

# Agriculture: Double trouble

How climate change could disrupt global agriculture

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## Disclaimer & Disclosures

This report must be read with the disclosures and the analyst certifications in the Disclosure appendix, and with the Disclaimer, which forms part of it

- ▶ **Agriculture is disrupted by the effects of climate change, but deforestation and processes are emissions contributors; both act as a supply constraint**
- ▶ **We expect global cereal growth to be lower with climate change, creating volatile prices and changing trade flows**
- ▶ **Long-term thematic winners are productivity-improving companies such as fertilisers, crop protection and seeds, but short-term economic fundamentals are key share price drivers**

**The victim and the perpetrator:** In our proprietary climate change country analysis '[Scoring Climate Risk](#)' (9 August 2011), we noted that the food system is already in stress from rising demand and constrained supply, even before the disruptive nature of climate change takes hold. Now, a new report by the IPCC highlights that the magnitude and frequency of weather extremes are changing. We think this will directly impact agricultural output.

**Here, we isolate and analyse climate change factors for agriculture and assess the likely macro impacts.** We think localised price volatility and regional cost burdens are the short-term response to disruption. In the longer term, trade flows could change, but the ability to respond could be impacted by protectionism if food security is threatened.

**We think several sub-sectors are directly exposed to the food supply-demand imbalance theme in the long run.**

Fertilisers will benefit from the drive for productivity gains but could potentially be hurt by tighter emission regulation. New market opportunities will open up for seed and crop protection companies, but a more volatile cost base could be difficult for food producers to manage. On a shorter term tactical basis our fertiliser and agricultural chemicals equity analysts are more worried about the economic backdrop than the long-term positive structural drivers. Our global coverage of agriculture-related stocks is provided on pages 9-10. In Europe we have Overweight ratings on K+S (SDFGn.DE, EUR36.05, target price EUR59) and Yara (YAR.OL, NOK237.8, target price NOK347).

# Summary

- ▶ Agricultural output is constrained by three factors relating to climate change: temperature rises, water availability, restricting emissions
- ▶ HSBC finds India, Indonesia and China the most climate change vulnerable; agriculture is more economically significant for these
- ▶ Price volatility, trade flows and increased focus on food security are the demand-supply imbalance adjustment mechanisms

## 'Low' economic value...

Agriculture only contributes 3% to global economic output, but is especially susceptible to the impacts of climate change. The output of the growing season is dependent on an optimum range of water and temperature, key expressions of climate change.

## ...potentially high disruption

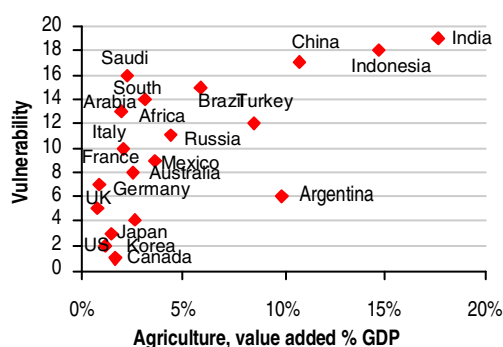
Despite the 'low' economic value, the wider ramifications of disruption to agriculture not captured in GDP are significant and include inflationary pressures, controversial food security decisions (eg non-domestic land grab and producer subsidies) and changing trade flows.

Simple population and wealth drivers mean food demand will increase over the next 40 years, with a range of estimates pointing towards a 50-70% increase requirement by 2050. On the supply side, without climate change global cereal production will increase by 38% to 2050 but with climate change the increase is just 30%. In a climate-disrupted world, all G20 countries except China, (where the difference is marginal) and Canada would be worse off in terms of cereal volume

growth to 2050. In any case a supply-demand imbalance seems inevitable. The climate change factor provides a 'double whammy' to the supply side by restricting incremental land availability (forests must stay intact) and by disrupting output.

In '[Scoring Climate Risk](#)' (9 August 2011), HSBC devised a proprietary framework to rank the relative vulnerability of the G20 to climate change impacts. India, Indonesia and China, the most climate change vulnerable countries according to our metrics, are also the most dependent on agriculture, as shown in chart 1.

