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Power in Global Agriculture: Economics, Politics, and Natural Resources

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ABSTRACT

Recent events, such as the 2008 food price crisis, have focussed global attention on the agriculture and food sectors. In particular, many countries have become increasingly concerned with the issue of ensuring the security of their food supply and one key element of this is who has power within the food supply chain. Through examining three dimensions of power – Economic, Political, and Natural Resources – this paper explores where power currently lies in world agriculture and how this might change in the future. Whilst recognising that power is a somewhat abstract concept, through a process of deriving potential indicators, a picture of the distribution of power is drawn. These indicators were also used to develop a simple ‘global power index’. The power index indicates that the US and the EU dominate world agriculture in terms of economics and politics, but are potentially vulnerable in terms of their possession of natural resources. On the other hand, the emerging economies have lower political and corporate power, but seem better placed in terms of natural resources. The paper concludes by discussing the implications of these findings for the main food producing regions.

KEYWORDS: Agriculture; Power; International Trade; Trans-National Corporations; Natural Resources

1. Introduction

The 2008 food price crisis has focussed global attention on the agriculture and food sectors. In particular, many countries have become increasingly concerned with the issue of ensuring the security of food supply and one key element of this is who has control or power within the food supply chain. In addition, a number of other recent developments in the agriculture and food sectors and the wider economy make consideration of the issue of ‘power’ particularly timely.

First, the perception that global power is shifting eastwards has attracted considerable interest (Nye, 2011; Whalley, 2009). For example, the economies of the US and many European countries have continued to decline in recent years, whilst China’s economy has continued to grow, even during the recent economic turmoil. This has sparked speculation as to whether or not the recent recession is a sign of the decline of US and European power in the world (Nye, 2011). This speculation raises the interesting question as to whether this decline in western economic power in general is also evident in the agricultural sector.

Second, as the food system has become more globally integrated, there have been major changes in the way trade is conducted between nations. Closed-door policies to protect farmers from outside competition are disappearing as is the operation of state trading. Rather, due to the influence of globalisation - increased transnational migration, movement of assets and capital from one country or region to another – agricultural markets are prone to be more open than ever before.

This evolution has given rise to dramatic changes in the global agri-food system, with once food-deficit countries appearing as powerful trade entities, giving rise to increased competition and power struggles in the international arena.

Third, as the agricultural system has become increasingly global it has also become highly commercialised and concentrated. For example, the fact that a few large transnational corporations (TNCs) handle the vast majority of the grain traded internationally is often cited as an example of both the globalisation and concentration of the agriculture sector (Hendrickson, et al., 2008). In addition, rapidly evolving global supermarkets are penetrating almost every corner of the globe. The emergence of these corporate actors in the food system has created a major reorientation in the locus of power, arguably, even further away from farmers (Murphy, 2006).

Fourth, a significant characteristic of the global agri-food system is the reliance on non-renewable natural resources, such as minerals and fossil fuels. Since these resources are scarce they often lead to conflicts and tensions between nation states. These tensions and struggles are likely to be exacerbated in the coming decades due to the impact of climate change. Therefore, natural resource endowments will become an increasing source of power in global agriculture.

The purpose of this work, therefore, is to use available evidence to improve our understanding of the above issues in global agriculture. More specifically, this study attempts to assess who currently has power in global agriculture, how this may change in the future and what this might mean for those involved in the sector.

Table 1: Indicators and data sources used to assess power in this research

Dimensions	Indicators	Key data sources
Economic	Agricultural Gross Value Added (GVA) Values and volumes of international agricultural trade <ul style="list-style-type: none"> • Aggregate trade • Commodity-specific trade Dominant TNCs headquartered in the country and their income and assets <ul style="list-style-type: none"> • Aggregate picture • Commodity-specific pictures 	World Bank (http.) database FAOSTAT (TradeStat), FAO Statistical Yearbook (2010), USAID Foreign Agricultural Services database, OECD-FAO Agricultural Outlook 2011–2020 database UNCTAD (2009) data, Financial Times (FT) Global 500 data
Political	Countries: Financial contribution and power within the WTO Countries: Financial contribution and voting power within the World Bank TNCs: Political lobbying and election campaign financing expenditures	WTO reports; other publications World Bank reports; other publications Centre for Responsive Politics (2011) database
Natural Resources	Land (total land and arable land) Water (total, renewable) Minerals (mine reserves, production, consumption and depletion time of phosphate and potassium) Energy (reserves, consumption and depletion of crude oil and natural gas)	World Bank database; FAO Statistical Yearbook (2010) FAO AquaStat US Geological Survey (2011) data Central Intelligence Agency (CIA, 2010) database

In the following sections we elaborate on the concept of power, discuss the indicators and methods used in assessing power, present the results of our analysis, and finally draw some conclusions as to the implications for those involved in the agricultural sector.

2. Conceptual Framework and Research Methods

At the outset it is important to note that there is no single or unified definition of the term ‘power’. However, three possible dimensions of power, economic, political and power over natural resources form the basis of this paper.

Economic power can be defined as the ability of an actor to compel, persuade, or control the behaviour of other actors through the deliberate and politically motivated use of economic assets (Frost, 2009; Whalley, 2009). At an international level, exercise of this type of power manifests itself in the denial of market access, withdrawal of investments, the imposition of trade embargoes or the control of exports. For corporate businesses, economic power may arise due to the existence of highly concentrated sectors and manifest itself in the ability to influence price and reduce the competition (Murphy, 2008).

Political power (often closely related to economic power) is the ability of actors to coerce, control or persuade others by using political means. The most obvious source of such power is political legitimacy acquired through electoral processes coupled with holding positions in key decision making bodies. For countries and regions this power may be obtained through positions on such bodies as the United Nations, World Bank, International Monetary Fund, World Trade Organisation, etc. (The Economist, undated). Political power of the TNCs, on the other hand, is manifested through their influence on public policy processes (Clapp & Fuchs, 2009).

Whilst economic and political dimensions of power are often discussed in the literature, the power resulting from the possession of natural resources is less well documented. However, the industrial scale and nature of agriculture means it relies heavily on the use of natural resources, such as water, minerals and fossil fuel. As many of these resources are scarce and non-renewable, those in control of these resources are likely to be in a much stronger position to exert power. By the same token, those who have scarcity in these resources are likely to be vulnerable to outside control (Fanzul, 2006; Hendrickson et al., 2008).

In order to assess these three dimensions of power a number of indicators were developed and these are highlighted in Table 1, along with the sources of data.

As highlighted in the table, three indicators provide the basis of our analysis of economic power. These are agricultural gross value added (GVA), the size of international trade, and the magnitude of corporate concentration. The first indicator shows the size of the agricultural economy and the second implies that actors possessing wealth and market strength are likely to be in a position to influence others or prevent others from influencing them.²

The third indicator is based on the assumption that countries that are home to a larger number of TNCs are better placed to exercise power over the countries that have a weaker corporate base. We are aware that this might be contested, but believe that corporations are vital for understanding a country’s economic power, because it is the TNCs rather than the nation states themselves that trade the bulk of agricultural commodities (Fanzul, 2006). For example, in the year 2000, corporations were identified as being responsible for

² The choice of agricultural based indicators to reflect economic power reflects the focus of this paper on power within agriculture, but it is acknowledged that this may have limitations. For example, it can be argued that countries with stronger levels of total economic power have dominated the agricultural trade agenda in the past. Conversely, it is of course possible that countries with strong agricultural sectors could have low overall economic power which might limit their ability to exert power over trade.

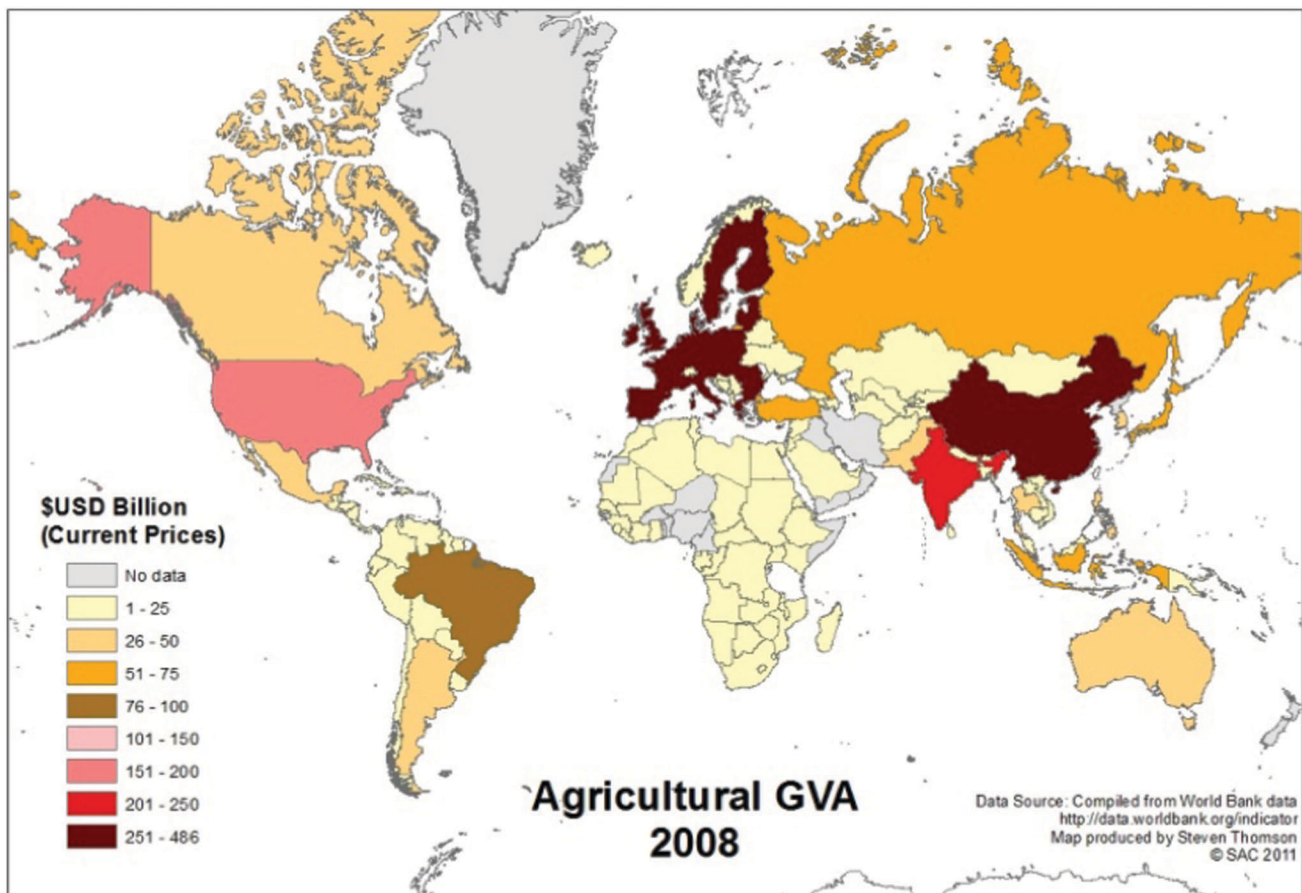


Figure 1: Agricultural GVA, 2008

two-thirds of global trade with their worldwide sales quadrupling from US\$3 trillion³ in 1980 to US\$14 trillion in 2000 (Action Aid, undated). Although TNCs, by definition, operate in multiple countries and hence do not belong to any specific country, their power is usually located in the headquarters of their home country. In this study, TNCs are analysed in terms of their location, income, and market share.

