



# **Agriculture's Strategic Role in Feeding and Fueling a Growing World**



***Issue Report***

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## Preface

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As we look to the future, agriculture in the United States and around the world faces a difficult challenge: how to feed a growing world. Global population is expected to increase by one-third to reach 9 billion by 2040. Incomes are rising, too, bringing increased demand for agriculture to provide food, fiber and energy, and increasing pressure on global resources.

U.S. agriculture alone cannot feed a growing world. However, with its rich endowment of agricultural resources and its leadership in technology, the United States will play a critical role in determining if the world will meet this 30-year challenge.

Given the right tools and incentives, we are confident the world's agricultural producers and agribusinesses will rise to the challenge. But those incentives and tools are heavily influenced by public policy. Current food and agricultural programs and policies in the United States have been shaped by decades of abundance and declining real food prices. But consumers, environmental concerns and climate change are reshaping the public policy landscape. It is not clear that today's policies—designed to deal with issues of the last century—will provide appropriate tools and incentives to address the 30-year challenge.

Farm Foundation has a 75-year commitment to objectivity, fostering constructive debate that is essential to sound public policy development in a democracy. It is appropriate that Farm Foundation be the catalyst to spur all stakeholders to begin discussions on the 30-year challenge. The need is real and well recognized. A new Administration and a new Congress are about to begin their terms. The world stage is set for new directions and solutions. This is a “generational opportunity” to begin new discussions on public policies for the 21st Century.

This project was not conceived to recommend solutions but to start the discussion and debate among all stakeholders about the multitude of choices which lie before us if we are to meet the 30-year challenge.



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## Executive Summary

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Over the next 30 years, agriculture will be challenged to provide food, fiber and energy to a growing world population. World population is forecast to increase by more than one-third to 9 billion people by 2040. The number of undernourished people is expected to remain in the hundreds of millions.

The setting for this challenge is characterized by income growth that changes dietary preferences, increasing competition for natural resources, expanding demand for agricultural output for food and non-food purposes such as biofuels, and concerns about a changing environment. Climate change may require agriculture to adapt to ongoing changes and to play a role in mitigating greenhouse gas emissions.

In the United States and most developed economies, both public policies and private-sector decisions have been shaped by decades of abundance and declining real food prices. In the future, agriculture will be challenged to meet competing and growing demand for its products. Inaction or reaction without clear vision of the long-term future invites inconsistency and unintended consequences. U.S. agriculture cannot meet this challenge alone—it cannot single-handedly feed a growing world. However, as a principal agricultural producer and a leader in the development of agricultural technology, the United States will play a critical role in determining whether the world is able to meet the challenge of feeding and fueling a growing world over the next three decades.

The 30-year challenge for agriculture defies easy analysis or simple solutions. Farm Foundation initiated this project to provide public and private decision makers with insights into the complex nature of the challenge and the range of long-term strategies and policies that might be considered. In keeping with Farm Foundation's history of objectivity—the Foundation does not lobby or advocate—this project was not conceived to recommend specific approaches or solutions. Rather, this report is a catalyst to foster understanding among all stakeholders of the challenges ahead, potential options to address those challenges, and the consequences of those options. Meeting the 30-year challenge begins with discussion of the issues and options.

### Six categories of challenge

To develop this report, Farm Foundation drew on the insights of leaders from business, government, non-governmental organizations and academia. We began with a small group of individuals whose discussions defined the 30-year challenge in six broad categories:

*1. Global financial markets and recession.* While the current financial situation is shrouded in uncertainty, agriculture faces the short-term risks that threaten the entire economy, difficulty in accessing credit and shrinking economic activity.

Long-term, the changes in financial market regulation that will likely emerge from the current crisis may help to ensure that the financial institutions serving agriculture are able to provide the capital and risk management services agricultural producers and businesses will need to meet the 30-year challenge.

*2. Global food security.* World population is forecast to exceed 9 billion by 2040, an increase of more than one-third. Meanwhile, increased protein consumption and other changes in diets that accompany income growth, along with the demand for bioenergy feedstocks, will put even greater pressure on agricultural resources. Agriculture will be challenged to provide stable access to safe food for this growing population.

*3. Global energy security.* The combination of high energy prices and public policies encouraging biofuel production globally has led to the rapid development of a biofuel industry. As a result, the agriculture and energy sectors are now linked through markets for key feedstocks including grains, oilseeds and sugar. A growing world population means increasing demand for both food and energy. As a source of both, agriculture will be challenged to balance and meet competing demands.

