LESSON 7: UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION SUMMIT

THE BIGGER PICTURE

Students conduct a United Nations Food and Agriculture Organization Summit (UN Summit) in order to address the food security challenges they have researched throughout the Food Security module. As a representative of their country, they recommend actions to improve the food production system and follow-up with an individual critical evaluation of the proposed actions. The UN Summit is an authentic, Project Based Learning (PBL) product that incorporates current Next Generation Science Standards (NGSS) and systems thinking. Students will synthesize and apply knowledge and skills acquired in Food Security (FS) Lessons 1-6, and work collaboratively to solve real-world problems.

OBJECTIVES

What students learn

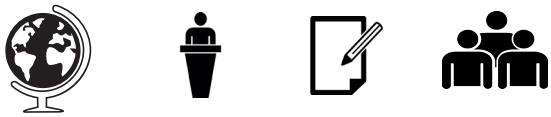
Students learn that a thorough understanding of the complexity of the global food production system is necessary for designing effective solutions to food insecurity. They will learn the importance of negotiation and compromise in reaching consensus in the global community, and the role that the UN plays in addressing international issues. Students also learn how to outline an effective argument, and to support their claims with evidence and logic.

What students do

Students conduct a UN Summit, working collaboratively to come up with practical and realistic solutions to food insecurity in three different countries. They will synthesize information and apply skills learned in FS lessons 1-6, both when outlining major food security challenges as well as when designing their solutions. Finally, they will apply the claim-evidence-reasoning approach in critically evaluating the final four UN Summit Actions developed by the class.

TIME

Part I (50 min) - Defining problem and gathering evidence
Part II (50 min) - Finding solutions and building consensus
Part III (50 min OR homework option) - Testing a solution



STANDARDS

- NGSS PE: HS-LS2-7; DCI: LS2.C; SEP: CEDS; CC: S&C
- NGSS PE: HS- ESS3-4; DCI: ESS3.C; SEP: CEDS; CC: S&C; Influence of ETS
- NGSS PE: HS-ETS1-2; DCI: ETS1.C; SEP: CEDS; CC: Influence of ETS
- NGSS PE: HS-ETS1-3; DCI: ETS1.B; SEP: CEDS; CC: Influence of ETS
- Common Core Science Standards: 1) ELA/Literacy: Integration of Knowledge and Ideas: ELA-LITERACY.RH.11-12.7; 2) Mathematics: MP.2 Reason abstractly and quantitatively (HS-ETS1-1), (HS-ETS1-3), (HS-ETS1-4); 3) Using Mathematics and Computational thinking
- AP Environmental Science standards 11, 16, 17

PREREQUISITES

Student will need their materials from FS Lessons 1-6, and projected water and food import reduction calculations from APPLICATION 1. APES students will also use their population projection and trend calculations. Students should be familiar with with ratios, percentages and proportional relationships.

BEFORE CLASS

Print and read:
PartII UNSummit Systems Thinking Guide Teacher Key
Prepare the following supplies:
Posters: 1 per country group
Post-it notes: 4 per student
Markers: class set
Pull up on computer:
UN Summit overview table (pg. 4 of this document)
UN Overview Video
WRI 2013 - "The Great Balancing Act"
Print 1 copy of the following per student:
Part I_UNSummit_Overview_(Student)
Part I_UNSummit_Gathering Information and Finding Solutions (Student)
Part II_UNSummit_Systems Thinking Guide (Student)
Part III_UNSummit_Testing_A_Solution_(Student)
Part III_UNSummit_Claim_and_Evidence_Rubric_(Student)
Print 1 copy of the following per country group:
PartII_UNSummit_Example_UN Actions_EastFenwick_(Country_Group) (May need to reformat references)
Optional: Example_UN Goals_FAO_Sustainable_Development
WRI(2013)_The_Great_Balancing_Act
Print 1 copy of the following per UN Summit group:
PartII_UNSummit_Grant_for_Proposed_Actions(UNSummit_Group)
Student need to gather these resources from previous lessons in the module:
FS1-FS6: Building Your Case worksheet (handed out during FS1)
APPLICATION 1
FS3: Stakeholder Guiding Questions (Student)
FS3: Stakeholder Table (Student)

TEACHER INSTRUCTIONS

Part 1: Defining the problem, introduction to the United Nations (50 mins)

1. Before class begins, have the students sit with their country groups. Ask them to take out the following resources from previous Food Security module lessons, as they will need them for this class and the remainder of the UN summit: Building Your Case (Student) (handed out during FS1), APPLICATION 1 calculations, Stakeholder Guiding Questions and Stakeholder Table (FS3), and Balancing Act Chart Analysis (Student)(FS5). Then read the following overview of the UN Summit to the class: *"As a result of climate and past land management practices a drought is predicted that cuts agricultural water supplies by 30 percent a year. You as students must practice consensus building to address the crisis, by conducting a UN Food and Agriculture Organization Summit (UNFAO)."*

TEACHER INSTRUCTIONS CONTINUED

1. Continued....*"You will decide as a group to take action for the expansion of growing vegetables to meet the needs of projected population growth over the next 10 years in three countries. As you collaboratively develop ideas as first a country group and then as part of the UN Summit, keep in mind what you have learned throughout the Food Security module about sustainability, different methods of food production, and the complex dynamics of food production systems."*
2. Project the following table for the students, and walk through the plan for the next 3 class periods. Handout a copy of Part I_UNSummit_Overview_(Student) to each student, and tell them to refer to this document as the class moves through the UN Summit.

Day	What students do	What students are asking
Part I: Defining the problem Gathering information	- Learn about the role of the United Nations in world affairs - Country groups conduct research and gather information about the issue of food insecurity in their home country. They then present opening statements to the UN Summit whole group.	- What role could the United Nations play in helping the world solve the problem of food insecurity? - What are the major challenges our country faces around the issue of food security? - What evidence can we provide to most effectively support our claims about the major challenges our country faces around food insecurity?
Part II: Finding solutions Building consensus	- Country groups develop and propose Actions to the UN Summit whole group - Country groups build consensus at the UN Summit to formulate four Actions that will improve food security among the three countries	- How best can the challenges to our country's food security be addressed over the upcoming 10 years, given projected population growth and water shortages? - How and why do our proposed Actions modify the food system and move toward food security? - What evidence can we provide that our country group Actions will be effective? - How can our country group compromise effectively on the international stage to best meet our objectives?
Part III: Testing a solution	- Students compose a critical evaluation letter that supports or argues against the four actions agreed upon at the UN Summit	- What evidence and justification is there for how each Action addresses food insecurity, from the perspective of our stakeholder, in our country?

