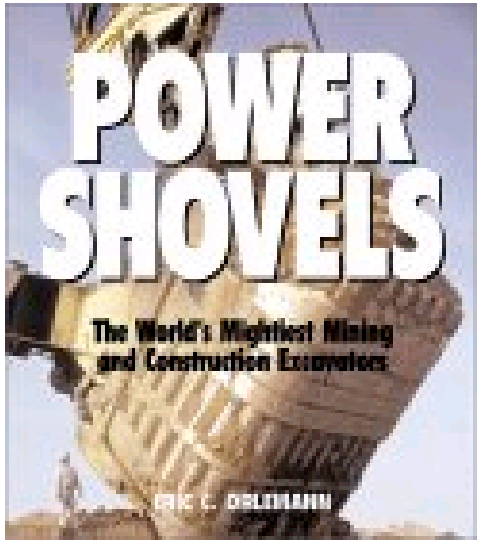


Harmless toys?



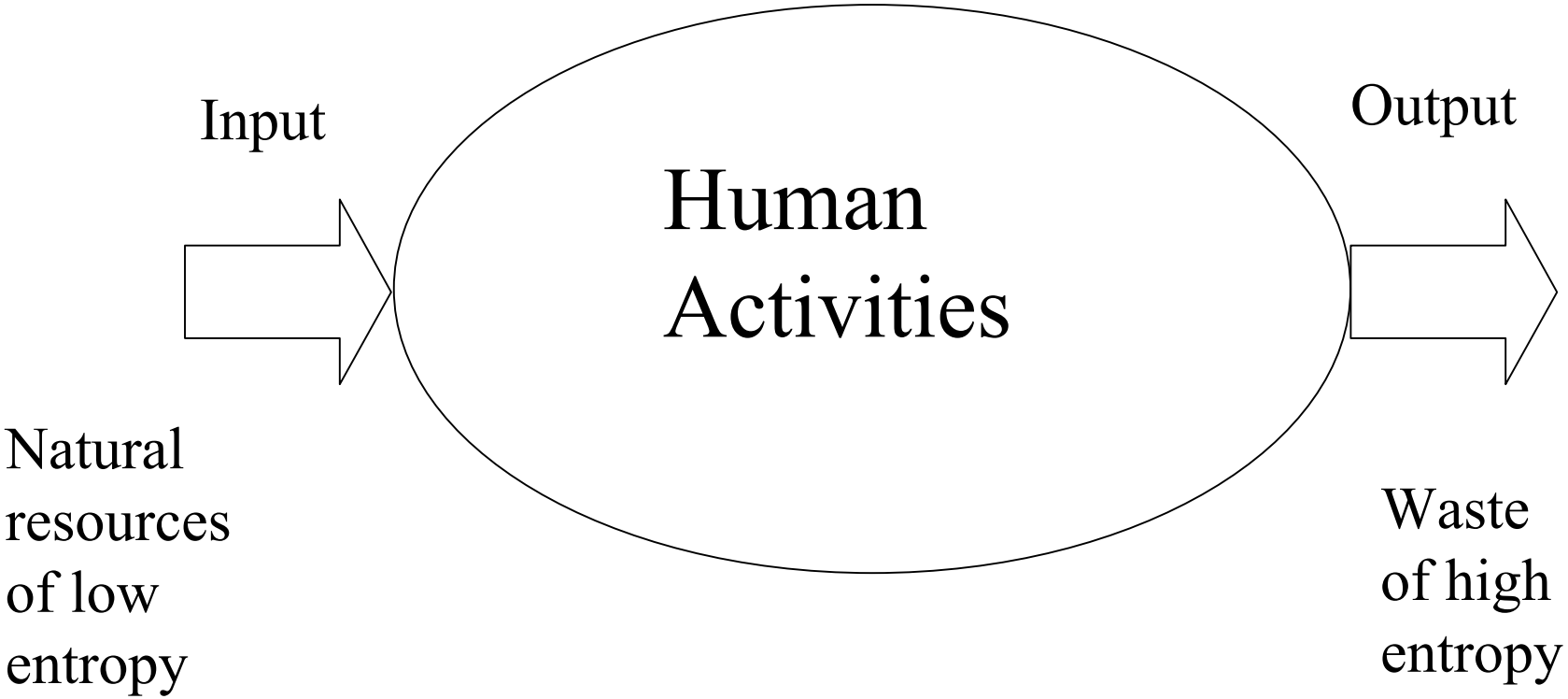






Grown-ups are interested too

MFA: Analysing the throughput of materials



Input

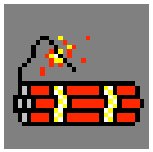
Output

Human Activities

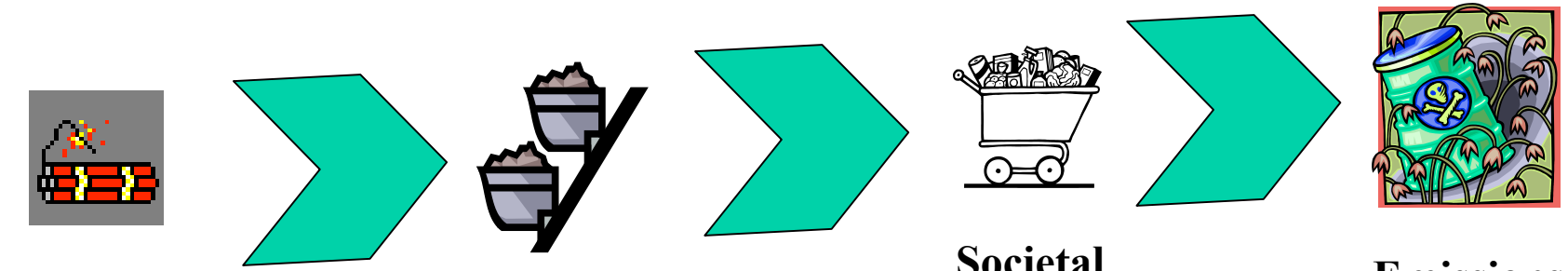
Natural resources of low entropy

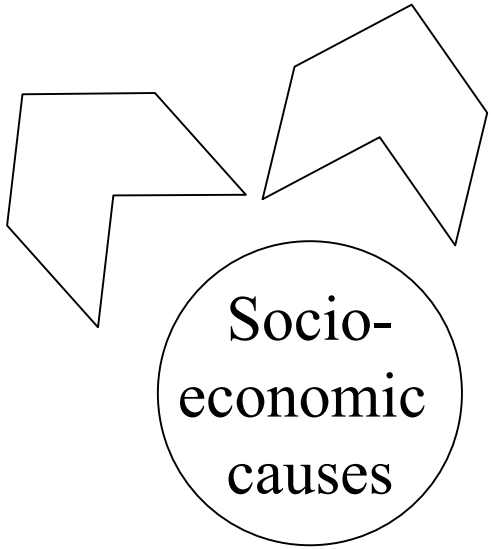
Waste of high entropy

Extractors



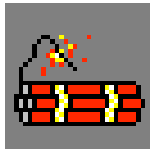
Dealing with extractors is more preventive than dealing with amounts extracted

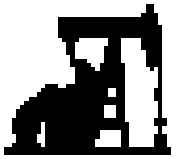




Extractors are defined as all human tools enabling extraction of materials (including air and water) from their natural state.

Extractors





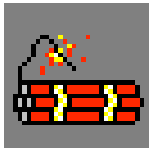
	Unused Extraction	Used Extraction	Other Material moved	Primary extractors	Secondary extractors
Agriculture	Earth ploughed	Agricultural products	Water	Tillage tools, pumps	Tractors
Mineral Extraction	Overburden, vegetation cover	minerals		Explosives & Digging engines	Other engines
Forestry	Vegetation	Wood		Forestry engines	Forestry trucks
Infrastructure creation	Soil, vegetation cover			Explosives & Digging engines	Other engines
Energy	Overburden, vegetation cover	Petrol, Coal, Gas	Water, O2	Oil and gas wells, Explosives & Digging engines, Dams	

More extractors

	Unused Extraction	Used Extraction	Other Material moved	Primary extractors	Secondary extractors
Leisure	Soil	Wild game		Cross-country vehicle and firearms	
Dredging	Material dredged	Sand		Dredgers	
Fishing	Discarded sea resources	Sea resources		Nets and other fishing equipment	Fishing boats
Air extractors			N2, O2	HaberBosh process Combustion engines and other processes	