As outlined earlier, political power is exercised through political legitimacy, position, authority and governance rules. Since these concepts underpinning political power are not easily quantifiable, examples and narratives are used as evidence of political power. We have analysed two cases that are illustrative of the political power of nation states in world agriculture – the World Trade Organisation (WTO) and the World Bank. Whilst focussing on these organisations we recognise that a number of other international institutions – such as the International Monetary Fund (IMF) and the United Nations (UN) – are also important for understanding the exercise of political power. The political power of TNCs was assessed based on their lobbying and political campaign financing expenditures (Clapp & Fuchs, 2009).

In terms of the possession of natural resources as a source of power we have analysed four aspects representing the key demands of agriculture namely: land, water, agricultural minerals, and energy. The

current distribution of these resources between countries and regions and how such factors as resource depletion may alter this distribution in the future are considered.

3. Results

Economic Power

Historically the USA and EU27⁴ have had the largest agricultural economies measured by value of agricultural Gross Value Added (GVA). However, the emergence of the Chinese and Indian farm economies has been significant, with China's agricultural GVA increasing six fold between 1988 and 2008 and that of India by 2.4%. In comparison, during the same period, the growth in GVA has only been 1.6% and 1.7% in the EU27 and USA respectively. Figure 1 reveals the largest agricultural economies in 2008.

China's agricultural GVA was US\$485 billion, dwarfing that of the next largest farm economies of the EU27 (US\$266 billion), India (US\$214 billion) and USA (US\$176 billion). However, the size of the agricultural sector, whilst highlighting the scale of agriculture and potential importance to these countries, does tell us relatively little about who has power,

³In early October 2012 US\$1 was approximately equivalent to £0.62 and €0.77 (www.xe.com).

⁴It should be noted that generally within this study the figures for the EU27 are presented as if it is a single entity, whereas this is not the case with other trade agreements such as NAFTA, ASEAN etc. In part this differentiation is undertaken due to the greater level of integration (trade, legislative, monetary and economic) within the EU compared with many of the other agreements. This is not to downplay the importance of these trade agreements.

because it is through interactions between countries (for example trade) that power manifests itself.

It is also important to recognise that whilst as a single entity the EU27 may compete with the US and China in terms of scale, the power dynamic is likely to be very different. The existence of a diversity of interests in such a union may weaken the negotiating position in comparison to a single country such as the US. For example, within the EU, net importing and net exporting countries may have diverging views as to policy and compromises will inevitably occur.

International Agricultural Trade: Aggregate imports and exports

When examining trade patterns in agriculture it is pertinent to remember that historically agricultural trade has been heavily distorted by a range of factors including domestic agricultural policy, import protection and export subsidies. Trade patterns therefore reflect the influence of these factors. However, as 'old style' agricultural protection is declining it is useful to examine how trade patterns are evolving and what this means for the balance of power in agriculture.

According to the Food and Agriculture Organisation (FAO), from 1999 to 2008, annual trade (imports and exports) of agricultural products in the world averaged over US\$600 billion. This trade was highly concentrated, with 20 countries accounting for 70% of world imports and 78% of exports. The EU27 (particularly the EU9 countries) played a dominant role in this trade, accounting for 44% and 46% of the total global imports and exports, respectively. However, intra EU27 trade accounted for 75% of total EU27 exports and 73% of

imports over the decade, reiterating the significant importance of the EU's internal market to total global agricultural trade.

When intra-EU trade is excluded (Figure 2) the USA and EU27 can be seen to dominate world agricultural trade. Between 2006 and 2008 the EU27 and USA each accounted for just over 16% of total exports (average of \$583 billion per annum) with Brazil (7.6%) and Australia and New Zealand (6.17%) the next largest exporters. Among the BRICS coalition only Brazil and China (4.2%) were significant exporters with the other three countries— India, Russia and South Africa – having minimal exports.

The EU27 (17%) was the dominant importer of agricultural produce globally, followed by the USA (12.8%), China (8.4%), Japan (7.7%) and the African continent (7.6%). It should be noted that not all commodities that are imported into a country are for use in the country as a proportion will be re-exported, particularly with some added value. It is noteworthy that in Asia and the Middle East only five countries had large import demands; China, Japan, South Korea, Saudi Arabia and Malaysia, whereas none of the Latin American countries were in the top 20 importers of agricultural produce.

Comparing the export figures with imports, we can see three broad groupings. First, the EU27, USA, and China are both large exporters and importers. Second, Japan and Russia are large importers, but not exporters. Finally, Australia and New Zealand, Brazil, Argentina, and India are major exporters, but not importers.

In terms of power, this does raise the question whether an importing country has power because it is wealthy enough to create the demand for goods? Or

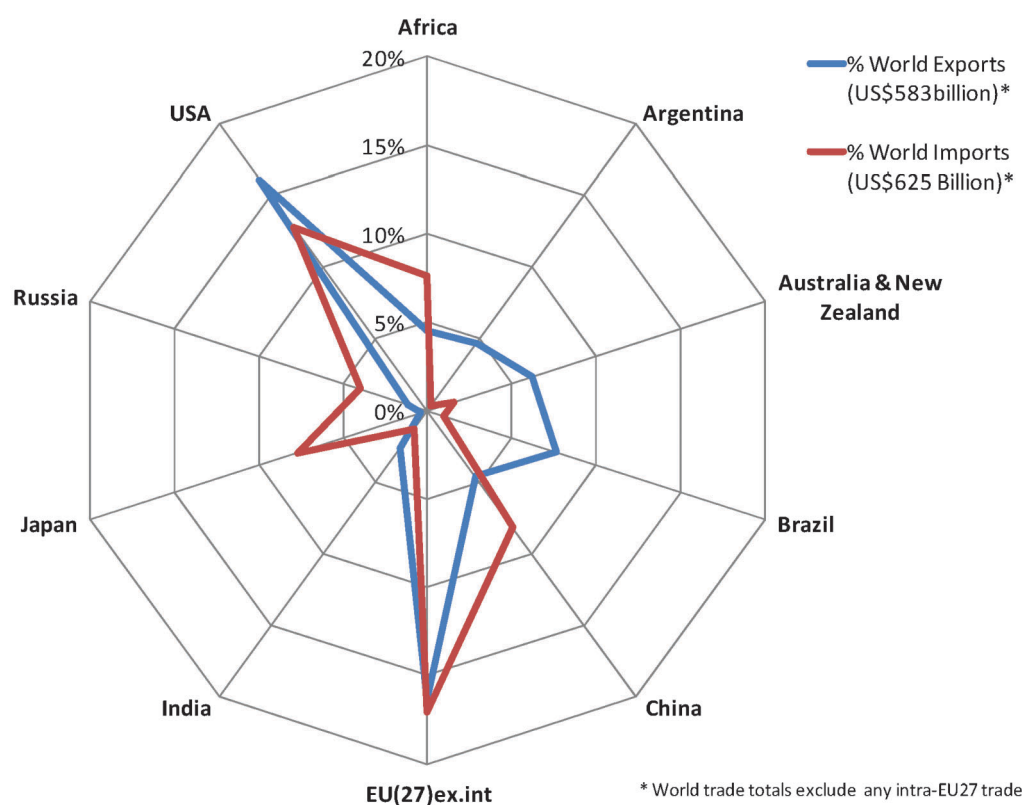


Figure 2: Proportion of World Agricultural Trade (average 2006 to 2008)

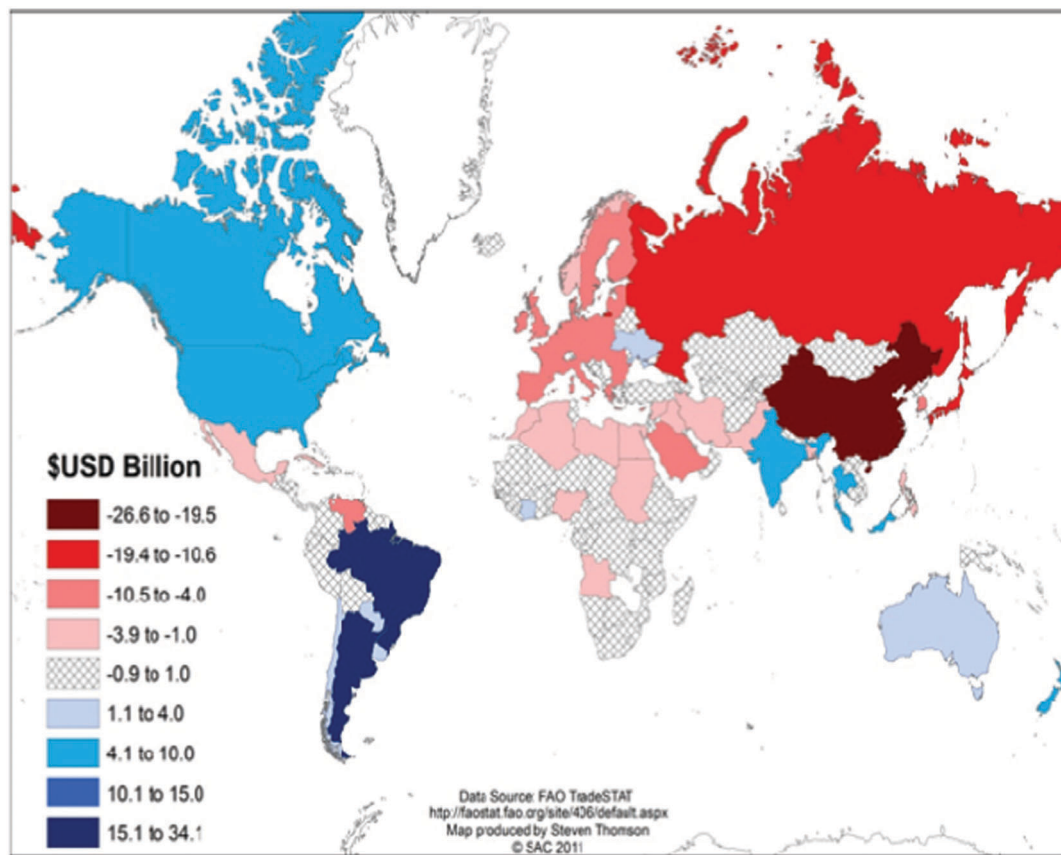


Figure 3: Change in Net Trade (exports minus imports) between average of 1997–99 and 2007–09

does power lie with the country that produces a surplus and exports? We hypothesise that countries with both import and export capacities (group one) are likely to be more powerful than the countries in the other two groups. Whilst Figure 2 provides a snapshot of the overall agricultural trade situation, it is useful to consider how trade patterns have evolved over time.

Figure 3 highlights how global net agricultural trade (exports minus imports) has changed between the averages of the 1997–99 and 2007–2009 periods. The darker blue the country/region, the more the net trade balance has improved (proportionally higher exports); the redder the country/region is, the more the trade balance has decreased (proportionately higher imports). A picture of a New/Old world split seems to emerge with North and South America and Australasia seeing improvement in their net agricultural trade balances whilst Europe's have declined⁵ alongside the emerging economies in Russia and China where there have been significant increase in net agricultural imports. There are a number of reasons for these changes, not least significant shifts in agricultural policy within the EU-27 that altered net-production balances (EC, 2011).

International Agricultural Commodity Trade

As previously discussed countries/regions can be placed into the categories of predominantly exporters, predominantly importers or a combination of both.

⁵As the map is based on value of net trade, the scale of the change can be affected by changes in prices between the two periods; however, it is still useful to highlight the direction of change.

