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## INTRODUCTION : THE NEED FOR *FORESIGHT*

Given inevitable constraints of the fiscal year framework for development planning, not to mention the day to day rush of project design and implementation, development policymakers and practitioners often simply lack the time to engage in longer term strategic planning. While there is usually a general sense of what they want to see happen 10 years down the line, there is still a need to think more systematically about what should be done today to best ensure those goals are actually achieved. In other words, we need to increase our resources for thinking over the horizon and strive to better understand how to get to where we really want by acting earlier in a more coordinated fashion. *Foresight* is intended to help meet this need in a novel way, by offering new insights drawn from cutting edge evidence based academic research. Each issue will be dedicated to a single theme, to be defined through a dialogue between academic researchers and the policymaking community. Articles will synthesize current research from the perspective of what we need to think about today in order to achieve our goals 10 years from now. In this way, we hope to create a new nexus between research, policy and practice by disseminating the latest development research in a practical way that is in tune with the priorities of the development community.

## FOOD SECURITY

### Chandra A. Madramootoo & Helen Fyles

#### Introduction

Soaring food prices in 2007 and early 2008 provoked social unrest in countries around the world and threatened the political and economic stability of poor

nations. UN Secretary-General Ban Ki-Moon called it a global crisis and Executive Director of the UN World Food Program, Josette Sheeran, said that rising prices pushed up the number of undernourished people in the world from more than 850 million in 2005 to 925 million in 2008. World Bank president Robert Zoellick warned that at least 33 countries faced social unrest as a result of

sharply higher food prices. The first Millennium Development Goal for 2015 of reducing by half the number of people who suffer from hunger will not be met under these conditions of food shortages.

The single most important cause of food insecurity is poverty and the world's poor, who spend the majority of

their income on food, have been the hardest hit by rising food prices. Countries with the highest proportion of hungry people are predominantly found in Sub-Saharan Africa but areas of Asia, Central and South America also have pockets where over 25% of their populations are undernourished.

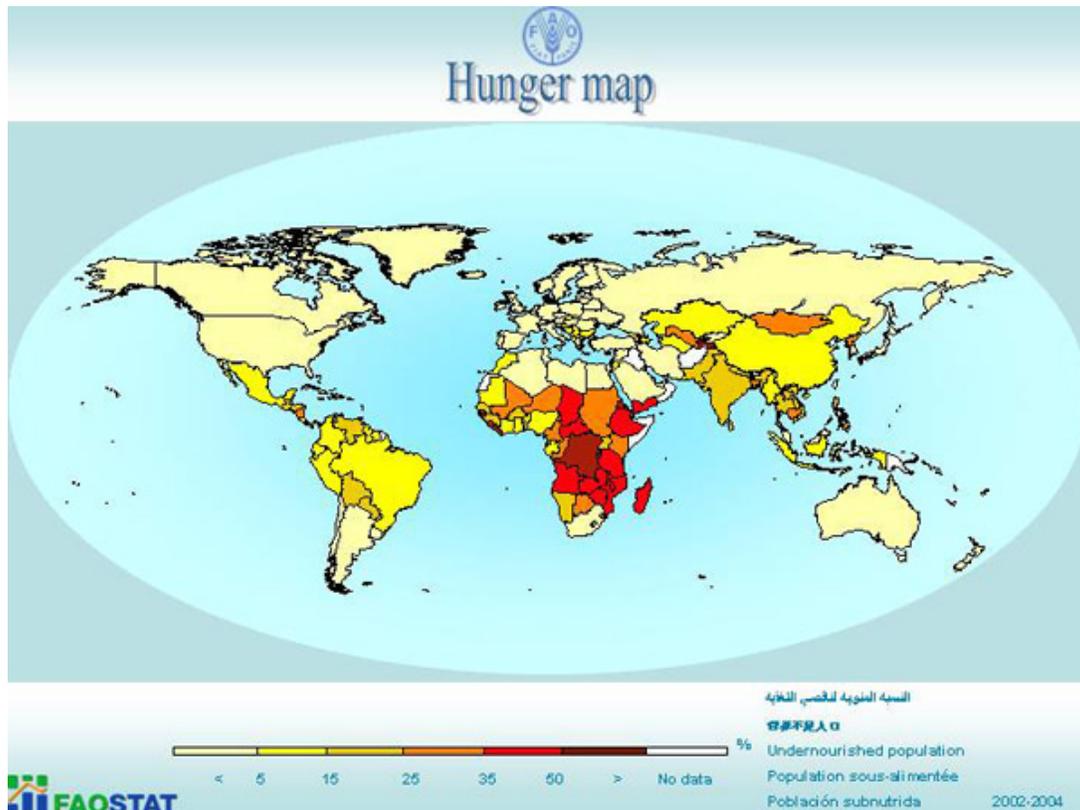


Figure 1. World hunger map (Source: FAO, 2004).

