

Food Solutions Challenge

This challenge is designed to:

1. Raise awareness and support learners to think more deeply about compelling issues that shape society and agriculture (e.g. climate change, food security, the economic viability of food production, and feeding a growing planet).
2. Prepare learners with a broader understanding of the issues, an understanding of the complexity of the many factors and inputs that affect these subjects, and the ability to draw their own conclusions.
3. Identify how our food systems contribute to carbon emissions
4. Prepare learners to design a thoughtful entry to the Food Solutions Challenge of:
 - a. “How might we move towards a more carbon neutral or carbon positive food supply chain?”

What is the Food Solutions Challenge Toolkit?

The Food Solutions Challenge Toolkit includes everything you need to conduct this challenge that will generate innovative, sustainability-oriented business solutions. You are welcome to customize these materials to fit YOUR audience. Some of this information might be too low-level for your audience or you might see gaps. You are welcome to add/delete information to make it work for your class!

1. The **Facilitator’s Guide** to assisting with this lesson (hint: it’s what you’re reading right now). This includes everything you need to know.
2. The **Slide Deck** includes the information you’ll present to learners so they can understand the context of the challenge and create solutions for the Challenge
3. The **Case Studies** are designed to help breakout session teams ideate a solution around a specific corn product at a specific state in the food supply chain.
4. The **Business Canvass Solution** is designed to be used by the team that comes together after the event to refine and present their solution to the class. It can be used if the team finds it helpful.

Run-of-Show

Use the Slide Deck and the instructions below as a guide to run the event. Here is a high-level overview of the event agenda:

Length	Section	Notes
5 min	Welcome & Warm up	Sign in, welcome, introductions, and warm up
10 min	Impacts of food loss	
15 min	Causes of food loss	
5 min	Real life application	
45 min	Breakout Session!	Use scenarios to generate solutions

Material needs for the event

- Scratch paper and pens
- ~30 copies of the case studies (10 copies of each case study)
- ~15 copies of the Business Canvass Solutions
- Laser pointer – The clicker for your projector probably has a laser pointer already on it. Check to be sure. Having a laser pointer is critical for the clear presentation of the slide deck.
- Projector – You will be projecting a PowerPoint
- External speakers – You will be projecting videos that need sound. Usually the speakers on the projector itself are too quiet for a large room

During your Event: Talking points

Welcome & warm up (5m)

1. Slide 1 (title slide) as learners gather
2. Convene group and show Slide 2 (agenda). We're going to do a lot in during today's event. Here's what we hope to achieve:
 - a. You learn more about the holistic nature of the food supply chain
 - b. You identify how our food systems and specifically food loss contributes to climate change
 - c. And you have the chance to think more deeply about compelling issues that shape society and agriculture.
 - d. Everything you learn today will prepare you to ideate solutions about how to reduce food loss!
3. Slide 3: Warm Up: Where is food lost?
 - a. Think about the different stages of the food supply chain that you see on the screen.
 - b. Reflect on where and how you think food is lost at each one of these stages (1m)
 - c. And share your guesses at your table (2m)
 - d. *Large-group share out*
 - e. Can anyone share their thoughts? (take 2 comments and move on) (1m)

Impacts of food loss (10 min)

4. Slide 4: Impacts of food loss
 - a. Today we are going to explore food loss and how it relates to climate change and the ability to feed a growing population. But first, let's understand what food loss is and its various impacts.
5. Slide 5 – Food loss vs food waste
 - a. Two key terms we will be using today are food loss and food waste
 - b. *Read Definitions*
 - i. Food Loss refers to all edible food that is lost before it reaches the consumer.
 - ii. Food Waste refers to all edible food that is lost after it reaches the consumer.
 - c. But why are we focusing solely on food loss today and not food waste?
 - d. First, it's because food loss is the invisible way that edible food isn't used in our food supply chain and we want to bring light to that today. While some people are aware of the food they personally don't eat, very few of us pay attention to the edible food that never reaches us.