Figure 4 shows selected countries that fall into these categories, revealing their import and exports for key agricultural commodities for the 2006 to 2008 period.⁶ This highlights the significant role that Brazil plays in global exports of poultry meat, beef and to a lesser extent pork, with Australia and New Zealand being dominant exporters of beef and dairy products. For these agricultural products Japan was highly reliant on imports, as was Russia for beef, pork and poultry meat. The USA and EU27 (excluding internal trade) played significant roles in both supplying exports and importing commodities for their internal market.

Changing trade patterns

Further insight into the nature of trade can be gained by examining the destination of exports from the major exporters and examining how these have changed over time. It is clear that trade patterns reflect, amongst other factors, location and historic relationships, but Regional Trade Agreements and other factors have led to new and evolving trade patterns emerging. Taking beef as an example commodity, Figure 5 presents the change in destinations of exports between the 1997–1999 and 2007–2009 periods.

The maps indicate that there have been significant changes in the trade relationships in the beef sector. Australia has taken the USA's position as the most important global supplier of beef between 1997–99 and

⁶Whilst noting that intra-EU trade is a very important component of international trade, the following considers the EU27 as a single trading bloc and therefore will exclude intra EU trade from the global figures.

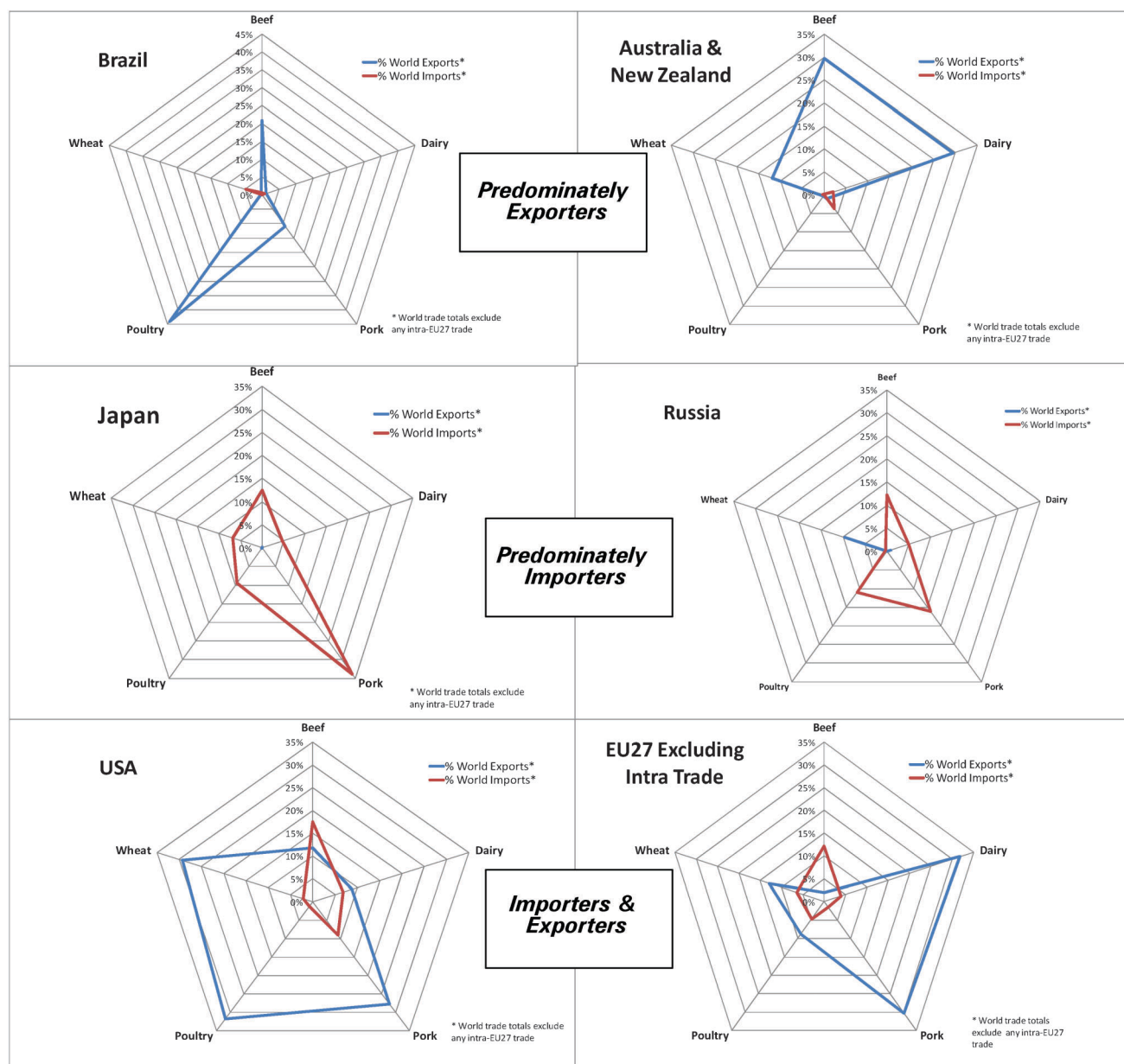


Figure 4: Proportion of Global Trade in Selected Agricultural Commodities, by country / region (average 2006–2008)
Source: FAO

2007–09. Australia's key beef export markets remain relatively similar proportionately (although South Korea rose from 5.4% of Australia's beef exports in 1997–1999 to 14.9% in 2007–2009), although the value of those exports more than doubled. This means that Australia is reliant on three markets for 80% of its beef exports, although all of them are covered by bilateral trade agreements⁷ (although the recent US-Korea Free Trade Agreement may impact on Australia's beef trade⁸).

Of particular note is the rapid emergence of Brazil as the second most important exporter of beef in the 2007–09 period (exports having grown 10 fold in the preceding decade). In the late 1990's Brazilian beef exports were only about US\$300, with three-quarters going to the

EU27. A decade later Brazil exports were over US\$3.5 billion and its most important market is now Russia (31% of its exports) with the EU27 now taking under 16 per cent. The USA's beef exports have remained stable in value (although have fallen in real terms) over the period and links to the Japanese market have diminished (falling from 55% of all beef exports to 14%), whilst links to regional partners, Canada and Mexico have grown in importance, highlighting the significance of the North American Free Trade Agreement (NAFTA).

Corporate concentration

The structure of global business is continually changing through a process of mergers, takeovers etc. and therefore it is only ever possible to obtain a snapshot of the situation. UNCTAD, however, provided a list of the world's top 150 agribusiness corporations which we

⁷ <http://www.bilaterals.org/spip.php?rubrique127>

⁸ <http://www.bilaterals.org/spip.php?article21118>

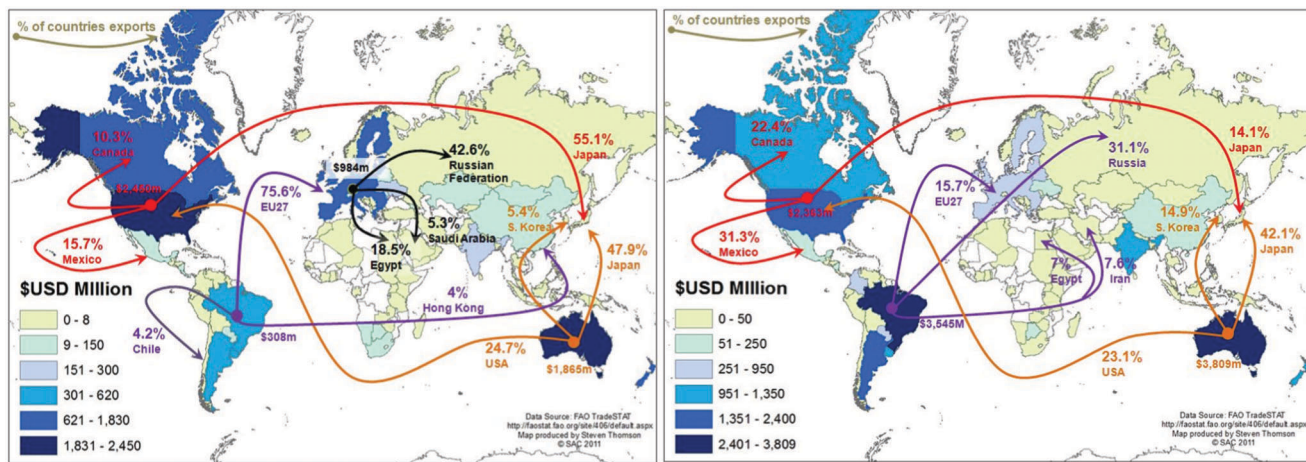


Figure 5: Value of beef exports and main destinations of export destination for major exporters

have taken as the basis for our analysis (UNCTAD, 2009). According to this report, about 89% of these corporations are located in just 20 countries. With 43 (over a quarter) of these companies the USA is home to the largest number. In second position is the UK with 11 of the top 150 companies whilst France and Germany are in third and fourth positions with 10 and seven of the top corporations, respectively.

On a regional basis, 44% of these corporations are located in just 17 countries of the European Union, 31% in just two countries of North America (USA and Canada) and 22% in the 14 countries of the Asia-Pacific region. This suggests that EU leads in terms of overall global corporate power, although individually the major EU economies are small when compared with the corporate power of the USA.

A more disaggregated view of corporate power can be obtained by examining individual sectors. The global food products industry, consisting of agricultural products and packaged foods, generated revenues of US\$3.2 trillion in 2008 (IMAP, 2010). A small number

of TNCs currently dominate this sector. In terms of annual turnover, the Swiss Corporation Nestlé ranks first in the world with a turnover of over US\$112 billion (Figure 6). Archer-Daniels-Midland (ADM) and Unilever rank second and third with annual sales of US\$62 billion and US\$59 billion respectively. The annual turnover of the top 11 companies combined is about US\$393 billion. The total asset value of these TNCs is estimated to be US\$439.5 billion. Using this indicator, Nestlé, Kraft Foods, and Unilever rank first, second and third respectively (Figure 6).

The ranking is similar for net annual income. With a profit of about US\$37 billion, Nestlé ranks first, followed by Kraft Foods (US\$5.7 billion) and Unilever (US\$5.69 billion) which rank second and third respectively. The aggregate annual profit of the top 11 TNCs totals close to US\$59 billion.