Historian perspective.

Over human history extractors have been associated with the development of material extraction, culminating in modern history with the development of combustion engines and explosives.



Problems where the extractors analysis is useful

- Pollution on-site, hidden flows
- Shortage of raw materials
- Direct downstream impacts initiating physical causality chain
- Indirect contribution to general material growth

Bulk MFA:
DEMATERIALISATION

SFA: DETOXIFICATION
=
LESS EXTRACTION

Data gathering for MFA

- Study of extractors
(economy wide or locally)
- Development of factors of extraction

Extractor-based indicator

For substance flows

For bulk MFA

- extractive capacity
- extractive potential

Policies based on the reduction of extractors

Better link with reality

Policies may include:

- Regulations
- Tax or removing subsidies
- Quotas
- Ban of some extractors?

Improve extractors

New types of extractors could be developed with a lower ratio hidden flows/used flows

but:

- problems remain downstream
- danger of the rebound effect (cf Jevons)

Disavantages of studying extractors

- *Technological change*
- *Specificity of the environment of the site*
- *Specificity of the resource management in each site*
- *Age of extractors population*

Advantages

- *Concrete objects for concrete policy*
- *Image of the future*
- *Tackle wide problems*
- *Measure of the effectiveness of environmental policies*
- *Often large enough to appear in statistics*
- *Good for communication to the public*

Proposals

- International cooperation
- Factors in different countries and regions
- Development of unified methodologies

New culture with less extractors?