

Civic Engagement Lunch Talk, April 6, 2021



# Enhancing Community Awareness of and Participation in Reducing Food Insecurities and Wastage



Ning Ai, Ph.D.

# Outline

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- Dual challenges of food Insecurities and wastage
- Research motivation to focus on civic engagement
- IPCE Research Award Project Activities
  - **Partnership with the Plant Chicago**
  - **Review of existing tools**
  - **Development of Chicago Food Waste Management Planning & Awareness Tool**
- Food for thought

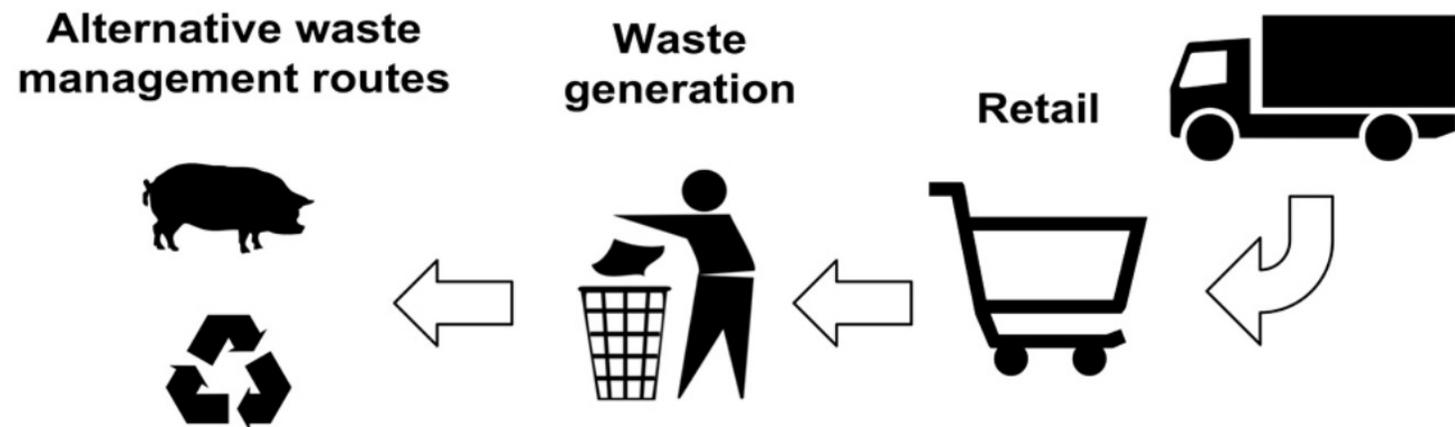
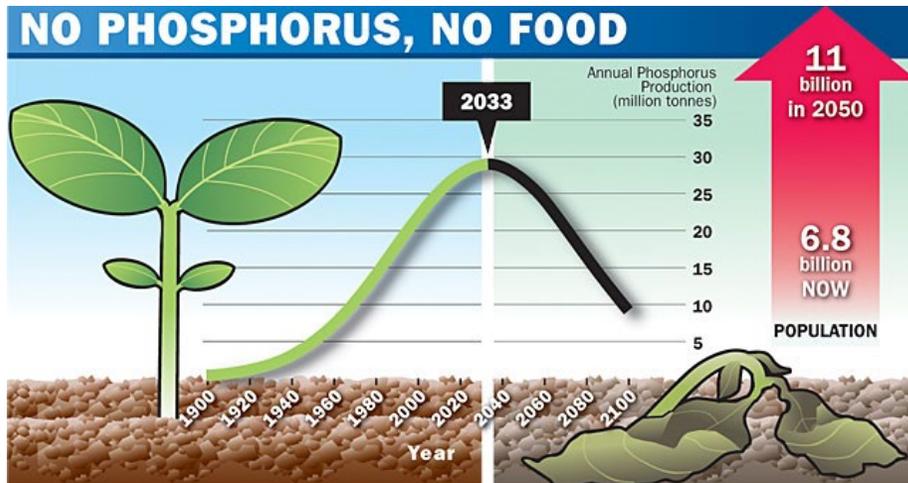
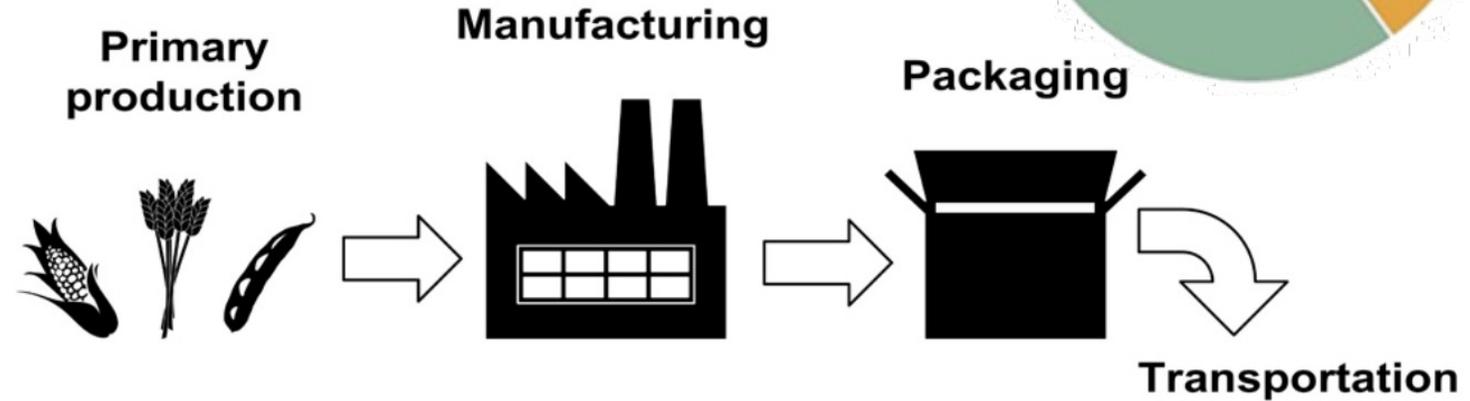
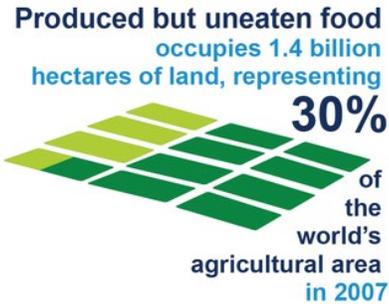
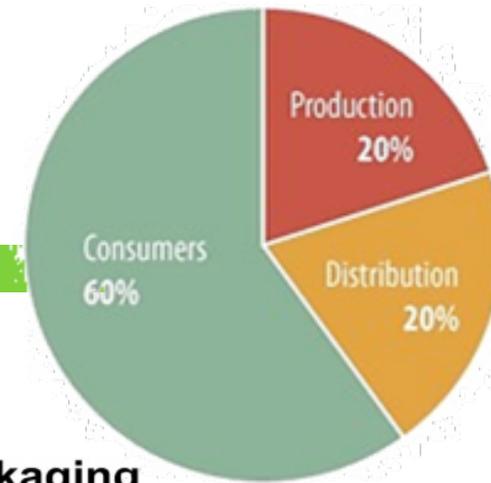
# Dual Challenges of Food Insecurities and Wastage

