

Highlights

- The ITO3dE model is built from three dimensions of “Input-Translate-Output”.
- Land variations influence agricultural non-point source pollution (AGNPS) risks.
- The ITO3dE model is effective in risk assessment of AGNPS.
- Geographic analysis method is beneficial to risk assessment research of AGNPS.
- The results of ITO3dE model can be effectively used for risk prevention and control.