

LESSON 3: WHO CARES? STAKEHOLDERS!

 THE BIGGER PICTURE

Stakeholders are a vital part of the food security system. It is important for students to realize that to solve the global issue of food insecurity, all of the stakeholders' voices must be represented. In a system, there are often trade-offs to being able to make something work. They will have an impact on the system and other stakeholders, based on the choices they make and the resources they use. In this activity, each student group of 2-3 (depending on class size) will be assigned the role of a stakeholder and will receive a stakeholder information card along with guiding questions that will help them prepare a 2-3 minute poster presentation to the rest of the class on their stakeholder's position on the food security crisis. Each student will also be given a blank stakeholder table to fill in the information being presented by their classmates. This activity will be followed by lesson FS4 where students will build a causal loop diagram of the network created by the stakeholders involved in the food security crisis.

 OBJECTIVESWhat students learn

Stakeholders are people, groups, or organizations with a vested interest in an issue. Students recognize the influence of stakeholders in decision making and the challenges of coming to a consensus. There are many stakeholders involved in the food security crisis.

What students do

Students are assigned the role of a stakeholder. After examining the stakeholder's information, students introduce themselves through presentations and generate a response to a critical question: will an increase in food production alone solve the global food crisis.

 TIME

50 minutes - 1 class period

 STANDARDS

- NGSS PE: HS- ESS3.1; DCI: ESS3. A; SEP: Constructing Explanations and Designing Solutions; CC: Cause and Effect
- NGSS PE: HS-ETS1-1; DCI: ETS1.A; SEP: Asking Questions and Defining Problems; CC: Influence of ETS
- CCSS ELA-LITERACY.RI.11-12.1 Key ideas and details in text

 PREREQUISITES

There are no course prerequisites. However, there are assumptions: 1) students have already completed the Cell Phone Network activity and/or know what a network is, 2) students have been introduced to the concept of food security through lesson one, and 3) be familiar with the Stakeholder Resource Guide.

 BEFORE CLASS

Students should have been given the Stakeholder Reference Guide to look over and read. Teacher needs to provide a copy of the Stakeholder Table (1 per student), Stakeholder Cards (1 per group), and the Stakeholder Guiding Questions (1 per student). One ball of yarn is required if completing the optional "Yarn Toss" activity (step 4). All of the *Modeling Sustainable Food Systems* resources are on the SEE website: see. systemsbiology.net.

 TEACHER INSTRUCTIONS

1. Start by reviewing what the students learned in Lesson FS1 about the three pillars of food security, then review how they looked at different farming techniques in Lesson FS2.
2. Explain that the objective of this lesson is to focus on the stakeholders involved in solving the issue of food insecurity.
3. In the class period before the lesson, make sure that the students are given the Stakeholder Reference Guide to review as homework. Ask if there are any of the terms that they either do not understand or have a question about.
4. **Yarn Toss: optional interactive vocabulary activity (15 minutes).** This activity provides a more interactive, stimulating approach to learning new vocabulary. Students stand in a large circle around the room. One student holds the end of the ball of yarn and calls out one of the vocabulary words from the Stakeholder Reference Guide. They then explain the definition of that word. While holding the end of the yarn, they throw the ball across the circle to another student. The new student must select a new word from the vocabulary list and explain how the new word is related (by any means) to the previous vocabulary word. This process continues until you've used all words on the vocabulary list. To wrap up, ask students what they notice about the pattern they've created with their yarn. What does that represent? Discuss how these words are all part of a larger network, or system.
5. Ask the class how they would define the term stakeholder. This could be a warm-up question either they respond to verbally or in their notebook. Get responses from 2 or 3 students. Explain that [Merriam-Webster's dictionary](#) describes a stakeholder as "one that has a stake in an enterprise, or someone who is involved in or affected by a course of action".
6. Explain to the students that in small groups they are going to investigate some of the stakeholders that are involved with food insecurity. Each stakeholder has a unique perspective on how the global food crisis affects them and how they think it should be addressed.
7. Group students into 2 or 3 individuals (depending on class size). Pass out the Stakeholder Cards (1 card per group). This will assign a stakeholder role to each group. For smaller classes, you can pass out 2-3 cards for each group; however, they will need more time to complete the activity.
8. Pass out Stakeholder Guiding Questions - one copy to each student, or one per group. Students can use those questions to help them decide what information should be included in their Stakeholder Table.

