



## DEMAND DRIVERS FOR GLOBAL FARMLAND

### **ABSTRACT:**

A review of global farmland demand trends and drivers

### **KEYWORDS:**

Global farmland, population growth, food demand, population growth

## INTRODUCTION:

Global demand for farmland is driven by growing demand for agricultural products due to:

- Growing population
- Improving diets
- Increasing biofuels consumption

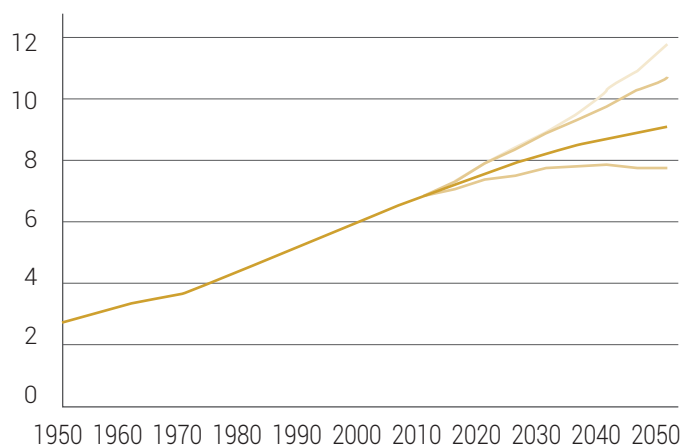
## DISCUSSION:

Let us deal with each of the points above in order. No degree of importance is implied to the factor by its order in the list.

### Population growth and economic prosperity

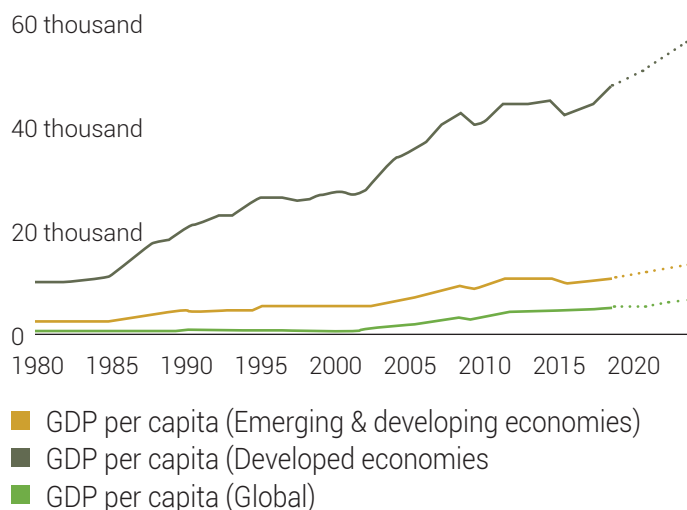
The global population is estimated to grow 56% between 2018 and 2050 (compound annual growth rate (CAGR) of 1.4%).

**Fig 1 – Historical and projected population (in millions)**



Global gross domestic product (GDP) per capita is expected to grow 21.3% between 2018–2023 as compared to 4.3% between 2013–2018. The major push is expected to come from developing and emerging economies as compared to the developed nations, as can be seen from the growth rate table.

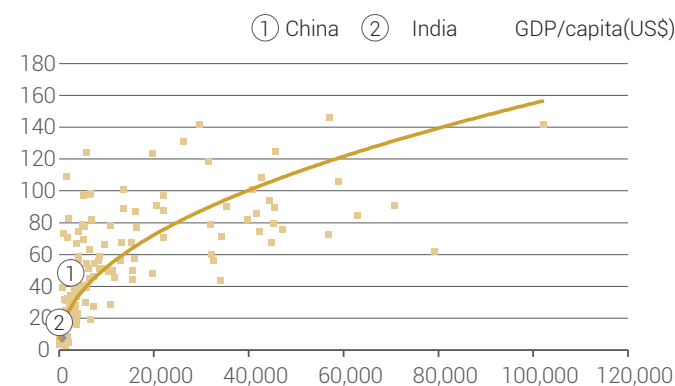
**Fig 2 – GDP per capita (PPP) (in international dollars)**



	2013-2018		2018-2023	
	Growth %	CAGR %	Growth %	CAGR %
<b>Global</b>	4.3%	0.8%	21.3%	3.9%
<b>Developed</b>	7.3%	1.4%	18.8%	3.5%
<b>Developing</b>	4.4%	0.9%	30.9%	5.5%

The relationship between GDP per capita and animal protein consumption is well understood. As a society become wealthier it consumes more meat and consumption increases more quickly at the early stage of economic development – i.e. people in emerging economies improve their diets first as their incomes increase.