Chart 1: Climate change vulnerability and agriculture (19 = high relative vulnerability, 1 = low relative vulnerability)



Source: HSBC, World Bank

## Agriculture is a victim...

A recent report<sup>1</sup> found that "It is virtually certain<sup>2</sup> that increases in the frequency and magnitude of warm daily temperature extremes and decreases in cold extremes will occur in the 21st century on the global scale" and "it is likely that the frequency of heavy precipitation of the proportion of total rainfall from heavy falls will increase in the 21st century over many areas of the globe". We think that rising GHGs make it increasingly difficult to keep temperature rises to within 2°C by the end of the century and therefore the physical impacts of change will be increasingly felt.

Agricultural output is already impacted by extreme weather events. In 2010, regions totalling c14% of global wheat production posted weather-related production declines in excess of 10%. Beyond the extremes, chronic climate change also matters. On average, during the growing season, for every 1°C temperature gain above the optimum, yields decline by 10%. In hotter temperatures, plants require more water. Since water is not evenly distributed (droughts in some areas, floods in others) agricultural productivity will be disrupted.

## ...but is also a perpetrator

Around 26% of annual greenhouse gas (GHG) emissions come from agriculture and deforestation<sup>3</sup>. Policy measures, such as the EU Emissions Trading Scheme (EU ETS) already target some fertiliser and agricultural chemical companies, but we expect low-carbon initiatives in agriculture to become higher priority as emission reduction aims in other sectors are too

slow to generate the emission cuts required. To date, the biggest unresolved policy initiative to stop deforestation (and by doing so restricting the supply of arable land) is REDD+<sup>4</sup>. Agriculture is not currently an explicit part of global climate negotiations but a work programme is likely to be adopted. Our views on COP 17 are set out in [‘Plan D for Durban’](#), 14 November 2011.

## Productivity gains required

Fertiliser companies are the obvious beneficiaries of a drive towards crop productivity, and HSBC equity analysts are currently overweight K+S and Yara. From a climate change perspective, however, we think that longer term fertilisers will be caught up in tougher emissions regulation. We summarise company and sustainability factors on page 8.

## Location matters

Here, we focus on cereals, but analysis of the magnitude and direction of disruption for all output (food, fuel, feedstocks, fibres) with and without climate is useful for several reasons:

- 1 To determine whether companies are integrating long-term climate risks/opportunities
- 2 To identify regions of new market opportunity
- 3 To determine potential margin squeeze in the supply chain or regional in-house operations
- 4 To identify where food security could be a factor, creating civil unrest and/or wage inflation

*We gratefully acknowledge the assistance of Rajiv K Chaturvedi, Abhishek Kumar and Beate Sonerud in the preparation of this report.*

<sup>1</sup> Special Report on Managing the risks of extreme events and disasters to advance climate change adaptation

<sup>2</sup> Virtually certain indicates a 99-100% probability of outcome, likely is a 66-100% likelihood of outcome

<sup>3</sup> Deforestation accounts for 86% of emissions from land use, land use change and forestry

<sup>4</sup> Reducing emissions from deforestation and forest degradation in developing countries plus forest conservation

# Gaining exposure to the agriculture theme

- ▶ The agricultural value chain comprises natural resources, inputs, outputs, trade and consumers
- ▶ Investors can access the theme through input and output companies, but climate impacts them differently (regulation, costs)
- ▶ Regulatory risk can be assessed but cost impact is more difficult because of limited company disclosure on operations by region

## Agriculture is unique

Agriculture is unique because it is a significant contributor to climate change through emissions resulting from land use, land use change and forestry (LULUCF) and greenhouse gas (GHG) releasing input processes, but output can also be acutely disrupted by the temperature and water effects of climate change. The two sides of the equation limit supply. On the one hand, incremental expansion of arable land is restricted (to keep the carbon sink properties of the forest intact) and the use of fertilisers may be regulated (potentially limiting productivity), while on the other hand, some harvests decline.

The agricultural value chain of resources, inputs, outputs, trade and consumer is depicted in chart 3. In chart 4 we summarise the sources and/or sinks of GHG emissions from each element, summarise the constraints presented by climate change, and highlight HSBC stock coverage relating to each part of the value chain.

