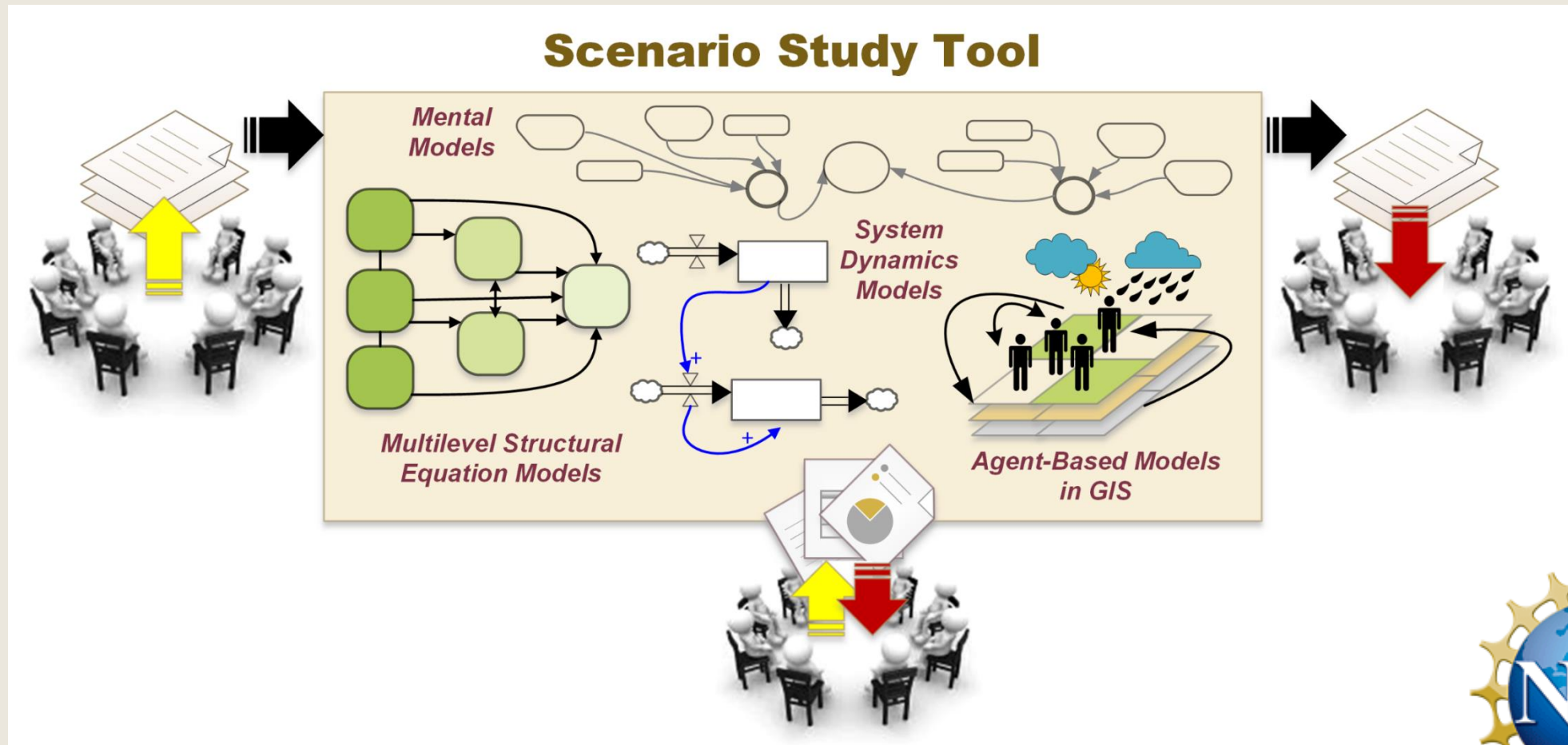


IBSS: Participatory-Ensemble Modeling to Study the Multiscale Social and Behavioral Dynamics of Food Security

