



THE WORLD FOOD PRIZE

MICHIGAN YOUTH INSTITUTE

At Michigan State University

Student Research Paper Instructions

To participate in World Food Prize Michigan Youth Institute, students research a global challenge and write a 2-5 pages paper with the guidance of a teacher mentor at their high school. The 2017 World Food Prize Michigan Youth Institute is scheduled for **May 11th, 2017** at the Michigan State University. The research paper is due on **March 31, 2017** [online](#).

Please read the complete instructions to ensure eligibility. Further details and instructions for the paper are found in the following document and online at: www.worldfoodprize.org/MICHIGAN

For questions, please contact Makena Schultz at schul430@anr.msu.edu or (517) 432-7603 and Brian Wibby at wibby@anr.msu.edu or (906) 475-5731.

EXPLORE

- Choose a country and a critical global challenge to research.
- Propose your own solution to the challenge in a country of your choice.
- Discover careers paths and opportunities in STEM, food, agriculture, and policy.
- Analyze how global trends affect a country and its people, economy, environment, health, and way of life.

ENGAGE

- Present your ideas to fellow students and experts who are working to solve these real-world problems every day.
- Participate in interactive, hands-on experiments and simulations led by professors and faculty.
- Connect with other students who want to change the world.
- Immerse yourself at Michigan State University labs and facilities to experience firsthand what it would be like to study and work in these fields.

EARN

- Qualify for international internships, paid fellowships at the USDA, and other exciting opportunities to fight hunger.
- Have a life-changing experience with world-renowned experts
- Network with global leaders in science, industry and policy, and receive personalized feedback on your research and recommendations.

STEPS TO COMPLETE THE RESEARCH PAPER

STEP 1:

Select a country as the focus of your research (Page 3)

STEP 2:

Select one key factor affecting food security (Page 4)

STEP 3:

Answer the listed questions to develop your paper (Page 5)

STEP 4:

Ask a mentor to help review and edit your paper (Page 6)

STEP 5:

Submit the paper online with your mentor (Page 7)



INTRODUCTION TO THE ISSUES

“Food is the moral right of all who are born into this world.”

- Dr. Norman Borlaug, Nobel Peace Prize Laureate and World Food Prize Founder in his Nobel Peace Prize Lecture, Oslo, Norway, December 11, 1970

BACKGROUND

Sustainably feeding the more than 9 billion people who will be on our planet by the year 2050 is a critical issue that must be urgently addressed. Iowa native Dr. Norman Borlaug, renowned Nobel Peace Prize Laureate and World Food Prize founder, advocated throughout his life and career, as a scientist and humanitarian, that attaining global food security would require effective solutions, technologies and policies for the world’s smallholders. Fittingly, his poignant final words were, “Take it to the farmer.”

In today’s world, almost 1 billion people – 1 out of every 8 – go to bed hungry every night. There are strong, direct relationships linking poverty, agricultural productivity, and food security. About 70% of the world’s poor live in rural areas, especially in Africa and Asia. The majority of these poor subsist on about 450 million smallholder farms (five acres or less). The most critical and immediate improvements in the livelihoods of smallholders can be achieved through agriculture-led economic growth and improved nutrition and health. As rural farmers and urban gardeners are able to grow and access more and better food, improved diets and health, higher family incomes, and improved livelihoods result. Families with the financial resources to escape extreme poverty rarely suffer from chronic hunger, while poor families not only suffer the most from chronic hunger, they are also the segment of the population most at risk during food shortages. Therefore, raising incomes through improvements in agricultural productivity and food availability is a key to directly benefiting the poor.

Volatile climate effects from rising temperatures such as the increasing frequency and severity of storms, flooding and droughts, the spread of plant diseases and weeds, and rising sea levels will have significant negative impacts on agricultural productivity. Shifting trends in agricultural production driven by these effects will most severely impact the world’s poorest countries in Africa and Asia, threatening the ability of smallholder farmers to overcome hunger and malnutrition.

Successful technologies and policies for enabling smallholder farmers to overcome hunger and poverty by increasing agricultural productivity must be adapted to local climatic circumstances, guided by the farmers themselves, and more readily available to them.

WHAT IS FOOD SECURITY?

Food security is when people do not live in hunger or fear of starvation. Food insecurity exists when people are undernourished as a result of the cost or physical unavailability of food and adequate nutrition. Worldwide, more than 925 million people – one seventh of the world population – are without enough food to eat on a regular basis and six million children die of hunger annually. Two billion people face sporadic food insecurity throughout the year, and there are 22 countries, 16 of which are in Africa, where more than one-third of the population is malnourished.