High food prices have a disproportionate impact on the poor who spend at least 60-70% of their income on food. As food prices increase, the most nutritional foods are cut out of their diets to save money resulting in negative nutritional and health outcomes. Children who are malnourished in the first months of life are permanently impaired with lifelong implications not only for the children and their parents but for the future food security and economies of the countries that will depend on them to be part of their labour force.

People are forced to sell assets to buy food and as a consequence get into debt. They take their children out of school and cut back on health care to further reduce their expenses. Again, there are long term implications for children that affect their future prospects.

Marginal lands are farmed and people migrate into heavily used agricultural areas. As food becomes less affordable, households are compelled to clear and cultivate marginal lands on steep hills which results in

overgrazing, soil degradation and erosion, and deforestation.

There are, of course, beneficiaries of high food prices. Food exporting countries and farmers who are net sellers all stand to make a profit as prices rise assuming that input costs remain at acceptable levels. However, only 10-20% of farmers world-wide are net sellers.

The large numbers of hungry people worldwide indicates the enormous difficulty of securing a global food supply that is available, accessible and affordable to all. As the world population grows and individuals consume more, creating a secure global food supply from a diminishing per capita land, water and energy base, will pose a formidable challenge.

### **The McGill Conference on Global Food Security**

McGill University's Faculty of Agricultural and Environmental Sciences took the leadership to convene this conference from September 24-26, 2008, in Montreal, Canada. The Conference was Co-Chaired by former Canadian Prime Minister and Minister of Foreign Affairs, and Professor of Practice at the Centre for Developing-Area Studies, the Rt. Hon. Joe Clark and McGill's Chancellor, Mr. Richard Pound. There were some 400 participants and a high level group of invited speakers and panellists were assembled.

The Conference was launched with a Public Lecture delivered by Dr. Kanayo Nwanze, Vice President of the UN International Fund for Agricultural Development, and Mr. Nicolas Carpentier, Coordinator of Communications and Marketing with Sun Youth Organization in Montreal. It then followed with six sessions on September 25 and 26. Each session consisted of experts delivering an invited presentation, followed by responses from an invited panel. This provided unique and insightful observations and perspectives on the theme of each session. There was then opportunity for wide ranging questions and discussions from conference attendees.

The major financial sponsors of the Conference were: TD Canada Trust, Atoka Cranberries, Dr. Donald McQueen Shaver, O.C., the Canadian International Development Agency, *le Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec*, *le Ministère des Relations internationales du Québec*, and the Nova Scotia Department of Agriculture.

The conference helped to clarify the critical causes and issues of rising food prices and global food security and provided recommendations for alleviating the food crisis.

### **Rising Food Prices**

Food insecurity is not a new global issue. In 1970, 35% of the world population or 917 million people were undernourished. In 2008, similar numbers of people are hungry although they make up about 14% of the world population. The problem of food insecurity, in fact, is not that food prices are too high, but that incomes are too low. According to the International Monetary Fund, prices of food commodities are generally still far below their 1970s highs.

Vulnerability to rising food prices is largely based on how much food is bought as a share of expenditures. Canadians spend only 9% of their annual disposable income on food, down from 18% in the 1970s. The average Haitian spends almost 70% of his or her income on food and is very vulnerable to any rise in food prices. The people most at risk are the rural landless, pastoralists, small farmers who are net food buyers and the urban poor

According to the Food and Agriculture Organization (FAO), the food price index rose by nearly 40% in 2007, compared with 9 % in 2006, and in the first months of 2008 prices again increased drastically. Between March 2007 and August 2008 increases in grain prices were as follows: corn (31%), rice (74%), soybean (87%), and wheat (130%). Dairy products, meat, poultry, palm oil,

and cassava also experienced significant price hikes. Although the FAO Food Price Index is currently dropping mainly due to favourable crop prospects, observers from the World Bank, US Department of Agriculture (USDA), International Food Policy Research Institute (IFPRI), Organization for Economic Cooperation and Development (OECD), and the FAO expect prices to remain high for some time.

