Food for thought

IN THIS EDITION

Farmland: an untapped asset class? Quantifying the opportunity to invest in agriculture

While interest is building in farmland investing, institutional investment is estimated at a modest $30-40 billion, a small fraction of the total global value of farmland of $8.4 trillion. We explore the amount and distribution of agricultural land and the relative yields and total land values of the top investment countries. This has enabled us to provide insight into the investable universe of farmland, estimated at $1 trillion.

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Analysis: Global farmland in a portfolio context

How can agriculture contribute toward lowering risks within a portfolio of investments? Traditional portfolio analysis is difficult to apply to farmland due to the paucity of agricultural performance data sets and benchmarks. In this article our research concludes that an internationally diversified portfolio of agricultural land could contribute significantly to delivering positive, uncorrelated capital returns compared to other asset classes.

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Water scarcity: an investment opportunity?

According to the UN, over the next two decades global demand for fresh water will vastly outstrip reliable supply in many parts of the world. Several major population centres of both rich and poor nations have reached a point of physical scarcity which is forcing them into pursuing costly water transfer alternatives. A further consequence for the food supply in these parts of the world is that goods that were once produced domestically with local water supplies may now be imported.

In this article we look at where the world’s water supply is being used, and how increased demand this may lead to investment opportunities.

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Farmland: an untapped asset class?
Quantifying the opportunity to invest in agriculture

By Bradley Wheaton
Agricultural Product Specialist, Macquarie Agricultural Funds Management
and William J. Kiernan
Director of Global AgInvesting Research & Insight

There has been increasing attention paid to farmland investment opportunities in recent years. However, what may be surprising to some is that this interest is only just starting to flow into the sector in the form of investment by institutions. Investors and advisers alike are looking to better understand the size and structure of the investable asset base before committing resources to understanding the intricacies of the sector or investing in the establishment of an agriculture investment platform.

One of the major challenges in effectively analysing the sector is to obtain accurate and timely market data1. The analysis undertaken here draws on current and informed sources to provide insight into the size, scope and ownership structures that shape the opportunity to invest in agricultural land globally.

In analysing the major agricultural regions and the countries being targeted by agricultural investors, the data demonstrates that while areas such as the U.S. have higher levels of institutional investor ownership, farmland ownership globally is heavily dominated by family farmers who both own and operate their farms. Given the small scale of the average farm globally and the challenges for such businesses accessing capital, the scope and need for institutional capital to be deployed in agriculture in order to improve efficiencies and generate higher returns is significant.

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1 In established markets such as the US, Australia and Canada government data is collected systematically and is publically available. While there are limitations around the timeliness and some biases inherent in some of the collection methods used, it is generally useful in understanding the sector. In markets where governments have not or only recently commenced collecting data it is often independent industry consultants or non-Government organisations that have more accurate data.
The investable universe of farmland

The United Nations Food and Agriculture Organisation (UN FAO) maintains a database of the total agricultural land area throughout the world. The two major classifications of farmland are arable land\(^2\) — the land used for row crops or broad acre, and permanent crops\(^3\) — the land planted with trees or vines. The availability of arable land is of interest to investors for the following key reasons:

- It faces the greatest demand of all agricultural land and is decreasing in availability on a per capita basis. Since 1960, the amount of arable land per capita available for agriculture globally more than halved\(^4\).
- For the land that is agronomically suitable, crops are predominantly the highest value and best use of the land.
- The land is mostly used for producing grains (e.g. wheat, corn, barley), oilseeds (e.g. soybean, canola/rapeseed, sunflower) and fiber (e.g. cotton). These commodities are experiencing increasing demand for use as food, animal feed and increasingly biofuel and industrial production.

Spatial agricultural land use by type

The graphic below shows the spatial distribution of the land use types globally. The key observation is the prevalence of cultivated land shown in orange (>75 per cent) and yellow (50-75 per cent). The areas shown as grass and woodland also contain the land producing row crops.

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2 Arable land is the land under temporary agricultural crops (multiple-cropped areas are counted only once), temporary meadows for mowing or pasture, land under market and kitchen gardens and land temporarily fallow (less than five years). The abandoned land resulting from shifting cultivation is not included in this category.

3 Permanent crops is the land cultivated with long-term crops which do not have to be replanted for several years (such as cocoa and coffee); land under trees and shrubs producing flowers, such as roses and jasmine; and nurseries (except those for forest trees, which should be classified under “forest”).