3. **Say:** "The UN is an international governing body that can help find solutions to complex global problems that manifest locally in unique ways, given differing social, economic, and environmental dynamics. As you watch the following video, take notes in your journal about the role of the UN and ways in which it could help countries achieve greater food security. "
   - Show this introductory video about the UN: UN Overview Video
   - Have students pair-share their thoughts on the above prompts
4. **Direct students** again to their Part I_UNSummit_Overview_(Student) worksheet and review the "Central question for investigation during the UN Summit" and "Additional focus questions" as a class:
   - **Central question:** How would you propose to make your country's food production system more sustainable and less dependent on food imports, if available water was reduced 30% annually due to a predicted 5-year drought across all biomes?
   - **Additional focus questions:** How could you support agricultural expansion to reduce dependency on imports to meet the needs of the population growth of your country over the next 10 years? How could you redirect land and water use to address the 30% reduction of water available for agriculture? Could aquaponics and alternative food growing methods help add stability to the food production system, and reduce environmental impact by cutting greenhouse gas emissions and fertilizer production? Thinking beyond agriculture and recognizing that food security is a systems issue, are there social, political, or economic adjustments that can be made in your country to improve food security?
5. **Say,** "As country groups, you will now develop and present opening statements to the UN body. Your opening statements will serve as an introduction of your country to the UN, with particular focus on the challenges your country faces regarding food security and the specific ways in which drought would impact your food production system." Hand out a copy of Part I_UNSummit_Gathering Information and Finding Solutions (Student) to each student. Direct them to work in country groups for 10-15 minutes to fill in the first column of the "Country Opening Statements" table, using information from their Building Your Case (Student) and any other resources completed earlier in the Food Security module that might prove helpful (see Step 1).
6. Country groups should select one representative to present the opening statement to the class. As presentations unfold, students should take notes in the remaining two columns of their "Country Opening Statements" tables.

Part II: Finding solutions and building consensus (50 mins)

7. **Say,** "Now that we have heard an overview of the major challenges each country faces in addressing food insecurity, each country group will develop and propose a set of four Actions. These proposed Actions will be developed with input from major stakeholders within the country, involved in the issue of food security. In order to persuade other members of the UN summit to adopt your Actions, the Actions should be:" (Ask students to follow along in their Part I_UNSummit_Overview_(Student) handout)
   - Achievable: outline specific steps that can be taken to achieve your action
   - Effective: describe how the action would positively impact different nodes in the food production system, and how such impacts could be quantified
   - Beneficial to as many stakeholders as possible: your Actions will most likely be adopted if you can identify allies within the UN community and if you can demonstrate that the Actions will benefit all three countries

TEACHER INSTRUCTIONS CONTINUED

2. **Hand out a copy** of PartII_UNSummit_Example_UN Actions_EastFenwick_(Country_Group) to each country group, explaining that the document contains an example of Actions proposed to the UN, from the fictitious country of East Fenwick. Encourage students to also look again at their Building Your Case (Student) and "Balancing Act Article Chart Analysis" (FS5) handouts, as well as calculations from APPLICATION 1, as this work can help provide Action ideas.
3. Optional: you can also hand out the original "Great Balancing Act" article (WRI 2013_The_Great_Balancing_Act) and/or Example_UN Goals_FAO_Sustainable_Development as additional resources for the students to review while developing their Actions.
4. **Hand out a copy** of Part II_UNSummit_Systems Thinking Guide (Student) to each student. Within their country groups, have students work individually or in pairs for 15 minutes to complete this worksheet for a particular stakeholder (they can adopt the same stakeholder that they worked with in "FS3: Who Cares? Stakeholders!"). Stakeholder groups should brainstorm 1-2 Actions to propose to their country group, and think through how their Actions will both improve food security given projected drought and population growth, and how their Actions will impact other stakeholders. Encourage students to also think through any opposition their proposed Actions might meet in the international community, and how they might counter this opposition. If students are stuck, see PartII_UNSummit_Systems_Thinking_Guide (Teacher_Key) for prompt ideas.
    - Modifications for varying class sizes: for small class sizes, you can opt for students to all work together as a country group (rather than as stakeholders within a country) to develop their actions. For large class sizes, you can split the class into multiple UN summits or have multiple students work together as a particular stakeholder group.
5. Having completed the "Systems Thinking Guide", all stakeholders within a country group should come together, discuss the Actions formulated by various stakeholders, and choose four to propose to the UN Summit. Allow 20-25 minutes for this step. Students should complete the, "Part II: Finding Solutions - Country Group Action Proposals (student)", which will help them prepare to present their actions to the UN summit. As students discuss and negotiate, circulate and conduct an informal assessment of stakeholder notes, country Action items, and conversation.
6. **Hand out poster paper** and markers to country groups, and direct students to outline their four proposed Actions in poster format. Each country group should choose a representative (someone different from whoever presented the country overview) to present their four Action items to the UN Summit.
7. **Reconvene** the UN Summit for country group Action presentations. Distribute four post-it notes to all UN Summit participants, and tell students that they will be using the post-it notes to vote on what they believe will be the four most effective Action items for all three countries. Check in with the class about the definition of "consensus" - general agreement, or the judgment arrived at by most of those concerned (Merriam-Webster, 2018). Emphasize that while the goal is for the majority of members to agree, the votes may not be unanimous. Encourage students to evaluate Actions from the perspective of their stakeholder, their country as a whole, and as a member of the international community.
8. **Proceed with presentations** and voting on Action items. Appoint a secretary to transcribe the final four Action items into PartII_UNSummit_Grant_for_Proposed_Actions(UNSummit_Group). Each Action item should also include a statement of evidence supporting the effectiveness of the Action.
9. **Formative Exit Ticket:** At the conclusion of the UN Summit, have students reflect in their journals on the following two questions from their personal perspective:
    - Which sub-systems - social, political, economic, environmental, etc - within the food production system do the proposed UN Actions target?
    - Describe three other nodes of the food security system that could be targeted to increase food security, that you feel have not been included in the proposed Actions. How could prioritizing these nodes also prove effective in improving food security?
10. In preparation for Part III, hand out to each student and assign for reading Part III_UNSummit_Testing_A_Solution_(Student) and Part III_UNSummit_Claim_and_Evidence_Rubric_(Student).

