I welcome the comments of Dr. Maring. Indeed, even though agriculture occupies the largest land area in the EU, other forms of land use are also very important when considering attempts to reach the SDGs (comment 2). As is pointed out, urban land use and reclaiming polluted industrial sites offer unique challenges. The same holds for forestry, that is not mentioned. In contrast to agriculture, LL's could indeed be focused on particular problems to be solved that can well be tested in an international context as they are not site-specific. And, indeed, attention for new pollutants is urgent (e.g. PFAS).

Comment 1: Indeed, the LL concept is based on multiple seperate sites, an aspect that was not addressed in my article, although implicitly indicated by emphasizing that farmers face "wicked" problems with no simple magic solution. The farm being studied by the cited Bouma et al (2022) paper occurred on a well drained calcareous light clay soil and did not yet meet thresholds for the various ecosystem services. Other farms on comparable soils (to be part in future of a regional LL network) may do so following unique and inspiring management practices, qualifying them to be :"Lighthouses" for this particular soil condition. Every farmer is different. The decision to publish results for one farm, exploring techniques and procedures to be used, was pragmatic. To obtain the required 10-15 farms would have taken years and would have come too late. Let me remind the reader that a review of progress on the Mission concept is planned for the end of 2023. (EC, 2021). Also , the council of ministers of the EU has recently confirmed this by stating:"*review of the missions has to proceed by December 31, 2023, before adopting any decision on creating new missions or on continuing, terminating or redirecting ongoing European missions.* (Council of the Eur.Union, 2022). The council is concerned about governing structures of the missions and integration with many ongoing existing programs.

Comment 3: Considering the complex relations between the SDGs, ecosystem services, soil health and land use and management, it would indeed be good to develop a conceptual descriptive model, as suggested, that describes in an accessible manner the ultimate intentions of all these activities and the role of the various elements in doing so. Indeed, "framing"the SDG story in accessible language is a top priority. This should indeed include external effects that could have an impact on the global footprint: "act locally, think globally".

Comment 4: Only thresholds for water quality have so far been defined (EU Water Guideline with the nitrate directive.). However, as pointed out in the article, so far regional thresholds for greenhouse gas emissions, carbon capture, biodiversity preservation and soil degradation (to be expressed by soil health) have not yet been defined. But even if this is done in future, thresholds should reflect the state-of-the-art in terms of research and should be revised when needed. Not too often, though, because that would confuse the stakeholders. The thoughts of Dr Maring about Lighthouses are interesting but I see problems in having Lighthouses with different light intensities and would prefer to have the concept to be resticted to entities that satisfy the various ecosystem-thresholds for that location c.q. region. Elsewhere, I have compared a modern farmer with a chess-player, playing simultaneously on five boards. While the chess rules are clear, those for ecosystem services are not. If he or she is successful, only he or she deserves the emission of a full blast of light from

the lighthouse. Of course, successful methods should be communicated and this is an important part of the overall communication strategy.

Comment 5: Good to remember that sustainable development entails not only environmental aspects but social and economic aspects as well. A good business plan is indeed an essential part of the entire package. In Europe we can learn from the US National Soil Health Institute that has a strong economic program, focused on the adoption of regenerative agriculture (www. soilhealthinstitute.org).

Comment 6: Citizen engagement is strongly promoted by the EU (EU, 2021, Dro et al, 2022). Successful citizen engagement in biological programs, for example by counting birds or determining vegetation types, is somewhat difficult to extrapolate to soil health programs in the context of sustainable development. Soils, after all, are invisible below the surface and soil characterisation is therefore a rather professional activity. Still, it is essential to communicate results of sustainable management and the role of soil by on-site demonstrations that can include selected observations that can easily be made , for example testing soil resistance with penetrometers as an indicator for soil structure. This form of citizen engagement is crucial to contribute to their better understanding of e.g. food prices ,consumption patterns or the role of city greenery .

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