

# Soil science in land evaluation and planning



**WORKING WITH SOIL**  
setting standards in soil science



## Background

The evaluation of land for its potential to support different uses and to supply ecosystem services is fundamental to the sustainable use of global land and soil resources by a growing world population. Land evaluation is normally accomplished by the application of one or more relevant international or national land evaluation schemes (including land capability and suitability methodologies) to spatial natural resource information such as soil, terrain and land use/cover maps and climate data. The output from land evaluation is used in a range of contexts. It may be in the planning of the use of land for food or timber production, assessing the sustainability of different development options e.g. new housing or infrastructure projects or the protection of natural resources such as productive agricultural land, groundwater or wetland and peatland ecosystems from urban development or other inappropriate activities. An understanding of the functions of soil and of the ecosystem services that depend on soil functions is relevant.

While some land evaluation includes socio-economic considerations, these normally lie outside the role of the professional soil scientists for whom the focus is the interpretation of soil resources within their physiographic context. Professional competence in soil science for land evaluation therefore depends heavily on an adequate understanding of how soils interact with other components of the natural environment such as climate and topography. It builds on and is additional to foundation skills in field soil investigation, description and interpretation (BSSS PCSS Document 1).

## Qualifications

Professional soil scientists with competence in land evaluation will have graduated in a relevant science. They will have a second degree in a relevant subject and/or a number of years of relevant experience (including experience in the field) and will have, or be adequately qualified for, full membership of a relevant professional body such as the British Society of Soil Science (BSSS).

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## Minimum competencies

### Skills:

- 1 The ability to clearly understand the objectives of the land evaluation project to be undertaken
- 2 The ability to design, specify and undertake an appropriate desk study and/or field survey campaign that reflects the objectives of the evaluation, the size of the study area, available thematic information, and the required spatial differentiation and levels of confidence of the land evaluation output
- 3 The ability to collate and critically evaluate available soil, terrain, climate, land cover and other relevant maps, data and information appropriate to the requirements (spatial scale and certainty) of the project
- 4 The skills and understanding to identify the need for and the ability to specify any further thematic surveys of soil, terrain and/or land cover in line with the project objectives
- 5 The ability to systematically collect, record and organise information about the land cover, topography, soils and geology of the study area at an appropriate scale and sampling intensity
- 6 The ability to compile thematic information on land cover, soil, geology, topography and climate in the formats required for application of the land evaluation classifications to be applied in the study. This may require the derivation of secondary attributes such as pedo-transfer functions<sup>1</sup> and their subsequent application
- 7 The ability to apply appropriate land evaluation classifications to the study area and to critically interpret and evaluate the resulting spatial and property information including the comparison of output from classifications for different potential land uses, management systems or ecosystem services
- 8 The ability to draw conclusions from the work and to reliably recommend any further work that may be desirable or necessary
- 9 The ability to effectively communicate the principles, processes and outcomes of land evaluation in a simple and relevant form to clients, developers, planners and other relevant professionals with clear statements as to the reliability and certainty of the results

- 10 The ability to write accurate, concise reports in clear English and in line with best practice examples of land evaluation that communicate the findings to all interested parties
- 11 The ability to apply a relevant system of quality assurance to the output of the project

### Knowledge:

- 1 An understanding and technical knowledge of the influence of physical, chemical and biological land and environmental factors on land use and land use potential
- 2 A general knowledge, previous experience and understanding of land evaluation as a methodology and an awareness of relevant international and national published schemes
- 3 Sufficient understanding of land evaluation schemes and methodologies, their strengths and weaknesses, to assess those that are relevant and appropriate to the objectives of the project
- 4 A knowledge and understanding of soil functions and of how these relate to ecosystem services where these form a part of the project including key international and national publications on the subject
- 5 A knowledge of paper and/or digital topographic, land cover, geology and soil maps, other relevant thematic reports and technical sources of information, and of their role in land evaluation
- 6 A knowledge of relevant international, regional and national policies and regulations relating to the use and protection of land resources
- 7 When field work is involved, knowledge of relevant Health and Safety, Environmental and Biosecurity regulations, including any animal or plant health restrictions in force, and all relevant safe working practices
- 8 An awareness of the importance of systems of quality assurance and control in all aspects of professional work

1 Pedo-transfer functions are predicted soil properties or functions derived from primary soil property data collected during field soil survey

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