The global retail industry is currently dominated by between 10 and 12 TNCs. In 2007, the top 10 retail TNCs shared 40% of worldwide retail sales (ETC Group, 2008). According to the FT Global 500 data,

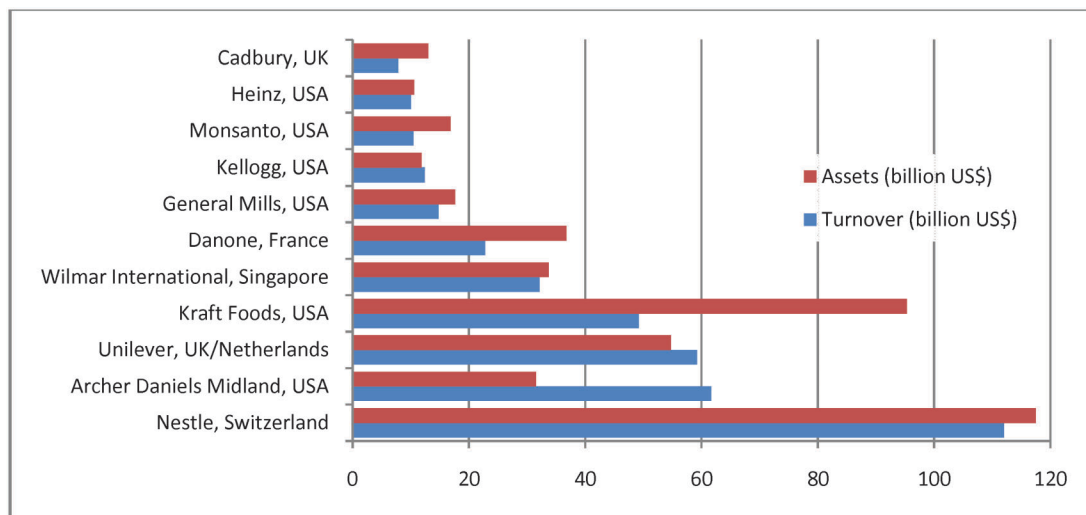


Figure 6: Annual turnover and asset value of world's top food products TNCs
Source: FT Global 500

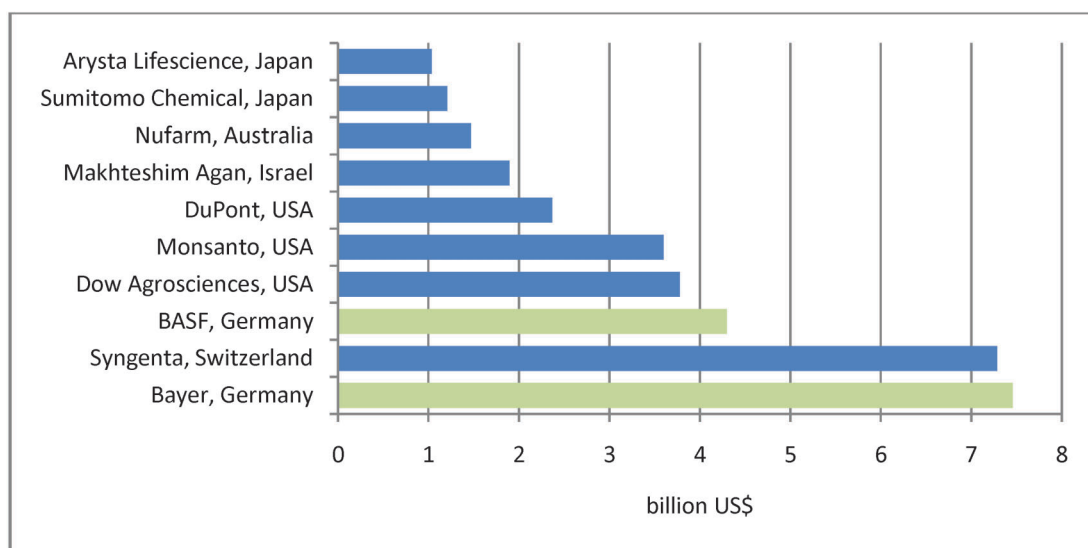


Figure 7: Annual sales of world's top agrochemical TNCs (2008)
Source: Agrow World Protection News, 2008

in 2010, the top 12 retail TNCs collectively had an annual turnover of US\$1.32 trillion. With an annual turnover of around US\$419 billion, the US Corporation Wal-Mart, by some margin, was the largest. The only UK retail TNC in this list was Tesco (seventh position). The asset values of these top 12 TNCs was over US\$564 billion in 2010 and Wal-Mart alone represented 32% (US\$180.3 billion) of this. The asset values of the next three TNCs – Carrefour, Tesco and CVS Caremark – were around one-third of Wal-Mart (FT Global 500. This reiterates the economic prowess of Wal-Mart at the global level.

The economic power of TNCs also manifests itself in the market for agricultural inputs such as agrochemicals, seeds and fertilisers. Like the other sectors, we find a high degree of concentration with a few TNCs having substantial market shares (ETC Group, 2008). For example, in 2007, the top 10 agrochemical companies controlled 89 per cent of the global market (Figure 7)

with Bayer ranked first in the world, Syngenta second and BASF ranked third. Of the US\$38.6 billion sales in the world, Bayer and Syngenta shared 19 per cent each (around US\$7.5 billion), and BASF 11 per cent (US\$4.3 billion). It is also apparent from Figure 7 that only five companies – Bayer, Syngenta, BASF, Dow and Monsanto – account for nearly 70 per cent of the world's agrochemical market.

According to the ETC group, in 2007, the global sale of proprietary seeds was US\$22 billion. As shown in Figure 8, Monsanto was by far the largest company accounting for just under a quarter of global sales (about US\$5 billion). Together with DuPont (15%) and Syngenta (9%), these three companies controlled nearly 50 per cent of the world's proprietary seed market in 2007.

Only seven TNCs currently dominate the fertiliser market of the world (Figure 9). In terms of net income in 2007, Potash Corporation ranked first in the world

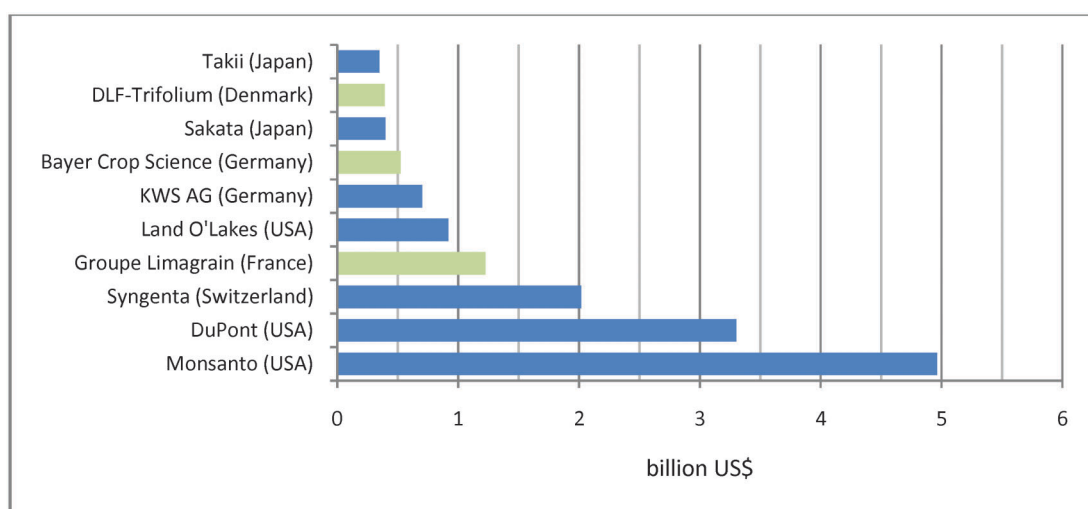


Figure 8: Annual sales of world's top seed TNCs in 2007
Source: ETC Group, 2008

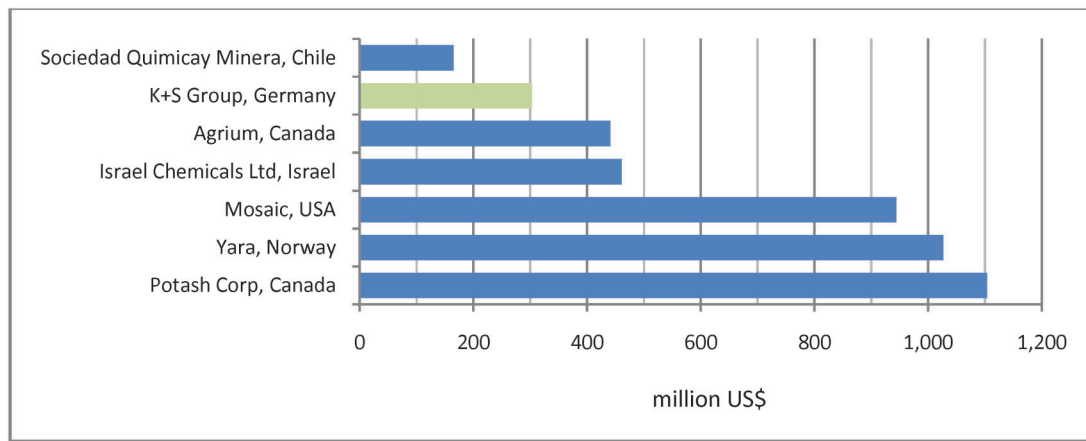


Figure 9: Net annual income of world's top fertilizer TNCs in 2007
Source: ETC Group, 2008

(US\$1104 million), while Yara (US\$1027 million) and Mosaic (US\$944 million) ranked second and third respectively.

Whilst these figures give an indication of the scale of the TNCs and market concentration, they clearly do not tell the whole story in terms of power for a number of reasons. First, it should be noted that a number of very large companies are privately owned and therefore their figures are not publically available. Second, it does not tell us the *number* of countries that the companies operate in, or the number of companies operating *within* a particular country. This is clearly important in terms of the degree of power faced by farmers. Third, as well as rapidly growing in size through the process of mergers and takeovers, other forms of business relationship have increased the economic power of TNCs. An example from the UK is the creation of Frontier Agriculture as a joint enterprise between Cargill and ABF focusing on crop inputs and grain marketing. In effect this increases the economic power of both companies in the UK.

Political Power

Using the WTO and World Bank as examples, we illustrate some of the issues surrounding international political power in the area of agriculture and demonstrate how closely it is linked to economic power.

Power within the WTO

The WTO's main purpose is to facilitate the liberalisation of global trade (including agri-food trade) by acting as a 'platform' for countries to negotiate trade problems, settle disputes (e.g. market access, tariff concessions, and quotas), and formulate and sanction trade rules. The organisation currently has 153 members (countries) that cover almost 90% of global trade. In assessing the power of nation states within the WTO we have relied on three indicators – financial contribution to WTO (proxy indicator), capacity to use WTO's dispute settlement mechanisms and influence in WTO's decision making.

An analysis of the financial contribution of member states to WTO's budgets reveals that the WTO relies heavily on the donations of a few countries – most of

which are the large trading nations that we have shown in section 3.1. For example, in 2011, only 12 countries, mostly large economies, collectively contributed over 79% of WTO's budgets. As shown in Figure 10, the five largest contributors in order are: EU-15⁹ (38.75%), USA (12.4%), China (11.18%), Japan (5%) and Canada (3%). Disregarding the EU as a single entity, the highest contributors in order are USA, China, Japan, Germany (8.86%), France (4.49%) and UK (4.84%).

The relationship between economic power and political power in the WTO can be highlighted in two areas.

First, a strong relationship exists between the level of financial contribution and the use of the WTO's platform in settling trade disputes. For instance, about 84% (351) of the 419 trade disputes brought into the WTO from 1995 through to 2010 were made by 12 countries only.¹⁰ The remainder of the 141 member countries together launched slightly over 15% of the complaints. Whilst the use of the trade dispute platform is likely to be closely related to the extent of trade, it does also represent the exercise of power as significant resources are required in order follow the dispute process through.

Second, examples provided in the literature indicate that WTO's decision making has historically been dominated by a handful of countries, in particular, the USA. Although the WTO claims that it operates on a 'one country one vote' basis and its decisions are made based on 'consensus' some researchers (e.g. Jamara & Kwa, 2003; Monbiot, 2004; Steinberg, 2002) argue that the WTO's decisions are often made through a process of informal negotiations between a few large and high-income member states, for instance, the so called 'Quad', comprising USA, EU, Canada and Japan (Monbiot (2004: 205–207).

However, although, historically, the developed Western nations, in particular USA, have dominated

⁹These 15 countries are UK, Sweden, Switzerland, Spain, Poland, Norway, Netherlands, Italy, Ireland, Germany, France, Denmark, Belgium, Austria, and Portugal. Among these 15 nations Germany's contribution is the highest (8.86%), followed by France (4.49%), and UK (4.84%). The contribution of other countries range from 3.7% (Italy) to 0.51% (Portugal).

