Multiscale RECIPES for Sustainable Food Systems Clusters and Activities
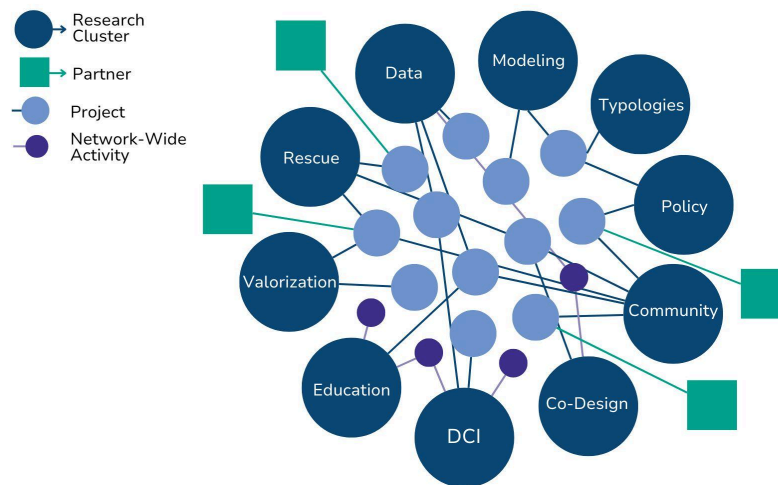

Figure: We have 10 research "clusters" that collaborate on almost 40 research and intra-network projects together!

1. The **data** cluster aims to understand the drivers and interactions in urban-rural food systems and create a new data architecture and ontology for wasted food, along with addressing the need for an integrated, flexible, multi-depth database. This cluster includes researchers from five activities:
   - Collecting & upscaling household-level data on food consumption and waste using imaging technology that can recognize and estimate food quantity and content from visual input without intensive human input
   - Tracking of wasted food by consumers by the creation of a food waste surveillance data infrastructure of quarterly residential survey data collection and annual econometric analysis of consumer food purchasing.
   - Quantifying on-farm losses, upstream food supply chain losses, and downstream food flows into recovery processes.
   - Engaging with stakeholders to design a measurement approach for food rescue management.
   - Quantifying co-occurring resource and waste flows.

2. The **modeling** cluster creates new modeling structures that can help model projections of current wasted food outcomes and test proposed solutions. The cluster includes researchers from three activities:
   - Creating a new modeling paradigm that captures regional food system interactions and that has explicit process representation and accounts for marginal changes as a result of decisions by integrating the process representation of optimization models, the aggregation of I-O, and the marginal, nonlinear representation of equilibrium models.
   - Endogenizing interconnections with other infrastructures through bottom-up models to couple associated infrastructures with the food system.

- Create a dynamic regional integrated model of food, health, and energy systems.

3. The **co-creation & community** cluster looks to understand waste with insight into relevant behaviors, beliefs, cultures, and institutions, with a critical lens on the material manifestations and philosophical valuations of what gets called 'waste'. This cluster includes researchers from three activities:
   - Ethnographic study of urban-rural wasted food material and moral economy in Baltimore, Washington, DC, and Baton Rouge to gather ethnographic data and perform critical analysis on the nexus of wasted food production.
   - Work in policy & institutions to evaluate food policies alongside the stakeholders, systems, and infrastructures, including regulations focused on food (production, health, safety) and wasted food (donation, date labeling, recycling).
   - Map and analyze the development of community hubs that optimize human health, community wealth, and ecological well-being.

4. The **typologies** cluster will create the first regional system typology framework specific to wasted food, in contexts across urban-rural dimensions, socioeconomic status, population size, infrastructure age, and governance.

The **circular** clusters will take novel approaches to co-benefits, specifically the ways preventing wasted food can dovetail with addressing social determinants of health and nutrition. This initial meeting will be broken into the cluster's three individual sub-clusters:

5. The **circular-rescue** subcluster will conduct research into recovering high quality food surplus and use it to improve food access and public health outcomes and include the following activities:
   - Estimate impacts and tradeoffs of policy actions in terms of amount of food rescued, environmental quality, and population health and equity outcomes across typologies.
   - Mixed methods approach to jointly address environmental racism and equity when matching rescued food to communities
   - Creating a data ontology for food rescue

6. The **circular-valorization** subcluster will evaluate new integrations of technology to valorize wasted food, site and scale technology to minimize hauling requirements, and integrate ecological impact analysis in decisions about wasted food valorization

7. The **policy** cluster was created in response to the diverse ways policy cuts across a significant amount of the research this network performs. The cluster conducts research on and for policy and governance related to wasted food prevention in particular and food and agricultural systems at large, from Farm Bill to fishery management, climate justice to food and farm justice. The cluster will allow folks to touch base, ask questions, and ensure work is complementing one another rather than duplicating efforts. The cluster will draw together researchers, community partners, and organizations with any

policy questions or updates on findings. The cluster will also serve the network by coordinating non-research policy activities, in conjunction with other clusters and the network leadership. It will not have capacity to engage in every policy issue, but can share information with the network, and in selected cases, develop or coordinate responses. → show breadth of policy- schools, nation-wide, diversity and inclusion, etc.

8. The **co-design** cluster focuses on the role of design in enabling convergent thinking and action across the RECIPES network, as well as on exploring the concept and process of convergence itself.

9. The Diversity and Culture of Inclusion (**DCI)** cluster will study the extent to which the structure and procedures undertaken within the network effectively promote diversity, equity, and inclusion, and derive insights that can guide best practices for similar research networks and collaboratives.

10. The **education** cluster will engage a broad range of academic (undergraduate, graduate, K-12 students) audiences to provide knowledge and research skills to transform public understanding of food systems. Specific activities include *Food-Fueled*, the undergraduate student science journal on food systems, research experiences for deaf and hard of hearing students, and *Food for Thought*, a complex problems academic course on wasted food.