RESEARCH PAPER INSTRUCTIONS

Your Mission: Select ONE developing country (see Step 1) and ONE of the key factors affecting food security (see Step 2) as the focus of your research. You will then prepare your paper using the guided questions (see Step 3), presenting your research findings and recommendations for increasing food production and availability in ways that improve food security and household livelihoods in your chosen country.

STEP 1. SELECT ONE OF THE COUNTRIES BELOW AS THE FOCUS OF YOUR RESEARCH:

Example: If you consider the **Indian Subcontinent**, your research will focus on a factor affecting food security in ONE of these countries: **Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan or Sri Lanka**

North Africa: Algeria, Canary Islands (Spain), Egypt, Libya, Morocco (including Western Sahara), Tunisia

Central Africa: Angola, Cameroon, Central African Republic, Chad, Congo, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Sudan, South Sudan, Zambia

East Africa: Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mayotte, Mozambique, Reunion, Rwanda, Seychelles, Somalia, Tanzania, Uganda

West Africa: Benin, Burkina Faso, Cape Verde islands, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, São Tomé & Príncipe, Senegal, Sierra Leone, Togo

Southern Africa: Botswana, Lesotho, Namibia, South Africa, St. Helena (U.K.), Swaziland, Zimbabwe

Caribbean: Anguilla (U.K.), Antigua & Barbuda, Bahamas, Barbados, Bermuda (U.K.), Cayman Islands (U.K.), Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique (France), Montserrat (U.K.), Netherlands Antilles, Puerto Rico (U.S.), St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines, Trinidad & Tobago, Turks & Caicos (U.K.), Virgin Islands (U.K., U.S.)

South America Tropical: Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Venezuela

South America Temperate: Argentina, Chile, Falkland Islands (U.K.), Uruguay

Central America: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama

Indian Subcontinent: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka

East Asia: China, Hong Kong S.A.R. (China), Japan, Democratic People's Republic of Korea (North), Republic of Korea (South), Macao S.A.R. (China), Mongolia, Taiwan

Southeast Asia: Brunei, Darussalam, Burma (Myanmar), Cambodia, East Timor, Indonesia, Lao People's Democratic Republic (Laos), Malaysia, Philippines, Singapore, Thailand, Vietnam

Central Asia: Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan

Middle East: Bahrain, Cyprus, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Turkey, United Arab Emirates, Yemen

Eastern Europe: Albania, Armenia, Azerbaijan, Belarus, Bosnia/Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Russia, Serbia, Montenegro, Slovakia (Slovak Republic), Slovenia, Ukraine

South Pacific: Christmas Island, Cook Island, Federated States of Micronesia, Fiji, French Polynesia (Tahiti), Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn, Samoa, American Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, Wake Island, Wallis & Futuna



STEP 2. SELECT ONE KEY FACTOR AFFECTING FOOD SECURITY FROM THE FOLLOWING:

Biology, Environmental & Agricultural Sciences

Factors 1-12

- 1. Plant Science** Increasing crop yields and improving disease/drought resistance through research and breeding of improved plant varieties
- 2. Water Scarcity** Managing water scarcity and adapting farming practices to reduced water supplies with improved irrigation technologies and conservation practices
- 3. Biofuels** Balancing the demand on global food and energy supplies and ensuring that developing nations also benefit from the use of biofuels
- 4. Animal Health** Preventing the transmission of disease in livestock and poultry with improved management, investments in vaccine development, and proper application of medications to avoid antibiotic-resistance
- 5. Climate Volatility** Responding to climate volatility by adapting agricultural practices and policies to increase carbon sequestration and support ecological resilience to erratic weather, rising temperatures/drought, saltwater intrusion, and shifting plant diseases and pest infestations
- 6. Sustainable Agriculture** Developing and implementing sustainable agricultural practices (no-till, crop rotation, integrated pest management, etc.) to combat erosion, desertification and soil depletion and reduce pesticide/herbicide use and minimizing environmental degradation associated with industrial agricultural practices (improved animal waste disposal, conservation buffers, etc.)
- 7. Animal Agriculture** Implementing sustainable practices for raising livestock and poultry (management intensive grazing, integrated livestock/poultry grazing and poultry/vegetable production systems, fish pond farming systems, etc.)
- 8. Spoilage & Waste** Reducing spoilage and improving the quality and shelf life of food products with improved food preservation techniques and increased processing capacity (flash-heating, aseptic processing, freeze drying, bulk storage, etc.)
- 9. Water & Sanitation** Increasing access to safe, potable water supplies, toilets and pit latrines, and education on proper sanitation/hygiene and food preparation techniques to reduce the transmission of food and water-borne disease
- 10. Dietary Diseases** Addressing obesity, heart disease, diabetes, and other dietary diseases through nutrition education, access to nutritious foods, and healthy behavior (dietary diversification, food selection, portion-size control, exercise, etc.)
- 11. Malnutrition** Alleviating micronutrient deficiencies (iron, vitamin A, iodine, zinc) and protein-energy malnutrition through improved access to nutritious food, fortification, supplementation, school-feeding programs, nutrition education, emergency therapeutic feeding, etc.
- 12. Human Diseases** Reducing the burden of illness and infectious diseases like HIV/AIDS, Tuberculosis (TB), Malaria, etc., to improve human health and nutrition and raise agricultural production
- 13. Demographics** Addressing the challenges and opportunities posed by population growth and urbanization
- 14. Conflict Resolution** Preventing and resolving political and armed conflict with diplomatic initiatives
- 15. Human Rights** Addressing gender, cultural and economic discrimination and improving access to credit and securing property rights for the poor and marginalized
- 16. Education** Investing in education, training and extension for improved implementation of agricultural research and technology
- 17. Good Governance** Reducing corruption by promoting the rule of law, government accountability, democratic principles and transparency
- 18. International Trade** Removing discriminatory international trade policies to improve market access, promote fair trade and increase economic development
- 19. Foreign Aid** Assisting vulnerable populations and improving the effectiveness of humanitarian relief and food aid in conflict zones and disaster sites
- 20. Farm to Market** Improving access to markets through infrastructure development (roads and railways, internet, mobile technologies, electricity)