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- ❑ Over one third of food produced for human consumption is wasted.
- ❑ Over 100 million tons (\$218 billion worth) of food supply is wasted each year and most end up in landfills (EPA, 2020; ReFed, 2016).
- ❑ Over \$70 billion every year is spent on the US Supplemental Nutritional Assistance Program (SNAP).
- ❑ Just 30% of wasted food could have fed all the food insecure Americans for their entire diet (Leib et al., 2017).

# Life Cycle Impacts of Wasted Food

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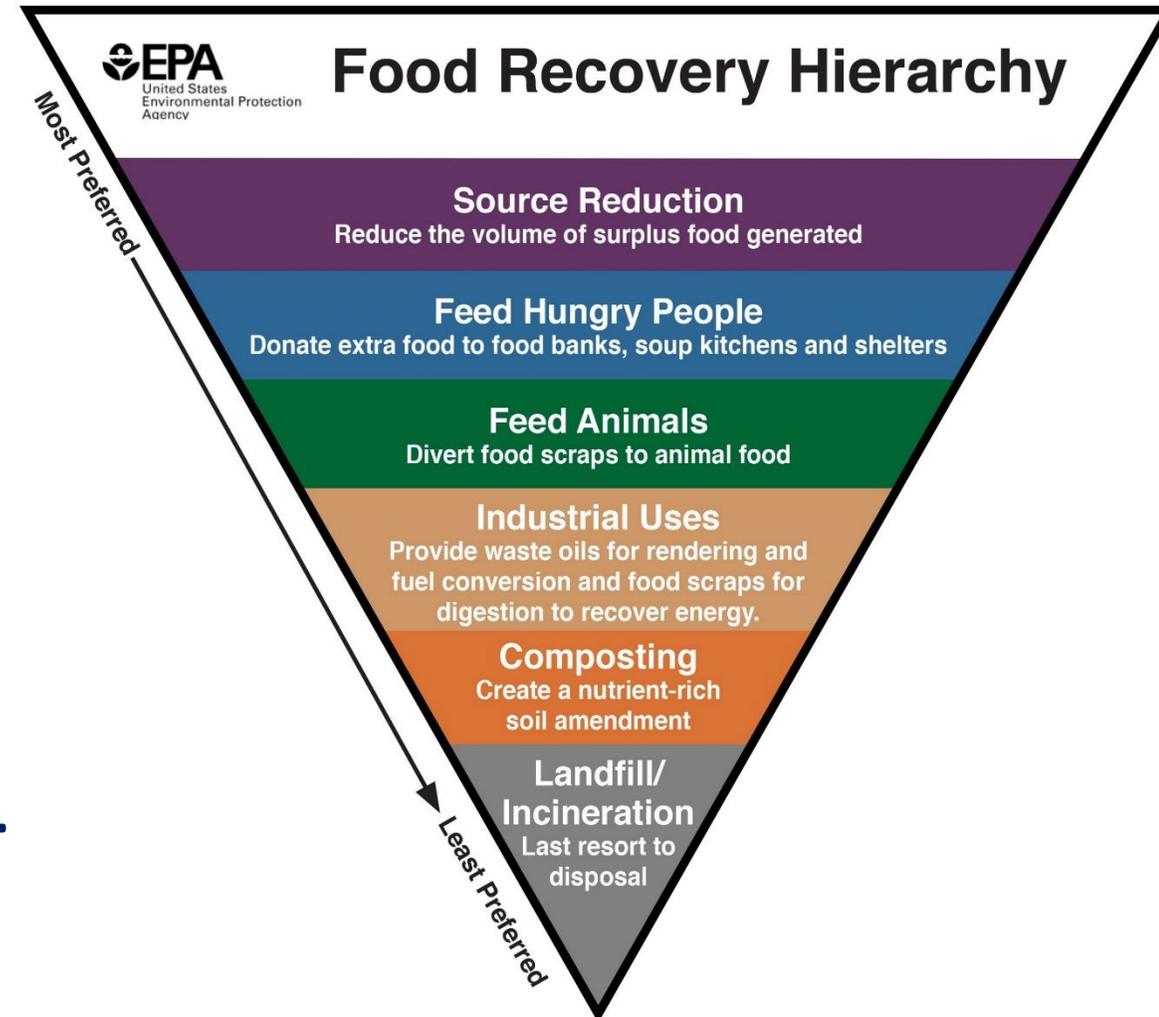


