Risk based Environmental Management: Survey on Demand

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Surveys 2006-2007

Different survey were carried out

at different potential users of the database

Owners

Remediation companies

Etc.

Situation – users

- 89% had to face problems of soil pollution at workplace or home.

- 95 % would need knowledge on environmental remediation technologies and early warning systems to carry out their work or support their decision.

Demands on the Tools

- Static database on CD (structured and updated regularly) 11 %
- Combination of CD and on-line database 15%
- Dynamic on-line database updated continuously 26 %
- **Dynamic on-line Database with Decision Support Tool 42%**

No answer 6%

Information needs - methods I.

Users would take into consideration information from reliable database in the decision making process **:**

- early warning system - if international and Hungarian experiences are available in details: **68 %**
- environmental remediation technologies - if international and Hungarian experiences are available in details: **89 %**

Information needs - methods II.

The users would take into consideration the micro-biological methods

- Assessing the polluted area **47%**
- Environmental monitoring **68%**
- Establishing early warning systems **37%**

Information needs - methods III.

- **the users would take into consideration the environmental technological methods**

- Assessing the polluted area **74%**
- Environmental monitoring **84%**
- Establishing early warning systems **58%**

Knowledge about the methods

- **a) Vibrio Fischer test** **25%**
- **b) Dehydrogenate gas activity test** **33%**
- **c) Biodegradation tests** **53%**
- **d) Root growth test** **53%**
- None 25%

More answers were possible.

Potential types of application

- Preparation of decisions 90%
- Gathering information 65%
- Learning 25%
- Long term development 25%
- Short term development 15 %
- Control the contractors 15%
- Teaching 10%

Factors in decision – making I.

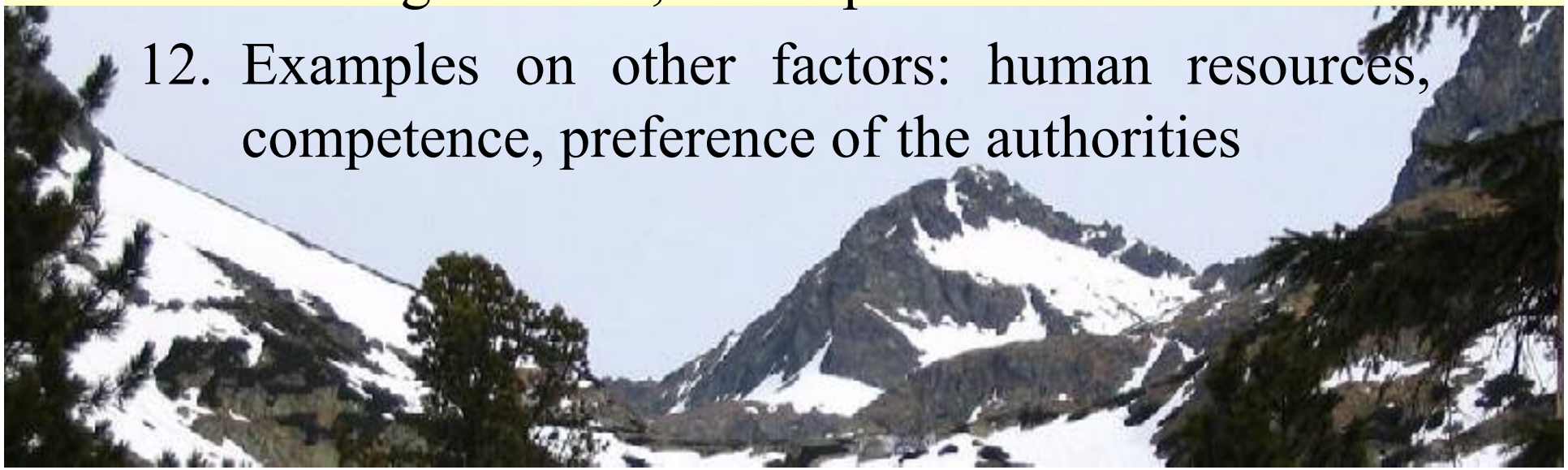
Key factor: the main concern of the decision –maker.

- The rank of the factors in the decision-making:

1. Results
2. Relation to the problem
3. Costs
4. Risk to the environment
5. References

Factors in decision – making II.

6. Simplicity
7. Time demand
8. Material risk
9. Reputation of the method or technology
10. The personality, who makes the offer
11. The organisation, which provides the service
12. Examples on other factors: human resources, competence, preference of the authorities



Current situation – companies

- *Companies* : 200

in environmental remediation

- *Sources* :

Questionnaire 2006-2007

www.kszgysz.hu/xir.htm

Applied Risk Assessment Methods*

**In number of companies.*

Phase / Method	State assessment	Technology monitoring	Post monitoring
Physico-chem	86 %	54%	59%
Biological	54%	27%	9%
Okotoxical	27%	14%	9%
Modelling	50%	23%	14%

- Remote sensor: 18 %
- Early warning system : 1 company

Remediation projects 2001-2005

Total number : 815

- Exchange of soil 22 %
- Ground water treatment at surface 80 %
- Biological treatment in situ : 3 % ex situ : 4%
- In situ chemical treatment 0.6 %
- Thermical treatment in situ : 0 % ex situ: 0.1%
- PEREBAR 0.2 %
- Physical treatment in situ 1 % ex situ: 5 %

Applied remediation technologies - examples

- In situ toxic metal stabilisation
- Ex situ toxic metal stabilisation
- Biological oil degradation in soil
- Air stripping in soil
- Biodegradation in water
- Adsorption water cleaning
- Skimmer, stripper, adsorber in ground water
- Localisation
- Pump and treat technologies
- On site biological treatment
- Drinking water treatment with natural based ion exchanger and adsorbents
- Active and passive water treatment
- Soil exchange
- Air sparging
- Localisation with perebars
- Bio ventilation, bio sparging

Innovative technologies and risk assessment methods

- Definition : **INNOVATION**

Examples

- Test organisation for quick analysis of mixed pollution
- Observation of fito-toxic reactions
- Bioremediation technologies for treating hydrocarbon pollution.
- Metal extraction from industrial waste water with special yeast bacteria
- Recultivation of natural surface water
- Fito remediation
- In situ biological treatment of chloride polluted soil
- Bio membrane stripper
- Combined remediation
- Removal of polluting parts
- Fixation technologies

Determining factors – from companies

- Based on companies' answers:

Most important factors for decision –making:

1. Costs
2. Timeframe of execution of the remediation

These factors are at the 3rd and 7th places on the users' list.

Conclusions

- In practise the applications of innovative remediation technologies are not on the priority list.
- Considering the most important factors of the owners and decision makers, the innovative technologies should improve the costs and time demand to bridge the gap between the pilot phase or demonstration and the market.
- A database with reliable information would improve the market access of innovative technologies.