- e. But it's also because food lost before it reaches the consumer accounts for 64% of all food lost along the supply chain.¹
 - f. Altogether, this means that addressing food loss is a huge opportunity to increase the available food supply and decrease a significant contributor to climate change. I want to note that later in this presentation we will be describing some of the impacts of food loss **and** waste – that is because it is often difficult to separate data about one from the other.
 - g. I also want to note that the way food loss and waste occur happens differently in different parts of the world. Today's presentation will be a general overview. During the breakout session, you will have a chance to work on a food loss issue facing a specific geography.
 - h. Before we dive deeper into the impacts of food loss, let's watch a quick **VIDEO** to understand some of the broader implications of this issue.
 - i. *Watch video*
 - j. Post video
 - i. What is something new you learned from watching that video?–take comments and then move on
6. Slide 6 – United Nations SDGs
- a. The video also mentioned the UN SDGs. I want to touch on those briefly.
 - b. The UN Sustainable Development Goals have been adopted by governments and organizations around the world. They tackle 17 key areas for development by 2030.
 - c. I bring these up because three goals are very relevant to the work we will do today – Goal 2, Zero Hunger, Goal 12 Responsible Consumption and Production, and Goal 13, Climate Action.
 - d. Specifically, Target 12.3's goal is to halve food loss and waste by 2030.
 - e. It's important to remember reducing food loss is a powerful and important goal and that we are part of a global movement.
 - f. So let's start to dive into some of the real impacts food loss is having...
7. Slide 7: Feeding a growing population
- a. First, there is an imminent issue that needs to be solved – how is the world going to feed 9.8 billion people by 2050?
 - b. As you can see, that population increase translates to a 69% increase in food calories needed to feed this growing population. Which means we need to make more food available.
 - c. But if the only way we make more food available is by producing it, this will have serious impacts on climate change.
8. ***OPTIONAL*** Slide 8: How food production impacts climate change ***LASER POINTER USEFUL***
- a. I know this is a lot of information but let's try to break it down together.
 - b. First, the graph on the left ***use laser pointer*** shows a breakdown of the world's greenhouse gas emissions by industry. The light green slice is what's blown up in the graph on the right. ***use laser pointer***
 - c. This graph pulls out that 24% of **all** the world's GHG emissions come from agriculture, forestry, and land use.
 - d. But how does that 24% relate to food loss?

¹ Lipinski, B. et al. 2013. "Reducing Food Loss and Waste." Working Paper, Installment 2 of *Creating a Sustainable Food Future*. Washington, DC: World Resources Institute. Available online at <http://www.worldresourcesreport.org>.

9. Slide 9: Food loss and waste GHG emissions

- a. In hard numbers, food loss and waste accounts for 6-10% of all human generated greenhouse gasses.²
- b. We can see in this graph that if food loss and waste were its own country, it would be the third largest greenhouse gas emitter behind China and the United States.
- c. So you can see food loss does double damage – not only is that food not feeding anyone but its contribution to climate change is making it even harder to grow food and sustain the booming population.

10. Slide 10: Food loss and waste land use

- a. Another major contributor to GHG emissions is the land needed to produce food.
- b. It takes an area the size of China, Mongolia, and Kazakhstan to grow food that's ultimately lost or wasted.³
- c. This is important because we are currently deforesting our planet in order to meet global food needs. Deforestation accounts for ~9% of total world GHG emissions.⁴
- d. We cannot continue to use agricultural land for wasted food. Imagine if we could put the food this land produces to use and feed our growing population. We could stop deforestation and its associated GHG emissions while fighting hunger.

11. Slide 11: Water

- a. Another impact food loss has is on water usage.
- b. Agricultural production uses a huge amount of water -- in fact, agriculture is 92% of all of the world's water usage.⁵
- c. In fact, the blue water footprint of food loss and waste is 45 trillion gallons of water – an amount that could represent all of the world's water needs for one year.⁶

12. Slide 12: Economic

- a. Food loss and waste also has grave economic costs for both farmers and consumers.
- b. At the consumer level, it is estimated that an American family of four loses \$1,500/year because of food loss and waste.⁷
- c. For farmers, the picture is even worse. It is estimated that food loss and waste costs food producers USD \$940 billion annually.⁸
- d. That represents profit that farmers could earn and use to better their lives.
- e. When you consider that most of the world's farmers live on less than \$2/day, the loss of that kind of money because of food loss and waste is a major inhibitor to the economic viability of farming.

