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Cooperation or negotiation for dietary diversity within the farm household

The objective is to understand the processes leading to dietary diversity.

We look at the interactions among household members, create a multi-agent toy model and simulate various scenarios

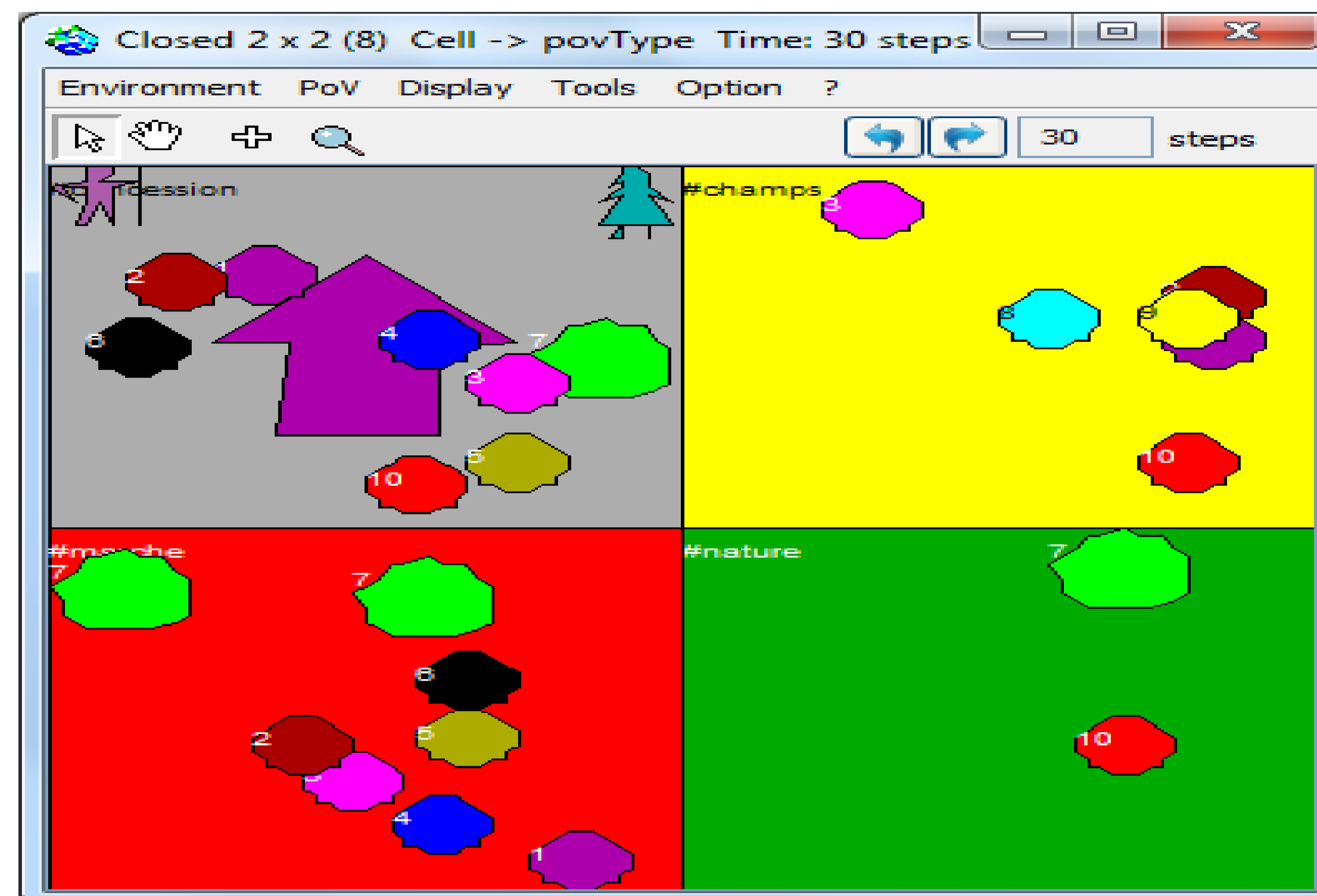
Promoting resilience in the African rural households: food systems at a crossroads (RELAX project).



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The model is composed of :

- Food products from 10 nutritional groups,
- Three food sources (fields, nature, and market). Availability depends on production decisions and market and nature seasonality.
- One granary where cereals are stocked,
- Two agents.



The first agent's (A1) objective is to secure cereals supply through agricultural production.

The second agent's (A2) objective is to secure nutritional diversity through agricultural production, market access and natural products gathering.

