

# Towards Understanding the Socio-Hydrological Dynamics of Irrigated Agriculture.



TECHNISCHE  
UNIVERSITÄT  
DRESDEN



Maria Elena Orduna Alegria <sup>1</sup>, Niels Schütze <sup>1</sup>, Fatima Monji <sup>2</sup>, Gloria Mozzi <sup>2</sup>

(1) Technische Universität Dresden, Institute of Hydrology and Meteorology.  
(2) Technische Universität Dresden, Groundwater and Global Change - Impacts and Adaptation



International Research Training Group:  
"Resilient Complex Water Networks"

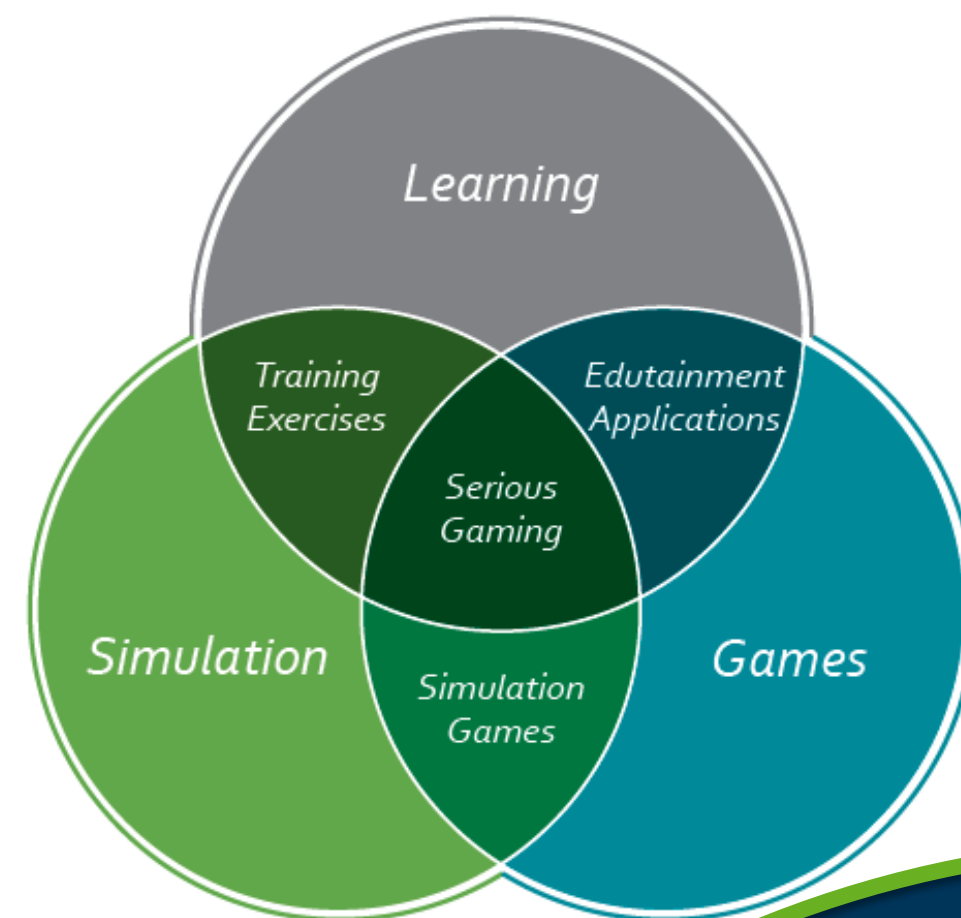
## Objective

One of the challenges of the study of the interdependence of agriculture and water resources is the understanding of the rationale of the stakeholders' decisions for adaptation when climate, land, and food markets are increasingly variable. The present approach examines the socio-hydrological dynamics to find an integrative solution to the tragedy of commons regarding cooperation and communication.

## Introduction

**Serious Games** or applied game is a game designed for a primary purpose other than pure entertainment work because they appeal to three intrinsic motivational human needs identified in self-determination theory.

