



McGill Institute for Global Food Security

**Fifth McGill Conference on
Global Food Security:**

Food Prices and Political Instability

SUMMARY,
KEY FINDINGS AND RECOMMENDATIONS

OCTOBER 16-18, 2012

MONTREAL, CANADA



McGill Institute for
Global Food Security
Institut pour la sécurité
alimentaire mondiale
de McGill

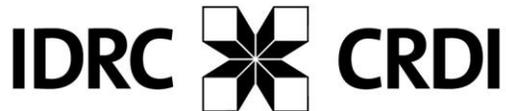


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This Conference is made possible through the generous support of

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agriculture



The Macdonald Stewart Foundation

- Anton Angelich
- Erin Hogg
- Anita Jean Dunn
- Chesley Lockhart
- Roland McC. Greenbank
- Dr. Keith MacMillan



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EXECUTIVE SUMMARY

Population growth, changing diets, high oil prices, reduced level of stocks, increased use of biofuels made from food crops, climate change, growing shortages of water for agricultural use and climate change all contribute to high food prices. Climate shocks, such as droughts or flooding, reactive trade policies and civil unrest result in high food price volatility. Both increase stress on livelihoods: for the poor who spend the majority of their income on food and for the small holder who is reluctant to invest when food prices are unstable. Many governments respond by subsidizing food prices or food production, straining government resources and leading to increased government debt and/or declines in government services and the capacity to develop the country. Increasing unhappiness of the populace, related to diminished living standards and the erosion of government capacity, can contribute to social unrest and political instability. The objective of the 2012 conference was to examine the relationship between global food prices, price volatility and political instability and explore how high prices and price volatility could be managed over the short and long terms.

Key messages of the conference:

- Food price spikes in 2008 and 2011 were closely associated with social unrest in countries around the world. However, prices of food, crude oil and non-food commodities followed similar curves and since all three would affect personal incomes, it is difficult to attribute social unrest only to food
- There are two different views of managing the agricultural sector. Merchants and governments generally manage food production and distribution in an economically rational and efficient way (the commercial or market economy) while others feel that food should be managed according to ethics, justice and tradition (the moral economy). Public feelings of injustice at the imposition of the market onto food production and availability may trigger more political volatility than expensive food on its own.
- Food prices are closely linked to oil prices through the energy required to make fertilizer and cultivate, process and transport food and also through the FAO Food Price Index which includes grains, oils and sugars, food commodities which may be diverted to make biofuel. As crude oil prices rise, so does the value of these commodities and with them, the Food Price Index.
- The international price of food is the price of food available for export while the domestic price is dependent on location. Domestic markets are frequently not connected to international markets and changes in international food prices and volatility may therefore play only a small role in domestic markets. Domestic price volatility has a greater impact on food insecurity and is due to weather shocks reducing harvests, poorly developed market infrastructure, unpredicted policy changes, and conflict.



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- Responses to high food prices and volatility are different for international and domestic markets. Domestic, and often short term, responses to high food prices and volatility seen during the 2007/8 food price spike included: trade policies (reduction of tariffs on imports, restricted or banned exports, released stocks at subsidized prices); safety nets (cash transfer, food assistance) and interventions to boost domestic supply in the short run (production support/input subsidies).
 - At the international level, increasing the availability and transparency of information about global food supplies will reduce panic-induced policy actions which may cause price surges. The new Agricultural Marketing Information System (AMIS) provides reliable and up-to-date data on supply, demand, stocks, and export availability of major crops and will lead to a more coordinated policy response to market tensions. The establishment of an international grain reserve that maintains a stock-to-use ratio above 21% would also help to reduce price volatility.
 - Growth of the GDP originating in agriculture is much more effective in reducing poverty than GDP growth originating outside the agriculture sector. Long term investments which raise agricultural productivity, improve market access and trade, protect private property, deliver public services to rural areas and protect the poor and vulnerable through targeted safety nets are necessary to improve food security.
 - Sub-Saharan Africa, China, the Middle East, Central and South Asia face unique challenges in dealing with domestic food insecurity. In Sub-Saharan Africa, between 2012 and 2025, 330 million youths will be added to the labour market ((195 m in rural areas and 135m in cities). Policies and investment in rural areas that support improvements in smallholder farm productivity and allow farmers to make a decent living could provide millions of jobs, enhance food security and prevent widespread unemployment and social tensions.
 - With only 6% of the world's water, 9% of the land but 21% of the people, food security in China is an issue of global importance. The main challenges to food security in China are the growing population, the declining land base and rising water scarcity. The Chinese Central Government introduced a program in 2011: Accelerating Water Sector Reform and Development to increase public investment in irrigation and drainage, optimize water allocation, develop water-saving agriculture, expand effective irrigation area, enhance the development of small irrigation projects, improve disaster prevention and mitigation, promote integration of science and technology, and promote reform in rural areas.
 - The Middle East has 2/3 of the world's oil reserves, massive reserves of phosphate and imports 1/3 of the world's grain, much of it to feed livestock. These countries have very limited resources to produce their own food and are worried more by possible export restrictions of food trading partners than by food prices. They therefore feel food



insecure. Foreign land acquisitions and domestic food storage are possible options for food security but with implications for international trade.

- Undernourishment in Central Asia has dropped substantially in the last ten years but challenges to agricultural production in the future remain. Population growth, management of soil fertility, excessive removal of fertile soil by water and wind erosion, climate change, unfinished land restructuration, growth of industrial production and prevalence of water release from reservoirs in winter (to make hydropower) rather than during the growing season when it is needed for irrigation must all be addressed. Improvements to land and water productivity will best be served by extension services (through water user associations) that will promote best management practices.
- Reliable monitoring of food security contributes to the effective operation of food and nutrition assistance programs and other government initiatives aimed at reducing food insecurity. The USDA monitors the extent and severity of food insecurity in U.S. households through an annual, nationally representative survey. Almost 15% of the population was food insecure at least at some time during 2011 and levels of food insecurity varied widely across the country from 7.8% in North Dakota to over 19% in Arkansas. Rates of food insecurity were substantially higher than the national average for households with incomes near or below the Federal poverty line, households with children headed by single women or single men, and Black and Hispanic households.
- In Mexico poverty is measured by an organization autonomous from government every two years at the state level and every five years at the municipal level. The focus is on low income households that do not have access to at least one of six deprivations or social rights: food, education, social services, health services, basic welling and household services. A 2008-2010 survey estimated that 46% of the Mexican population had low income and suffered from at least one deprivation while 10% suffered from three or more deprivations.

