# *Sustainable remediation: How to compare solutions?*

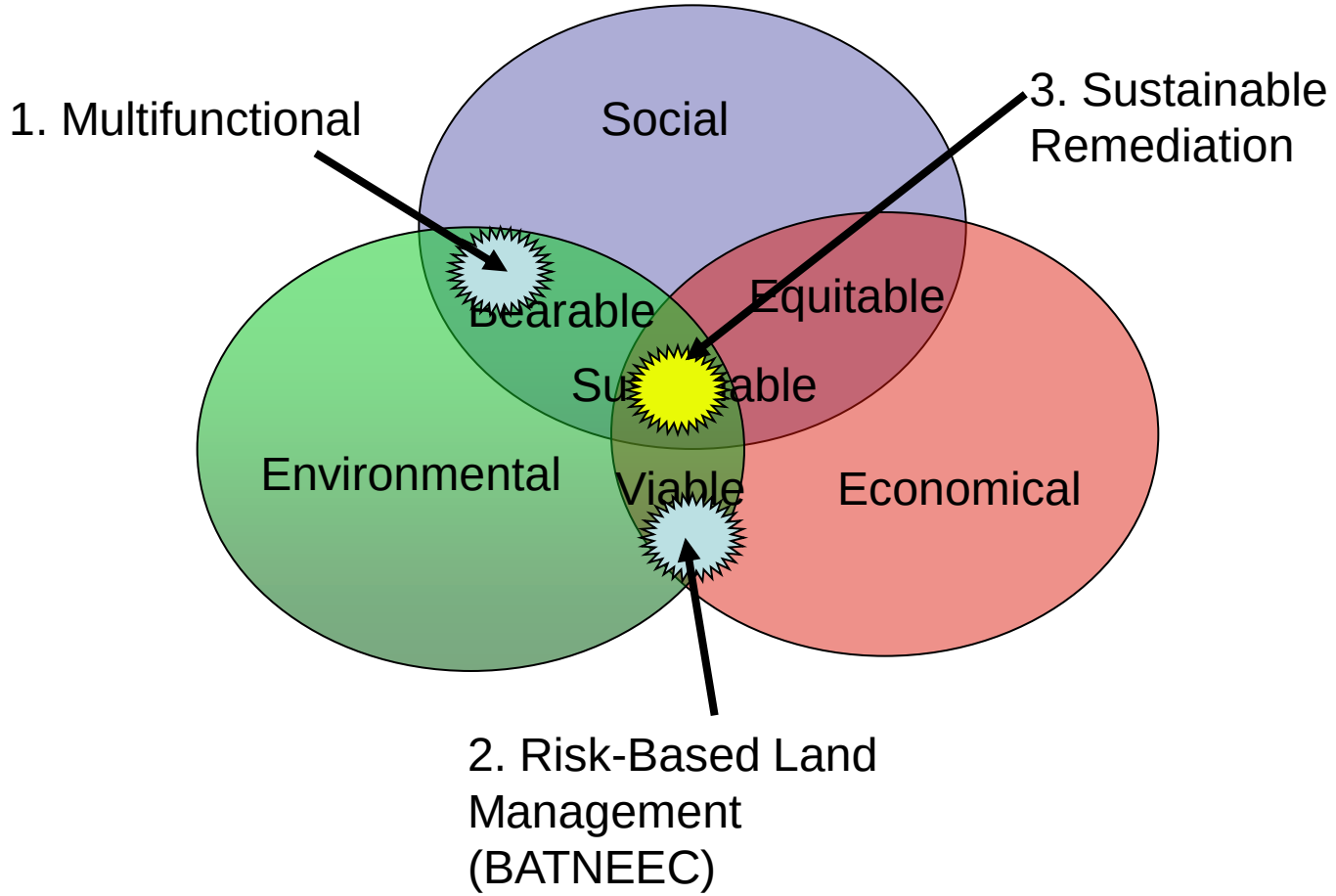
J. Haemers

Deep Green

# Context

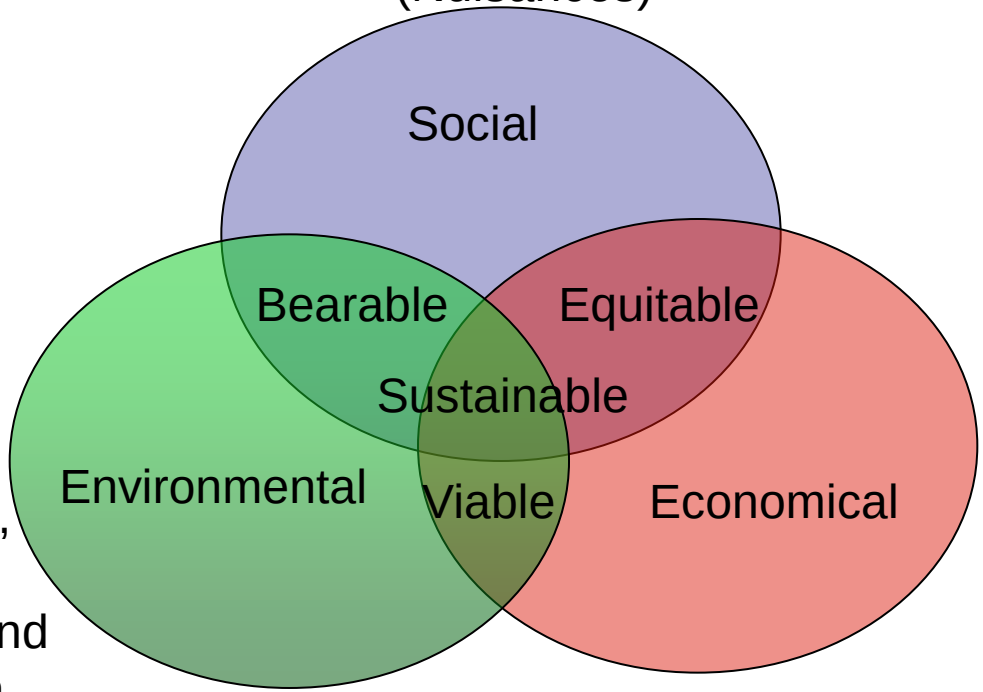
- Informal approach Brussels Capital Region
- Regulators and policy makers face ‘parking inflation’ issue following RBLM application
- Willingness to implement ‘sustainability’ into the equation
- Implementing without exposure to lawsuits against government for arbitrary decisions.

# Historical Evolution in Soil Remediation



# What does it mean for Soil?

Land Usage and Impact on Population (Nuisances)




Impacts on Air, Water, Soil, Ecosystems and Human Health

(RISK ASSESMENT MODELS)

Net Cost/Profit

# Methodology

- Scoring sustainable development is based on a balance of the 3 base segments (economic, environmental and social)
- Weighing of overall and/or individual parameters is a political decision/matter.
- By definition, it is UNSCIENTIFIC
- At least, it can be consistent,…

- To be applied to compare pre-screened technologies (excl. costs)
  - Applicability (achieving the aimed results)
  - Timing
  - Other external constraints (accessibility, economic activity, etc.)

# Economical Score (1-10)

- Total cost of remediation
- Total cost of monitoring – Follow-up
  - External & *Internal costs*
- *Future Remediation Costs*
  - *If residual pollution, estimate future remediation costs*
  - *Multiply estimated cost by probability of occurrence*
  - *Discount factor (Net Present Value)*
- *Variation (increase) of Land Value*
- *Other Additional benefits (cooling, heating, etc.)*

# Environmental Score (1-10)

- Reduction of Impact on Human Health
  - (RISK ASSESMENT MODELS)
- Reduction Impact on Ecosystem
- Net $CO_2$ Impact
  - Complete scope where applicable
- Stress on natural resources
  - Water, sand, gravel, etc.
