

Activity 4.6

Title: Developing a Model

Learning outcome: to gain an understanding and experience on how to build models

Applicable: it can be used in the fourth lecture of the Systems Thinking module

Green skills: discussion, collaborative planning, co-creation, systems thinking

Instructions: Ask the students to build the model of the following description

Extend the previous Model with the following structure:

Create a new stock called Food that represents the available food in the world every year.

The stock increases by the inflow food production and decreases by the outflow food consumption and the outflow “material of food used for energy”

The inflow “food production” depends on the variable

General production per year = $GDP * \text{production efficiency}$

Production efficiency = 0.75

GDP from the previous model

The outflow “food consumption” is determined by:

Food consumption = $\text{MIN}(\text{Food} * (1 - \text{percentage of food material converted to energy}), \text{world food needs})$

world food needs = $GDP * \text{food intensity}$

Food intensity = 1.3

percentage of food material converted to energy = 0.3

The outflow “food consumption” is determined by:

Food consumption = $\text{MIN}(\text{Food} * (1 - \text{percentage of food material converted to energy}), \text{world food needs})$

world food needs = $GDP * \text{food intensity}$

Food intensity = 1.3

percentage of food material converted to energy = 0.3

The outflow “material of food used for energy” is:

material of food used for energy = $\text{Food} * \text{percentage of food material converted to energy}$

While the stock Food has an initial value of 1000



Simulate the model and answer the following questions:

- 1) Are the world food needs covered in this model?
- 2) Why do you believe that is?
- 3) Do you think that the model is realistic depiction of reality?
- 4) How it can be expanded?

The model is provided