Recommendations of the conference:

- Improve the availability of data and information on crop supplies and demand at the international level to allow institutions and governments to better manage long term volatility of food prices.
- Improve information about food insecurity and ensure that it is measured both consistently and regularly to provide national governments with accurate data for decision-making and policy development.
- Carry out baseline community-based research that will provide data on how to increase agricultural food production and profitability and will allow informed decision-making at the farm, community and regional levels.



- In Least Developed Countries, the productivity and profitability of small holders needs to be enhanced through: R&D targeted at crops important to the poor; increased inputs; bridging the yield gap; infrastructure investments; a policy and regulatory environment that provides incentives to increase production.
- In emerging economies, production growth will come from integration of small holders into retail chain systems and by enhancing production and value-added products in regions within these countries (China, India) that are lagging.
- Climate change is major problem as increased frequency of extreme climate events affects food price volatility. Climate change needs to be managed in terms of:
 - Short term volatility-changes in on-farm practices and efficient input use, better crop insurance systems, managing shock at the farm level.
 - Long term volatility-increases in overall agricultural productivity; crops adapted to manage stress (drought, submergence); creation of resilient and stable agricultural systems.
- Increase the emphasis on domestic support for policy changes to improve productivity.
- Develop a grain reserve that maintains a stock-to-use ratio above 21% that is available internationally to countries facing sudden shortages.



ACKNOWLEDGEMENTS

We are very grateful to the following sponsors and donors who supported the conference:

SPONSORS

Syngenta Foundation for Sustainable Agriculture
International Development Research Centre (IDRC)
McGill Faculty of Agricultural and Environmental Sciences
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We would also like to thank the numerous McGill student volunteers who helped throughout the conference.

We are extremely grateful to Helen Cohen Rimmer who assisted with the conference website and all promotional materials.

CONFERENCE ORGANIZING COMMITTEE

The members of the conference organizing committee were:

Chandra Madramootoo (Chair), Caroline Begg, Sylvia Borucki, Sharon Campbell, Julie Fortier, Helen Fyles, Eduardo Ganem Cuenca, Katherine Gombay, Douglas Hedley, Tim Johns, Ron Henry, Kristine Koski, Hugo Melgar-Quinonez, Anwar Naseem, Kim Reany, Paul Simard, Don Smith, Doug Sweet, Paul Thomassin, Pascal Thériault.

1. Background

In September 2008, McGill University's Faculty of Agricultural and Environmental Sciences convened a high level, international global food security conference to examine the underlying causes of rapidly rising food prices. The success of this first conference at bringing together international experts and scholars, representatives of farmer organizations, policy makers from developed and developing countries, NGOs, private industry and the Canadian public for direct exchange about the long term solutions to declining world food stocks and rising food prices provided momentum for an annual Global Food Security conference.

The 2nd conference in 2009 '**Impacts of the Global Financial Crisis on Food Security**' highlighted the importance of improving livelihoods and production of small farmers through investment and technical capacity building in all parts of the agricultural sector including farm production, food storage and processing, transportation, markets, agri-business, research, extension and the financial sector. The 3rd conference in 2010 '**Addressing the Water and Nutrition Challenges**' launched the McGill Institute for Global Food Security to carry on McGill's strong leadership in food security initiatives. Recommendations of the 3rd conference emphasized the need for food security, nutrition, social services, education and health including sanitation and a safe water supply to be addressed at the same time if overall health and food security are to be improved in developing countries. In 2011, the 4th conference, '**Risks and Threats to Global Food Security**', examined food price volatility; diminishing natural resources (land, water, soil nutrients, biodiversity), foreign direct investment including land grabs; and effects of food safety controls on international trade. Details of these conferences can be found at www.mcgill.ca/globalfoodsecurity.

The FAO Food Price Index remained high in 2012 (Figure 1). Severe droughts in the summer



Figure 1: FAO Food Price Index from 1990 to September 2012

in the United States and across a large part of Europe and into Central Asia were the main cause of reduced wheat and coarse grains crops and high food prices. Spikes in food prices in 2007/8 and in 2011 coincided with social unrest in 48 countries around the world and there was concern that continued high food prices would lead to further unrest.

Food insecurity both contributes to, and is exacerbated by, various aspects of social instability. Limited access to food and being forced to allocate increasing amounts of household income to food, reduces funds available for other valuable activities, such as the education of children, health care or housing. Discontent over food prices can inflame other latent discontents within a nation, such as the high unemployment, effectiveness of government and its policies, perceived relative advantages of one part of a society relative to others (classes or ethnic groups) and even rivalries with adjacent nations. Some of this discontent may be focused on distant and more developed nations, perceived to be exploiting resources in the area where food insecurity has developed. The threat of food insecurity in some financially well-off countries has driven policies to support agricultural investments in developing countries to ensure continued access to cheap food for their own population and political stability. While these land acquisitions have the potential to enrich the host country, they may also contribute to increased regional poverty and unrest if local people are not compensated for loss of land and other resources.

Population growth, changing diets, high oil prices, reduced level of stocks, increased use of biofuels made from food crops, climate change, growing shortages of water for agricultural use and climate change all contribute to high food prices. Climate shocks, such as droughts or flooding, reactive trade policies and civil unrest result in high food price volatility. Both increase stress on livelihoods: for the poor who spend the majority of their income on food and for the small holder who is reluctant to invest when food prices are unstable. Many governments respond by subsidizing food prices or food production, straining government resources and leading to increased government debt and/or declines in government services and the capacity to develop the country. Increasing unhappiness of the populace, related to diminished living standards and the erosion of government capacity, can contribute to social unrest and political instability.

