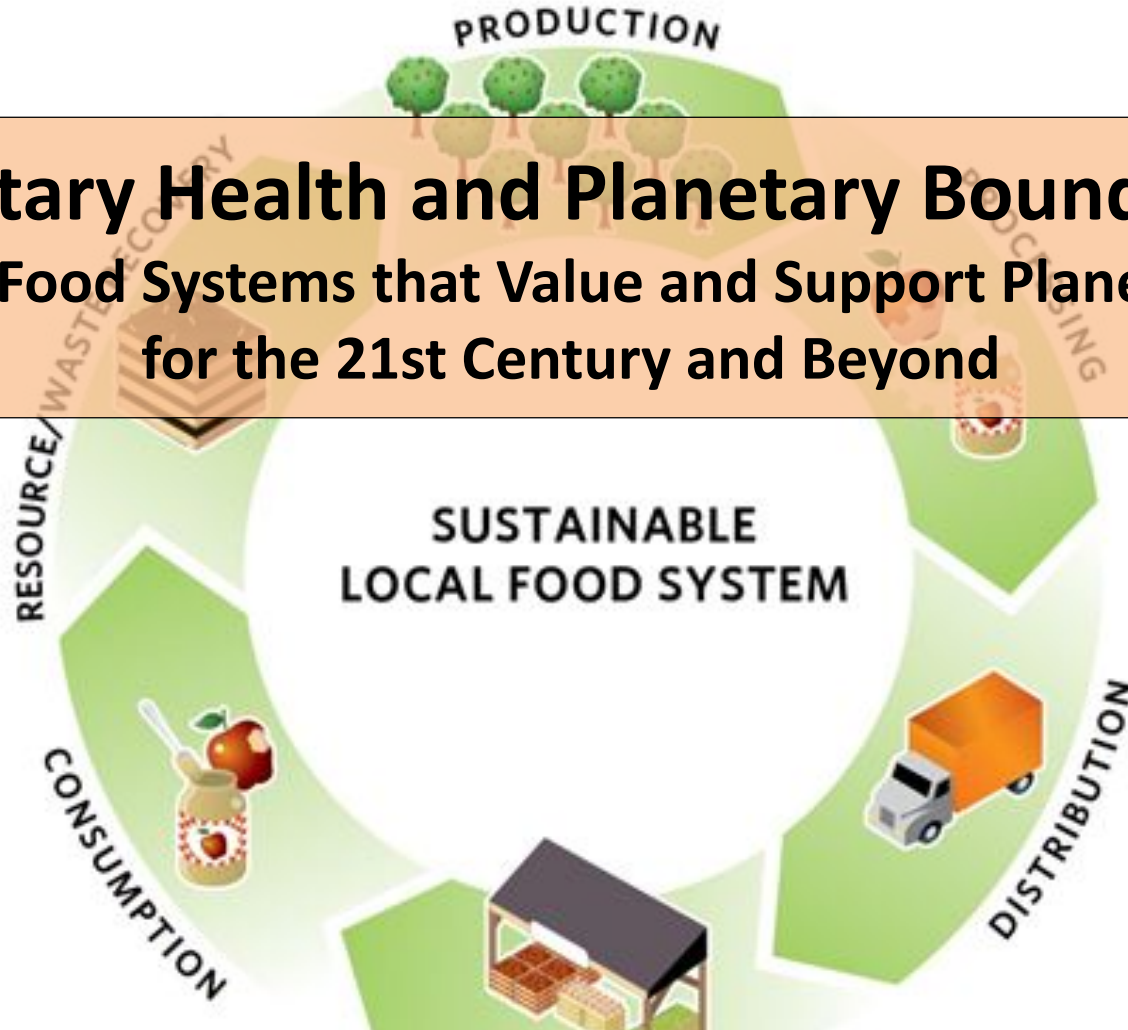


# Planetary Health and Planetary Boundaries: Rethinking Food Systems that Value and Support Planetary Health for the 21st Century and Beyond



