

UP IN THE AIR: Understanding Vulnerability when toilets fly

TEACHERS HANDOUT

Case Study in Uganda

Camp Beseri Fort Portal, Uganda

Photo by: Blair Stewart

SUMMARY

Across sub-Saharan Africa, both natural and social factors contribute to household level vulnerability. This case study focuses specifically on Uganda, which has made progress towards meeting the United Nation's Millennium Development Goals, most notably halving the proportion of the population that is below the poverty line. Despite these impressive achievements, many households remain vulnerable to multiple social and environmental stressors. A better understanding of the drivers of household level vulnerability will assist stakeholders and policy-makers in determining what drives vulnerability at a household level, where vulnerable populations are, and suggest what type of aid to target specific locations to be of greatest benefit.

The goal of this case study is to encourage students to develop an appreciation for systems thinking through the construction of a conceptual model of household vulnerability in Uganda. Students will work in small teams to review vulnerability literature and studies focused on Uganda. Students will then use that information to construct a concept map that highlights the linkages among multiple variables and identify points of intervention that are effective in reducing household vulnerability and improving coping capacity to various stressors.

Each team will create a NGO with a mission statement and a proposal for a project funding. This proposal will take the form of a short oral presentation and a two page report, which will serve as the NGO's pitch for funding. Only one of the student projects will receive funding, which will be decided through a plurality vote by the rest of the class and the faculty member.

AUTHORS

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Student Handout Introduction

“Toilets are flying” one Ugandan official explained when describing how funding is needed to support sanitation infrastructure. The coordinator was referring to an article published just the day before in the Ugandan national newspaper documenting the common practice of residents in the slums around Kampala to put their human waste in small polythene bags and toss them into a local wetland or leave them in an alleyway because of the lack of formal sewage systems. “The way sewage is being dealt with is unsustainable, we need funding to build new capacity, which in turn will stop the pollution of the local water sources”, he declared.

Another NGO official exclaimed that soil erosion must be controlled. The loss of soil not only reduces soil fertility but it also pollutes local water sources. Meanwhile, yet another NGO cites the burden on women who must spend hours collecting and transporting water every day. The list of priorities is long and changes based on whom you talk to. Government officials, NGO’s, local leaders, and individuals will advocate for a number of different funding needs to include: education, especially of girls, building of roads, reducing population growth rates, empowering women, increasing electricity access, and improving public health.

Deciding which projects should get funding is tricky business for funding agencies! How do they decide? Is there one specific project that will increase human well being more than another? Should funding focus on a small neighborhood project or a large country project? What demographic group should be targeted? These are all important questions that need to be considered.

Case Study Objectives

Over the next five lessons your team will create a NGO with a focus on increasing human welfare in Uganda. The final goal is to design a pitch for funding for presentation to a selection committee. Your project will compete with other projects, only one project will be funded. To be successful you need to incorporate systems thinking, identify the drivers of vulnerability, and focus on aspects your assessment indicates are most important. Your project should be focused at a local scale, by either identifying a specific region or group of people.

What level is this case appropriate for?

This case is appropriate for a use in small classes at the 200-400 (second-fourth year) level for both disciplinary and interdisciplinary courses at a broad range of institutions.



SES learning goals

1. Understand the structure and behavior of socio-environmental systems. Identify the environmental and social components of the system and their interactions. Identify feedbacks and explain the dynamics of an socio-environmental system. Use tools and modeling approaches to understand dynamics of an socio-environmental system.

Since vulnerability is a **multifaceted, multidimensional concept**, students will need to explore factors from multiple disciplines, and develop their own concept maps that link these variables systemically. They will get exposed to and use Mental Modeler to develop their concept maps, which will allow students to think about both direct and indirect causal pathways as well as feedbacks.

In the advanced version of this case, students will use a pre-built model to try, observe, and learn about the impacts of their preferred policy interventions on multiple variables. Engaging with the model will permit them to develop a quantitative sense of the effects of these interventions.

2. Consider the importance of scale and context in addressing socio-environmental problems. Understand that ecological and social processes often vary across differing contexts, including space, time, and conditions (e.g. economic or political). Understand that ecological and social processes interact across different scales.

Both **spatial and temporal scales** are crucial to understanding what makes households vulnerable. Spatially, local and regional shocks such as a drought or a pest infestation have very different impacts compared to a broader shock such as a shift in national policy, or a change in the price of a crop on the global market. The shocks in these examples also play themselves out at very different temporal scales, and a thoughtfully developed concept map can highlight the differences among them.