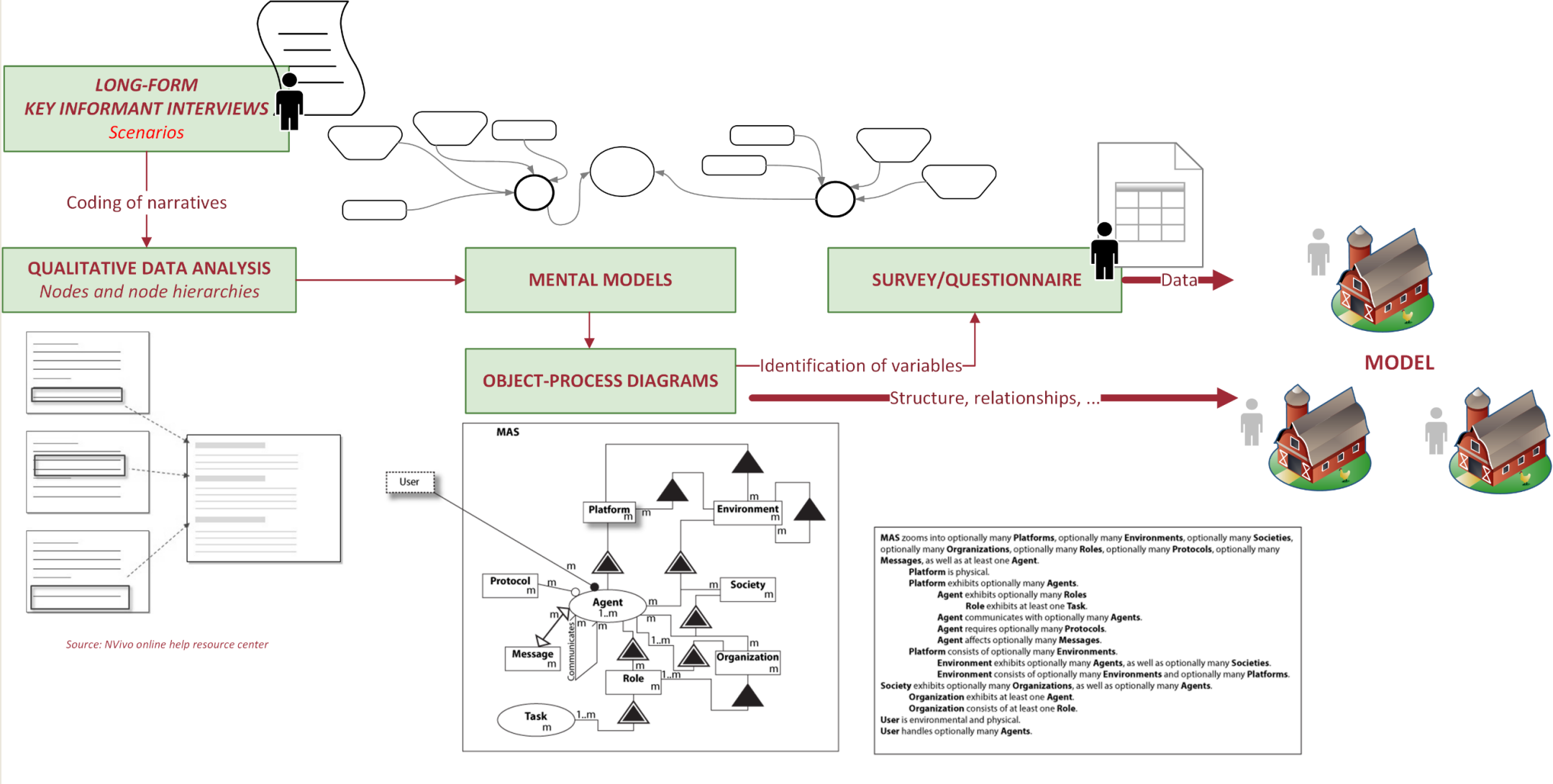


Mental models of food security in Mali



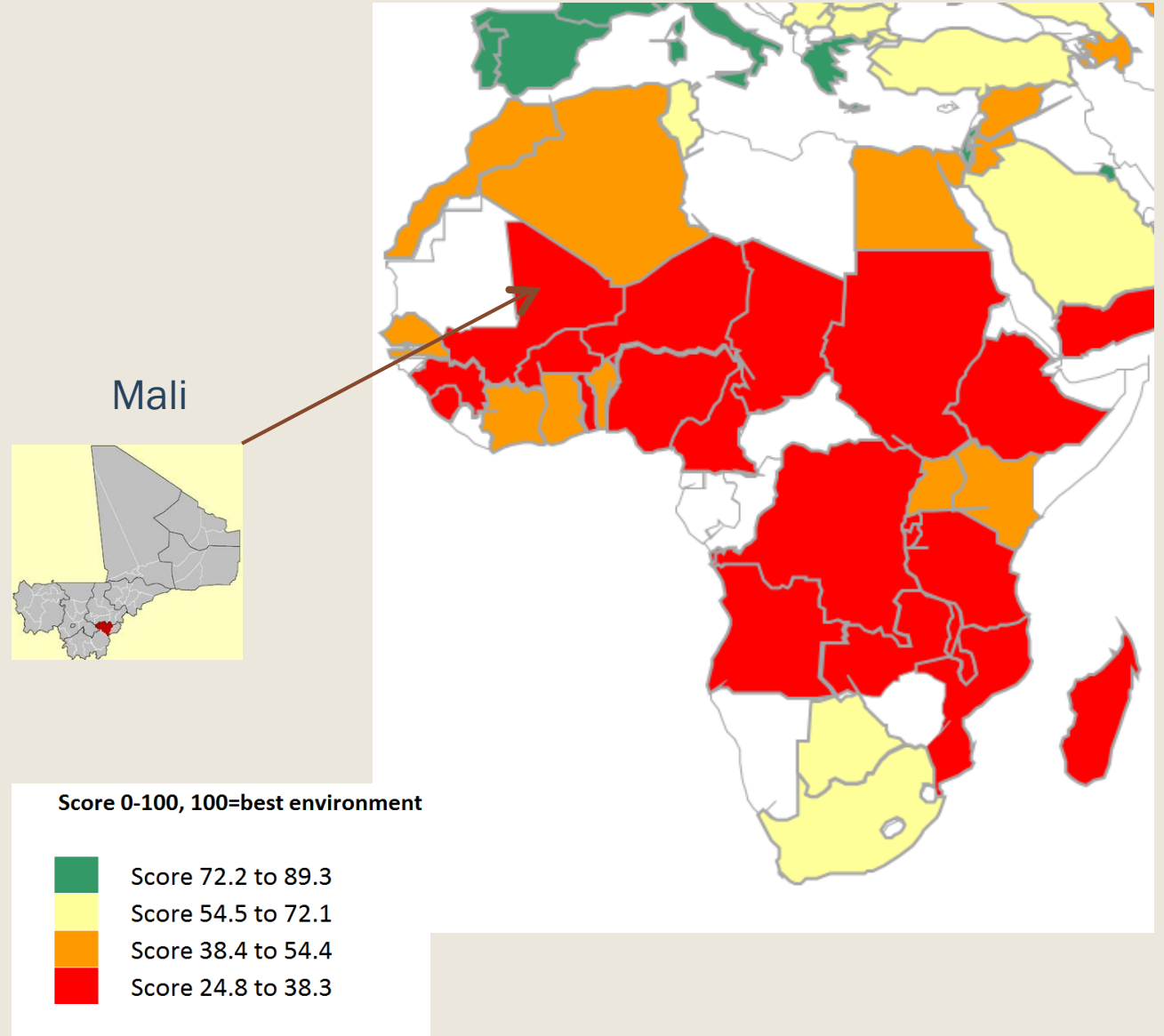
Mental models are graphical representations of how people know, perceive, make decisions, and construct behavior in a variety of environments.

From-Interviews-to-Agents Framework



Study location in Mali, West Africa

- 44 respondents in six villages in Koutiala
- Narratives from elder men and women , younger men and women
- Aim of narratives:
 - Components of **individual cognition and perceptions** of agriculture, climate change and food security.
 - Individual and household-level **decision making** in terms of adaptation to climate risks and food insecurity



Households in Mali



- Polygamous structure
- Average household size - 70-80 members
- **sub family units** living in co-existence and **sharing** the family resources.
- Collective and individual plots
- Subsistence farmers with average land size 1-4 ha
- Traditional ploughing methods such as ox and hand ploughs.
- Crops grown :
 - Maize
 - Sorghum
 - Millet
 - Rice
 - Cowpeas
 - Soybeans
 - Peanuts
 - Cotton



Elder man

Malick Dembélé
Village : Molobala

Primary decision maker on

- **land use**
- **crops grown**
- **selling of crops/livestock**
- **allocation of food grain** to the women for cooking
- **farming decisions** on input use and selling in the markets etc.)