For investors, the key sub-sectors to access the theme are highlighted in table 1 below.

**Table 1: Summary investor access to agriculture theme**

Inputs	Outputs	Trade/ Consumers
Fertilisers Pesticides  Agricultural Equipment Water Management Seeds	Fuel feedstocks Consumer/Industrial product feedstocks (palm/soy) Food Producers	Food Retailers Bulk commodity traders

Source: HSBC

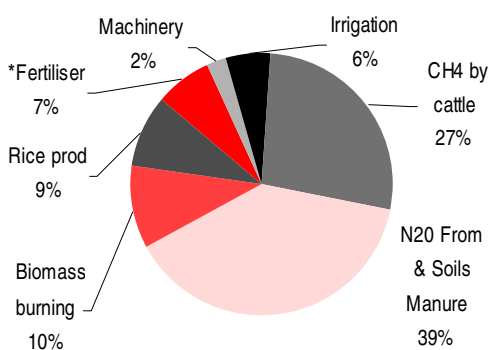
REDD+ is the proposed initiative to prevent deforestation which would save the properties of the forest as a carbon sink. We cover REDD+ issues in Appendix 1.

However, we expect the carbon sink properties of soils and forests to act as a brake on the expansion of arable land, further exacerbating the impending supply shortage, in lieu of mitigation policies in other industries that are not being implemented quickly enough to keep warming to within 2°C.

## Inputs: Regulatory targets

Despite only accounting for 7% of agricultural emissions annually, we believe the fertiliser, pesticide, seed and agricultural machinery industries are prime targets for low-carbon regulation.

Chart 2: Agricultural GHGs come mainly from soil and cows



Source: World Resource Institute \*Fertiliser and pesticide production

Fertilisers and pesticides are used to improve agricultural productivity, which is required to improve yields, but the application of Nitrogen (N) in fertilisers and manures is not always used efficiently by farmers. More precise application volumes and positioning (eg at the root of the crop) would reduce emissions of N<sub>2</sub>O generated by soil microbes (and would reduce costs for farmers).

The EU ETS already regulates companies relating to agriculture, including those involved in fertilisers, (K+S, Yara International) and crop protection (BASF, Bayer). In addition, India is targeting fertilisers in its energy efficiency PAT (Perform, Achieve, Trade) scheme.

In New Zealand, the proposed emissions trading scheme will include agriculture, targeting meat and dairy producers, exporters of live animals, fertiliser importers and manufacturers and egg producers. Reporting begins in 2012 for the scheme but the first New Zealand Units have to be surrendered in 2015.

We expect agriculture to move further up the regulation agenda, as other policies for emission

reduction are not implemented quickly enough to keep temperatures to within a 2°C rise – the global goal.

On a 12-month view HSBC equity analysts are Overweight K+S and Yara in the fertiliser space, and Neutral on KWS Saat and Syngenta in crop protection and seeds. The fertiliser companies are benefiting from record-low crop inventories, robust farmer margins and structural changes in supply, but fears over competition from generics dampen the outlook for crop protection. Please see [‘It’s showtime’](#) 1 December 2010 for our European Chemicals equity team’s complete analysis of the drivers for agricultural chemicals companies and [‘The Fertile Crescent’](#) 13 September 2011 for our recent views on fertiliser companies.

