



Sustainable land subsidence scenario development for the Netherlands

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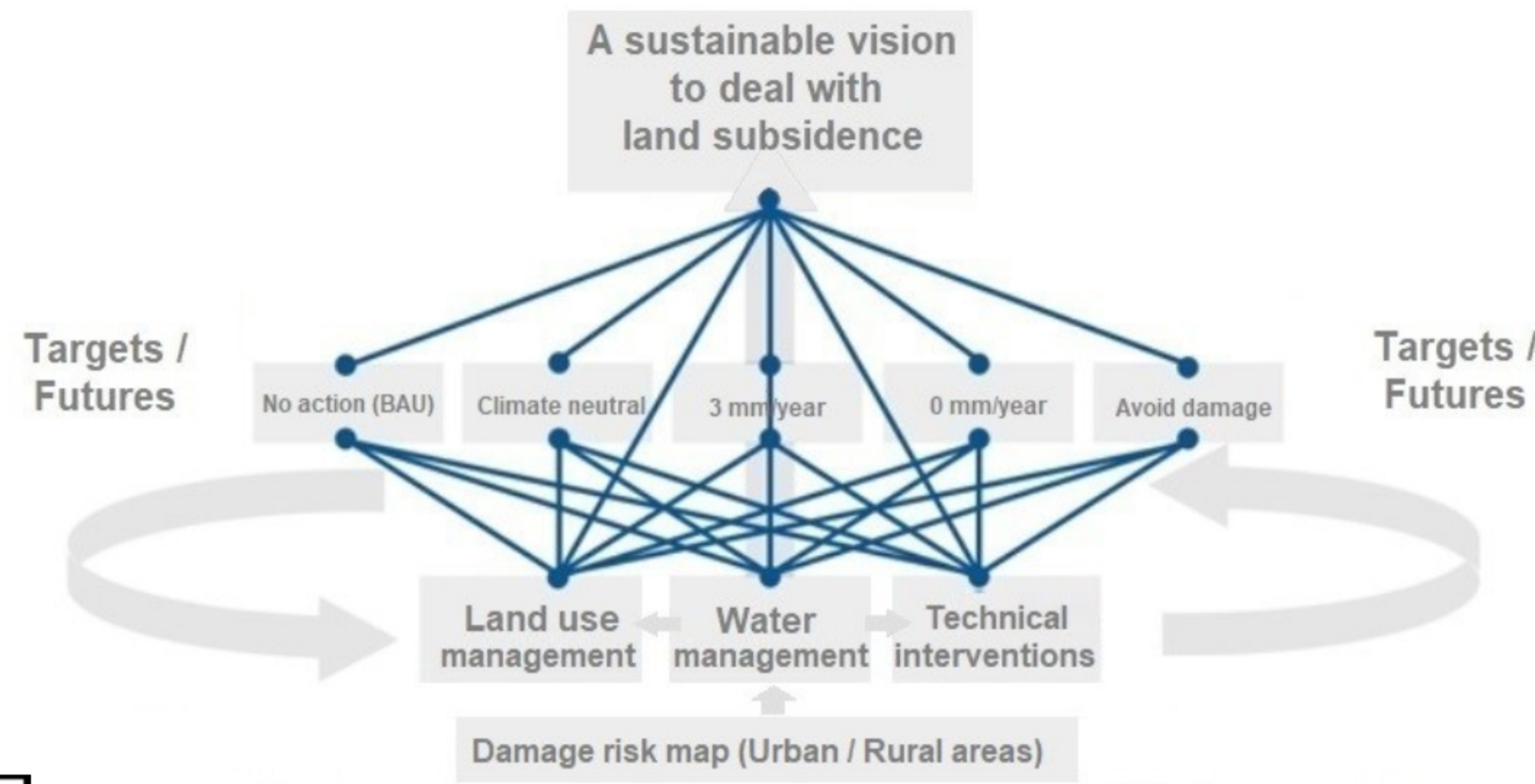
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Introduction:

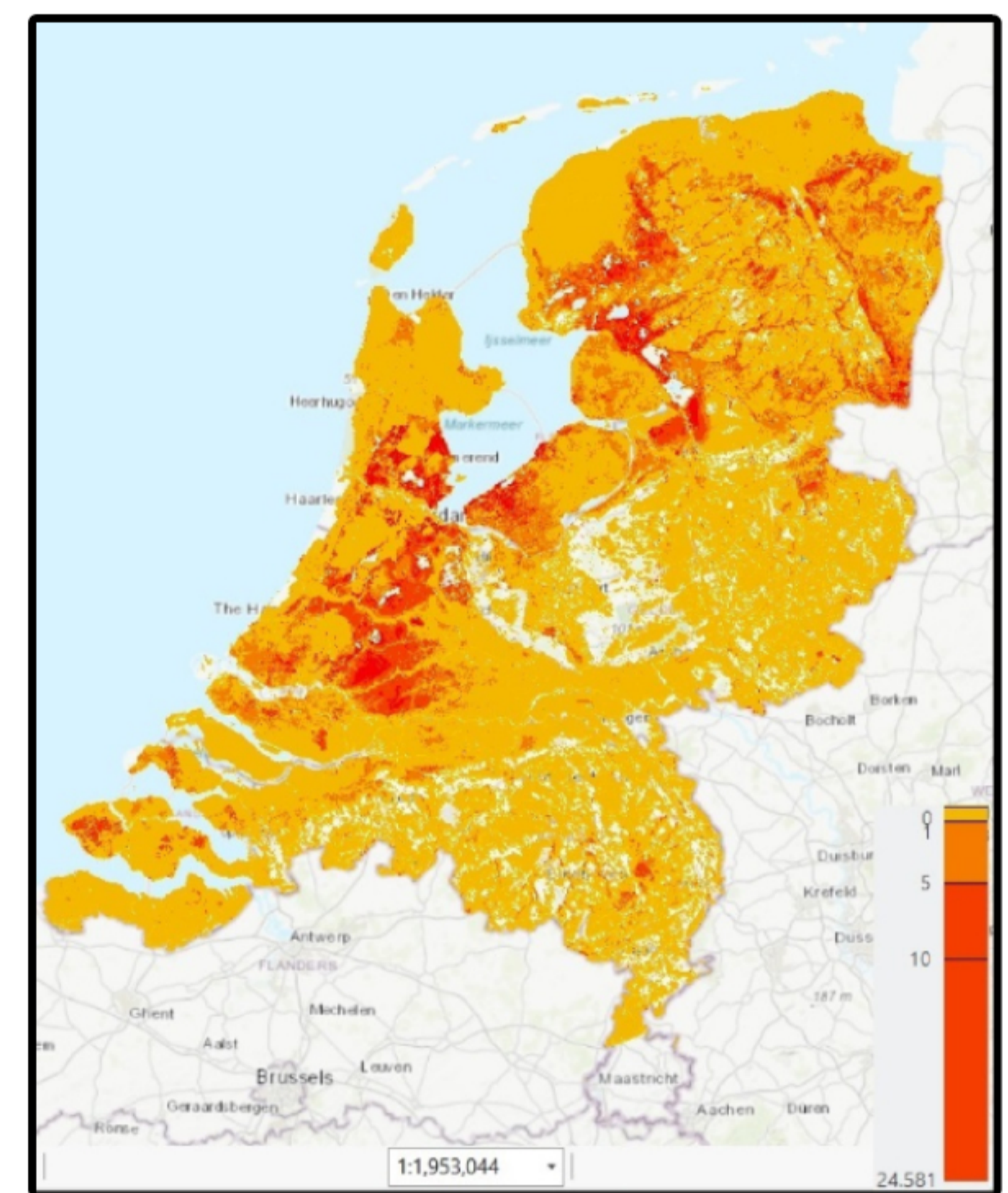
Land subsidence is a major challenge in many parts of the Netherlands, and in order to develop practically plausible scenarios and pathways of possible mitigation and adaptation measures under inclusive governance, it is necessary to take sustainability into consideration. For the LOSS project, a sustainable vision and five target futures have been set for land subsidence scenario development process within a backcasting approach.