Elder woman

Djeneba Tounkara
Village: Namposela

Decides on :

- Daily menu
- Cooking
- Food distribution within household members
- Individual plots to grow supplement food
- Shea butter production
- President of two collective women organizations

Younger man



Ibrahima Coulibaly
Village : m'pessoba

Involved in:

- Collective and individual field labor
- Cattle herding

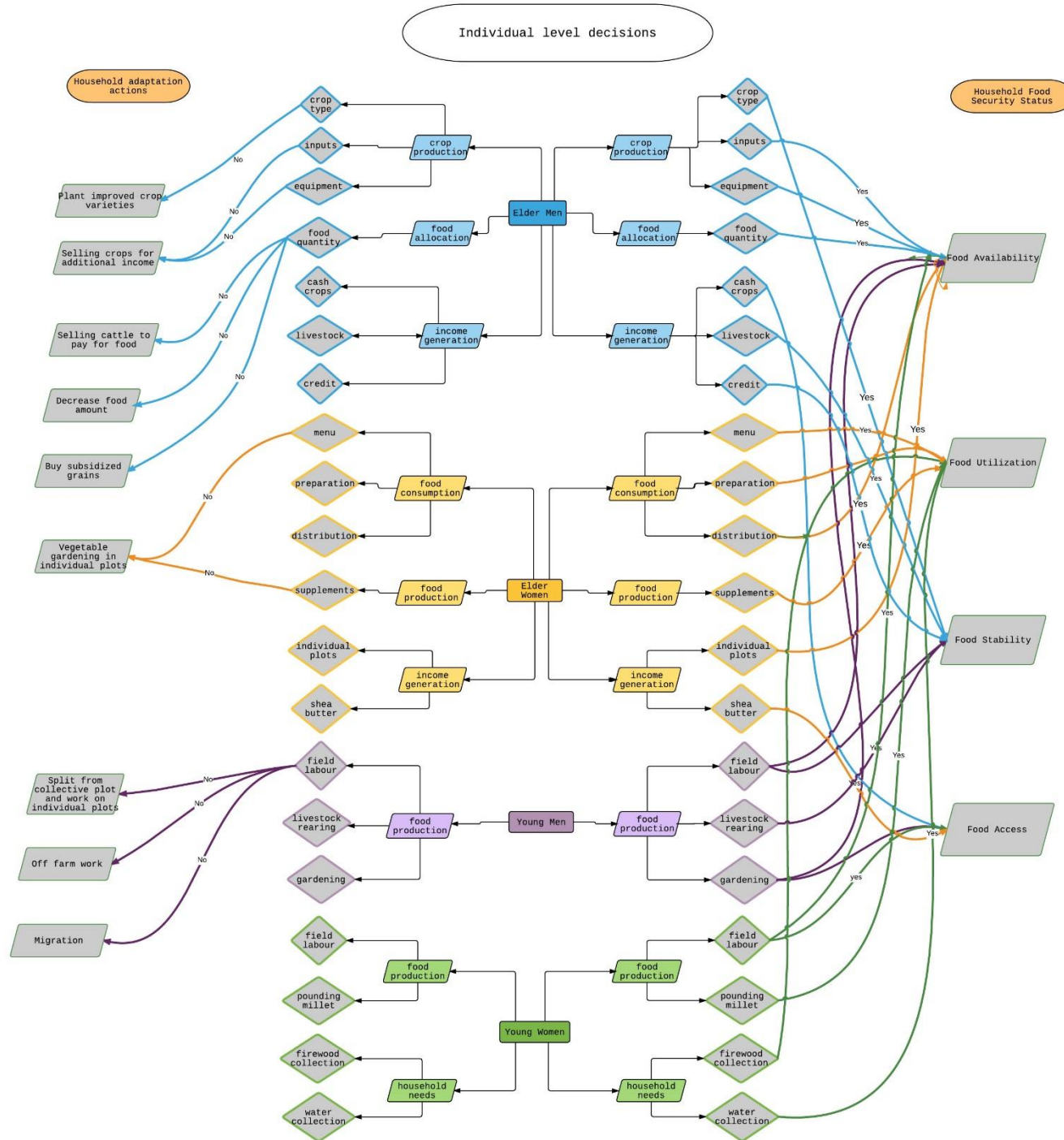


Younger woman

Mariétou Dembélé
Village : Namposela

Involved in:

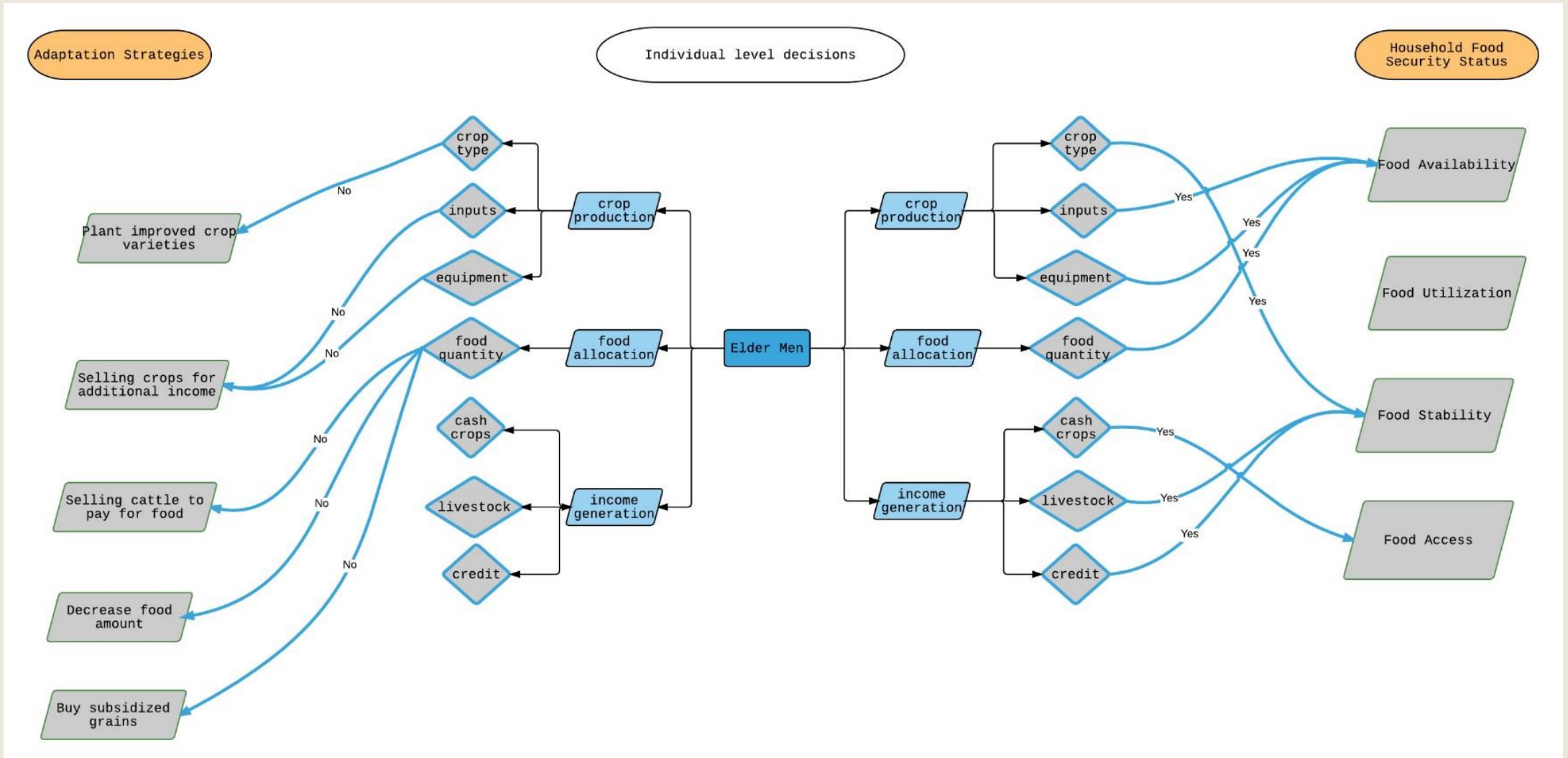
- Collective field labor
- Collection of water and firewood
- Pounding millet
- Selling cakes in the weekly village market