¹⁰The USA (97) raised the highest number of disputes, followed by EU (82), Canada (33), Brazil (25), India (19), Argentina (15), Japan (14), South Korea (14), Thailand (13), Chile (10) and China (8).

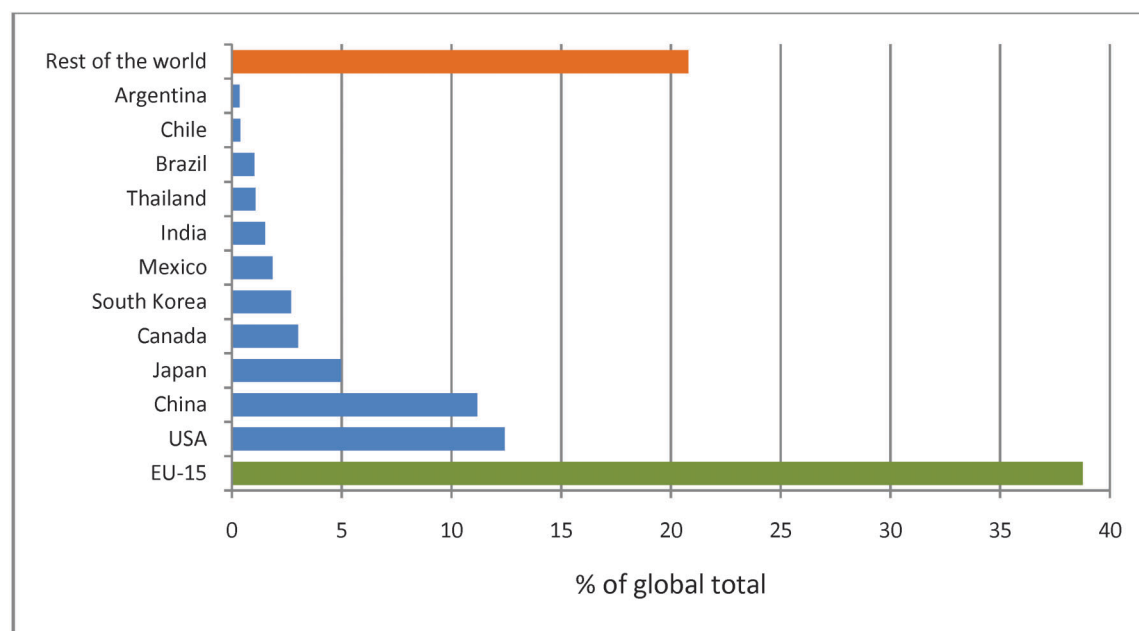


Figure 10: Share of financial contribution to WTO's budgets
Source: WTO, 2011

the WTO, recent incidents indicate a power shift, with the emerging developing countries also appearing as powerful players. This power shift manifested itself in the collapse of the Geneva talks under the Doha Development Agenda (which began in 2001) due to disputes between USA, EU, China and India regarding the liberalisation of agricultural trade. This has been labelled in the international media as a significant shift in global power. A German business daily Handelsblatt, for example, wrote:

"Above all the failure of the WTO talks reflects the changing power relations in the world. Gone are the days when the US and Europe could set the tone and largely draw up the world trade agreements amongst themselves. China and India took a tough stance. They fight hard for their interests and only support free trade when it suits them. The old industrial powers will slowly realize the bitter truth of this. Geneva was just a foretaste" (Quoted in Spiegel Online International, 2008).

Power within the World Bank

Like the WTO, the World Bank is also a global institution, represented by 170 member states (World Bank, 2010). The organisation has historically played crucial roles in shaping global agriculture through its lending operations and technical assistance programmes (see Pincus, 2001). This trend still continues. For example, in the Fiscal Year 2010, the Bank invested about US\$2.6 billion in agricultural development programmes, including a Global Agriculture and Food Security Programme (GAFSP) in order to respond to the financial needs in developing country agricultural sectors (World Bank, 2010).

Whilst, the World Bank is represented by 170 member countries, the voting power of individual countries within the Bank is unequal and contingent on the financial contribution made by each member country.

Thus, the country that contributes the most has the highest voting power. With 16 per cent of the voting power, the USA currently ranks first, whilst the UK ranks fifth. If we analyse this voting power in terms of economic coalitions, we see that the G-7 block¹¹ has the highest voting power (44%), while the BRIC coalition, comprising of the emerging economies, has only 11% of the votes.

In terms of global power in agriculture, this distinction is important because greater voting power enables countries or coalitions to push forward their own agenda by influencing the key decisions made by the Bank, including which countries receive loans and under what conditions. For example, through its Structural Adjustment lending programmes the World Bank persuaded many developing country governments to slash their budgetary support to agriculture, privatise state-owned corporations and adopt liberalised policies in agricultural trade. The Bank used these reforms as 'pre-conditions' for sanctioning loans to debt-ridden developing countries and this condition-based loan-sanctioning mechanism is still in practice (see Oxfam, 2006). Whilst it is argued that these conditions have a sound economic rationale, they do enable powerful countries, like the USA and its agribusiness corporations, access to developing country markets. Similarly it has been argued that, since the 1970s, the USA has systematically used its influence in convincing the Bank not to grant loans that could facilitate the production of goods that would compete with US products, i.e. palm oil, citrus fruits and sugar (Toussaint, 2006).

However, although the World Bank has historically been dominated by powerful economic coalitions such

¹¹ The G7 member countries are France, Germany, Italy, Japan, UK, USA, and Canada. The G7 (which is an informal grouping) is considered to be the most powerful economic and political coalition in the world. Although it should be noted that with the addition of Russia it has become known as the G8, and there are reports that France is keen to expand it further to include other countries such as Brazil, India and China. This again can be seen to reflect the changing balance of political power in the world.

as the USA and the G-7 group, recently, there has been a shift in this power game. Although it is still the USA and the EU countries that have most of the power, the Bank has recently provided more power to emerging economies like China and India (World Bank, 2010). This clearly shows a changing geopolitical landscape with clear signs of power shift from the West to the East. As the Chairman of the World Bank Group, Robert Zoellick himself stated in the 2010 annual report of the Bank:

“Our shareholders..... fulfilled the commitment....to increase voting power at the International Bank for Reconstruction and Development (IBRD)¹² for developing and transition countries by at least 3 percentage points, bringing them to 47.19 per cent—a total shift of 4.59 per cent since 2008. Developing-country voting power in the International Development Association (IDA) will rise to more than 45 per cent. Developing and transition countries’ shares at the International Finance Corporation (IFC) will increase by 6.07 per cent to 39.48 per cent. These changes in voting power help us better reflect the realities of the new multipolar global economy, where developing and transition countries are now key players.”

Political power of TNCs

Evidence from the US highlights the considerable sums that are spent by the TNCs on lobbying and political campaign financing. Between 2008 and 2010, for example, it is estimated that Monsanto alone, one of the world’s largest seed and agrochemical firms, spent over US\$8.5 million per year in lobbying (Centre for Responsive Politics, 2011) and only three companies – Monsanto, Syngenta and Dow – donated over a quarter million US\$ to democrat and republican parties during the 2009–2010 election cycle (Agri-Pulse, 2010). Evidently, the TNCs spent these sums in order to influence public policy processes (Jowit, 2010; Madsen & Davis, 2011). It is therefore contended that the TNCs have significant political as well as economic power. However, it is also evident that civil society organisations are becoming increasingly adept at using the political system themselves to counter some of the power of the large corporations. In 2002, for instance, farmer organisations lobbied and forced Monsanto to withdraw its applications for regulatory approval of GM wheat submitted to the Canadian and US authorities (Falkner, 2009). Similarly, after eight years of campaign by Greenpeace in Brazil, Bayer finally halted trying to introduce GM rice to Brazilian farmers (Greenpeace International, 2010).

Natural Resources and the Future of Power

This section examines how key natural resources (land, water, minerals and energy) are distributed globally and in particular how this distribution maps onto agricultural power.

Land

About three quarters of the world’s 4.8 billion ha of agricultural land is located within the borders of only 25 countries. According to the FAO (2010), the countries with the largest shares of global agricultural land are China (10.7%), Australia (8.5%), USA (8.4%), Brazil (5.4%) and Russia (4.4%). Collectively, they occupy over one-third of the world’s agricultural area. However, simply ranking by area may be misleading as it does not take into account the population that the land has to sustain (for example, the situation in China) or the quality (productive capacity) of the land. Correcting for population alone, Mongolia has the highest per capita agricultural area (44 ha/person), followed by Australia (20 ha/person) and Namibia (18 ha/person). By using this indicator, some large countries i.e. Russia (32nd), Brazil (35th), USA (36th) and China (109th) become much less land rich.

In terms of total arable land, which may be argued to better reflect productive capacity, the USA ranks first in the world with an endowment of 170.5 million ha – over 12% of the world’s total (1.4 billion ha). India ranks second (11.5%), Russia third (8.8%), China fourth (7.9%) and Brazil fifth (4.4%). However, on a per capita basis, Australia ranks first in the world with Kazakhstan and Canada in second and third places, respectively (Figure 11). Brazil ranks 37th in the world with per capita arable land of 0.32 ha, India is 106th with 0.13 ha and China 138th with 0.08 ha. Although, some of the EU countries are within the top 25 in the world in terms of per capita arable land holding these are not the agriculturally powerful. On the contrary, powerful countries like France ranks 41st (0.29 ha) and the UK ranks 126th (0.09 ha) in the world.

Water

The total renewable water resource (by volume) in the world is estimated at just over 54 billion m³ per year (FAO Aquastat). About 67 per cent of this is located in just 15 countries and many of these water-rich countries are developing economies (Figure 12). The major EU economies appear to be water poor in comparison to these developing countries, with the EU-27 only having the eighth highest water resources globally. The advanced EU economies may therefore be in a more vulnerable situation in terms of natural renewable water levels in comparison to some of the other key agricultural producers such as the USA, Canada and the BRIC countries. However, whilst total renewable water resources provide an indicator of this vulnerability it does not really take into account the extent that water is actually acting as a constraining factor on agriculture. That is while total volumes of water supply are important, the lack of spare or excess capacity is what actually might constrain agriculture moving forward.

Minerals

As mentioned earlier, phosphate rock and potassium are two of the key minerals required by agriculture. In addition, they are non-renewable and currently there are no suitable substitutes available. Therefore, they provide useful examples of how control over production may provide power in agriculture.

¹² IBRD, IDA, and IFC are collectively called the ‘The World Bank Group’.