As a consequence of surging food prices, FAO estimated that in developing countries, the cost of food imports went up by 25% to nearly \$233 billion.

Soaring corn prices sparked tortilla riots in Mexico City in 2007 as the price of the flat corn bread, the main source of calories for many poor Mexicans, had recently increased by over 400%. Skyrocketing flour prices have destabilized Pakistan, and Egypt's government faced a serious political threat over its inability to maintain a steady supply of heavily subsidized bread to its impoverished citizens; Haiti, Cote d'Ivoire, Cameroon, Mozambique, Uzbekistan, Yemen and Indonesia are among the countries that experienced violent food riots or demonstrations.

### Underlying Factors of High Food Prices and the Food Crisis

Rising food prices were driven by a complex set of factors including higher world populations, increasing demand for meat and dairy products in emerging nations like India and China, historically low levels of grain reserves, sharply rising fuel prices, biofuel production, droughts in key food-producing countries, market and trade speculation, and agricultural subsidies.

**Population growth:** The world's population is believed to have reached 6.65 billion in March 2008 and is projected to reach 9 billion in 2050. The current growth rate is 1.3% and although this rate is expected to slow, it is estimated that each year until 2020, the world's farmers must try to feed an additional 70 million people. This growth is concentrated in the Indian subcontinent and sub-Saharan Africa, which are also the regions with the highest levels of poverty, and climatic variability.

**Changes in food consumption:** Rising incomes worldwide have enabled some 3 or 4 billion low-income consumers to move up the food chain, consuming more poultry, pork, beef, milk, eggs, and farmed fish. World meat production climbed from 44 million tons in 1950 to

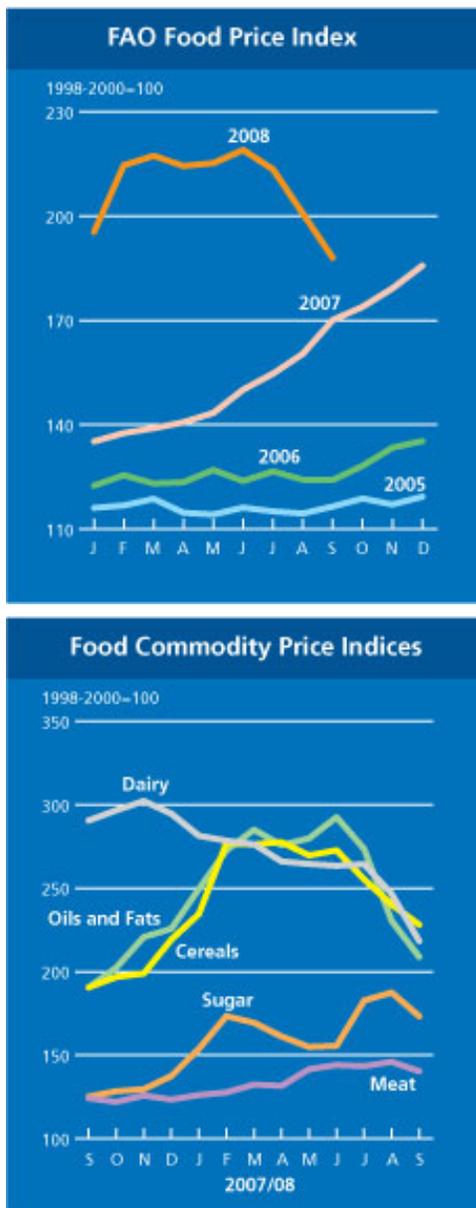


Figure 2. Food price indices (Source: FAO, 2008).

265 million tons in 2005. During this 55-year span, consumption per person more than doubled from 17 kilograms to 41 kilograms. The production of each kilogram of beef requires 7-8 kg of maize and livestock production, including animal feed production, now accounts for one third of all arable land.

