





# COMPLEXITY



**UNCERTAINTY**

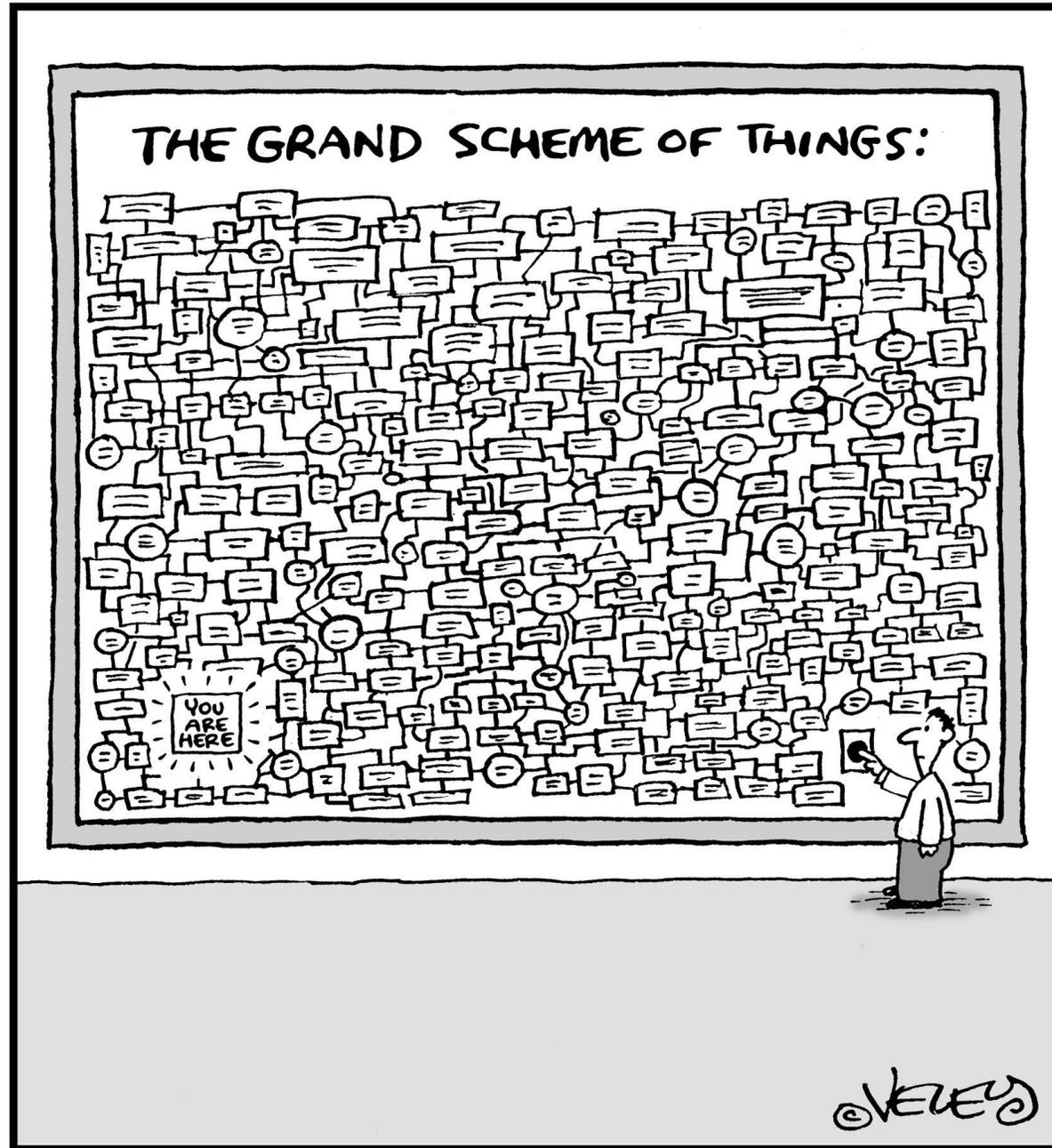


**AMBIGUITY**

**I'M SURE GLAD  
THE HOLE ISN'T  
IN OUR END**



How  
to  
work  
with

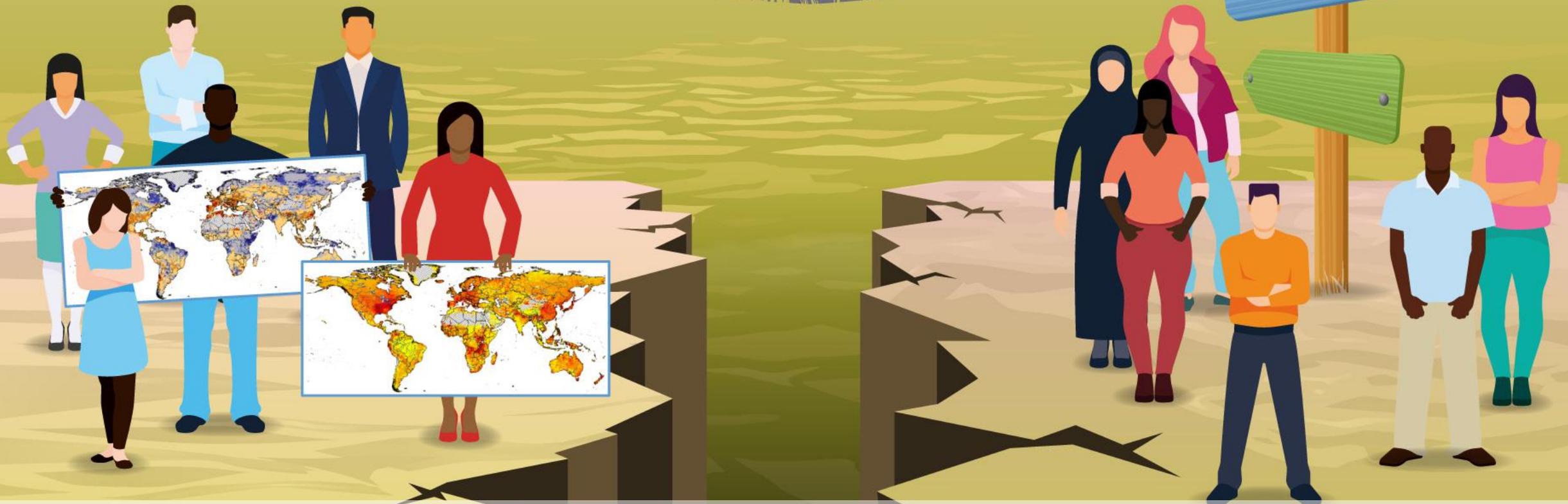


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T  
Y  
?