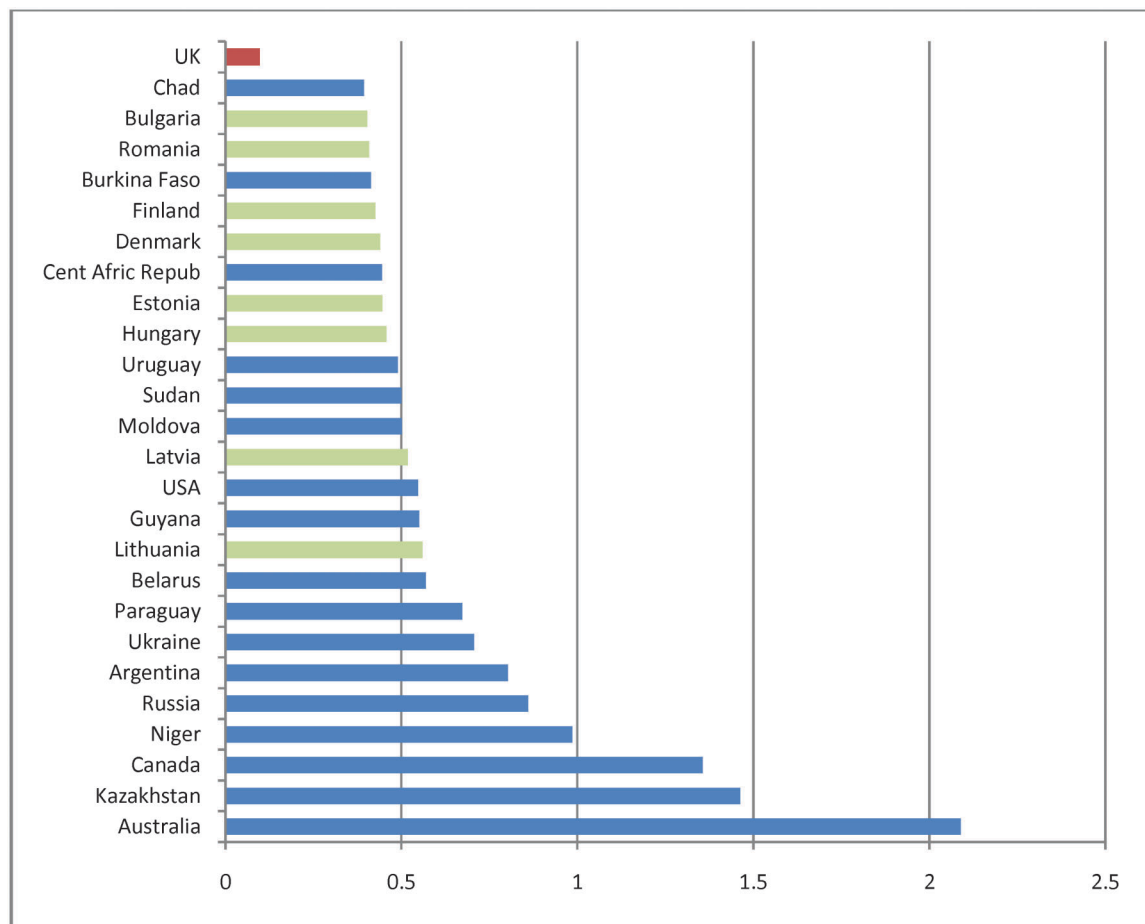


Figure 11: World's top 25 countries according to per capita arable land holding in hectares vis-a-vis UK
Source: FAO, 2010

Almost the entire reserve of world's phosphate rock, which is estimated to be 65 billion tonnes, is located in just 15 countries (USGS, 2011). Nearly 77 per cent of this reserve is in Morocco and Western Sahara (M&WS) and over 98 per cent is in just nine countries (Figure 13).

A number of the countries with considerable phosphate rock reserves are important players in agriculture, such as USA, Canada and three of the BRICS countries. In contrast, none of the EU countries have any phosphate rock reserves, potentially making them vulnerable vis-à-vis the emerging BRICS countries.

In terms of production, China currently ranks first in the world with an average annual production of about 63 million tonnes (Figure 12). In second and third positions are the USA (26.3 million tonnes) and M&WS (24.5 million tonnes).

Looking forward, at the current rate of production and with known reserves, phosphate reserves are forecast to last for a further 400 years. However, with the exception of M&WS, the phosphate rock reserves of a number of currently important producers are going to be depleted in the much nearer future. For example, Canada's reserve is going to be exhausted in just seven years, Australia's in 29 years¹³ and China's in about 60 years. Although the current reserves in the M&WS

region are more secure into the future, this region is likely to be the focus of a power struggle between the major world economies in future.

The current global Potassium reserve is estimated to be around 9.5 billion tonnes. Almost 100% of this reserve is located in just 13 countries, while over 81% in just two countries – Canada and Russia (Figure 15). Germany is the only country within the EU with any considerable Potassium reserves.

In 2009/10, the average production of Potassium in the world was about 27 million tonnes per year. Canada is currently the largest producer and, in 2010, accounted for over 28% of the world's production (Figure 16). The other major producers were Russia (20%), Belarus (15%), China (9%) and Germany (9%). These five countries currently produce over 80% of the world's Potassium. The UK is the second highest potassium producer within the EU, Germany being the first. However, the amount shared by the UK is only about 1.2% and Germany and the UK together produce slightly over 10% of the world's Potassium.

Looking forward, given the current reserves and the current rate of production, it is estimated that potassium reserves will be depleted in just under 300 year's time. However, six of the above 13 countries are going to deplete their Potassium reserves in between just 19 and 70 years. These include Israel, followed by Jordan, Spain, UK, Germany and China. The immediate depletion of the Potassium reserves in countries such

¹³ Although Australia is a phosphate rock producer, the country's reserve is only 82 million tonnes, which is 0.13% of the world. This is why Australia is not shown in Figure 4.4 as having phosphate rock.

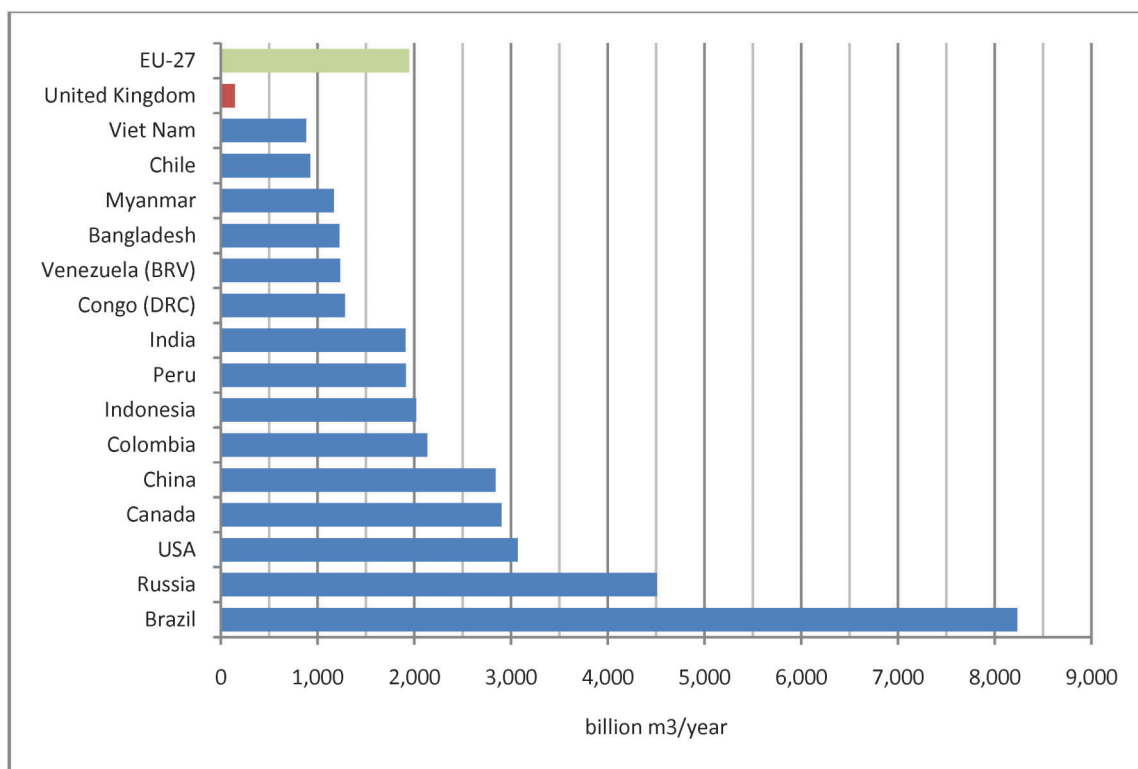


Figure 12: Top 15 water rich countries vis-a-vis EU-27
Source: FAO AquaStat

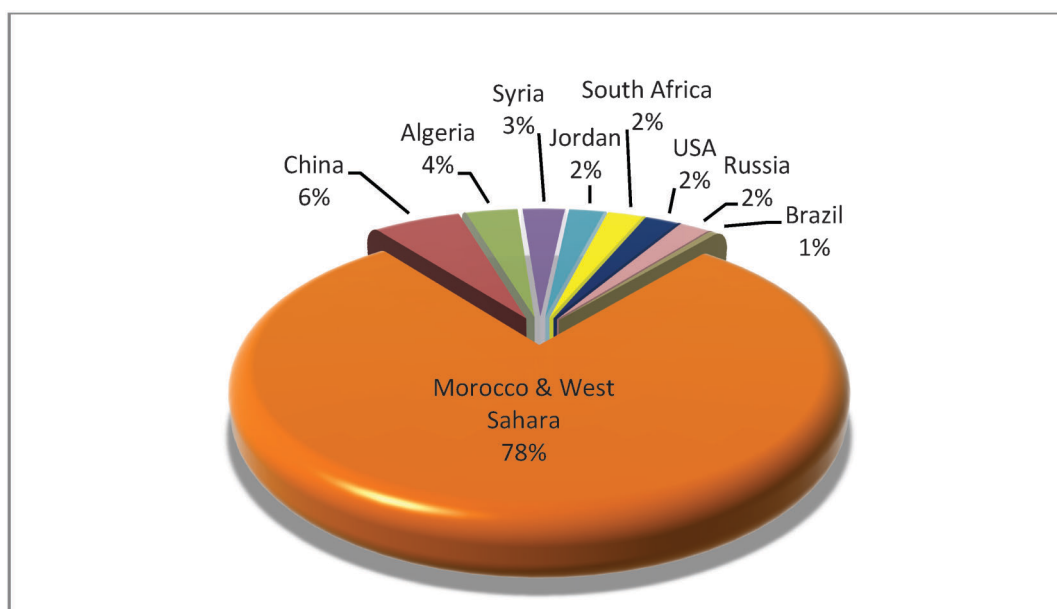


Figure 13: World's phosphate rock reserves
Source: USGS, 2011

as the UK, Germany and China may place them in a vulnerable position vis-à-vis the other top agricultural producers in the world – such as Brazil, Russia, Canada and the USA.

Energy

The final resource considered is energy. Whilst agriculture is estimated to account for less than two per cent of

total energy demand in the world, it is essential to modern agriculture. Therefore access to energy is as important to future agricultural production as it is to the rest of the economy.

