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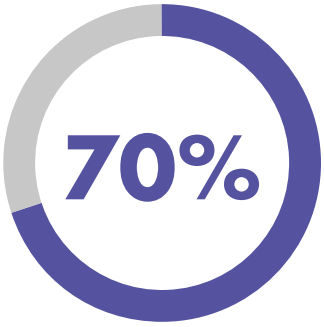
MARKET COMMENTARY

Feeding the World 2050: The Role of Financial Institutions in Agribusiness

The year 2000 ushered in the new millennium on a grand scale. Populations had quadrupled since the turn of the previous century,[1] swelling to over 281 million across the U.S.[2] and 6 billion worldwide.[3]



Worldwide food demand increase by the year 2050

Now, as we watch the second decade of the new millennium draw to a close, we see a similar trend in action. The United Nations predicts that global population numbers will rise to over nine billion by 2050.[4]

Rising population growth will impose a significant impact on worldwide food supplies as demand is projected to increase by at least 70 percent by 2050.[5] To feed the growing population, U.S. farmers will need to come to terms with three significant trends:

- Changing demographics that are already shifting demand for current staples, impacting trade and farmers' bottom lines.
- Evolving climate conditions that have impacted crop production and are expected to further alter current agricultural trends in many countries over the next 30 years, negatively impacting food supplies.
- Pulling more from available land and combat climate variables, technological advances that can be counted on to improve yields, but farmers will need to make drastic changes in many cases, to avail their operations of the new advancements.

Meeting the rising demand for food supplies will require sweeping changes across the agricultural landscape. Financial institutions, especially local banks and credit unions will play an important role in supporting American farmers in feeding a growing global community.

1. Elizabeth Nix. How Fast Is the World's Population Growing? History, Dec. 18, 2012. Web.
2. U.S. Summary: 200 Census 2000 Profile. US Census Bureau, Jul. 2002. Web.
3. World Population by Year. Worldometers, 2019.
4. Ibid.
5. How to Feed the World 2050. FAO, 2009.

of America's farmland is owned by a person over the age of 65

Changing Demographics Shift Agricultural Demand

Feeding the world in 2050 will be a complex proposition as rising income levels in emerging economies result in dietary changes across the developing world. The Food and Agriculture Organization of the United States (FAO) predicts that worldwide average pay levels will be "many multiples of what they are now", and demand for healthier and more nutritious food will rise proportionately.

To understand this trend better, we have only to look at the current global economy of Southeast Asia, where a growing middle class has already begun to alter historical food consumption.

Currently, Southeast Asia is the third-largest regional market for U.S. agricultural exports.[6] Sales of farm and food products totaled over $14 billion in 2018, according to the Office of the United States Trade Representative, but times are changing.[7]

Products, such as wheat, rice, coarse grains, oilseeds, and tobacco—exports that once made up the bulk of U.S. agricultural trade—are being supplanted by demand for high value products, such as dairy, meats, fruits and vegetables.[8]

Even in non-food agricultural markets, exports are shifting. In parts of the northeast, for example, the shade tobacco trade has been undermined in recent years by competition from foreign markets.

To remain alive in a dwindling farming economy, The Thrall Family Farmers in Connecticut made the decision to fill a local void, aided by emerging regulations. Banking on increased popularity of the craft beer trend and The Connecticut Farm Brewery Bill, which requires a certain percentage of beer ingredients to be produced in state, the Thralls shifted a portion of their acreage from tobacco production to malting grains.

The move required a change from a highly labor-intensive operation to a more mechanized method of farming. Hundred-year-old tobacco barns were razed, and new equipment purchased, but the future at this point is far from certain.

Across the heartland where much of the world's agricultural food exports are produced, it is a similar story. Shifting from one farm product to meet emerging demands often comes with the need for significant capital outlay for new equipment or livestock.

While some farmers evolve their operations, others are forced out of the industry or leave voluntarily. The American Farmland Trust (AFT), an entity focused on the preservation of America's farmable land, indicates that 40 percent of American agricultural property is owned by individuals aged 65 and up.[9] Many see the sale of land as the only way to fund their retirement. According to AFT, 371 million acres of the country's agricultural property could change hands by 2034.[10]

6. Trade Opportunities in Southeast Asia: Indonesia, Malaysia, and the Philippines. United States Department of Agriculture: Foreign Agricultural Service, Jul. 2018. Web.
7. U.S-ASEAN-10 Trade and Investment Facts. Office of the United States Trade Representative, 2018. Web.
8. U.S. Agricultural Trade at a Glance." United States department of Agriculture, updated Feb. 27, 2019. Web.
9. Lori Sallet. American Farmland Trust Featured in BBC World News Documentary, Follow the Food: Generation Farmer American Farmland Trust, Jun. 7, 2019. Web.
10. Ibid.