“Here’s where you give me  
non-comprehending nods of approval.”

# Can Scientists and Policy Makers work together?



Choi, B. C., Pang, T., Lin, V., Puska, P., Sherman, G., Goddard, M., ... & Clotey, C. (2005). Can scientists and policy makers work together?. *Journal of Epidemiology & Community Health*, 59(8), 632-637.

# Different Approaches to Decision-making



## „Thinking first“

features the qualities of

science  
planning,  
programming  
the verbal  
facts



## „Seeing first“

features the qualities of

art  
visioning,  
imagining  
the visual  
ideas



## „Doing first“

features the qualities of

craft  
venturing,  
learning  
the visceral  
experiences

# Bridging the Gap



**ACTIVE**



**& EXPERIENTIAL**



**Reflexive ...**

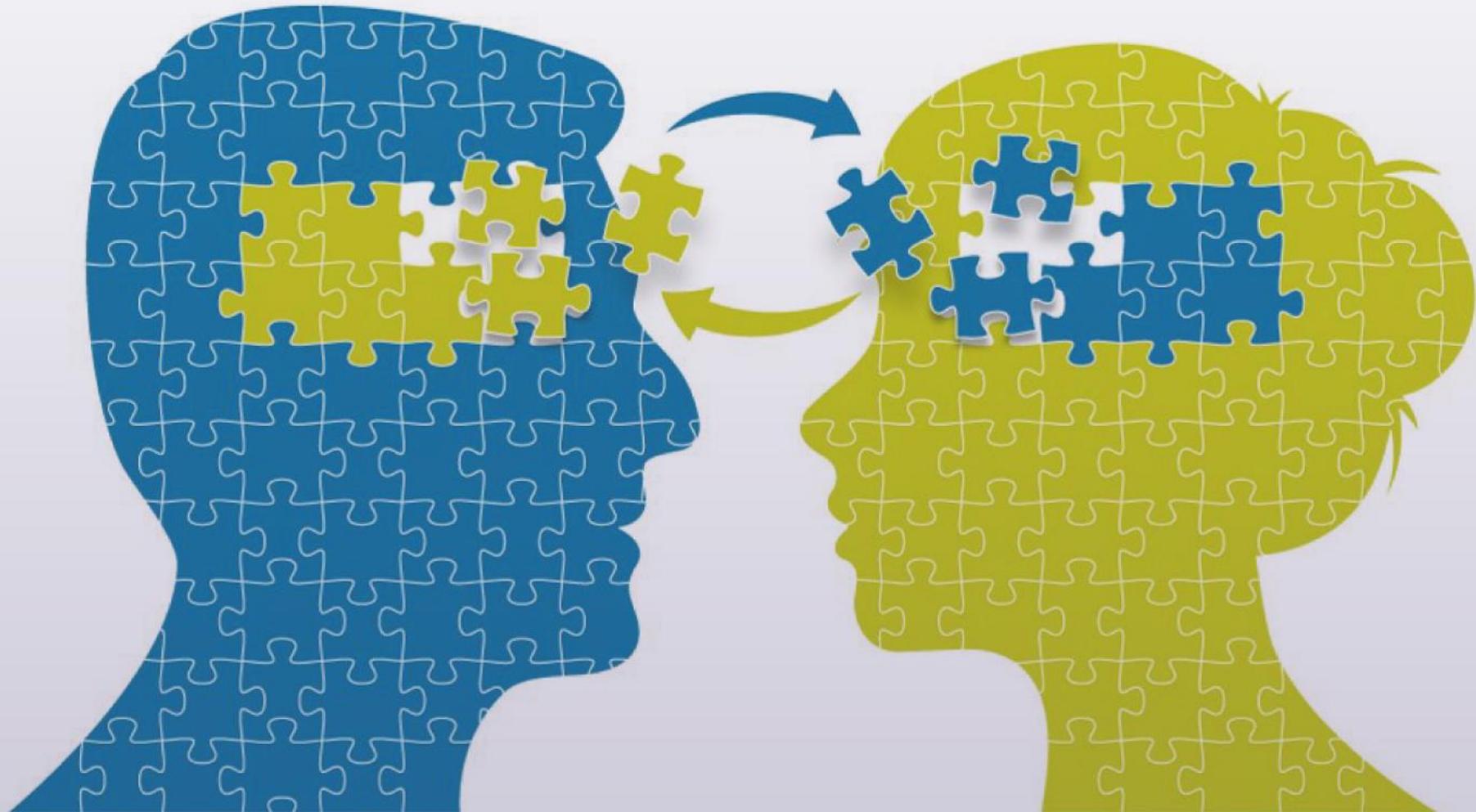
**... and  
conceptual**

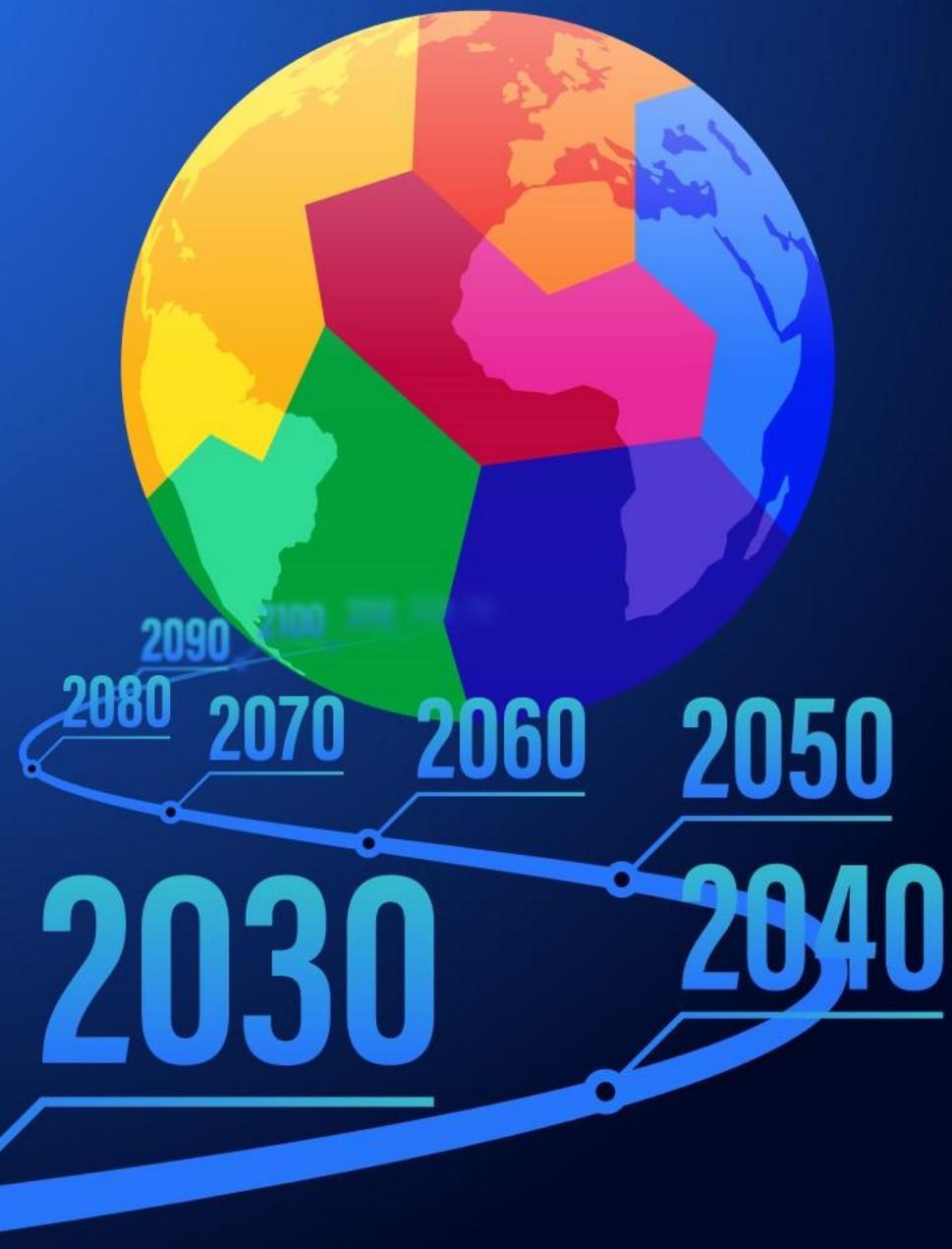
# PROBLEM-ORIENTED



# PEOPLE-ORIENTED

COMMUNICATION & COLLABORATION







# SOCIAL SIMULATIONS





Centre  
for Systems  
Solutions

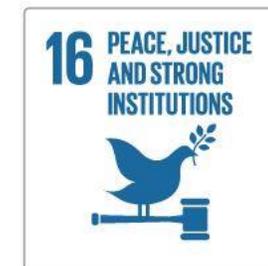
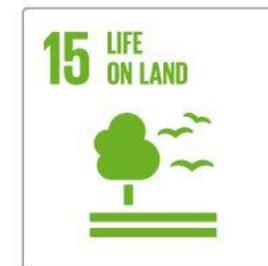
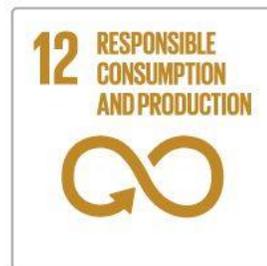


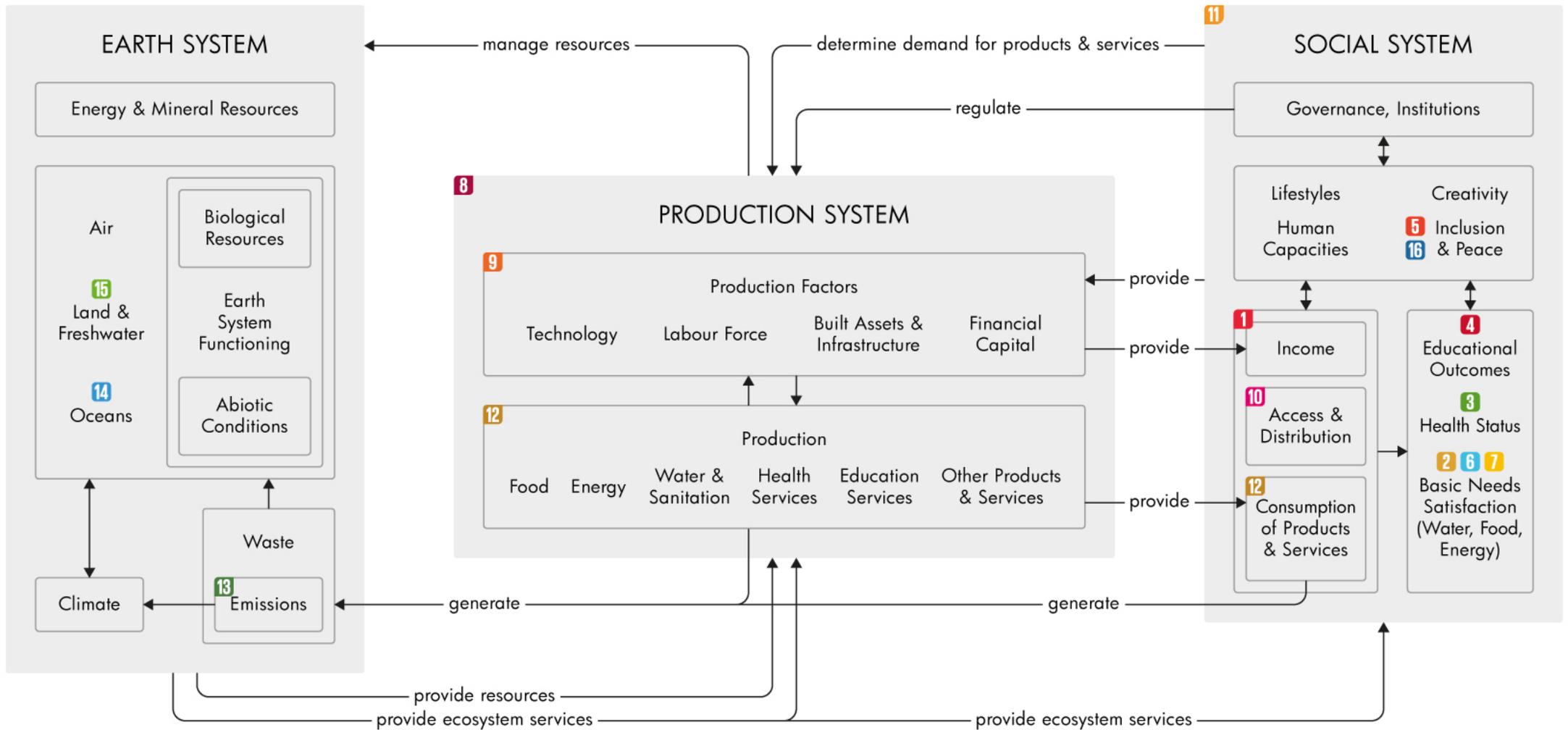
International Institute for  
Applied Systems Analysis