4 FAO 2012

5 World Bank, Agroconsult 2011
There are some important observations from this data:

> the U.S., Russia, Brazil, Canada, Australia, Ukraine, and Argentina are the only countries to have over 30 million hectares of arable land.

> only Brazil, Argentina, and Australia have over five million hectares of suitable land yet to be brought into crop production\(^5\).

> Australia has the most arable land per capita, with over two hectares per person. This is more than four times that of the US. The higher the proportion of arable land per capita a country has, the greater its opportunity to export its agricultural produce.

> while there are significant areas of arable land in Russia, Kazakhstan, and the Ukraine, utilisation rates are much lower and crop yields lower mainly due to poor farming practices limiting productivity. Low productivity is symptomatic of challenges to agriculture such as the lack of infrastructure, government regulation stifling activity or a lack of human resources\(^6\).

> average crop yields are low in Australia due to the large proportion of low density cropping that constitutes the overall arable land area.

> of all the countries that have surplus arable land, Brazil has the largest area of arable land available for expansion, approximately 22 million hectares. The land is predominantly located in the Cerrado region in central Brazil and not in the Amazon biome where land clearing for crop production is strictly regulated by law\(^7\).

\(^5\) Institution investors are predominantly public, industry and corporate pension plans, foundations and endowments.

\(^6\) Non-institutional investors are those private individual investors that seek to own but not to operate agricultural enterprises.

\(^7\) United Nations Department of Economic and Social Affairs, 2012.

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Global agricultural land ownership

Cereal crop yield


* Institutional investors are predominantly public, industry and corporate pension plans, foundations, and endowments.

* Non-institutional investors are those private individual investors that seek to own but not to operate agricultural enterprises.

* Cereal yield, measured as tons per hectare of harvested land, includes wheat, rice, maize, barley, oats, rye, millet, sorghum, buckwheat, and mixed grains. Production data on cereals relate to crops harvested for dry grain only. Source: FAOSTAT, 2012.

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* Institutional investors are predominantly public, industry and corporate pension plans, foundations, and endowments.

* Non-institutional investors are those private individual investors that seek to own but not to operate agricultural enterprises.

* Cereal yield, measured as tons per hectare of harvested land, includes wheat, rice, maize, barley, oats, rye, millet, sorghum, buckwheat, and mixed grains. Production data on cereals relate to crops harvested for dry grain only. Source: FAOSTAT, 2012.
What is striking is the proportion of land owned and operated by family farmers, resulting in a very fragmented industry. One of the attractive factors from an investment perspective is the opportunity for consolidation given the importance of scale in driving returns from agriculture.

Agricultural land ownership is predominately fragmented, with ownership resting largely with family owner operators who own a single property. However, there is a significant difference between the structure of the US market compared to that of other countries. Non owner-operators or, in other words, investors who do not themselves farm (including institutions) owned 29 per cent of farmland in 2007 and the Corn Belt had a higher proportion at 38 per cent. While investor ownership is significant in the U.S., foreign ownership of cropping land is still low at 0.4 per cent as of 2010, with 0.6 per cent of pasture land owned by foreigners and one per cent of all forest land.

This contrasts with estimates that institutional ownership in countries such as Australia, Argentina, Brazil and Canada is below 10 per cent and in many cases below 2 per cent. Former Soviet Union Countries have differing land ownership structures. In some cases it is only the government that is able to own land, and access to farmland is only available through leasehold tenure.

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### Estimated farm land value ($US billions)

<table>
<thead>
<tr>
<th>Country</th>
<th>Pasture and range land</th>
<th>Arable land (annual and permanent crops)</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>1,083.0</td>
<td>1,557.9</td>
</tr>
<tr>
<td>Brazil</td>
<td>359.3</td>
<td>333.2</td>
</tr>
<tr>
<td>Argentina</td>
<td>208.3</td>
<td>217.0</td>
</tr>
<tr>
<td>Australia</td>
<td>11.2</td>
<td>216.9</td>
</tr>
<tr>
<td>Canada</td>
<td>190.9</td>
<td>18.5</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>140.8</td>
<td>36.8</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>74.0</td>
<td>28.2</td>
</tr>
<tr>
<td>Ukraine</td>
<td>33.4</td>
<td>3.2</td>
</tr>
<tr>
<td>New Zealand</td>
<td>21.9</td>
<td>19.6</td>
</tr>
<tr>
<td>Chile</td>
<td>1.6</td>
<td>0.4</td>
</tr>
<tr>
<td>Uruguay</td>
<td>10.3</td>
<td>6.4</td>
</tr>
</tbody>
</table>

Institutions with alternative investment allocations are attracted to farmland for similar reasons that drove them to invest in timber land over the last few decades. Institutional capital started to move into timber land in the 1970s, with forest product companies and state land authorities looking to take large land holdings off their balance sheet. This was aided in the US by the passage of the Employee Retirement Income Security Act (ERISA) in 1974 that required greater diversification in institutional investment portfolios. The timber industry today has attracted approximately 100 institutional investors from public and private pensions, foundation, and endowment funds.