A1 controls A2 access to :

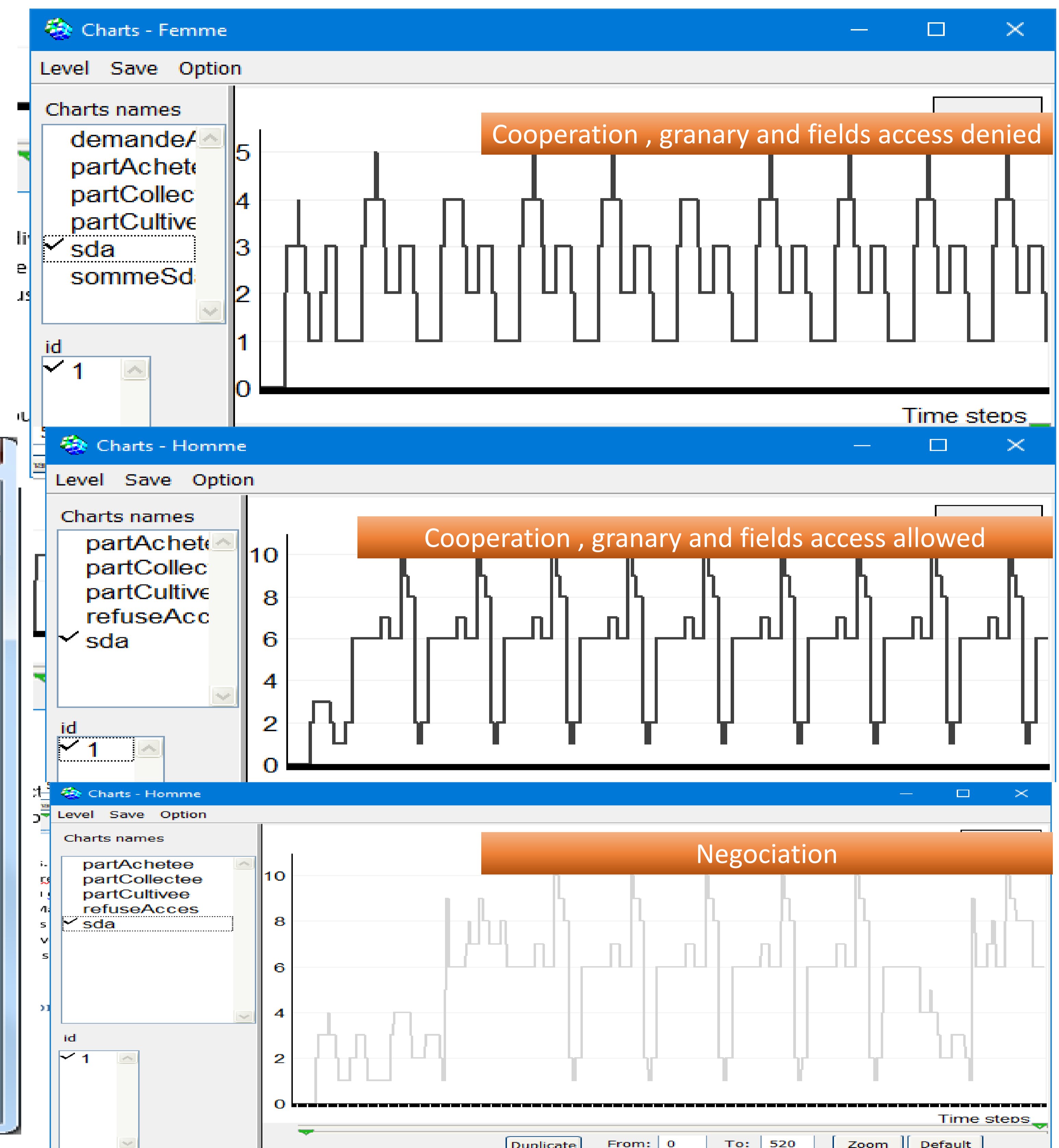
- the granary to withdraw cereals, sell them and go to the market to purchase food products
- the fields to grow food products

Cooperation processes (based on empirical observations from the Relax project in Burkina Faso).

1. Both agents produce cereals, A2 purchases at market and collect in nature
2. A1 produces cereals, A2 produces food products, purchases at market and collect in nature

Negotiation process (based on A. Sen cooperative conflict model).

A2 granary and fields access depends on relative power of A1 and A2. Each power variable is updated according to agent objective satisfaction.



Simulated evolution of nutritional diversity score over 10 years

Lessons:

- Dietary patterns vary with cooperation and negotiation among household members for access to production and market
- Negotiation theoretical model is more dynamic but does not fit with observed processes

Future research:

Look at the sensitivity of cooperation models to market, production or natural hazards