Exploring Malnutrition Through the Lens of Systems Thinking

A webinar with Joanna Cummings, MS, RD, CNSC and Jasia Steinmetz, PhD, MS, RD

How to Use This Webinar

This webinar was originally hosted live in May 2019 as part of the Academy of Nutrition and Dietetics Foundation's Future of Food initiative, which is funded by an educational grant to the Foundation from National Dairy Council.

This webinar was originally hosted as part of an interactive, three-part series:

1. A live "training webinar" (recording available)
2. Independent completion of a hands-on activity by participants (activity template available)
3. A live "follow-up webinar" for small-group discussion and feedback (not available)

The following materials are available to facilitate access to sustainable food systems training for dietetic interns, students, and professionals:

- **Instructions** (this document), which includes:
    - Session description, learning outcomes, CDR learning codes, speaker bios
    - Required reading: Introduction to Systems Thinking
    - Instructions for Activity: Impact Analysis
    - Example Impact Analysis
    - Guide for conducting a follow-up discussion after the activity
    - Supplemental resources (for students to use when working on the impact analysis)
- **Recording** from the training webinar
- **Activity Template** (PowerPoint slides with blank impact analyses)
- **CPE certificate** for 1 CPEU (expires 3/20/2022)

If you are a program director or educator, you can use these materials to implement the interactive, three-part format with your students:

1. Students watch the recording on their own time, either individually or in groups
2. Students complete an Impact Analysis on their own time, either individually or in groups. Resources include the "Introduction to Systems Thinking," supplemental resources, an example impact analysis (all are part of this document), and a separate PowerPoint template.
3. Students convene (in person or virtually) to discuss the activity in small groups, share and provide feedback as part of a larger group, ask follow-up questions, and synthesize what they have learned. See the "Guide for conducting a follow-up discussion" below for more detail.

For questions, please contact Marie Spiker, PhD, MSPH, RDN, Healthy and Sustainable Food Systems Fellow, at mspiker@eatright.org. If you have feedback or success stories to share about this resource, we would love to hear from you!

Session Description

Systems thinking encourages practitioners to consider the context within which they operate. A systems approach recognizes that essential properties arise from the interactions and relationship among parts. Registered dietitian nutritionists can utilize this approach to address malnutrition, one of the largest contributors to disease in the world. This webinar will explore how tools from systems thinking can be applied to cases of malnutrition in both domestic and international settings. Participants will hear from expert dietitians and gain hands-on experience in applying an impact analysis to malnutrition case studies from the United States and Laos.

Learning Outcomes

At the end of this series, participants will be able to:

- Describe what is meant by a systems thinking approach
- Describe at least one way systems thinking can be applied to the field of nutrition and dietetics
- Use an impact analysis to discuss issues related to malnutrition in both the United States and a global context

CDR Learning Codes

- 1070 Leadership, critical and strategic thinking

Speaker Bios

Jasia Steinmetz, PhD, MS, RD: Jasia is a food and nutrition professor and a registered dietitian whose areas of expertise include sustainable food systems, community food security, and community nutrition. She is a Professor at the University of Wisconsin Stevens Point and serves as the Vice President for the Society for Nutrition Education and Behavior.

Joanna Cummings, MS, RD, CNSC: Joanna is a faculty member at Oregon Health and Science University in the Human Nutrition Graduate Program. She works in Lao in Southeast Asia as the Director of Clinical Nutrition & Research and is currently working with the Lao Ministry of Health and government hospitals to train Clinical Nutrition Specialists for every provincial hospital. She has a depth of experience in pediatrics, oncology, and metabolic disorders in addition to global malnutrition.

Introduction to Systems Thinking

All participants should read this introductory material before completing their impact analysis.

An Introduction to Systems Thinking

Short explanation: Systems thinking is using the mental framing and perspective (thinking) to analyze the interrelationship about the interconnectedness and linkages of the system's components that result in an understanding of how the system operates holistically. This is based on the knowledge that the way components act individually is different than their action within a system. "The whole is greater than the sum of its parts."