- Long term impacts
  - Air & Water
  - Fauna & Flora

# Social Score (1-10)

- Nuisances of Remediation works
  - Local communities
  - Noise
  - Traffic
  - Vibrations
  - Other Short term nuisances
- Land usage limitations

Land consumption to date

Example: USA - *Farmland:*

*420 million acres (1982) to 368 million acres (2003)*

*314 m²/second*

*Source: Natural Resources Inventory – USDA – Febr 2007*

# Shenzen, China



*Source: NASA – June 2006*

# Summary indicator/score

| **TOTAL SCORE** | | **ECO x ENV x SOC** | | **1 - 1000** |
|---|---|---|---|---|
| ***Economical Score*** | | ***Default weighing*** | ***ECO*** | ***1-10*** |
| | Total cost of remediation works | 10 | 1-10 | |
| | Total Cost of monitoring measures (incl. internal costs) | 10 | 1-10 | |
| | Future remediation costs (weighed by probability of occurrence) | 10 | 1-10 | |
| | Increase in value of real estate | 10 | 1-10 | |
| ***Environmental Score*** | | | ***ENV*** | ***1-10*** |
| | Impact on human health | 10 | 1-10 | |
| | Impact on Ecosystem | 10 | 1-10 | |
| | Total Net CO2 impact | 10 | 1-10 | |
| | Total impact primary resources | 10 | 1-10 | |
| | Recycling level (ladder Lansink) | 10 | 1-10 | |
| ***Social Score*** | | | ***SOC*** | ***1-10*** |
| | Land usage limitation | 10 | 1-10 | |
| | Impact of remediation works (EIA) | 5 | 1-5 | |

- Total score : MULTIPLICATION of 3 segment scores for favoring balanced solutions

*Addition:*

*1 + 4 + 10 = 5 + 5 + 5*

*Multiplication:*

*1 x 4 x 10 = 40*

*5 x 5 x 5 = 125*



DEEP GreeN FOR A CLEAN FUTURE Duferco Group

# Conclusions

- Sustainable scores are UNSCIENTIFIC. They can be consistent and flexible
- Scoring helps acting
- All 3 aspects are important, even if they can have different weight.
- Multiplying scores favors more balanced solutions.

# Thank You

www.deep-green.com