- **Relatedness:** the feeling of being connected to others
- **Autonomy:** feeling in control of our own actions
- **Competence:** feeling efficient and confident when playing the game

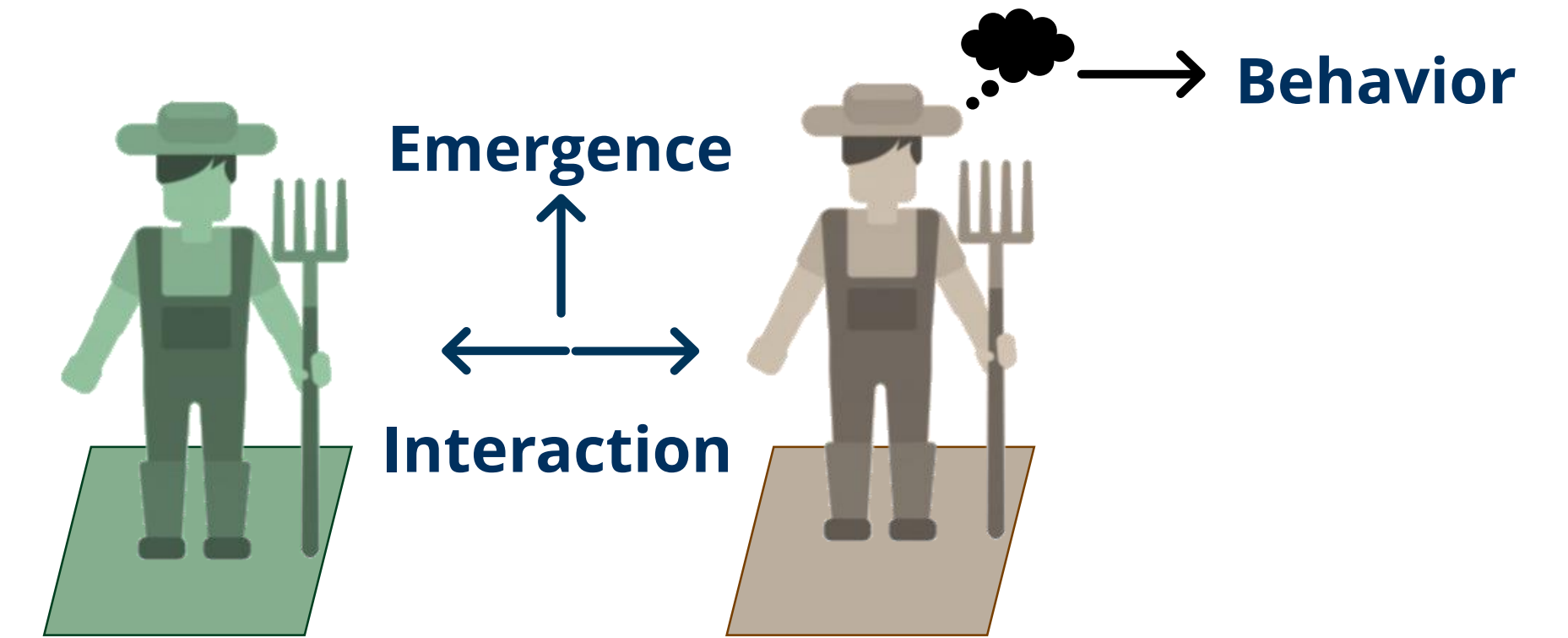


Various participatory tools and methodologies have been shown to foster social learning. **Role-playing** is a good tool to introduce flexibility in analytical framework. Instead of defining strict parameters from the onset, RPG methodology involves opening up possibilities for unforeseen behavior, which then can be studied with less open methodologies.