You intuitively know systems thinking because you are surrounded by it. For example, you know that your action is different when you are by yourself than when you are with others. So a group of people (system) operate differently than individuals (component). A very simple example is the power of a group is more than the sum parts of the individuals (think about lifting large objects). You know that the human body works synergistically and holistically with the subsystems (nervous, circulatory, endocrine, skeletal, etc.) and other factors such as emotions, beliefs, etc. While understanding these components or subsystems is valuable, we also must understand how the larger system works.

Importance: most of the world is a large system and not recognizing how this operates leads to malfunction. This leads to "big, hairy problems" or complex, difficult problems such as poverty or climate change. To solve these problems, we need to understand how systems operate over the long-term so we can avoid unanticipated consequences.

Here is a short video from the CDC that introduces system thinking in the public health context:
The Systems Thinking -CDC 2017 https://www.youtube.com/watch?v=Fo3ndxVOZEo (10 min)

The approach that we are using for system thinking and analysis includes 3 parts:

- Worldview (your perspective of the world)
- Key players (sometimes called stakeholders)
- Areas of impact (effects or consequences of something happening)

Sustainability considerations:

Sustainability involves economic, social and environmental sustainability.
Diversity in the system leads to great resiliency.
Replication and adaptation are features of resilient, biological systems.

Your experience with systems thinking: You have been doing this for many years!

→ You have practiced systems thinking since you were small, especially with your parents.

Here is an early example: "If you let me stay up past my bedtime, I will love you forever"

- Worldview: Love is important between people. People can be convinced to change their minds. Adults (elders) are higher in a hierarchy than children (responsibility, decision making, wisdom, etc.). Directness is valued.
- Key players:
    - directly involved: parent and child
    - indirectly involved: other parent, siblings
- Areas of impact:
    - Parents will value the love with their children.
    - Children will increasingly use negotiation to convince parents.

→ Your system thinking and analysis became more sophisticated with age and experience:

"If you let me go to this movie with my friends, I will …."

….be responsible for my chores without complaining (social-emotional impact)
…. Pay for the ticket and snacks (economic impact)
…. all my friends are going (social-emotional impact)
…. My friend's parents will drive (economic, environmental)

From parent's perspective: If I let you go to this movie, then….

…. My child will be able to spend more time with these good friends (social-emotional)
… my child cannot spend time with these friends who are not a good influence (social-emotional)
… The movie theater will make more money (economic)
…. I don't have to drive (environmental, economic)

Key players:

- Directly involved: friends, parents, movie theater staff
- Indirectly involved: vendors at movie theater for snacks, film makers, actors, other family members, city government that regulates businesses, selling food, etc.

Notice how the above analysis includes more key players and impact analysis from both the child and parent perspective. In fact, you became very sophisticated in anticipating your parent's reactions, which is how you came up with the first impact "then I will do my chores without complaining"

System thinking champions

Every day, you use impact analysis to decide how to organize your day, who you spend time with, how you spend your money, etc. You also used this to decide on buying a car, choosing your university, taking vacations, etc.

The most important action for these modules is to become aware of your systems thinking that you do each day. The more attention (observation) that you bring to your thinking…

- The more you recognize that you already have abundant skills
- You increasingly recognize how you see and interpret the world and how others see it.
- The faster you are able to categorize the impacts into different areas
- The easier it is for you to organize your thinking using a systems approach
- The faster you can analyze and solve problems
- The more complete your analysis of a problem
- The more you can avoid unintended (bad) outcomes
- The more creative and successful the solutions

