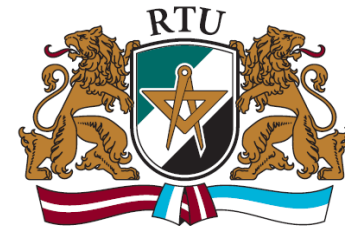




Riga Technical university
Faculty of Power and Electrical Engineering
Institute of Energy Systems and Environment
www.videszinatne.lv



Bioekonomikas modeļa izstrāde bioloģisko resursu ilgtspējīgai izmantošanai klimata pārmaiņu samazināšanai un pielāgošanās kapacitātes celšanai

Prof. Pal Davidsen

Prof. Andra Blumberga

Prof. Gatis Bažbauers



RTU
VASSI



BIOECONOMY



RTU
VASSI



- **Project name:** Development of a training course and study program module „Socio-economic aspects of the climate technology for bioeconomy sector”
- **Project aim:** The aim of the project is the establishment of an innovative training system about social and economical aspects of the climate change, based on the analysis of the biological economics development analysis.

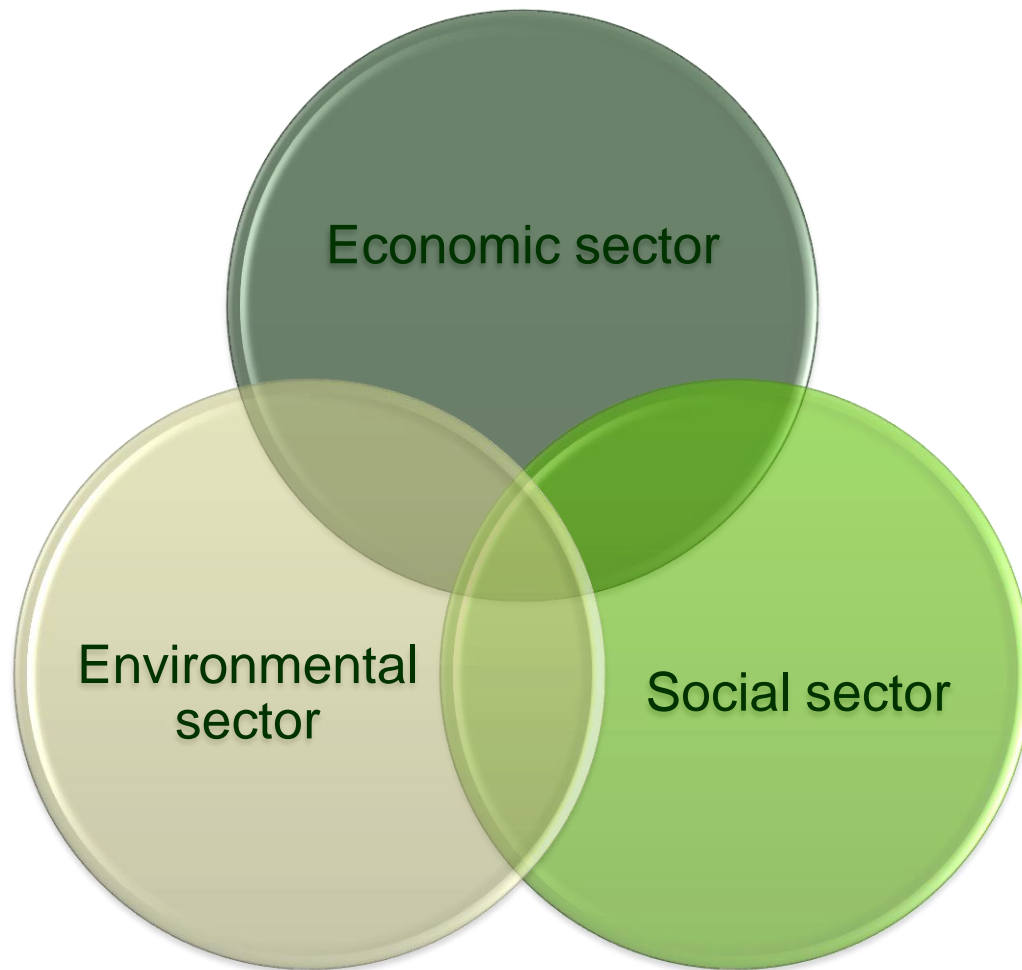
BIO-CLIMATE



RTU
VASSI



- **Project name:** Development of bioeconomy model for sustainable use of biological resources in order to reduce climate changes and improve adaptation capacity
- **Project aim:** to develop scientifically-based tool for medium/long term (2030/2050) modeling, simulation, and policy assessment of Latvian bioeconomy.
- **Partner:** System Dynamics Group, University of Bergen



METHODOLOGY

System Dynamics

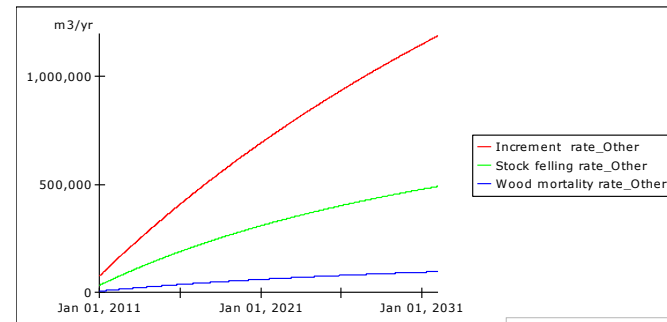
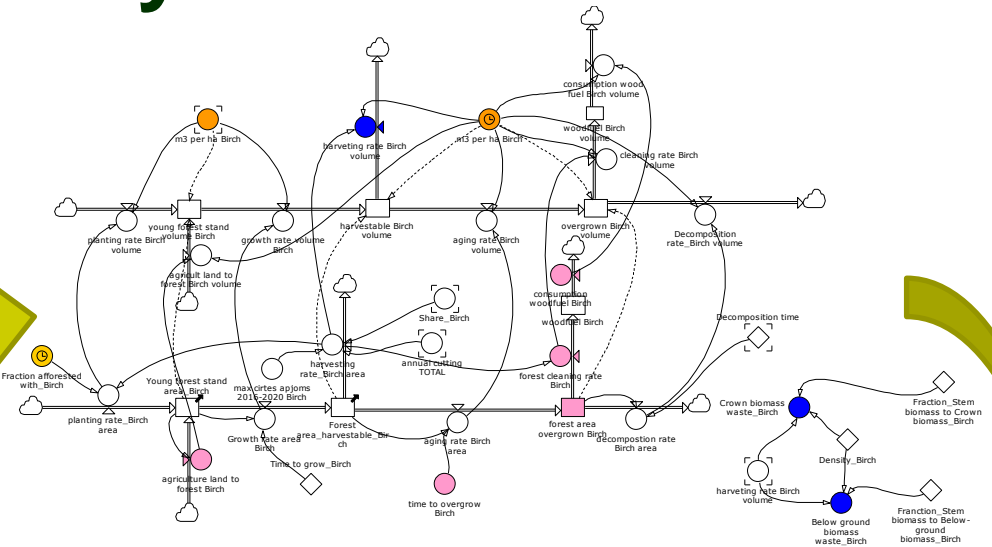
Method for;

- the analysis of complex dynamic systems
- the development and assessment of public policies

by way of modelling and simulation.