It is the low correlations, relative stability of returns and inflation protection shared by both agriculture and timber land that are driving institutional interest.

Why then is agriculture so far behind timber in terms of institutional investment relative to industry capitalisation? One factor explaining this is the fragmented nature of farming and the absence of large operations with appropriate diversification and institutional-grade management in place. Compare this to origins of timber as an asset class, where forests owned by timber mills and state land authorities were divested, as those organisations sought to run more ‘efficient’ balance sheets. This meant that large scale assets, which in some cases were run by existing management teams, became available for investment. Another factor is the liquidity in the sector, albeit there are varying degrees to which this is evident from country to country.

**Conclusion**

Agricultural land assets sit at an estimated $8.3 trillion in total value with an estimated $1 trillion\(^{11}\) of that being investable. This represents a compelling opportunity for institutional investors. While growth in investor interest has been strong, there has been a moderated translation into investment flows. Gradually, the industry is developing a track record and investors and their advisors are developing a deeper understanding of the opportunity. With that, a new asset class is establishing.

Until recently, agriculture and farmland did not have a natural home in the investment portfolios of the mainstream institutions. This is now changing and has the potential to make significant changes to capital ownership structures in the industry and the quantum of investment in the sector over time.


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**Comparison to the timber industry**

![Comparison Diagram](image-url-here)


\^ Investable universe estimate

The total land value is reduced to the investable universe due to a range of factors that significantly restrict or prevent institutional investment including a lack of basic infrastructure, adverse governmental policies or unacceptable social and environmental risks.
Analysis: Global farmland in a portfolio context

By Samuel Morris, CFA
Analyst, Macquarie Agricultural Funds Management

Synopsis

Traditional portfolio analysis is difficult to apply to farmland due to the paucity of agricultural performance data sets and benchmarks. In this article, we look at how agriculture can help lower portfolio risk, using multi-country agricultural land price data sourced from a combination of public and private sources. Our analysis concludes that owning farmland has the potential to deliver uncorrelated, positive returns over the long term. It demonstrates that an internationally diversified portfolio of agricultural land could contribute significantly to delivering positive, uncorrelated capital returns compared to other asset classes, while lowering portfolio risk. The analysis is limited to returns derived from owning, but not operating, farmland. Exposure to these two sources of return, being land appreciation and operating returns, has the potential to deliver higher and more diversified returns for an investment portfolio and should be considered when evaluating the opportunity to invest in agriculture.

Methodology

In undertaking this work, we selected six global listed and/or liquid financial asset indices representing some of the major traditional asset classes for institutional investors. Alternative asset classes, such as hedge funds, private equity and infrastructure were omitted to avoid controversy around benchmark selection and to better contrast agriculture to traditional bond, equity and property allocations.

Agricultural land price data sets from the US, Australia and Brazil were averaged to form a proxy for a globally diversified agricultural land return index. These agricultural land prices were translated into $US at each historical data point to match the financial asset indices. Returns were adjusted to real terms using US all-items CPI inflation 1.

We carried out our analysis on an agricultural land return-only basis, which means the returns did not include the yield component, only capital value changes. As agricultural land markets are inherently private, it is difficult to obtain directly comparable data on operating returns from farmland across countries due to different accounting and data collection methods, ownership structures (owner-operator versus lease arrangements) and the private nature of agricultural land transactions.

The analysis was conducted over two periods:
> monthly returns over 10 years from 30 June 2001 to 30 June 2011
> monthly returns over five years from 30 June 2006 to 30 June 2011.

The farmland price data points varied from quarterly to annual, with linear interpolation 2 being used to estimate land values between actual data points 3.

Results – risk vs. return

Over the two periods we looked at, global farmland performed very well, having the highest Sharpe ratio 4 of the asset class comparison over both time periods.