**Fig 3 – Meat Consumption Kilos/capita/year versus GDP/capita**



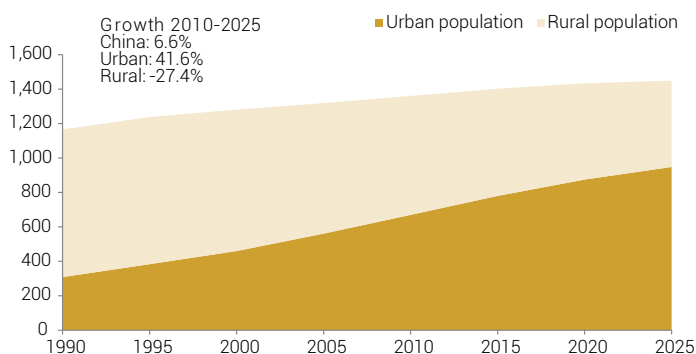
Source: World Bank, FAO, Company Reports

The combined effect of population growth and economic prosperity expected in developing nations, creates a definite need to increase food production. According to the Centre for Agricultural and Rural Development, demand for feed grains is projected to double by 2050 if per capita consumption of meat and dairy products in countries like China and India merely reaches levels seen in 1966 by the United States and Europe.

### Consumption in China

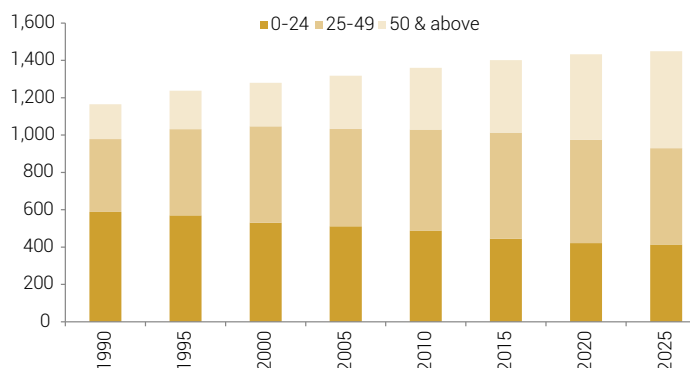
China is one of the major commodity consumers in the world today. Its population, which increased 6.2% between 2000 and 2010, is expected to increase by 6.6% from 2010 to 2025. The urban population, which constituted 35.9% of China's total population in 2000, had increased to 49.2% in 2010 and may further grow to 65.4% by 2025. In addition, the age demographics of China's population present some challenges. The population of the elderly (50 years and above), who

**Fig. 4 – China population - urban and rural segmentation (in millions)**



Source: UN–Population Division

**Fig. 5 – China's population (segmented by age, in millions)**



Source: UN–Population Division

have the maximum requirement for food nutrition due to physiological changes, may rise from 16.0% of the overall population in 1990 to 35.8% by 2025. This will be an additional burden on China and the global food supply chain, which is already strained.

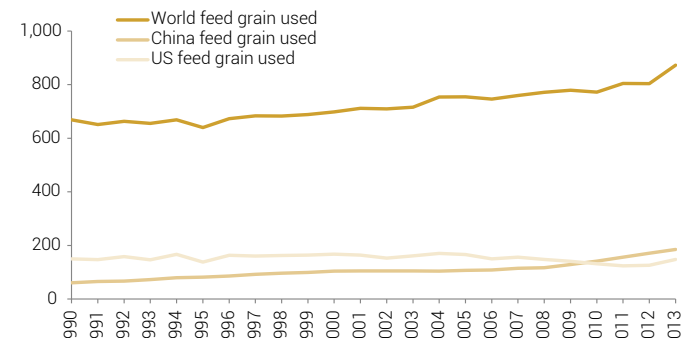
With the accelerated pace of urbanization on the mainland, China's farmland is expected to decline from 135 million hectares in 2003 to 129 million hectares in 2050. This, combined with the expected growth in per capita GDP over time, will negatively impact the global food supply/demand balance. China is among the world's largest importers of agricultural products and has been included by the UN Food and Agriculture Organization (FAO) among the countries suffering from "severe localized food insecurity".

In 2013, for every 100 kgs of food grain consumed globally, 36.4 kgs were consumed as feed grains, out of which 7.7 kgs and 6.2 kgs were consumed in China and the United States respectively.