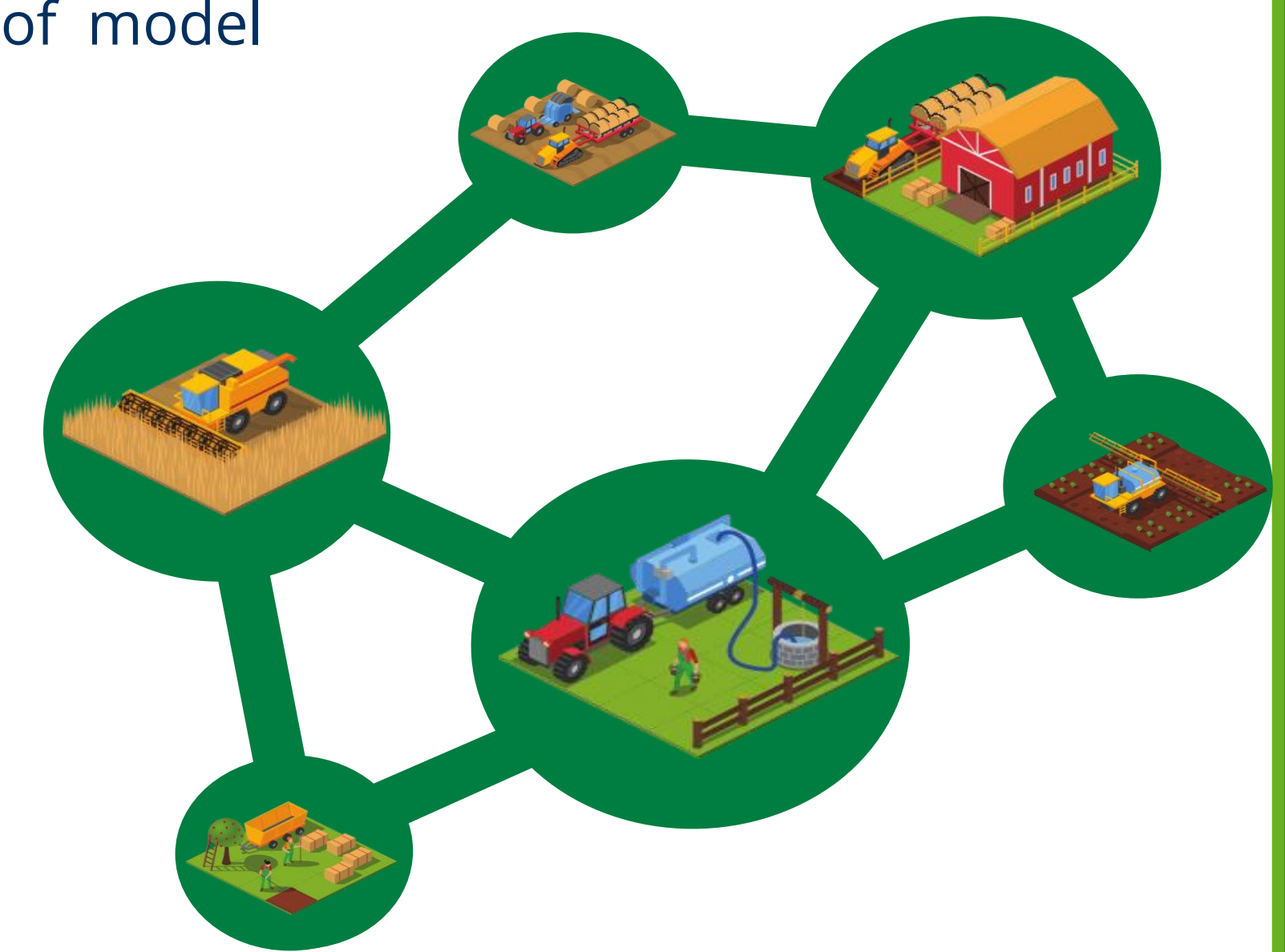
## Methodology

The proposed methodology matches the paradigms of the current scientific decade 'Panta Rhei'. The methodology is based on the companion modeling (ComMod) and consists of two main parts:

1. A rules-based modeling and simulation, known as Agent-Based Model, of the interdependencies of hydroclimatic, crop production and economic parameters;



2. A simplified representation using a cooperative and competitive role-playing game called Mahiz to emulate behaviors in a controlled and safe environment and to serve as built-in instruments of model validation



## Results

The preliminary results showed that this approach was effective in enabling participants to collectively understand the tragedy of commons problem that farmers face with climate change.

The proposed approach show the capability to generate time-efficient simulations of possible agricultural scenarios and demonstrate that cooperation is vital to maintaining the sustainable levels of water resources and that communication and incentives are important factors that enhance the control and coordination of the resources.