Part III: Testing a solution (50 mins or homework)

11. **Ask students** to follow along in their PartIII_UNSummit_Testing_A_Solution_(Student) handout as you introduce the assignment: "As a group the UN Summit deliberated on a set of four Actions that, when funded, can change food production systems to help improve security. As stakeholders in your country, you must now evaluate these Actions. Your critical evaluation of these Actions will demonstrate your learning and systems thinking skills. Your central question is: Will the four Actions adopted by the UN Summit improve food security for your country, given projected population growth and a 30% decrease in the available water supply?"
12. **Walk through** the remainder of the handout guidelines with the class, reminding students of the 3 pillars of food security, explaining the claim-evidence-reasoning structure that you are asking them to follow, and encouraging them to refer to previous assignments from the Food Security module when collecting evidence to support their claims. Emphasize that they are taking a stand on the effectiveness of the Actions in their home country and from the perspective of their stakeholder.
13. **Ask students** to take out their copy of Part III_UNSummit_Claim_and_Evidence_Rubric_(Student) if they haven't already, and summarize how you will evaluate their letters based on how successfully they support their claims with evidence and logically argue their position.
14. Allow the remainder of the class for students to complete their letters, and assign the remainder for homework if necessary.

LESSON 7: UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION SUMMIT

RESOURCES

- UN Video Overview
- WRI 2013 - "The Great Balancing Act"
- PartII_UNSummit_Systems_Thinking_Guide (Teacher_Key)
- Part I_UNSummit_Overview_(Student)
- Part I_UNSummit_Gathering Information and Finding Solutions (Student)
- Part II_UNSummit_Systems Thinking Guide (Student)
- Part III_UNSummit_Testing_A_Solution_(Student)
- Part III_UNSummit_Claim_and_Evidence_Rubric_(Student)
- PartII_UNSummit_Example_UN Actions_EastFenwick_(Country_Group)
- Example_UN Goals_FAO_Sustainable_Development
- PartII_UNSummit_Grant_for_Proposed_Actions (UNSummit_Group)
- Part II: Finding Solutions - Country Group Action Proposals (student)
- FS1-FS6: Building Your Case (Student) (handed out during FS1)
- APPLICATION 1
- FS3: Stakeholder Guiding Questions (Student)
- FS3: Stakeholder Table (Student)
- FS5: Balancing Act Chart Analysis (Student)

RESOURCES - Not required, but additional information if interested

- http://www.fao.org/faostat/en/#country (demographic, economic, political, environmental, and food production statistics on each country, from the FAO)
- http://www.globalhungerindex.org/results-2017/ (current reports on worldwide hunger and undernutrition)

Case Study: Haiti

- http://www.fao.org/faostat/en/#country/93 (FAO statistics for Haiti)
- http://www.greenfacts.org/en/water-resources/figtableboxes/aquastat79.htm (Water availability in Haiti)
- http://www.iadb.org/en/news/webstories/2013-03-04/irrigation-in-haitis-artibonite,10333.html (Example of an aid initiative to train local farmers on more effective agricultural techniques)
- http://pdf.usaid.gov/pdf_docs/Pnach663.pdf (Case Study USAID Haiti)
- http://www.ifpri.org/news-release/2013-global-hunger-index-country-case-study-haiti (International Food Policy Research case study)
- http://humanitarian.worldconcern.org/2013/04/17/food-insecurity-the-silent-crisis-in-haiti/ (challenges facing small farmers in Haiti, and a potential solution)
- http://www.foodsecurityportal.org/haiti (food security indicators, including GNI and measurements of exports and imports)
- http://www.genderaction.org/publications/fdsec/haiti.pdf (emphasizes the importance of considering gender equity in projects funded by international development investing in Haiti)

Case Study: North Korea

- http://www.fao.org/faostat/en/#country/116 (FAO statistics for North Korea)
- http://www.greenfacts.org/en/water-resources/figtableboxes/aquastat96.htm (Water availability in North Korea)
- http://www.fao.org/news/story/en/item/412030/icode/ (FAO, impact of drought on food production in North Korea)
- http://www.fao.org/emergencies/countries/detail/en/c/161543/ (FAO initiatives in North Korea to improve food security)
- https://www.npr.org/sections/goatsandsoda/2018/06/19/620484758/the-food-insecurity-of-north-korea (impact of politics on food security)
- http://www.miseast.org/en/nkorea/food-insecurity-north-korea (aid organization's overview of factors contributing to food insecurity in North Korea)
- https://www.brookings.edu/opinions/world-food-day-the-challenge-of-north-korea/ (political, economic, and social factors contributing to food insecurity in North Korea)

Case Study: Namibia

- http://www.fao.org/faostat/en/#country/147 (FAO statistics for Namibia)
- http://www.greenfacts.org/en/water-resources/figtableboxes/aquastat123.htm (Water availability in Namibia)
- http://www.un.org.na/home_htm_files/ZHRM.pdf ("Namibia Zero Hunger Roadmap" - outlines initiatives to eliminate hunger in Namibia 2016-2020)
- http://www.orangesenqurak.com/challenge.aspx (overview of water use and management in the Orange-Senqu River Basin, the main source of fresh water in Namibia)
- http://www.the-eis.com/data/literature/UNDP%20Adapting%20to%20climate%20change_2012.pdf (report on UNDP project to improve adaptive capacities of natural resource users in preparation for drought related to climate change)
- http://www1.wfp.org/countries/namibia (The World Food Program on hunger in Namibia)
- https://www.usnews.com/news/best-countries/articles/2017-12-29/africa-hunger-initiatives-bearing-some-fruit (Article on successful agricultural initiatives in various African countries)
- https://borgenproject.org/hunger-in-namibia/ (Outlines structural and environmental causes of hunger in Namibia, and provides links to government development initiatives)

LESSON 7: UNITED NATIONS FOOD AND AGRICULTURE ORGANIZATION SUMMIT

RESOURCES: PART I UNSUMMIT_OVERVIEW_(STUDENT)

UN Summit Overview:

At the UN Summit, three countries will gather to propose Actions that will help overcome food security challenges, given projected population growth and a reduction in water supply due to drought. Stakeholders representing each country will offer their expertise and perspective in helping to shape these global initiatives. Using country-specific data generated earlier in the Food Security module, participants will provide supporting evidence and apply systems thinking to help solve a complex, real-world problem that involves economic, political, social, and environmental systems. How can the UN help these countries produce and manage local resources in an environmentally sustainable fashion that will help them meet the future nutritional needs of their respective populations?