> Urban expansion means fewer acres for agricultural production and less food production.

Preserving American farmland is critical to meeting future food demands as the number of individuals living in rural areas shrinks by 18 percent,[11] and 68 percent of the global population is predicted to reside in urban centers over the next 30 years.[12] Urban expansion means fewer acres for agricultural production and less food produced in developing nations where population growth is expected to be strongest.

The U.S. is currently one of the largest producers of food and remains the largest exporter of agricultural products, feeding developing nations across the world. China and India fall in behind, but due to large population numbers and limited resources, both countries consume more than they contribute to worldwide food supplies.

As the trend persists, the U.S. will be called upon to continue providing its share of food products, but due to changing demand, many farmers will need to evolve into new markets.

Changing Weather Patterns and Frequent Natural Disasters Impact Agricultural Productivity

While climate change remains a hotly debated topic, most experts agree on the agricultural impact of warmer, wetter summers and more frequent natural disasters.

The FAO anticipates that warmer global temperatures will have a negative impact on farming markets in Africa, the Middle East and parts of South Asia by 2050 that could curb the nascent agricultural movement afoot in some of those nations. Predictions by the FAO indicate that parts of India, for example, could see production decrease by 2.6 percent over the next 30 years.[13]

The U.S., and other areas with a temperate climate, could benefit from the impact, as warmer and wetter conditions often result in longer growing seasons and higher crop production. Based on current trends, the FAO predicts that the U.S. will see a five percent rise in yield, while Canada sees the greater benefit, with a 27 percent increase in output by 2050.[14]

Reshaping the productivity of the world's agricultural centers will significantly impact import and export patterns over the next 30 years. Assuming that current climate conditions, macroeconomic and agricultural policy trends continue, the FAO anticipates that much of South Asia will require a 3.6 percent increase in agricultural imports while India could be hit hard by more than a 20 percent rise.[15]

Much of the flow of imported agricultural goods will come from North America as warmer temperatures increase crop yields, and factors such as technological advances allow farmers to do more with less land. However, rising temperatures could also result in heat waves, which can have the opposite effect, destroying crops and killing livestock.

A three-day heat wave in July of 2011 resulted in the death of as many as 4,000 Iowa cattle.[16] In early 2019, flooding in the Midwest and Plains states resulted in $3 billion in damages and millions of acres left unseeded.[17]

11. FAO's Director-General on How to Feed the World in 2050. (2009). Population and Development Review, 35(4), 837-839.
12. 68% of the World Population Projected to Live in Urban Areas by 2050, says UN. United Nations Department of Economic and Social Affairs, May 16, 2018. Web.
13. The State of Agricultural Commodity Markets. Food and Agriculture Organization of the United Nations, 2018. Web.
14. Ibid.
15. Ibid.
16. Heat Wave Has Killed up to 4,000 Iowa Cattle." Wallaces Farmer, Jul. 31, 2011. Web.
17. Emma Newburger. It Never Stops': US Farmers Now Face Extreme Heat Wave after Floods and Trade War. CNBC, Jul. 20, 2019. Web.

> Agricultural producers will need to capitalize on technology and genetic engineering to reduce the impact on the environment.

However, American ingenuity and pride in U.S. agriculture remains strong. The United States Department of Agriculture (USDA) predicts continued specialization of farming products, as farmers and ranchers zero in on profitability and make the most of available land. But agricultural producers will need to capitalize on technology and genetic engineering to reduce the impact on the environment while raising yields and lowering the cost of production.

Technology in Agriculture

Feeding the world in 2050 will require significant increases to current production levels. The FAO predicts that current outputs of meat production will need to increase by over 200 million tons.[18] Outputs in cereal grains, an area where worldwide yields have been declining, will need to rise by three billion tons.[19]

Technology will play a strong hand in meeting escalating food demands, creating more arable land and increasing crop yields and intensity. Advances in farming techniques will also change many current agricultural businesses, creating more efficient and local operations.

A report by the Graduate School of Stanford Business studied current crop production and the impact of technology on agricultural value drivers. Their research found that technology can drive significant improvements in areas such as production and yield as well as the amount of water and fertilizer used per ton.[20]

Precision agriculture, also known as site-specific crop management, has been shown to raise average yields by 13 percent while taking out 15 percent of the costs.[21]

Precision agriculture uses sensors and advanced analytics to evaluate relative sources of data, such as soil, available nutrients, pests and moisture to determine improvement actions that increase crop yields.

Farmers are also sending drones to the skies to monitor fields for potential problems in irrigation or with pests. The mile-high view allows farmers to take evasive action while the problem is still in its early stages.

