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Climate Land Energy Water nexus models reviewed across scales: progress, gaps and best accessibility practices

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Approaches that integrate feedbacks between climate, land, energy and water (CLEW) have increasingly advanced and have become more complex. Such so called nexus approaches have already been useful in quantitatively assessing strategies under resource scarcity, planning infrastructure for achieving the Sustainable Development Goals or assessing cross-sectoral climate change impacts. However, most of the models and frameworks do often miss some important inter-linkages that could actually be addressed by using newest models. The reason for such negligence is often technical and practical, as many of the newly developed and open-source frameworks are not yet widespread. We review and present these models so that decision maker needing tools for analysis could identify what is best for their needs. Particular attention is given to model usability, accessibility, longevity and community support. At the same time we discuss research gaps, and room for improvement for next development of the models from a scientific point of view. We explore at different scales where and why some nexus interaction are most relevant. We find that both very small scale and global model tend to neglect some CLEW interaction, but for different reasons. The first rarely include climate impacts, which are often marginal at local level. While the latter mostly lack pieces because of the complexity of large full CLEW system at the global level.