Sources: Brancoli et al., 2017; PLOSONE; National Institute of Diabetes; Digestive and Kidney Diseases; LOVEFOODHATEWASTE.COM; Action 2020; SPUR; Lipinski B. et al. (2013); Elara.

# Pressing Need and Silos in Practice

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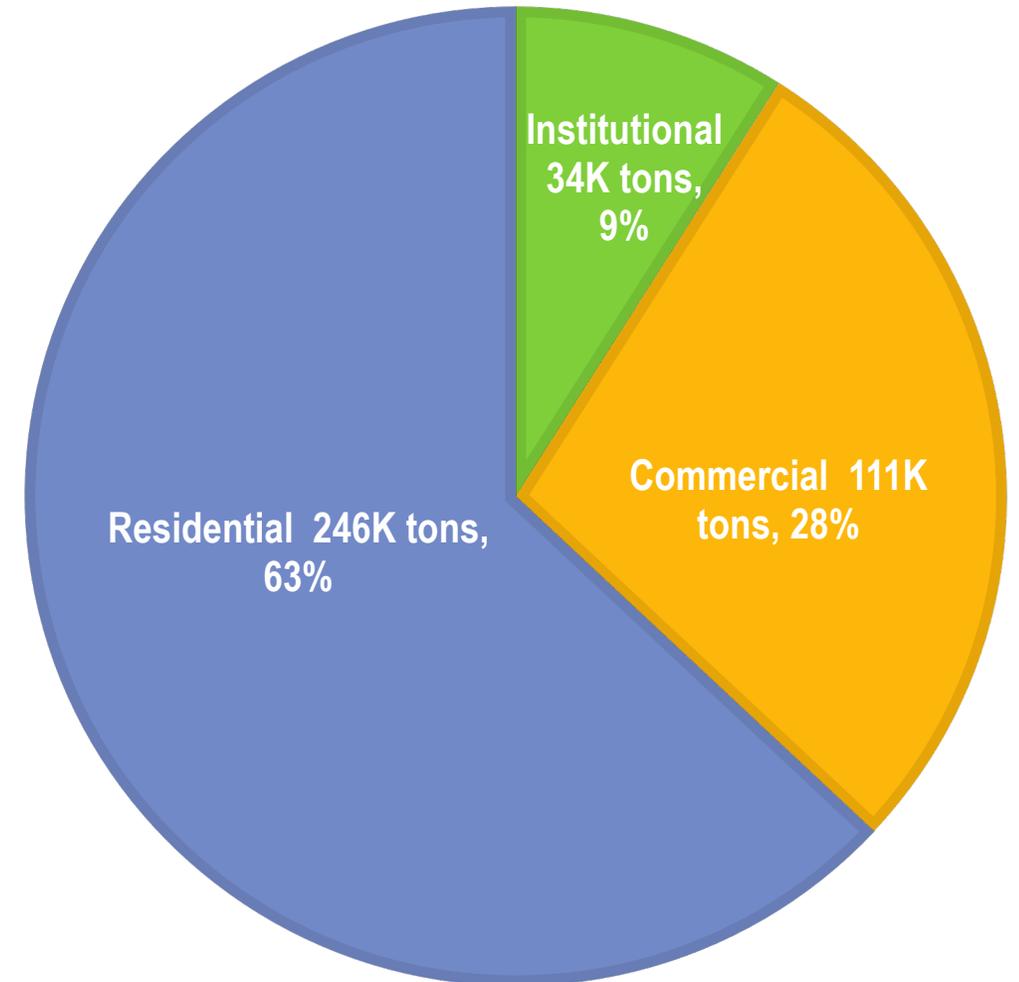
- ❑ First ever nation-wide goal (EPA and USDA, 2015) to reduce food loss and waste by half by 2030.
- ❑ Actionable implementation strategies and/or infrastructure generally lacking.
- ❑ Most of existing waste programs only focus on centralized systems of composting; other management methods/strategies are largely ignored.
- ❑ Food wastage, insecurities, and health are managed in three systems.



