

The Ten Principles of Good Soils and Stones Management

This paper proposes the basic principles of soils and stones management for a common Soils and Stones Framework.

1. Implement soils and stones management practices to drive sustainable economic growth.
2. Preserve, protect and enhance the value of all soils and stones in situ.
3. Promote and enhance the inherent value of soils and stones as part of a wider integrated environmental system (e.g., for carbon sequestration, food security and biodiversity).
4. Use a common quality standard for soil health in relation to land-use, taking underlying soil conditions into account in the choice of land use.
5. Use a common quality standard for soil health based on principle #4 for excavated soils, stones and dredgings to be used in specific end-uses.
6. Understand and identify soil value at the start of the master planning stage of a project or change of land-use. Define the status of any excavated soils and stones according to their value as an end-use resource rather than by the intention to discard them as surplus to the needs of the project.
7. Implement a soils and stones management hierarchy (leave in situ; remediate in situ; reuse; remediate ex situ and return to source; remediate ex situ and re-use elsewhere on the site of origin; remediate ex situ and re-use at a third-party site; recycle; and finally dispose to landfill).
8. Implement financial metrics for the life-cycle of all projects that are based on the impact on soil value in order to drive the market for offsetting (e.g., metrics for biodiversity loss, carbon sequestration and loss of food security).
9. Implement a national policy progressively to harmonise legislation, best practice guidance and monitoring programme to protect soils. Include the fields of planning, land contamination, forestry, agriculture and waste management. Aim to promote integrated markets for soils and stones, offset trading and policies thereby allowing land values to reflect optimum soil health based on metrics in principle #4.
10. Periodically benchmark the natural and economic value of UK soils against both base-line UK and international metrics, taking into account global social, economic and environmental sustainability (e.g., the supply chain impacts of ensuring UK food security, and the valuation of soils and stones).

The Ten Principles of Good Soils and Stones Management

Explanatory Notes

General

Recommendation HLaP3 (Harmonising Legislation and Policy) of the April 2021 SocEnv [Soils and Stones Report](#) was for “*Reviewing existing legislation and regulation for protection and restoration of healthy soils, for their sustainable use and management, with simpler common regulations within a common ‘Soils and Stones Framework’ and an ACoP for all soils reuse and recycling.*”

While this recommendation covered a range of issues, the overarching need for a framework against which to review and to improve regulation is the subject of this paper. The paper sets out ten principles of good soils and stones management to promote a regulatory framework and common focus for sustainable economic growth.

The ten principles are intended to be a universal framework for all custodians of the land (including the agricultural, forestry and leisure sectors), for legislators, developers, consultants, soils practitioners and for the waste management, aggregate and landscaping industry sectors. The framework provides a hierarchy of options similar to that of the waste hierarchy, and orders these options sequentially.

Principle 1: Sustainable Economic Growth

The first principle promotes sustainable economic growth across all sectors through practices that improve soil resilience and health, avoiding the degradation of a natural asset on which future generations will rely for their quality of life.

Principle 2: Preserve, Protect and Enhance Natural Soils and Stones

This fundamental principle seeks to preserve the natural capital value of soils in situ. In view of the complex nature of soils, their relation to geology, local climate and landscape, and their connectivity through, for example, mycorrhizal networks, this principle sets out to preserve natural soil structure as a living system. Even ploughing disrupts soil structure, and the principle will support minimum tillage agriculture as well as in situ remediation of damaged soils. The principle recognises that soil structure can be quickly destroyed, but can take centuries to recover, putting soil biodiversity, carbon sequestration potential and fertility under stress. Practitioners would be expected to comply with this principle or explain themselves. By promoting sustainable growth as a positive agenda, this principle can be achieved without disturbing natural soils in many aspects of development. Designating soils protection zones in, on and around the redline boundary of a development would support this. This principle will also support the avoidance of soil compaction.

Principle 3: Valuing our Soils and Stones

The third principle underpins the first in the area of natural capital. It not only repeats the principle of preservation but extends it to promotion, to include, for example, research and development. The three most important aspects of natural capital are listed, as these should be quantifiable and critical to sustainability. The principle does not, however, preclude the softer, more subjective elements of natural capital, or the value of soils for water retention and natural flood management.