3. Co-develop research questions and conceptual models in inter- or transdisciplinary teams. Identify disciplines and approaches relevant to the problem. Understand the value of different knowledge sources and ways of knowing.

Our team consists of a geographer, a hydrogeologist, and an economist. We will encourage students to incorporate relevant concepts not only from these disciplines but also others including, sociology, politics, history, and ecology. The case also involves bringing together multiple perspectives into the classroom. For example, the economics perspective encourages students to develop their notion of sustainable livelihoods as they think about various actors who have different, and sometimes conflicting, interests who operate within a paradigm that emphasizes specific ideas, and within a particular set of institutional rules.

4. Find, analyze, and synthesize existing data, ideas (e.g. frameworks or models), or methods. Identify data sources and appropriate tools, evaluate quality of data, and manage data. Understand the different kinds of data and research methods used by relevant disciplines in the natural and social sciences. Integrate different types of data (interdisciplinary integration).

Although students are not expected to use using data in their models, they have to develop a solid understanding for what data exists and how they go about measuring vulnerability. These data sources must be **interdisciplinary** because vulnerability is influenced both by environmental and social variables.



Learning Objectives: Learning Outcomes Mapped to Socio-Environmental Synthesis Goals and General Education Learning Objectives

Student Learning Outcome	Relationship to S-E Synthesis Goals
<ul style="list-style-type: none"> Students will be able to apply a systems thinking approach to understand the problem and identify properties of the system. Students will be able to define core concepts and elements of a system. Students will be able to identify and describe concepts such as boundaries, nonlinear relationships, emergent properties, patterns, and drivers . 	1a, 1b, 2a, 2b, 3a, 3b
<ul style="list-style-type: none"> Students will develop a definition of vulnerability. Students will identify and link various environmental, economic, social, and political factors that impact vulnerability. Students will gain the knowledge of concept mapping and will develop an initial concept map. 	1a, 1b, 2a, 2b, 3a, 3b, 4a, 4b
<ul style="list-style-type: none"> Students will explore the research process by developing an annotated bibliography or brief review of selected literature. Students will update concept map developed based on improved understanding of the topic from literature and class discussion. Students will transfer concept map to Mental Modeler (http://www.mentalmodeler.org). 	1a, 1b, 1c, 2a, 2b, 3a, 3b,
<ul style="list-style-type: none"> Students will propose the creation of an NGO and develop its mission statement that reflects its specific emphasis. Students will craft ideas to attract funding from potential donors for their proposed NGO. 	1a, 1b, 2a, 2b, 3a, 3b
<ul style="list-style-type: none"> Students will present arguments to potential donors in a competitive process for funding. 	1a, 1b, 2a, 2b, 3a, 3b





Part 1: Introduction to Systems Thinking

Time Estimate: 1-2 hours

Lesson Objectives:

- Introduce systems thinking and the properties of systems.
- Define core concepts and elements of a system.
- Consider fundamental properties of systems.
- Introduce concepts such as boundaries, nonlinear relationships, emergent properties, patterns, and drivers.

Assignments due before Part 1:

- Read chapter 7 on An Earth System Perspective in the “Global Environmental Outlook” Use the following url for the entire publication <http://www.unep.org/geo/geo5.asp> or access Chapter 7 alone at http://www.unep.org/geo/pdfs/geo5/GEO5_report_C7.pdf

Materials:

For the in-class activity the instructor will need to bring in large sheets of paper and tape that can be used to create thin and long rolls or tubes for the Helium Stick exercise.

Background:

Systems can help people **conceptualize and understand** the interactions and behaviors that we observe in wicked or complex phenomenon and problems. Starting with the selection of elements, the way that you define a system determines the kinds of answers or solutions you will find or identify.

Classroom Activities:

- Ask students to write a minute essay on the UN development goals.
- Lecture on general systems topics and definitions (approximately 45 minutes). Topics and content may be similar to: http://modeling.outreach.msu.edu/upload/2015/T2_McNall_Brown_ComplexProblems.pdf
- Students will play a game called “Helium Stick” to understand how the parts of a system interact to create unexpected behaviors and diagnose potential points for intervention and change to achieve a desired outcome. As a team students will work together to develop a strategy for winning the game and after playing, the debrief session can be used to help students deconstruct the parts of the game to understand it as a system. For example, the game has physical and structural components that can be likened to a natural system, while the team is following a set of prescribed norms or rules as they participate in a socially constructed game. Viewing the Helium Stick through a systems lens can help students conceptualize and practice using systems thinking in the classroom.
- (A complete description of Helium Stick <http://www.wilderdom.com/games/descriptions/HeliumStick.html>)

Assessment: None

Assignments due before Part 2

- For homework students must familiarize themselves with the UN development goals (<http://www.un.org/millenniumgoals/>).