# Case Illustration in Chicago

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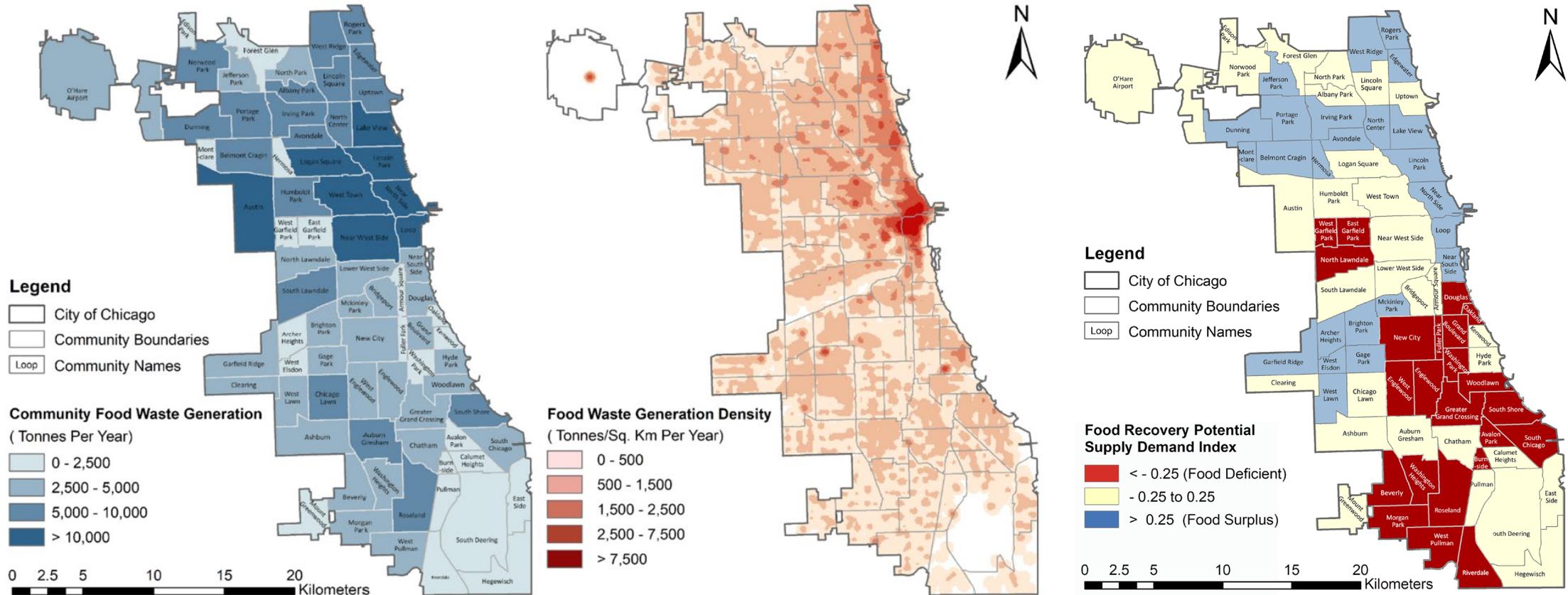
- ❑ Wasted food
  - ❑ 450,000 tons per year (Ai & Zheng, 2019)
  - ❑ About two thirds from residents
  - ❑ 14,000 tons of recovery potential
- ❑ Recoverable food
  - ❑ 27 tons/day surplus food from businesses and institutions
  - ❑ 9600+ locations



# Chicago Food Waste Study: Connecting Local Supply and Demand

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- Impacts on equity, transportation impacts, and resource inefficiencies
- Varying volume and density of food waste generation across city neighborhoods
- Mismatch between surplus food clusters and communities in need (Ai and Zheng, 2019)



# Importance of Policy and Civic Engagement

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- ❑ Limited knowledge and data about food waste
- ❑ Relatively low residual value, high frequency of generation, and from large number of locations – economies of scale matter
- ❑ Lack of economic incentives to reduce food losses and wastage, especially for non-industrial sectors
- ❑ Need for multiple types and complimentary infrastructure and programs in support of circular economy
- ❑ Solutions and impacts depending on local profile (heterogeneities)

# Partnership with the Plant Chicago



## THANK YOU

The Closed Loop Forum is organized by the Plant Chicago Auxiliary Board, a group of volunteers that share Plant Chicago's mission of implementing local circular economies. We bring together our enthusiasm, creativity, and appreciation for good company to support Plant Chicago and launch new efforts. For more information about how to get involved with Plant Chicago or the Auxiliary Board, email [info@plantchicago.org](mailto:info@plantchicago.org).