**World food stocks:** World carryover stocks of grain, the amount in the bin when the next harvest begins, are the most basic measure of food security. Grain reserves have shrunk by half since 1999, from a reserve big enough to feed the entire world for 116 days to a predicted low of only 57 days by 2007/2008. As world food stocks declined below 60 days' reserves, price volatility and price changes became magnified.

The global cereal harvest in 2008 is considerably larger than forecast, resulting in as much as an 8% increase in world cereal stocks even accounting for increased utilization. With anticipated improved supply, international prices have weakened significantly which could mean a cutback in plantings followed by reduced harvests next year in major exporting countries. Given continuing low grains stocks, FAO suggests that this scenario could lead to another turn of record food prices next year – a catastrophe for millions who by then would be left with little money and no credit.

**Commodity markets and trade:** Speculators, anticipating future food price increases, poured billions of dollars into commodities, further accelerating price rises. For example, in a single day in February 2007, global wheat prices jumped 25% after Kazakhstan's government announced plans to restrict exports of its giant wheat crop for fear that its own citizens might go hungry.

Farmers in developing countries cannot compete with exports from developed countries that heavily subsidize agriculture and they are often put out of business by cheap imports. In 2002, agricultural subsidies reached \$300 billion annually in developed countries allowing, in many cases, production costs to be lower

than those in developing countries. Freer trade since 1995 has made countries in the southern hemisphere more dependent on imports and therefore more vulnerable to food price increases.

**Oil prices:** The cost of oil doubled between 2005 and 2008 resulting in a tripling of fertilizer prices and a doubling of transportation costs. Food production costs therefore increased substantially.

**Biofuel production:** The emerging biofuels market is now a significant source of demand for agricultural commodities such as sugar, maize, oilseeds and palm oil. These crops, predominantly used as food in the past, are now also used as feedstock for producing biofuels which diverts land away from food production, reduces food availability and drives up food prices. Significant increases in the price of crude oil combined with concerns about climate change led to the implementation of public policies to support the biofuels sector. Global biofuel production tripled from 4.8 to 16 billion gallons between 2000 and 2007 and production continues to grow at a rate of about 15% annually. Biofuel demand will continue to have an important effect on world food prices as long as petroleum prices remain high. However, since 70-80% of the cost of biofuels is constituted by the cost of the feedstock itself, if the feedstock prices begin increasing faster than the price of crude oil, biofuels may cease to be competitive with fossil fuels.

**Reduced investment in agriculture and irrigation:** Investments in agriculture and food production have declined since the 1980s. It was widely believed that the global food security problem was solved and as a result our resource base and agricultural infrastructure were neglected. Since 1990, funding of Official Development Assistance (ODA) to agriculture has declined from 18 per cent to less than 4 per cent of the total ODA from the OECD countries. In developing countries, agriculture contributes 29 per cent of gross

domestic products, but less than 4 per cent of GDP has been invested in agriculture.

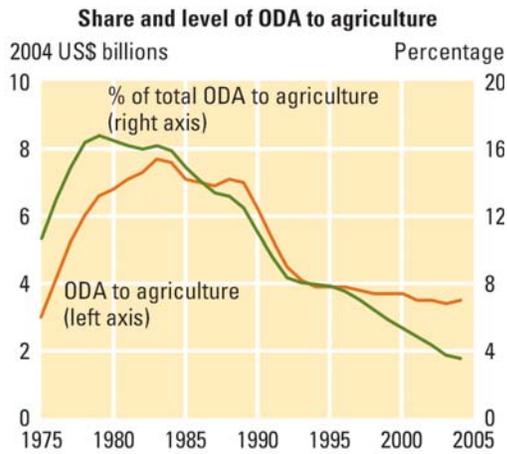


Figure 3. ODA investments in agriculture (Source: World Bank, 2008).

Declining investments in the agricultural sector have resulted in a lack of infrastructure in rural areas including roads, electricity, irrigation, water storage and an absence of rural markets, collection and certification centres, and transport for perishables all of which have impeded food production gains. Declining investments also resulted in a lack of research and development into building the technical capacity of farmers, improving crop productivity, reducing post harvest losses (which can reach 20-30 %), improving water use efficiency and preventing environmental degradation. Since the beginning of the 1990s, crop yields have essentially stopped rising.