2. Conference Objectives

The objective of the 2012 conference was to examine the relationship between global food prices, price volatility and political instability and explore how high prices and price volatility could be managed over the short and long terms.

Specific Objectives:

- I. To provide a forum for direct exchange between international experts and scholars, policy makers from developed and developing countries, NGOs and the Canadian public, to establish a basis for long term solutions to declining world food stocks and rising, volatile food prices.

II. To use the inputs and discussions emanating from the Conference to chart out a future engagement of policy makers, development experts, food and agriculture specialists, and civil society, in deriving solutions to the global food crisis.

III. To explore new ways in which the McGill Institute for Global Food Security will contribute to solving the challenges associated with agriculture and food production.

3. Conference Organizer and Host: McGill Institute for Global Food Security

The McGill Institute for Global Food Security, the organizer and host of the conference, was created in 2010 and provides a focal point to examine issues constraining the measurement of food insecurity, agriculture and food production, development of marketing and distribution systems and the associated external drivers of climate, food safety, world markets, commodity prices, changes in land use, water resources, labour, and agricultural inputs. The Institute creates a platform for scholars and policy makers from around the world to guide and support the needs of governments, international agencies, foundations and the agri-food industry.

4. Breadth of Conference Participation

The conference provided an important forum for direct exchange between experts, scholars and policy makers from developed and developing countries, NGOs and the business community. The Conference drew over 300 participants from 13 developed and developing countries, with representatives of 11 international organizations, and many student participants, as well as academics and representatives of industry. All speaker biographies are available at: www.mcgill.ca/globalfoodsecurity/speakers.

Conference attendees were as follows:

- *International and national agencies:* UN Food and Agriculture Organization (FAO), La recherche agronomique pour le développement (CIRAD), International Food Policy Research Institute (IFPRI), The World Bank, International Development Research Centre (IDRC), Inter-American Institute for Co-operation on Agriculture (IICA), International Commission for Irrigation and Drainage (ICID), United States Department of Agriculture (USDA), Barcelona Centre for International Affairs (CIDOB), National Council for the Evaluation of Social Development Policy (CONEVAL), Information Centre of Interstate Coordination Water Commission of Central Asia (SIC ICWC)
- *Private sector and non-governmental organizations:* Syngenta Foundation for Sustainable Agriculture; Bill and Melinda Gates Foundation, International Dairy Federation, Ecological Products of Ethiopia (Ecopia), Canadian Foodgrains Bank, International Land Coalition, The Energy and Resources Institute (TERI)
- *Policy makers and specialists* involved in the agriculture and food sectors from: China, Ethiopia, France, Guyana, India, Mexico, Morocco, Spain, Switzerland, US, Uzbekistan and Canada
- *Government officials* from Africa, Canada, Europe, US.
- *International scholars* from Africa, South America, Canada, China, India, US.

- *Graduate and undergraduate students*
- *Members of the public*

5. Program Overview

Each session consisted of experts delivering an invited presentation, followed by a lively and thought provoking question and answer period. The conference website (www.mcgill.ca/globalfoodsecurity/) contains full details of the conference program, speakers and presentations.

Public Lecture

Tuesday October 16, 2011

Moderator: Chandra Madramootoo, *Dean Faculty of Agricultural and Environmental Sciences, McGill University*

Special Guests:

Alain Therrien, *MNA, (Sanguinet) Parliamentary Asst, Minister of International Relations, La Francophonie and External Trade*

Marc Weinstein, *Vice-Principal and Alumni Relations, McGill University*

Margaret A. Gilliam, *President, Gilliam & Co.*

Public Lecture: *What Goes Up Must Come Down: Price Volatility in the 21st Century*

Jean Lebel, *Vice-President, Programs and Partnership Branch, International Research and Development Centre*

Conference Session 1

Wednesday October 17, 2012

Keynote Address:

Prabhu Pingali: *Deputy Director, Agricultural Development, Bill and Melinda Gates Foundation*

The Challenge of Feeding 9 Billion People

Session Chair:

Anwar Naseem, *Professor, Dept of Natural Resource Sciences (Agricultural Economics), McGill University*

Marco Ferroni, *Executive Director, Syngenta Foundation for Sustainable Agriculture*

Robert L. Paarlberg, *Professor, Political Science, Wellesley College*

Mitslal Kifleyesus-Matschie, *CEO, Ecopia (Ecological Products of Ethiopia)*

Can High Food Prices and Volatility Be Managed?

Session Chairs:

Paul Thomassin, *Professor, Dept. Natural Resource Sciences (Agricultural Economics), McGill University*

Kakali Mukhopadhyay, *Senior Research Associate, Dept. Natural Resource Sciences (Agricultural Economics), McGill University*

Florence Rolle, *Senior Liaison Officer, FAO*

Marc F. Bellemare, *Professor, Sanford School of Public Policy, Duke University*

Evan Fraser, *Professor, Department of Geography, College of Applied Human and Social Sciences, University of Guelph*

Paul Hagerman, *Director, Public Policy Program, Canadian Foodgrains Bank*

Politics and Food

Session Chairs:

Donald Smith, *James McGill Professor, Plant Science Department, McGill University*

Alok Adholeya, *Director, Biotechnology and Bioresources Division, The Energy and Resources Institute, India*

Etienne Hainzelin, *Conseiller du Président directeur général du Cirad, Professeur invité à l'Université d'Ottawa*

Zhanyi Gao, *Engineer in Chief, China Institute of Water Resource and Hydropower Research, President of International Commission on Irrigation and Drainage*

Eckart Woertz, *Senior Research Fellow Associate, Barcelona Centre for International Affairs (CIDOB)*

Action Against Hunger: Student Initiatives

Session Chair:

Caroline Begg, *Faculty Lecturer, Plant Science Department, McGill University*

Arlette Saint Ville, *MSc Candidate, Natural Resource Sciences, McGill University*

Ramesh Murugesan, *Ph.D. candidate, Bioresource Engineering, McGill University*

Verena Seufert, *Ph.D. candidate, Geography, McGill University*

Tracy McDonough and Nadia Browne, *MSc candidates, School of Dietetics and Human Nutrition, McGill University*

