

In the coming decades, the demand for agricultural and food products is expected to increase significantly. This research note discusses some of the factors driving the increase in global food demand, various investment opportunities across the agriculture value chain, and prominent risks and considerations unique to the sector.

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Agriculture sector overview

The global agriculture sector represents a meaningful contributor to global economic activity. With the sector comprising approximately 5.4%,¹ or \$1.1 trillion, of 2017 US Gross Domestic Product ("GDP") and 3.4%² on a global level, the investment opportunity set is significant. Over the coming decades, food and agriculture is expected to expand significantly, driven by increases in demand resulting from global population growth, expansion of the global middle class, and changing consumer habits.

¹ USDA Economic Research Service

² The World Bank

World populations are projected to experience significant growth over the coming decades. According to the US Census Bureau's International Data Base, there were approximately 7.6 billion people living on the planet in 2019, and by 2050, that figure is projected to exceed 9.5 billion people, representing a 25% increase or almost 1.9 billion additional people. The sheer increase of people alone will bring about significant increases in the demand for food. However, food consumption patterns are changing in both developing and developed countries, which is accelerating the already increasing demand. Furthermore, advances in medicine and a general improvement of societal health and living conditions are contributing to longer life expectancies.

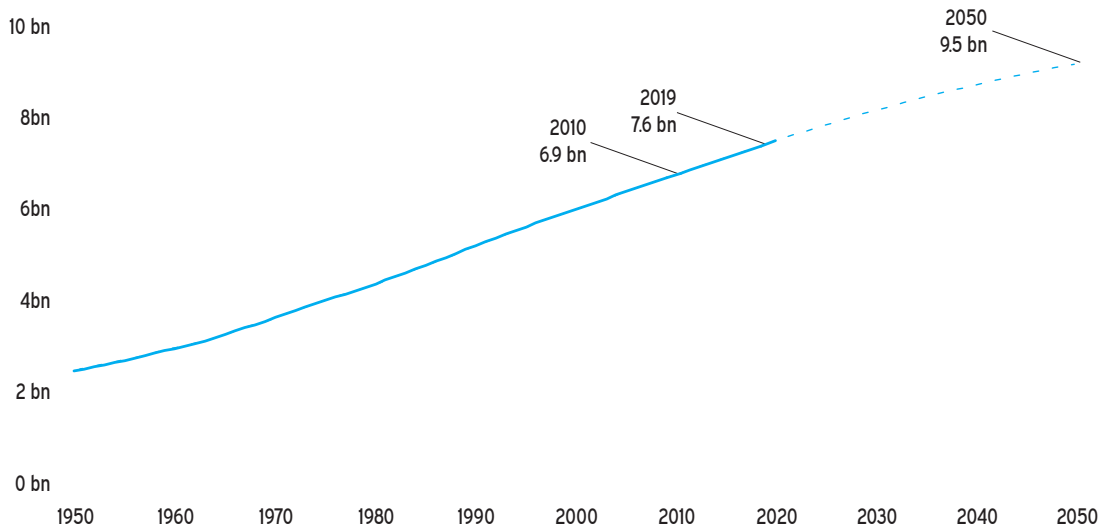


FIGURE 1
World Population Projections³

³ Census.gov

Today, approximately 85% of the world's population resides in developing countries where incomes are well below those of developed countries. However, incomes in developing countries are on the rise, and overall welfare is improving on a relative basis. The OECD Development Centre estimates that the world's middle-class will increase from 1.8 billion people in 2009 to 3.2 billion by 2020 and to 4.9 billion by 2030 as more people emerge from poverty levels. The income effect is the relationship between income and demand for goods, and people naturally seek to improve their standards of living and increase consumption of goods, inclusive of food and agricultural products, as incomes increase. Additionally, increased meat consumption typically goes hand-in-hand with rising incomes,⁴ which has a multiplier effect on the demand of grains. For example, approximately seven pounds of grains are necessary to produce one pound of beef, and two to three pounds of feed are required to produce one pound of chicken.

⁴ Schroeder, Ted & Barkley, Andrew & Schroeder, Kathi (1996). Income Growth and International Meat Consumption. *Journal of International Food & Agribusiness Marketing*. 7. 15-30. 10.1300/J047v07n03_02.