Recommended Sources:

Booth Sweeney, L. & D. Meadows (1996). *The systems thinking playbook: Exercises to stretch and build learning and systems thinking capabilities*. The Turning Point Foundation.



Part 2: Defining Vulnerability

Time Estimate: 1-3 hours

Lesson Objectives:

- Develop a definition of vulnerability.
- Identify the drivers of vulnerability.
- Develop an initial concept map.

Materials:

Students will need computers to access information on Human Development Indicator (HDI) and the UN millennium goals.

Background:

Determining what makes people vulnerable is a question that is as simple as it is complex. Vulnerability – like happiness – is dynamic and changes based on temporal and geographic scales. Vulnerability is a human state that limits wellbeing. It is influenced by environmental stress. However, environmental stress, in turn, is significantly influenced by socioeconomic variables. This human-environment interaction can be exacerbated by population pressure, resource shortages, environmental change, and natural hazards.

Classroom Activities:

- Start a class discussion with the question, “**What is vulnerability?**” Ask students to consider how vulnerability is experienced in rich versus poor countries, how can vulnerability be observed and is it measurable? Introduce global development indicators such as the Human Development Indicator (<http://hdr.undp.org/en/content/human-development-index-hdi>).
- Divide students into small teams (2-4 students) to brainstorm and create a definition of vulnerability. Once teams feel they have a good definition have teams share their independent definitions and discuss what each team feels is key to their definition as a class.
- Continue the group dialogue with the goal of selecting a shared definition that the class will use for the remainder of the case study. The simpler, the better, for example: “vulnerability is the inability to withstand the effects of social or environmental changes”. It is also important to discuss a definition for wellbeing. Wellbeing can be defined as “the state of being content, healthy and prosperous”. Write a one minute essay answering the question: “what was the most challenging part about defining vulnerability?”
- Consider the role that aid organizations or NGO’s play in increasing wellbeing in communities. Have each team conduct an internet search for examples of NGO’s that specialize in development work. Also, refer to the UN millennium goals (<http://www.un.org/millenniumgoals/>) to discuss what some of the key development priorities are. End this exercise with each team sharing which NGO they found and which development goal(s) it focuses on with the rest of the class.
- Once the class has derived a definition for vulnerability give teams sticky notes and board space, have students identify drivers and connections between drivers as well as systems that they influence. Make sure to take a picture of the final board with the sticky notes. Students must pay attention to spatial and temporal resolution. Their models need to address both. Finish this exercise with teams writing a paragraph explaining their model/ concept map. For guidelines on creating concept maps please review the appendices of the following document: <http://www.sesync.org/tutorial-1-overview-of-socio-environmental-synthesis>.

Assessment:

- One minute essay on defining vulnerability.
- First draft of concept map.



Part 2: Defining Vulnerability continued

Assignments due before Part 3:

- Students are asked to search for literature or informational sources on vulnerability and Uganda specific reports. Each student should select one source about vulnerability and one article or report on Uganda. They must summarize key considerations that inform their understanding of the aspects of vulnerability. These annotated summaries should be brought to class to contribute to an in class activity where the class will create a shared list of references and provide the source for a discussion during Part 3.
- Scan the Mental Modeler website (www.mentalmodeler.org) make sure to watch the 4 minute tutorial video.