Conference Session 2

Thursday October 18, 2012

Social Dimensions of Food Security and Nutrition

Session Chairs:

Hugo Melgar-Quiñonez, *Director, McGill Institute for Global Food Security and Professor, School of Dietetics and Human Nutrition, McGill University*

Timothy Johns, *Professor, School of Dietetics and Human Nutrition, McGill University*

Mark Nord, *Sociologist, Food Assistance Branch, Economic Research Service, U.S. Department of Agriculture (USDA)*

Ricardo Aparicio, *Deputy Director-General for Poverty Analysis, National Council for the Evaluation of Social Development Policy, Mexico*

Marie Chantal Messier, *Senior Nutrition Specialist, The World Bank*

Role of Societal Actors in Solving the Food Crisis

Session Chairs:

Humberto Monardes, *Professor, Animal Science, McGill University*

Mohamed Ait Kadi, *President, General Council of Agricultural Development, Rabat, Morocco*

Richard Doyle, *Executive Director, Dairy Farmers of Canada, and President, International Dairy Federation*

Bruce Moore, *Founding Director, International Land Coalition*

Viktor Dukhovny, *Director, Scientific Information Center of Interstate, Coordination Water Commission of Central Asia (SIC ICWC)*

Sergiy Zorya, *Senior Economist in Agriculture and Rural Development Department (ARD), World Bank*

Plenary Session

The Chair of the Plenary Session presented a summary of the key points which emerged from the conference. Members of the Plenary Session panel gave their perspectives on the conference presentations and deliberations. Participants had an opportunity to react, and present their views in an open forum on the key subjects discussed during the conference.

Session Chair:

Chandra Madramootoo, *Dean, Faculty of Agricultural and Environmental Sciences, McGill University*

Panel:

Mohamed Ait Kadi, *President, General Council of Agricultural Development, Rabat, Morocco*

Audia Barnett, *Inter-American Institute for Co-operation on Agriculture (IICA)*

Hugo Melgar-Quiñonez, *Director, McGill Institute for Global Food Security and Professor, School of Dietetics and Human Nutrition, McGill University*

Joanne Gaskell, *Post doctoral Fellow, UC Berkeley*

6. Conference Summary

The Public Lecture began with an address by **M. Alain Therrien**, Parliamentary Assistant to the Minister of International Relations, La Francophonie and External Trade in Québec, who spoke about some of the major causes of food insecurity including the globalization of food production, the decline in local production, the high and volatile price of crude oil and climate

change. He reported that Québec was investing in local agriculture, both human capital and infrastructure; was encouraging renewable energy; fighting climate change and supporting improvements to agricultural production in Africa.

Mrs. Margaret Gilliam (B.Sc. '59), who made a generous gift of \$1.5-million to support research, teaching, outreach and graduate fellowships at the McGill Institute for Global Food Security also addressed the audience. "Food security is a worldwide problem that requires our immediate attention," Gilliam said. "I am delighted that McGill is working towards addressing this issue and that I can play some part in this worthwhile mission."

The Public Lecture continued with an address from **Dr. Jean Lebel**, Vice-President, Programs and Partnership Branch, International Research and Development Centre (Canada).

Highlights of the Public Lecture – Jean Lebel

What Goes Up Must Come Down: Price Volatility in the 21st Century

- Price volatility is a measure of how much and how quickly prices move up or down. There is a predictable variation (seasonal) and an unpredictable variation (due to weather, markets and government policies).
- Agricultural Market Information System (AMIS) is a G20 initiative to enhance food market transparency and encourage coordination of policy actions in response to market uncertainty. It is anticipated that it will help to reduce speculation about crop supplies and reduce price volatility.
- Although price volatility is a problem, the real crisis is the one out of eight people on earth who go hungry. Most of these people live in Africa and South Asia.
- Canada's response to this crisis is the Canadian International Food Security Research Fund. It invests in applied agricultural and nutrition research through innovative partnerships across countries, disciplines and sectors. It will use research results to inform food security policies and programs.
- There are no simple solutions to solving food insecurity in the world. Nature is complex, diversity is important, and it is a challenge to scale up from the farm level to the community and regional scale. Time and patience are necessary as results take a long time to happen.

Keynote Address – Prabhu Pingali

Food Prices and Food Security: Getting the Supply Side Right

- The FAO food price index is composed of different indices (staple cereal crops, livestock products, oils and fats, sugar and other commodities) and food price trends depend on what happens to each of these commodities:
 - Among the cereal crops, the rice trade is not large, so any change will have enormous implications on the price. Since countries substitute one staple for another, a price or supply change in one staple will influence the others. There is

- increased consumption of cereals due to population increase and diet shifts (more meat). The supply has not grown as rapidly leading to shortfalls in production – a tighter supply- and more volatility.
- For the meat products index, livestock productivity growth is sluggish compared to demand and has led to a steady price increase.
 - The changes in prices of the oils and sugars indices are more dramatic and have risen 3-4 times since 1990. The diversion of these products into biofuel markets is a major part of the increase and creates a strong link between the food price index and energy markets.
- The supply response to high food prices is two-fold:
 1. In Least Developed Countries, the productivity of small holders needs to be enhanced through: R&D targeted at crops important to the poor; increased inputs; bridging the yield gap; infrastructure investments; a policy and regulatory environment that provides incentives to increase production.
 2. In emerging economies, production growth will come from integration of small holders into retail chain systems and by enhancing production in regions within these countries (China, India) that are lagging.
 - Climate change is major problem as increased frequency of extreme climate events affects food price volatility. Climate change needs to be managed in terms of:
 - Short term volatility-changes in on-farm practices and efficient input use, better crop insurance systems, managing shock at the farm level.
 - Long term volatility-increases in overall agricultural productivity; crops adapted to manage stress (drought, submergence); creation of resilient and stable agricultural systems.
 - Long-term sustainable donor support for agricultural development is needed across the developing world, with emphasis on least developed countries.
 - The emphasis should be increased on domestic support for policy changes to improve productivity.
 - Improve data and information on the state of the agricultural sector to allow institutions to better manage long term volatility of food prices; transparency is critical for managing volatility.