Social Studies & Geography

Factors 9-19

Economics & Business

Factors 15-20



STEP 3. ANSWER THE FOLLOWING QUESTIONS TO DEVELOP YOUR PAPER:

1. **Choose ONE of the countries listed under Step 1 as the focus of your research.**
2. **Define a typical subsistence farm family or poor urban family in your country:**
 - a. family size and composition, diet, education and access to health care;
 - b. farm size, crops grown, and agricultural practices (if researching a farm family) or employment and wage, and where they typically purchase food and have access to private or community gardens (if researching an urban family); and
 - c. major barriers to improving agricultural productivity, employment and earning a living wage, and gaining access to food markets and adequate nutrition.
3. **Select ONE of the key factors listed under Step 2 as the focus of your research.**
4. **Answer the following questions to develop your paper and understand how your selected factor affects food security in your country:**
 - a. How does the factor you selected affect agricultural productivity, household income or food availability and quality in your chosen country? Discuss the following:
 - i. What role does the factor presently play in causing your family to not produce enough food, earn sufficient income to purchase food, or access adequate nutrition?
 - ii. What is the present status of this factor? How severe is the situation? Is the environment being degraded? Are women, rural or urban poor, or developing countries particularly disadvantaged? If so, how?
 - iii. Are the trends for this factor improving, worsening, staying the same? How are the trends for this factor measured? Do these measurements indicate the situation is changing? If so, how? Because of potential change, or no change, is the situation for your rural farm or urban family getting worse, improving or staying the same?
 - b. How would improving or resolving this factor increase the amount or quality of food or income available to your family? Preserve the environment sustainably? Lead to economic development and poverty reduction? Benefit women, smallholder farmers or urban dwellers in your country of focus?
 - c. How will other major issues (climate volatility, population growth, water scarcity, urbanization, energy demand, pollution, etc.) affect your chosen factor and the wellbeing of your family and their community in the decades ahead?
 - d. Based on your research, give your recommendations on how to effectively address your selected factor to improve the food security of your rural or urban family in the country on which you have focused. What policies, technologies, practices or investments do you recommend to solve this situation? Describe one or more local projects in your focus country that could be scaled up successfully.
 - e. Give your suggestions for the appropriate role of communities, the national government, corporations and other organizations (United Nations, World Bank, international research agencies, non-governmental and civic organizations, etc.) in implementing your recommendations in your country. How should rural farm and urban families be involved as key players in implementing these recommendations?

RESEARCH PAPER CHECKLIST

As you review your final paper for submission, use this checklist to ensure you have completed all of the guided instructions:

Country selected: _____

- ___ Define a typical family
 - ___ Family size and composition
 - ___ Diet
 - ___ Education
 - ___ Access to health care
- ___ Describe a typical farm OR urban area
 - ___ Typical Farm
 - ___ Farm size
 - ___ Crops grown or animals raised
 - ___ Agricultural practices
 - ___ OR Urban Area:
 - ___ Employment and wages
 - ___ Access to purchased food
 - ___ Urban food production
- ___ Describe major barriers facing the typical family
 - ___ Barriers to improving agricultural productivity
 - ___ Barriers to employment at a living wage
 - ___ Barriers to accessing food markets and adequate nutrition