Complex dynamic systems

- feedback
- delay
- non-linearity
- uncertainty



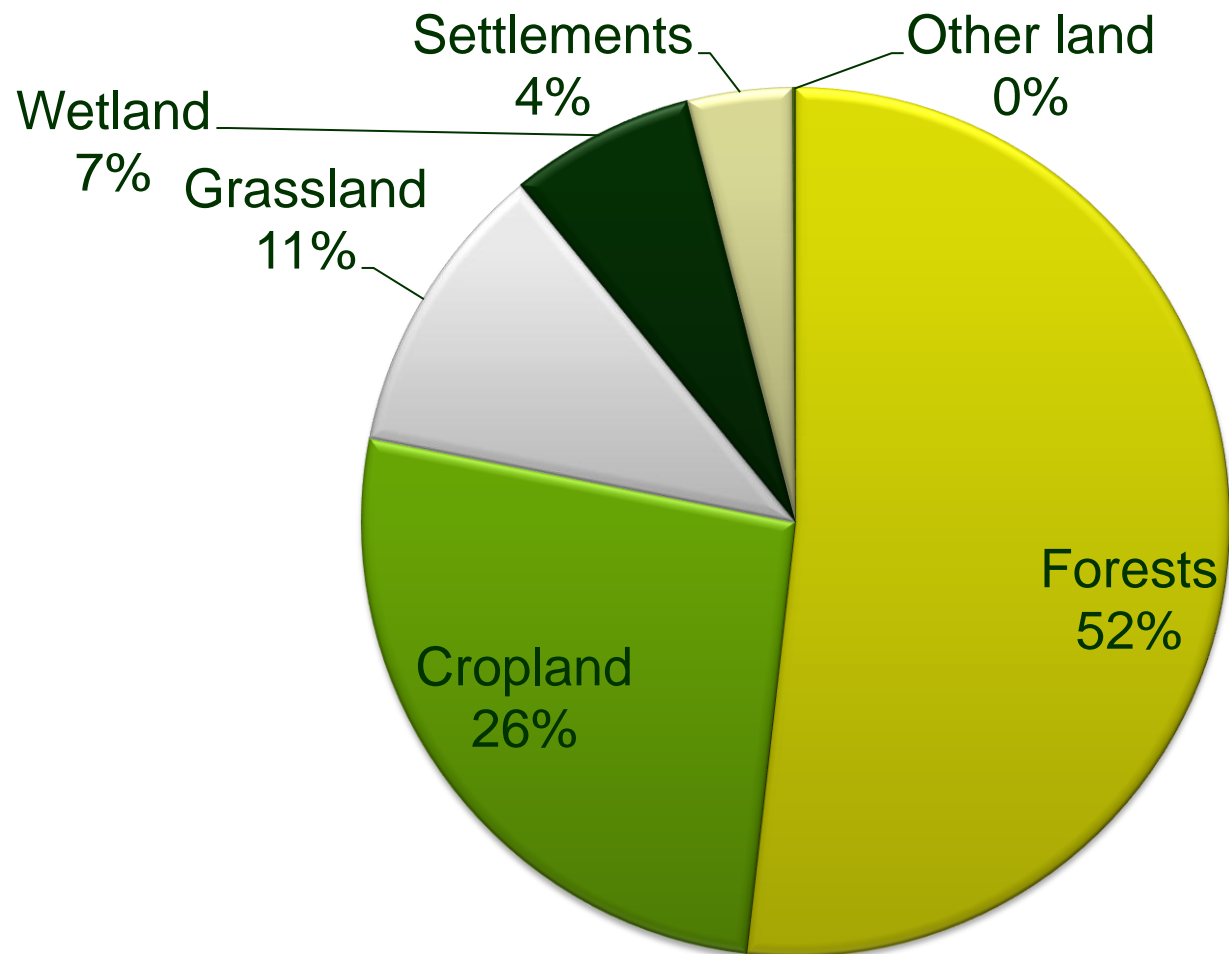
Non-commercial use only



**System
Dynamics**

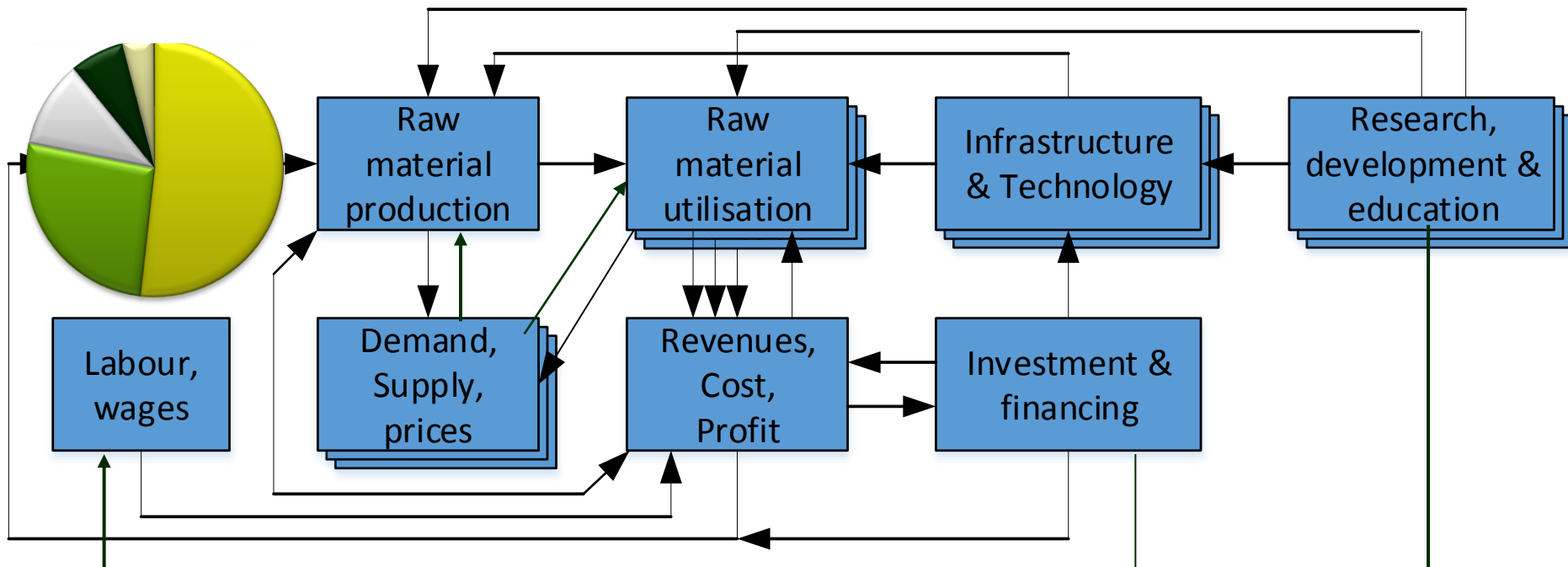
**Dynamic
GIS**

Land use in Latvia



Overview of sector interactions in the model

Sustainable Development Index (Emergy)



Overview of sector interactions in the model

Sustainable Development Goals (Energy)
Environmental sector

Economic sector

Social sector

Raw material production

Raw material production

Infrastructure & Technology

Research, development & education

Demand, Supply, prices

Revenues, Cost, Profit

Investment & financing

Bioeconomy model

- Bottom-up approach
- Cascading principle: how to increase added value to biological resources
- Sustainable Development Index (Emergy) as constraint