Food Insecurity and Political Instability

R. Paarlberg, M. Bellemare, E. Fraser and B. Moore spoke about the relationship between high food prices and social unrest and different approaches to addressing food insecurity. There was a significant association of food price levels and the number of news stories about social unrest during the food price spikes of 2008 and 2011 (Figure 2a).

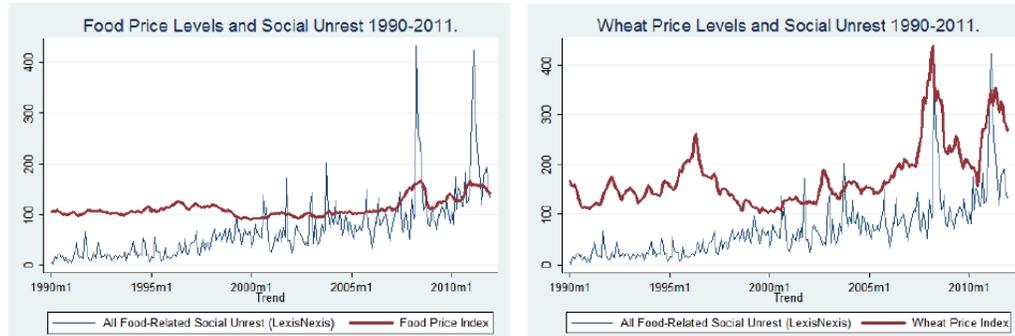


Figure 2a: Food price levels and social unrest. **2b** Wheat prices levels and social unrest (From M. Bellemare)

When food price levels were further dissected to individual crop price levels, the relationship appeared even stronger (Figure 2b). However, the parallels between prices of food, crude oil and all commodities suggest that high food prices may not always be the sole cause of social unrest (Figure 3).

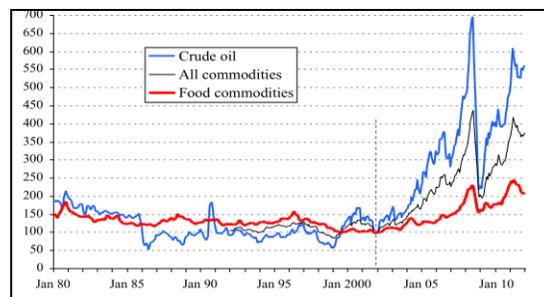


Figure 3: Prices of crude oil, commodities, food (from R. Paarlberg)

In order to correctly interpret reports of food insecurity and social unrest, it is necessary to distinguish between:

- International food prices vs. food shortage. For example, in 2008, rice price tripled, at a time when rice production and rice stocks increased more than the rice consumption. The sudden shortage was due to trade policies that restricted or banned rice exports and rice available for export declined. There was no actual rice shortage.
- International vs. domestic food prices. The international price of food is the price of food available for export while the domestic price is dependent on location (more information on the link between these two in the following section). Countries may buy products at high prices and make them available at lower prices domestically.
- Income deprivation vs. food deprivation: The necessity of diverting a larger proportion of income towards food and away from non-food items is not the same as going hungry.
- Angry vs. hungry people: People can become angry when their income is squeezed and they are forced to cut back on the consumption of nonfood items. Hungry people seldom represent a real threat to governments because they are not politically active. They tend to be infants under two, pregnant or nursing women, illiterate and mostly live

in rural areas with poor access to urban centres where political action is seen and heard.

- Demonstrations vs. riots: A riot involves violence and theft while street demonstrations may be the only affordable opportunity for political expression.
- Social unrest vs political change: Social unrest not always a precursor to political change and does not require food shortage.
- Land acquisitions vs land grabs: At an international level there is a willing seller and a willing buyer. However, when a national government makes an arrangement with a foreign country or business to use its land, it may be a land grab if the local people are not consulted or compensated.

There are two different views of managing the agricultural sector. Merchants and governments generally manage food production and distribution in an economically rational and efficient way (the commercial or market economy). Investments to improve food security made via the market economy assume benefits will 'trickle down' to the food insecure. Others feel that food should be managed according to ethics, justice and tradition (the moral economy) and that improving food insecurity starts with investments in small farmers. Public feelings of injustice at the imposition of the market economy onto food production and availability, part of the moral economy, may trigger more political volatility than expensive food on its own.

Managing high food prices and volatility

Price volatility in the last five years has been higher than in the previous two decades. For some developing countries, trade liberalization has meant a significant increase in food imports, thereby making international food price volatility of local socio-economic and political concern. Volatile food prices discourage investment in the agricultural sector due to increased financial risks. F. Rolle, P. Hagerman and S. Zorya discussed the link between international and domestic food prices and volatility as well as the causes of, and the responses to, food price volatility.

The international and domestic volatility of food prices are rarely parallel or of similar magnitude and are caused by different factors. On average, only 43% of domestic cereal markets are connected to international markets. Even if the markets are co-integrated, it can take up to six months for a sudden price change on the international market to move into domestic markets. International food price changes therefore play only a small role in domestic market volatility. The causes of international price volatility are poorly understood although perceptions of global food supplies play a significant role. Domestic price volatility has a greater direct impact on food insecurity and is due to weather shocks reducing harvests, poorly developed market infrastructure, unpredicted policy changes, and conflict.

Responses to high food prices and volatility are different for international and domestic markets. At the international level, it is felt that increasing the availability and transparency of information about global food production and supplies will reduce panic-induced policy actions which may cause price surges. The creation of an Agricultural Marketing Information System

(AMIS) in 2011 by G20 nations provides reliable and up-to-date data on supply, demand, stocks, and export availability of major crops and should lead to more coordinated policy response to market tensions.

International grain price surges can be correlated with the size of reserves held by exporting countries. As stock-to-use ratios decline below 21%, fear of a grain shortage increases and prices rise. The establishment of an international grain reserve that maintains a stock-to-use ratio above 21% would likely help to reduce price volatility. The example of the Food Corporation of India, which has worked since 1964 to stabilize domestic rice and wheat prices, shows that storing food is an affordable option has benefited Indian farmers and consumers. The cost of an international wheat reserve is estimated at only \$36/ton/y. However, balancing the diverse interests of exporting and importing countries, consumers and traders would make the governance of such a reserve complex.