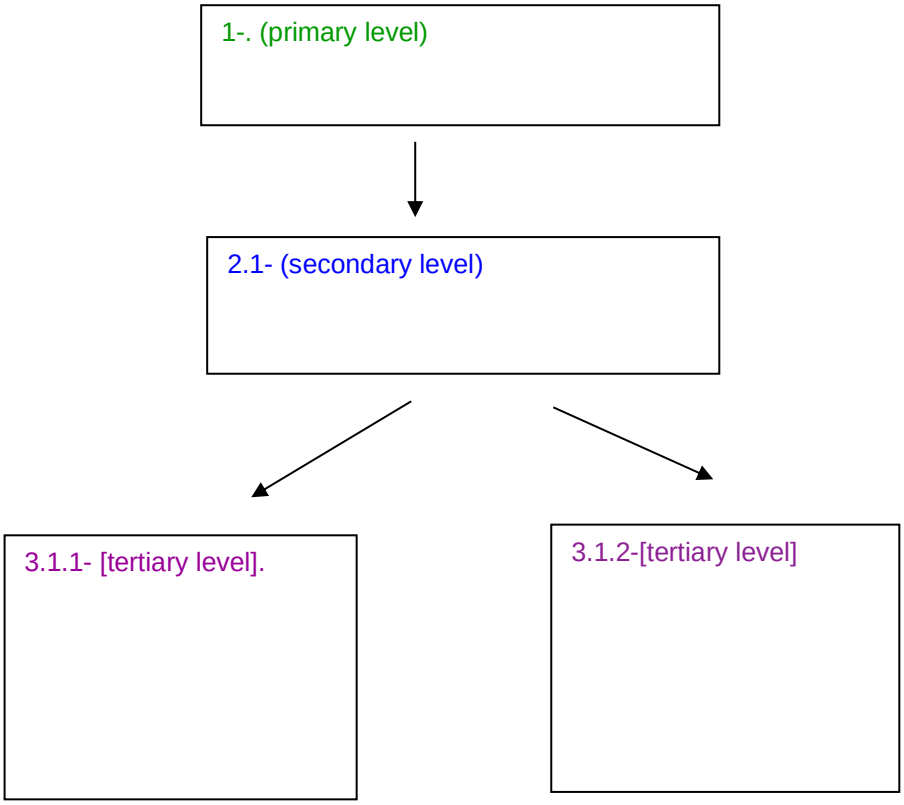
Instructions for Activity: Impact Analysis

The recording concludes with an invitation for participants to practice what they have learned by using an Impact Analysis to think of primary, secondary, and tertiary impacts that could result from case study examples presented in the training webinar. The case studies and impact areas can be divided up so that each individual or small group only completes impact analyses for one or two impact areas for a single case study, but the group as a whole discusses all impact areas for both case studies during the follow-up discussion. Participants may complete their impact analyses individually, or in groups.

Assignment:

Choose one of the case studies. For that case study, create a separate impact analysis for one or more areas of impact (ecological, agricultural, economic, or social).

1. For your case study, make a list of the direct and indirect key players that are involved. Be sure to think through the larger systems, including the food system.
2. For your case study, please think about this question for you impact analysis:
    a. Case study 1: If Phat's family must increase supplements and follow the diet recommendations (increase eggs, vegetables, fat and meat) then…
    b. Case study 2: If Jack's mom must increase red meat each day and reduce milk consumption, then….
3. For each area of impact, you will do a complete primary to tertiary analysis. This template is useful so that you can see that one level "causes" the next level. You will complete one of these diagrams for each of your two assigned areas listed above.



Each impact analysis considers one of these four impact areas. For example, if you are completing an impact analysis in the "ecological" domain for the Laos cause study, the primary-, secondary-, and tertiary-level impacts should all be in the ecological domain, in order to practice exploring each domain in depth.

- **Ecological:** impacts that affect the environment (e.g., loss of biodiversity, greenhouse gas emissions from using fossil fuels, affects on water or air quality)
    - e.g., if I buy a new model cell phone, then dangerous components will end up in the landfill
- **Agricultural:** impacts that affect food producers, laborers, and food producing operations, including resources (e.g., animals, plants, soil, water, inputs, equipment)
    - e.g., if I buy a new model cell phone, I can reliably talk with my family members
- **Social:** impacts that affect people, interactions between people, cultural values within communities
    - e.g., if I buy a new model cell phone, the company expands and takes over more farm land
- **Economic:** impacts that affect money, salaries, businesses, stock markets, market demand.
    - e.g., if I buy a new model cell phone, the workers in China will be employed

Tips for completing the assignment:

See the example impact analysis on the next page: "If I shop at a large supermarket, then…"
There are 4 areas of impact that were considered: ecological, agricultural, social/cultural, economic.