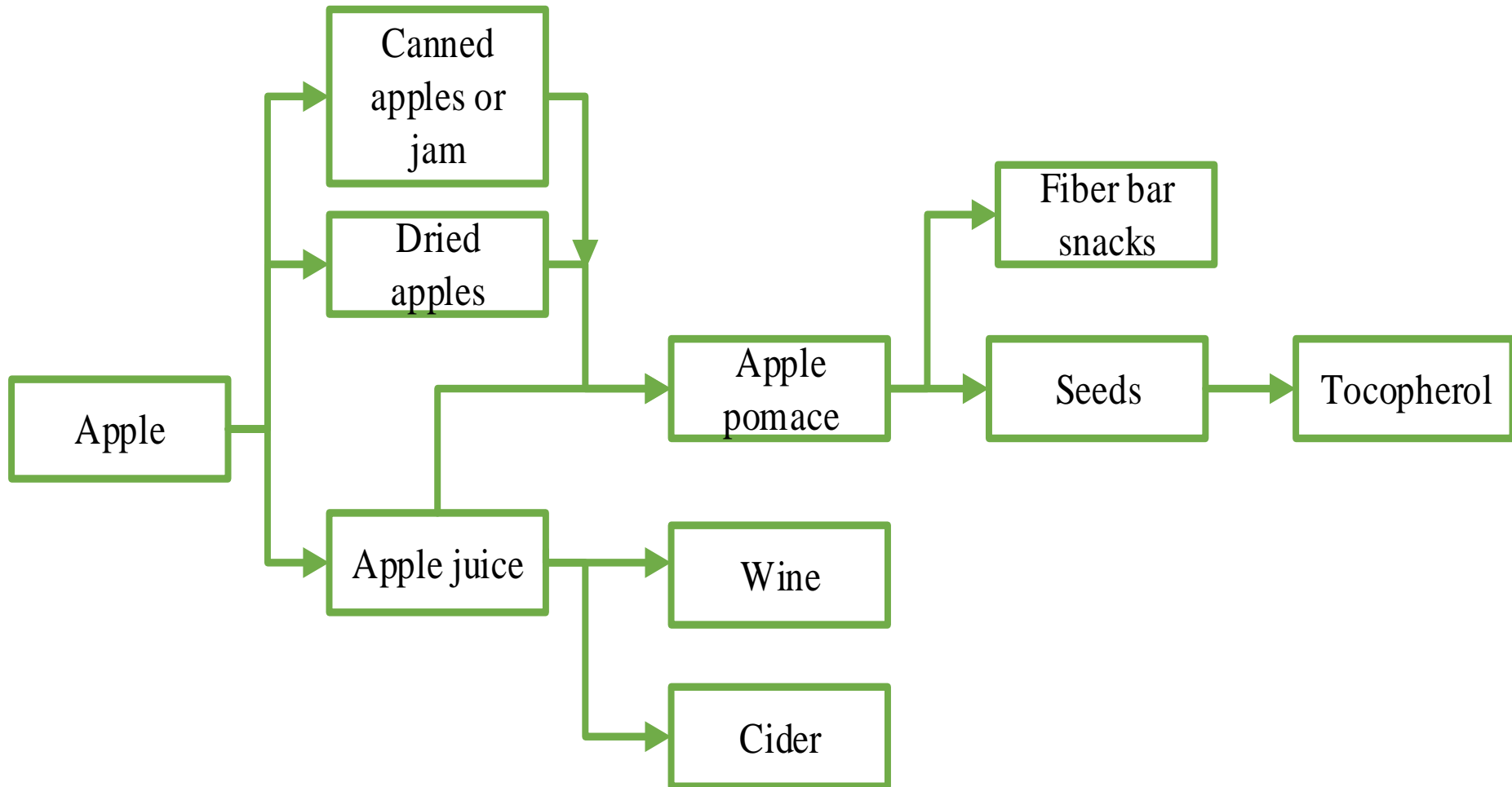
Dynamic GIS layers

- Use of land
- Population
- Employment
- Economic investments and production
- Environmental Sustainability Index