Schedule: 3 x 50 min class periods

Day	What students do	What students are asking
Part I: Defining the problem Gathering information	- Learn about the role of the United Nations in world affairs - Country groups conduct research and gather information about the issue of food insecurity in their home country. They then present opening statements to the UN Summit whole group.	- What role could the United Nations play in helping the world solve the problem of food insecurity? - What are the major challenges our country faces around the issue of food security? - What evidence can we provide to most effectively support our claims about the major challenges our country faces around food insecurity?
Part II: Finding solutions Building consensus	- Country groups develop and propose Actions to the UN Summit whole group - Country groups build consensus at the UN Summit to formulate four Actions that will improve food security among the three countries	- How best can the challenges to our country's food security be addressed over the upcoming 10 years, given projected population growth and water shortages? - How and why do our proposed Actions modify the food system and move toward food security? - What evidence can we provide that our country group Actions will be effective? - How can our country group compromise effectively on the international stage to best meet our objectives?
Part III: Testing a solution	- Students compose a critical evaluation letter that supports or argues against the four actions agreed upon at the UN Summit	- What evidence and justification is there for how each Action addresses food insecurity, from the perspective of our stakeholder, in our country?

Central question for investigation during the UN Summit:

- How would you propose to make your country more food secure, if available water resources are reduced by 30% annually due to a predicted 5-year period of drought across all biomes?

Additional focus questions:

- How could you support agricultural expansion to reduce dependency on imports to meet the needs of the population growth of your country over the next 10 years?
- How could you redirect land and water use to address the 30% reduction of water available for agriculture?
- Could aquaponics and alternative food growing methods help add stability to the food production system, and reduce environmental impact by cutting greenhouse gas emissions and fertilizer production?
- Thinking beyond agriculture and recognizing that food security is a systems issue, are there social, political, or economic adjustments that can be made in your country to improve food security?

PART 1: DEFINING THE PROBLEM

1. As a country group, you will first prepare an opening statement. Your opening statements will serve as an introduction of your country to the UN, with particular focus on the challenges your country faces regarding food security and the specific ways in which drought would impact your food production system.
2. Have the following materials from previous lessons on hand to help you gather the information necessary for your opening statement, as well as the work you will be doing in Part II and III:
   - FS1-FS6: Building Your Case (Student) (handed out during FS1)
   - APPLICATION 1
   - Stakeholder Guiding Questions and Stakeholder Table (FS3)
   - FS5: Balancing Act Chart Analysis (Student)
3. Fill out the first column in "Country Opening Statements" table in the handout, Part I_UNSummit_Gathering Information and Finding Solutions (Student), using the questions to guide you as you prepare your statement.
4. As other country groups present their statements, listen critically and record evidence in the remaining columns of the "Country Opening Statements" table.

RESOURCES: PART I UNSUMMIT_OVERVIEW_(STUDENT) CONTINUED

PART II: FINDING SOLUTIONS AND BUILDING CONSENSUS

5. Each country group will develop and propose a set of four Actions to address the issue of food insecurity in all three countries. These proposed Actions will be developed with input from major stakeholders within your country, involved in the issue of food security. In order to persuade other members of the UN summit to adopt your Actions, the Actions should be:
   - Achievable: outline specific steps that can be taken to achieve your action
   - Effective: describe how the action would positively impact different nodes in the food production system, and how such impacts could be quantified
   - Beneficial to as many stakeholders as possible: your Actions will most likely be adopted if you can identify allies within the UN community and if you can demonstrate that the Actions will benefit all three countries
6. Refer to the handout, PartII_UNSummit_Example_UN Actions_EastFenwick_(Country_Group), to see examples of of Actions proposed to the UN, from the fictitious country of East Fenwick.
7. Either individually or in pairs, select a stakeholder group within your country group and complete the Part II_UNSummit_Systems Thinking Guide (Student) handout from the perspective of your stakeholder. Your goal is to brainstorm 1-2 Actions to propose to your country group, and think through how these Actions will both improve food security given projected drought and population growth, and how these Actions will impact other stakeholders. Additionally, try and predict any opposition that your proposed Actions might meet in the international community, and strategize about how you might counter this opposition.
8. Rejoin your country group, and discuss your proposed Actions with the other stakeholders. Together you will now complete "Part II: Finding Solutions - Country Group Action Proposals", starting on pg. 2 of your Part I_UNSummit_Gathering Information and Finding Solutions (Student) handout. Use the poster paper and markers provided to write up the final four Actions that your country group agrees upon.
9. Select two country representatives to present the four proposed Actions to the whole UN Summit group. All other members listen and record notes using the final table on the Part I_UNSummit_Gathering Information and Finding Solutions (Student) handout.
10. Await further directions from the teacher.

PART III: TESTING A SOLUTION

11. In this portion of the lesson, you will critically evaluate each of the four Actions adopted by the UN Summit, from the perspective of the stakeholder you represented in Part II. Refer to your PartIII_UNSummit_Testing_A_Solution_(Student) and Part III_UNSummit_Claim_and_Evidence_Rubric_(Student) handouts for detailed instructions.

Congratulations!
You have significantly contributed to improving global food security through your detailed research, analysis, clear logic, and cooperation and negotiation at the UN Summit.

RESOURCES: PART I: GATHERING INFORMATION AND FINDING SOLUTIONS (STUDENT)

UN Summit Country small group: _____

Use the first column of this table to describe the status of food security in your country. One representative from each country will use this information to present an opening statement about your country to the UN Summit. As the other two country groups are presenting, take notes in the remaining two columns about their state of food security.

TABLE: Country Opening Statements - Outlining Food Security at the National Level

Defining the Problem	Country _____	Country _____	Country _____
What are the three most important problems overall this country faces?			
Describe any challenges the country already faces specifically related to food security and water shortage.			
What is the current water usage for agriculture? Where do they get water for agriculture?			
How would the country be impacted by a 30% reduction in agricultural water supply due to a drought? Are there backup water resources available?			
What are some constraints you would face in trying to improve food security in this country?			
Is there any other information about this country (e.g. political, social, economic) that would be helpful to know in determining how best to address food insecurity and drought?			