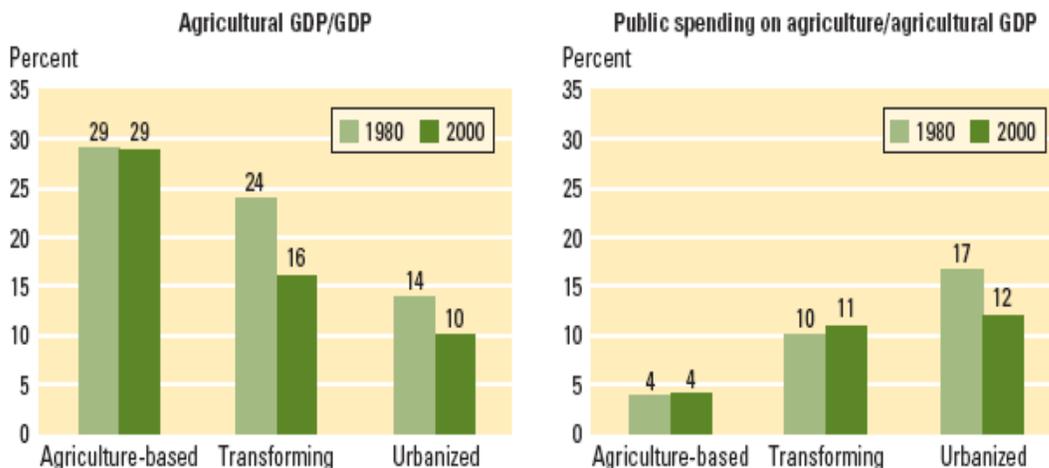


Figure 4. Public spending in agriculture (Source: World Bank, 2008).

**Climatic effects:** Tropical developing countries, many of which have poor land and water resources and already face serious food insecurity, may be particularly vulnerable to climate change as droughts and floods become more frequent. Regions that rely on large irrigation systems for food production will also be vulnerable as temperature changes alter runoff regimes from high mountain glaciers such as the Himalayas,

Rocky Mountains, and Andes. High runoff periods are expected to shift towards early periods in the spring, when irrigation water demand is still low meaning that less water will be available for peak periods of the growing season.

The Canadian prairies suffered from several droughts in recent years, which reduced Canadian production of wheat and other commodities for export. Droughts in

Australia have had the same effect on reducing the world supplies of food. We must also not forget the impacts of drought on famines in Ethiopia and the Horn of Africa in the recent past. Extremes of climate in the forms of drought and floods can have a disastrous effect on food availability, and the buffering capacity in the developing countries is negligible, which makes the populations of these countries highly vulnerable.

### The Importance of Water to Food Security

Irrigation increases crop yields 2 to 3 times that in dryland farming, promotes stabilization and reliability of crop production and allows for crop diversification in farm production including the introduction of new crops that are not generally viable under dryland farming. Irrigated agriculture has also been critically important for poverty reduction in many countries. In Asia, the poverty head count is typically far lower in irrigated areas—in Vietnam, 18 % against over 60 % in rainfed areas.

Without irrigation, the increases in yields and output that have fed the world's growing population and stabilized food production would not have been possible. Agriculture currently accounts for the more than 70% of world's total water use. Its share drops to ~ 40% in countries that import food and have a developed and diverse economy but rises to over 95% in many of the countries where agriculture is the prime economic activity. Today, only 19 % of the world's croplands are irrigated, but those lands yield some 36 % of the global harvest. Irrigation makes the greatest contribution to global food security in Asia. Irrigated lands account for as much as 80 % of food production in Pakistan, some 70 % in China and over 50 % in India and Indonesia.

As the world population increases and the climate changes, the pressure on the world's water will intensify.

## SUMMARY OF POLICY RECOMMENDATIONS

### Recommendations for Alleviating the Food Crisis

To better understand the factors that led to rising food prices and higher numbers of hungry people and to address solutions, McGill University convened a high level international consultation from September 24-26, 2008. Views and inputs were solicited from stakeholders in developed and developing countries including the food industry, international organizations, donor agencies, governments, farmers, international scholars, and non-governmental organizations

As stated by the Rt.-Hon. Joe Clark "The solutions to the food crisis – and it is a real and important crisis – will not come from individual governments or groups working on their own. The solutions will come from experts at all levels working together, and that's exactly what this conference was able to achieve in a very short time."

