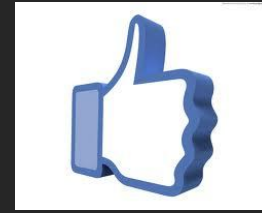


# Modular ABM development in NRM for improved dissemination and training

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# What I like about the paper



## 1. Promotes linking multiple models & approaches that use different approaches.

- This will increase modeling efficiency and address data problems - common for NRM modeling
- Enhance collaboration with other scientists using different models

## 2. Promotes peer-reviewed openABM models. This will:

- Enhance collaboration among scientists
- Help students and researchers quickly use & build on existing models

# What I missed or didn't like about the paper



## 1. Too short

- Missed a lot about what the paper is contributing to literature. ABM has been used before

## 2. How will ABM be linked to non-ABM models - including qualitative approaches is not clearly stated.

- Modeling human-environment interaction will require careful consideration on how to take into account other important models and approaches.

# My thoughts

- Integrated modeling key to achieving sustainable intensification:
  - **Economic:** Policies & actions guided by cost & benefit analysis
    - Total economic value (TEV) approach to ensure we take into account value of ecosystem services
    - Integrated models (ABM, IMPACT, CGE, etc) - such as openABM models - but greater
  - **Environment:**
    - Ecological economics modeling
  - **Social welfare**
    - Value of ecosystem must be defined & embedded to improved human welfare - MEA 2005
  - **Institutional**
    - Policies & actions are more effective under an institutional framework that takes into account institutional landscape of a society
- Quantitative and qualitative approaches required to achieve such  
Complex system
- Good news, data availability and computing power are increasing

# SI framework too complex, could make one feel dizzy and fall

