**General description**

The model simulates the decision-making process of the water authorities and residents (hereafter “actors”), and its effect on the spatial distribution of socio-hydrological vulnerability in Mexico City.

The model operates at the scale of a census block and it is fed by census blocks geographical attributes which correpond to each of the criteria defined by the actors. Each actor is represented in the model as an agent that modifies the census blocks geographical attributes.

Through a series of workshops with the actors, we identified the criteria and action alternatives which better represent the decision-making process of the actor. These criteria and action alternatives are then translated into the model using a multicriteria decisión analysis (MCDA).

The model also includes four simulation submodels: water supply, flooding, gastrointestinal diseases and subsidence.

Parrafin diciendo que los atributos de los agebs pueden ser modificado por: residentes, sacmex y los submodelos

**Agents**

For each model iteration, the criteria values are processed through four steps to take a decision: Normalize criteria, use limit matrix, obtain distance-to-ideal-point for each alternative and finally make a decision. This decision dinamically updates the criteria values.

1. *Normalize criteria values*

Criteria values are normalized by applying a value function which is assigned to each alternative-criteria combination. The value functions are preliminar and are expected to be modified based on further meetings with the actors(SACMEX and residents).

1. *Use limit matrix*

“analitic network processes theory”

3. *Obtain distance-to-ideal-point*

4. *Make a decision*

Sacmex: depending on policy type selected, sacmex takes distances to ideal points and decides wich alternative of action

**Submodels**

Water supply: this submodel simulates water scarcity measured as the number of days without water within each census block. Input data comes from a survey carried out at the municipality level. The calculation is made by fitting a Poisson distribution to the data and then use this distribution to obtain a probability that each census block will experience one or more days without water. Andres: we need u toexplain datails

Flooding: this submodel simulates the probabilty of flooding given the amount of precipitation observed in a census block. These probabilities were derived from a bayesian approach in which categories of obseved frequencies and total precipitation were used to characterize the census blocks.

Gastrointestinal diseases: this submodel simulates the probabilty of gastrointestinal diseases as a function of the spatial distribution of the driver variables. Andres: we need u toexplain datails

Subsidence: this submodel is based on the idea that more subground water extraction leads to more subsidence (this is a simplification of the goal submodel)

Nata: hay que tener consistencia entre los términos usados en el diagrama y el texto

Nota: mostrar en el diagrama las diferentes escalas temporales y los loops

Nota: el diagrama debe incluir los 4 steps que están en esta descripción