Over 90% of the world's crude oil reserves are located in a handful of countries, most of which are in the Middle East and North Africa, North America (Canada and USA) and Latin America (Venezuela, Algeria, and Brazil) (CIA, 2010). The only country in Europe with a

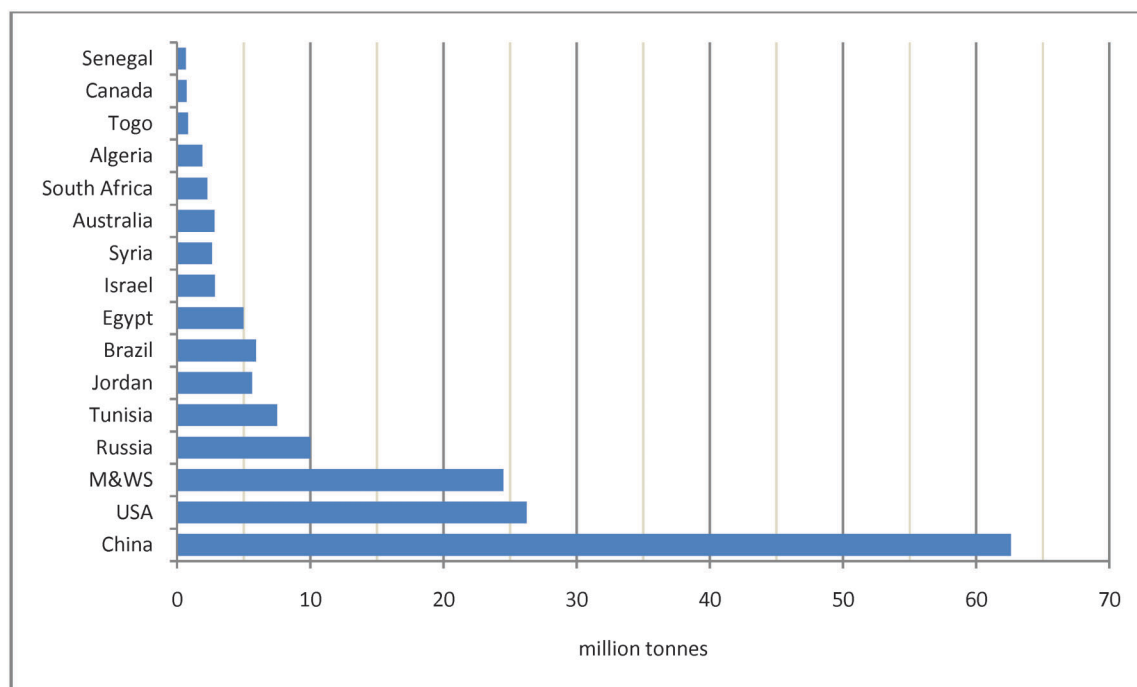


Figure 14: Annual Phosphate rock production (2009–2010)

Source: USGS, 2011

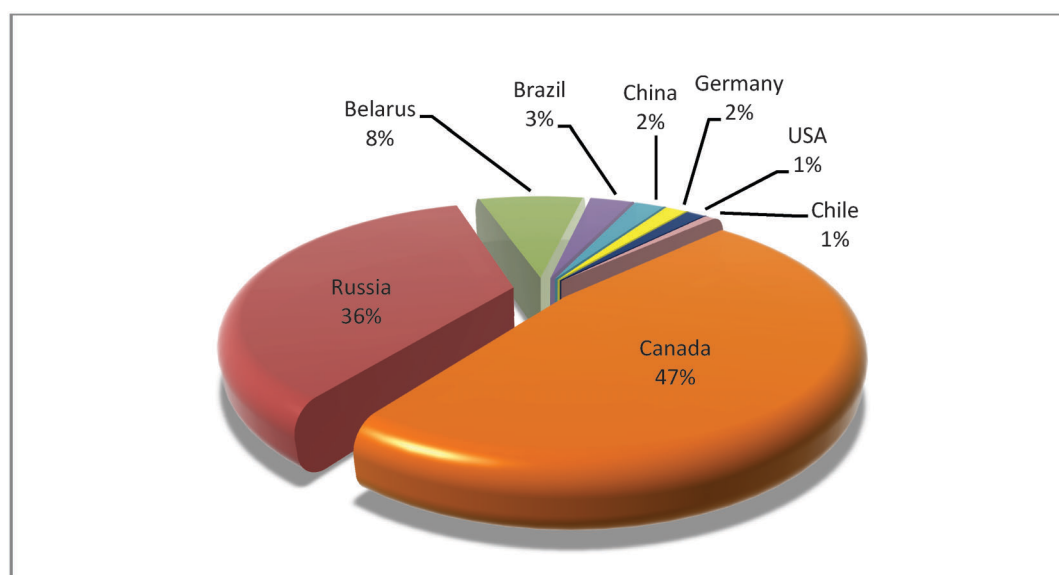


Figure 15: Global potassium reserves

Source: USGS, 2011

significant reserve of crude oil is Russia (74.2 billion barrels). Very few of the EU countries that currently dominate the world in terms of agricultural production and trade have any significant oil reserve.

In terms of crude oil production, a similar picture emerges. Over 85% of the world's crude oil is currently produced by only 25 countries only (CIA, 2010). Among these countries, Russia currently ranks first, while Saudi Arabia and USA rank second and third, respectively. It is noteworthy that, only about a third of the current global 'oil giants' are the global 'food giants'. This means that two-thirds of the existing global food giants have to rely

to a large extent on a steady supply of oil from the non-agricultural countries. Other things being equal, this situation suggests a degree of vulnerability. This vulnerability becomes even clearer, particularly for EU countries, if we take into account the high level of oil consumption in these countries (CIA, 2010). For example, our estimates suggest that at the current rate of consumption, domestic reserves can sustain most European countries for between just 24 and 359 days, with the exception of UK, Norway and Denmark. If there is an oil crisis, the energy-intensive agricultural sectors of these countries would clearly be adversely affected.

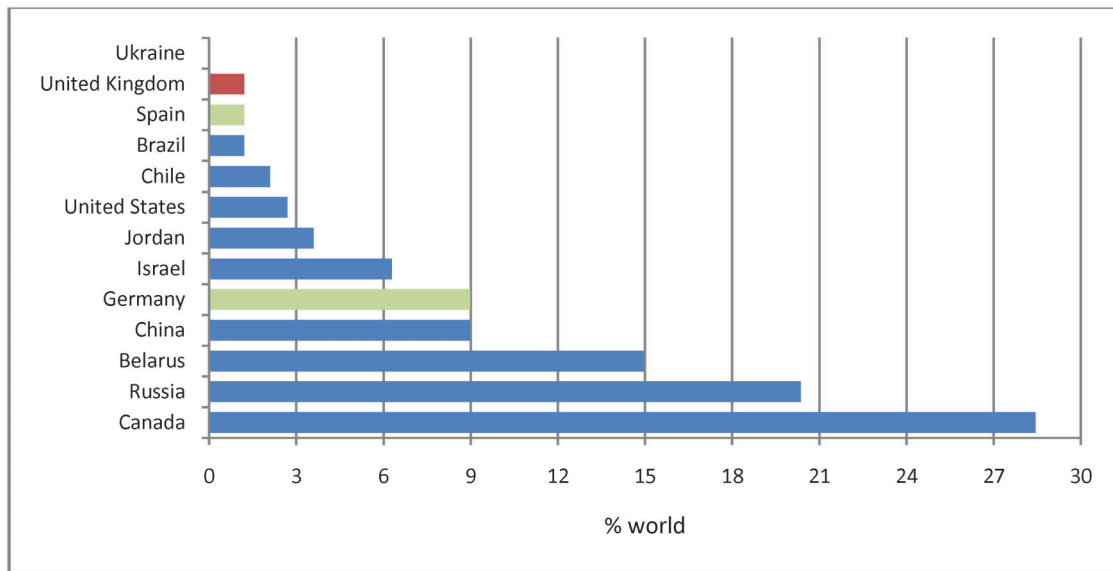


Figure 16: Annual Potassium production (2009–2010)
Source: USGS, 2011

The current world reserve of natural gas is 188 trillion m³. Like oil, almost all (> 94%) of this reserve is located in just 25 countries (CIA, 2010). Russia ranks first with a reserve of 47.6 trillion (25.30% of the world), followed by Iran (15.75%) and Qatar (13.55%). These three countries share more than one-half (55%) of the world's natural gas reserves. The natural gas reserve is minimal in European countries, except Norway and the Netherlands that collectively share 2% of the world's reserves. It is also noteworthy that very few of the world's other agriculturally important countries have substantial natural gas reserves (CIA, 2010).

4. Discussion and Conclusions

This paper has considered the issue of power in world agriculture – economic, political and natural resources. This section briefly discusses their implications, and introduces the 'Power Index' as a way to draw together the results of the study.

The analysis of the economic power of nation states in the world indicates that, at present, the power is concentrated in North America and Europe. However, certain countries such as Brazil and New Zealand are currently the largest exporters of some commodities (e.g. beef and dairy products) of the world. There is little evidence to suggest that this current power situation is likely to change markedly in the next 10 years. However, it is also apparent that the EU as a whole has retreated from world markets as policies have changed and that the export capabilities of the EU-27 in some key commodity sectors are predicted to decline further in the next 10 years, unless policy measures change markedly. This change may be seen as indicating a decline in the power of the EU-27 within the global context. However, given that a significant proportion of the exports were subsidy driven, the move to a more market orientated situation may in fact improve its competitive position in the longer term. In addition, in the short run, being less reliant on export subsidies will also strengthen the EU's position in trade negotiations.

Our analysis also indicates that, although the emerging economies, in particular, China and Brazil, have clear advantages in certain commodity markets, their corporate power in agriculture is still not on a par with that of North American (US and Canada) and European countries, especially, UK, France and Germany. These major North American and EU economies therefore are in a strong position to consolidate their economic power through their transnational agribusiness corporations. However, a major challenge for them is to balance corporate power with consumer and farmer power domestically, whilst maintaining global power.

The available evidence supports the view that the political power relevant to global agriculture is still concentrated in the hands of the USA, major EU countries and some other economically powerful countries within the G-8 coalition. However, recently there have been indications that this situation is changing and some emerging economies in the developing world are increasingly powerful players on the world stage. This has important implications for European and UK agriculture, in particular, in terms of transnational agricultural trades. In the coming decades, EU countries may have to confront increased pressure to allow greater access to their markets. This pressure is likely to come from emerging economies – like China, India and Brazil and will have implications for domestic producers.

Our analysis also confirms the influence of transnational corporations (TNCs) in global agriculture. Although, their power is not limitless and, it can be argued that ultimately it is nation states who can control agriculture, for example as shown in 2008 when a number of countries implemented export bans to try to ameliorate the impacts of a food crisis. There is also evidence that in some cases civil society organisations and farmer groups have had a significant impact in countervailing or balancing corporate influences. These findings do not corroborate the suggestions made by

Table 2: Global Power Index for Agriculture

Dimension	EU27	US	Brazil	Russia	China	Australasia	Japan
Trade	4.5	5.0	2.0	3.0	3.0	2.5	2.5
Corporate	5.0	5.0	1.0	1.0	2.0	2.0	3.0
Political	5.0	5.0	1.0	3.0	2.0	1.0	4.0
Natural	3.5	4.0	3.3	3.5	4.5	3.3	1.5
Minerals	1.3	2.5	2.3	4.3	3.3	1.0	0.0
Total	19.3	21.5	9.5	14.8	14.8	9.8	11.0

some that, in this age of corporate globalisation, the state is powerless to resist corporate activities.

In terms of control over natural resources, our analysis shows a potentially grim picture for many of the currently powerful agricultural countries, including USA and Europe. In particular, European countries, including the United Kingdom, appear to be relatively poorly endowed in global terms with the critical natural resources used in agriculture – such as land, water, potassium, phosphate, oil and natural gas. This situation, especially the availability of water and energy, is likely to become worse because of the impacts of climate change. Although many of the emerging economies, like Brazil, China and Russia are better-placed in terms of water and energy endowments, some of these countries appear to be vulnerable in terms of their possession of agricultural land (more specifically, arable land) and critical minerals relative to their population size. This partly explains the much reported phenomenon of ‘land-grabbing’ in Africa, in which some major EU countries have also taken part (Friis & Reenberg, 2010).

Three key implications can be drawn from these findings for agriculture worldwide:

- There will be increased competition for available land and resources which is likely to result in significant upward shifts in the prices of these resources.
- In the shorter term, further improvements in resource use efficiency (water, fertiliser and energy) are needed to sustain current levels of production.
- As traditional resources become scarcer, alternative practices will need to be developed and adopted.