LESSON 3: WHO CARES? STAKEHOLDERS!

TEACHER INSTRUCTIONS CONTINUED

9. Share with students the Important Organizations listed in “Resources” section of the teacher instructions so they understand the organizations that are involved with the stakeholders.
10. Handout one copy of the Stakeholder Table per student. Students use this table to collect information about their stakeholder using the following resources: the Stakeholder Guiding Questions document, Stakeholder References guide and their Stakeholder Card.
11. **Following their research, students will prepare a 2-3 minute presentation** on their stakeholder to the rest of the class. Presentation ideas: students can present their information verbally to the rest of the class or in a poster walk format, focusing on answering the guiding questions for their stakeholder. They can also present the information visually using one of the following options:
 - Option 1: Powerpoint presentation - focus on including pictures to represent the information pertinent to their stakeholder.
 - Option 2: Poster presentation - other than the stakeholder name, only pictures are allowed to represent the information about their role. These can then be hung up around the classroom as a reference for future lessons in this unit.
 - Option 3: If a class is very small, students can receive more than one stakeholder. One option is to group the stakeholders together based on similar roles (Ex. representatives of developed country farmers with small farmers in developing countries). Students can present their stakeholders by creating a poster to compare/contrast the two stakeholders. Similar to option 2, the posters should be used as a visual to represent the two stakeholders with as few words as possible. Students can put the name of each stakeholder at the top of their poster, then create a Venn Diagram to compare/contrast the two stakeholders.The final part of the presentation should include the position the stakeholder takes on answer the question from the Stakeholder Table, “Can we simply expand the current food production system as it is now to meet needs of 9 billion people by 2050/justify position?”. Visit the resources tab in Lesson 3 at see.systemsbiology.net to see examples of student work.
12. Each student will complete their Stakeholder Table during the other stakeholder presentations. Once all presentations are complete, their table will also be complete with information about all stakeholders.
13. **Building your case worksheet:** Students now re-form the three country groups they worked in during the previous food security lessons, and fill out questions 1 and 2 in the Lesson 3 section of the “Building Your Case” worksheet. The goal of this activity is to continue to build their case for the summative assessment where they are participating in a UN summit.
14. **Wrap-up the lesson with an exit ticket**, which can either be done on a separate slip of paper or a reflection in their notebook.
 - Why is it important to consider stakeholders when generating a plan?
 - After hearing about the other stakeholders, was there a particular stakeholder that had more of an impact on global food security?

MODIFICATIONS

- The activity is designed for 2 students per group to encourage deep engagement and student accountability. If your group is smaller, these are the stakeholders you may delete or choose to combine. Some options are combining developing country fishermen and farmers, combining world policy makers and developed country government, combining energy and transportation systems
- If you have smaller classes and are combining stakeholders, an optional presentation idea is to have the students create a poster with a Venn diagram, focusing on the similarities and differences between their assigned stakeholders and each stakeholder’s position.

RESOURCES

- SEE website: see.systemsbiology.net
 - Food Security Vocabulary PowerPoint
 - 3 Pillars PowerPoint
 - Student poster examples
- Stakeholder Reference Guide
- Stakeholder Guiding Questions
- Stakeholder Table
- Stakeholder Cards
- “Building Your Case” worksheet

Important Organizations

- World Health Organization (WHO): WHO is the directing and coordinating authority for health within the United Nations system. It is responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, communicating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends. (<http://www.who.int/about/en/>)
- World Bank: The World Bank is a United Nations international financial institution that provides loans to developing countries for capital programs. The World Bank is a component of the World Bank Group, and a member of the United Nations Development Group. (<http://www.worldbank.org>)
- World Trade Organization: The World Trade Organization (WTO) is the only global international organization dealing with the rules of trade between nations. At its heart are the WTO agreements, negotiated and signed by the bulk of the world’s trading nations and ratified in their parliaments. The goal is to help producers of goods and services, exporters, and importers conduct their business. (http://www.wto.org/english/thewto_e/whatis_e/whatis_e.htm)
- United Nations: The United Nations is an international organization founded in 1945 after the Second World War by 51 countries committed to maintaining international peace and security, developing friendly relations among nations and promoting social progress, better living standards and human rights. (<http://www.un.org/en/aboutun/index.shtml>)