The per capita consumption of food, as measured in calories, has been relatively stable for developed countries, as shown in the figure below. However, caloric consumption has been rapidly rising for countries experiencing large income growth such as China and India. With increased ranks of the global middle class and population increases, the trajectory of food demand and consumption is expected to increase significantly in the coming decades.

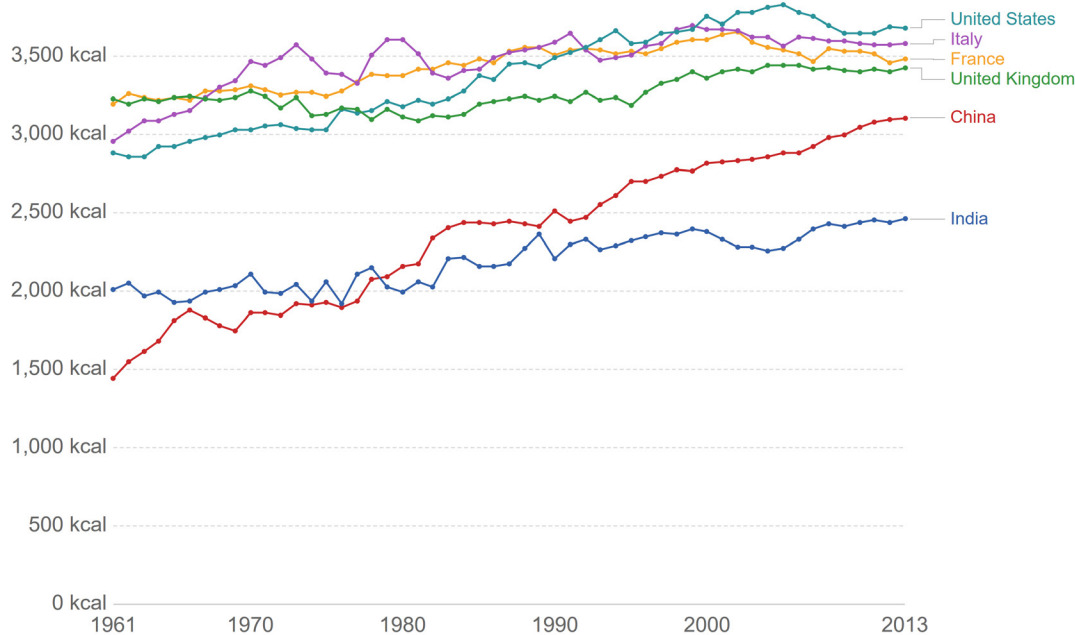


FIGURE 2
Daily Per Capita Caloric Consumption by Country

Source: FAO (2017);
www.ourworldindata.org

Global per capita consumption of food is expected to increase by 2050, driven primarily by increases in developing countries. The most meaningful increases in daily calories consumed are projected to occur in South Asia, Sub-Saharan Africa, and East Asia, with increases of 23%, 22%, and 13%, respectively.⁵

⁵ FAO – World Ag Toward 2030/2050 (2012 revision).

⁶ The Economist, Barbarians at the Farm Gate, December 30, 2014.

“In the next 40 years, humans will need to produce more food than they did in the previous 10,000 put together”⁶

At the same time, evolving consumer preferences are driving growth in certain segments while creating new markets altogether. The prominence of the health conscious consumer and discerning diets are helping to drive this change. For example, fresh produce and products with less preservatives are becoming an important consideration when consuming foods. Products labeled “organic” must limit the use of certain synthetic inputs and are perceived, and recognized, as healthier alternatives. Additionally, the manner in which food is grown or raised, whether in a more environmentally friendly and sustainable manner, or processes that consider improved animal welfare, are increasingly being factored into consumptive behaviors. Foods such as cage-free chicken eggs, 100% grass-fed cows, and plant-based protein alternatives, among others, were not mainstream products years ago but can now be found in many local grocery stores, along with premium prices that accompany them. In order to accommodate these new products, food supply chains will also need to expand, sometimes distinct and separate from conventional channels.