# THE WORLD'S FUTURE

A SUSTAINABLE DEVELOPMENT GOALS GAME





- 1 NO POVERTY
- 2 ZERO HUNGER
- 3 GOOD HEALTH AND WELL-BEING
- 4 QUALITY EDUCATION
- 5 GENDER EQUALITY
- 6 CLEAN WATER AND SANITATION
- 7 AFFORDABLE AND CLEAN ENERGY
- 8 DECENT WORK AND ECONOMIC GROWTH
- 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
- 10 REDUCED INEQUALITIES
- 11 SUSTAINABLE CITIES AND COMMUNITIES
- 12 RESPONSIBLE CONSUMPTION AND PRODUCTION
- 13 CLIMATE ACTION
- 14 LIFE BELOW WATER
- 15 LIFE ON LAND
- 16 PEACE, JUSTICE AND STRONG INSTITUTIONS







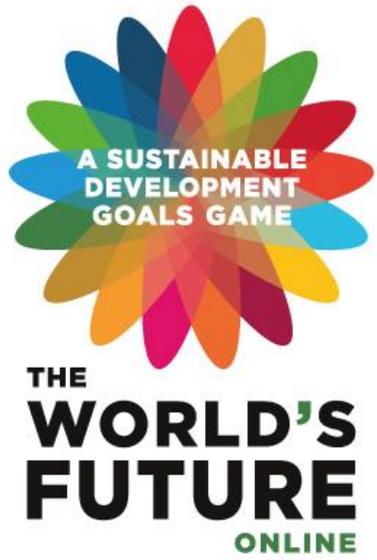
...leading to ...  
...to ...  
...to ...

Needs  
=> Urgent needs for multilateral solutions  
=> How can we build strong support and agreements for development

Green Award  
to col

MEMORANDUM  
SUSTAINABLE DEVELOPMENT GOALS

VESPUZIA



MENU

GHG 20



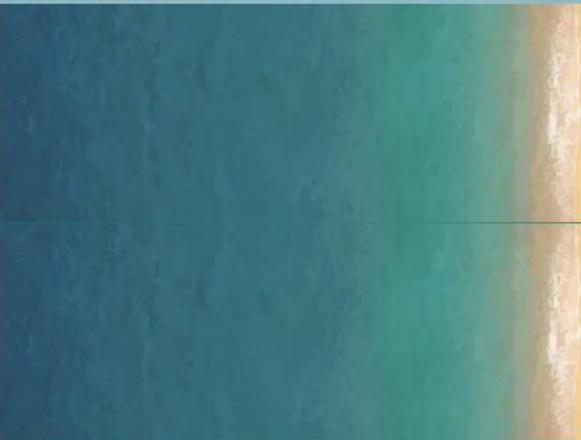
LAURENTIA

DEPT. OF ECONOMY

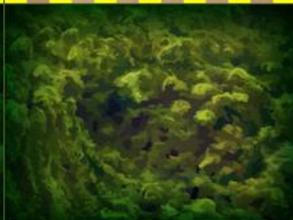
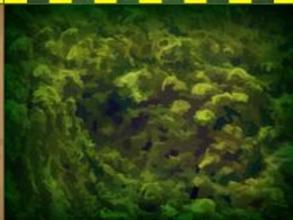
ROUND 1

00:30

OPERATIONS



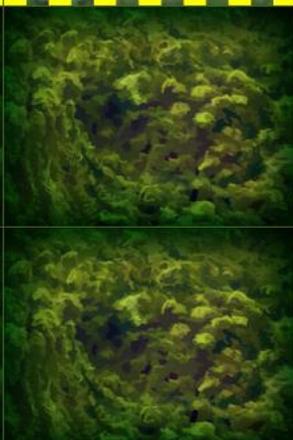
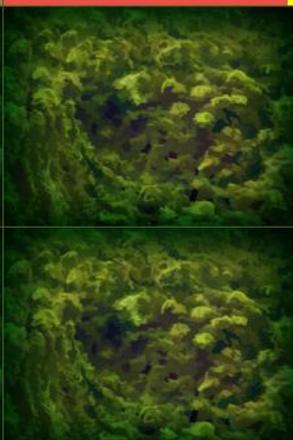
CO<sub>2</sub>  
20  
Fish  
15/15