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RESOURCES: STUDENT HANDOUT -STAKEHOLDER REFERENCE GUIDE

Vocabulary

subsistence farming: typically a small-scale farming operation in which farmers focus on growing enough food to feed themselves and their families.

malnutrition: lack of proper nutrition, caused by not having enough to eat, not eating enough of the right foods, or being unable to use the food that one does eat.

infrastructure: the basic physical and organizational structures and facilities (e.g., buildings, roads, and power supplies) needed for the operation of a society or enterprise.

urbanization: the increasing number of people that live in urban areas. It predominantly results in the physical growth of urban areas, be it horizontal or vertical. The United Nations projected that half of the world's population would live in urban areas at the end of 2008.

monoculture: the agricultural practice of producing or growing a single crop or plant species over a wide area and for a large number of consecutive years

diversity: the condition of having or being composed of differing elements; variety

pathogens: a bacterium, virus, or other microorganism that has the ability to cause disease.

affluent: (especially of a group or area) having a great deal of money; wealthy.

food insecurity: the state of being without reliable access to a sufficient quantity of affordable, nutritious food.

inflation: a general increase in prices and fall in the purchasing value of money.

subsidies: a sum of money granted by the government or a public body to assist an industry or business so that the price of a commodity or service may remain low or competitive.

hygiene: conditions or practices conducive to maintaining health and preventing disease, especially through cleanliness.

agricultural treadmill: Because most farmers specialize in production of commodities such as feed corn or soybeans, which cannot be differentiated in the marketplace (i.e., Farmer John cannot claim that his feed corn is superior to Farmer Jane's, because for most intents and purposes, the corn is identical), they must take whatever the market price is when they choose to sell their crops. Because the price of grain is the same for all farmers, the farmers who earn profits are those who aggressively adopt new technologies that reduce production costs and boost yields relative to other farmers. While these "early adopters" profit from the use of new technology, once a given yield-enhancing technology is widely used, the resulting increases in supply lowers prices for all farmers.

lobbying: seeking to influence (a politician or public official) on an issue.

transgenic: of, relating to, or denoting an organism that contains genetic material into which DNA from an unrelated organism has been artificially introduced.

commodity: a raw material or primary agricultural product that can be bought and sold, such as copper or coffee.

tariffs: A tariff is either a tax on imports or exports, or a list of prices for such things as rail service, bus routes, and electrical usage.

speculation: the forming of a theory or conjecture without firm evidence. To place money into a stock on the belief that the value will rise rapidly.

biofuel: a fuel derived directly from living matter.

aquaculture: the rearing of aquatic animals or the cultivation of aquatic plants for food.

greenhouse gas: a gas that contributes to the greenhouse effect by absorbing infrared radiation, e.g., carbon dioxide and chlorofluorocarbons.

nonrenewable resource: A resource of economic value that cannot be readily replaced by natural means on a level equal to its consumption. Most fossil fuels, such as oil, natural gas and coal are considered nonrenewable resources in that their use is not sustainable because their formation takes billions of years.