- Notice the wording for impact (change),
- Notice how one level "causes" the next level.
- Notice how each impact must be within the area.

Tips for thinking through impacts:

- **Use these words: "If this happens, then ….this impact happens"**
- If this primary impact happens, then this secondary impact happens. (The impact causes the next level impact)
- If this secondary impact happens, then this tertiary impact happens.

If you get stuck trying to think of impacts:

- Think from the perspective of different key players (consider all key players in the food system)
- Consider positive and negative impacts
- Consider short and long-term impacts
- **Refer to the recommended readings** to help you understand the larger systems and identify key players (both direct and indirect, the bigger the system the more key players) and impacts in various areas

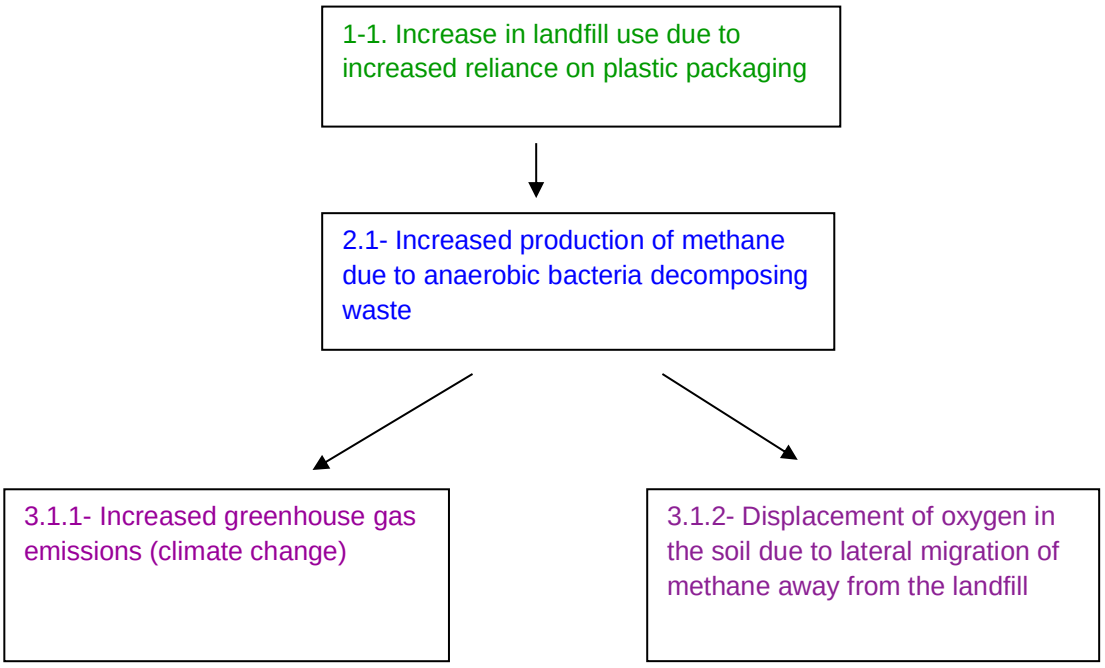
Double check your work:

- An impact is something happening (there is more or less of something, there is a change). This means you must use more than 1-2 words to describe what is happening.
- Every impact is within the same area (don't use an economic impact if you are analyzing social impacts)