The Ten Principles of Good Soils and Stones Management

Explanatory Notes

Principle 4: Quality Standard for Natural Land and Soils

Principle 4 proposes a quantifiable standard for in situ soil quality based on fertility, carbon sequestration and biodiversity specific to the use of land (e.g., agriculture, forestry, recreation, and amenity). Soil fertility metrics are well established for NPK and some trace elements (cf. [RB209](#) and the [Fertiliser Advisers Certification and Training Scheme](#)). The carbon sequestration potential of soils is developing fast. Soil biodiversity is a less mature science; for example, a measure based on mycorrhizae has yet to be fully evaluated. Developing such standards will allow optimum soil health to be determined for the specification of soil improvement targets, and for offset trading, where soils are unavoidably damaged or removed during development. The principle also promotes land-use that is appropriate to the soil (e.g., to improve food security).

Principle 5: Quality Standard for Soils and Stones Re-use

Principle 5 extends the soil quality standard to ex-situ soils, such as those moved from one site to another, those manufactured from source materials or recycled from waste soils, dredgings, sludge, silt and gulley waste. It ties the standard to an optimum value for specific end-uses (e.g., agriculture, forestry, recreation, amenity, site restoration, aggregates and substrates).

Principle 6: Soil Valuation in Planning and Development

The sixth principle focuses on development projects, and puts the material consideration of soil quality and the natural capital of soils at the heart of planning any project. It sets out an important change to the concept of what constitutes “waste” for the purposes of waste legislation. Surplus soils will not be defined as “waste” by virtue of the producer’s intention or obligation to discard it, but by their value as a resource, and the quality standards appropriate to virgin soils. This will set a new basis for a UK legislative framework, allowing the current somewhat cumbersome application of Waste Regulations, exemptions and frameworks, such as [DoWCoP](#), to be amended. This will avoid discard, and support targets for soil health by valuing natural soils in all circumstances in line with the waste hierarchy and circular economy drive.

Principle 7: Soils and Stones Hierarchy

Principle 7 mirrors the waste hierarchy, with specific detail to support principle #2.



The Ten Principles of Good Soils and Stones Management

Explanatory Notes

Principle 8: Project Life Cycle - Offsetting the Impact on Soils

Behind these principles lies an opportunity to drive the economic advantages of soils management, particularly for meeting a need for biodiversity and carbon offsets for new developments. This is based on the understanding that soil quality improvements require more than altruism in reaction to the science of long-term environmental degradation. With a financial driver behind the improvement of soil quality, the proposals will receive a better reception from government and industry. By offering a solution to meeting sustainability targets through a system of soil assay such as is used for ore by JORC ([Joint Ore Reserves Committee](#)), soil quality can be monetised.

Principle 9: Harmonising Soils and Stones Regulation and Guidance

The ninth principle reflects the focus of the 2021 Soils and Stones Report to simplify and harmonise a disparate portfolio of soils legislation, standards and advice. This sets a commitment to an holistic approach to soils management, recognising that this will take time to achieve. Changes to regulation and standards will always be aligned to the ten principles to effect long-term harmonisation. This principle therefore sets out the highway that all changes to regulation will follow to realise the vision of the other nine principles. This principle will allow regulation and guidance to accommodate mitigation of, resilience against, and adaptation to climate change in soils management practice.

This principle also provides a solution to the WIIFM (“what’s in it for me”) question. It proposes to link the monetary value of land to its soil quality. These principles will not succeed without the support of major landowners. Hence their capital investment to effect soil quality improvements (either through self-funding or from offsets) and resultant losses incurred by taking land out of agricultural production, will be reflected in, and offset by, increasing land value based on soil quality metrics. This approach builds on principles 4 and 8 by incentivising the drive to grow the environmental capital of soils.

Principle 10: Benchmarking the Natural and Economic Capital of UK Soils

This principle recognises that the UK is a global economy and part of a global environment. It relates to “natural capital”, which is explained in the explanatory note to principle 3, and the monetisation of soils to increase the value of UK soils as an asset with tradable options for carbon sequestration and biodiversity offsets. The principle promotes the use of Life Cycle Analysis to account for all impacts on the global environment from changes in UK land use. About 40% of UK food security already depends on imported food, and this will rise if significant areas of UK land are taken out of production without a major compensatory intensification of UK agricultural practice. This principle demands that a global account is made of any changes to achieve these ten principles in the UK, such that improvements in UK soil quality is not at the expense of soil quality elsewhere in the world (through, for example, deforestation, biodiversity loss, unsustainable agricultural practice and net soil carbon emissions). Anything that we do to improve soil quality in the UK must therefore prove that it has achieved wider sustainability goals for the entire planet, and to show that the UK has not simply outsourced its carbon footprint and biodiversity losses to another country.