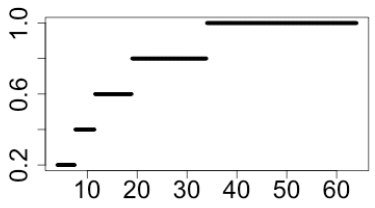
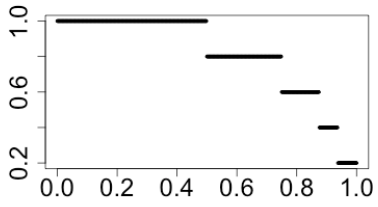
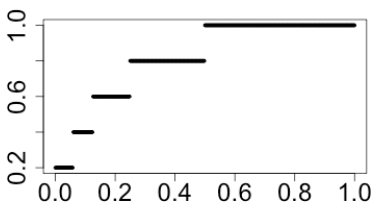
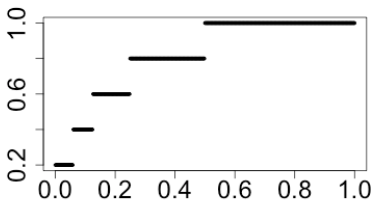
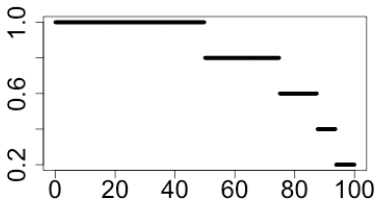
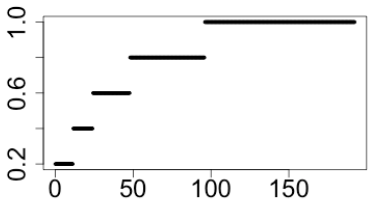
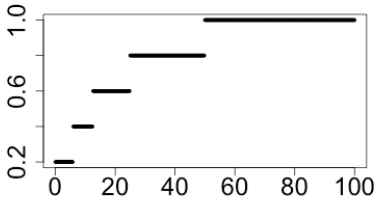
Normalize criteria values

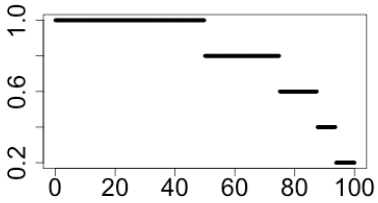
(Water operator)

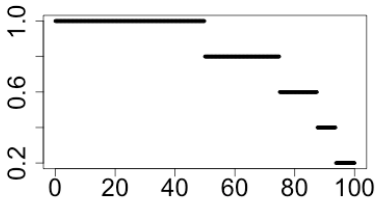
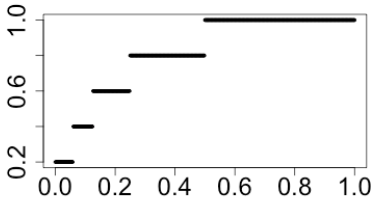
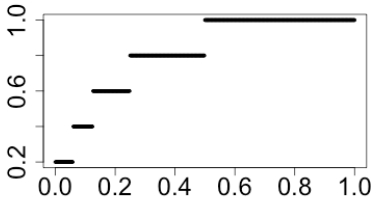
Attributes were rescaled to normalized scores using value functions. Some criteria are associated to different value functions depending on the action.

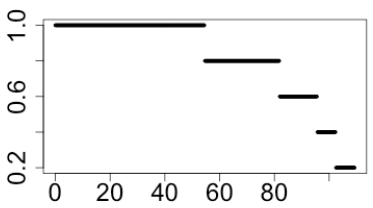
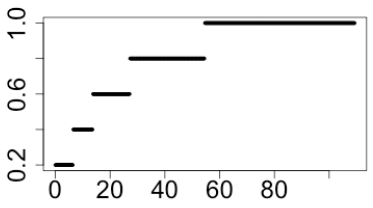
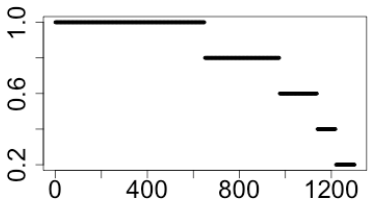
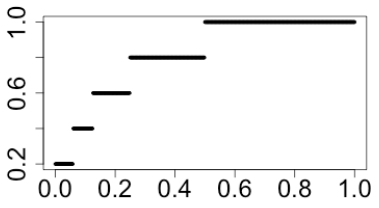
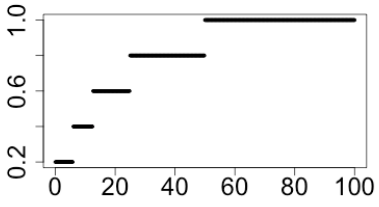
* All actions: Extracción, mantenimiento, distribución y nueva infraestructura.

