# **Modelling the Dynamics of our Common Future**

# Sustainability Simulation in the TERRA2000 Project

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# The TERRA-2000 project The Insight for TERRA (IfT) model Some Simulation Results Conclusions

# The TERRA-2000 Project

http://www.terra-2000.org

➡ Goal: Make policy recommendation
IST-2000-26332
concerning the transition to the GNKS

- ➡ Type of project
  - multidisciplinary
  - international
- ➡ Structure of TERRA 2000
  - » Modelling-pillar
  - » Scenario-pillar
  - » Dissemination-pillar



The TERRA-2000 project
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# Why Create Dynamic Models?

- 1. To <u>understand</u> the <u>dynamics</u> of complex system
- 2. To <u>check</u> coherence of
  - a. assumptions of causality
- \_\_\_b. <u>definitions</u> of variables
- 3. To <u>assess</u> the <u>future</u> (threats & opportunities)
- 4. To evaluate policy alternatives
- 5. To **communicate** with others

# Insight for TERRA: What?

- ➡ A complement to the World3 model
- A global "simple" model fitting in a multi-level modelling framework
- Modelling of the transition to GNKS (Global Networked Knowledge Society)
  - explicit representation of Networking
  - explicit representation of Knowledge (& Knowledge Growth)
- Sustainability indicators on all dimensions
  - economic
  - social
  - ecologic

# A complement to World3: Why?

Insight for TERRA includes Representation of

- Social Dimension
- Governance
- Networking

➡ Further Development has to include

- Regionalisation
- Cultural Dimension

## Dominant Relations





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## Scenario 11: More R&D



# Scenario 2: More Networking



## Scenario 3: More Education



## Scenario 42 Factor 10



# Natural Capital Running out



## Economic Growth Rate



## Economic Growth Rate (2)



## Factor 10: Needled,....



## ... Ibuít moít sufficient



Splitting the economy into a number of sectors

- agricultural sub-model finished (COSMOPAD)
- others under way
- Regionalisation Gaming
  - COIs
  - Agents
  - Structural changes



The TERRA-2000 project
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The COSMOPAD modelling framework
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➡ The model "works"

There is a path for expanding the model through sub-models

but, the Insight Model does not attempt to replace detailed models (like IFs)

➡ Rigid structure

➡ Are we asking the right questions?

# New Questions

Exact data does not always matter that much...

 Problems are well identified... yet nothing seems to happen: "environmental" schizophrenia

"yes I care about sustainability,... <u>but</u> I am caught in a system"

## New Questions about structural changes

## ➡ Abstract - Scientific

- New Science of Networking
  - » Topological characteristics
  - » Contextual Random Boolean Networks
  - » Integrating time dynamics into the science of networks
- Self Organised Criticality
- Predictable Innovation (http://www.creax.com)
- ➡ Practical policies
  - IPR
  - Participation Subsidiarity
  - Closing the Economic Loop

## The End.



## in memoriam Dr. Ing. Robert Pestel