DECIPHERING DISASTER RECOVERY CHARACTERISTICS THROUGH A MULTI-AGENT SIMULATION MODEL

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Aim of Research

Objectives:

- Understanding the way people make decisions under uncertainty, and how these decisions get propagated over space and time to eventually affect the overall recovery in the community.
- Clarify the relationship between pre-disaster characteristics of the city and the recovery-policy-induced future of the city by revealing hidden behaviours.
Simulation Model

Each agent has (for each layer):
- Preference (Weightage)
- Goals (Threshold –min. requirement)

Through the simulation each layer shows recovery progress of a particular aspect

Recovery policies can be represented through adjusting the layer parameters.

Agent Types:
1. High Attachment (to disaster area), High Option (range of choices)
2. High Attachment, Low Option
3. Low Attachment, High Option
4. Low Attachment, Low Option

Given that $C_d < C_{\text{max}}$:

$$A_d + \frac{dA_d}{dt} \Delta t - Wo Ao - \frac{1}{W_c} C_d > 0$$
Example Run

Initial Screen

- Disaster area
- Nearby existing area

Community layer

- Mid Simulation

- Recovery progress
- Cost decline

Infrastructure layer

Designated recovery area

Development prospect layer

Cost layer

Simulation Output

People are moving to the nearby area and not the designated recovery area.