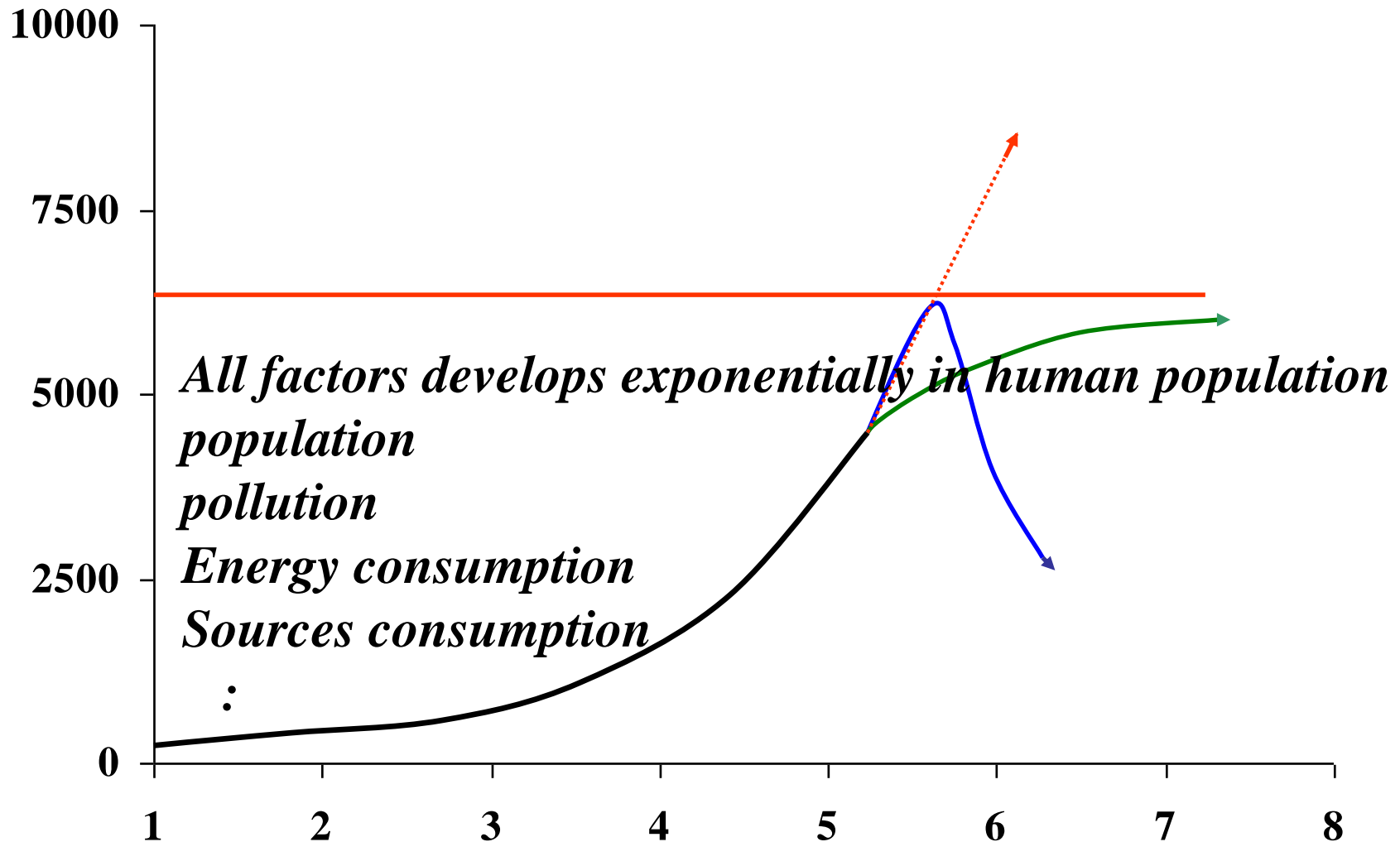


SUSTAINABLE DEVELOPMENT

- Why current development is not sustainable ????
- What sustainable development is ???
- Common decision process
- Indicators of SD
- Agenda 21
- Examples of global changes, ...