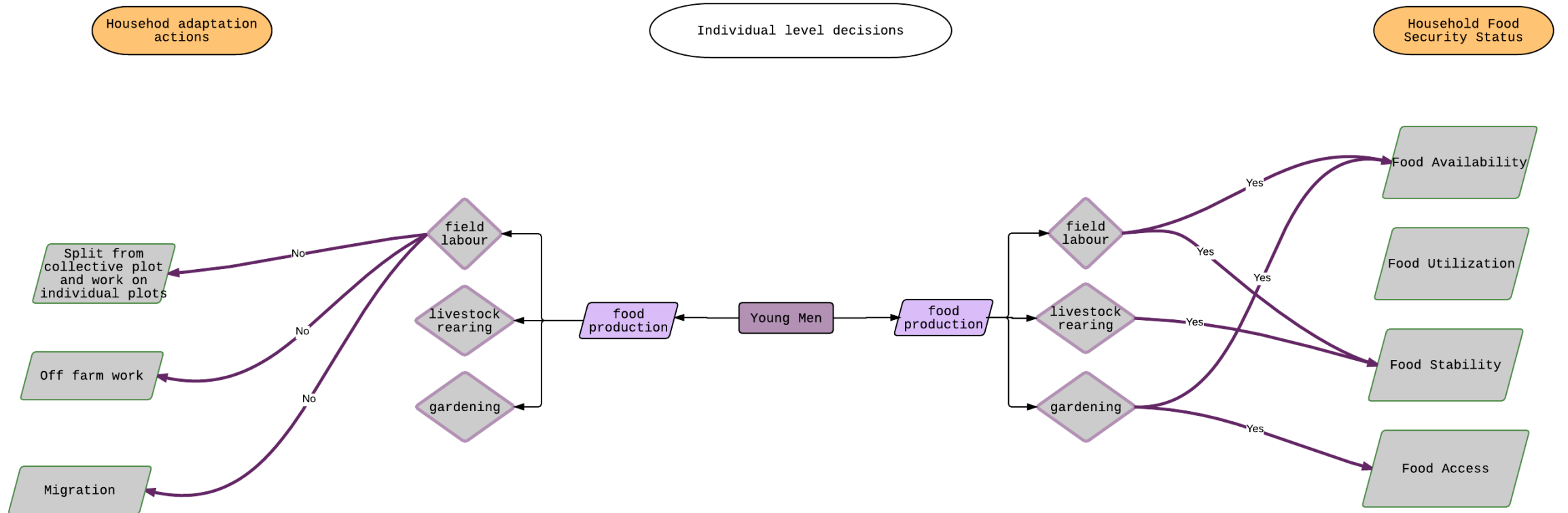
Decision structure of household food security and adaptation

- Fewer decision nodes on
 - Food stability &
 - Food access
- Men (elder & young) mostly decide on strategies for food availability, stability and food access
- Women (elder and young) mostly decide on strategies for food utilization as well as availability
- Decisions on various adaptation strategies is mostly taken by men (elder and young)
- Conflicts between strategies taken by elder and younger men

Decision structure of elder men



Decision structure of younger men



Innovations

- Insights into inter and intra household food security
- Dives into the cultural and social changes and challenges in households due to food insecurity
- Decision structure format of the metal model set a platform for system dynamics, agent based and structural equation modelling

Future steps

- Quantification of intra-household food dynamics
 - *Survey questions*
 - *Role playing board games*
- Translation of mental model into ABM and system dynamics model
- Replication of the study in other regions in West Africa (Ghana, Burkina Faso)

Thank you!

Questions?