THE „ ENFO" KNOWLEDGE BASE TO SUPPORT EFFICIENT MANAGEMENT OF WASTE UTILIZATION ON SOIL

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About „ ENFO"

„ENFO" (ENvironmental inFOrmation) is a comprehensive web based environmental knowledge base and expert system, supporting decision-making with systematically organized and searchable information on environmental legislation, assessment and monitoring methods, risk and impact assessment tools, environmental remediation methods and a Decision Support Tool (DST).

„ ENFO" includes legal, scientific and practical engineering levels. Within these levels the information are presented in versatile forms : glossary, relational databases, maps, picture galleries, e-courses, available from the entry page of the ENFO portal (Fig. 1).
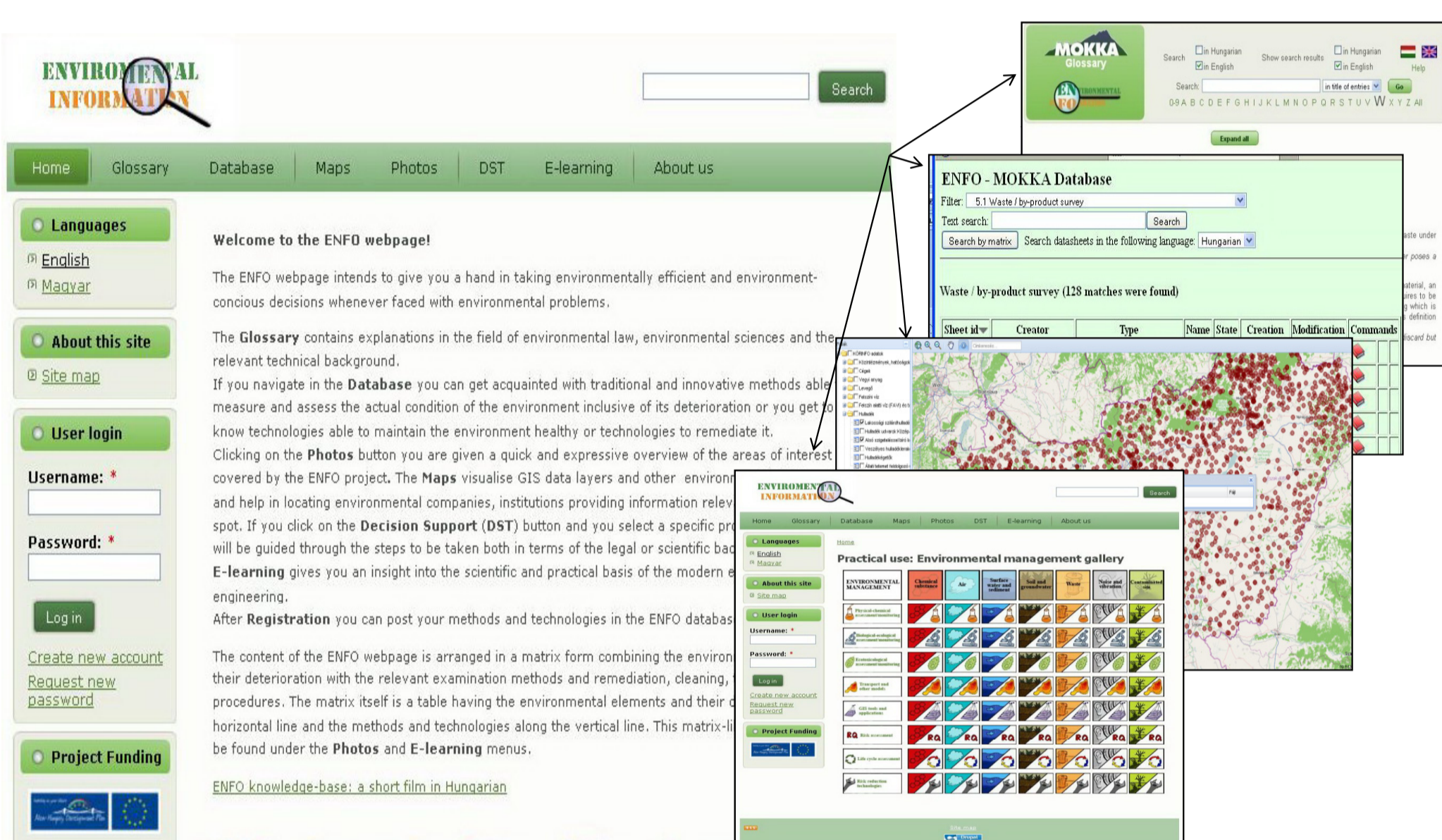

Figure 1. Entry page of the ENFO portal and the information behind the main menus

Waste utilisation on Soil

The SOILUTIL project has developed the „Waste „ and „Soil" topics within „ ENFO" , focusing on the interaction between „Soil" and „Waste" in terms of waste utilisation on soil.

The „Waste characterisation" data sheets provide description of various wastes. The „Soil amelioration technology" datasheets present case studies about waste utilization on soil (Figure 2.)