The following is a summary of the solutions and recommendations derived from the conference speakers and discussions.

#### Broad policy and social recommendations

- Agriculture has been an engine for growth and development in Europe, North America and parts of Asia. In this context, we need to reinforce the importance of the agricultural sector for economic development in developing countries. This will invigorate economies and generate wealth to help combat poverty.
- Countries in the early stages of structural transformation, where agriculture is more important than other industries, should be encouraged to increase food production for domestic and regional consumption. Civil society, government and the private sector must all be involved. The farmer, particularly women farmers, should be at the centre of engagement and actively involved in the development process.

- International and local relief organizations should be supported in their efforts to provide immediate relief for vulnerable populations, and assist them in building their assets and productive capacity to transition into a level of food security. Responses may include:
  - Food vouchers and cash so that recipients can buy locally produced food and thus help generate wealth in the community;
  - Food for work and cash for work programs;
  - Mother and child nutrition programs;
  - Feed children in school and continue the program during vacation time;
  - Adjust the food basket between different grains as food prices vary, and shift to more nutritious foods;
  - Provide cash transfers to countries in proportion to the number of children in school or attending nutrition centres. This money is circulated locally, so that people buy non tradable commodities;
  - Vouchers for seeds and fertilizers, and for specific agricultural assets such as livestock, so as to prevent farmers from falling into debt and deeper poverty.
- There is a need to place stricter controls on taking farmland out of food production, in order to maintain the agricultural land base.
- Promote rural entrepreneurship, particularly among women in rural communities, so that value can be added to basic food commodities, in order to increase food supplies, and generate wealth and increased food purchasing power in vulnerable communities. Viable cottage industries and village agro-processing plants need to be supported.

#### **Institutional policy recommendations**

- Global policies and development aid should focus on eliminating agricultural and trade barriers. Government policies should allow farmers to take advantage of local, regional and international market opportunities.
- Export bans and restrictions on food trade increase market volatility. These restrictions should be removed within the context of global and regional trade organizations, so as not to affect smaller countries. Trade discussions between countries will improve understanding of food supplies and food demands, and reduce the panic about food shortages within countries.
- An early warning system is necessary to allow countries to prepare in advance for food shortages.
- Developing countries should create policy tools such as credit, regulatory and fiscal frameworks, environmental sustainability, risk management, and rights to resources for food and agriculture production. They

should also create price stability and adequate remuneration to increase food production.

- Encourage a new generation of farmers through youth training and grants, and stimulate more young people, particularly in developing countries, to go into agricultural production and research.

#### **Technical Recommendations**

- Higher farm incomes will enable farmers to invest in their own communities, in water and sanitation infrastructure, and in veterinary medicines. There is thus a need to develop suitable technologies which will increase farm income.
- Improve the dissemination of technology best practices, and practices on nutrition, and information on child and maternal health in community and farm level organizations.
- Massive educational and extension programs ought to be implemented at local and regional levels.
- There is a need for technologies which will produce more food with fewer inputs and resources, and build resilience into our soils and ecosystems.
- Information on modern technologies in the areas of crop production, post harvest technology, irrigation and water storage, soil fertility and stabilization urgently needs to be available to farmers.
- Innovative research programs should be developed rapidly to focus on crop yield improvements, transformations of production and post-production systems, reducing post harvest losses, sustainable land and water use, and preventing environmental degradation.

#### **Financial recommendations**

- Investment in the agricultural sector needs to be ramped up and should be made a priority of both national governments and donors.
- Investments are urgently needed for fast impact programs and for medium and long term programs including improving rural infrastructure (roads, power, irrigation, post-harvest storage and distribution, agro-processing facilities), agricultural production, research and development, and building technical capacity for extension workers, scientists, and farmers.

## Next Steps and Way Forward

Given the current global financial crisis and the impact that this is likely to have on a worsening food crisis, it is critical that world food production become an international priority.