Water with skull icon  
0  
Water drop  
14/15



Water with skull icon  
0  
Water drop  
20/20



20



4/4



20/20

STORAGE



0



0



8

MENU

POPULATION: 1



DEMOGRAPHIC FORECAST: ↑



VAT



GOODS & SERVICES\*



WORKFORCE POTENTIAL



INCOME TAX



20

**WATER\***

ACCESS 0 | 0

**HEALTH**

ACCESS 1 | 1

**EDUCATION**

ACCESS 1 | 1

R&D



**FOOD\***

**ENERGY\***

ACCESS 0 | 0

**LAW & SAFETY**

VAT LOSSES

STORAGE



\*PROVIDED EACH ROUND



POPULATION INDICATORS THAT YOUR DEPARTMENT IS RESPONSIBLE FOR



LAURENTIA

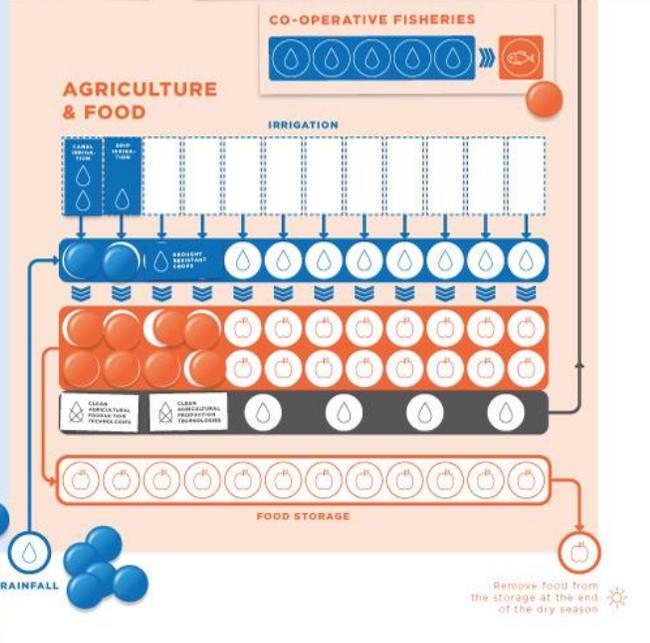
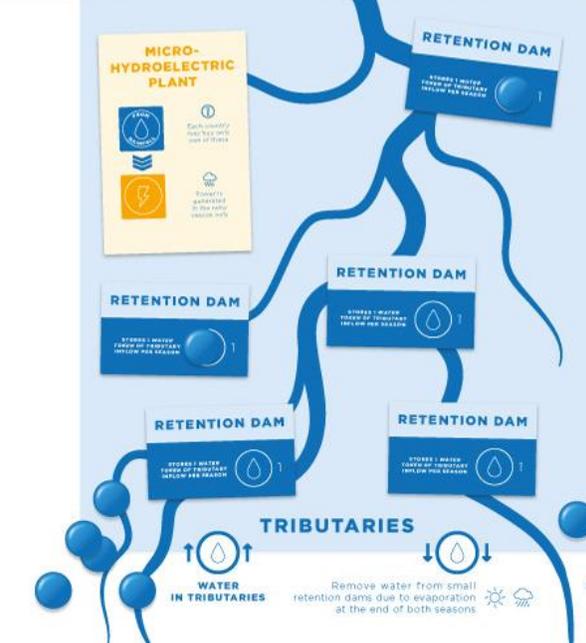
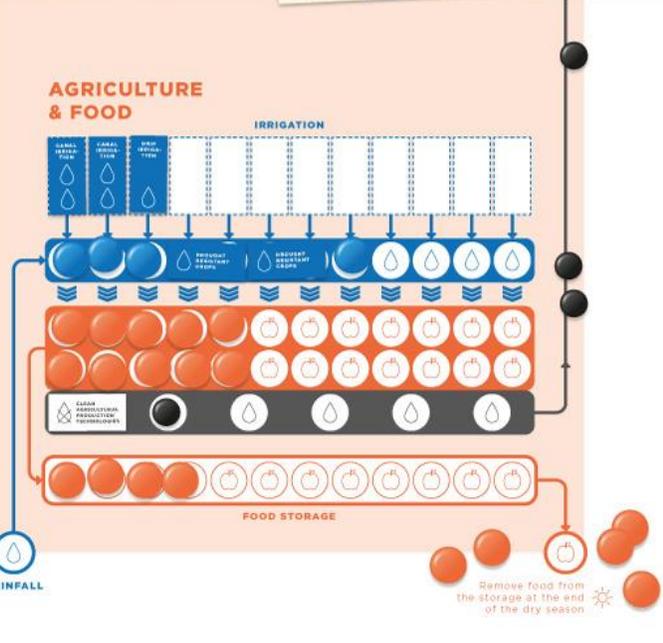
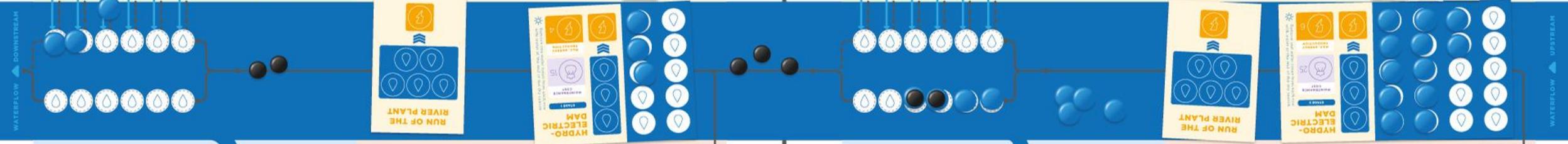
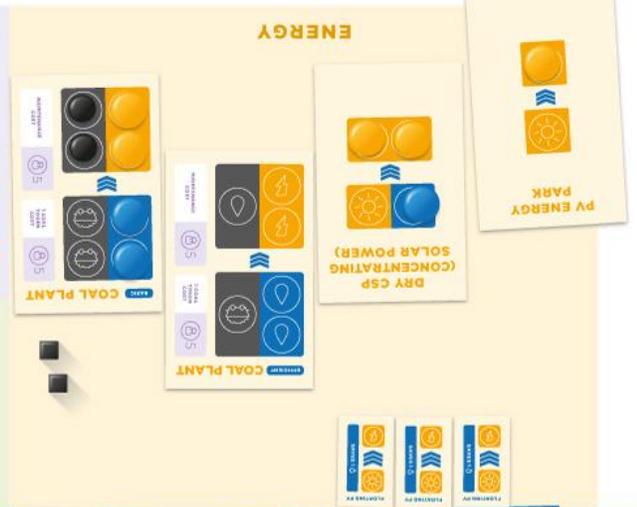
DEPT. OF ECONOMY





