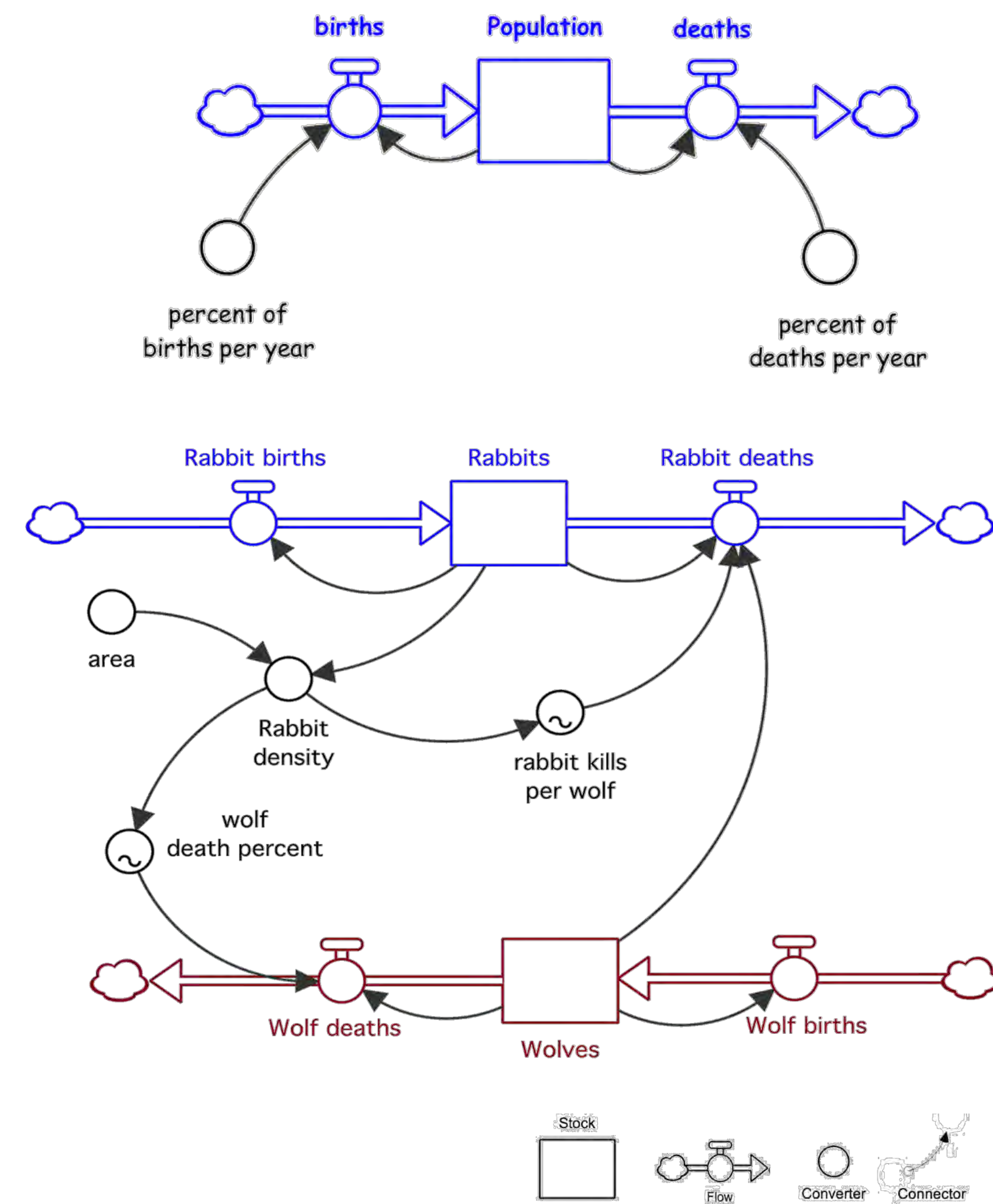


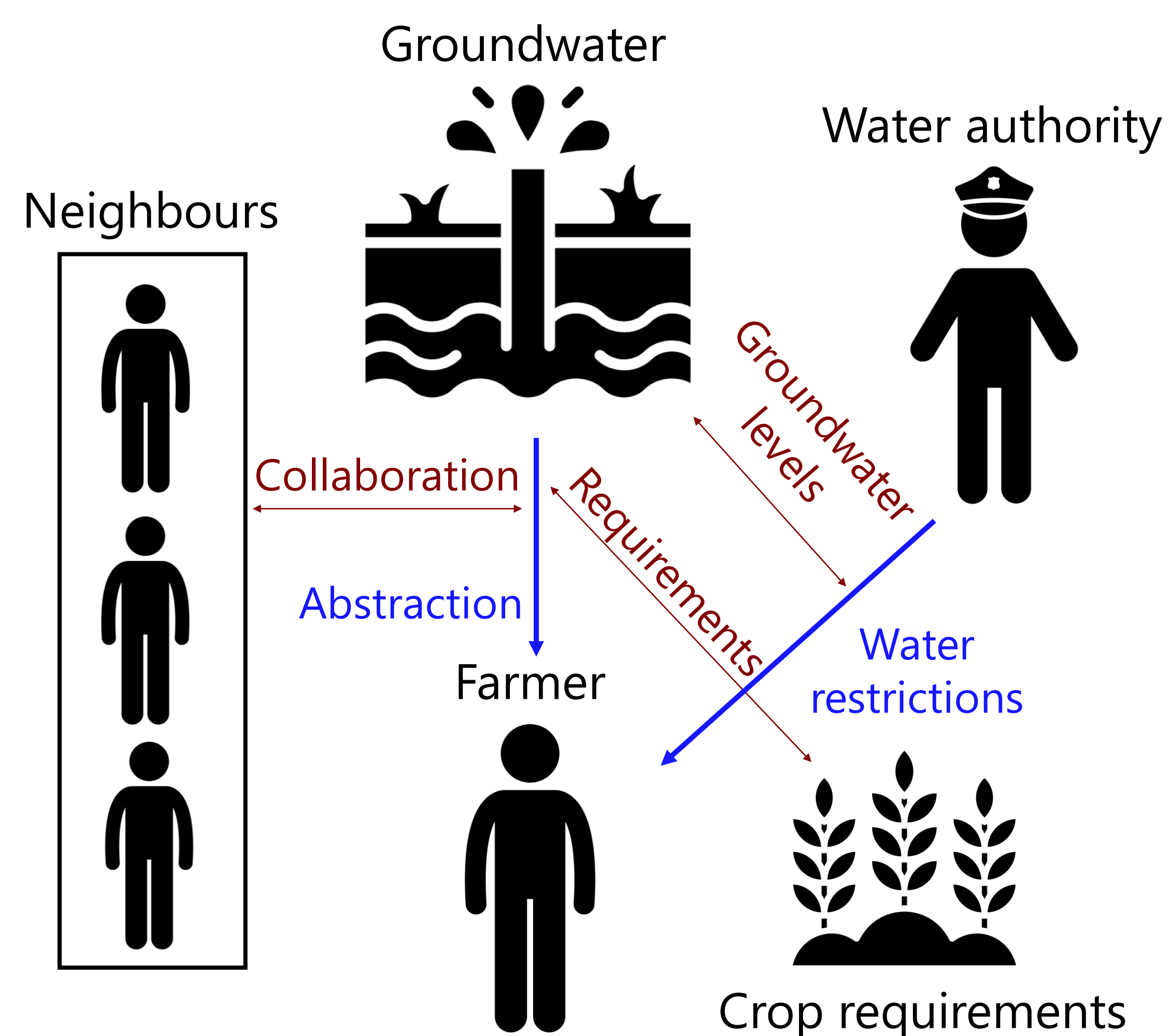
# System dynamics modelling

Analyse complex systems to reveal how **known structures** produce **unexpected behaviour**

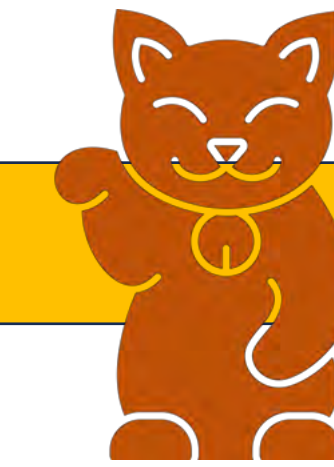


# Agent-based modelling

Agents are programmed to interact with each other and the environment. **Large-scale effects** emerge from **individual behaviour**



## Create your own **model bowl**



**1**

Choose your **spatial carb**