### Special Thank You To Our Keynote Speaker

Gary Cooper



Dr. Garry Cooper is the CEO/Co-founder of Rheaply, Inc., a Chicago-based technology startup that helps organizations buy smarter and waste less through better surplus asset visibility, utilization, and management.

### Special Thank You To Our Sponsors



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SEPTEMBER 28, 2019

## CLOSED LOOP FORUM

CULTIVATING THE LOCAL CIRCULAR ECONOMY  
Sept 28, 2019



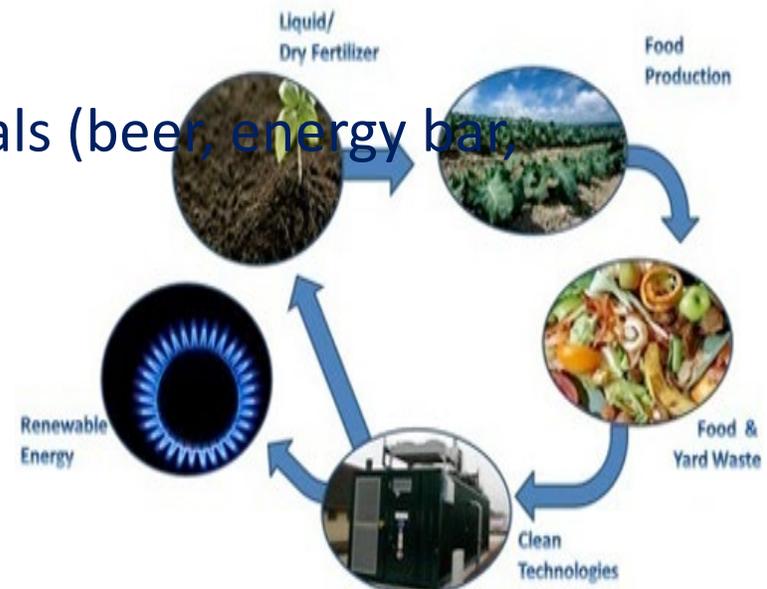
# Review of Existing Tools

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- ❑ Over 20 tools at global and regional levels
- ❑ Various focus: technical assistance, information-sharing, equipment, biotech, pick-up/delivery services
- ❑ Approaches:
  - ❑ Enabling marketplace for surplus food recovery (B2B or neighborhood)
  - ❑ Re-marketing unsellable and “ugly” food
  - ❑ Programming and up-cycling surplus produce or food residuals (beer, energy bar, prepared meals, industrial products)



IMPERFECT™  
produce #loveuglyfood



**THE CIRCLE OF LIFE**

Images from left to right: [1] <https://www.foodrescue.io/>; [2] <http://olioex.com/>; [3] <http://cdn.psfk.com/wp-content/uploads/2015/05/loveuglyfood.jpg>; [4] <http://cleantechnica.com/files/2012/11/Re-Nuble.jpg>.