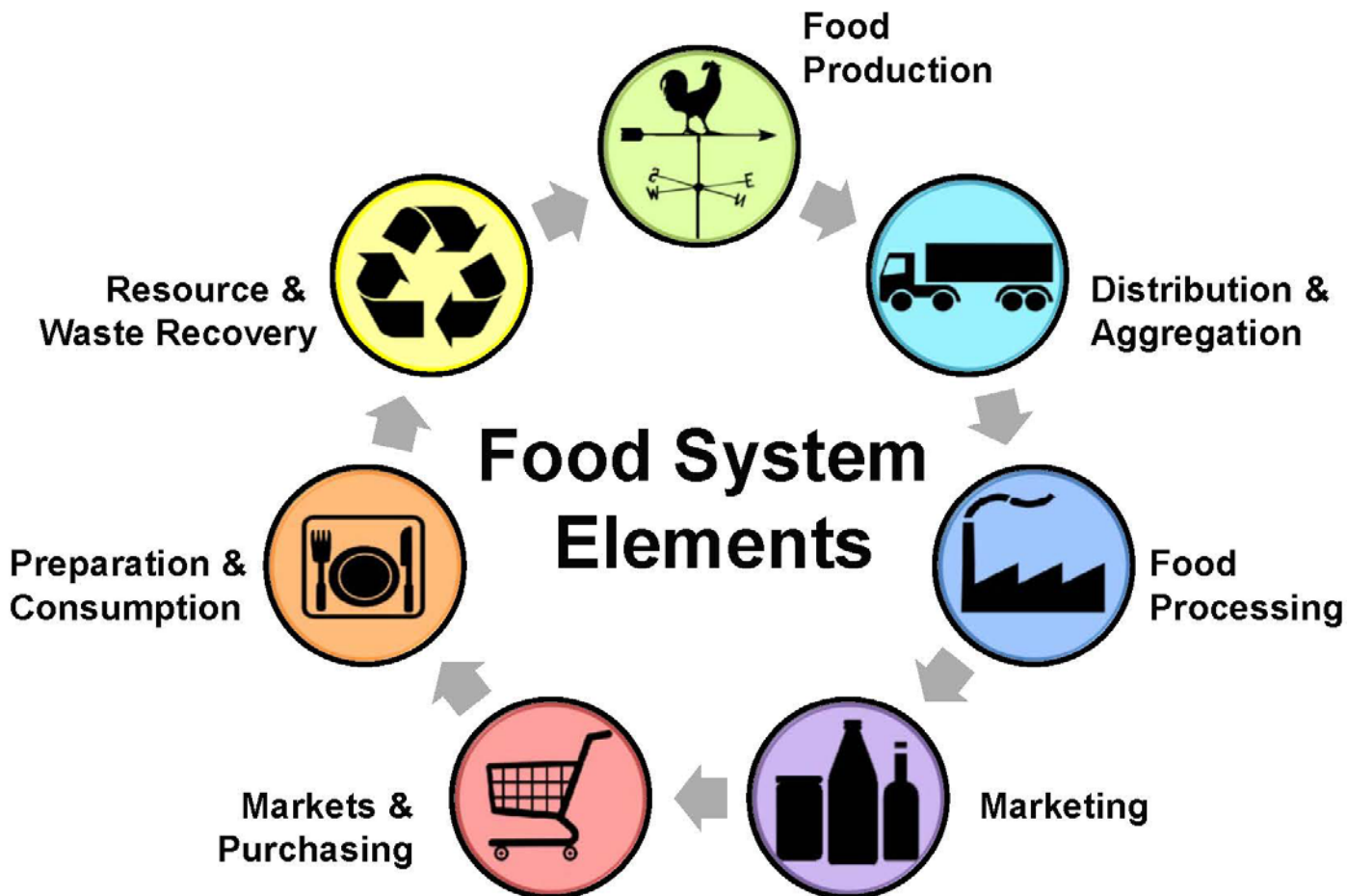
Middlebury

Molly D. Anderson

July 22, 2017

*Society for Nutrition Education & Behavior  
Summer Meeting  
Washington, DC*

# Depicting food systems – for what purpose?



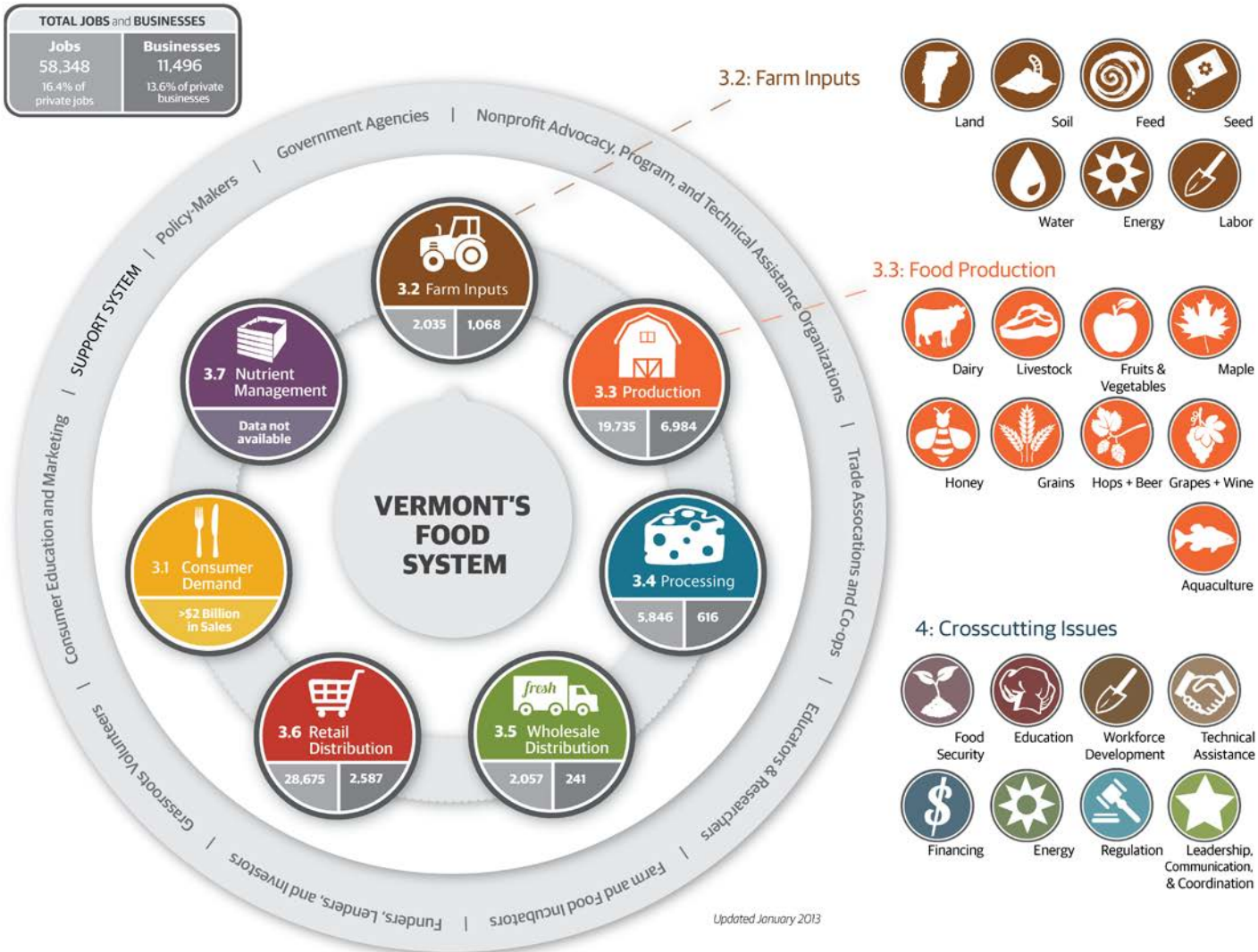
Adapted by Christy Shi, Center for Environmental Farming Systems.

From: Wilkins, J. and Eames-Sheavly, M. *Discovering the Food System: An experiential learning program for young and inquiring minds.*

Cornell University, Departments of Nutritional Science and Horticulture. <http://www.discoverfoodsys.cornell.edu/>



# Depicting food systems – for what purpose?





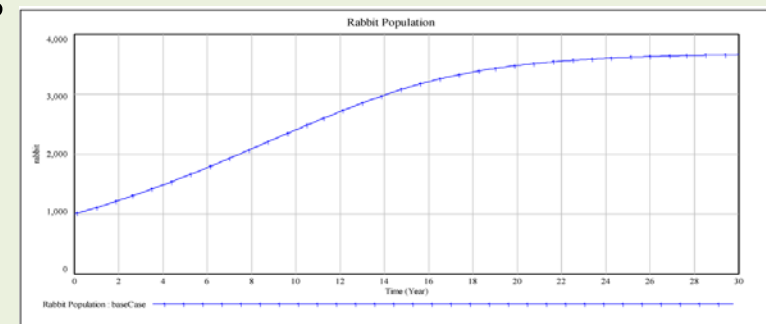
# The Global Food System

Food System Map  
Version 1.2 March, 2009

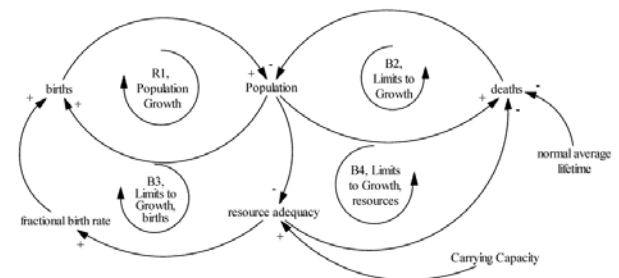




- Better understand issues and problems stemming from the interaction of system components and their key drivers
- Think logically and comprehensively about behavior over time of those components; reason about the structure and function of the system
- Share this understanding with others
- Make predictions by modeling interactions
- Test assumptions and theories of change
- Help to figure out intervention points
- Develop visions of alternatives, and imagine pathways to achieve them



