REJUVENATE
Crop Based Systems for Sustainable Risk Based Land Management for Economically Marginal Degraded Land.

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Aqua Consoil, Barcelona 16-19 April 2013
Decision making framework (decision support tool, DST)
Decision Support Tool Structure
(Rejuvenate DST)

Stage I: Crop type selection

Stage II: Site Management

Stage III: Valuation of Approach

Stage IV: Project Risk

Start
set objectives

Stage I
Crop types
Climate/ topography
Biomass use option

Crop

Stage II
Set Characteristics
Risk Assessment
Process impacts

Site

Stage III
Economic
Environmental
Social

Value?

Stage IV
Technology status
Detailed diligence
Stakeholder views

Risk

Output: project risk assessed/
minimised

Output: site management strategy

Output: option for suitable crops and uses?

Output: no suitable crops & uses?

no suitable crop found

Stage I: no suitable crops found

Stage II: no suitable intervention available

Stage III: insufficient value

Stage IV: not possible possible mitigation

Output: no appropriate approach, but objectives can be reconsidered

Stage II: no suitable intervention available

Stage III: insufficient value

Output: no suitable intervention available

Output: no suitable crop found

No appropriate approach, but objectives can be reconsidered

Appropriate approach

Verification
Implementation

Output: option for suitable crops and uses?

Verification
Implementation

Output: site management strategy

Output: option for suitable crops and uses?

Output: no suitable crops & uses?

Start
set objectives
Case study sites

Swedish demonstration sites
  Vivsta varv
  Hägga torp landfill, Kallinge

Romanian sites
  Copsa Mica, Micasasa
Case study tasks

• Measure concentrations in
  – soil
  – vegetation - potential intake by grazers

• Triad analysis

• Assess potential costs and revenues

• Test the DST
  – SWOT analysis
Triad – the Häggatorp landfill, Kallinge
Results – Häggatorp landfill and Vivsta varv, Sweden

SOIL:

• Vivsta varv: low contaminant concentrations (chemical analyses)
• Häggatorp landfill:
  – on average moderate contaminant concentrations
  – TRIAD - no risk through the course of project

Vegetation:
Low concentrations in stem and leaves – no risk for grazing animals.

Higher growth Häggatorp landfill than Vivsta varv
Häggatorp landfill, Sweden – Salix Inger

Growth after approx 1 year

- Higher pH
- Drier
- Less permeable soil
Cost and revenues, Vivsta and Kallinge

1. The biomass can be sold as biofuel
   Net income:
   50 - 160 € /a/ha (Vivsta)
   270 - 370 € /a/ha (Kallinge)

2. The biomass classified as hazardous waste
   Net loss: 160 – 260 € /a/ha

3. The biomass left at site
   Cost: 100 € /a/ha
Results – Copsa Mica

- Soil: High concentrations of contaminants

- Vegetation: varying uptake in different plants and plant parts

- Risks for grazers
  - Current use of "site: feed stock cattle"
  - Rejuvenate: biofuel
Application DST

Swedish demonstration sites
Vivsta varv
Kallinge/Hägga torp deponin

Romanian sites
Copsa Mica, Micasasa

Other sites based on ongoing/prev. studies
Campine - Vanheusden, Witters et al. ("CBA")
Phytopop – Chalot et al.
Phytosed Ec1- Bert et al.

Radio active sites - work shop activity
Results DST application and SWOT analyses

- Phyto-remediation is a sustainable option in most of the cases
- The DST method offers structure
- Need of short guide -> development of short guide
- The method is useful at early stages in the planning and decision process
- The method can be part of wider decision support frameworks
Thank you!

Further information:
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Thank you for your attention!

Questions?

http://projects.swedgeo.se/r2/