McGill University is extremely well-placed to take leadership on the issues of global food security and bring together world experts to develop solutions. To build on the momentum generated by the conference, there was unanimous agreement from participants that McGill University create a Global Food Policy Institute that would implement a research and training comprised of several objectives, including the following, in the immediate short term:

- Analyze policies of food production and trading that may exacerbate food insecurity and development of ideas which may reduce the harmful impacts of distorted policies;
- Monitor food supplies in select vulnerable countries, and develop early warning and alert mechanisms which could trigger short term food production, in order to lessen impending crises.
- Define an innovative research agenda which can be rapidly implemented at the village or community levels, in order to increase food availability immediately;
- Undertake immediate, short term training programs to build capacity of farmers, extension workers and scientists involved in food and nutrition;
- Develop and disseminate a series of advocacy papers on specific topics related to the food crisis, which can be disseminated widely to governments, donors, NGOs and the private sector. Papers will include topics such as the need to increase investment in agriculture, community nutrition programs to improve child and maternal health, and mechanisms for building resilience in vulnerable communities.

In order to achieve the above objectives, it would be necessary to focus on some very specific countries such as: Kenya, Ethiopia, Malawi, Ghana, Mali, Senegal, Zambia, Guyana, Honduras, Cambodia, and Bangladesh.

It was further proposed that the McGill Conference on Global Food Security should become an annual event. It will provide an ongoing forum where experts from international organizations, governments, and farm organizations can meet to further understanding and cooperation and find solutions to the ongoing food crisis. The results of some of the above policy analyses and monitoring can be reported at the annual conferences.

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## BIOGRAPHICAL NOTES

**Professor Chandra Madramootoo** is Dean of the Faculty of Agricultural and Environmental Sciences, and an internationally respected expert in water table management, irrigation, drainage, water quality, watershed management, land reclamation, agricultural research, and international agriculture development. He currently serves as the President of the International Commission on Irrigation and Drainage (ICID), and was Vice President of ICID from 2000-2003. He is also a member of the Governing Board of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), one of the 15 Centers supported by the Consultative Group on International Agricultural Research (CGIAR), and headquartered in Andhra Pradesh, India. His research and teaching in water resources management have led to extensive international involvement with governments and institutions in the Caribbean, Central Asia, Egypt, Pakistan, India and Sri Lanka.

**Helen Fyles** is a Research Associate in the Faculty of Agriculture and Environmental Sciences at McGill University with many years of experience writing proposals, literature reviews, and reports for various university and government agencies. Her expertise is in soil science, C and N cycling, water resource management, sustainable agriculture and food security.



## ABOUT CDAS

Founded in 1963, the Centre for Developing-Area Studies is undergoing a process of renewal so that it better reflects the changed reality of the world we live in. In the

not so distant past when the Cold War had an inescapable impact on the “third world,” the developmentalist state was almost universally regarded as a solution to development bottlenecks and the advantages of various non-democratic forms of government were hotly debated. Today the Cold War is over, states are often seen as obstacles to market-led development and political democracy is an explicit goal of a wide range of national and transnational actors. Sadly, while the problems of poverty and inequality often remain daunting after decades of development research and assistance, the solutions seem to be more complex than ever given the often contradictory tendencies associated with many of the changes that have so transformed the world in which we live. It is also more apparent than ever before that bridges need to be built between academic researchers, policymakers and various non-governmental actors to deal with these challenges. CDAS plans to help build these bridges. *Foresight* is one way to accomplish that.

CDAS' new research agenda revolves around the need for *Understanding the Foundations of Democratic Governance*. To an unprecedented degree, achieving democratic governance where it does not exist and improving its quality where it does have become dominant goals, from the local level to the global. Yet it is not clear whether there is just one form of democratic rule, or if there is not, what qualities all democracies must share. For many new democracies, there is also a growing concern with the apparent inability of elected governments to effectively respond to citizens' most urgent needs. However valued democracy may be in the abstract, the perceived ineffectiveness of actual democratic governments threatens to lead people to question its *relevance* to the most pressing issues of the day.

CDAS' renewal also reflects a tradition of strength in development research and teaching at McGill. With literally dozens of tenure-stream professors working on issues relating to development, well over 100 graduate students completing MA and PhD degrees in Arts focusing on development issues and a new MA Development Option at the graduate level, not to mention almost 1000 undergraduate students in McGill's *International Development Studies* program, CDAS is poised to assume a new leadership role in development studies.

## EDITORIAL COMMITTEE

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