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Vocabulary Continued

renewable resource: A renewable resource is a natural resource which can replenish with the passage of time, either through biological reproduction or other naturally recurring processes. Renewable resources are a part of Earth's natural environment and the largest components of its ecosphere.

confounding: mix up (something) with something else so that the individual elements become difficult to distinguish.

sustainable agriculture: the act of farming using principles of ecology, the study of relationships between organisms and their environment. Farming using non ecological damaging practices.

agribusiness: the business of agricultural production. It includes agrichemicals, breeding, crop production (farming and contract farming), distribution, farm machinery, processing, and seed supply, as well as marketing and retail sales.

microbiology: is the study of microscopic organisms, either unicellular (single cell), multicellular (cell colony), or acellular (lacking cells).

zoonoses: diseases that are naturally transmitted from vertebrate animals to humans and vice-versa.

conglomerate: a number of different things or parts, such as businesses, that are grouped together to form a whole but remain distinct entities.

lethal: sufficient to cause death.

humanitarian: concerned with or seeking to promote human welfare.

desalinate: remove salt from (seawater).

conservation buffers: small areas or strips of land in permanent vegetation, designed to slow water runoff, provide shelter and stabilize riparian areas.

biodynamic: a whole farm approach that seeks to manage the soils, crops, and animals on a farm in such a way that the enterprises on a farm strengthen and support each other.

holistic: characterized by comprehension of the parts of something as intimately interconnected and explicable only by reference to the whole.

mutually reinforcing: A situation in which two parties work together, supporting the interests of each other.

dietary staples: Most staple plant foods are derived either from cereals such as wheat, barley, rye, maize, or rice, or starchy tubers or root vegetables such as potatoes, yams, taro, and cassava. The definition of a dietary staple varies depending on what part of the world you are referencing.

aquifer: a body of permeable rock that can contain or transmit groundwater.

tributaries: a river or stream flowing into a larger river or lake.

degradation: to be broken down or to deteriorate chemically.

sedimentation: Sedimentation is the tendency for particles in suspension to settle out of fluid, and come to rest against a barrier, such as the bottom of a container. This is due to their motion through the fluid in response to the forces acting on them, for example, gravity. Sedimentation happens as water erodes soils, carries the soil particles down the river, and then the particles build up against a barrier in the river.

ecosystem: a biological community of interacting organisms and their physical environment.

node: each part of the system

edge: links nodes together and defines relationship between the nodes and direction of communication between nodes

tipping node: a node that is vital to the system, and without it, the system would collapse

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RESOURCES: STUDENT HANDOUT -STAKEHOLDER GUIDING QUESTIONS

As you look over your stakeholder cards and prepare to share your information with the rest of the class, be sure you understand the following information so you can be the expert on your stakeholder.

1. What is the name of your stakeholder group?
2. Why is your group considered to be a stakeholder? What is your role in the food security crisis?
3. What policy/policies does/do your group want to see in place with food security?
4. Why would these policies benefit you?
5. What do you predict will happen to your group if these policies are not enacted or put into place?
6. How essential is your group's role in the food security system? Are you a tipping point node?
7. Who do you think you most need to talk to or hear from to define your group's "place" in the food security system?
8. What nodes (stakeholders) do you think are most closely related to you? Why do you think this?
9. What should others know and understand about your group?

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RESOURCES: STUDENT HANDOUT -STAKEHOLDER TABLE

STAKEHOLDER	KEY ISSUES IMPORTANT TO STAKEHOLDER	POSITION AND JUSTIFICATION STAKEHOLDER TAKES ON THE QUESTION: "Can we simply expand the current food production system as it is now to meet needs of 9 billion people by 2050?"
DEVELOPING COUNTRY ECONOMY AND GOVERNMENT		
REPRESENTATIVES OF A DEVELOPED COUNTRY ECONOMY		
REPRESENTATIVES FROM THE WORLD HEALTH ORGANIZATION		
WORLD POLICY MAKERS		
URBAN CITIZENS IN DEVELOPED COUNTRIES		
REPRESENTATIVES OF FOOD TRANSPORT COMPANIES		
REPRESENTATIVES OF AGRICULTURAL SUPPLY COMPANIES		

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REPRESENTATIVES OF ENERGY COMPANIES		
FISHERMEN IN DEVELOPED COUNTRIES		
THE ENVIRONMENT		
REPRESENTATIVES OF EARTH'S WATER SUPPLY		
SMALL FARMERS IN DEVELOPING COUNTRIES		
REPRESENTATIVES OF DEVELOPED COUNTRY FARMERS		
FISHERMEN IN DEVELOPING COUNTRIES		
DEVELOPED COUNTRY CITIZENS		