## Outputs: Disruption awaits

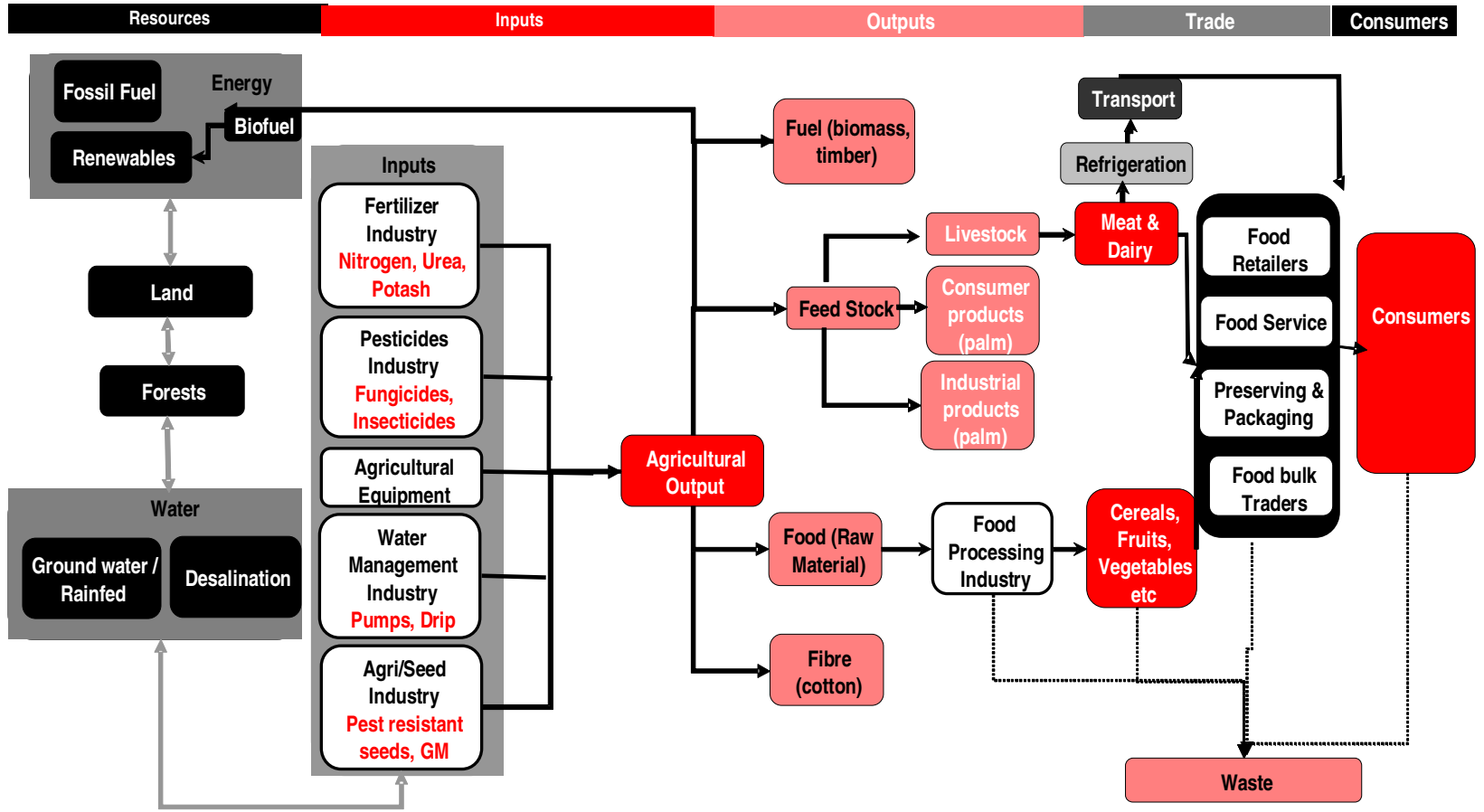
Competition between agricultural output (cereals, crops for bioenergy, oils for consumer and industrial products and plants for fibre) is based on the comparative advantage of yields between crops. Optimum crops are grown for soil characteristics and microclimate, regulatory incentives (biofuel standards) and prices.

Climate change constraints impact all types of agricultural output, but here we focus on cereals. One area of contention in the use of agricultural product is biofuels. These are cleaner than traditional fuels because they only emit CO<sub>2</sub>, as opposed to sulphur, nitrogen or other impurities and are derived from vegetation. However, CO<sub>2</sub> reduction capabilities depend on the feedstock used, and they are accused of distorting food prices as land gets diverted from food to fuel.

Companies relating to the output part of the agriculture value chain are generally those that are victims of climate change, and will most likely be affected by the short-term economic response to disruption, namely price change. It is

difficult to ascertain to what degree costs will change at individual companies and over what time frame, because companies are not transparent on the location of operational costs or supply chains. As weather-related disruption increases, we expect investors to request more clarity on these issues. In the next chapter we look at output disruption.