Additional notes:

Is there any additional information about your country that would be helpful to present in your opening statement that you haven't already researched in previous lessons of the food security module (other calculations, environmental conditions, limits to resources, methods of growing food, etc)?

RESOURCES: PART II: UN SUMMIT - EXAMPLE UN ACTION, EAST FENWICK (COUNTRY GROUP HANDOUT)

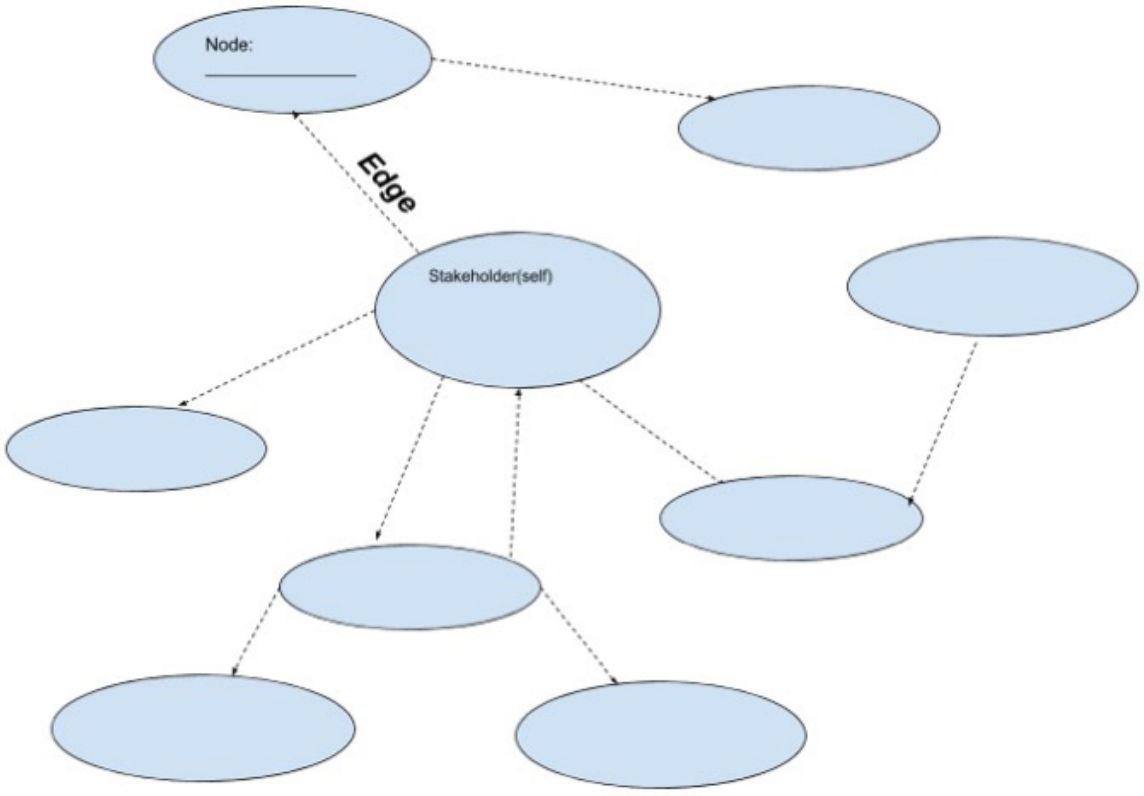
Here are example recommendations for actions that the country of East Fenwick has proposed, which include many potential solutions working in tandem:

Here are samples of earlier proposals to GUIDELINES for sustainable development. (Note: not all of these goals apply directly to individual countries and their food growing system).

RESOURCES: PART II: UNSUMMIT_SYSTEMS THINKING GUIDE (STUDENT)

Directions:

From the perspective of your stakeholder group, come up with two or more UN Actions that you will propose to your country group. Begin by using the food security causal loop systems diagram below to refresh your memory from "Lesson 3: Stakeholders! Who Cares?" and "Lesson 4: Food Security as a System" about how your stakeholder group is connected to other stakeholders within the food security system. Recall that the circles/nodes represent the stakeholders in the system, and the arrows/edges represent the relationships between stakeholders. Your "Stakeholder Guiding Questions" and "Stakeholder Table" from Lesson 3 will help you complete this task. Then, try and formulate Actions that will benefit as many other stakeholders as possible, keeping in mind that the aim of these Actions is to improve food security in all three countries. The "Balancing Act Article Chart Analysis" handout from Lesson 5 can help provide Action ideas.