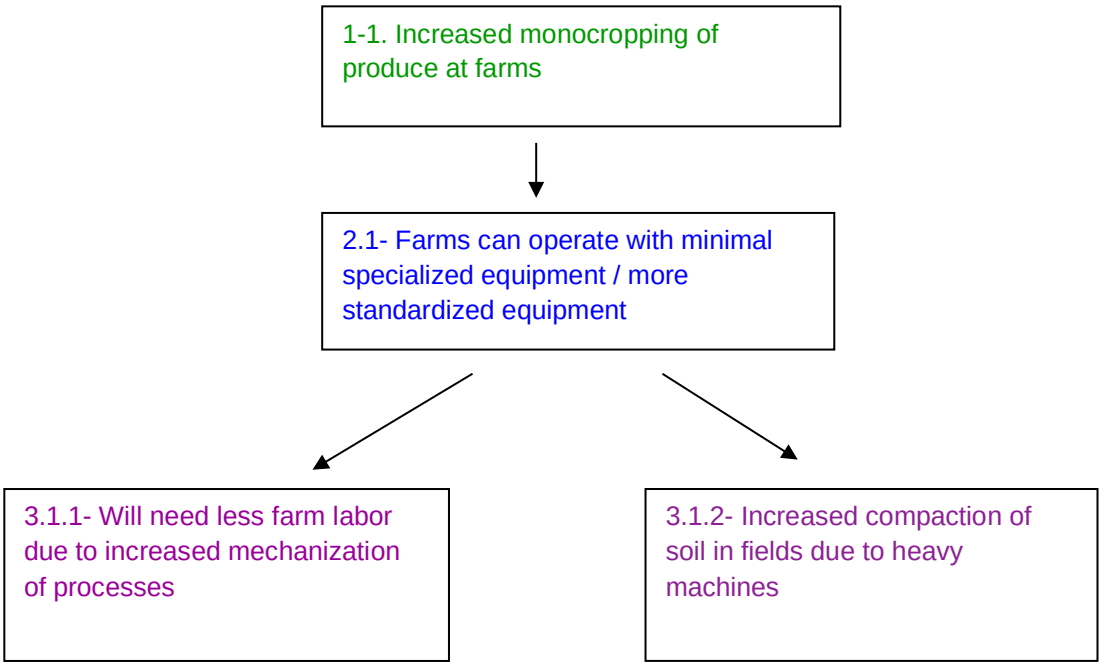
Example Impact Analysis

Four sample impact analyses in response to the prompt: "If I shop at a large supermarket, then…"

