

GENERAL INTRODUCTION

OF THE MODEL STRATEGIES ON
EXAMINATION, AFTERCARE AND
REDEVELOPMENT

TO ACHIEVE

SUSTAINABLE USE OF FORMER AND
ABANDONED LANDFILLS IN EUROPE

Client: Interreg IIC, Lille, France

Project: Sustainable Use of Former and Abandoned Landfills Network
(SufalNet)

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SUSTAINABLE USE OF FORMER AND ABANDONED LANDFILLS

1. Problem of former and abandoned landfills

Closed landfills take up a considerable amount of space in many countries. Many locations are situated near the edge of cities and villages. In terms of efficient use of space, closed landfills can provide alternative locations for companies, offices, golf courses, city parks or ski runs, for greenhouse farming or the cultivation of forests. However, many closed landfills may also pose environmental- and public health risks. In order to protect environment and public health of negative consequences caused by former and abandoned landfills, risks should be assessed and managed.

Europe counts around 150.000 of these landfills which cover approximately 300.000 hectares. Most of these landfills are closed and are not sufficiently provided with environmental facilities to secure and isolate these landfills from the environment. Leakage of hazardous contaminants will be a threat to human health and environment. As a result people living near a closed landfill generally will be concerned and tend to keep their distance from such a former landfill.

However, leaving the landfill as it is, secured but unused, will also affect the environment. As any derelict land in a populated area, abandoned landfills will affect the community negatively. Landfill sites could as well be opportunities to be redeveloped in terms of space for new activities like city parks, golf courses, commercial- industrial- and residential area, forestry and ecological zones. These landfills can also be redeveloped in terms of materials as well. Some landfills could also be reused by mining specific wastes that represent an economic value as secondary resources. This becomes an option when primary resources become rare and prices are going up.

In the framework of the EU program INTERREG IIIC 21 partners from 12 different Member States joined a network promoting sustainable use of former and abandoned landfills (SufalNet). Objective of INTERREG IIIC is to help regions without joint borders to share expertise by working together in networks of cooperation. These partnerships enable regions to develop new solutions to social, economic and environmental challenges in order to contribute to a sustainable development of society.

Sustainable re-use of landfills

Environmental benefits

Protection of ground-water, surfacewater and air

Protection of public health and safety

Reduction of pressure on greenfields

Social benefits

Improving the quality of life by renewal of degraded property

Reduction of fear of illness

Elimination of negative social stigmas of living in contaminated area

Economic benefits

Attraction of investment and creation of jobs

Increasing landvalue by improving degraded property

Development of new technology

2. SufalNet: Sustainable use of former and abandoned landfills network

SufalNet was approved by INTERREG IIIC in January 2005 and has been funded for the duration of 3 years till December 2007 by the European Union with € 788.000,- SufalNet was managed and coordinated by a steering group and the project secretariat was facilitated by the Province of Noord-Brabant, Netherlands.

The overall aim of SufalNet is to reduce environmental and public health risks and to stimulate re-use of former and abandoned landfills through exchange and dissemination of policies, projects and instruments. Secondary aim of SufalNet is to get the issue of former and abandoned landfills at the European agenda and consequently to stimulate public authorities and public equivalent bodies at national, regional and local levels to start dealing with former and abandoned landfills. SufalNet is also aiming at involving stakeholders like waste management sector, project development, consultants and the public in early phases of decision making. To achieve these aims SufalNet has identified and brought together expertise and good practice about dealing with former and abandoned landfills by examining, programming aftercare and redeveloping of these landfills.

Together with information about the landfill situation in the participating regions and several case studies (e.g. San Guiliano urban park in Venice, Normannenstraße landfill in Emden, Gulbergen estate in Mierlo and North Foreshore in Belfast) SufalNet has resulted in a model strategy to implement sustainable use of former and abandoned landfills. Concerning all the stages of redevelopment (examination, aftercare, redevelopment) three tools have been drawn up to facilitate regional and local authorities to start policy programmes in order to reduce environmental and public health risks of former and abandoned landfills and to promote redevelopment of these sites. Each tool can be read as a document itself or as a part of a unique model strategy concerning all the stages of redeveloping and transforming former and abandoned landfill sites in new uses.

The model strategy has been discussed at seminars which were held every six months. It is based upon the best practices of 21 partners across Europe. Partners contributed SufalNet by hosting seminars and by delivering papers on monitoring of groundwater, top covers, landfill gas, risk communication and showcases of redevelopment projects transforming landfills in golf courses, city arcs, forests, industrial- and even in residential area's. At the final conference of SufalNet in Brussels the model strategy was discussed with stakeholders like landfill operators, NGO's representing community interests, geotechnical institutes, urban planners and developers of contaminated area's (brown fields).