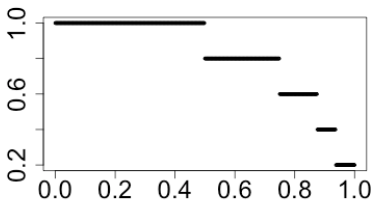
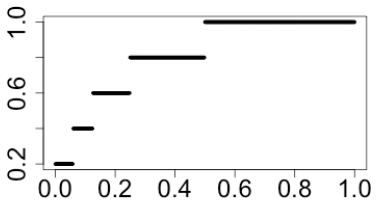
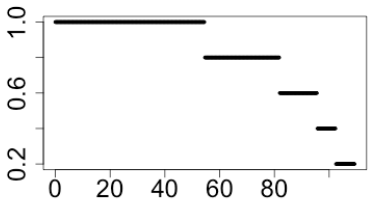
Criteria	Actions	Value function
Antigüedad	*	
Capacidad	*	

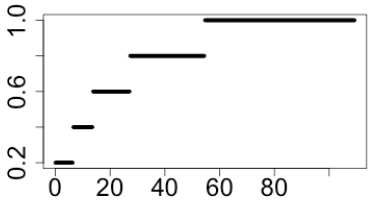
Falla	*	
Falta	*	
Presión hidráulica	*	
Gasto hidráulico	*	
Basura	*	

Monto	*	

Calidad de agua	*	
Escasez	Distribución	
Escasez	Extracción, mantenimiento, nueva infraestructura	

Inundación	Extracción	
Inundación	Distribución, mantenimiento, nueva infraestructura	
Abastecimiento	*	
Petición delegación	*	
Petición usuarios	*	

Presión medios	*	
Presión social	*	
Hundimiento	Extracción	
Hundimiento	Distribución, mantenimiento, nueva infraestructura	
Encharcamientos	Extracción	

Encharcamientos	Distribución, mantenimiento, nueva infraestructura	

This procedure standardizes each criteria using normalization functions. This procedure is needed to evaluate the distance to the ideal point of each census-block related to each action k, and system v. This procedure is called every cycle of decision. The information will define the vectors of criteria and will update their representation in a standardize scale using the procedure report "value function". This step is critical to quantify relationships between condition of the attributes in the landscape (e.g., age, capacity, etc) and the perceived response by agents. Formally this procedure takes the following notation:

$$x_{ijvt}^{k} = f\left(A_{ijt}, \varrho\right),$$

Where x_{ijvt}^{k} is the perceived magnitude of stimulus defined by the state of attribute i in census-block j at time t, A_{ijt}. Parameter ϱ refers to the constant fraction (ref). Function $f()$ is often represented by a logarithmic function:

$$x_{ijvt}^{k} = \varrho \log A_{ijt}$$

However, in the current version of this model, the function $f()$ is implemented using a set of cutoff ϱ_{ivc}^{k}, such that

$$x_{ijvt}^{k} = \begin{cases} 1 & \text{if} \quad A_{ijt} > \varrho_{iv4}^{k}\widetilde{A}_{\iota} \\ 0.8 & \text{if} \quad \varrho_{iv4}^{k}\widetilde{A}_{\iota} > A_{ijt} > \varrho_{iv3}^{k}\widetilde{A}_{\iota} \\ 0.6 & \text{if} \quad \varrho_{iv3}^{k}\widetilde{A}_{\iota} > A_{ijt} > \varrho_{iv2}^{k}\widetilde{A}_{\iota} \\ 0.4 & \text{if} \quad \varrho_{iv2}^{k}\widetilde{A}_{\iota} > A_{ijt} > \varrho_{iv1}^{k}\widetilde{A}_{\iota} \\ 0.2 & \text{if} \quad \varrho_{iv1}^{k}\widetilde{A}_{\iota} < A_{ijt} \end{cases}$$

Where $\varrho_{z}$are canonical cut-offs that follow the Weber-Fechner progression {0.5,0.25 0.125,0.0625} for increasing functions and {0.937,0.875 0.725,0.5} for decreasing functions. Parameter $\widetilde{A}_{\iota}$ represents the maximum value of the attribute, A_{ijt}, which will set the range of the value function.

In the current Netlogo version of the model, this procedure is called in the context of actions, which are called in the context of the census-block.