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Press release

Preserving soil quality in the long term

Spatial planning tools, agriculture and forestry that suit local conditions, nationwide soil mapping, and a more committed and coherent soil policy are the cornerstones of the measures put forward by the National Research Programme “Sustainable Use of Soil as a Resource” (NRP 68) to safeguard soil quality in Switzerland in the long term.

By virtue of its properties, soil fulfils a wide variety of functions. Its value to society – in agriculture and forestry, drinking water production, protection against natural hazards such as flooding or earthquakes, and climate protection – is inestimable. Without adapted soil use, ecosystem services are lost. Soil in Switzerland is under threat from compaction, erosion and loss of organic material and biodiversity as well as from contaminant and nutrient input.

Incorporating soil quality into spatial planning

The greatest risk, however, comes from building new settlements and infrastructure, as a result of which soil is removed or sealed and soil functions are lost completely. This phenomenon affects high-quality soils at the edge of settlements and outside the building zone. One of the proposals put forward by NRP 68 is that spatial planning decisions should take account of soil quality. Researchers developed soil index points to enable them to quantify soil quality. “By using soil index points, we can steer settlement development towards poorer quality soils as well as towards existing settlements”, explains Adrienne Grêt-Regamey from ETH Zurich. “In that way we can preserve soil quality in the long term.”

Gearing soil management to soil quality

NRP 68 investigated the effects of agriculture and forestry on soil quality. In an experiment lasting several years, researchers observed how soil regenerated after it had been compacted by a tractor. They found that one single incident of compaction reduces yields for more than a decade.

Organic matter (humus) plays a crucial role in determining soil quality. “Maintaining it is a key goal of sustainable management”, emphasises Emmanuel Frossard, President of the NRP 68 Steering Committee. “And that requires measures designed to preserve soil functions.” NRP 68 advocates developing agriculture and forestry management systems so that they are adapted to local conditions and geared to soil quality. As part of this, organic matter content should become a key indicator in agricultural policy.

Factoring in the impact of soil on climate

Humus depletion is at its greatest in drained peatland. Because draining releases CO₂, such peatland is the biggest source of CO₂ emissions in Swiss farming. At the same time, however, the soil is of great economic value, for example for growing vegetables. NRP 68 researchers have shown that it is not possible to sustainably farm this land based on the knowledge available at present. NRP 68 therefore advocates holding a fundamental political discussion on the future use of peatland. In view of the impact of nitrous oxide on the climate, however, it is also important to continue reducing nitrogen input in agriculture.

Closing the gaps in soil mapping

Soil quality can only be taken into account if detailed soil data is available. In Switzerland, however, such data has only been generated for between 10 and 15 per cent of agricultural land. By proposing a Swiss soil information platform, NRP 68 has developed the key parameters for innovative nationwide soil mapping that should progressively close this gap within twenty years. The cost of implementing the platform will be around CHF 10–25 million a year throughout this period. Once the soil data is available, it will be possible to use soil more efficiently in terms of, for example, irrigation, fertiliser use, drinking water production or protection against natural hazards – for no more than one half to one tenth of the cost.

Global responsibility for sustainable soil use

The soil in other countries on which the food and consumer goods that are imported into Switzerland are produced is several times greater in area than the whole of Switzerland. As a result, Switzerland directly and – by means of raw materials trading and financial transactions – indirectly uses and has an impact on soil throughout the world. Since the country is dependent on the availability of fertile soil abroad, it shares responsibility for the ecological and social impact of using that soil. NRP 68 researchers investigated this impact based on a large-scale land investment in Sierra Leone. To be able to take responsibility, consumers need information on soil use. “Companies and Swiss foreign policy should also ensure that soil is a consideration when acquiring large areas of land”, Peter Messerli from the University of Bern explains.

Making soil policy more coherent

Switzerland does not have a cross-sectoral soil policy as yet. This leads to a lack of coherence and to soil use that is not sustainable. There are also major shortcomings in implementation. Progress in the sustainable use of soil as a resource will only come about when there is greater commitment from government and better coordination between stakeholders. NRP 68 therefore recommends improving coordination at the administrative level, approving the associated federal soil strategy that is currently under discussion, implementing it rapidly and, above all, making decision makers more aware of soil-related issues.

Steiger U., Knüsel P., Rey L. (2018): Making sustainable use of soil as a resource: Overall synthesis report for the National Research Programme "Sustainable Use of Soil as a Resource" (NRP 68); Eds.: NRP 68 Steering Committee, Bern.

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National Research Programme "Sustainable Use of Soil as a Resource" (NRP 68)

NRP 68 lays the groundwork for the sustainable use of soil in Switzerland. In so doing, it considers both the environmental and economic benefits of soil. The concept of ecosystem services makes it possible to realise the value of soil functions and their contribution to human well-being. The programme comprised 25 research projects carried out between 2013 and 2017. The budget amounted to CHF 13 million. The results are presented in five thematic syntheses and one overall synthesis report.

www.nrp68.ch

Links

- Download image: Urbanisation is the most important factor for the loss of cultivated land. ©Aargauer Zeitung/Mario Heller
- Illustration (in German): Soil is more than surface. It fulfils numerous functions that human beings use as ecosystem services, for example for agricultural and forestry production, protection against natural hazards such as floods or landslides, or for recreation. ©Nadja Baltensweiler, Lucerne
- Overall synthesis report (German or French)
http://www.snf.ch/SiteCollectionDocuments/medienmitteilungen/181217_mm_nfp68_gesamtsynthese_de.pdf
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