Domestic, and often short term, responses to high food prices and volatility seen during the 2007/8 food price spike included the following (the number in brackets refers to the number of countries that followed the policy):

- Trade Policies: reduction of tariffs or customs fees on imports (43 countries), restricted or banned exports (25), suspension, reduction of taxes (23), released stocks at subsidized prices (35), administered prices (21)
- Safety nets: cash transfer (23); food assistance (19), increase disposable income (16)
- Interventions to boost domestic supply in the short run: production support/input subsidies (35), production safety nets (15), market intervention (15).

Long term responses to high food prices are based on the knowledge that growth of GDP originating in agriculture is much more effective in reducing poverty as GDP growth originating outside the agriculture sector (Figure 4). Long term investments which raise agricultural productivity, improve market access and promote trade, protect private property, deliver quality public services to rural areas and protect the poor and vulnerable through targeted safety nets are necessary to improve food security.

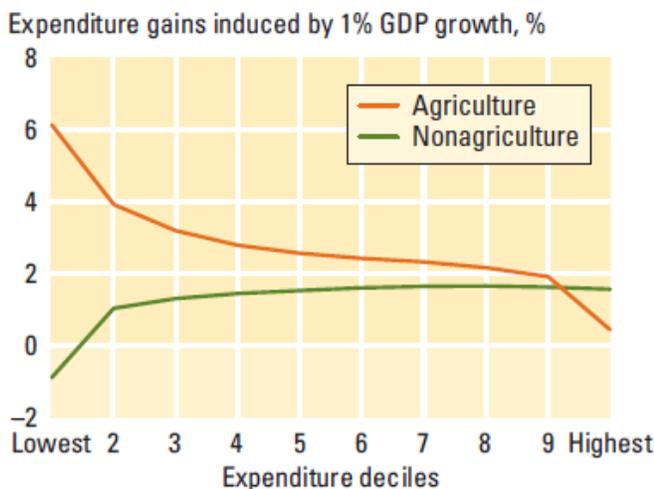


Figure 4 Growth of GDP originating in agriculture vs non agriculture investments (from F. Rolle).

Food and Politics

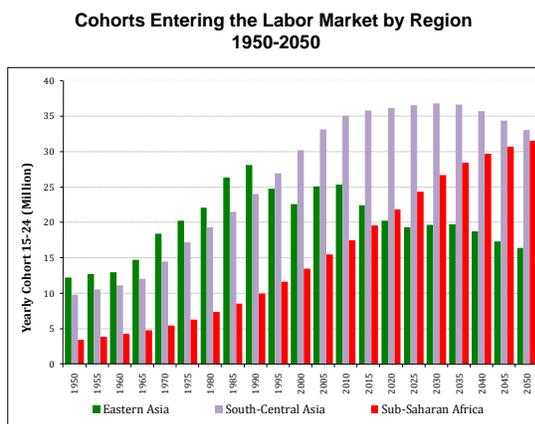
It is expected that population growth and changing dietary patterns will create a need for 70% more food between now and 2050. However, natural resources are limited and an increasingly unstable climate will blunt our ability to raise global food production which may in turn lead to increased social unrest. Providing solutions to the challenges of feeding a growing population, climate change, water scarcity, and the use of dwindling land resources is a daunting task that was addressed by M. Ferroni, E. Hainzelin, Z. Gao, E. Woertz, and V. Dukhovny.

There is optimism that human ingenuity will once again rise to the challenge of increasing food production. Closing yield gaps, cutting waste and inefficiency from food production, efficient and effective uses of resources (people, land, water and inputs) and development of infrastructure will improve agricultural production and food security. In order to get private investors more involved in the agricultural sector, business plans that assess costs of crop production from planting to post harvest to marketing need to be developed. Raising agricultural production and farmer income is a task that requires technology, service, and access to markets.

Sub-Saharan African countries are confronted with a rapidly expanding economically active population, a high level of rural poverty and an economy that is just beginning to grow. In Sub-Saharan Africa, between 2012 and 2025, 330 million youths will be added to the labour market ((195 m in rural areas and 135m in cities) (Figure 5).

Sufficient jobs must be generated to prevent widespread unemployment and social tension. Public policies and investment that will improve agricultural productivity and profitability

of small holder farms would enhance food security, reduce rural poverty and provide millions of jobs for these youths. Support to agriculture must be part of a broad plan for rural development that includes all parts of the value chain from production to marketing and also promotes environmental services. Smallholder farming in Sub-Saharan Africa needs to become a profitable business if it is to attract new, young farmers.



With only 6% of the world's water, 9% of the land but 21% of the people, food

Figure 5. Change in labor market by region 1950-2050 (From E. Hainzelin)

security in China is an issue of global importance. Grain demand increased from 50.4 m tons in 2000 to 56.6 m tons in 2010 and is expected to increase to 62.5 by 2020. The three main challenges to food security in China are the growing population, the declining land base due to repurposing for other uses and rising water scarcity and competition with industrial and domestic uses. The Chinese Central Government introduced a program in 2011: *Accelerating Water Sector Reform and Development* to increase food production without using more water. The program aims to increase public investment in irrigation and drainage, optimize water allocation, develop water-saving agriculture, expand effective irrigation area from 60 to 66 million ha, enhance the development of small irrigation projects to help small land holders, improve disaster prevention and mitigation, promote integration of science and technology, and promote reform in rural areas.

The Middle East has two thirds of the world's oil reserves, massive reserves of phosphate and imports one third of the world's grain, much of it to feed livestock. This region therefore plays a very important role in the global food system. Local food production is limited and declining due to scarce water resources and this generates a perception of food insecurity within these countries. Most Middle East countries are well off and food prices are much less of a concern than export restrictions by trading partners which affect food availability. Increased storage of grains and land acquisitions in nearby African countries are both being used to secure a supply of food that will be available if supplies drop in international markets. These strategies may have negative consequences for global markets if storage is perceived as hoarding and land acquisitions as land grabs.