(a)



(b)

## Thinking in Systems

*A Primer*

Donella H. Meadows

*Edited by Diana Wright  
Sustainability Institute*

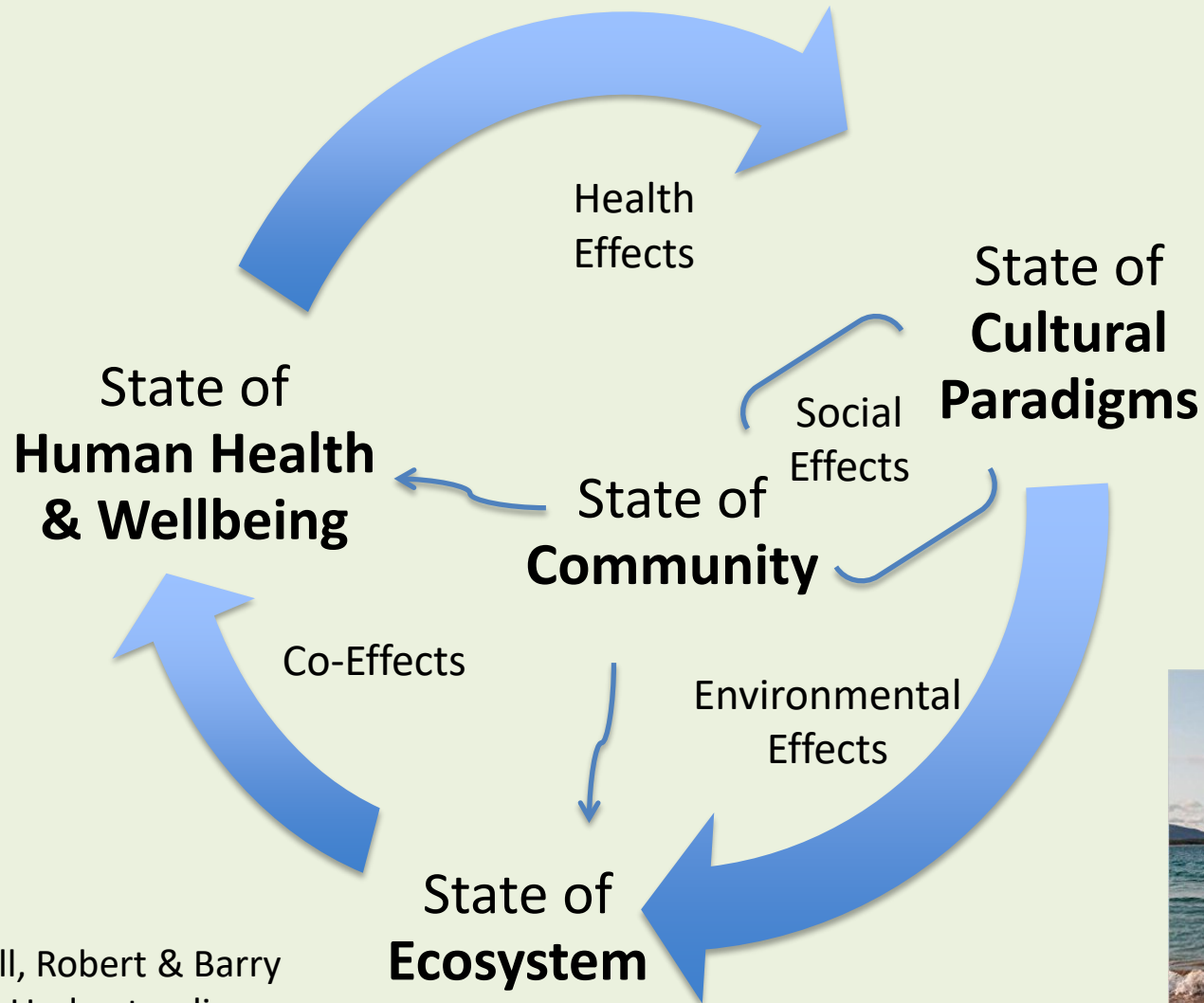


## PLACES TO INTERVENE IN A SYSTEM:

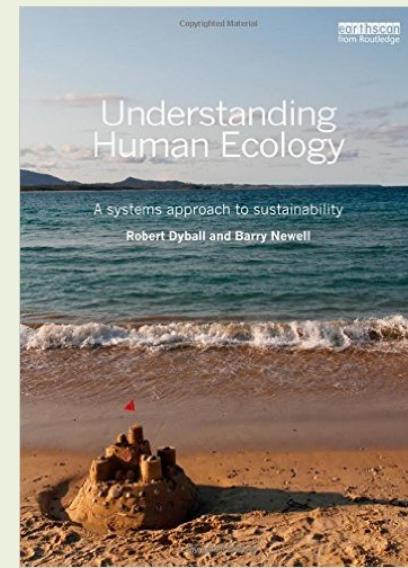
12. Constants, parameters, numbers (subsidies, taxes, standards)
11. The sizes of buffers and other stabilizing stocks, relative to their flows
10. The structure of material stocks and flows (transport networks, population age structures)
9. Length of delays, relative to the rate of system change
8. The strength of negative feedback loops, relative to the impacts they are trying to correct against
7. The gain around driving positive feedback loops