Methodology:

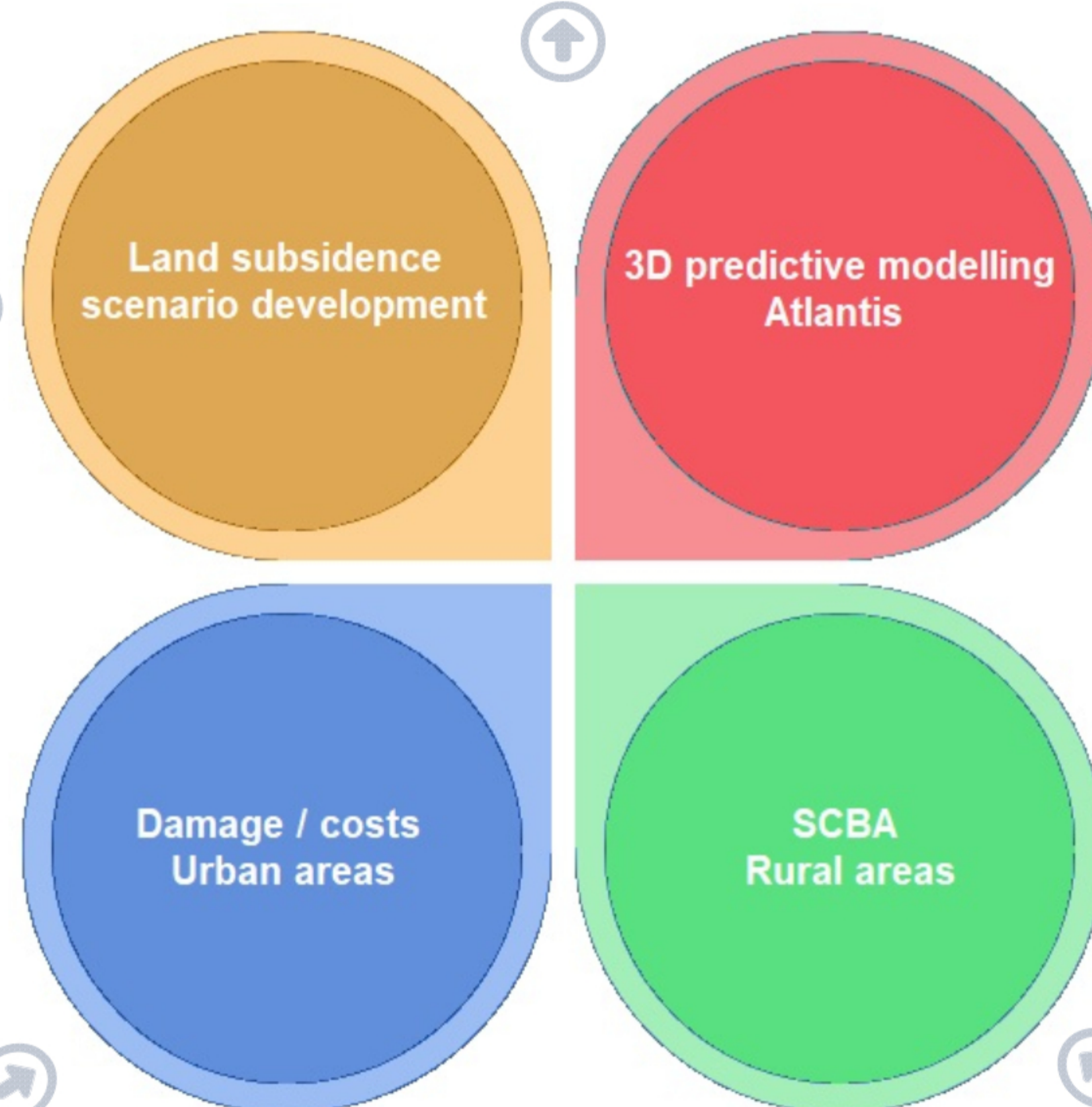
To know when and where each of the 5 target futures should be reached, a statistical method should be employed to identify high damage-risk areas of land subsidence and developing tailored intervention water and land use management scenarios and pathways for sustainable dealing with land subsidence in the Netherlands to reach the final sustainable vision for both urban and rural area.