## Conclusion

*When I hear, I forget.  
When I see, I remember.  
When I do, I understand.*

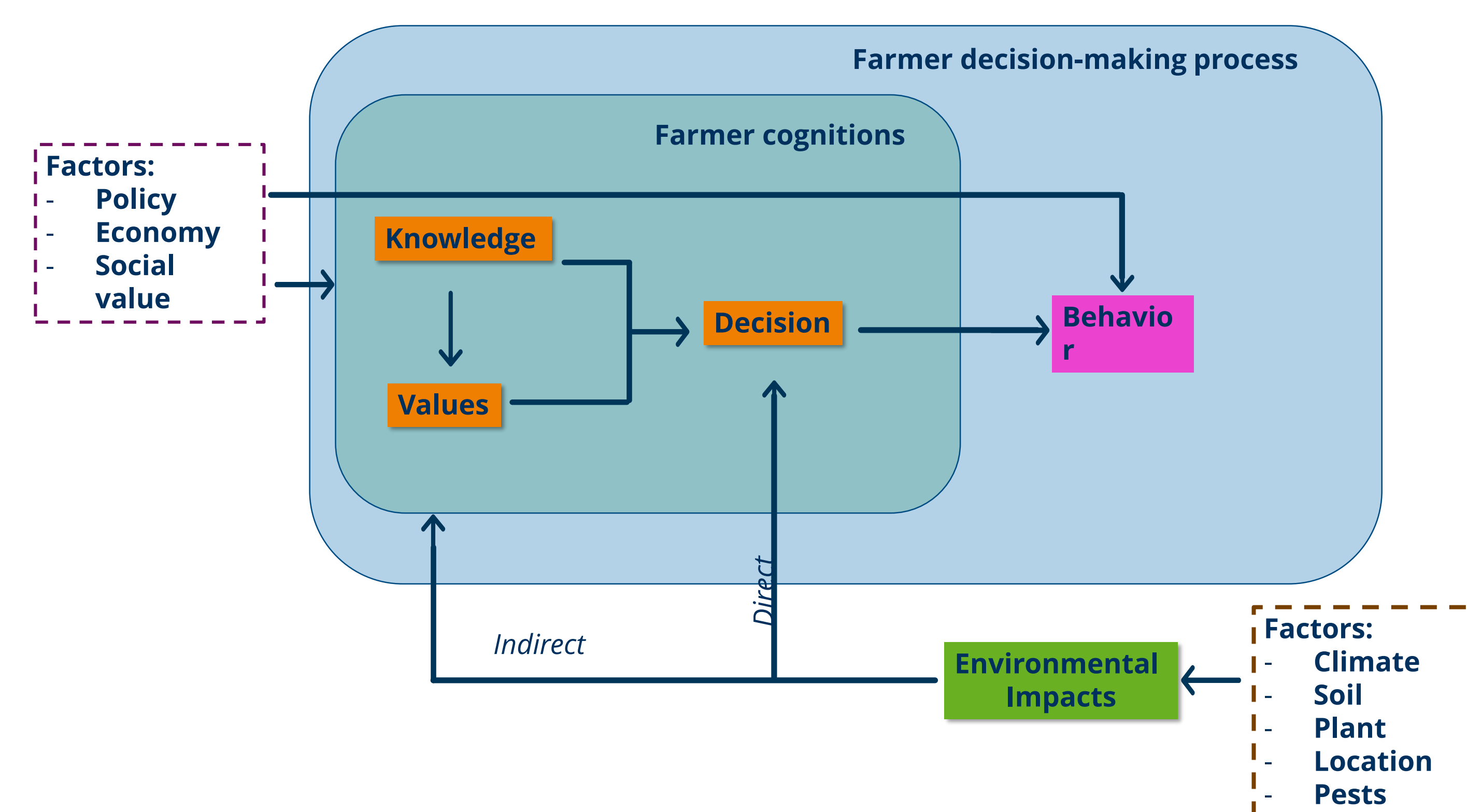
Chinese Proverb

Serious Games can create positive user experiences and potentially:

- ✓ Enable social good; aiding a greater cause
- ✓ Make a dull subject entertaining
- ✓ Improve knowledge retention
- ✓ Be a powerful way of introducing new concepts
- ✓ Encourage learners to be active in the learning process
- ✓ Go beyond content to enable problem-solving
- ✓ Enable real-time data and analysis



Mahiz, a serious board game can be used as a way to translate the concept of water scarcity into an operational framework, as it addresses needs such as developing common understanding and making the role of policy makers more transparent. The framework illustrates the feedback loop between human actions and nature, uncovering divergencies in social representations and highlighting social interactions.



## References

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## Game

**Interested in playing serious games?  
Do you know any other serious games you would like to share?**

**Fill out the form and Let's Play**