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1 For a detailed description of the asset indices chosen, please see appendix 1.
2 If the two known points are given by the coordinates the linear interpolant is the straight line between these points.
3 For the financial asset indices, the data points are end of month.
4 The Sharpe ratio is the ratio of excess return (return over the risk free rate) per unit of risk (standard deviation).
Results – time series comparison

On a time series basis, diversified agricultural land ownership has performed well, generally outperforming the other major asset classes in $US terms and in the relevant local currencies.

Results – Correlation and diversification

Agricultural land ownership represents an asset class that offers distinct diversification benefits when compared to traditional asset classes. Low real return correlations have shown a diversification benefit over both a 10 year period and over the past five years, up to mid-2011.

Correlation Matrix – 10 years

<table>
<thead>
<tr>
<th></th>
<th>Ag Land</th>
<th>Developed Equities</th>
<th>Emerging Equities</th>
<th>Property</th>
<th>Cash</th>
<th>Bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Land</td>
<td>1.00</td>
<td>0.55</td>
<td>0.55</td>
<td>0.41</td>
<td>0.19</td>
<td>0.02</td>
</tr>
<tr>
<td>Developed Equities</td>
<td>1.00</td>
<td>0.89</td>
<td>0.72</td>
<td>0.45</td>
<td>0.16</td>
<td></td>
</tr>
<tr>
<td>Emerging Equities</td>
<td>1.00</td>
<td>0.67</td>
<td>0.44</td>
<td>0.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property</td>
<td>1.00</td>
<td>0.12</td>
<td>-0.02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>1.00</td>
<td></td>
<td></td>
<td>0.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>

Correlation Matrix – five years

<table>
<thead>
<tr>
<th></th>
<th>Ag Land</th>
<th>Developed Equities</th>
<th>Emerging Equities</th>
<th>Property</th>
<th>Cash</th>
<th>Bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Land</td>
<td>1.00</td>
<td>0.51</td>
<td>0.54</td>
<td>0.36</td>
<td>0.24</td>
<td>-0.03</td>
</tr>
<tr>
<td>Developed Equities</td>
<td>1.00</td>
<td>0.91</td>
<td>0.77</td>
<td>0.63</td>
<td>0.29</td>
<td></td>
</tr>
<tr>
<td>Emerging Equities</td>
<td>1.00</td>
<td>0.65</td>
<td>0.63</td>
<td>0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Property</td>
<td>1.00</td>
<td>0.23</td>
<td></td>
<td>0.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>1.00</td>
<td></td>
<td></td>
<td>0.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
</tr>
</tbody>
</table>
Two optimal minimum variance, or “efficient” portfolio frontiers, were created using the portfolio returns, standard deviations and asset class covariances from the 2001 to 2011 data, with one frontier including agriculture while the other did not. Zero leverage and zero short-sale constraints were added to the asset weightings in the efficient portfolio construction.

Given the correlation benefits and the relatively strong return performance, the chart shows that adding an exposure to internationally diversified agricultural land between 2001 and 2011 could have significantly decreased risk without having a detrimental effect on returns. At all points along the efficient frontier the portfolio including agricultural land provided a superior risk-return outcome. The exception was the point of maximum risk and maximum return on the efficiency frontier, which was 100 per cent exposed to emerging market equities and the same for both portfolios. For all other timeframes, this difference was greater due to the value of agricultural land from a diversification and risk reduction perspective.

**Limitations**

The proxy for agricultural land indices used in this analysis are not directly investable like an equity index. This makes it important to select managers that are able to provide effective management of the controllable factors inherent in agriculture systems and that execute strategies of large scale farming operations across geographies, commodities and markets, to capture the benefits of diversification.

As a retrospective analysis, the results here are reflective of historical performance and therefore may not represent the asset class in the future. Recognising that investors are likely to limit their asset class allocation to agriculture (regardless of its historical performance), we have calculated the same efficient frontiers with a 10 per cent limit for the agricultural land allocation. The result is shown in the chart below.

Even with the allocation to agricultural land capped at 10 per cent it makes a meaningful contribution to the portfolio – lowering portfolio risk by an average of 4.14 per cent at the return levels above, compared with no portfolio allocation to agricultural land.

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5 The minimum variance, or ‘efficient’, frontier is a graph of the portfolio risk/return outcomes for the optimal combination of asset class portfolio weightings that produce the lowest portfolio standard deviation (risk) for a given level of return. This can be calculated using the ‘solver’ optimisation tool in Microsoft Excel once the average historical returns, variances and covariances are known for each asset class.
Conclusion
The analysis suggests that the low correlation of agricultural land prices to traditional asset classes makes farmland an attractive proposition in a portfolio context. Historically, agricultural land returns have been driven by factors with low or no correlation, such as decreasing arable land per capita, changing diets and growing populations in emerging markets\(^6\). Farmland assets could have the ability to provide exposure to soft commodity price inflation, without the volatility that comes from pure exposure to the commodities. The cash yield from operating farmland has not been analysed here because of the limitations of the data available. However, including the cash yield component from owning and operating farm land could provide further diversification benefits to an overall investment portfolio and should be taken into account when considering agricultural investments options.