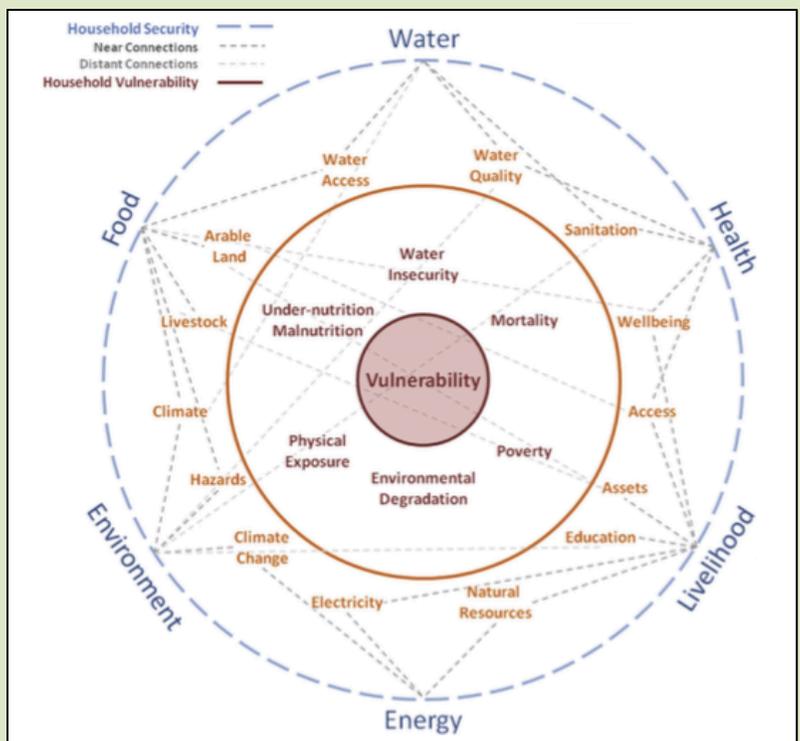
Recommended Sources:

- Amy Krakowka Richmond; Dylan Malcomb, and Kristine Ringler. 2015. Household Vulnerability Mapping in East Africa's Rift Valley. *Journal of Applied Geography*.
- See various resources via the Mental Modeler resource list (<http://www.mentalmodeler.org/#resources>)
- Gray, S., Zanre, E., and Gray S. 2013. Fuzzy Cognitive Maps as representations of Mental Models and group beliefs: theoretical and technical issues. *In Fuzzy Cognitive maps for Applied Sciences and Engineering - From fundamentals to extensions and learning algorithms* Ed: Elpiniki I. Papageorgiou. Springer Publishing

Example of a Conceptual Model of Vulnerability

This diagram depicts a conceptual model for the causal processes and dynamics that drive vulnerability at a household level in the East African Rift based on extensive fieldwork. The outer circle represents household wellbeing. Indicators in red around the center circle are pathways commonly attributed in research to the social-ecological environment in sub-Saharan Africa and capture how households exhibit vulnerability. Indicators in orange serve as metrics used to measure along a spectrum of vulnerability (inner circle) and household security (outer circle).

*Vulnerability network diagram;
Richmond et al. 2015*



Part 3: Analyzing the literature and creating a concept map

Time Estimate: 1-3 hours

Lesson Objectives:

- Explore the research process by completing an annotated bibliography or brief summary selected literature. Sources from either peer reviewed or grey literature (e.g. governmental or NGO reports) are acceptable.
- Adjust the concept map developed in Part 2 based on student's updated understanding of the topic from literature and class discussion.
- Give students practice and experience with iterative processes with concept models.
- Develop a model of your concept map in Mental Modeler (<http://www.mentalmodeler.org>).

Materials:

- Students must bring sources of information and 1-2 entries in an annotated bibliography format to class.
- Both teacher and students must bring a computer that can access Mental Modeler (Windows OS for downloaded executable and the online web option can be used for other OS such as Apple or Linux).

Background:

The goal of this section is to have students develop skills in gathering a variety of sources and then **summarize and synthesize** them into a shared bibliographic reference list. Students will discuss the sources they select with their team and using the original concept maps from Part 2 with new information from the literature reviews, students will further refine the concept map design. Once they are confident that their concept map captures the pertinent drivers of vulnerability and the connections between the drivers, they will formalize their model in Mental Modeler.

Classroom Activities:

- Each student will come to class having read at least one peer reviewed article on vulnerability and a report or article that may or may not have been peer reviewed with a focus on Uganda.
- Students should complete an annotated bibliography or summary of each article that meets assessment standards (rubric defined below).
- Start class with discussion of the annotated bibliographic references within small teams.
- Have groups determine what they think are the primary drivers of vulnerability in Uganda.
- After groups have determined drivers of vulnerability, discuss as a class. Make sure to address the influence of spatial and temporal resolution.
- Using Mental Modeler have students use their previously developed concept map to design a model of household level vulnerability.

Assignments due before Part 4:

- Conduct an individual journal exercise where students write one page about how their current concept model of vulnerability has developed and how temporal and resolution is addressed.
- Teams must complete their concept map in Mental Modeler with narrations.
- Students prepare a presentation of their narrated concept map.

