

WUR contributed to the first UN report on soil biodiversity

Soil needs to get off the ground

The UN has published its first report on biodiversity in soil. 'This report aims to put soil on the map,' says one of the initiators, Wim van der Putten.

Text Roelof Kleis

The report *State of Knowledge of Soil Biodiversity* was published on World Soil Day (5 December). This was a special day for extraordinary professor of Functional Biodiversity Wim van der Putten. He can justifiably call the report his baby. Van der Putten played a key role in the decision by the FAO (the UN Food and Agriculture Organization) to produce this review. As one of the editors, he had a big influence, along with soil scientist Peter de Ruiter (WUR Biometrics and Global Soil Partnership). With contributions from Liesje Mommer (Plant Ecology and Nature Conservation), Thom Kuijper (Soil Biology), Stefan Geisen (Nematology) and Jaap Bloem (WEnR) as well, WUR has had considerable input.

The report gives an exhaustive overview of the useful services to society delivered by the soil and soil life. But it remains unclear how much biodiversity there is in soil.

'That's right, we don't know. Estimates say 24 to 40 per cent of the biodiversity on the planet is in the soil. We do know that most of the biodiversity is microbial. A couple of years ago, I estimated for a piece in *Nature* that a handful of earth will contain 5000 different species. The question is how you extrapolate that handful to the planet.'

Is that a weakness?

'No. The importance of biodiversity lies in the network that determines the soil functions. It doesn't really matter whether a handful of earth contains 5000 species or 5010.'

I also didn't see an opinion on the state of the soils around the world. What kind of a state are they in?

'I would have liked to include that too, preferably with maps. But it turned out to be a step too far. That's a pity. The FAO policymakers were more interested in a report that gave a clear overview of everything. The next challenge is a report like that with distribution maps and an assessment of the state.'

What kind of a state are Dutch soils in?

'We don't yet have a good picture of the biodiversity in the Netherlands either. We currently have the project "Under Ground Level", funded by the National Postcode Lottery, in which we are making a start on a soil biodiversity atlas for the Netherlands. We will be setting up a calibration centre in Lelystad and at the Netherlands Institute of Ecology in Wageningen, where I also work. We will have demonstration projects there to determine the biodiversity in Dutch soils and we will work on a database as a model for worldwide distribution maps.'

Is such a special position for soil diversity necessary? If the biodiversity above ground is fine, surely it will be below ground too?

'That's the question. If I say our soils are not in a good condition, many people in the Netherlands will be very indignant. "What do you mean, not in a good condition? We have the most productive farmland in the world. Surely the soil can't be poor?" But our intensive grassland soils are currently in the same state from a

'The soil biology, the soil life, is crucial for the supply of ecosystem services.' Photo Shutterstock.com

soil biology perspective as the arable land. And there is a lot of room for improvement in the soil biodiversity of arable land. Too often, soil is considered from a physical and chemical perspective. But it is the soil biology, the soil life, in particular that is crucial to the supply of ecosystem services such as carbon sequestration, curbing greenhouse gas emissions, forming the soil structure, suppressing pests and limiting leaching of nutrients such as nitrate into the groundwater.'

What do you see as the three most important recommendations of the report?

'We need to see the soil as a multifunctional whole, we have to protect the soil properly and we have to find ways of producing food that don't ruin the soil.'

Is the current effort to embrace sustainable agriculture a game-changer for soil?

'That depends on how it turns out in practice for the soil. Sometimes sound policy is drawn up but what happens in practice is very different to what you had expected. So I'm cautious. The important thing is for soil in all its glory and in all the system's facets to be taken into account in policy.'

What is the biggest challenge for soil researchers at the moment?

'Look beyond soil and link up with other disciplines such as crop research, crop breeding and biodiversity studies. We actually started doing that in the 1990s, connecting up what happens below ground to what happens above ground. We need to open up the black box of the soil and translate this into something people can understand and appreciate. If you build on a plot of grassland, you lose not just the grass but also the soil and all its biodiversity and functions. If people can realize that and act on that basis, then we will really have achieved something. Soil needs to become mainstream.' ■

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