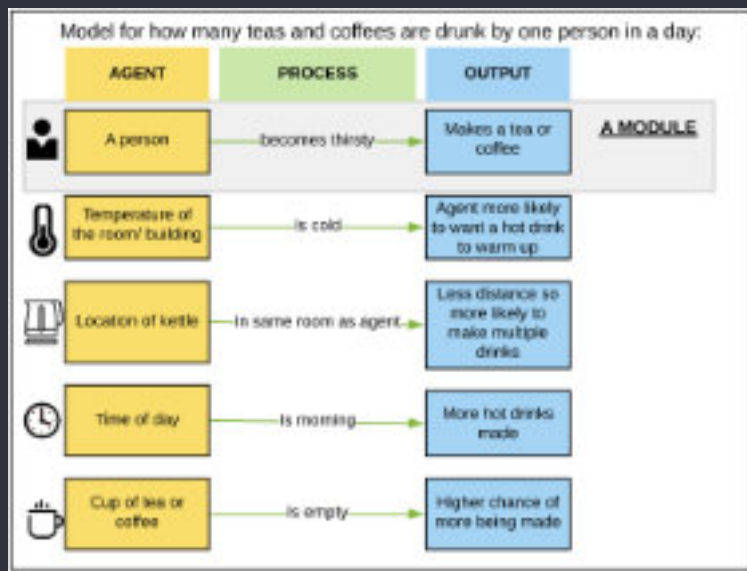




An agent-based model of greening Ravenna for reducing pluvial flooding



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 821282



ABM example model

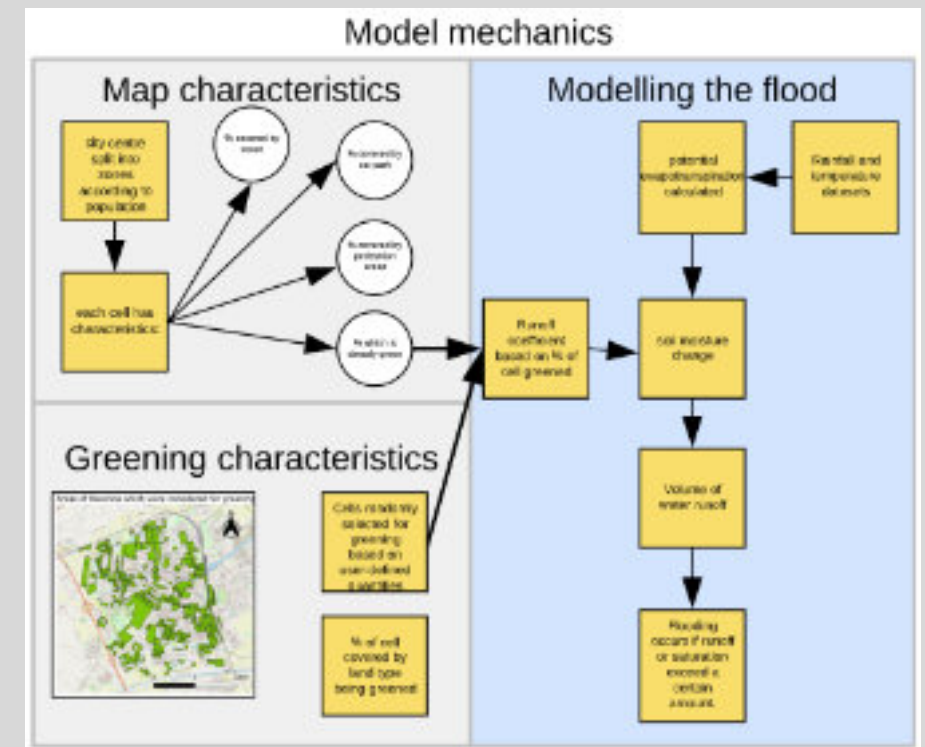
Agent-based modelling (ABM) for scenario analysis

ABM is an explorative type of computer modelling which looks at the actions and interactions between agents. In this case cells of surface area and their interactions with each other and their environment are explored.

Much of Ravenna's city centre consists of impermeable ground surface which exacerbates the issue of pluvial flooding. An ABM was created which explores greening of different parts of the city centre and its impact through absorbing rainfall on the volume of pluvial flooding.

How

- Conversations between Ravenna and modelling team to identify needs
- Python Mesa library used to code the model
- temperature and precipitation series combined with land cover map
- streets, car parks, pedestrian areas were considered for greening
- Model run 12,500 times to generate results



Tool | Results

- More cells with greening measures applied = less excess runoff
- Greening streets has a bigger impact than other surface types
- Flood areas shift due to changes in runoff patterns from greening

Functionality

The model supports SHELTER's scientific technical objective 3, which is to analyse, test and pilot novel cost-effective solutions and tools.

ABM can be used as a rapid assessment tool to examine potential solutions for reducing hazard impact and is thus useful for improving both preparedness and improving recovery and response to hazards.