Assessment:

Annotated bibliography - should include a descriptive paragraph that 1) includes a complete listing of citation information needed to reference the article and 2) a descriptive overview of the article content. The descriptive overview for each annotated record should briefly summarize important points of the article, or report that may be useful for the creation of a vulnerability index and/or understanding. The group will select a subset of articles for the class bibliography and the annotated content will streamline discussion about which articles to incorporate.

Recommended Sources:

Jarchow, M., Using concept mapping to experientially introduce systems thinking, On the Cutting Edge Peer reviewed teaching activities collection, accessed on August 27, 2015, <http://serc.carleton.edu/integrate/workshops/sustainability2012/activities/jarchow.html>



Part 4: Creating a NGO, a mission statement, and an investment pitch

Time Estimate: 1-3 hours

Lesson Objectives:

- Create an NGO with a name and a mission statement.
- Outline an investment pitch. What is the project that the NGO wants funding for? (Make sure to remind students that the presentation rubric and the two page pitch rubrics are in their student handout).

Materials:

Students need to bring their Mental Modeler concept maps.

Background:

Students design an NGO with a specific mission and focus. For example, their NGO might focus on water. If students have a difficult time figuring out what to focus on, or if multiple teams want to focus on the same topic, the instructor might need to assign groups focus areas. For example, one team might focus on water the other on food security.

Next, students will design a project focused on a specific geographic region or group of people. The projects will address the **drivers of vulnerability** in their model that they believe influences vulnerability the most. For example, the Lganaga district just east of Kampala is one of Uganda's most vulnerable areas. Health is the primary vulnerability driver in this region. HIV rates are 15 percent, which is over double Uganda's national average of 6.5 percent. The population in this region consists of 57 percent children and of those, 47 percent are orphans and vulnerable children because of impacts of HIV (Uganda Bureau of statistics, 2007). Another uniquely vulnerable area in Uganda is the Hoima district in Western Uganda on Lake Albert. Oil has recently been discovered here, and some \$1.5 billion has already been invested in Uganda's oil (Groen and Jacobs, 2012). Building refineries has made land disputes common in this area as has caused hundreds of residents to be evicted from their land (Voice of America, 2014). Oil exploration and production have also polluted the environment.

Classroom Activities:

- Spend the first part of class having students present their concept models created in Mental Modeler and explain what drivers of vulnerability and connections they identified.
- In the second half of class students will work with their teams to develop their NGO and design the project they want funded. NGO's must have a specific mission, which will be identified in a mission statement. An excellent example of an NGO is wateraid (<http://www.wateraid.org/what-we-do>). Their mission statement is as follows: "WaterAid is an international organisation whose mission is to transform the lives of the poorest and most marginalised people by improving access to safe water, sanitation and hygiene."
- Once students have designed a NGO and a mission statement they need to create a proposal for funding a specific project. These projects can be designed to decrease vulnerability for a specific, small scale region such as a village or group of people.



Part 4: Creating a NGO, a mission statement, and an investment pitch, continued

Assignments due before Part 5:

- Students need to write a two page project proposal for their NGO. This two page document needs to be well designed and act as an aid to their oral presentation. Use your concept maps to inform your proposal.
- Prepare a 10 minute Pitch for funders needs to include time for questions.