Resources are limited to meet the expected increase in food consumption and demand. Two prominent constraints to increase production are the availability of arable land and scarcity of water. The most productive crop-producing regions with established routes (e.g., roads and waterways) to end markets continue to diminish due to urbanization and development activities. While new lands are being cultivated in geographies such as South America and Sub-Saharan Africa, these areas typically face challenges due to lack of transportation infrastructure, water resource availability, limited access to equipment and skilled labor, and inferior soil fertility. In California, the agriculture industry has increasingly relied on groundwater from wells to help supplement declining surface water availability. The surge in groundwater extraction has resulted in unsustainable water draws and surface subsidence in certain areas. In order to help recharge groundwater resources and mitigate the sinking of land, California passed the Sustainable Groundwater Management Act (“SGMA”), which is expected to further limit water resources available to California’s farmers.

Agriculture investment opportunity

Due to the anticipated continued growth in food demand, significant investment across the food and agriculture sector is necessary. With increasing food consumption and limited resources, such as arable land and water, global agriculture requires a solution to produce more with less. The agriculture industry continues to develop technology, operational efficiencies, and industry best practices to ensure food security and safety in an environmentally sustainable manner. For many of the reasons previously mentioned, we believe there is a significant opportunity to invest across the agriculture value chain.

The agriculture sector can be broadly defined across components of the food value chain including: 1) inputs, 2) farming and production, and 3) processing and distribution of food products to the consumer.



FIGURE 3

Inputs

Inputs include the raw materials and supplies that enable food production or are critical for the growth of agricultural products. Prominent examples of inputs include seeds, water, fertilizers, pest & disease control products, and animal feed & nutrition products. Inputs may also include equipment and machinery utilized on the farm to assist with operations and increase efficiencies. The industry continues to innovate and adopt technology such as water efficient irrigation systems, GPS-guided combine harvesters, robotics, drone and satellite imagery, data collection and analysis, indoor vertical and warehouse farming, and gene editing.

Investment strategies and the scope of opportunities can be wide, but investment managers tend to focus on companies with established businesses and marketable products that can benefit from growth capital to further expand business initiatives and operational improvements. General value-add opportunities that drive investment returns may include increasing revenue and EBITDA metrics through add-on and organic growth activities, realizing operational efficiencies and cost reductions, optimizing capital structures, and professionalizing business processes and corporate governance.

Farming and production

Farming and food production activities typically include the growth and harvest of food products such as row crops (e.g., corn, wheat, soybeans, vegetables) and permanent crops (e.g., apples, avocados, grapes, oranges). It may also include activities associated with the breeding and raising of protein such as livestock, fish, and poultry. Activities within this sector generally take place on a farm, ranch, or fishery.

As a result, investments may have a land-based component, which provides downside protection in the form of real asset ownership. It may also involve exposure to farming operations, with returns dependent on commodity prices and crop yields. Farm operators typically seek to improve land productivity and crop yields by investing in capital improvements such as drainage, irrigation, and land leveling, and improving operations and increasing scale with the use of highly efficient equipment and machinery. Because of the annual harvesting activities or rents received from landownership, this segment of the value chain typically produces regular income and yield.

Processing and distribution

Processing and distribution activities link producers with consumers further down the value chain. Examples include processing of food (e.g., conversion of grain to flour, milk to cheese, etc.), packaging and handling of food products, and transportation and logistics operations to move food to consumers. Food safety and supply chain traceability is becoming an increasingly important factor for food companies when sourcing ingredients from various suppliers, particularly given the recent high profile illness outbreaks.

Value-add opportunities within this segment of the value chain are often associated with growth and business operations, inclusive of supply chain optimization and tracking, capital expenditure programs, cost reductions, capital structure optimization, and company governance policies.

Risks and considerations

Investing in agriculture involves many general investment considerations along with unique sector-specific risks. At the macro level, agriculture has high sensitivity to weather and climate change, availability of water, and urbanization. The effects of climate change and major weather events such as floods, hurricanes, and droughts have the potential to devastate crop production and disrupt the supply chains of food and agribusiness companies. Agriculture consumes almost 70% of available fresh water resources and has increased susceptibility and risk to water shortages, droughts, and regulatory policies related to conservation and sustainability. Municipalities and energy companies are competing with agriculture for water resources. Furthermore, the industry must manage risks associated with pests and diseases, particularly if one is an organic farmer or food company, which has a more limited tool kit to address these problems. Urbanization continues to remove productive crop-producing land. Much of the land being converted to crop-producing farmland is located in emerging markets, where logistics and transportation challenges are elevated. Additionally, investments outside of the US are exposed to geo-political issues and changes in exchange rates and currency, which can magnify risks.