Appendix 1 – Asset data set descriptions

**Financial Indices data (Bloomberg)**
- Global Developed Market Equities = FTSE All-World Developed Index (USD)
- Emerging Market Equities = FTSE All-World Emerging Index (USD)
- Global Developed Market Property = FTSE EPRA/NAREIT Developed Real Estate Index
- Bonds = CGBI WGI World All Maturities Index (USD)
- Cash = JPM Global Cash (USD)
- CPI = All Urban, All Items (USD)
- FX conversion rates

**Agricultural Land data**

**United States**
- USDA Agricultural land statistics

**Australia**
- ABARES (Australian Bureau of Agricultural and Resource Economics and Sciences) broad acre farm values – all Australia

**Brazil**
- Informa Economics-FNP consultants – average of all Brazilian farmland

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\(^6\) Macquarie Agricultural Funds Management research (2010).
Water scarcity: an investment opportunity?

By Andrew Sliper
Agricultural Product Specialist, Macquarie Agricultural Funds Management

"Many of the wars of the 20th century were about oil, but wars of the 21st century will be over water unless we change the way we manage water."
Ismail Serageldin, Former World Bank Director and Chairman of the World Commission for Water in the 21st Century

According to the UN, over the next two decades global demand for fresh water will vastly outstrip reliable supply in many parts of the world. Forty per cent of the world is already suffering from some form of water scarcity, and urbanisation and economic growth will continue to increase the demand. The rivers Nile, Ganges and Yangtze all fade to a trickle for much of the year, the Aral Sea in the former Soviet Union has shrunk to ten per cent of its size in the last half-century, and entire natural lakes, such as Lake Layla in Saudi Arabia, once the largest on the Arabian Peninsula, have disappeared completely.

Heavy and costly to transport, water is inherently a local resource. When thinking about water security there are varying degrees of scarcity. The limited ‘economic water supply’ (water that can be extracted through existing available capital resources) has inhibited human health and economic growth in much of the developing world for some time. Several major population centres of both rich and poor nations have reached a point of physical scarcity which is forcing them into pursuing costly water transfer alternatives. A further consequence for the food supply in these parts of the world is that goods that were once produced domestically with local water supplies may now be imported.

Who is consuming all the water?

Food production is a very water intensive business. It is estimated that approximately 70 per cent of the Earth’s freshwater is taken up by agriculture, 20 per cent by industry and 10 per cent by households. As the global population continues to increase and urbanise, demand for food will increase with it. The Food and Agriculture Organisation (FAO) estimates that the global requirements for food will increase by 70-100 per cent by 2050. While there is more awareness of the changing balance between food supply and demand – growing population, urbanisation, dietary changes, biofuel production, droughts and climate change – there is much less recognition of the declining availability of water that is needed to produce our food and fibre requirements.

The direct requirement of water for drinking and sanitation is easy to see and understand, humans also deplete water reserves through the production of food and fibre. The water embodied in such goods is known as ‘virtual water’. While we drink about two to three litres of water per day, the average human in developed countries consumes more that 3,000 litres of virtual water per day. As urbanisation continues, people’s dietary consumption also increases and consequently, so does their demand for virtual water.

In the last four decades, the amount of fresh water available for each human being worldwide shrank by almost two-thirds. It is expected to be halved again by 2025.

The table on the next page shows how an increase in demand for protein and nutrient-dense foods in diets amplifies the pressure on water resources. It is clear that even small increases in the demand for higher value foods will put additional strain on water supplies. As the global trade of food and virtual water increases, water shortages, no matter where they occur, will impact every person who buys agricultural products.