² Vermeulen SJ, Campbell BM, Ingram J SI. 2012. Climate change and food systems. *Annual Review of Environmental Resources* 37:195–222.

³ FAO. 2013a. *Food wastage footprint. Impacts on natural resources. Summary report*. Rome: FAO

⁴ IPCC, 2014: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

⁵ FAO. 2013a. *Food wastage footprint. Impacts on natural resources. Summary report*. Rome: FAO

⁶ Lipinski, B. et al. 2013. "Reducing Food Loss and Waste." Working Paper, Installment 2 of *Creating a Sustainable Food Future*. Washington, DC: World Resources Institute. Available online at <http://www.worldresourcesreport.org>

⁷ Buzby, J.C., H.F. Wells, and J. Hyman. 2014. The Estimated Amount, Value, and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States. Washington, DC: USDA Economic Research Service.

⁸ FAO. 2015. *Food Wastage Footprint & Climate Change*. Rome: FAO

Causes of Food Loss (15min)

13. Slide 13: Causes of Food Loss

- a. So now we understand some of the impacts food loss is having on our environment and economy.
- b. But what causes food loss?
- c. In the next few slides, I will attempt to answer those questions by understanding how food is lost at various stages of the food supply chain.
- d. Again, I want to reiterate that what I am about to present is a broad overview and these causes can vary widely depending on geographic location. You will have the chance to dig deeper into a geographic-specific case soon.

14. Slide 14: Food loss at the farm

- a. At the farm stage, there are many reasons why food is lost. Here are a few key ones:
 - i. First, farmers will **plant an overage** expecting to have a percentage of produce that will not make it to the next stage. Farmers do this because they do not want to miss their contract goals with a retailer and be penalized for shortages.
 - ii. However, when farmers have a better than expected yield this leads to high supply coupled with low prices which may force the farmer to decide not to harvest, as it is not cost effective to cover the costs associated with harvest. In short, planting an overage is in many individual farmers' financial interest, although it is a significant contributor to food loss.
 - iii. Second, when farmers **do not meet the retailer criteria as it relates to product uniformity/specifications** they will choose not to harvest their fields to avoid additional costs involved with produce they will not be able to sell.
 - iv. **Disease and pest damage** are the cause of much of the edible food lost at the farm stage. Moreover, less developed countries have fewer resources to combat disease and pests so they suffer higher losses as compared to developed countries.
 - v. **Weather-related events** such as drought or heavy rains. As climate change increases, so does the unpredictability of weather patterns which can have disastrous consequences for farmers
 - vi. And lastly, **inadequate and/or old harvesting equipment** that can lead to spillage and damage can lead to losses. Again, this issue is particularly pronounced in the developing world where many farmers do not have the financial means to invest in new high-tech equipment.

15. ***OPTIONAL*** Slide 15: Farm forward with big data

- a. High tech agricultural equipment not only leads to less spilling and damage it is also revolutionizing the way some farmers are conducting their business.
- b. Let's hear from a farmer in Illinois about how they are using big data on their farm
- c. *Watch video for 3:30 min*
- d. *Ask the room*: What is one thing you took away from watching that video?
- e. *Take two comments and move on*

16. Slide 17: Food loss during post-harvest

- a. Let's move to the next stage of the food supply chain: post-harvest – meaning after food leaves the field for handling, storage, and transport. Food, mainly grain, is often stored for a few months at this stage so the farmer can sell in batches and have a steadier income.
- b. Food loss at this stage is particularly prominent in developing countries.
 - i. **The lack of adequate storage** options often causes food to degrade and spoil before it reaches consumers. This problem is exaggerated for produce which typically needs refrigerated storage after harvest in order to reach their destination before going bad.