6. The structure of information flows (who does and does not have access to what kinds of information)
5. The rules of the system (such as incentives, punishments, constraints)
4. The power to add, change, evolve, or self-organize system structure
3. The goals of the system
2. The mindset or paradigm out of which the system – its goals, power structure, rules, its culture – arises
1. The power to transcend paradigms

Source: Meadows, Donella H. 2008. Thinking in Systems. A Primer. White River Junction, VT: Chelsea Green Publishing.





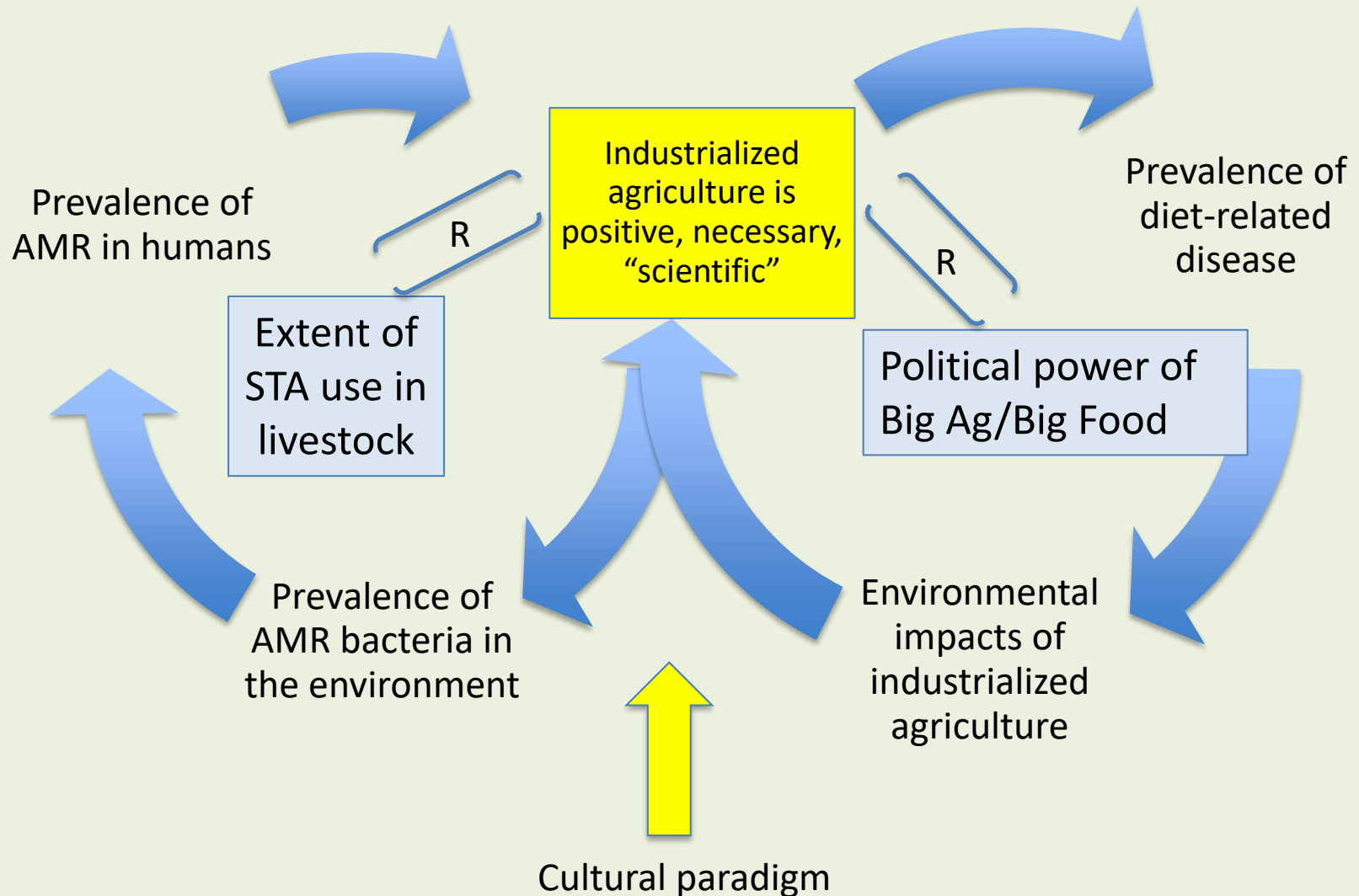
Source: Dyball, Robert & Barry Newell. 2015. Understanding Human Ecology: A Systems Approach to Sustainability. Earthscan.