### Consumption of meat and dairy products

Around 35–40% of global grain production is used as animal feed, which means that meat consumption is significantly dependent on cropland. It is forecast that by 2050 around 45–50% of global cereal production will be used as feedstock.

**Fig. 6 – Feed grain production for animal farming (million tons)**



Source: Earth Policy Institute

If per capita disposable income and meat consumption data for China and the United States between 1990 and 2009 are compared, we find a high correlation (approximately 0.89) between the two data sets. Considering China's growing dominance in the

global economy and increasing economic prosperity predicted for the future, per capita meat consumption can be expected to rise further in China and in other developing nations. This, in turn, would further strain food grain production, particularly feed grains.

### Biofuels

The global demand for biodiesel in 2012 was 21.8 million tons and is expected to surge to

approximately 35 million tons by 2020, with Europe accounting for bulk of it. Demand is likely to be steady going forward due to government regulations mandating biofuel consumption.

Biofuels could supply 9% of world transport demands by 2030, with production of 6 million barrels/day. According to the FAO, to meet this growing demand will require around 35 million hectares of land.

Countries	Regulatory requirements
<b>Brazil</b>	Effective May 2013, ethanol blend to gasoline set at 25%. Biodiesel use mandated at 5% up to July 2014 and a provisional measure from May 2014 set the blend at 7% as of November 1, 2014
<b>Canada</b>	5% renewable content in the national gasoline pool and 2% renewable content in the distillate pool, excluding heating oil. Western provinces and Ontario have mandates for ethanol blend (5-8.5%) and biodiesel blend (2-4%)
<b>China</b>	Ethanol blend rate mandated at 10% in designated markets
<b>EU-27</b>	Mandate to reach a minimum of 10% for renewable energy in the transport sector by 2020
<b>India</b>	Increasing the ethanol blending rate from 5% to 10% in 2015 under consideration. An indicative 20% target for biodiesel and bioethanol blending proposed by 2017
<b>Japan</b>	Oil refiners required to supply 500,000 kl (oil basis) of biofuels by 2017. Direct blend limit for ethanol is set at 3% while that of Ethyl Tert-Butyl Ether (ETBE) gasoline is at 7%. In April 2012, sale of gasoline blended with 10% ethanol or 22% ETBE were allowed
<b>South Africa</b>	Mandate for petroleum manufacturers to reach the target of biodiesel blending up to 5% and bioethanol blending up to 10% by October 1, 2015
<b>United States of America</b>	Requirement for increasing the volume of renewable sources into the overall fuel supply from around 13 billion gallons in 2011 to 36 billion gallons by 2022, of which superior biofuels like sugarcane ethanol will account for 21 billion gallons

Source: USDA reports, SugarCane.org

<b>Fig. 7 – Land requirement for biofuel production</b>								
	2004 <sup>1</sup>		2030 <sup>2</sup>		2030 <sup>3</sup>		2030 <sup>4</sup>	
	Million hectares	% arable	Million hectares	% arable	Million hectares	% arable	Million hectares	% arable
<b>The United States &amp; Canada</b>	8.4	1.9	12.0	5.4	20.4	9.2	22.6	10.2
<b>European Union</b>	2.6	1.2	12.6	11.6	15.7	14.5	17.1	15.7
<b>OECD Pacific</b>	Neg.	Neg.	0.3	0.7	1.0	2.1	1.0	2.0
<b>Transition economics</b>	Neg.	Neg.	0.1	0.1	0.2	0.1	0.2	0.1
<b>Developing Asia</b>	Neg.	Neg.	5.0	1.2	10.2	2.5	11.5	2.8
<b>Latin America</b>	2.7	0.9	3.5	2.4	4.3	2.9	5.0	3.4
<b>Africa &amp; Middle East</b>	Neg.	Neg.	0.8	0.3	0.9	0.3	1.1	0.4
<b>Global</b>	<b>13.8</b>	<b>1.0</b>	<b>34.5</b>	<b>2.5</b>	<b>52.8</b>	<b>3.8</b>	<b>58.5</b>	<b>4.2</b>

Source: FAO, International Energy Agency 1 Land used for biofuel production in 2004 and as a percentage of total arable land 2 Situation in 2030 if current trends remain unchanged 3 Situation if countries adopt all of the policies they are currently considering related to energy security and CO<sub>2</sub> emissions 4 Situation in which some biomass for biofuel production comes from non-arable land and residues, reducing arable land requirements

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