- ii. However, **the cost and limited energy sources** make storage solutions, and especially refrigerated storage solutions, difficult for small holder farmers.
- iii. **Pests, fungus and disease** also infest inadequately stored food and can be not only the source of huge losses but health impacts on those who eat contaminated food.
- iv. **Transportation related damages** also play a part at this stage – whether from food being bruised due to poor packaging, food falling out of a truck because of bumpy or inadequate roads or falling out of open-top trucks.

17. Slide 17: Empowering smallholder farmers to reduce post-harvest loss

- a. Let’s learn a little more about post-harvest loss from farmers in Uganda and what is being done to help prevent it...
- b. **Watch Video**
- c. **Ask the room**: What is something that surprised you about this video? **take 2 comments and move on**

18. Slide 18: Food loss during processing

- a. Food is also lost while it is being processed for human consumption.
- b. Processing includes losses due to **spillage** either from inadequate machinery and/or human error.
- c. Losses also occur when edible food is **sorted out or trimmed** to ensure the end product is the right size and shape. Those trimmings are usually disposed of but are often edible food⁹
- d. **Errors in processing** that lead to final products with wrong weight, shape, appearance or damaged packaging that end up being discarded.⁹
- e. And all of these issues are compounded in the developing world where there is often a **lack of processing facilities** in the first place – meaning the raw ingredients spoil before they can be used.¹⁰

19. Slide 19: Food loss during distribution

- a. Distribution is the final step of the food supply chain before food reaches the consumer and food is lost here in a multiple of ways:
- b. At supermarkets, **edible products often expire** before being purchased and are thrown away.
- c. In much of the developing world, food is bought at **outdoor markets**. These markets often have hot and humid climates and cause food to go bad quickly.
- d. If there is an **overproduction from the farm** it means there is a glut on market and food goes bad because no one is buying it.
- e. Lastly, edible produce is sorted out due to **quality concerns**. Supermarkets in the developed world often have rigid produce standards and they will review produce coming in and throw any away that they think don’t meet these standards. The “ugly food” movement is one response to direct some of that edible food to consumers

20. ***OPTIONAL*** Slide 20: Food waste rebel wants you to eat ugly food

- a. In this short video, Tristram Stuart, a major figure of the food waste reduction movement will describe his work in the “ugly food” movement.
- b. **Watch video**

⁹ Lipinski, B. et al. 2013. “Reducing Food Loss and Waste.” Working Paper, Installment 2 of *Creating a Sustainable Food Future*. Washington, DC: World Resources Institute. Available online at <http://www.worldresourcesreport.org>.

¹⁰ Lipinski, B. et al. 2013. “Reducing Food Loss and Waste.” Working Paper, Installment 2 of *Creating a Sustainable Food Future*. Washington, DC: World Resources Institute. Available online at <http://www.worldresourcesreport.org>.

- c. From this video, you can see that strict retail guidelines in the developed world lead to massive amounts of food loss.

Real life application (5min)

21. Slide 21: Real life application

- a. Now we are going to quickly look at some real life applications where **you** can help ideate solutions to reduce food loss.

22. Slide 22: Case studies and challenge statement

- a. Soon we are going to break out into smaller groups where you will work on a solution that responds to our challenge statement:
 - i. How might we reduce food loss before it reaches the consumer in order to increase the amount of available edible food and lessen the impact on climate?**
- b. We are giving you the choice of three different case studies that will provide a framework for you to focus your solutions on. They all provide you with particular opportunities to explore solutions to the challenge statement.
- c. However, if none of these case studies spark your interest that is ok! You are welcome to work on a “wildcard” solution – meaning a solution that does not respond to one of the case studies. Maybe this is a food loss project you’re already working on or another way you see to address food loss in your community.
- d. But I want to reiterate that all of our case studies and wildcard solutions are focused on answering the challenge statement: How might we reduce food loss before it reaches the consumer in order to increase the amount of available edible food and lessen the impact on climate?