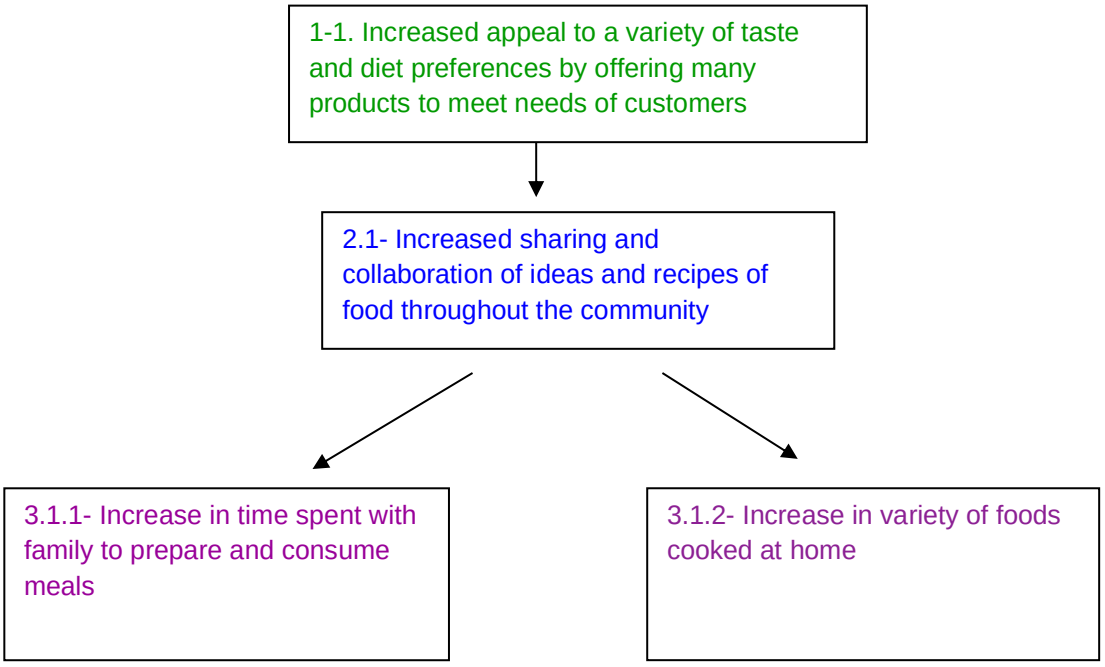
Example of Ecological Impacts



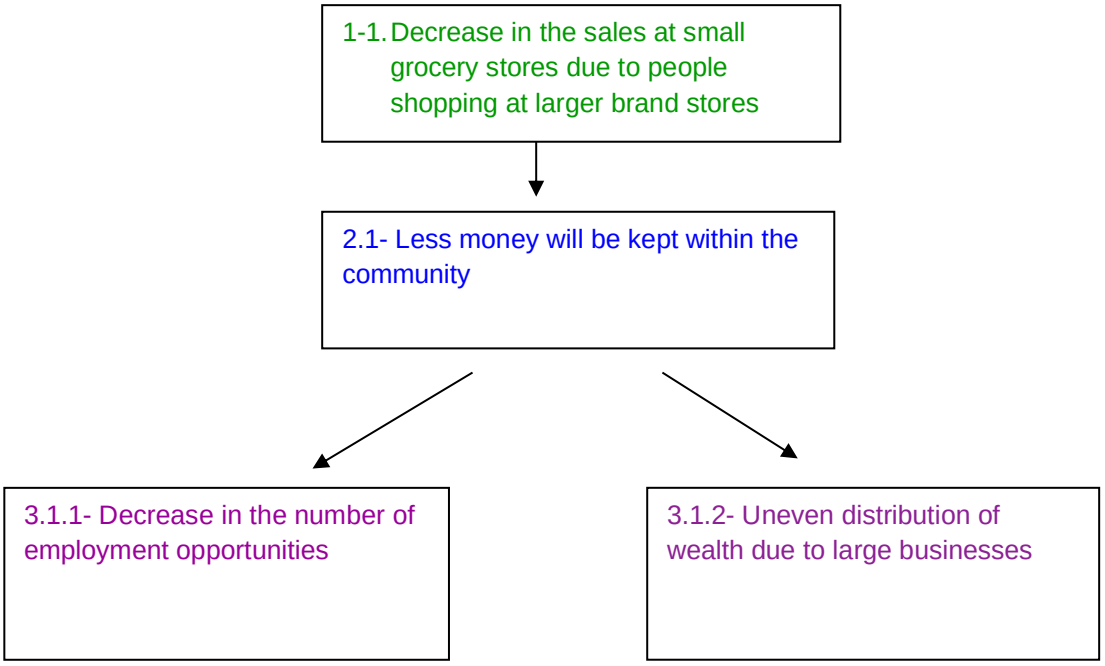
Example of Agricultural Impacts



Example of Social/Cultural Impacts



Example of Economic Impacts



Guide for Conducting a Follow-Up Discussion after the Activity

The following guiding questions may be helpful for conducting a follow-up discussion after the activity.

Notes for educators:

- If students are convening virtually, note that some video call platforms allow for smaller group discussion in breakout rooms.
- Whether convening in person or virtually, it may be helpful for each group to complete their Impact Analyses on slides that can be compiled and shared with the wider group. See the attached PowerPoint slide template, which can be shared with students in advance or uploaded to Google Slides for live, shared editing during a virtual meeting.