# Exploring synergies and trade-offs between policies affecting water, energy, and land.







ROLES



ENVIRONMENT

DECISIONS



SOCIAL AND  
ECONOMIC RULES









Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

## Global Environmental Change

journal homepage: [www.elsevier.com/locate/gloenvcha](http://www.elsevier.com/locate/gloenvcha)



# Simulation games as a catalyst for social learning: The case of the water-food-energy nexus game

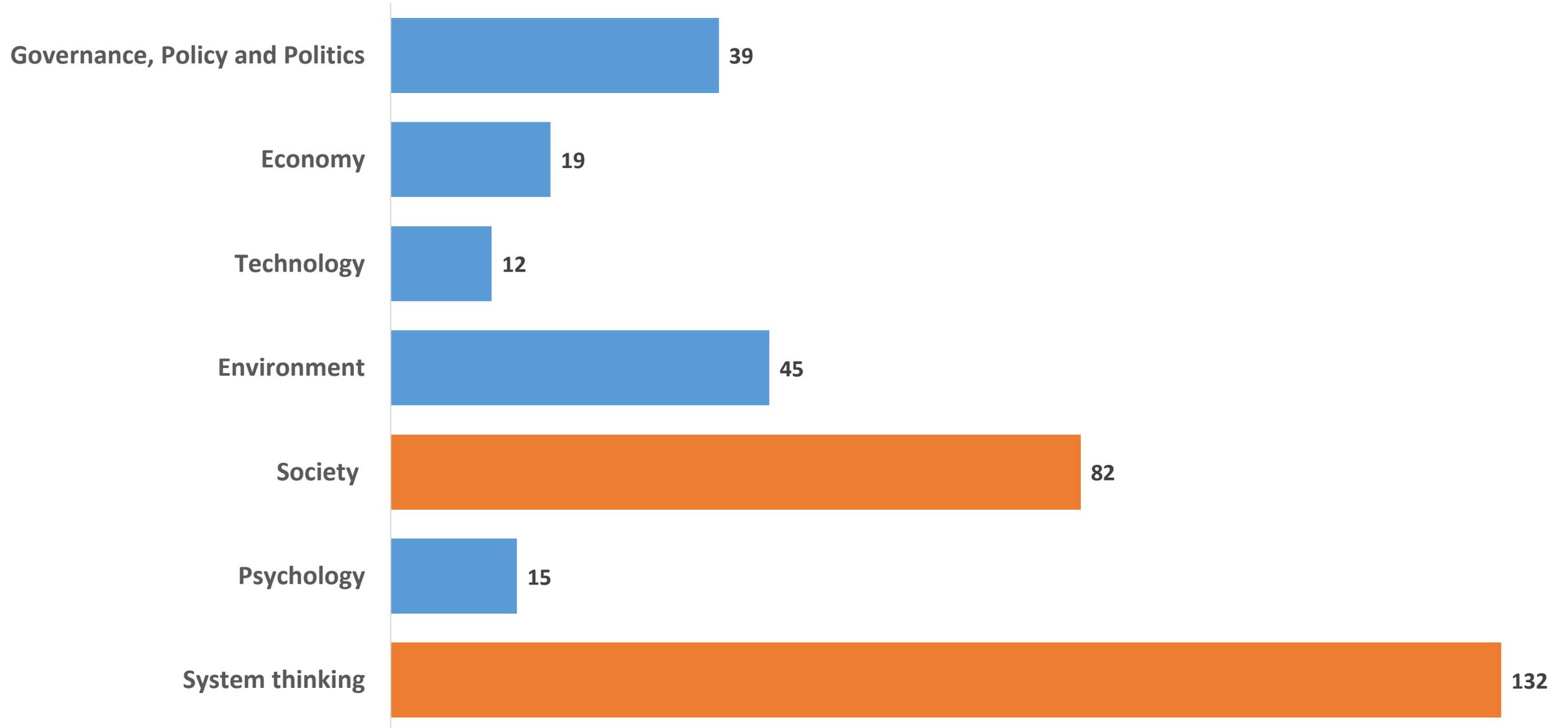
Junko Mochizuki<sup>a,\*</sup>, Piotr Magnuszewski<sup>a,b</sup>, Michal Pajak<sup>b</sup>, Karolina Krolikowska<sup>b,c</sup>,  
Lukasz Jarzabek<sup>b</sup>, Michalina Kulakowska<sup>b</sup>

<sup>a</sup> *International Institute for Applied Systems Analysis (IIASA), Schlossplatz 1, A-2361 Laxenburg, Austria*