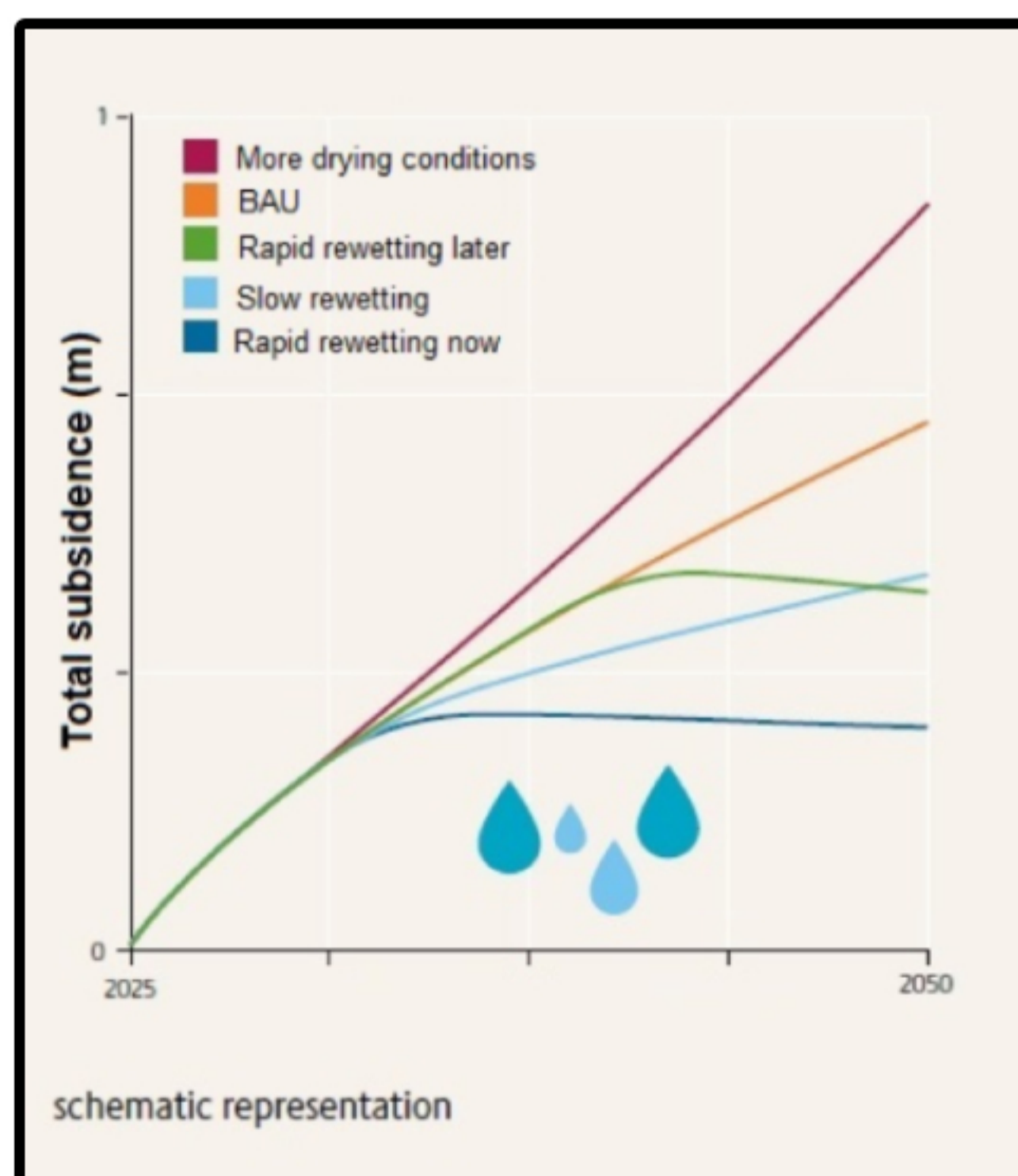
An analysis of remote sensing land subsidence data between 2017-2022 (Hammad et al. 2024)