Every system develops fast in good conditions. In certain moment it reaches **limit** (food, pollution, space available, oxygen, ...)



Either *slower development and stagnation* or **disaster** follows

Economical and civilization development is not sustainable at all
...not even in isolated area (single state) → the problems are global..

Local problems are
successfully solved:

- ✓ air quality in cities
- ✓ water pollution in rivers (waste waters treatment plants)

Global problems – no success till now:

- ✓ climate changes
- ✓ pollution of the oceans
- ✓ Drinking water sources depletion
- ✓ Decreasing of biodiversity

Consumption and economical growth are very different in different countries....

	China	USA
Area [km ²]	9 598 029	9 629 047
population [mil.]	1 289	292
Popul. density [people/km ²]	134	30
Emissions CO ₂ per pers. [t]	2,5	19,8
E consumption/pers.[oil eq]	880	7 960
Consumption of meat/pers. [kg]	47	122
Consumption of paper/pers. [kg]	33	331
Persons in a room	1,1	0,5
TV pro 1000 pers	292	844
Cars pro 1000 pers	129	774

Development of China → economical growth 8%

- As many cars/pers. Like in US? = for 600 mil. Cars more (more than total number of the cars in the world now)
- Energy consumption (75% from coal), emissions,... grow ☹

The main moments of „SD“=(sustainable development)

60.th – the Rome club

...prognostics in environmental eng.

1969 – United nations

*...weapons, population explosion,
environment*

1972 – UN conference in Stockholm –
about environment

*...economical development +
protection of env.*

1972 – Limits of growth
(D.H.Meadows)

*...exponential character of growth
= 14÷15 double, limited sources!*

1983 – World commission for
environment and
development

*...econ. develop. + env. Protection is
not in contradict. In SD conditions
support*

1987 – report „Our common future“
(G.H.Brundtland)

*...protection of env. and sources,
SD*

1992 – Conference about ...*Agenda 21, 27 rules of SD*
Environment and
development in Rio de
Janeiro

1994 –Conference about population
in Cairo

1995 – Social summit in Copenhagen

1996 – Conference about cities in
Istanbul

1997, 2002 – „Rio+5, Rio+10“
meetings of UN about env.

:

What is SD?

...your definition ?

→ Our common future...

SD is that development, where our current generation behaves the way, that the future generation will have no limits to fulfill their needs

→ According to „Law of the CR about environment“

SD is that development of the society, which allows future generations to fulfill their life needs, does not lower diversity of the nature and keeps natural functions of the ecosystems

Understanding of Sustainable development varies a lot – depended on:

- history
- culture and religion
- life standard

Sustainable development is **post-material merit** → hard to explain in poor parts of the world



Social decision making process

1. Problem identification *Damages on ozone layer by freons has been suspected already from 70.years, ...*
2. Social acceptance and decision to solve it *Important persons have to be convinced + public. → **1985 Vienna protocol**... „threat of ozone layer damages is real...“*
3. Formulation of measures *government + institutions have to formulate (**CFC production limits**)*
4. Realization *Who is responsible, who checks, which sanctions? (**1987 Montreal protocol**)*
5. Evaluation of reached changes *experts + public – the goal was reached? → further measures, (2003 improvement)*

Indicator are permanently developed...

government:

The Netherlands, Canada, Norway, UK, USA...
Environmental agency in Copenhagen

NGO:

International Union for Conservation of Nature
(IUCN),
Water Research Institute (WRI)

...examples of indicators:

A) social

- employment rate [%]
- mean life length [years]
- population growth [%]
- population density [persons per km²]

B) economical

- Row product growth (pro person) [%]
- trade balance of the goods and services [US \$]
- annual energy consumption [J]
- row materials storages [t]

C) ecological

- consumption of H₂O in households [m³ pro person/year]
- pesticides consumption [t.km⁻²]
- greenhouse gasses production [t/year]
- non-renewable resources exploitation [t]
- the rate of expenses for nature protection from raw national product [%]
- area of protected landscape [% of area]

Principles of sustainable development according to „Agenda 21“

SD is not (and must not be) limitation of development, but...

