



Modelling as an indispensable research tool in the information society.

Johan Bouma

Formerly Wageningen University, Netherlands. (johan.bouma@planet.nl)

Science and society would be well advised to develop a different relationship as the information revolution penetrates all aspects of modern life. Rather than produce clear answers to clear questions in a top-down manner, land-use issues related to the UN Sustainable Development Goals (SDGs) present “wicked” problems involving different, strongly opiated, stakeholders with conflicting ideas and interests and risk-averse politicians. The Dutch government has invited its citizens to develop a “science agenda”, defining future research needs, implicitly suggesting that the research community is unable to do so. Time, therefore, for a pro-active approach to more convincingly define our: “societal license to research”. For soil science this could imply a focus on the SDGs, considering soils as living, characteristically different, dynamic bodies in a landscape, to be mapped in ways that allow generation of suitable modelling data. Models allow a dynamic characterization of water- and nutrient regimes and plant growth in soils both for actual and future conditions, reflecting e.g. effects of climate or land-use change or alternative management practices. Engaging modern stakeholders in a bottom-up manner implies continuous involvement and “joint learning” from project initiation to completion, where modelling results act as building blocks to explore alternative scenarios. Modern techniques allow very rapid calculations and innovative visualization. Everything is possible but only modelling can articulate the economic, social and environmental consequences of each scenario, demonstrating in a pro-active manner the crucial and indispensable role of research. But choices are to be made by stakeholders and reluctant policy makers and certainly not by scientists who should carefully guard their independence. Only clear results in the end are convincing proof for the impact of science, requiring therefore continued involvement of scientists up to the very end of projects. To realize the described paradigm shift, that will provide meaning to abstract and often misused terms like inter- and transdisciplinarity, fundamental changes are needed in the way the research process is organized, including its evaluation..