The industry also faces risks related to government policy, regulation, and intervention. The US agriculture industry has powerful lobby groups, and it has benefitted from government support in various forms including crop insurance, subsidized income payments, various conservation and land fallowing programs, and marketing and trade. As a result, the agriculture industry is subject to a relatively high amount of distortion by non-market forces. For example, the US agriculture industry has been a victim of the recent trade and tariff disputes between the US and China. China has an enormous demand for food products and has historically been a major importer of US agricultural exports, particularly soybeans. According to the USDA, China accounted for over 60% of US soybean exports in 2017. However, exports to China have decreased significantly, resulting in a crash in soybean prices and focus on identifying alternative markets.

Demographic shifts in the US and elsewhere in the world, driven by a wave of retiring farmers and waning agriculture interest from younger generations, is helping drive consolidation of farmland ownership.

General opposition to genetically modified organism (“GMO”) crops has increased over the past several decades. Despite the many benefits that genetically modified (“GM”) plants have provided society, such as increased crop yields and vitamin-enriched grains, concerns of monarch butterfly-killing corn and Roundup resistant crops helped propel an anti-GM movement. Opposition related to GM foods could impact the overall demand, and therefore pricing, of these GM foods.

Further, demographic shifts in the US and elsewhere in the world, driven by a wave of retiring farmers and waning agriculture interest from younger generations, is helping drive consolidation of farmland ownership. While large-scale farmers and farmland owners benefit from economies of scale and typically have greater means to invest in and improve land and operations, they are sometimes met with apprehension and negative sentiment from smaller scale operators and advocates of “mom & pop” farms.

Other general risks applicable to the agriculture sector, as well as other sectors and industries, include the successful operation and execution of a business' operations. Early-stage investments often face technology and market risks associated with the viability of a product or service, successful customer adoption, and scaling of a business. Additionally, successful execution of a management team's growth plans, capital structure, cost reductions, and operational efficiencies will ultimately drive the success of a business and investment returns.

While some of these risks can be meaningful, we believe there is an attractive investment proposition for many themes across the agriculture industry.

Portfolio considerations

The investment characteristics of different agriculture strategies and approaches can vary significantly. It is important for investors to determine how agriculture fits their investment objectives and expectations and asset allocation goals. For example, agriculture can provide stable income or outsized return potential by way of investing in either farmland or a growth oriented company, respectively. Furthermore, consideration of commodity price exposure and hedging against inflation may be a determining factor in allocating capital toward a certain approach and strategy.

Investments within the sector, particularly agribusiness and venture investments, have typically been executed by investments managers with diversified strategies inclusive of agriculture. Reflecting the increased investment opportunity and investor interest, there has been an increase in the number of funds and investment managers with sector-focused strategies pursuing agriculture investments; however, it still remains small. Preqin reported that as of July 2019, there were a total of 370 unlisted natural resources funds in market seeking to raise a total of \$208 billion. Of these, 37 were agriculture related, with an aggregate target of \$9.5 billion, or less than 5% of the natural resources universe.

Because the universe of agriculture managers is limited relative to other sector-focused strategies such as energy, healthcare, or financial services, benchmarking remains a challenge given the thin and limited data sets. Preqin provides data sets on agriculture within its natural resources performance benchmark; however, some of the underlying strategies may not be comparable. For example, the composite includes venture capital agriculture and farmland investments which would otherwise not be directly comparable given their risk and return profile differences. Other major private markets data providers, such as Cambridge Associates and Burgiss, do not provide specific performance figures for agriculture.

Meketa typically classifies agriculture investments within a private natural resources or real assets strategy due to the tangible nature of the assets and exposure to commodity prices that some strategies provide. However, some strategies, such as ag-tech and agribusiness investments, can be appropriately allocated within a private equity or venture capital asset class as a sector-focused or special situation strategy. Wherever an agriculture strategy is located within a portfolio, it should appropriately align and match with one's desired characteristics for the asset class.

Summary

The global agriculture sector is an area that will require substantial investment in the coming decades to help meet increasing demand for food driven by population growth and increased per capita food consumption. In an effort to produce more food with fewer resources, the industry is increasingly looking to technology and operational efficiencies across the agriculture value chain to help meet future demand. As a result, we believe there is a strong and compelling investment opportunity. Relative to other asset classes, agriculture remains underpenetrated by private equity, but is becoming increasingly important and ripe with investment opportunity.

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