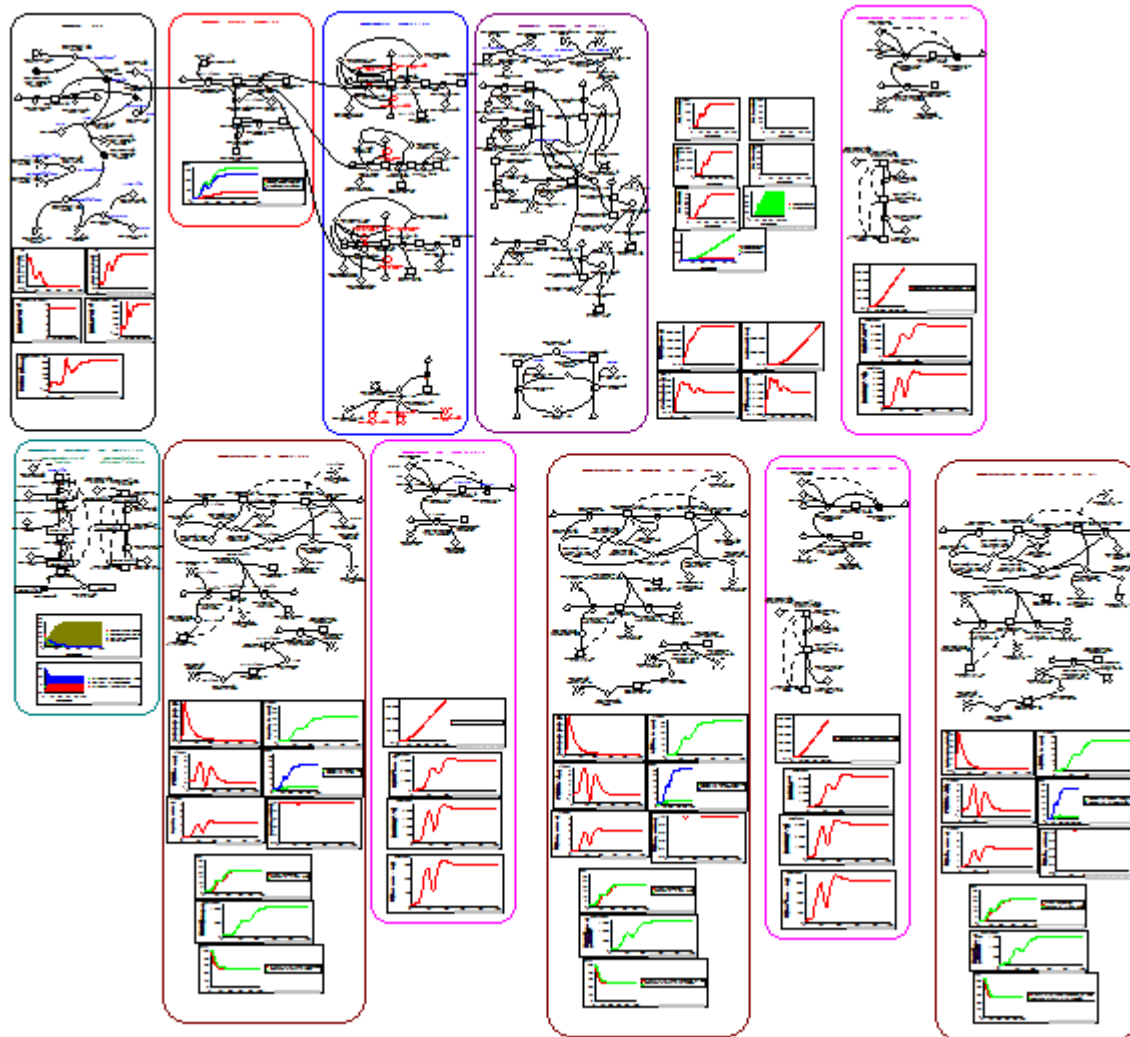
Product chains from:

- Forestry: wood (different types) and non-wood products
- Agriculture:
 - Livestock farming (cattle, swine, sheeps, birds, goats)
 - Pomiculture (grain farming, technical cultures, roots, legumes, berries, fruites)
- Fishery (inland water basins)

Example: apple orchards



System Dynamics model structure and behaviour



Apple orchards vs rural tourism