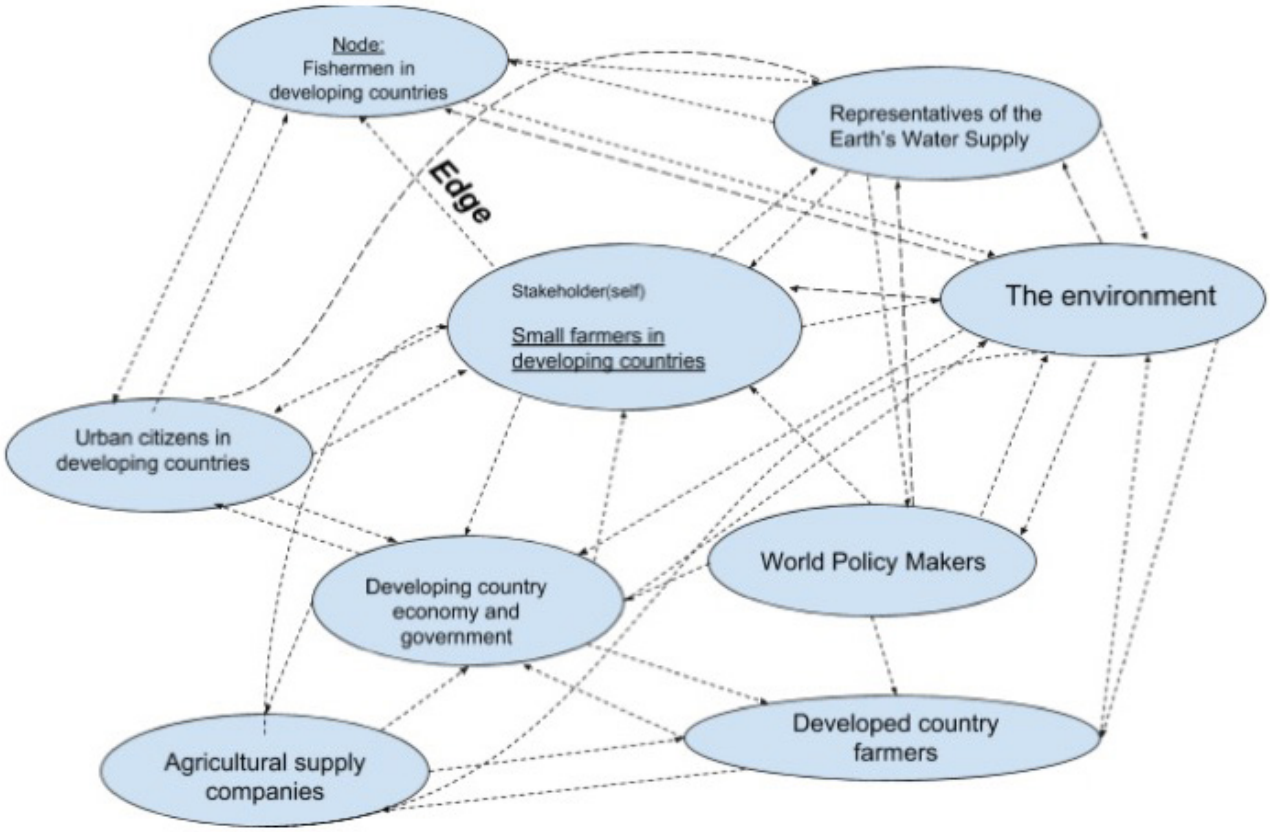
RESOURCES: PART II: UN SUMMIT _SYSTEMS THINKING GUIDE (STUDENT) Stakeholder Group _____

Ideas for UN Actions (proposed solutions) that would be beneficial from the perspective of your stakeholder group	How would the Action you proposed improve food security in your country?	Which other systems nodes/stakeholders would be positively affected by your Action?	Which other systems nodes/stakeholders would be negatively affected by your Action?	Can you think of any unintended consequences your Action might have on the system?	How do you foresee your Action being received by the international community?

RESOURCES: PART II: UNSUMMIT_SYSTEMS THINKING GUIDE (TEACHER KEY)

Directions:

From the perspective of your stakeholder group, come up with two or more UN Actions that you will propose to your country group. Begin by using the food security causal loop systems diagram below to refresh your memory from "Lesson 3: Stakeholders! Who Cares?" and "Lesson 4: Food Security as a System" about how your stakeholder group is connected to other stakeholders within the food security system. Recall that the circles/nodes represent the stakeholders in the system, and the arrows/edges represent the relationships between stakeholders. Your "Stakeholder Guiding Questions" and "Stakeholder Table" from Lesson 3 will help you complete this task. Then, try and formulate Actions that will benefit as many other stakeholders as possible, keeping in mind that the aim of these Actions is to improve food security in all three countries. The "Balancing Act Article Chart Analysis" handout from Lesson 5 can help provide Action ideas.



RESOURCES: PART II: UN SUMMIT _SYSTEMS THINKING GUIDE (TEACHER KEY)

For the teacher: in the table below, we list one Action for each of the stakeholder groups, and suggest different Actions for each group to provide a variety of ideas. Some of the actions can be proposed by several of the stakeholder groups, while some may not be applicable to certain case study countries.

Stakeholders	Ideas for UN Actions (proposed solutions) that would be beneficial from the perspective of your stakeholder group	How would the Action you proposed improve food security in your country?	Which other systems nodes/stakeholders would be positively affected by your Action?	Which other systems nodes/ stakeholders would be negatively affected by your Action?	Can you think of any unintended consequences your Action might have on the system?	How do you foresee your Action being received by the international community?
Small farmers in developing countries	Higher tariffs on imported food	Increase demand for local produce and economically support small farmers	The environment - reduced GHGs due to transportation of produce, reduced packaging materials	International agribusiness	Increased food prices, decreasing food security for those who can't afford the rise in price	Both positive and negative reactions, depending on whether a country imports or exports agricultural products, and whether or not they feel they can be self-sufficient in terms of food production
Fishermen in developing countries	Implementation of marine protected areas, with exclusive fishing rights surrounding them granted to local fisherfolk	Marine protected areas prevent the collapse of local fisheries and improve yields along their boundaries	The environment, urban citizens in developing countries	Fishermen in developed countries who might be employed by international businesses that fish off developing country coastlines	Initial decreased catch (and food insecurity) due to local fishing areas being relegated to marine protected area status	Positively by those stakeholders with a long-term perspective on food security, negatively by countries with international fishing fleets
Urban citizens in developing countries	Funding for public education and job-related training programs	Higher education enables individuals to obtain higher-paying jobs, which provide more income available for food expenditures	Developing country economy, small farmers and fishermen in developing countries	None really. A stretch would be that low-income families often rely on the labor of their children, so might suffer initially as their children spend time in school rather than in the labor market.	Developing countries often experience "brain drain" when educated citizens emigrate in search of better opportunities overseas	Positively
Developing country economy and government	Funding for implementation of improved irrigation systems	By reducing reliance of farmers on rainfall, irrigation technology helps mitigate the adverse impact of drought on agricultural production.	Small farmers and urban citizens in developing countries	Poorly planned irrigation systems could harm the environment	Over-use and drainage of groundwater supplies, re-routing of funds into the pockets of corrupt politicians	Positively, but with some skepticism from representatives of the Earth's water supplies
Representatives of developed country farmers	Subsidies to promote organic farming methods and more biodiverse crops	Improved land management and reduced fertilizer use will sustain higher crop yields and reduce impacts on downstream water supplies, where fishing occurs.	The environment, developed country citizens (food consumers)	Agricultural supply companies, because changes in farming methods would most likely decrease demand for synthetic fertilizers and genetically modified seeds	Movement away from monocultures might initially decrease the supply of staple food crops	A mixed reception. World policy makers (concerned about bulk food supply) and representatives of developed country economies (which supply products needed to sustain monocultures) might resist this action.

LESSON 6: WHERE DOES OUR FOOD COME FROM?