## Ex. 1: Using systems analysis – Antibiotics in livestock

**Relationships of sub-therapeutic antibiotic use (STA), antimicrobial resistance (AMR) and cultural paradigms**







- **Better understand issues and problems stemming from the interaction of system components and their key drivers**
- Think logically and comprehensively about behavior over time of components in the system
- Share this understanding with others
- Make predictions by modeling interactions
- Test assumptions and theories of change
- **Help to figure out intervention points**
- Develop visions of alternatives, and imagine pathways to achieve them

## Ex. 2: Using systems analysis - New England Food Vision

- Grow 50% of the food we consume in New England by 2060
- Achieve the right to food for all
- Create racial equity and food justice
- Develop thriving communities
- Achieve sustainable fishing and farming
- Keep at least 70% forest cover

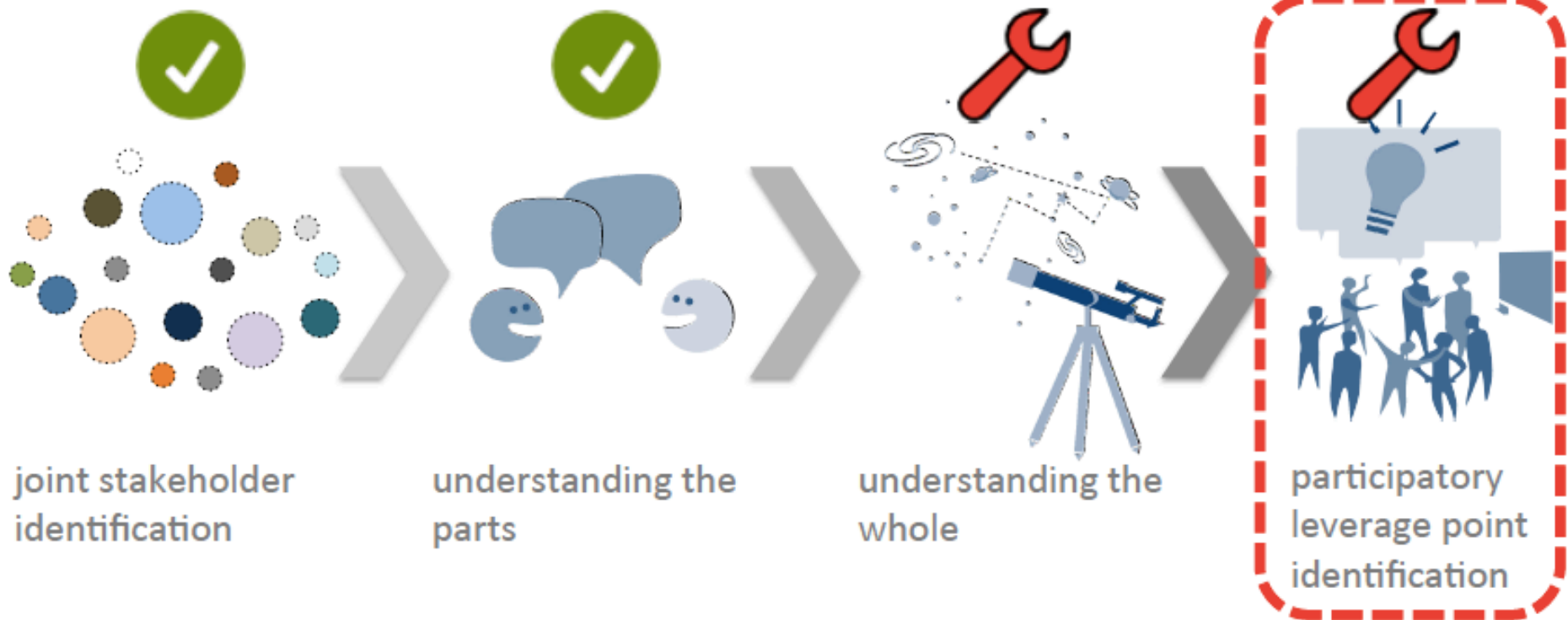
What this will take:

- Triple the amount of current farmland (6 million acres) by returning to a similar landscape pattern as New England had in the mid-1900s



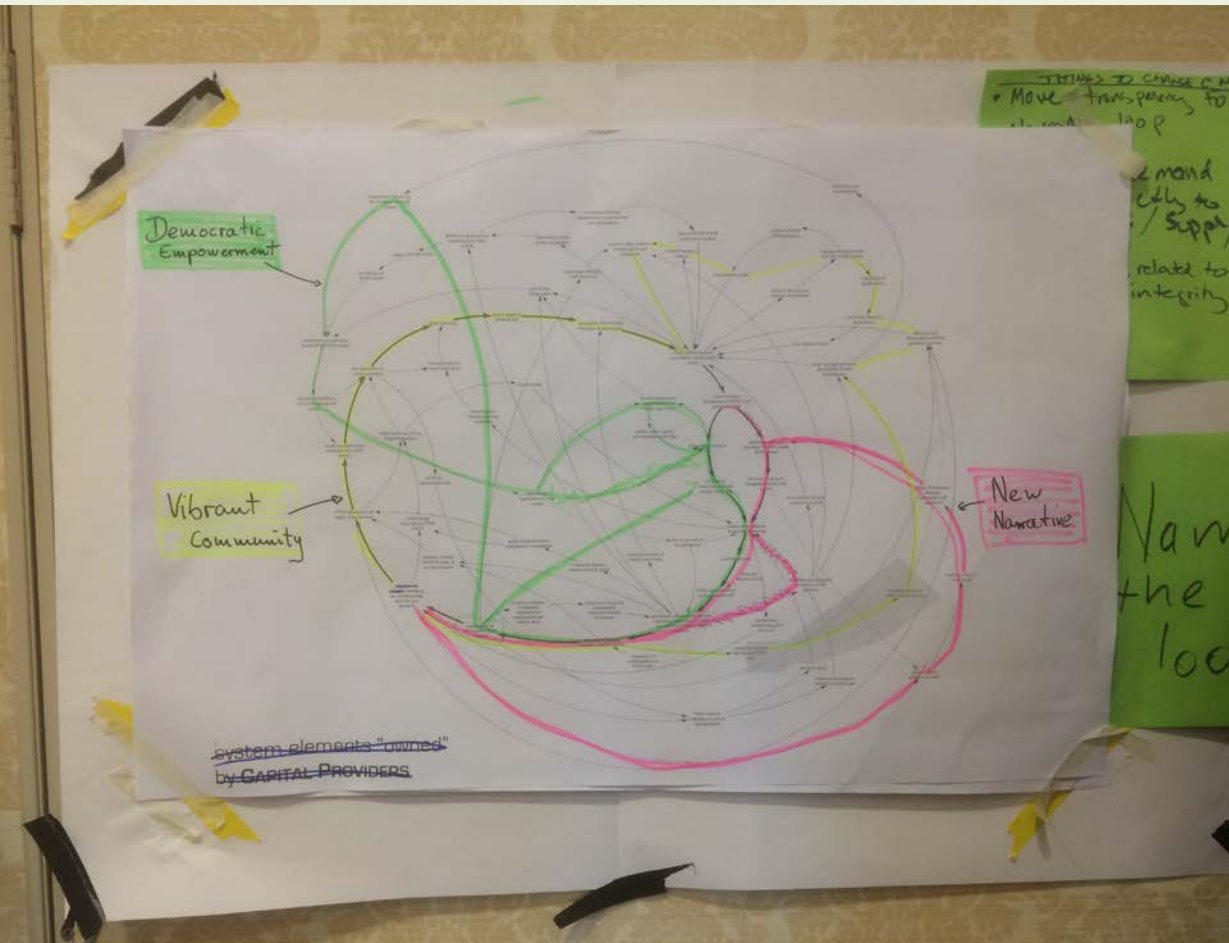
## Systems Mapping and Leverage Points project