23. Slide 23: Cassava lost during post-harvest

- a. Our first case study will focus on cassava lost during post-harvest in Nigeria.
- b. Cassava is a starchy root that is the second most important source of calories in Nigeria.
- c. While cassava has many properties that make it an ideal crop for farmers, it does have one major Achilles heel – once harvested, cassava root deteriorates within 24 to 72 hours. Because of this, 40% of cassava is lost post-harvest.

24. Slide 24: Producing a surplus during the farm stage

- a. Our second case study is about producing a surplus during the farm stage in the United States.
- b. Feeding America estimate that 6 billion pounds of fresh produce goes unharvested and unsold each year.¹¹

25. Slide 25: Supply-chain collaboration using the Food Loss and Waste Standard

- a. The Food Loss and Waste standard is a shared yardstick by which companies, governments, and other entities can measure their food loss and waste.
- b. As of now, the FLW Standard has untapped, game-changing potential. Without reliable data that companies can easily share and understand, the kind of multi-stakeholder collaborations that lead to monumental change are unlikely to occur.

¹¹ Gunders, Dana. NRDC Issue Paper. 2012. Wasted: How America is Losing up to 40 Percent of Its Food from Farm to Fork to Landfill

Breakout session! (45min)

26. Slide 26: Breakout session!

- a. We are now going to take the rest of our time to surface potential solutions to combat food loss.
- b. Please choose the case study that you are most interested in working on a solution for. Again, if none of the case studies spark your interest. That's ok. You can work on a wildcard solution.
- c. The only "requirement" is that solutions answer the challenge statement.

27. Slide 27: Business Canvas Solution

- a. As we pass out the case studies, we will also pass out the Business Canvas Solution. This is a tool that is meant to help you work on and refine your idea.
- b. I would strongly encourage you to use this tool.

28. Slide 28: Challenge Statement

- a. As a reminder here is the challenge statement that you are trying to find a solution to:
 - i. *Food loss, meaning food wasted before it reaches a consumer, accounts for 64% of all edible food that is lost. When food is wasted at the farm, in harvesting, in production, and in transportation, we lose both edible food and also the climate-changing environmental resources that went into producing it. **How might we reduce food loss before it reaches the consumer in order to increase the amount of available edible food and lessen the impact on climate?***
- b. Think about this question in the context of your case study. You will have the next 45 minutes to brainstorm solutions among your table to reduce the food loss impact of your case study product.
- c. Please feel free to Google or search for any other information you think is pertinent.
- d. Also, I encourage you to choose someone at your table to take notes on the scratch paper provided. I/our facilitator will be walking around to see how you are doing throughout this process.
- e. Once you know what you want to work on, form a group of 2-3.

****OPTIONAL****

If you are interested in including a "pitch" portion of your event this is where you should include it. Please see the slides at the end of the PPT for ones about how to make a great pitch.

29. Slide 29: Thank You!

- a. *Thank everyone and adjourn*

30. Slide 30: Rubric

Optional slides: Please feel free to add these slides into your presentation

31. Slide 31: Time to Pitch

- a. *Call room together. Ask one person from each group to describe their specific challenge, and pitch their top solution. One minute per table—have a co-host use a timer to keep things moving.*
- b. *After all groups pitched, facilitator should summarize each table's pitch in 5 words or less before moving to voting*
- c. You will now vote for the idea that best responds to the challenge statement
- d. *Vote on favorite solution. Use whatever voting method works best for your audience Give them 2 minutes to vote*
- e. *Tally votes and announce the winner*

32. Slide 32: What makes a great pitch

- a. Let's learn a little bit about what makes a great pitch.
- b. Great pitches often
 - i. Clearly solve a specific problem
 - ii. Get your attention with their unique idea
 - iii. Have a name for their solution
 - iv. Explain why the solution will appeal to and help consumers
 - v. Communicate the short term (<1 year) and long term (5-20 year) impact of their solution
- c. Great pitches can:
 - i. Use a personal example to focus on a user's need
 - ii. Feel like a conversation
 - iii. Keep people's attention: 1 min max

33. Slide 33: Food wastage footprint