RESOURCES: PART II: UN SUMMIT _SYSTEMS THINKING GUIDE (TEACHER KEY)

For the teacher: in the table below, we list one Action for each of the stakeholder groups, and suggest different Actions for each group to provide a variety of ideas. Some of the actions can be proposed by several of the stakeholder groups, while some may not be applicable to certain case study countries.

Stakeholders	Ideas for UN Actions (proposed solutions) that would be beneficial from the perspective of your stakeholder group	How would the Action you proposed improve food security in your country?	Which other systems nodes/stakeholders would be positively affected by your Action?	Which other systems nodes/stakeholders would be negatively affected by your Action?	Can you think of any unintended consequences your Action might have on the system?	How do you foresee your Action being received by the international community?
Energy companies	Support for research and development of sources of alternative energy (solar, wind, geothermal)	Reductions in greenhouse gas emissions will slow the rate of climate change, which can cause devastation to agricultural productivity (e.g. tropical storms, drought, rising sea level)	The environment, representatives of the Earth's water supply, EVERYONE	Possibly representatives of food transport companies, who might deny the necessity of switching away from fossil fuels given the difficulty and expense of transitioning to transportation vehicles that run on alternative fuels	Down the road, economies reliant on fossil fuel exports (e.g. Venezuela, Saudi Arabia) will falter as alternative energy sources are adopted, and food insecurity may increase in those areas. Alternative energy sources can also have environmental consequences, such as bird mortality on wind farms and impacts on downstream habitat after dam construction.	A mixed reception, with likely some resistance from food transport companies, big agribusiness, and governments that do not fully accept the scientific evidence behind climate change
Agricultural supply companies	Support for research and development of improved seed varieties, and seed libraries to preserve knowledge of native plant species	Developing seed varieties adapted to drought and other climate variations resulting from global warming will ensure harvests even under challenging environmental conditions. Seed libraries can provide the fodder for developing these improved varieties	Citizens of developed and developing countries, possibly the environment (depending on whether or not genetic modification is used), the Earth's water supply	Possibly small farmers, if access to improved seed varieties is controlled by agribusiness	If seeds are genetically modified, the adult plants can cross-pollinate with neighboring organic crops and produce seedless plants, resulting in increased reliance of local farmers on agribusiness for their seed supply.	Positively, as long as public access to seed banks is ensured
Representatives of food transport companies	Support research and development of technologies that improve the lifespan of produce	Areas unable to produce their own food due to adverse environmental conditions could still have access to relatively fresh fruit and vegetables	Developed and developing country citizens, developed and developing country economies, Earth's water supply	The environment (action does not address the consequences of fossil fuel use in produce transportation)	Maintains the status quo regarding demand for agricultural products far from where it is produced	Positively, although small farmers may resist
Developed country citizens	More stringent regulations regarding food labeling, with emphasis on the environmental impact of the production process	Citizens will be better informed as to how their food is produced, and can choose food produced in a more sustainable fashion, encouraging positive stewardship of the environment	The environment, representatives of the Earth's water supply, fishermen and farmers who produce food sustainably	Representatives of developed country farmers, representatives of a developed country economy	If not appropriately regulated, inaccurate food labeling can mislead consumers. Also, farmers reliant on unsustainable methods of farming will go out of business	A mixed reception - representatives of developed country economies and farmers might argue that this action will drain the resources of food producers

RESOURCES: PART II: UN SUMMIT _SYSTEMS THINKING GUIDE (TEACHER KEY)

For the teacher: in the table below, we list one Action for each of the stakeholder groups, and suggest different Actions for each group to provide a variety of ideas. Some of the actions can be proposed by several of the stakeholder groups, while some may not be applicable to certain case study countries.

Stakeholders	Ideas for UN Actions (proposed solutions) that would be beneficial from the perspective of your stakeholder group	How would the Action you proposed improve food security in your country?	Which other systems nodes/stakeholders would be positively affected by your Action?	Which other systems nodes/ stakeholders would be negatively affected by your Action?	Can you think of any unintended consequences your Action might have on the system?	How do you foresee your Action being received by the international community?
World policy makers (e.g. FAO, UNDP)	Provision of equipment and training to local farmers to mitigate the impact of drought	Build resilience of local farmers to environmental shocks and stabilize food production	Farmers (both in developed and developing countries), representations of the Earth's water supply, the environment, citizens	Possibly energy companies, as farmers learn more efficient methods of providing their crops with water; citizens may experience reduced choice regarding plant products if drought-resistant species adapted to local environments are encouraged	Ideas about effective equipment and farming methods coming from international policy makers may pull local farmers away from traditional farming methods suited to their local geography	Positively
Representatives from the World Health Organization	Improve girls' education and access to reproductive services to achieve a replacement fertility rate of 2.1	Women can provide better nourishment to fewer children, and education also enables them to help raise their family's socioeconomic status (greater disposable income can be spent on food products)	Citizens of developing countries, including small farmers, fishermen, and urban dwellers	Male heads of households may be opposed to the empowerment of women in their families, and their voice might be echoed in representatives of their country's economy and government	This intervention could disrupt traditional cultures	Positively overall, with resistance from paternalistic societies opposed to uplifting women
The environment	Improve soil management techniques (e.g. biological nitrogen fixation, crop rotation, cover cropping) through farmer-training programs	Food production per unit land area can be increased with intelligent and sustainable soil management techniques. Improved soil management will also prevent erosion, salinization, and desertification, processes that render agricultural land unproductive	Citizens and farmers in both developed and developing countries, national economies	Possibly agricultural supply companies, as fertilizer use becomes more efficient	This funding may go to waste if government subsidies that encourage planting crops ill-suited to their environment continue. Various cover crop species could spread uncontrollably as alien invasives if local species are not utilized. Watershed health will improve as fertilizer runoff decreases.	Positively overall, with potentially some resistance from big agribusiness
Representatives of the Earth's water supply	Upscale aquaponics systems	Greater agricultural productivity per unit of water use, increased protein supply, reduced reliance on synthetic fertilizers	The environment, energy companies, agricultural supply companies (aquaponics equipment)	Agricultural supply companies (fertilizer), fisherfolk	Increased greenhouse gas emissions if electricity is not sustainably generated	Positively

RESOURCES: PART II: FINDING SOLUTIONS - COUNTRY GROUP ACTION PROPOSALS (STUDENT)

Directions: Having completed the "Systems Thinking Guide", all stakeholders within a country group should come together, discuss the Actions formulated by various stakeholders, and choose four to propose to the UN Summit. Complete the sections below to guide you in preparing to present to the summit.