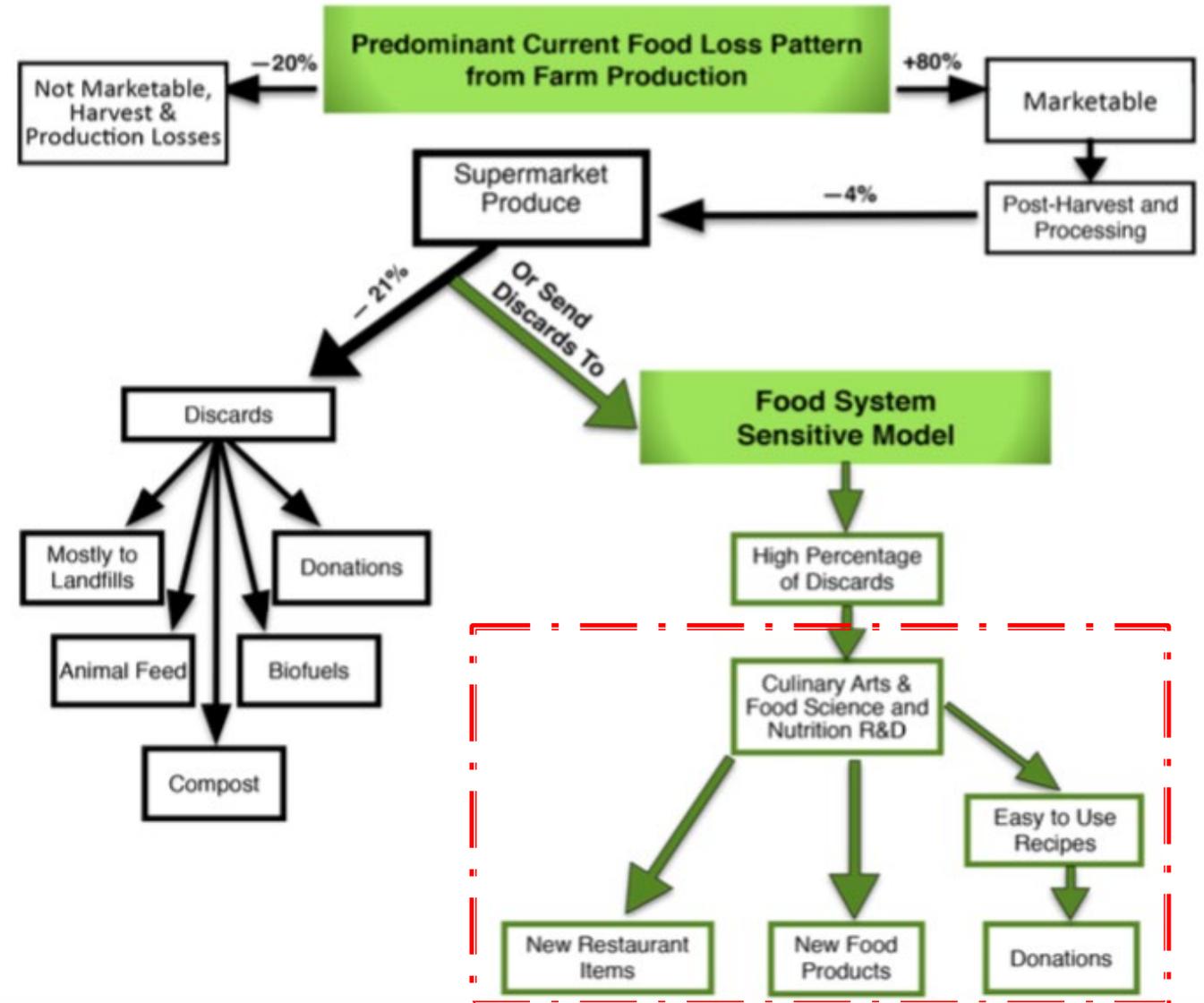
# Urban Model for Surplus Food Recovery

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(Drexel Food Lab, Philadelphia, PA)

(O'Donnell 2015)

**Life Cycle of Supermarket Produce Discards**  
Enhanced by New Methods for Waste Prevention & Healthier Food Products. Numbers refer to percentage of the indicated flow.



# Community Tool Development

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- Goals (identified needs from our review)
  - Provide community-specific data reference
  - Balance environmental and socioeconomic goals
  - Enable an interactive web interface
  - Allow user feedback for data validation and model improvement (ongoing work)
  - Facilitate future updates and/integration with other tools
- **[URL: go.uic.edu/foodwaste](https://go.uic.edu/foodwaste)**

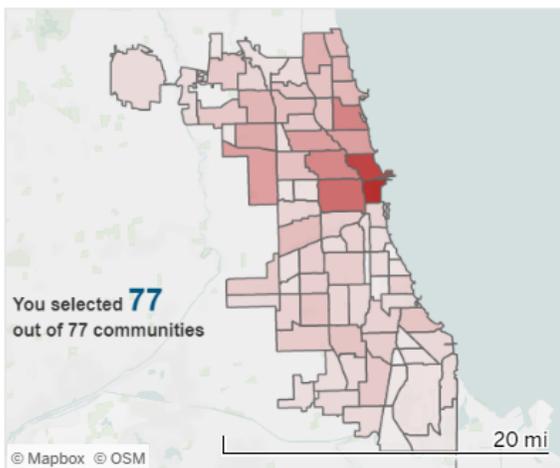
***Comments and feedbacks are welcome and appreciated!***

# [go.uic.edu/foodwaste](http://go.uic.edu/foodwaste)

## Chicago Food Waste Management Planning and Awareness Tool (v0.40)

### 1 SELECT one or more communities

Food waste generation varies greatly by community. Select one or multiple adjacent Chicago communities in the map for estimated food waste generation and landfill diversion scenarios/impacts (Steps 3 & 4). [See instructions].



### 2 CHARACTERIZE food waste

Generation rates and composition of food waste vary by sector and by community. The table below shows food waste generation from the selected area by sector. [See sectors definition].

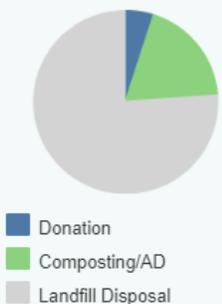
	Generation (tons/yr)	Percentage
Single Family Home	202,779	45.04%
Multi-family Home	64,395	14.30%
Food Retail Sales	45,039	10.00%
Food Services	100,999	22.43%
Institution	36,990	8.22%
<b>Total Generation</b>	<b>450,203</b>	<b>100.00%</b>

### 3 CUSTOMIZE diversion scenarios

Diverting food waste from landfills contributes to environmental, economic and social benefits. Here is the option to customize the diversion scenario by strategy and by sector to learn potential impacts. Customize the diversion scenario below to view potential impacts (Step 4). [See instructions].

