SNOWMAN NETWORK
Knowledge for sustainable soils

FACTSHEET

REJUVENATE 2

Crop Based Systems for Sustainable Risk Based Land Management for Economically Marginal Degraded Areas,Phase II: Demonstration projects and evaluation decision support tool

DURATION OF THE PROJECT:
15-1-2010 - 30-12-2012

PROJECT COSTS:
Total project costs: 493. 640 EURO
SNOWMAN network contribution (name funders):

Formas,	241.843 EURO
UEFISCSU	116.920 EURO
OVAM	64.900 EURO
SKB	69.977 EURO

CONSORTIUM PARTNERS:
Lead organization: Swedish Geotechnical Institute, Sweden
Coordinator:– Swedish Geotechnical Institute, **Sweden – Yvonne Andersson-Sköld**
Research partner organization: R&D National Institute for Metals and Radioactive Resources INCDMRR-ICPMRR) Romania
Research partner organization: Centrum voor Milieukunde (Centre for Environmental Sciences) Belgium
Research partner organization: Bioclear, The Netherlands

OVERALL OBJECTIVE:
This project will apply a decision support tool (DST), designed by the Snowman 1 project Rejuvenate, to three practical applications at realistic scales. Based on this test-work, the aims of this project are to i) validate and optimise the decision making framework, ii) provide detailed case studies for the reuse of contaminated land for biofuel crop production– in particular for secondary biofuels and iii) to extend the scope of the DST by applying and validating it in three new jurisdictions (Belgium, Netherlands and Romania). The goal of Rejuvenate 1 and this project (Rejuvenate 2) is to facilitate transparent and robust decision making to facilitate the responsible, sustainable and appropriate use of contaminated marginal land for biofuel and other biomass production. A consistent decision making approach will support an increase in the land area for biofuel crop growth, by improving the effectiveness of decision making and providing a common platform for different stakeholders, e.g. land owners, developers, planners and regulators to engage in discussions. Rejuvenate 1 developed a set of “model procedures” to support decision making for bring marginal land back into use for such nonfood crops (see Rejuvenate Consortium, 2009).

The specific objectives of Rejuvenate 2 are to:

1. Establish three full scale case studies in three participating countries.
2. Provide a mechanism for other countries and third party funders to add further case studies to the project over its three year life span.
3. Validate the decision support approach based on Strength, Weakness, Opportunity and Threat (SWOT) analysis, with regard to i) crop and site management and ii) biomass use anddelivery of value to stakeholders.
4. Perform environmental, legal, economical and ethical assessment of the crop based systems for sustainable risk based land management (RBLM), including the full chain of choice of fields to biomass use.
5. Identify ongoing research, developments and experience of implementation agendas for the re-use of contaminated land for biofuels.

The project will begin with case studies in Sweden and Romania, however, the mechanism will be open and will enable third party funders to attach their case studies to the project. This project is cross cutting across the three areas of the Snowman 2 Call, but focuses in particular on the use of contaminated land for biofuel production.

PROJECT RESULTS:

The DST developed in Rejuvenate was applied in this second phase of Rejuvenate at several demonstration sites and was found applicable. Through the course of Rejuvenate 2 the DST was also applied based on the results from the demonstration sites to assess the environmental and economic risks.

The combined results from the different demonstration sites show that the risk depends on several factors including contaminant concentrations in soil. The results indicate that the risks related to health and ecotoxicity and ecology caused by the energy crops grown on low to moderately contaminated land, such as at the Swedish sites Vivsta varv and the Häggatorp landfill, are low. The risks at the lowest contaminated site, Vivsta varv, are even very low.

At the more contaminated site in Romania both the ecotoxicity and the risks for grazing animals were found to be higher. At this site, different types of crops were grown. For individual elements the calculated risk for grazing animals varies across the different crops and parts of the crop, but none of the plants or parts (with exception for corn cob) of the plants investigated shows results where there is no calculated risk for grazing animals. There is currently, however, no domestic grazing at the field. The field can be reached by wild animals from the surroundings but the risk is still low compared to keeping grazing animals on the field. More importantly, currently within the area the harvested crops are used to feed domestic cattle. The current use of crops grown in the area thereby poses a higher risk than crop production for energy or other non-food purposes as the intention in Rejuvenate. Accordingly, to utilise the crops for energy instead of feeding cattle can be a more favourable alternative. To identify the best land use alternative, a discussion among the different stakeholders in the area is suggested as there are several interests to be reconciled. These interests include socioeconomic aspects such as salaries, food and energy demands, and the value of the land and products.

The results from the sites show that the costs and benefits depend on how the product can be used. For the Swedish demonstration sites there is a need of financial support, such as EU bioenergy support, or that there is a significantly increased demand of energy from non-agricultural land.

The results have shown that cultivation, and consequent use of biomass for biofuel use instead of fossil fuel, results in renewable energy potentials with CO_2 abatement. The wider environmental benefits of phytoremediation compared to excavation are significant, while utilising the land as a park depends on the amount of soil importation needed for such utilisation. The biological diversity is increased in both cases (energy crop cultivation and park establishment) while the social values depend on the context.

The DST has been shown to be systematic, transparent and transferrable. It is useful for assessing the risks, costs and benefits on internalities, environmental risks and externalities. The experience is also that the tool shall be used as a checklist in an iterative procedure. Based on the activities in Rejuvenate we even recommend the tool to be used already in the first iterative step to identify non-working alternatives and to find out which, and what type of information, is further needed before sustainable decisions and planning can be further undertaken.