

# AGENT-BASED MODELLING OF A COUPLED WATER DEMAND AND SUPPLY SYSTEM AT THE CATCHMENT SCALE

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## AGENT BASED MODELLING (ABM)

The actors in an ABM are called agents and represent entities of real-world systems. In Aqua.MORE, the higher-level entities of the agents are *waters*, *managers* and *users*.

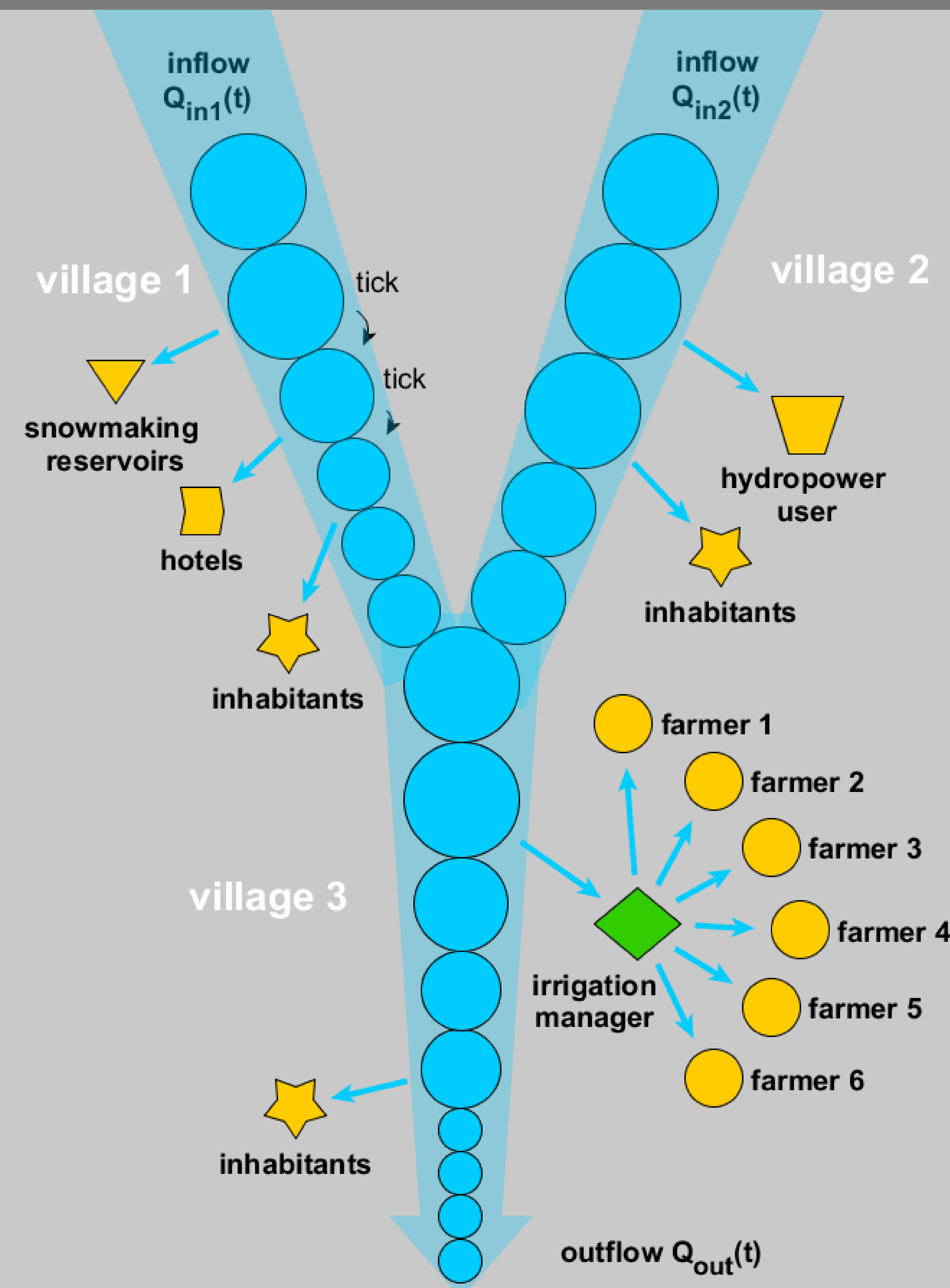
## PROGRAMMING PLATFORM

Aqua.MORE is implemented in NetLogo (Wilensky 1999).

## THE RESOURCE COMPONENT

*Waters* are created every time step at one side of the model environment and are moving all the way through it to the other side (i.e., downstream), thereby forming a one-dimensional downstream flow. *Waters* have the state variable 'amount\_water', which value is initially imported from an external data file and is adapted whenever water is extracted by *managers* or *users*.

Aqua.MORE is an  
agent based model  
for simulating  
water demand and supply.



## THE SOCIO-ECONOMIC COMPONENT

*Users* consume the resource, while the *managers* regulate and manage resource flows to *users*. The state variable 'demand' represents the amount of water the *manager/user* wants to extract from the *waters*. The 'demand' is adapted regularly during a model run because *managers/users* react to water scarcity situations.

## A COUPLED DEMAND AND SUPPLY SYSTEM

Aqua.MORE covers the full coupled natural and social system, where people and nature mutually interact and cause feedback loops: Higher water demand leads to lower water availability for competing *managers/users*. At the same time, the water availability also affects water demand because *managers/users* respond to water availability by modifying their water use behaviour.

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