	Donation	Composting and/or AD
Single Family Home	No donation	National avg. (18.3%)
Multi-family Home	No donation	National avg. (18.3%)
Food Retail Sales	National avg. (19.5%)	National avg. (29.5%)
Food Services	National avg. (13.5%)	National avg. (21.5%)
Institution	No donation	National avg. (18.2%)

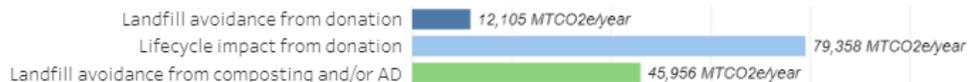
Food Waste Diversion Potential (tons/yr)



### 4 UNDERSTAND environmental and socioeconomic impacts

Food waste diversion in the selected communities (Step 1) under customized diversion scenarios (Step 3) generates environmental, economic, and social benefits. [See the scope of impacts].

In total, **food waste diversion** reduces **137,420** MTCO<sub>2</sub>e of GHG emission every year, which is equivalent to remove **29,874** passenger vehicles on road every day.



**Food waste diversion** could avoid landfill disposal cost by **\$ 4,300,863** per year

**Food donation** could recover **81,890** meals per day

Landfill disposal cost at  \$ per ton

**ACKNOWLEDGEMENT:** The development of this website is supported by the Institute for Policy and Civic Engagement at UIC.

**DISCLAIMER:** The dashboard is for illustration purposes only. All rights reserved. Food waste generation estimates are subject to change when newer and better quality references become available.

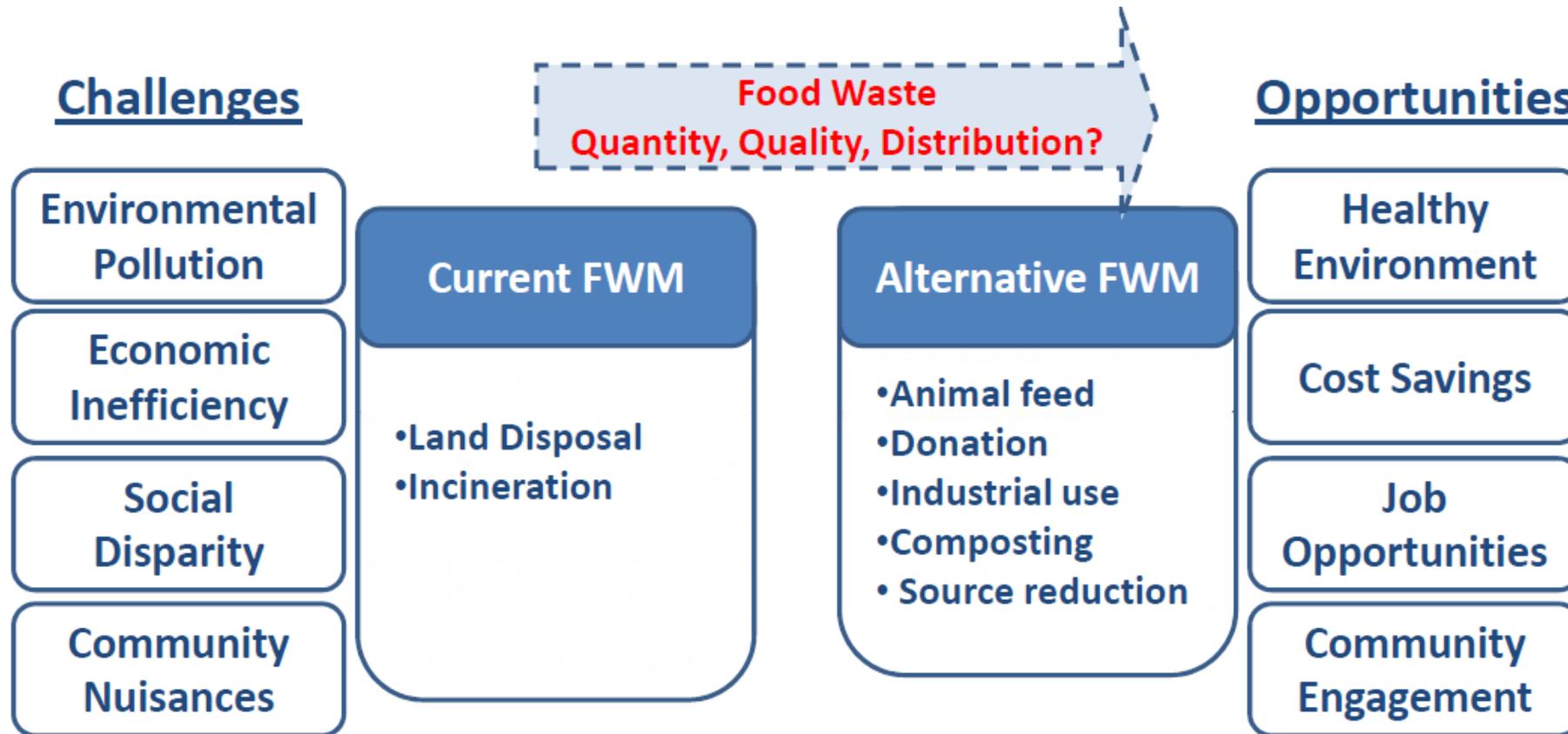
**PROJECT LEAD:** Ning Ai, Ph.D | **WEB DESIGN:** Junjun Zheng  
**LAST UPDATED:** April 5, 2021 | [See key references]