- **Lumped**  
"Bucket" model

- **Distributed** 🌶️🌶️  
Discretised in space

- **Semi-distributed** 🌶️  
Discretised in larger regions

**2**

Choose your **hydrological proteins**



- **River flow**

- **Surface runoff**

- **Groundwater flow** ★

- **Vadose zone**

**3**

Choose your **social dressing**



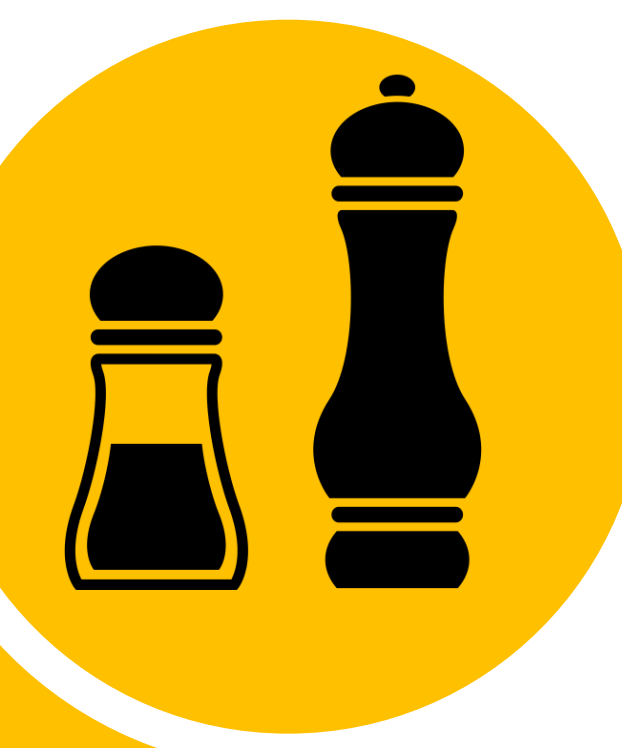
- **As boundary conditions**  
E.g., reduce abstraction, change evapotranspiration