Factor selected: _____

- ___ Describe how the factor you selected affects agricultural productivity, household income, OR food availability and quality
 - ___ Describe the effect of the factor on the typical family in your country
 - ___ Describe the present status of this factor
 - ___ Describe the trends for this factor (improving, worsening, or constant)
 - ___ Describe how improving this factor would benefit your country
- ___ Describe how other major issues (climate volatility, population growth, water scarcity, energy demand, pollution, etc.) will affect your chosen factor

Give recommendations on how to effectively address your factor to improve food security for the typical family in the country you have selected:

- ___ Describe one or more local projects in your focus country that could be scaled up successfully
- ___ Give suggestions for the appropriate role of communities, the national government, and organizations in implementing your recommendations
- ___ Describe how the typical family can be involved in implementing your recommendations

PAPER FORMAT REQUIREMENTS

Be sure to review the *Introduction to the Issues* and instructions on *How to Write Your Paper* before beginning your research, and follow the *Paper Format Requirements* below, as all papers will be evaluated on both content and formatting. A list of suggested references can be found in the *Sample Resources*, and the *Sample Paper* provides an example of how to format and structure your paper.

Students selected to attend the Global Youth Institute as a delegate will have their research papers peer-reviewed and published online by the World Food Prize Foundation.

FORMAT REQUIREMENTS

Papers must include:

- **Identification in the upper left-hand corner** of the first page providing the name of the student author, high school name, school city, school state, selected country and factor number, and essay title (in bold)

Example: Jackie Smith
Central High School
East Lansing, MI
India, Factor 11: Malnutrition

India: A Holistic Approach for the Rural Population

- **Body of approximately 2-5 pages minimum** in length including:
 - an introduction and conclusion, each of which must be at least one-half page
 - word count of approximately 1000 to 2500 words minimum, excluding bibliography
- **Bibliography page with at least five sources and in-text citations** using the standards set by the Modern Language Association (MLA) or American Psychological Association (APA). Choose one style and use it consistently.
- **MLA Style Guide:** <http://owl.english.purdue.edu/owl/resource/747/01/>
- **APA Style Guide:** <http://owl.english.purdue.edu/owl/resource/560/01/>

Papers must be submitted as a Word (.doc or .docx) file and meet the following page format requirements:

- **One-inch page margins** (top, bottom, left, right)
- **Eleven-point (11) font, Times New Roman**
- **Single-space text, no indentation**
- **Double-space between paragraphs**

SUBMISSION

Submit papers electronically through the online registration system:

<http://events.anr.msu.edu/wfpmiyi/>

ONLINE PAPER SUBMISSION DEADLINE: Friday March 31st, 2017

SAMPLE RESOURCES

Below are suggested resources, general and organized by factor, to aid your research. Note: This is not a full resource list and use of additional resources will be needed to meet the requirements of the paper.

The World Food Prize does not endorse any particular point of view represented in these resources.



MAPS, FACTS & FIGURES

Big Facts Site – CGIAR’s Research Program on Climate Change, Agriculture and Food Security (CCAFS) features over 100 infographics on this site that illustrate the most up-to-date information on these topics.

<https://ccaafs.cgiar.org/bigfacts/#>

Central Intelligence Agency - The World Factbook: Background information by country.

<https://www.cia.gov/library/publications/the-world-factbook/index.html>

Millennium Development Goals Monitor & Tracking Map

Track how countries are progressing in their efforts to achieve the Millennium Development Goals (MDGs)

www.mdgmonitor.org/index.cfm www.mdgmonitor.org/map.cfm?goal=0&indicator=0&cd

Interactive Hunger Map & Country Database

World Food Programme (WFP), the United Nations’ frontline agency in the global fight against hunger

www.wfp.org/hunger

Global Hunger Index

International Food Policy Institute (IFPRI), Concern Worldwide, Welt Hunger Hilfe, 2013.

www.ifpri.org/publication/2013-global-hunger-index

Global Food Security Index

Measures the risks and factors that drive food security including affordability, availability, and quality and safety.

<http://foodsecurityindex.eiu.com>

Rural Poverty Portal - select country from drop down menu for statistics and articles

International Fund for Agricultural Development (IFAD)

www.ruralpovertyportal.org/web/guest/region

Famine Warning System Network (FEWS NET) - provides timely and rigorous early warning and vulnerability information on emerging and evolving food security issues.

www.fews.net/Pages/default.aspx

Farming First - highlights the importance of improving farmers’ livelihoods and agriculture’s potential contribution to global issues such as food security, climate change and biodiversity (*includes infographics and case studies*)

www.farmingfirst.org

FAO Infographic - Equal access to resources and power for food security in the face of climate change

The infographic describes the links between food security, gender and climate change.