Higher effectiveness

Application of natural abilities

We can take only what „we can afford“...

3 basic pillars of the principles...

1. People and institutions ...demography, health care, poverty, war, information, ...
2. economy ...new technologies, internalization of environmental costs into prices, ...
3. ecology ...resources protection, environment protection, ...

6 tasks resulting from Agenda 21

1. Population growth limitation
2. Providing food sources
3. Keeping alive natural resources
4. Development of secure and ecological energy resources
5. Searching for ecological friendly technologies
6. Development of urban areas

Technologies for Sustainable development

- preventive measures
 - consequent measures
-
- changes in technological processes
(lower losses and emissions)
 - application renewable sources instead of non-renewable ones

- ✓ Radically lower energy consumption
- ✓ Decreasing of material demands
- ✓ Exploitation of renewable resources
- ✓ Closed production cycles
- ✓ Exclusion of toxic or other risky matters
- ✓ Recycling
- ✓ Duration and reparability
- ✓ Monitoring of the life cycle of each product
- ✓ Technologies should be fit to local conditions

Global problems of the Earth

„Local action has global consequences...”

Ozon layer

...emissions CFC

Global climate changes

...greenhouse effect → weather changes = extremes

Decreasing of biodiversity *...fastest species dying out since dino...*

Land-use changes

...deforestation (CO₂), surface runoff, erosion

...etc: fast transfer of diseases + immunity, civilization diseases...

The purpose does not have to be always visible...

- 1600 b.c. – Santorin island explosion (100 x stronger than Krakatau 1883) – Minoa civilization diminishing
- 1150 – 1136 b.c. – explosion of volcano Hekla III. (Iceland) – chronicle in China „dust had rained from the sky,... ten days the ash had rained.... Frost has damaged 5 harvests....“ In Scotland and Northern England has disappeared 90 % of population
- 209 b.c. – other explosion at Iceland => 207 b.c. in China disastrous corn failure, faming (starving), „for 3 years there was not been seen sun or stars“

- 1783 – explosion of volcanoes Hekla and Skaptar Jokul (Iceland).
Explosion of volcano Asama (Japan – ca 100 x stronger). In Europe and US – 6 years of fogs, rains, cold weather, disastrous crop failure.
(??? 1789 – social troubles, Bastilla,... ???)
- 1815 – explosion of volcano Tambora (island Sumbawa, Indonesia)
=> 10000 dead people directly during the explosion, ca 80000 later.
1816 – in Europe „year without summer“ = snow in summer, ,
famine
- 1991 – volcano Pinatubo (Philippines) – particles stayed in atmosphere = for next 3 years covered global warming effect

Questions to think about or to be discussed:

- ✓ *Can we reach sustainable development, when being dependent on non-renewable resources ?*
- ✓ *How to manage decrease of consumption within the economy, based on the growth (Row product = main criterion of prosperity)*
- ✓ *How to avoid riots during slowing down development ? „Buy!, you will give a chance to earn to your colleagues...” (chancellor Gerhard Schroeder)*
- ✓ *How to solve economical and social inequity between North and South (to avoid conflict) ?*

- developing countries (money) – *subsidize (indebt)???*
- population explosion (China, Africa) – *to limit ???*
- acceptable capacity of the Earth ???
- USA versus rest of the world (consumption) – *are we able to reduce the standard ???*
- recycling (not profitable, saving sources) – *to subsidize ???*

Conclusions:

- Consumption and sources are **limited**, human needs develops **exponentially**...
- For **public decision** we need good and objective **Indicators** (social, ecological, economical)
- To decrease tension (differences) between poor (S) and rich (N)
- Current problems are **global ones**
- Sustainable development is not resolutely defined – it develops, but it **is not a PROHIBITION!**
- Necessity of **changing way of thinking** – overcome consume society