To disseminate the results (e.g. landfill overview and model strategy) of SufalNet's end report is presented at the website www.endreportsufalnet.net.

3. Scope of the model strategy

The model strategy is primarily focussed on former and abandoned landfills.

A former and abandoned landfill (hereafter: former landfill) is an area in the landscape where waste has been disposed in the past. The waste material can be composed out of household waste, industrial waste, chemical waste, demolition waste etcetera. The operation period can vary from very shortly to decades. The landfill area can vary from a few square meters to tens of hectares. The landfills mostly lack environmental protection measures. Slush landfills, ditch fillings and crushed-stone foundations are excluded. Also landfills which fall under the jurisdiction of the EU landfill directive (1999/31) are excluded. In practice the decision whether the location is a former landfill is taken upon historical information about the landfill.

The model strategy is also applicable for landfills that are environmentally controlled and have been recently closed or will be closed in the near future.



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4. Integration of the model strategy on examination, aftercare and redevelopment

In order to reduce environmental risks of former landfills and because redevelopment of former landfill has environmental, economic and social benefits as well the first step is to assess the environmental risks of these landfills. Identification and characterization of former landfills is an essential first step in getting information about environmental risks and need for aftercare. It is also an essential first step in establishing the redevelopment potential.

In order to help decision makers and stakeholders to understand the assessment of environmental impacts and risks of landfill sites a tool for examining former landfills by site investigation has been developed by SufalNet. The model strategy on examination aims to provide an efficient methodology to assess the environmental and public health risks associated to the present or future use of former landfills. It is applicable for an individual landfill and a large volume of former landfills as well. It also shows how to conduct a program to examine former and abandoned landfills at a regional scale.

The results of the risk assessment will inform on the extent of measures which are required to manage the identified risks. Therefore, the examination phase provides crucial information to feed the aftercare strategy and establish the monitoring targets and planning in a cost effective way, but also to identify the potential redevelopment restrictions (and opportunities) associated to the site and the options to manage them. Equally, the identification and assessment of risks constitutes a key element for the involvement of stakeholders and community in the redevelopment plan, and the design of an appropriate risk communication and risk management plan. The presence of real or perceived risks (threats) to human health or the environment, may limit the options for future land use.

The model strategy on aftercare is a tool for programming aftercare measures for former landfills in case the examination phase has resulted in landfills with environmental risks that are not acceptable. It provide a practical method for managing the environmental risks by taking the appropriate technical measures (e.g remediation, containment with top liner and coverage layer, monitoring and sampling and recultivation) in order to control these risks. The primary aim of this model strategy is to give a practical method for the programming of aftercare measures for one or more former landfills as a result of examination processes and/or within redevelopment processes.

So aftercare is linked with the other strategies because the starting point for aftercare programming are the results of the examination of the environmental situation and the risks (output of model strategy on examination). It is linked with the model strategy of redevelopment because aftercare measures can be realised within the actual or redeveloped situation (input for model strategy on redevelopment). Aftercare can be considered to be the variety of measures (like technical, financial and organizational) that are needed to reduce the risks for the environment or the public health, to an acceptable level and to maintain this acceptable level for a certain period. Aftercare aims at preventing further soil degradation and for landfills throughout Europe to be “fit for purpose”, and thereafter to be managed on a fully sustainable basis.

Redevelopment of former landfill sites can provide substantial environmental, economic and social benefits. However serious barriers to landfill redevelopment such as regulatory approval, financial risk, a lack of market or profitability, excessive transaction costs, lack of public acceptance, and litigation risk have to be overcome. To help decision makers the complexity of the decision process this process is clarified by assessing the feasibility of landfill redevelopment. The general aim of this model strategy is to promote and stimulate redevelopment by clarifying complexity of the decision process. So the work is finalized to improve decision course by an innovative approach that allows considering weakness and opportunities of redevelopment in a progressive way, orienting proposals towards the most feasible scenario. The model strategy doesn't give solutions: it represents a shared methodology that could drive developers, and the other subjects involved, toward a clear decision process.