Undernourishment in Central Asia has dropped substantially in the last ten years, particularly in Tajikistan (from 46 to 16%) and Kyrgyzstan (17 to 11%). Challenges to agricultural production in the future include: population growth, management of soil fertility, excessive removal of fertile soil by water and wind erosion, climate change, unfinished land restructuring, growth of industrial production and prevalence of water release from reservoirs in winter (to make hydropower) rather than during the growing season when it is needed for irrigation. Improvements to land and water productivity will be best served by extension services (through water user associations) that will promote best management practices. The water distribution system must also be improved for timely delivery of irrigation water and its effective use by farmers. It is important that national plans of Central Asian countries reflect the balance of interests among both water users and water suppliers. There are international problems between the downstream users and the upstream hydro power producers and a need to strengthen International Water Laws to guarantee food security.

Actions against Hunger

Five students presented the graduate research they are doing in the field of food security. In addition a farmer from Ethiopia described the company she has established and the President of the International Dairy Foundation reported on their mission and achievements.

In St. Lucia, farmer networks were mapped to better understand structural constraints that limit knowledge exchange and innovation uptake. Better use of existing social capital could improve the design of food security policy initiatives to foster innovation. In India, the value of millet as a highly nutritious, fast growing crop that withstands drought and poor soil nutrition is being enhanced through post harvest technological innovations. Organic agriculture is growing in popularity and can reduce the environmental cost of agriculture but yields tend to be lower. It can be promoted in developing countries where labour and inputs are available in concert with the development of markets and certification systems. Action Against Hunger Canada promotes the uses of Standardized Monitoring and Assessment of Relief and Transition or SMART, to collect information on the mortality rate of a population, and the nutritional status of children under five.

The company Ecopia (Ecological products of Ethiopia) uses food processing and storage technologies to extend the shelf life of a variety of fruits and meet the high standards demanded by foreign buyers. In addition, the processing plant hires many poor, deaf women who would otherwise have a difficult time finding employment. Ecopia uses a mobile phone system to connect farmers, the processing plant and buyers and a product labeling system to keep track of all products. There are 11,000 farmers in the database of suppliers and the company generates 54 food products. Although producers currently make a small profit, improvements to the value chain are necessary if farmers are to make a decent living.

The International Dairy Federation is a multistakeholder organization that represents 79% of world milk production and employs 1200 experts. Its mission is to represent the dairy industry as a whole at the international level by providing the best global expertise and scientific knowledge in support of the development and promotion of quality milk and milk products, to offer consumers nutrition, health and well-being. An FAO initiative, Global Agenda of Action (AoA), set to start in 2013, emphasizes the need for change in the livestock industry. The AoA has three areas of focus: production efficiency, restoring grasslands and reducing discharge of energy and nutrients. The Dairy Farmers of Canada is a national policy, lobbying, and promotional group which represents 12,700 dairy farmers in Canada and supports research in dairy production. Since 1966, production per cow in Canada has increased 125% and the number of cows has declined by 54%.

Social Dimensions of Food Security and Nutrition

Changing demographics and dietary aspirations that increase global demand for food affect the access of both rich and poor to nutritious diets. Directly addressing economic inequalities through conditional cash transfer programs to families living in extreme poverty has repercussions for nutrition, long-term food security and social stability. Cultural identity and socially-defined values related to equity, sustainability and health are potential mediators and motivators of human behaviors related to food/nutrition security. M. Nord, R. Aparicio and M-C. Messier discussed measurement of food insecurity, complex social dimensions that constrain policies and opportunities for interventions.

The USDA Food Assistance Programs cost over USD 100 billion in 2011. Almost 15% of the population (17.9 million people) was food insecure at least at some time during the year, including 5.4% with very low food security meaning that the food intake of one or more household members was reduced and their eating patterns were disrupted because the household lacked money and other resources for food. Levels of food insecurity varied widely across the country from 7.8% in North Dakota to over 19% in Arkansas. All households that are food insecure are reducing the quality of food consumed, but not necessarily cutting out how much they eat. This is leading to problems of obesity. Households headed by single mothers with children are most likely to have low and very low food insecurity. Of households that are very insecure, 33% have at least one person employed and 40% have an adult with a disability. From a joint US-Canada study, food insecurity in Canada is estimated to be one third lower than in the US. The higher proportion of the population that has postsecondary education in Canada and the national healthcare system is thought to be part of the reason for this wide difference.

In Mexico poverty is measured by an organization autonomous from government (CONEVAL) every two years at the state level and every five years at the municipal level. The focus is on low income households that do not have access to at least one of six deprivations or social rights: food, education, social services, health services, basic dwelling and household services. A 2008-2010 survey estimated that 46% of the Mexican population had low income and suffered from at least one deprivation while 10% suffered from three or more deprivations. Of all the municipalities in Mexico (190), 7.7% contain 50% of population living in poverty and this was often linked to indigenous populations. Regularly produced official statistics promote transparency and accountability of government social programs in Mexico and have resulted in evidence-based decision-making for policy development to support the poor.

Recent economic growth in South Asia has resulted in poverty reduction and increased spending on human development. However this region continues to have the highest rate of malnutrition (42%) in the world due to gender inequality, social exclusion, inefficient food and nutrition service programs, and a lack of knowledge among the poor of what causes poor nutrition and poor hygiene. Undernutrition impairs human and economic development. Adults who were malnourished as children earn 10% less and are on average, one year behind in school. It is estimated that 2-3% of GDP is lost due to malnourishment. One of the challenges hampering improvement is that food (calories only) and nutrition are often dissociated and it is not well-understood that a balanced diet, particularly in the first 1000 days of life, is necessary to prevent malnutrition. South Asian Food and Nutrition Security Initiative (SAFANSI) aims to increase the commitment of governments and development partners to more effective and integrated food and nutrition-related policies and investments.