Other farmers are looking toward software to improve post-production processes, ensuring that food gets where it is mostly likely to be consumed. Silo, a new startup, recently raised $3 million of funding to create software that will help farmers match demand for their crops with waiting buyers.

Despite opposition to current advancements to farming, such as GMOs, fertilizers and crop protection products, no one can argue with the output from technological advances to date. According to Dr. Jude Capper, writing in The True Impact of Animal Agriculture on the Environment, U.S. dairy farmers now use 77 percent less feed and have reduced their carbon footprint per gallon of milk by 63 percent when compared to 1944.[22]

18. How to Feed the World 2050." FAO, 2009. Web.
19. Ibid.
20. Technology in Agribusiness: Opportunities to Drive Value." Graduate School of Stanford Business, Aug. 2017. Web.
21. Ibid.
22. Jude L. Capper, PhD. Animal Agriculture and the Environment: The True Impact of Animal Agriculture on the Environment. Animal Agricultural Alliance.

> Banking financial experts should counsel with farmers to help them make the best financial decisions for their current, as well as prospective needs.

According to FAO, to feed 2050 population numbers, technology in agriculture will be essential, particularly in developing nations or those expected to be hit hard by warming climate conditions. Technology advances will impact every part of farming from the crops we plant to the machinery used in harvesting or post-production processes.

The Role Banks Will Play in Meeting 2050 Food Production

Feeding the world's growing population will take more than savvy farmers and arable land. It will require financing.

Farming has long been a cyclical business and thanks to changing markets, trade negotiations and recent weather disasters, American farmers are currently sitting in a downward trend. Saving farmland to ensure the output necessary to support future generations requires consistent cooperation between farmers and their banking partners.

Community banks and credit unions believe in supporting and promoting agribusiness across the entire agricultural value chain. They take a partnership approach with farmers that goes beyond financing to providing knowledge and building networks. Agriculture bankers believe that farmers can succeed in meeting 2050 production needs with the right support and associations.

Part of that support is education on the risks and rewards of financial management. At times it makes sense to take out a loan for future investment. At other times, it might make more sense to draw on capital. Banking financial experts should counsel with farmers to help them make the best financial decisions for their current, as well as prospective needs.

Financing is, and will likely remain, a part of farming life for the foreseeable future. Technology adaptations will require extensive funding, particularly for farmers who will need to invest in sensor-aided machinery. Sensors will be an invaluable aid to farmers, measuring water and soil conditions, plant health and even product ripeness.

Just as technology will aid farmers in the field, emerging FinTech solutions can help them take better and smarter control of their finances. Banks that provide online banking tools, for example, are helping farmers make better use of their time, allowing them to check balances, make deposits and even pay bills from the ever-ubiquitous smartphone.

Fintech also makes it easier for banks to facilitate lending, by streamlining loan origination and processing. Citizens Savings & Loan in Leavenworth, Kansas reduced booking times from 45 minutes to five through the aid of technology enhanced lending applications.

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Regional and community institutions remain the backbone of the agricultural sector. Since 2015, agricultural loan portfolios at the nation's top 30 banks fell 17.5 percent,[23] while smaller banks continue to fill the agricultural lending need.

United Bank of Iowa, for example, continues to hold a 77 percent farm loan concentration.[24] These smaller institutions can continue to form vital connections with the agricultural community by enhancing their solution stack and making it easier for farmers to manage their finances and financial health.

FinTech offers a viable solution for banks to gain the technology they need without developing in-house products or offerings, something that is outside the budget for most institutions in the community sector.

Similar to the role that banks play with agricultural producers, Fintech providers partner with and support banks on technology solutions that make it easier for them to meet the needs of farmers as well as the internal operational needs of the bank.

A 70 percent population increase by 2050 means the future of agriculture looks bright, and banks will continue to play a strong supporting role in the success of agribusiness. FinTech partners will be the network in the background, quietly ensuring that banks have the products and tools they need to support agribusiness in its vital role of feeding the world.

23. Big Banks Exiting Farm Loan Business." ProAg. ProAg News, Jul. 12, 2019. Web.
24. Top 100 Farm Lenders Ranked by Dollar Volume." American Bankers Association, Quarter 1, 2019. Web.

About Finastra

Finastra unlocks the potential of people and businesses in finance, creating a platform for open innovation. Formed in 2017 by the combination of Misys and D+H, we provide the broadest portfolio of financial services software in the world today—spanning retail banking, transaction banking, lending, and treasury and capital markets. Our solutions enable customers to deploy mission critical technology on premises or in the cloud. Our scale and geographical reach means that we can serve customers effectively, regardless of their size or geographic location—from global financial institutions, to community banks and credit unions.
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