The methodology assessing the feasibility of landfill redevelopment provides a logical scheme of three assessment areas:

- *technical area*, that evaluates the engineering solution in order of context opportunities and constraints (including examination results and aftercare measures);
- *administrative area*, that allows to verify that redevelopment is fitted to social expectation, to committed development and to adjacent land use; this area also assesses feasibility in terms of model permit application and redevelopment approval process.
- *financial assessment* that aims to check redevelopment feasibility in terms of lifecycle costs, economic benefits, public/ private partnership

Furthermore a decision flow is presented. This decision flow starts with a wide range of redevelopment possibilities, reducing potential landfill sites to a list of a few ones and ending with a final proposal of landfills that are feasible to be redeveloped. The assessment itself follows the three main phases that constitute the feasibility of landfill redevelopment. First of all it has to be decided if the environmental risks of the landfill are acceptable and can be controlled with technical measures. Secondly community acceptance has to be assessed and decided upon. Without any public acceptance no redevelopment project is possible. Last but not least the financial risks have to be assessed and it has to be decided whether landfill redevelopment can be self-sustaining by the market or should be public driven.

5. Former landfills in EU-directives and European Regional Development Fund

The overall objective of the EU landfill directive is to provide measures, procedures and guidance to prevent or to reduce as far as possible negative effects on the environment, in particular surface water, groundwater, soil and air as well as any resulting risk to human health from landfilling of waste during the whole lifecycle of the landfill. This directive is only applicable for landfills still in operation, recently closed landfills and new landfills. Former landfills are not covered in this directive.

At the moment the European Commission has put forward a Thematic Strategy for Soil Protection and a Soil Framework Directive. The overall objective of this strategy and directive is to protect and to promote sustainable use of soil by preventing further soil degradation, preserving its functions and restoring degraded soils to a level of functionality consistent at least with current and intended use. Although landfill redevelopment is not included as such in this soil strategy and directive it could benefit from its positive effect on countries where a legal framework for the soil is missing. It will be important to recognize that because of the focus on risk management, creative options for redevelopment of landfills should not be reduced or even be blocked. The direct question to the European Commission and all bodies involved in the final decisions is to check that landfill redevelopment will still fit into the Soil Framework Directive after all the amendments are put into place. It will be important to point out that landfills need a tailor-made approach and can not only be seen as soil because of the waste in the landfill body.

Another instrument to facilitate sustainable use of former landfills is to fund projects to examine, to take aftercare measures if environmental risks are not acceptable and to redevelop these former landfills. In the framework of the European Regional Development Fund the European Commission has set forward a new initiative called “Regions for Economic Change”. The European Commission wants to stimulate investment in innovation. Re-using urban brown field and waste disposal sites for redevelopment are considered socially, economically, environmentally and culturally important for the development of cities and regions. Regions and cities for economic change are invited to develop projects and to participate in the new generation of networks.

6. Risk based land management

Three model strategies on examination, aftercare and redevelopment have been drawn up in the frame of SufalNet. They have in common that they are based on the concept of “risk based land management”. RBLM is a concept developed by the Contaminated Land Rehabilitation Network for Environmental Technologies (CLARINET) (Vegter J., Lowe J., Kasamas H., 2002) that provides a framework for the management of contaminated land in structuring the decision-making process to achieve sustainable solutions. RBLM is a concept that allows for regional and site-specific solutions

and can assist policymakers and regulators, as well as other stakeholders, in making balanced and informed decisions to achieve sustainable land use without destruction of capital. RBLM takes into account: risk assessment, overall benefits, costs and environmental effects, land value and conditions, redevelopment possibilities and community views within the possibilities and/or limitations of current policy. The concept is applicable on every level: strategic, tactical and operational. The context, global principles and the components of the RBLM concept are described in the model strategy on aftercare.

7. Risk communication

As landfills are considered to be a threat to human health and environment potential and actual risks of former landfills have to be communicated in a honest, frank and open atmosphere by stakeholders and competent public authorities as well. This aspect of risk communication is stressed in all three model strategies. In implementing the SufalNet model strategies communication with stakeholders and the community is essential. The community has to be informed about the hazards of the landfill. Local and regional authorities should involve stakeholders and community in early stages of decision making regarding site investigation and redevelopment of former landfills. It is important to acknowledge that involvement of stakeholders and community should be a two-way conversation in which the public authority informs and is informed by affected community members. Community fears, gaps in knowledge and desired technical solutions have to be taken serious in order to create trust with the community by establishing credibility.

Communication about risks is not only an ongoing dialogue in planning but also at the moment the landfill has been redeveloped and crisis may occur. Although every crisis is by definition unexpected and unpredictable it is nevertheless crucial to be prepared in advance by simulating various emergency scenarios and creating guidelines for crisis communication. To manage a crisis effectively it is important to react quickly and proactive, to speak with one voice, to coordinate between all actors and stakeholders involved and to manage the follow-up of the crisis.

8. Recommendations

At the final conference of SufalNet in Brussels 14 November 2007 the model strategies are to be discussed with stakeholders and a forum of politicians and decision makers. Consequently recommendations will be drawn up.