7.Key Messages

- Food price spikes in 2008 and 2011 were closely associated with social unrest in countries around the world. However, prices of food, crude oil and non-food commodities followed similar curves and since all three would affect personal incomes, it is difficult to attribute social unrest only to food
- There are two different views of managing the agricultural sector. Merchants and governments generally manage food production and distribution in an economically rational and efficient way (the commercial or market economy) while others feel that food should be managed according to ethics, justice and tradition (the moral economy). Public feelings of injustice at the imposition of the market onto food production and availability may trigger more political volatility than expensive food on its own.
- Food prices are linked to oil prices through the energy required to make fertilizer and cultivate, process and transport food and also through the FAO Food Price Index which includes grains, oils and sugars, food commodities which may be diverted to make biofuel. As crude oil prices rise, so does the value of these commodities and with them, the Food Price Index.
- The international price of food is the price of food available for export while the domestic price is dependent on location. Domestic markets are frequently not connected to international markets and changes in international food prices and volatility may therefore play only a small role in domestic markets. Domestic price volatility has a greater impact on food insecurity and is due to weather shocks reducing harvests, poorly developed market infrastructure, unpredicted policy changes, and conflict.
- Responses to high food prices and volatility are different for international and domestic markets. Domestic, and often short term, responses to high food prices and volatility seen during the 2007/8 food price spike included: trade policies (reduction of tariffs on imports, restricted or banned exports, released stocks at subsidized prices); safety nets (cash transfer, food assistance) and interventions to boost domestic supply in the short run (production support/input subsidies).
- At the international level, increasing the availability and transparency of information about global food supplies will reduce panic-induced policy actions which may cause price surges. The new Agricultural Marketing Information System (AMIS) provides reliable and up-to-date data on supply, demand, stocks, and export availability of major crops and will lead to a more coordinated policy response to market tensions. The establishment of an international grain reserve that maintains a stock-to-use ratio above 21% would also help to reduce price volatility.
- Growth of the GDP originating in agriculture is much more effective in reducing poverty than GDP growth originating outside the agriculture sector. Long term investments

which raise agricultural productivity, improve market access and trade, protect private property, deliver public services to rural areas and protect the poor and vulnerable through targeted safety nets are necessary to improve food security.

- Sub-Saharan Africa, China, the Middle East, Central and South Asia face unique challenges in dealing with domestic food insecurity. In Sub-Saharan Africa, between 2012 and 2025, 330 million youths will be added to the labour market ((195 m in rural areas and 135m in cities). Policies and investment in rural areas that support improvements in smallholder farm productivity and allow farmers to make a decent living could provide millions of jobs, enhance food security and prevent widespread unemployment and social tensions.
- With only 6% of the world's water, 9% of the land but 21% of the people, food security in China is an issue of global importance. The main challenges to food security in China are the growing population, the declining land base and rising water scarcity. The Chinese Central Government introduced a program in 2011: Accelerating Water Sector Reform and Development to increase public investment in irrigation and drainage, optimize water allocation, develop water-saving agriculture, expand effective irrigation area, enhance the development of small irrigation projects, improve disaster prevention and mitigation, promote integration of science and technology, and promote reform in rural areas.
- The Middle East has 2/3 of the world's oil reserves, massive reserves of phosphate and imports 1/3 of the world's grain, much of it to feed livestock. These countries have very limited resources to produce their own food and are worried more by possible export restrictions of food trading partners than by food prices. They therefore feel food insecure. Foreign land acquisitions and domestic food storage are possible options for food security but with implications for international trade.
- Undernourishment in Central Asia has dropped substantially in the last ten years but challenges to agricultural production remain. Population growth, management of soil fertility, excessive removal of fertile soil by water and wind erosion, climate change, unfinished land restructuration, growth of industrial production and prevalence of water release from reservoirs in winter (to make hydropower) rather than during the growing season when it is needed for irrigation must all be addressed. Improvements to land and water productivity will best be served by extension services (through water user associations) that will promote best management practices.
- Reliable monitoring of food security contributes to the effective operation of food and nutrition assistance programs and other government initiatives aimed at reducing food insecurity. The USDA monitors the extent and severity of food insecurity in U.S. households through an annual, nationally representative survey. Almost 15% of the population (17.9 million people) was food insecure at least at some time during 2011 and levels of food insecurity varied widely across the country from 7.8% in North Dakota



to over 19% in Arkansas. Rates of food insecurity were substantially higher than the national average for households with incomes near or below the Federal poverty line, households with children headed by single women or single men, and Black and Hispanic households. Food insecurity was more common in large cities and rural areas than in suburban areas and other outlying areas around large cities.

- In Mexico poverty is measured by an organization autonomous from government every two years at the state level and every five years at the municipal level. The focus is on low income households that do not have access to at least one of six deprivations or social rights: food, education, social services, health services, basic welling and household services. A 2008-2010 survey estimated that 46% of the Mexican population had low income and suffered from at least one deprivation while 10% suffered from three or more deprivations.

8.Recommendations

- Improve the availability of data and information on crop supplies and demand at the international level to allow institutions and governments to better manage long term volatility of food prices.
- Improve information about food insecurity and ensure that it is measured both consistently and regularly to provide national governments with accurate data for decision-making and policy development.
- Carry out baseline community-based research that will provide data on how to increase agricultural food production and profitability and will allow informed decision-making at the farm, community and regional levels.
- In Least Developed Countries, the productivity and profitability of small holders needs to be enhanced through: R&D targeted at crops important to the poor; increased inputs; bridging the yield gap; infrastructure investments; a policy and regulatory environment that provides incentives to increase production.
- In emerging economies, production growth will come from integration of small holders into retail chain systems and by enhancing production and value-added products in regions within these countries (China, India) that are lagging.
- Climate change is major problem as increased frequency of extreme climate events affects food price volatility. Climate change needs to be managed in terms of:
 - Short term volatility-changes in on-farm practices and efficient input use, better crop insurance systems, managing shock at the farm level.



- Long term volatility-increases in overall agricultural productivity; crops adapted to manage stress (drought, submergence); creation of resilient and stable agricultural systems.
- Increase the emphasis on domestic support for policy changes to improve productivity.
- Develop a grain reserve that maintains a stock-to-use ratio above 21% that is available internationally to countries facing sudden shortages.



APPENDIX 1

Conference Photos



Global Food Security Conference October 16-18, 2012







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