Guide for follow-up discussion:

1. **Discussion in small groups**: *each group discusses one of the case studies, and one or more of the impact areas (ecological, agricultural, economic, or social)*
    a. Brief introductions
    b. Identify one person to take notes, and one person to report out to the larger group
    c. Either in person or on a shared Google Slide, fill in an impact analysis (or multiple impact analyses) for your group – ideally, focusing on one of the case study examples, and one or more of the impact areas. This could be based on work participants performed on their own, or new ideas created as a group.

2. **Report-outs to the larger group**: *each group should do the following during their report-out*
    a. Walk the larger group through the impact analysis you filled out
    b. Reflect on your experience – what came easily, what was difficult?
    c. Share any questions you may have about the impact analysis or case studies.

3. **Discussion among the larger group**: *the following guiding questions may be helpful*
    a. How has this activity changed your thoughts on systems thinking?
    b. How has this activity changed your thoughts on malnutrition?
    c. How might you apply what you've learned to clinical practice?
    d. What was easy? What was challenging?
    e. What questions do you have? What additional resources would you like to have?

Supplemental Resources

These resources are not required in order to watch the webinar, but they may be helpful when completing the Impact Analysis.

Resources for the Laos case study:

Bazzano A, Potts K, Bazzano L, Mason J. The Life Course Implications of Ready to Use Therapeutic Food for Children in Low-Income Countries. International journal of environmental research and public health. 2017 Apr;14(4):403.

Briend A. Highly nutrient-dense spreads: a new approach to delivering multiple micronutrients to high-risk groups. British Journal of Nutrition. 2001 May;85(S2):S175-9.

Gabbatiss J. "Rice farming up to twice as bad for climate change as previously thought, study reveals." Independent. 2018 September 10. Available at https://www.independent.co.uk/environment/rice-farming-climate-change-global-warming-india-nitrous-oxide-methane-a8531401.html

Garibaldi L., B Gemmill-Herren, R D'Annolfo, B Graeub, S. Cunningham and T. Breeze. 2017. Farming approaches for greater biodiversity, livelihoods, and food security 32 (1):68-80.

India Today. "Rice farms as bad for climate as 600 coal plants: top 5 rice producing countries." 2018 September 12. https://www.indiatoday.in/education-today/gk-current-affairs/story/rice-farms-as-bad-for-climate-as-600-coal-plants-top-5-rice-producing-countries-1338372-2018-09-12

Jacob, Jeeva Mary, "Climate-Smart Agriculture: Farmer's Bane Or Boon?" (2015). *CUNY Academic Works.* Available at https://academicworks.cuny.edu/gc_etds/988

Sandige H., J. MacDonald, A. Briend, P. Ashorn and M. Manary. 2004. Home-based treatment of malnourished Malawian children with locally produced or imported ready-to-use food. *J Ped Gastroenterology Nutr* 39:141-146.

UN Environment. "Rice may be cheap, but production comes at a cost." 2019 March 26. Available at https://www.unenvironment.org/news-and-stories/story/rice-may-be-cheap-production-comes-cost

Resources for the United States case study:

Chaurvent C., M. DeMarco, C. Barnes, and A. Ammerman. 2019. WIC recipients in the retail environment: A qualitative study assessing customer experience and satisfaction. *J Acad Nutr Diet* 119 (3):416-424.

De Schutter O, Jacobs N, Clement C, Ajena F. Towards a Common Food Policy for the European Union. International Panel of Experts on Sustainable Food Systems (iPES FOOD). 2019.

DiNoia J., D. Monica, K. Weber Cullen, and D. Thompson. 2017. Perceived influences n farmers' market use among urban, WIC-enrolled women. *Am J Health Behav* 41 (5):618-629.

Powell L, Amsbary J, Xin H. Stigma as a communication barrier for participation in the federal government's women, infants, and children program. Qualitative Research Reports in Communication. 2015 Jan 1;16(1):75-85.

Saitone T. and P. McLaughlin. 2017. Women, infants and children (WIC) program redemptions at California farmers' markets: making the program work for farmers and participants. *Renewable Agriculture and Food Systems* 33 (4):334-346.