Chart 3: The Global Food System



Source: HSBC

Chart 4: Climate change factors

	Resources	Inputs	Outouts	Trade
<b>GHG Emissions</b> Increases GHGs = ↑ Reduces GHGs = ↓  Could increase or decrease emissions = ↑↓	<b>Energy:</b> ↑ (dependent on carbon content of energy source) <b>Land:</b> Land clearing: ↑ Soil: ↓ <b>Forests:</b> ↓ <b>Water:</b> ↓	<b>Fertilisers:</b> Production and use ↑ <b>Pesticides:</b> ↑ Production and use ↑, yield increases ↓ <b>Agricultural equipment:</b> Production and use ↑ (fuel) <b>Water management industry:</b> Water treatment ↑ <b>Agri/seed industry:</b> Overall: ↑ Production and use ↑, yield increases ↓	<b>Fuel (biomass, timber):</b> ↓ Depending on type/sustainability of sourcing <b>Feed stock &amp; livestock:</b> Methane ↑ <b>Food (raw material):</b> Production ↑ <b>Fibre (cotton):</b> Processing emissions ↑ <b>Waste:</b> Production and methane from landfill ↑	<b>Transport:</b> Fuel ↑ (dependent on carbon content of fuel) <b>Refrigeration:</b> Energy/electricity use <b>Food industry:</b> Manufacturing, retail ↑
<b>Climate change constraints</b>	<b>Energy:</b> Reduced water availability may limit energy production (hydro, nuclear) <b>Land:</b> Some land becomes unsuitable for use, yields decline. Soil degradation reduces land quality as a carbon sink. <b>Forests:</b> Possible impact negatively on forest growth. Carbon fertilisation may have a positive impact. <b>Water:</b> Increased evaporation, changed patterns of precipitation, droughts, floods	<b>Fertilisers:</b> Falling yields may increase demand <b>Pesticides:</b> Falling yields may increase demand for crop protection <b>Agricultural equipment:</b> Higher costs of higher carbon fuel <b>Water management industry:</b> More volatility in water supply and quality, increased capex requirement to manage more vulnerable water infrastructure <b>Agri/seed industry:</b> Increased demand for drought resistant seeds	<b>Fuel (biomass, timber):</b> Reduced land and water availability intensifies biofuels' competition with food <b>Feed stock (palm, soy oil):</b> Reduced land and water availability intensifies feed stock's competition with food <b>Food (raw material):</b> Land and water availability impacts food production and prices <b>Fibre (cotton):</b> Reduced land and water availability intensifies fibre's competition with food production <b>Waste:</b> Climate change constraints on food, fuels, feed and fibre means waste is likely to be reduced.	<b>Transport:</b> Risk of damage to infrastructure from weather events <b>Refrigeration:</b> Increased requirement during storage due to higher temperatures <b>Food industry:</b> Increased input costs, supply disruption risks
<b>HSBC company coverage</b>		<b>Fertilisers:</b> Arab Potash, Bagfas, Gubretas, Industries Qatar, Israel Chemicals, Jordan Phosphate, K+S, Maaden, Orascom Construction Industries, SAFCO, Saudi Basic Industries, Taiwan Fertilizer, Tekfen Holding, Uralkali, Yara International <b>Pesticides:</b> BASF SE, Syngenta AG <b>Agri/seed industry:</b> KWS Saat <b>Agricultural equipment:</b> Lonking Holdings <b>Water Management Industry:</b> Veolia, Suez Environnement	<b>Fuel (biomass, timber):</b> Cosan Limited, Cosan SA, Sao Martinho, Tereos Internacional <b>Feedstock:</b> Astra Agro Lestari, First Resources Ltd, Genting Plantations Bhd, Golden Agri Ltd, Indofood Agri Resources, IOI Corp Bhd, KL Kepong, Mewah Int'l, Wilmar Int'l <b>Food producers:</b> Abdullah Al-Othaim Markets, Agthia Group, Alicorp SA, Almarai Company, AVI Ltd, Brasil Agro, Brasil Food, CJ Cheiljedang, Cresud SA, Danone, Gruma SAB, Grupo Bimbo, Grupo Nutresa, Indofood CBP, JBS, Juhayna Food Industries, Marfrig SA, Minerva, Nestle, Nongshim, Orion Corp, Pacific Andes Int Holding, Pacific Andes Resources Development Ltd, Pioneer Food Group, Ruinian International, Savola Group, SLC Agrícola, Suedzucker, TAT Konserve, Tiger Brands, Unilever	<b>Food retailers:</b> Ahold, BiosTime International, Carrefour, Casino, CP All, Dairy Farm Int'l Holdings, Delhaize, DIA, Grupo Comercial Chedraui, Grupo Pao de Acucar, Jeronimo Martins, Magnit, Metro, Migros, Morrison, Ocado, Organizacion Soriana, Rallye, Sainsbury, Shinsegae, Sumber Alfaria Trijaya, Tesco, Wal-Mart de Mexico, Wal-Mart Stores Inc, X5 Retail <b>Bulk commodity traders:</b> Bunge, Olam International, Noble Group