www.fao.org/resources/infographics/infographics-details/en/c/180754



GENERAL RESOURCES

The resources in this section provide an overview of food security issues

Can We Feed Seven Billion People? Sir Gordon Conway, Huffington Post, October 28, 2011

www.huffingtonpost.co.uk/professor-sir-gordon-conway/can-we-feed-seven-billion_b_1063464.html

Food and Agriculture Organization of the United Nations: The food security arm of the UN, the FAO provides a global perspective on agricultural challenges and development. www.fao.org/index_en.htm

2014 International Year of Family Farming (IYFF) - aims to raise the profile of family farming and smallholder farming by focusing world attention on its significant role in eradicating hunger and poverty, providing food security and nutrition, improving livelihoods, managing natural resources, protecting the environment, and achieving sustainable development, in particular in rural areas.

www.fao.org/family-farming-2014/en

The State of Food Insecurity in the World 2015 (SOFI): The Multiple Dimensions of Food Insecurity

www.fao.org/publications/sofi/en

UN Zero Hunger Challenge Website (Resources & Documents)

www.un.org/en/zerohunger/resources.shtml

Millions Fed: Proven Successes in Agricultural Development

David Spielman, Rajul Pandya-Lorch. International Food Policy Research Institute (IFPRI), 2009.

www.ifpri.org/sites/default/files/publications/millionsfedbooklet.pdf

Innovations in Action (supplement to the Worldwatch Institute's 2011 State of the World Report)

www.worldwatch.org/system/files/NtP-Innovations-in-Action.pdf



RESOURCES LISTED BY FACTOR

Factor 1 - Plant Science:

Unleashing a Decade of Innovation in Plant Science: A Vision for 2015-2025

American Society of Plant Biologists, 2013.

<http://plantsummit.files.wordpress.com/2013/07/aspb-final-report-plant-summit-lo-res-web-july-15-2013.pdf>

New Technologies for Sustained Productivity Growth: Plant Breeding

Donald Duvick. Iowa State University, 2004

<http://ageconsearch.umn.edu/bitstream/33020/1/fo04du03.pdf>

Agricultural Biotechnology and Genetically Engineered Crops - Policy Briefs

US Agency for International Development (USAID), 2004

http://absp2.cornell.edu/resources/briefs/documents/warp_briefs_eng_scr.pdf

Factor 2 - Water Scarcity:

Water-Short World Will Need "More Crop per Drop" - Experts

Megan Rowling. Alertnet, 2012

www.trust.org/alertnet/news/water-short-world-will-need-more-crop-per-drop-experts

Beyond More Crop per Drop

Frank Rijsberman and Nadia Manning. International Water Management Institute (IWMI), 2006

[www.iwmi.cgiar.org/Publications/Other/PDF/Beyond more crop per drop.pdf](http://www.iwmi.cgiar.org/Publications/Other/PDF/Beyond_more_crop_per_drop.pdf)

Factor 3 - Biofuels:

Biofuels and Sustainable Development

Henry Lee, William Clark, and Charan Devereaux. 2008

www.globalbioenergy.org/fileadmin/user_upload/gbep/docs/2008_events/S_Servolo/San_Servolo_Biofuels_Report_FINAL.pdf

The State of Food and Agriculture 2008: "Biofuels: Prospects, Risks, and Opportunities"

Food and Agriculture Organization (FAO), 2008

Summary: [ftp.fao.org/docrep/fao/011/i0100e/i0100e01.pdf](ftp://ftp.fao.org/docrep/fao/011/i0100e/i0100e01.pdf)

Full Report: www.fao.org/docrep/011/i0100e/i0100e00.htm

Factor 4 - Animal Health:

Transboundary Animal and Plant Pests and Diseases

Food and Agriculture Organization (FAO), 2009

<ftp://ftp.fao.org/docrep/fao/meeting/018/k6361e.pdf>

Combating Infectious Diseases of Livestock for International Development

BBSRC and UKAid, February 2010

www.bbsrc.ac.uk/web/FILES/Publications/100215-cidlid-brochure.pdf

Factor 5 - Climate Volatility:

Micro-level Practices to Adapt to Climate Change for African Small-Scale Farmers

Till Below, Astrid Artner, et al. International Food Policy Research Institute (IFPRI), 2010

[www.fao.org/fileadmin/user_upload/rome2007/docs/Micro-level Practices to Adapt to Climate Change.pdf](http://www.fao.org/fileadmin/user_upload/rome2007/docs/Micro-level_Practices_to_Adapt_to_Climate_Change.pdf)

Climate Change Response Strategies for Agriculture: Challenges and Opportunities for the 21st Century

Francesco Tubiello, Josef Schmidhuber, et al. World Bank, 2008

www.fao.org/fileadmin/templates/em2009/docs/World_Bank_2008c_.pdf

Factor 6 - Sustainable Agriculture:

Agricultural Sustainability and Intensive Production Practices

David Tilman, Kenneth G. Cassman, Pamela A. Matson, Rosamond Naylor, and Stephen Polasky. Nature, 2002

www.cedarcreek.umn.edu/biblio/fulltext/t1860.pdf

The Paradigm of Conservation Agriculture

J. Dumanski, R. Peiretti, J. Benetis, et al. World Association of Soil and Water Conservation, 2006

www.unapcaem.org/publication/ConservationAgri/ParaOfCA.pdf

Factor 7 - Animal Agriculture:

Sustaining intensification of smallholder livestock systems in the tropics

J.J. McDermott, S.J. Staal, H.A. Freeman, M. Herrero, and J.A. Van de Steeg. Livestock Science, 2010

<http://dels.nationalacademies.org/resources/static-assets/banr/AnimalProductionMaterials/McDermottSustainingIntensification.pdf>

Revisiting Mixed Crop-Livestock Systems: Smart Investments in Sustainable Food Production

M. Herrero, P. K. Thornton, et al. Science, 2010 (Must create free "Science" sign-in for free access to full article)

www.sciencemag.org/content/327/5967/822/reply#sci_el_13136

Factor 8 - Spoilage and Waste:

Increasing Food Availability by Reducing Postharvest Losses of Fresh Produce

A.A. Kader. Acta Horticultura, 2005

<http://ucce.ucdavis.edu/files/datastore/234-528.pdf>

Postharvest losses and waste in developed and less developed countries: opportunities to improve resource use

R.J. Hodges, J.C. Buzby, and B. Bennett. Journal of Agricultural Science, 2010

<http://journals.cambridge.org/action/displayAbstract?aid=8030717>

Factor 9 - Water and Sanitation:

Water Quality

UN Water, 2011

www.unwater.org/downloads/waterquality_policybrief.pdf

Compilation of 13 Factsheets on Key Sustainable Sanitation Topics

Elisabeth von Münch, Rahul Ingle, Doreen Mbalo, and Leonie Kappauf. Sustainable Sanitation Alliance, 2012

www.sswm.info/sites/default/files/reference_attachments/MUENCH%20et%20al%202012%20Compilation%20of%2013%20Factsheets%20on%20Key%20Sustainable%20Sanitation%20Topics.pdf

Factor 10 - Dietary Diseases:

Chronic Diseases Growing in Developing Nations: WHO

Kate Kelland, Reuters (posted on Huffington Post), July 16, 2012

www.huffingtonpost.com/2012/05/16/chronic-disease-developing-nations_n_1520195.html

The Nutrition Transition and Obesity in the Developing World

Barry Popkin. American Journal of Clinical Nutrition, 2001

<http://jn.nutrition.org/content/131/3/871S.full.pdf+html>

Factor 11 - Malnutrition:

Micronutrients (Statements and Resources)

World Health Organization, 2012

www.who.int/nutrition/topics/micronutrients/en/index.html

Saving Lives in Africa With The Humble Sweet Potato

Dan Charles. National Public Radio, 2012

www.npr.org/blogs/thesalt/2012/08/15/158783117/saving-lives-in-africa-with-the-humble-sweet-potato

Factor 12 – Human Diseases:

Addressing the Links among Agriculture, Malaria, and Development in Africa

International Food Policy Research Institute (IFPRI), 2011

www.ifpri.org/sites/default/files/publications/2020anhconfbr16.pdf

HIV/AIDS and Food Security

Interagency Coalition on AIDS and Development, 2001

www.icad-cisd.com/pdf/HIV_AIDS_and_Food_Security_ENGLISH.pdf

Factor 13 - Demographics:

Population Aspects in the Reduction of Hunger

Food and Agriculture Organization of the United Nations, 2004

www.un.org/esa/population/publications/PopAspectsMDG/04_FAO.pdf

Population and Economic Development

Population Reference Bureau, 2012

www.prb.org/pdf12/population-economic-development-2012.pdf

Factor 14 - Conflict Resolution:

Food, Security, Justice and Peace

Food and Agriculture Organization (FAO), 2002

www.fao.org/worldfoodsummit/msd/Y6808e.htm

Conflict: A Cause and Effect of Hunger

Ellen Messer, Marc Cohen, and Thomas Marchione, Environmental Change and Security Program, 2001

www.wilsoncenter.org/sites/default/files/ECSP7-featurearticles-1.pdf

Factor 15 - Human Rights:

Underfed, Underpaid, and Overlooked: Women, the Key to Food Security in South Asia

Nira Ramachandran. International Institute for Environment and Development, 2008

pubs.iied.org/pdfs/14560IIED.pdf

Improving Gender Equity in Access to Land

Food and Agricultural Organization (FAO), 2006

ftp.fao.org/docrep/fao/010/a0664e/a0664e.pdf

Factor 16 - Education:

Education and the Developing World: Why Education is Essential for Development

The Center for Global Development, 2002

www.cgdev.org/files/2844_file_EDUCATON1.pdf

Girls' Education: Towards a Better Future for All

Department For International Development (DFID). 2005

www2.ohchr.org/english/issues/development/docs/girlseducation.pdf

Factor 17 - Good Governance:

Good Governance: An Overview

International Fund for Agricultural Development, 1999

www.ifad.org/gbdocs/eb/67/e/EB-99-67-INF-4.pdf

Global Consultation on Governance and the Post-2015 Framework

www.worldwewant2015.org/governance

Factor 18 - International Trade:

Promoting Market Access for the Rural Poor in order to Achieve the Millennium Development Goals

International Fund for Agricultural Development (IFAD), 2003

www.ifad.org/gbdocs/gc/26/e/markets.pdf

Improving Market Access: Toward Greater Coherence between Aid and Trade

International Monetary Fund (IMF), 2002

www.imf.org/external/np/exr/ib/2002/032102.htm

Factor 19 - Foreign Aid:

Foreign Aid Reform: Studies and Recommendations

Susan Epstein and Mathew Weed. Congressional Research Service (CRS), 2009

www.fas.org/sgp/crs/row/R40102.pdf

Renewing American Leadership in the Fight Against Global hunger and Poverty

Catherine Bertini and Dan Glickman. Chicago Council on Global Affairs, 2009

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Factor 20 - Farm to Market:

Infrastructure and Poverty Reduction - What is the Connection?

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BOOKS

Acker, David and Gasperini, Levinia. **Education for Rural People – The Role of Education, Training and Capacity Development in Poverty Reduction and Food Security**. Food and Agriculture Organization (FAO), Rome, 2009.

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Sachs, Jeffrey. **The End of Poverty: Economic Possibilities for Our Time**. The Penguin Press, USA, 2005.

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Thurow, Roger. **The Last Hunger Season: A Year in an African Farm Community on the Brink of Change.** PublicAffairs, New York City, 2012.

Thurow, Roger, Kilman, Scott. **Enough: Why the World's Poorest Starve in an Age of Plenty.** PublicAffairs, USA, 2009.

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Worldwatch Institute. **State of the World 2012: Moving Toward Sustainable Prosperity.** Worldwatch Institute, Washington DC, 2012.

Worldwatch Institute. **State of the World 2014: Governing for Sustainability.** Worldwatch Institute, Washington DC, 2013.

Worldwatch Institute. **State of the World 2015: Confronting Hidden Threats to Sustainability.** Worldwatch Institute, Washington DC, 2015.

Yunus, Muhammad. **Creating a World without Poverty.** PublicAffairs, New York, 2008.

High School and College Textbooks can also be used for background information on relevant scientific subjects, for example, nutrition, public health, molecular biology, genetics, botany, agriculture, sociology, economics, ecology and geography.



MASS MEDIA, NEWSFEEDS & BLOGS

Newspapers can often initiate awareness about current events, issues and ideas on food security at local, national, regional and international levels. *The New York Times* publishes a Science Section every Tuesday. *Yahoo! News*, on the Internet, has daily science and world headline articles that are taken from Reuters Press Agency and other sources. Other news sources to consult include:

IRIN Humanitarian News & Analysis
www.irinnews.org

Inter-Press News (African smallholder farming news)
www.ipsnews.net/new_focus/farmingfuture/index.asp

BBC News
www.bbc.co.uk/news

Voice of America News
www.voanews.com

National Public Radio
www.npr.org

Agriculture and Ecosystems Blog – CGIAR Research Program on Water, Land and Ecosystems
<http://wle.cgiar.org/blogs>

Global Food for Thought Blog – Forum for information, commentary and debate hosted by The Chicago Council and the Global Agricultural Development Initiative. <http://globalfoodforthought.typepad.com>

The New Agriculturalist - Provides an update on the latest news and developments in tropical agriculture for a global audience. www.new-ag.info



RELEVANT ORGANIZATIONS & INFORMATIONAL WEBSITES

African Renewal – African News and Analysis from the United Nations (*Quarterly News*)
www.un.org/africarenewal

Bangladesh Rural Advancement Committee (BRAC)
www.brac.net

Bread for the World

www.bread.org

The Chicago Council on Global Affairs

www.thechicagocouncil.org

Climate Wise Women

www.climatewisewomen.org

The Coalition for Adolescent Girls (Check out the “Knowledge” section to access the: “Girls Count Reports”, “Global Girl Facts” and “Girls Discovered Global Map”) www.coalitionforadolescentgirls.org