1. State the four actions you propose will address the problem of global food insecurity, with particular emphasis on the three countries represented at the UN Summit:

2. Explain how the Actions you proposed will improve food security in these three countries given the predicted drought.

3. What evidence do you have that your Actions will be effective? Use your research from previous lessons to justify the proposal of each Action.

4. In the space below, sketch a systems diagram to predict and trace the positive effects your actions will have on the food production system. You are encouraged to use different colors to represent the effects of the four different Actions. What are the social, economic, political, and environmental nodes within the food production system that these UN Actions will target?

RESOURCES: PART II: FINDING SOLUTIONS - COUNTRY GROUP ACTION PROPOSALS (STUDENT)

5. Finally, summarize your plan in the table below and use it to help present your Actions to the UN Summit.

Proposed Action(s)	Problems addressed (specific to the countries attending)	Predicted positive outcomes	Supporting evidence

6. NOTES on Actions proposed by other countries:

Country proposing	Proposed Action	Notes

RESOURCES: PART II: UNSUMMIT_GRANT_FOR_PROPOSED_ACTIONS (UNSUMMIT_GROUP)

1 per UN Summit, to be completed by the appointed UN secretary

In principle, UNFAO combined total funds of $1,000,000 will be allocated for projects and actions to support guidelines with default duration of two years. Grants will not necessarily match the full amounts applied for. Grant allocations will not exceed US$400,000 for any given project, and will be of a minimum of US$50,000. Applicants must request an amount within this range. The majority of projects are granted no more than $250,000. Once the implementation period has elapsed, beneficiaries will be required to return unspent funding to UNFAO. Examples from the fictional country of East Fenwick can be found here.

United Nations Food and Agriculture Organization Fund
Project Proposal Summary

Be it resolved that:

Article 1: The UNFAO will take action to provide ...

Article 2: The UNFAO will take action to provide ...

Article 3: The UNFAO will take action to provide ….

Article 4: The UNFAO will take action to provide ...

RESOURCES: PART III: UN SUMMIT - TESTING_A_SOLUTION (STUDENT)

The Assignment:

As a group the UN Summit deliberated on a set of four Actions that, when funded, can change food production systems to help improve security. As stakeholders in your country, you must now evaluate these Actions. Your critical evaluation of these Actions will demonstrate your learning and systems thinking skills. Your central question is: Will the four Actions adopted by the UN Summit improve food security for your country, given projected population growth and a 30% decrease in the available water supply?

You will answer this question in the form of a letter to the UN Food and Agriculture Organization. In this letter, be sure to do the following:

1. Write from the perspective of the country stakeholder you represented during the UN Summit, and assess the effectiveness of the Action for your country

2. Address the 3 pillars of food security: will food in your country be more available, more accessible, and used more effectively?

3. Evaluate each of the four UN Summit Actions using the Claim-Evidence-Reasoning approach. Your letter should either:
   - Make a claim on behalf of your country, supporting the proposed Actions and providing evidence and reasoning as to why each Action will positively affect food security.

     OR
   - Make a claim on behalf of your country, requesting specific changes to the proposed Actions and providing evidence and reasoning as to why you believe the Actions will prove ineffective in your country and why your suggested changes will better improve food security.

4. Answer these sub-questions:
   - What will the effects of the Actions be on food production efficiency, and your country's dependence on food imports?
   - Will the Actions create a more environmentally sustainable food production system? Consider fertilizer production and use, water resources, and greenhouse gas emissions in your answer.
   - How effectively will the actions address the predicted 30% decrease in available water supply?

5. Use scientific evidence, and preferably quantitative data, to support your claims. As you did when coming up with Actions to propose at the UN Summit, consider these resources that you have developed throughout the module:
   - Calculations from APPLICATION 1, estimating water and food import savings from a model aquaponics model system
   - Population growth and other country data from the "Building Your Case" worksheet (Lesson FS1)
   - Systems network diagrams nodes and edges from Lesson FS4 and UN Summit work
   - "The Great Balancing Act" and your "Balancing Act Article Chart Analysis" from Lesson FS5

6. Refer to the "Part III: UN Summit - Claim and Evidence Writing Rubric" handout that you received along with these guidelines for specifics on how your letter will be graded.

Take a stand! Again, your question is:
Combined, can the four adopted UN Summit Actions significantly improve food security in your country given projected drought and population growth?

RESOURCES: PART III: UNSUMMIT _CLAIM_AND_EVIDENCE_RUBRIC (STUDENT)

"Testing a Solution" Essay Assignment

	4 points	3 points	2 points	1 point
Claim: A correct and complete statement that responds to the question asked or the problem posed.	Claim is: • Clear • Correct (in the context of their data) • Logical • Detailed • Linked to investigative question	The claim is correct (in the context of their data) but is missing one of the aspects below: • Clear • Logical • Detailed • Linked to investigative question	The claim is missing two or more of the aspects below: • Clear • Correct (in the context of their data) • Logical • Detailed • Linked to investigative question	Student has made a claim; however, it is not understandable.
Evidence: Convincing, appropriate and sufficient data and observations that support the claim.	Only the most convincing data (most likely a calculation to summarize data) are used to support the claim. There is sufficient evidence to support their findings. Evidence makes a comparison to relevant groups (including control group) when appropriate.	Convincing data is used to support the claim (most likely a calculation to summarize data) Data may not be the most convincing or may be extraneous. There is sufficient evidence to support findings. Evidence makes a comparison to relevant groups (including control group) when appropriate.	Relevant data is used to support the claim; however, the data are not convincing, may lack calculations, or may include extraneous data. There is not sufficient evidence to support the findings. Comparisons among relevant groups are not appropriate or are not present.	Only vague observations or references to experiment as evidence are provided OR Only evidence that is not relevant to the claim is provided.
Reasoning: Logically connecting the claim to the evidence in an organized and well thought-out manner.	Student logically connected the claim to the evidence, clearly articulating their thought process and reasoning, and avoiding repetition.	Overall the student successfully linked their claims to the supporting evidence, but there may be minor gaps in logic and/or some repetition.	Student has partially linked their claims to the evidence, but there are major gaps in logics and/or significant repetition.	Student does not clearly link their claims to the evidence presented.