Source: HSBC



Table 2: HSBC stock coverage related to agriculture

Company		Ticker	Currency	Rating	Closing price	Target price	Analyst
<b>Agricultural inputs</b>							
Lonking Holdings	Agricultural Equipment	3339.HK	HKD	Neutral	2.8	4.2	Paul Choi & team
Arab Potash	Fertiliser	APOT.AM	JOD	Neutral	41.1	45.5	Yonah Weisz & team
Bagfas	Fertiliser	BAGFS.IS	TRY	Underweight	162.0	170.5	Erol Hullu & team
Gubretas	Fertiliser	GUBRF.IS	TRY	Overweight (V)	12.2	15.4	Erol Hullu & team
Industries Qatar	Fertiliser	IQCD.QA	QAR	Overweight	135.7	165.0	Sriharsha Pappu & team
Israel Chemicals	Fertiliser	ICL.TA	ILS	Overweight	36.2	67.5	Yonah Weisz & team
Jordan Phosphate	Fertiliser	JOPH.AM	JOD	Neutral	12.6	14.4	Alia El Mehelmy & team
K+S	Fertiliser	SDFGn.DE	EUR	Overweight	36.1	59.0	Jesko Mayer-Wegelin & team
Maaden	Fertiliser	1211.SE	SAR	Overweight	25.7	32.5	Raj Sinha & team
Orascom Construction	Fertiliser	OCIC.CA	EGP	Overweight	209.9	335.0	Alia El Mehelmy & team
SAFCO	Fertiliser	2020.SE	SAR	Neutral (V)	181.0	200.0	Sriharsha Pappu & team
Saudi Basic Industries	Fertiliser	2010.SE	SAR	Overweight (V)	96.5	119.0	Sriharsha Pappu & team
Taiwan Fertilizer	Fertiliser	1722.TW	TWD	Overweight	70.6	104.0	Abel Lee & team
Tekfen Holding	Fertiliser	TKFEN.IS	TRY	Overweight	6.0	8.1	Cenk Orcan & team
Uralkali	Fertiliser	URKAq.L	USD	Neutral	35.0	52.0	Yonah Weisz & team
Yara International	Fertiliser	YAR.OL	NOK	Overweight	237.8	347.0	Yonah Weisz & team
BASF	Pesticides	BASF.DE	EUR	Overweight	53.1	60.0	Geoff Haire & team
Syngenta	Pesticides	SYNN.VX	CHF	Neutral	267.1	280.0	Geoff Haire & team
KWS Saat	Seeds	KWSG.DE	EUR	Neutral	151.3	168.0	Jesko Mayer-Wegelin & team
Veolia	Water management	VIE.PA	EUR	Overweight (V)	8.52	11.00	Verity Mitchell & team
Suez Environnement	Water management	SEVI.PA	EUR	Overweight	8.77	15.00	Verity Mitchell & team
<b>Agricultural outputs</b>							
Cosan Limited	Fuel (Biomass/ Timber)	CZZ.N	USD	Overweight	11.9	17.0	Pedro Herrera & team
Cosan SA	Fuel (Biomass/ Timber)	CSAN3.SA	BRL	Overweight	27.9	34.0	Pedro Herrera & team
São Martinho	Fuel (Biomass/ Timber)	SMT03.SA	BRL	Neutral	18.5	23.0	Pedro Herrera & team
Tereos Internacional	Fuel (Biomass/ Timber)	TERI3.SA	BRL	Overweight	2.3	4.2	Pedro Herrera & team
Abdullah AL Othaim Market	Food Producer	4001.SE	SAR	Neutral (V)	96.8	110.0	Raj Sinha & team
Agthia Group	Food Producer	AGTH.AD	AED	Overweight	1.8	2.0	Raj Sinha & team