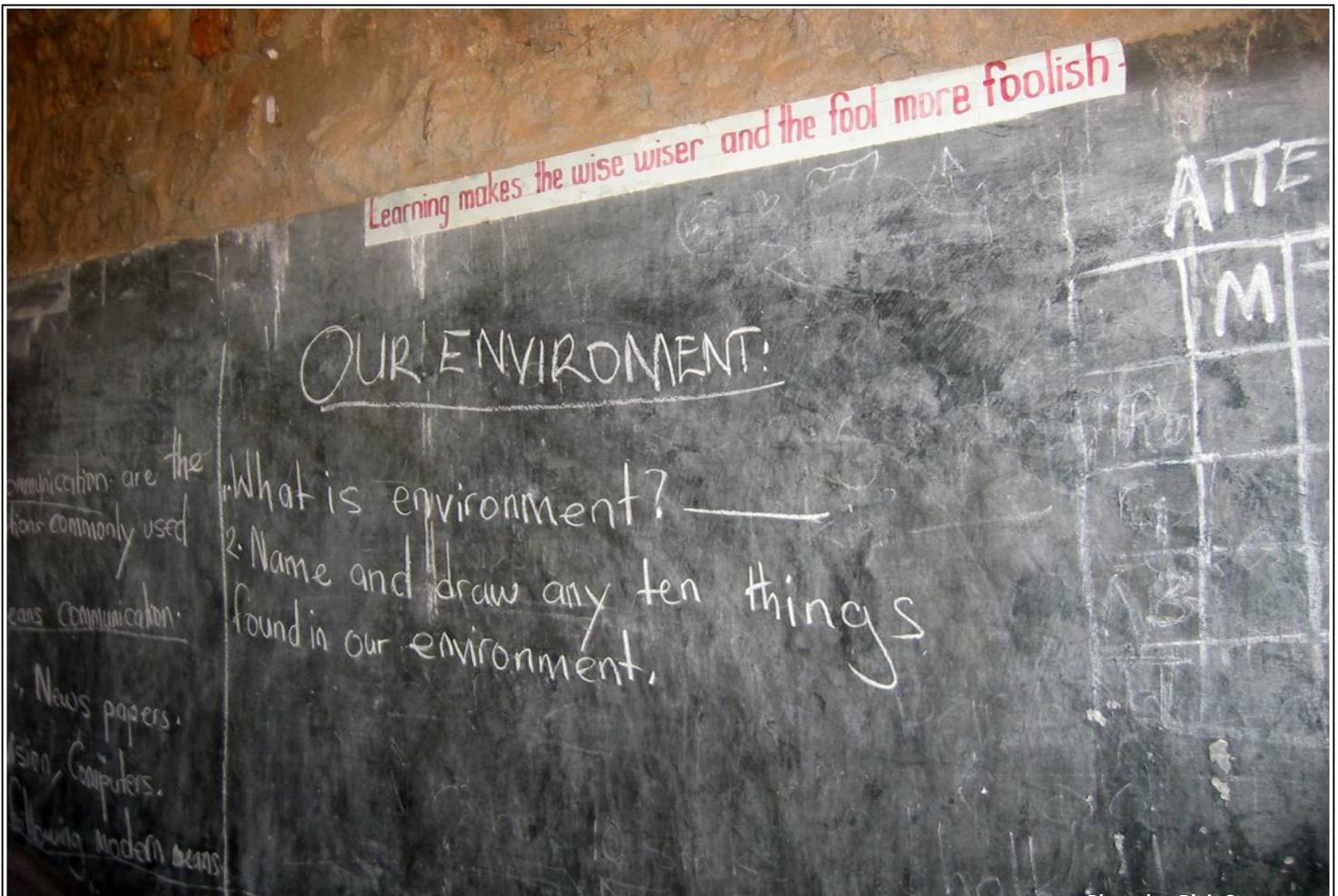
Assessment:

Narrated concept map (see Rubrics of Evaluating Systems Thinking Handout)

Recommended Sources:

Concept Maps, accessed on August 27, 2015,

http://serc.carleton.edu/integrate/teaching_materials/mineral_resources/conceptmaps.html





Part 5: Presenting the Pitch

Time Estimate: 1-3 hours

Lesson Objectives:

- Students will present a convincing pitch to compete for funding for their NGO's project.
- The class and the faculty member (and anyone else invited to attend) will vote on the best pitch.

Materials:

- Students must bring their pitch paper.
- Students must bring their pitch presentation with them (if PowerPoint send it to instructor beforehand).

Background:

The goal of this lesson is to have students present their **pitch for funding** as a culminating experience of this case. They will have 15 minutes to make the strongest case for their NGO. In addition they will hand out their NGO's two page document to support their pitch to the instructor and other teams. Presenting in this way mimics the real life presentations NGO's must do when competing for project funding. The class and teacher will vote on the best project and pitch. Students get one vote per team. This requires teams to negotiate the best project and reach a consensus. The faculty member gets one vote, in this way the faculty vote is worth slightly more than the individual students vote.

Classroom Activities:

- All teams have 15 minutes to present their pitch. This 15 minutes should include time for questions.
- After all the presentations are done, teams will need to come up with a way to decide which NGO to fund. To this they will have to establish their criteria and support their decision, this will need to be documented on a rubric that the instructor will supply.
- At the end of the class a student reflection period is necessary. Students will answer a survey and then discuss the case as a class.

Assessment:

- Ten minute pitch presentation.
- Two page pitch document.
- Criteria to decide which pitch to fund.