# Transforming Urban Challenges into Opportunities:

## “Closing the Loop” of Food

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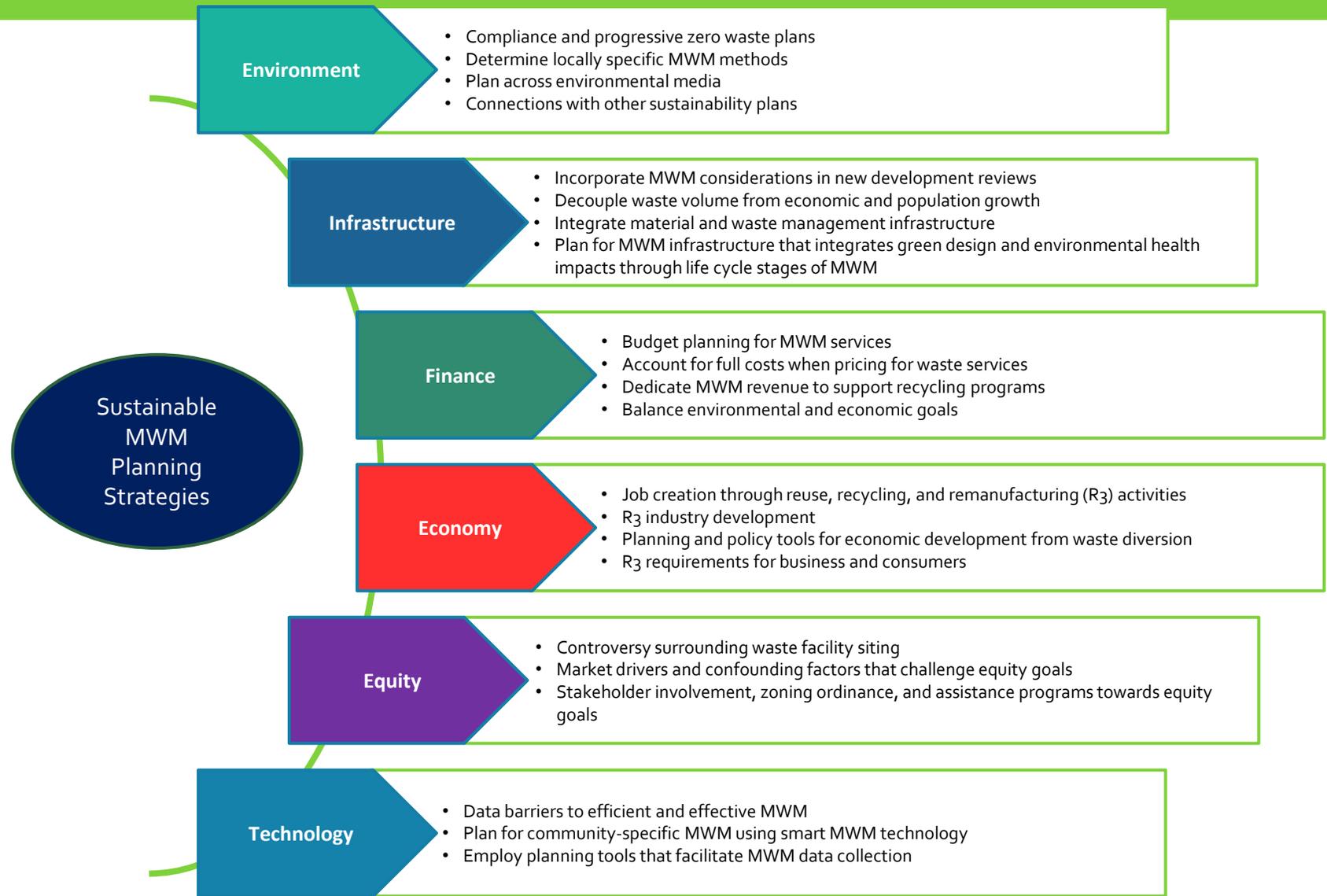


# Need for Convergent Knowledge and Planning

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*Ai and Leigh (2017)*



# Food for Thought

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- ❑ Education
- ❑ Knowledge-sharing
- ❑ Innovation
- ❑ Economies of scale



# Acknowledgement

- Support from the UIC Institute for Policy and Civic Engagement under Civic Engagement Research Awards - “Community Awareness Campaign and Advocacy for Addressing Food Insecurities and Wastage.”
- Project administration at the UIC Institute for Environmental Science and Policy.
- Assistance by UPP students Junjun Zheng (web too design), Taylor Gendel (existing tool review), and Em Hall (ad hoc research assistance).

Thank you!

Questions and comments

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