*4. Climate change.* There is uncertainty about the exact effects of global climate change, but science suggests it may result in greater volatility in crop production, and change the geographic distribution of crop production. Agriculture is not yet fully prepared to adapt to these changes. As one of the linchpins in the carbon cycle, agriculture has the potential to play a key role in reducing greenhouse gas emissions.

*5. Competition for natural resources.* The competition for natural resources is driven by competing demands for market goods, food and fuel, as well as society's increasing demand for environmental protection and services. Agriculture will be challenged to balance these competing demands.

*6. Global economic development.* In many developing countries, agriculture is the source of a large share of income, and food is a large share of expenditures. Agricultural sector performance is one element to the broader goal of economic development.

### Recurring themes

Farm Foundation then invited a broader group of leaders to explore each of the six categories, identifying critical strategic problems, alternative strategies and potential policies. Those discussions are the basis of this report. In the course of those discussions, several themes became apparent.

- A high degree of *uncertainty* surrounds most key policy issues. The effects of the current financial crisis and global recession on the agricultural sector are unknown. Climate change entails many uncertainties about what is happening,

what will happen and how to limit further changes. Uncertainty even clouds judgments about long-standing problems such as natural resource limits and the role of agriculture in economic development.

- *Public understanding* of agriculture has changed significantly over the last half century. As the segment of the population engaged in agriculture has dwindled, fewer and fewer people have any direct connection with or understanding of agricultural production. Many consumers are increasingly concerned about how their food is produced. Some of these concerns are related to food safety, while others reflect such ethical concerns as labor standards and animal treatment. Agricultural producers sometimes struggle to understanding public attitudes about these concerns. Bridging the gap in understanding between agriculture and the broader public will be critical to the development of policies needed to meet the 30-year challenge.
- *Unintended consequences* accompany any policy intervention. Neither consumers nor producers are passive with respect to changing incentives. Any change in policy or regulation that changes incentives will have indirect effects as quantity and price adjustments cascade through markets.
- Policies have costs as well as benefits. Balancing these *trade-offs* will be an important consideration. In some cases, identifying costs of policy change may involve straightforward budget analysis. Adequate data and careful analysis would help provide a sound basis for evaluating complex trade-offs, such as those dealing with short-term disruptions and the need for long-term strategic investment, or trade-offs between environmental goals and the increasing demand for food, fiber and fuel.
- New technologies resulting from *research and development* may help achieve goals for global food security and energy security while limiting depletion of natural resources or environmental degradation. However, decision making about research investment may fail to take into account its full value to society, since costs are often immediate while benefits/returns are long-term or global in nature.
- Physical and institutional *infrastructures* are critical to agriculture's ability to meet the 30-year challenge. Much of the physical infrastructure to move and trade U.S. commodities is aging and pushed beyond capacity, and the institutional infrastructure is not perceived by all consumers to provide safe food. The physical and institutional infrastructure does not extend entirely to the rapidly developing markets for bioenergy and emerging markets for environmental services. Developing countries often face even more severe deficiencies

in infrastructure that impede agricultural markets and policies, as well as economic development.

- Producers and consumers around the world have experienced gains from *trade* as barriers have been reduced and global markets become more integrated. The 30-year challenge requires efficient use of resources on a global basis. So trade will be critical. The framework of international trade will be a major factor in agriculture's ability to serve global needs making the most efficient use of limited natural resources.
- The United States currently *lacks a clear strategy* for meeting the 30-year challenge. A clear statement of goals that recognizes the global nature of the problems facing U.S. agriculture, the high levels of uncertainty surrounding many of these problems, the shift to an era of multiplying demands, increasing competition for resources, and climate change could lead to more consistency in public- and private-sector decision making. Policy consistency could lead to fewer counter-productive, unintended consequences and more effective use of scarce resources, both natural and financial.

### The 30-year challenge

The issues and options identified in the report are not intended to be inclusive; rather they are a starting point from which to expand discussion and debate. This is not a consensus document and it does not make recommendations. It does reflect the diverse opinions expressed by project participants, their analysis of the problems which must be solved to meet the 30-year challenge, and their assessment of some potential options to address those problems.

Today, more than at any other time in recent decades, there is an opportunity—some would term it a “generational opportunity”—to consider policy more broadly. With new agricultural and energy legislation in place and the election of a new President and Congress, the opportunity exists to review long-term policy priorities and mechanisms. This is a unique opportunity to set out a clear strategy to meet the 30-year challenge and institute the public and private initiatives to achieve that strategy.

In this report, Farm Foundation does not recommend any particular strategy or specific policies. Farm Foundation undertook this project to motivate a debate about how U.S. agriculture will meet the challenge to set the framework necessary to meet growing food, fiber and fuel demands in a way that is consistent with natural resource and climate change imperatives.

It is time to begin.