Additional Sources

Thinking in Systems

J. W. Forrester, *Industrial Dynamics*, The MIT Press, Cambridge, Massachusetts, 1961.

D. H. Kim, "Toolbox: Guidelines for Drawing Causal Loop Diagrams," *The Systems Thinker*, Vol. 3, No. 1, pp. 5–6 (February 1992).

G. P. Richardson and A. L. Pugh III, *Introduction to System Dynamics Modeling with DYNAMO*, Productivity Press, Cambridge, Massachusetts, 1981.

P. M. Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, Doubleday Currency, New York, 1990.

P. M. Senge, C. Roberts, R. B. Ross, B. J. Smith, and A. Kleiner, *The Fifth Discipline Fieldbook: Strategies and Tools for Building a Learning Organization*, Doubleday Currency, New York, 1994.

Concept Mapping References

Novak, Joseph D., and Cañas, Alberto J. 2008. *The Theory Underlying Concept Maps and How to Construct and Use Them*. Technical Report IHMV CmapTools 2006-01 Rev 01-2008. Florida Institute for Human and Machine Cognition. Available at <http://cmap.ihmc.us/Publications/ResearchPapers/TheoryUnderlyingConceptMaps.pdf>.

Vulnerability References

Homer-Dixon, T.F., Levy, M.A., 1995. Environment and Security. *International Security*, 20 (3), 189-198.

Kelley, P. M., Adger, W. N., 2000. Theory and practice in assessing vulnerability to climate change and facilitating adaptation. *Climatic Change*. 47 (4), 325-352.

Krakovka, A. R., Heimel, N., Galgano, F.A, 2012. Modeling Environmental Security in Sub-Saharan Africa. *The Geographical Bulletin* 53, 21-38.

Malcomb, D., Weaver, E., Krakowka, A. K., 2014. Vulnerability Modeling for Sub-Saharan Africa: An Operationalized Approach in Malawi. *Journal of Applied Geography*, 48, 17-30.

Stephan, L., Downing, T., 2001. Getting the Scale Right: A Comparison of Analytical Methods for Vulnerability Assessment and Household-level Targeting. *Disasters*, 25 (2), 113-135.

The Strauss Center's Program on Climate Change and African Political Stability (CCAPS)
<https://www.strausscenter.org/ccaps/research>.
Last accessed: 12 December

Turner, B.L., Kasperson, R.E., Matson, P.A., McCarthy, J.J., Corell, R.W., Christensen, L., Schiller, A., 2003. A framework for vulnerability analysis in sustainability science. *Proceedings of the National Academy of Sciences*, 100 (14), 8074-8079.



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Manyak, T. G., Katono, I. W., 2011. Impact of Multiparty Politics on Local Government in Uganda. *African Conflict & Peacebuilding Review*, Spring (Article) Published by Indiana University Press. 1 (1), 8-38.

Newborn survival in Uganda: a decade of change and future implications for the Uganda Decade of Change and Future Implications Analysis Group. *Health Policy and Planning*, 27, 104–117.

Ministry of Health (MoH) [Uganda], ORC Macro, and John Snow, Inc/Deliver, 2003. *Uganda Health Facilities Survey 2002: Key Findings*. Arlington, Virginia and Calverton, Maryland, USA.

Pender, J., Jagger, P., Nkonya, E., Sserunkuuma, D., 2004. *Development Pathways and Land Management in Uganda*. International Food Policy Research Institute, Washington, DC, USA, Indiana University, Bloomington, USA, and Makerere University, Kampala, Uganda. *World Development*, 32 (5), 767-792.

Pickering, A. J., Davis, J., 2012. Freshwater Availability and Water Fetching distance Affect Child Health in Sub-Saharan Africa. *Environmental Science & Technology*, 46, 2391-2397.

Ssewanyana, S., Younger, S. D., 2007. Infant Mortality in Uganda: Determinants, Trends and the Millennium Development Goals. Economic Policy Research Centre, Makerere, Uganda, and Cornell University, Food and Nutrition Policy Program, Ithaca. *Journal of African Economies*, 17 (1), 34–61.