Consultative Group on International Agricultural Research (CGIAR)

www.cgiar.org

Grameen Bank

www.grameen-info.org

Grameen Foundation

www.grameenfoundation.org

HarvestPlus

www.harvestplus.org

Heifer International

www.heifer.org

Intergovernmental Panel on Climate Change

www.ipcc.ch

International Assessment of Agricultural Science and Technology for Development (IAASTD)

www.unep.org/dewa/Assessments/Ecosystems/IAASTD/tabid/105853/Default.aspx

International Food Policy Research Institute (IFPRI)

www.ifpri.cgiar.org, www.ifpri.org/countries, www.ifpri.org/publications

The New Partnership for Africa's Development (NEPAD)

www.nepad.org

Oxfam International

www.oxfam.org

Partnership to Cut Hunger and Poverty in Africa

www.partnership-africa.org

United Nations Children’s Fund (UNICEF)

www.unicef.org

United Nations Development Programme (UNDP)

www.undp.org

The UN Millennium Project

www.unmillenniumproject.org

United States Agency for International Development (USAID)

www.usaid.gov

The World Bank (Click [here](#) for the Students & Teacher’s page – view Youthink! About Development “Issues Briefs” section) www.worldbank.org <http://blogs.worldbank.org/youthink>

World Food Programme (WFP) of the United Nations

www.wfp.org

World Resources Institute (WRI)

www.wri.org

Worldwatch Institute

www.worldwatch.org



RECOMMENDED INTERVIEWS, SPEECHES & PANEL DISCUSSIONS

“The Single Greatest Challenge in Human History” keynote by World Food Prize President, Amb. Kenneth Quinn, at the UN World Food Day Observance in New York, 23 November 2013

bit.ly/1iFbke8

Video Interview with 2003 World Food Prize Laureate Catherine Bertini on Nutrition and Girl’s Education, Chicago Council on Global Affairs, 23 October 2013. Chicago Council Senior Fellow and former Executive Director of the UN World Food Program Catherine Bertini discusses how gender relates to agriculture, the role of nutrition in the first 1,000 days of life, and the importance of US investment in agriculture development.

<http://globalfoodforthought.typepad.com/global-food-for-thought/2013/10/video-interview-with-catherine-bertini.html>

A New Dialogue: Putting People at the Heart of Global Development Hunger-Nutrition-Climate Justice-2013 Conference, Dublin, Ireland, 15-16 April 2013

www.mrfcj.org/pdf/hncj/conference-papers.pdf

Seven Billion And Counting On Point, NPR Audio Archives, 27 October 2011

<http://onpoint.wbur.org/2011/10/27/seven-billion>

Global Food Price Spikes On Point, NPR Audio Archives, 9 February 2011

<http://onpoint.wbur.org/2011/02/09/global-food-price-spikes>

“Take it to the Farmer”: Reaching the World’s Smallholders – Proceedings of the 2010 Borlaug Dialogue

World Food Prize International Symposium, Video and Audio Archives, 15-17 October 2010

www.worldfoodprize.org/en/borlaug_dialogue//previous_years/2010_borlaug_dialogue

Silent Tsunami: Global Food Crisis (John McArthur, Executive Director, Millennium Promise; Raj Patel, Visiting Scholar, University of California at Berkeley/Author of “Stuffed and Starved;” and Joia Mukherjee, Medical Director, Partners in Health) On Point with Tom Ashbrook, NPR Archive, 5 May 2008.

<http://onpoint.wbur.org/2008/05/05/silent-tsunami#>

Giving Africa Infrastructure for Growth Talk of the Nation, NPR Audio Archives, 5 April 2006

www.npr.org/templates/story/story.php?storyId=5325397

How Can Scientists Help Address Poverty? (Per Pinstrup-Andersen, 2001 World Food Prize Laureate; and other experts) Talk of the Nation, NPR Audio Archives, 17 February 2006

www.npr.org/templates/story/story.php?storyId=5221063

The Problems of Preventing Famine (Natasha Quist, West Africa Regional Director, OXFAM; Marc Cohen, Research Fellow, IFPRI; and Jason Beaubien, NPR News) Talk of the Nation, NPR Audio Archives, 26 July 2005

www.npr.org/templates/story/story.php?storyId=4771717

Addressing Hunger and Poverty (Jeffrey Sachs, Director, Earth Institute, Columbia University; and Lester Brown, President and Founder, Earth Policy Institute) Talk of the Nation, NPR Audio Archives, 20 May 2005

www.npr.org/templates/story/story.php?storyId=4660415

UNICEF’s Voices of Youth Digital Diaries

First-person accounts by young people from around the world on issues affecting their lives

www.unicef.org/voy/takeaction/takeaction_2692.html

