



# Logistic growth without time-delay

(Resource ID: 77)

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This teaching resource is allocated to following University:

**BOKU - University of Natural Resources and Life Sciences Vienna**

Institution:

**Center for Global Change and Sustainability**

<http://www.sustainicum.at/en/modules/view/77.Logistic-growth-without-time-delay>



**Work in pairs**  
**Group work**  
**Plenum**



**Less than 5**  
**students**



**Up to 3 lecture**  
**units**



**Internet**  
**connection**  
**necessary**



**English, German**

This building block handles growth within limits. When growth begins, limits protract the initial maximal (exponential) growth. Growth approaches these limits at an increasingly slow rate (asymptotic) before ultimately ending.

This building block is part of a six-block series from the SUSTAINICUM collection:

[From logistic growth to a turning point in global resource consumption-overview](#)

**Logistic growth without time-delay**

Time-delayed logistic growth

Optimal population

Technological progress

Turning point in global resource consumption

In this building block students analyze the diverse manifestations of limited growth and study them using a mathematical model. Above all, the difference to exponential growth should be understood. Exponential growth is actively pursued in many areas (e.g. in the economic sector: economic, capital and welfare growth and subsequently also resource growth; in demography as population growth) despite it being a dangerous illusion. "Dangerous" because growth limits are ignored despite their very real presence. High growth rates are pursued, despite the fact that this provokes crashes. This building block serves as preparation for the following building block, dealing with time-delayed logistic growth and, using an example from population ecology, shows that there is no exponential growth in nature that does not end in catastrophe.

Suggested methods for applying this building block, one of the six-part series, in the classroom can be found in the overview building block: [From logistic growth to resource turning point- Overview](#).

Building block materials:

[Background text with assignments for students \(german\)](#)

(Warning: in Firefox's built-in PDF viewer some of the formulas may be incorrectly displayed. We recommend that Firefox users download the file: right click > > save as)

[Dynamic diagram \(german\)](#)

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## Teaching Tools & Methods



Written material



Simulation program



Simulation

## Learning Outcomes

Students should understand and learn to work with the model presented and be capable of relating it to concrete scenarios.

## Relevance for Sustainability

The topics dealt with are directly relevant to understanding the growth of populations in limited ecosystems.

## Sustainability criteria

- Related to global challenges / needs

## Preparation Efforts

Medium

## Access

Free

## Funded by

Funded by the Austrian Federal Ministry of Science and Research within the framework of the call "Projekt MINT-Massenfächer" (2011/12)