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Assessment Rubrics

Annotated Bibliography Rubric

ITEM	Yes (2)	Partially (1)	No (0)
Is the article relevant			
References cited properly in the text and in the infographic.			
References are high quality, credible sources.			
Clearly state the relevance of the article			
Summary of article is clear			
Sentences are clear. Transitions between ideas are logical and smooth			
There are no grammatical or spelling errors			



Assessment Rubrics

Concept Map Rubric

Systems Thinking Concepts	1	2	3	4	5
Identification of critical variables					
Linearity					
Interconnectivity					
Cause-effect relations (causal loop)	Most of the feedback loop processes and effect on the variables and the overall behavior of the system are inaccurately described or missing and the feedback loops are out of balance or do not effectively regulate the system; and most of the nature of the feedback loops are inaccurately described.				
Dynamic Processes	View the whole system as static, and no consideration of dynamic processes, or time delay effects		View the whole system as partially static, or no consideration of dynamic processes occurred in the system; or no consideration of time delay		View the whole system as dynamic entity, considering dynamic processes occurred in the system; consider time delay effects
Contextualization	The reasoning process and conceptualization is decontextualized, taking no context-specific consideration, containing no contextual variables or effects		The reasoning process and conceptualization is partially contextualized, taking some context-specific considerations, containing an insufficient number of contextual variables or effects		The reasoning process and conceptualization is highly contextualized, taking full context-specific consideration, containing an appropriate number of contextual variables or effects.
Underlying mechanism (explanatory knowledge)	The description does not address the nature of the parts of the system and the intercausal relationships of the parts in a way that explains how these relations serve as underlying mechanisms in the system		The description partially addresses nature of the parts and inter-causal relationships in a way that explains underlying mechanisms and explanatory knowledge		The description articulates the nature of the parts of the system and inter-causal relationships and how these serve as the underlying mechanism of the system and explanatory knowledge



Assessment Rubrics

Presentation Rubric

	ITEM	Yes (2)	Partially (1)	No (0)
Content	Explain background information that provided the basis for pitch			
	Explain the significance of your project (why is this project worth doing?)			
	Explain your project (what is your focus, what driver are you focused on, what scale, over what time period?)			
	Explain why you choose your focus area			
	Use graphs, pictures, other visuals to explain your projects. Explain graphs, thoroughly ("walk us thru")			
	Explain why your project should be funded			
	Explain what you think should be done next.			
	Appropriate terminology was introduced/ explained & used.			
PPT Style	The slide show was clear and well organized.			
	The text was large enough to read from a distance.			
	Text was not overused. Images and diagrams were included wherever possible.			
	You delivered your presentation without rushing.			
	You spoke directly your audience, without frequently looking at the ppt.			
	Q&A: your group responded thoughtfully to questions.			



Assessment Rubrics

Two Page Pitch

	ITEM	Yes (2)	Partially (1)	No (0)
Title	Catchy title captures your attention			
Mission Statement	Succinct, intuitive statement			
Written Content	Clearly state the project			
	Explain why it is important			
	Show evidence of your reasoning			
	What driver(s) do you hope to influence			
	Do you clearly state your intent			
	Is your project concise and manageable?			
	Sentences are clear. Transitions between ideas are logical and smooth			
	There are no grammatical or spelling errors			
Visual Content: create an original infographic	Does your infographic show your major position about the claim?			
	Infographic shares the most relevant information accurately.			
	Infographic is visually rich, appealing, and makes complex ideas simple			
Style	Appropriate creativity is used to engage your audience- you want to read it makes you care & want to learn more!			
References	References cited properly in the text and in the infographic.			
	References cited properly at the end.			
	References are high quality, credible sources.			
	Findings from the references are described.			



Assessment Rubrics

Journal Rubric

Criteria	ITEM	Yes (2)	Partially (1)	No (0)
Critical Thinking	Rich in content; insightful analysis, synthesis and evaluation, clear connections made to real life situations or to previous content			
Written Content	Ideas are clear and well organized			
	Sentences are clear. Transitions between ideas are logical and smooth			
	There are no grammatical or spelling errors			
Style	Appropriate creativity is used			
	Insider knowledge is not assumed. Terminology is explained.			
	Writing stays on topic and to the point.			



Assessment Rubrics

Peer Review Rubric

Reviewer:

Team being Reviewed:

Criteria	Worst				Best
Content	1	2	3	4	5
Style	1	2	3	4	5
Professionalism	1	2	3	4	5
Argument	1	2	3	4	5
Project Design	1	2	3	4	5
Relevance of project	1	2	3	4	5
Creativity	1	2	3	4	5

Do you believe that this team identified a critical point of intervention that has potential to have a real impact?

Give one constructive criticism