Figure 2. List of „Waste Characterisation" and „Soil Amelioration" datasheets in the ENFO-MOKKA database

References

ENFO project (2008-2010) Environmental Information Dynamic information system to support environmentally efficient and environmental-conscious decisions, KMOP-2008.3.3.4, http://enfo.agt.bme.hu/drupal/en

SOILUTL project (2009-2014) SOIL amelioration by innovative waste UTILisation technologies, TECH_09-A4-2009-012, http://soilutil.hu/en

„Matching" software-supported DST

The matching software system is a decision making tool planned to match the utilizable characteristics of the waste to the amendable characteristics and/or missing components of the deteriorated soil to produce an efficiently remedied/amended soil. Data availability and matching capability of the current "Waste" database has been tested versus some soil degradation cases (Fig. 3).

Figure 3. Preliminary testing matrix matching the „Waste" datasheets in the database to the listed „Soil" problems.

Matching works according to the typical indicators (priority parameters) of the soil problem (i.e. bulk density, humus content, lime content in case of compacted soil). The priority parameters of the degraded soil (based on which the diagnosis is given) are grouped according to the main soil degradation cases (loss of nutrients, loss of organic matter, salinisation, acidification, sodification, compaction and pollution).

The navigation algorithms (Fig. 4.) within the system lead the user to various decision points, where they offer further problem specific navigation possibilities to reach the matching waste.
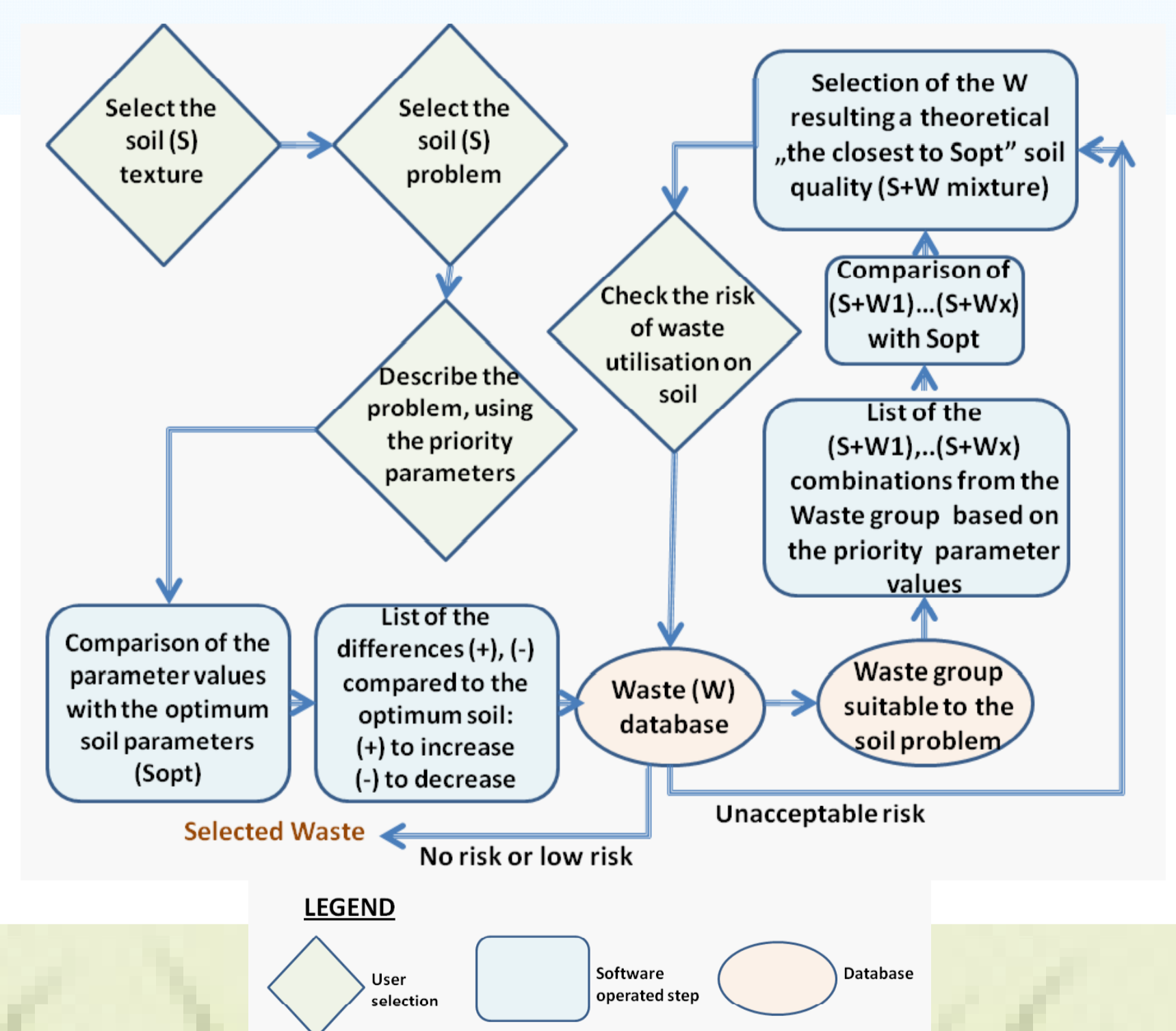

Figure 4. General navigation algorithm aimed at finding the suitable waste to amend a certain degraded soil

Conclusions

ENFO combines IT tools with scientific, engineering and management knowledge to help the systematic arrangement and easy search of information at various user levels.

The software-supported DST contributes to preliminary decisions on the sustainable, risk- based and efficient utilization of wastes for remediation of degraded and contaminated soil.