- **Agent-based modelling** 🌶️🌶️  
E.g., farmers, drinking water supply, water authority

- **System dynamics modelling**  
(Only with a lumped carb)

**4**

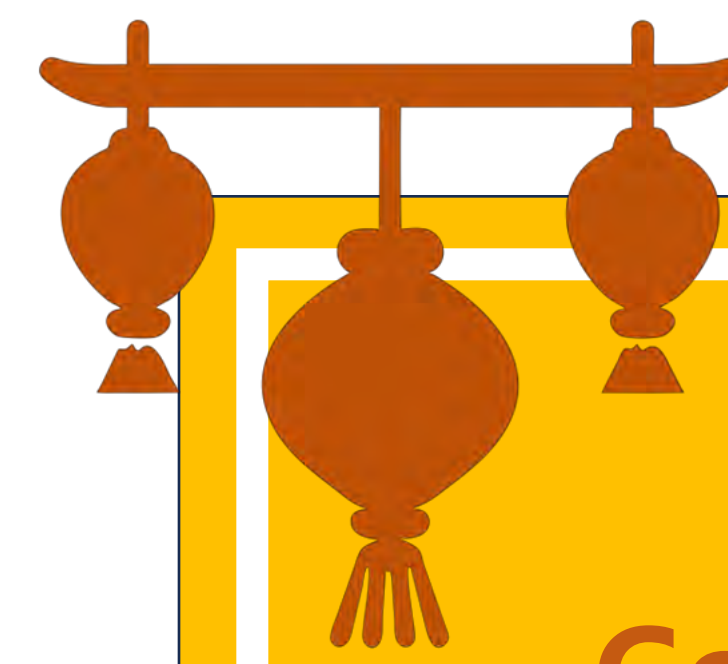
Choose your **measure toppings**



- **Reduce demand**  
E.g., less abstractions, efficient irrigation, less thirsty crops

- **Provide incentives**  
E.g., for some crops, to capture carbon in soils

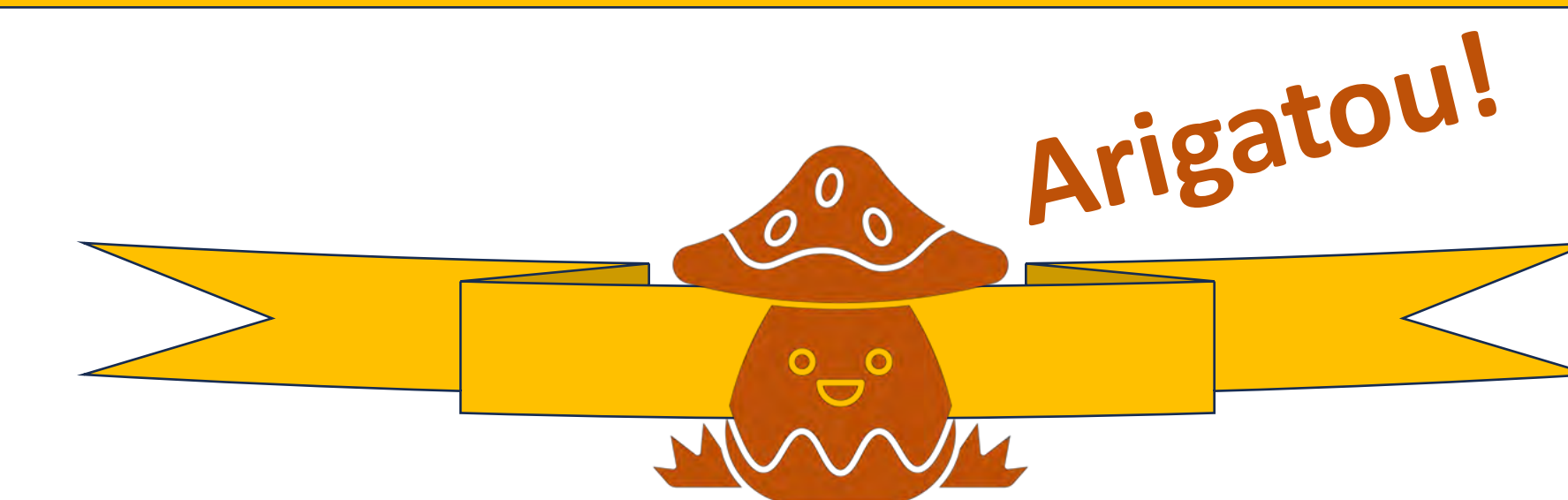
- **Change land use**



**Goal drinks**

- **Stress test**  
E.g., dry and wet years, climate change
- **Drivers**  
E.g., land use, soil, water table depth

- **Resilient landscape**  
Land use, governance, water use
- **Adaptation**  
To hydrological extremes



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