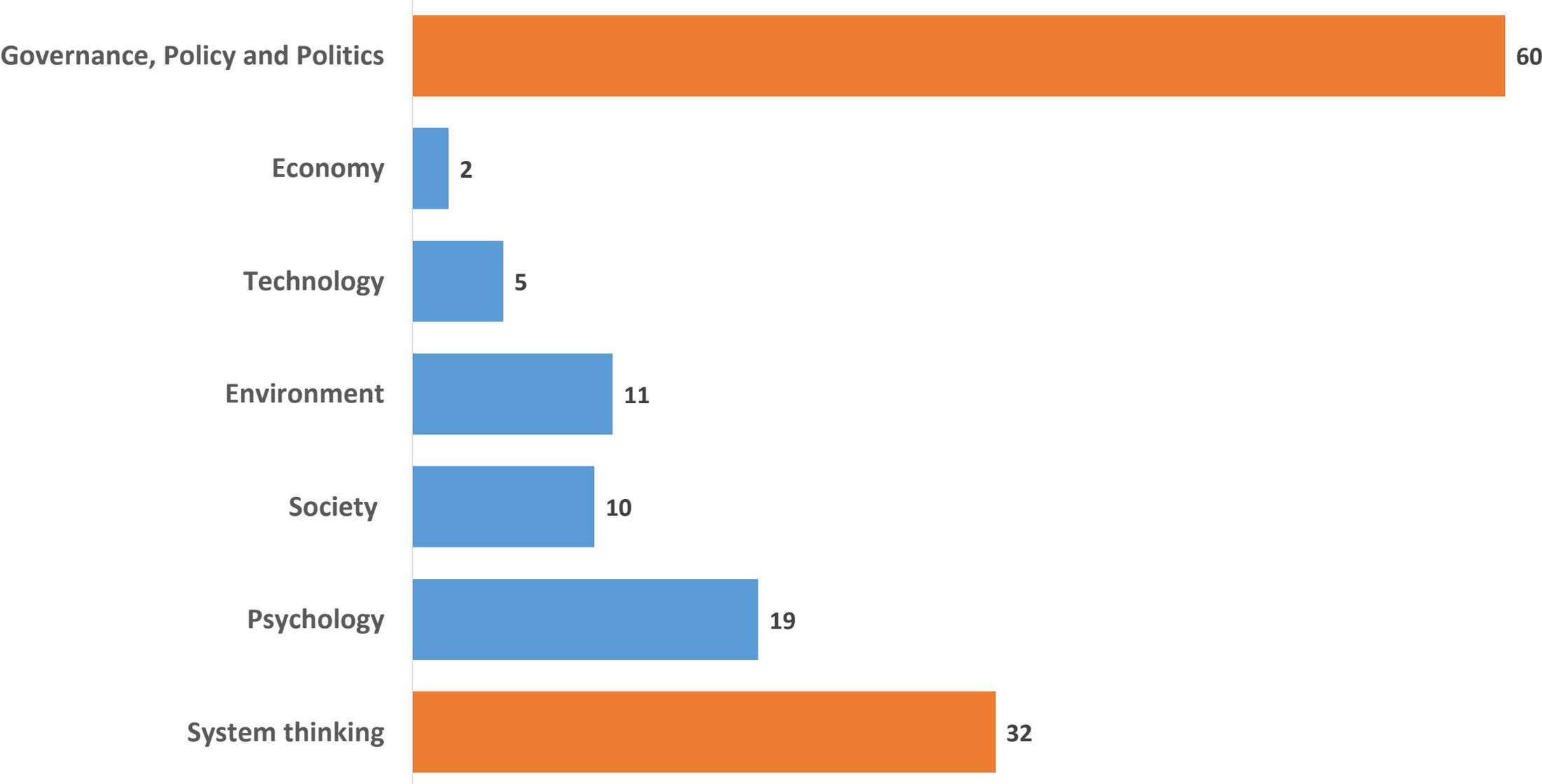
<sup>b</sup> *Centre for Systems Solutions (CRS), Stefana Jaracza 80b/10, 50-305 Wrocław, Poland*

<sup>c</sup> *Faculty of Finance and Accounting, WSB University in Wrocław, Wrocław 53-609, Poland*