Finally, Table 2 attempts to pull together the various dimensions of power that have been discussed into a power index. The index is simply constructed by ranking each country/region on a scale of 1 to 5 for the individual components of power discussed within this report. For example, agricultural trade comprises an average of the ranking for the role in exports and imports (treated equally), whilst natural is an average of the score for land availability (both total and arable), population and water¹⁴. It is of course an imprecise science but the findings support the general conclusions of the previous chapters.

As might be expected the US and the EU top the power index by some margin. However, the index does

highlight their potential vulnerability in terms of natural resources (key agricultural minerals and oil) moving forward. On the other hand the emerging countries at the moment have lower political and corporate power but seem better placed in terms of natural and mineral resources.

One aspect of the index that requires further clarification is the relationship between corporate power and the power index. Our approach has been predicated on the assumption that those countries/regions with a predominance of TNCs are more powerful. Implicitly this suggests that they confer power on a country. Whilst this is our view we accept that there are other ways of viewing this relationship. For example whilst TNCs may well locate in countries with economic and political power they are not necessarily the determinants of that power. In addition, it could be argued that due to their size and power, a predominance of TNCs may in fact be a challenge to the power of the state and this may not always be to the advantage of the agricultural sector.

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¹⁴ The power index was constructed by combining all the information in the report. For each power dimension the individual power components (e.g. imports and exports for 'Trade' or water, total land, arable land and population for 'Natural') were scored on a scale of 0 to 5 for each country / region. The score was allocated by the research team after consideration of the evidence, where 5 meant considerable power and zero meant effectively no power. These individual components of the power dimension were then averaged to populate the table.

Steven Thomson is a researcher within the Land Economy and Environment Group and has worked at SAC for 18 years. He is widely experienced in undertaking research, consultancy and education on a wide range of agricultural and rural economy issues. He has considerable experience in the evaluation of impacts of agricultural policy at farm level and on wider rural areas. He has conducted work for EU, UK and Scottish governments and also for a wide variety of governmental agencies and NGOs in the UK.

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REFERENCES

- Action Aid (undated). *Under the Influence: Exposing undue corporate influence over policy-making at the World Trade Organisation*. Available at: http://www.actionaid.org.uk/index.asp?page_id=100300 (last accessed, 03/10/2011).
- AFP News (8 February, 2008) *French GM ban infuriates farmers, delights environmentalists*. Available at: <http://afp.google.com/article/ALeqM5hyDkeOSZZGL5lclgJlfbHcjp8GLw> (last accessed, 29/09/2011).
- African Centre for Biosafety (2011) *Heavy Hands: Monsanto's control in South Africa*. Available at: <http://www.biosafetyafrica.org.za/index.php/20110513357/HEAVY-HANDS-Monsanto-s-control-in-SA/menu-id-100026.html> (last accessed, 28/09/2011).
- Agri-Pulse Communications Inc. (2010) *Agri-Pulse Newsletter*, Volume 6, Number 7, February 17, 2010, Available at: <http://www.northamericandevon.com/pdfs/02172010.pdf> (last accessed, 28/09/2011).
- BBC News (25 July, 2006). *Europe blames US for WTO failure*. Available at: <http://news.bbc.co.uk/1/hi/5209010.stm> (last accessed, 03/2010/2011).
- Bown, C. & Hoekman, B. (2005) WTO Dispute Settlement and the Missing Developing Country Cases: Engaging the Private Sector. *JIEL*, 8(4), pp. 861–870.
- Centre for Responsive Politics. Lobbying Database, Available at: <http://www.opensecrets.org/lobby/index.php> (last accessed, 28/09/2011).
- CIA (2010) *The World Factbook*. USA: Central Intelligence Agency. Available at: <https://www.cia.gov/library/publications/the-world-factbook/rankorder/rankorderguide.html> (last accessed, 14/10/2011).
- Davison, J. (2010) GM Plants: Science, politics and EC regulations. *Plant Science*, 178 (2), 94–98.
- European Commission (2011). *The CAP in perspective from market intervention to innovation*. Agricultural Policy Perspectives Briefs. Brief No1 January 2011. Available at: http://ec.europa.eu/agriculture/publi/app-briefs/01_en.pdf (last accessed 1 August 2011)
- ETC Group (2008) *Who Owns Nature? Corporate Power and the Final Frontier in the Commodification of Life*. Available at http://www.etcgroup.org/upload/publication/707/01/etc_won_report_final_color.pdf (last accessed, 17/10/2011).
- Falkner, R. (2009) The Troubled Birth of the 'Biotech Century': Global Corporate Power and Its Limits. In J. Clapp & D. Fuchs (eds.) *Corporate Power in Global Agrifood Governance* (pp. 225–251). Cambridge, MA: The MIT Press.
- Fanzul, G. (2006) *Agriculture and Trade in an Asymmetric World*. Ecofair Trade Dialogue Discussion Paper No. 3. Available at: http://www.ppl.nl/ebooks/files/BOELL_Fanzul_Agriculture-Trade_e.pdf (last accessed 17/10/2011).
- FAO (2010) *FAO Statistical Yearbook 2010*. Available at <http://www.fao.org/economic/ess/ess-publications/ess-yearbook/ess-yearbook2010/en/> (last accessed, 17/10/2011).
- FAO TradeStat. Data available at <http://faostat.fao.org/site/535/default.aspx#ancor> (last accessed, 17/10/2011).
- FAO-AquaStat. Data available at <http://www.fao.org/nr/water/aquastat/data/query/index.html?lang=en> (last accessed, 18/10/2011).
- Friis, C. & Reenberg, A. (2010) *Land grab in Africa: Emerging land system drivers in a teleconnected world*. Global Land Project (GLP) Report No. 1, GLP-IPO, Copenhagen.
- Frost, L. E. (2009) What is economic power? *Joint Force Quarterly*, April, 2009. Available at http://findarticles.com/p/articles/mi_m0KNN/is_53/ai_n31506031/ (accessed 28/09/2011).
- FT Global 500. Data available at <http://www.ft.com/cms/s/2/1516dd24-9d3a-11e0-997d-00144feabdc0.html#axzz1USBPfSjo> (last accessed, 17/10/2011).
- Fuchs, D. & Clapp, J. (eds.) (2009) *Corporate Power in Global Agrifood Governance*. Cambridge: The MIT Press.
- Greenpeace International (2010) *Annual Report*. Available at: <http://www.greenpeace.org/international/en/about/reports/#a0> (last accessed, 29/09/2011).
- Hendrickson, M., Wilkinson, J., Heffernan, W., & Gronski, R. (2008) *The Global Food System and Nodes of Power*. An analysis prepared for Oxfam America, August, 2008.
- IMAP (2010) *Food and Beverage Industry Global Report – 2010*. Available for download at http://www.imap.com/imap/media/resources/IMAP_Food_Beverage_Report_WEB_AD6498A02CAF4.pdf (last accessed, 17/10/2011).
- Jamara, F. & Kwa, A. (2003). *Behind the Scenes at the WTO: The Real World of International Trade Negotiations*. New York: Zed Books.
- Jowit, J. (2010) *Corporate lobbying is blocking food reforms, senior UN official warns*, Guardian online. Available at: <http://www.guardian.co.uk/environment/2010/sep/22/food-firms-lobbying-samuel-jutzi>.
- Madsen, T. & Davis, B. (2011) *Growing Influence: The Political Power of Agribusiness and the Fouling of America's Waterways*. Available at <http://www.pennenvironment.org/reports/clean-water/clean-water-program-reports/growing-influence-the-political-power-of-agribusiness-and-the-fouling-of-americas-waterways>
- Mohiuddin, Y. (2010) *India says no to first GM food crop*. Available at: <http://www.google.com/hostednews/afp/article/ALeqM5hx8gKVOxrM8-7Pkj6nWSsPwbXBlw> (last accessed, 29/09/2011).
- Monbiot, G. (2004) *The Age of Consent: A Manifesto for a New World Order*. London: Flamingo.
- Murphy, S. (2006) *Concentrated Market Power and Agricultural Trade*. Ecofair Trade Dialogue Discussion Paper No. 1, August. Available at: <http://www.isn.ethz.ch/isn/Digital-Library/Publications/Detail/?ots591=0c54e3b3-1e9c-be1e-2c24-a6a8c7060233&lng=en&id=56471> (accessed 04/07/2011).
- Nordstrom, H., & Shaffer, G. (2007) *Access to justice in the World Trade Organisation: A Case for a Small Claims Procedure*. ICTSD Dispute Settlement and Legal Aspects of International Trade Issue Paper No. 2, June 2007, pp. 9–10.
- Nottage, H. (2009) *Developing Countries in the WTO Dispute Settlement System*. Global Economic Governance Working Paper 2009/47, Department of Politics and International Relations, University of Oxford.
- Nye, J. S. (2011) *The Future of Power*. New York: Public Affairs.
- Organisation for Economic Cooperation and Development (OECD). *OECD-FAO Agricultural Outlook 2011–2020*. Data available at http://www.agri-outlook.org/pages/0,2987,en_36774715_36775671_1_1_1_1_1,00.html (last accessed, 17/10/2011).
- Oxfam (2006) *Kicking the Habit: How the World Bank and the IMF are still addicted to attaching economic policy conditions to aid*. Oxfam Briefing Paper 96, November 2006, Oxfam, UK.

- Pincus, J. (2001) *The Post-Washington Consensus and Lending Operations in Agriculture: New Rhetoric and Old Operational Realities*. In: C. Lapavistas & J. Pincus (eds.) *Development Policy in the 21st Century*. London: Routledge.
- Spiegel Online International (30 July 2008). *WTO Failure Reflects Changing Global Power Relations*. <http://www.spiegel.de/international/world/0,1518,569027,00.html> (last accessed, 03/10/2011).
- Steinberg, R. H. (2002) In the Shadow of Law or Power? Consensus-Based Bargaining and Outcomes in the GATT/WTO. *International Organisation*, 56(2), pp. 339–374.
- The Economist (undated). *Who runs the world? Wrestling for influence*. Available online at <http://www.economist.com/node/11664289> (accessed 28/09/2011).
- Toussaint, E. (2006) *The influence of the United States on the World Bank*. Available at <http://www.cadtm.org/The-influence-of-the-United-States> (last accessed 14/10/2011).
- UNCTAD (2009) *World Investment Report 2009: Transnational Corporations, Agricultural Production and Development*. New York and Geneva: United Nations.
- United States Department of Agriculture (USDA). USDA Long-Term Agricultural Projection Tables. Available at <http://usda.mannlib.cornell.edu/MannUsda/viewStaticPage.do?url=http://usda.mannlib.cornell.edu/usda/ers/94005/.2011/index.html> (last accessed, 17/10/2011).
- USGS (2011) *Mineral Commodity Summaries 2011*. Virginia: US Geological Survey (USGS).
- Whalley, J. (2009) *Shifting Economic Power*. Draft report prepared for an OECD Development Centre Project, Centre for International Governance for Innovation, University of Western Ontario, and CESifo, Munich, Germany.
- World Bank (2010). *The World Bank Annual Report 2010: Year in Review*. Washington DC: The World Bank.
- World Bank (undated) data at <http://data.worldbank.org/indicator/AG.LND.ARBL.HA.PC> (last accessed, 03/11/2011).
- WTO (2011). *The World Bank Annual Report 2011* Available at: http://www.wto.org/english/res_e/booksp_e/anrep_e/anrep11_e.pdf (last accessed, 17/10/2011).
- WTO (undated). *What is the World Trade Organisation?* Available at: http://www.wto.org/english/thewto_e/whatis_e/tif_e/fact1_e.htm (last accessed, 17/10/2011).