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1 Charting our water future, McKinsey report (2009)
3 Municipality of Riyadh (2012)
4 Food and Agriculture Organisation (2012)
6 David Pimentel et al, College of Agriculture and Life Sciences, Cornell University
Water required to produce common foods and products

<table>
<thead>
<tr>
<th>Food or Product</th>
<th>Water (in litres)</th>
<th>Water (in gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slice of bread</td>
<td>40</td>
<td>11</td>
</tr>
<tr>
<td>Potato</td>
<td>25</td>
<td>7</td>
</tr>
<tr>
<td>Tomato</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Cup of Coffee</td>
<td>140</td>
<td>37</td>
</tr>
<tr>
<td>Glass of milk</td>
<td>200</td>
<td>53</td>
</tr>
<tr>
<td>Egg</td>
<td>135</td>
<td>36</td>
</tr>
<tr>
<td>Glass of wine</td>
<td>120</td>
<td>32</td>
</tr>
<tr>
<td>Kilogram of grain</td>
<td>1500</td>
<td>396</td>
</tr>
<tr>
<td>Litre of palm oil</td>
<td>200</td>
<td>528</td>
</tr>
<tr>
<td>Kilogram of chicken</td>
<td>6000</td>
<td>1585</td>
</tr>
<tr>
<td>Kilogram of beef</td>
<td>15000</td>
<td>3962</td>
</tr>
<tr>
<td>Hamburger</td>
<td>2400</td>
<td>634</td>
</tr>
<tr>
<td>Cotton T-shirt</td>
<td>4000</td>
<td>1057</td>
</tr>
<tr>
<td>Pair of leather shoes</td>
<td>8000</td>
<td>2113</td>
</tr>
</tbody>
</table>

The lucky countries

The FAO estimates that 62 countries are viewed as having an abundance of water, with in excess of 10,000 cubic metres per person, per annum. Water surplus regions have geographical characteristics such as high rainfall resulting in good run off, aquifers, large bodies of freshwater sources (lakes, rivers, etc.), low evaporation rates (due to humidity or low flow rate of fresh air) and a low population relative to the water available.

As the demand for water increases, certain countries will be required to ‘export’ water in the form of virtual water imbedded in agricultural goods or even potentially as physical water in extreme cases. Given the FAO estimate that by 2050 the number of countries with an ‘abundance of water’ will be reduced from 62 to 31, these surplus countries will be well placed to address the issues caused by water shortages and the subsequent price inflation of goods that are linked to the price of water.

Source: Comprehensive Assessment of Water Management in Agriculture, 2007

~ The Coming Famine, Julian Cribb
The forecast – dry in Asia and Africa

The opportunity to invest in water

Investing in water infrastructure for domestic or industrial use or water utilities provides investors with exposure to water delivery assets or services. Water saving technologies have been a darling of investors, however these have risks and returns reflective of the technology more than the resource.

For investors seeking to gain pure exposure to water as a commodity, or to take a position on potential water scarcity, water asset markets are emerging in some countries, however they have been challenging to navigate.

One of the fundamental limitations is the need to establish the legal property rights for water. As a consequence, it has been mainly in developed countries with relatively strong regulatory frameworks combined with a strong competition for water that such investment opportunities have been developed. As water is principally regulated by state or provincial administrations, it has been certain states in the US and Australia where these conditions exist, that have been at the forefront of developing water rights markets.

For example, the Australian water trading market (of which 60 per cent\(^8\) of total volume is in the Murray Darling basin in the Southeast of the country) has reached a market capitalisation of over $A25 billion with an annual turnover of $A3 billion\(^9\).

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\(^8\) National Water Commission, December 2010
Investing in water ‘virtually’
A less direct but more traditional option for investors is to gain exposure to ‘virtual water’ through agricultural land. As the value of agricultural commodities is reflective of several factors of production, including water, the value of land used to produce those products incorporates the value of the volume, frequency and reliability of precipitation.

A rise in the number of countries that are unable to service their internal food and fibre requirements via their domestic production as a result of dwindling local water supplies, will incentivise those surplus countries to export products – and virtual water – to deficit countries. As water resources become further depleted, an abundance of natural rainfall will contribute to the faster appreciation in value of areas, compared to those with less rain.

The future
While some regions such as Latin America only use a small part of their available freshwater resource for food production, in others such as the Middle East, North Africa and South Asia, water withdrawals already account for a large share of the total renewable water available. Converting underutilised water resource to arable farmland brings with it the risk of environmental degradation and potential negative impacts on climate.

An increasing acceptance of the trade of virtual water is one part of what has to ultimately be a multilayered solution to solving the global water crisis. However, this involves removing uneconomical farming and water systems and importing food from the most efficient, competitive and sustainable producers. While the political sensitivity of sovereign food security means that this does not seem like an achievable solution in the immediate term, it does create investment opportunities for the public and private sector alike to attempt to bridge the gap.

10 The Coming Famine, Julian Cribb
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