*Understanding the transformation-dynamics of the food system in New England*





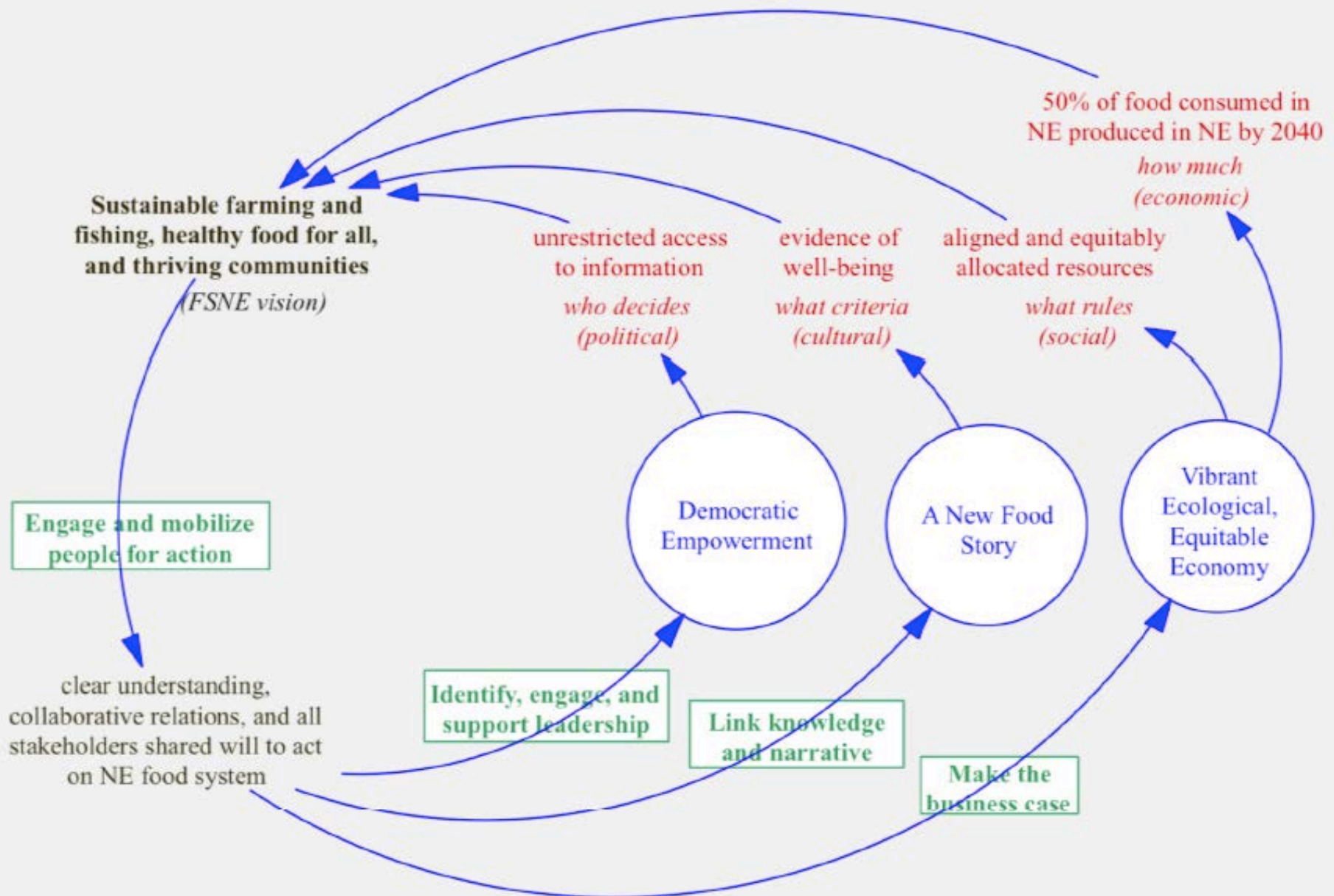
# How can we reach the New England Food Vision?







# How can we reach the New England Food Vision?





- Better understand issues and problems stemming from the interaction of system components
- **Think logically and comprehensively about behavior over time of components in the system**
- **Share this understanding with others**
- Make predictions by modeling interactions
- Test assumptions and theories of change
- **Help to figure out intervention points**
- **Develop visions of alternatives, and imagine pathways to achieve them**



# How can we reach the New England Food Vision?