# What have you learned from the simulation?

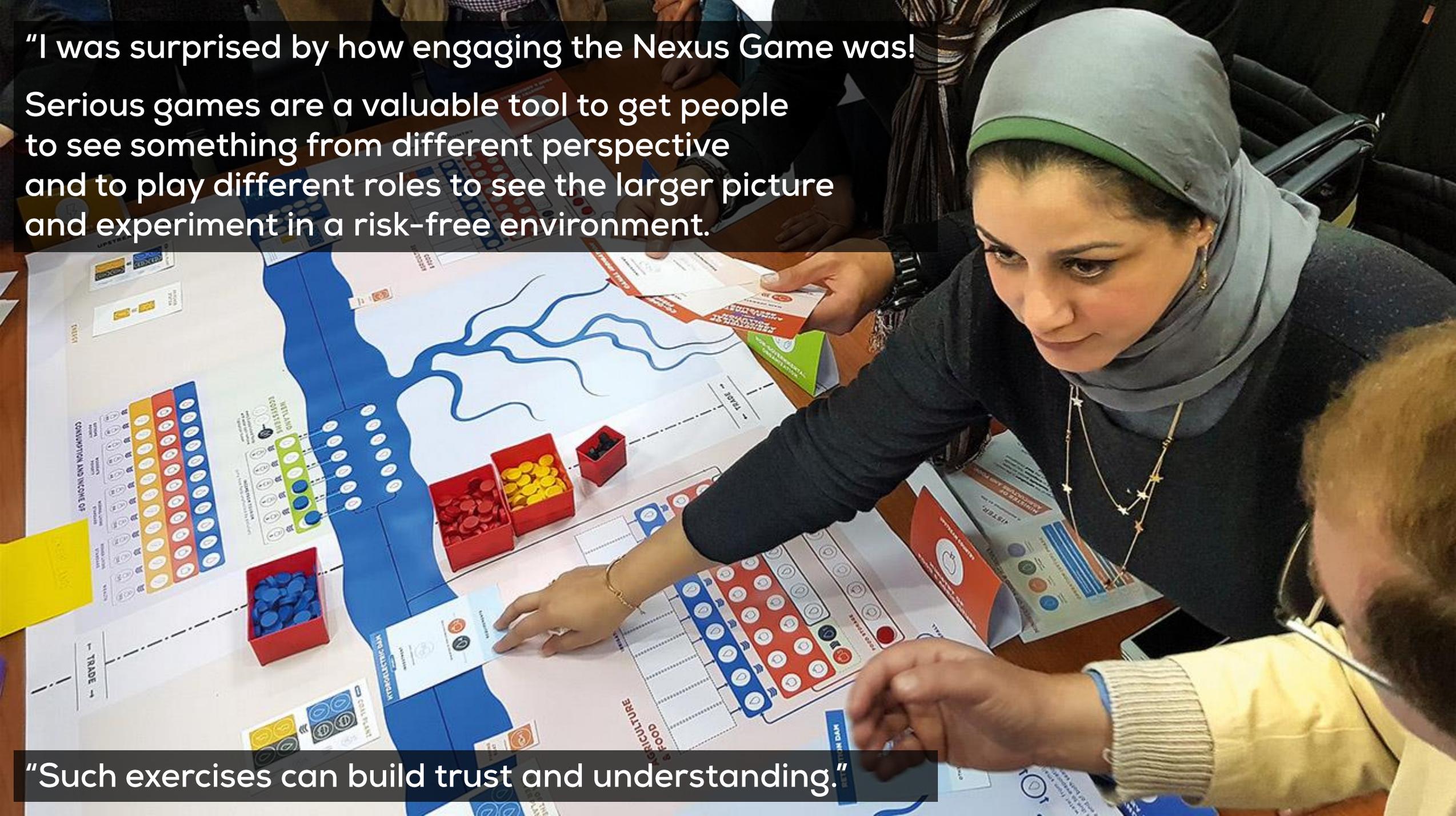


# Has this experience inspired you to take action in the real world?



"I was surprised by how engaging the Nexus Game was!

Serious games are a valuable tool to get people to see something from different perspective and to play different roles to see the larger picture and experiment in a risk-free environment.



"Such exercises can build trust and understanding."



**Application of the Policy Simulation**  
**INDUS RIVER BASIN**





GLACIERS

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10.0

# **Social Simulations ...**



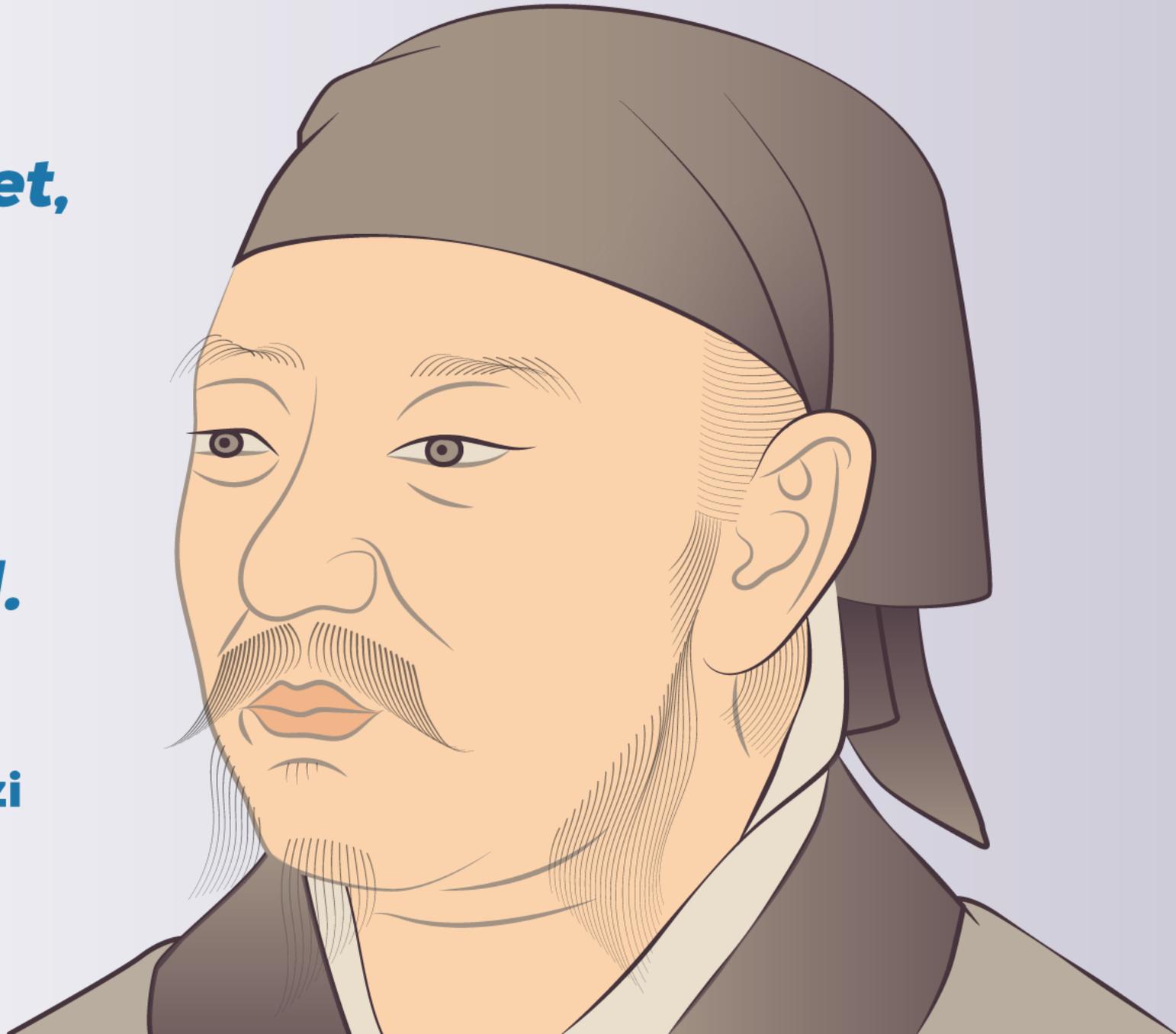
# **... around the World**

***Tell me and I forget,***

***Show me and  
I may remember,***

***Engage me and  
I will understand.***

**Xunzi**





# SOCIAL SIMULATIONS



Centre  
for Systems  
Solutions



International Institute for  
Applied Systems Analysis

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