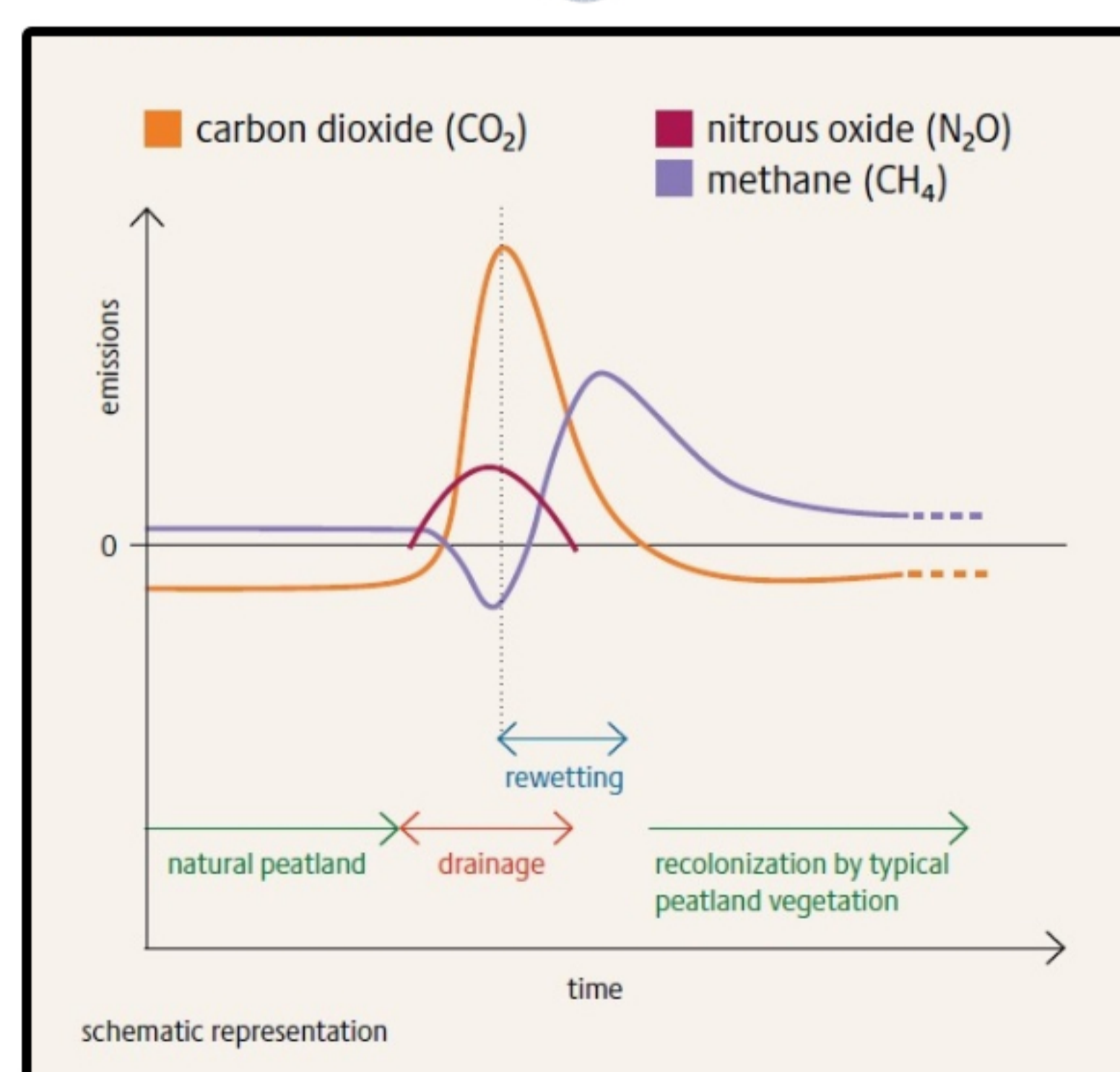
Forecasting land subsidence rates until 2100 for the strong climate change scenario (Atlantis)



Different modelling parts within the LOSS project



Land subsidence amount within different water management scenario projections (Schematic representation)



Greenhouse gas emissions from drained and rewetted peatlands (Peatland Atlas, 2023)

	construction	fuel	biogas	livestock bedding	fodder (pasture)	fodder (silage)	medicine	food	peat substitute
bogbean									
cranberry									
reed canary grass									
bulrush									
reed									
black alder									
sedge									
sundew									
peat moss									
gypsywort									
willow									

Examples of paludiculture - Land use management pathways (Peatland Atlas, 2023)

Conclusion:

The backcasting approach to deal with land subsidence in the Netherlands involves a comprehensive framework containing a statistical method for identifying high and low damage-risk areas of land subsidence in urban and rural areas, and combining water management scenarios, such as rapid and slow raising of the groundwater level, with land use management pathways, such as promoting paludiculture through rewetting peatlands. These scenarios and pathways will enable the policy-makers to make informed decisions based on their specific priorities and requirements.

References:

- 1- Peatland Atlas 2023, Heinrich-Böll-Stiftung & others.
- 2- Hammad, M., Stouthamer, E., and Erkens, G.: An analysis of remote sensing land subsidence data in the Netherlands, EGU General Assembly 2024, Vienna, Austria, 14-19 Apr 2024, EGU24-20524, <https://doi.org/10.5194/egusphere-egu24-20524>.