Alicorp SA	Food Producer	ALI.LM	PEN	Overweight	5.9	8.0	Pedro Herrera & team
Almarai	Food Producer	2280.SE	SAR	Overweight	96.5	121.0	Raj Sinha & team
AVI Ltd	Food Producer	AVIJ.J	ZAR	Overweight	37.3	37.0	Michele Olivier & team
BrasilAgro	Food Producer	AGRO3.SA	BRL	Overweight	8.5	16.0	Pedro Herrera & team
Brasil Foods SA	Food Producer	BRFS3.SA	BRL	Overweight	36.9	42.0	Pedro Herrera & team
CJ Cheil Jedang	Food Producer	097950.KS	KRW	Overweight	295500.0	400000.0	Karen Choi & team
Cresud SA	Food Producer	CRESY.O	USD	Overweight (V)	11.3	20.0	Pedro Herrera & team
Danone	Food Producer	DANO.PA	EUR	Overweight	47.6	58.0	Cedric Besnard & team
Gruma SAB	Food Producer	GRUMAB.MX	MXN	Overweight	27.2	32.0	Pedro Herrera & team
Grupo Bimbo SAB	Food Producer	BIMBOA.MX	MXN	Neutral	28.0	32.0	Pedro Herrera & team
Grupo Nutresa	Food Producer	NCH.CN	COP	Overweight	21240.0	27000.0	Pedro Herrera & team
Indofood	Food Producer	INDF.JK	IDR	Neutral	4825.0	5828.0	Sean Monaghan & team
Indofood CBP	Food Producer	ICBP.JK	IDR	Neutral (V)	4925.0	5948.0	Sean Monaghan & team
JBS	Food Producer	JBSS3.SA	BRL	Neutral (V)	5.7	5.0	Pedro Herrera & team
Juhayna Food Industries	Food Producer	JUFO.CA	EGP	Neutral (V)	4.3	4.4	Raj Sinha & team
Marfrig SA	Food Producer	MRFG3.SA	BRL	Neutral (V)	8.5	8.5	Pedro Herrera & team
Minerva	Food Producer	BEEF3.SA	BRL	Neutral	5.1	5.4	Pedro Herrera & team
Nestle	Food Producer	NESN.VX	CHF	Neutral	51.6	52.0	Cedric Besnard & team
Nongshim	Food Producer	004370.KS	KRW	Neutral	256000.0	250000.0	Karen Choi & team
Orion Corp	Food Producer	001800.KS	KRW	Overweight	604000.0	750000.0	Karen Choi & team
Pacific Andes Intl Holding	Food Producer	1174.HK	HKD	Overweight	0.7	1.7	Suman Guliani & team
Pacific Andes Resources	Food Producer	PACF.SI	SGD	Neutral (V)	0.2	0.3	Suman Guliani & team
Pioneer Food Group Limited	Food Producer	PFGJ.J	ZAR	Underweight	58.5	55.0	Michele Olivier & team
Ruinian International	Food Producer	2010.HK	HKD	Overweight (V)	2.9	7.2	Herald van der Linde & team
Savola	Food Producer	2050.SE	SAR	Overweight	26.2	30.0	Raj Sinha & team
SLC Agricola	Food Producer	SLCE3.SA	BRL	Neutral	16.6	22.0	Pedro Herrera & team
Suedzucker	Food Producer	SZUG.DE	EUR	Overweight	23.3	30.0	Jesko Mayer-Wegelin & team

Source: HSBC estimates

Table 2: HSBC stock coverage related to agriculture (contd)

Company		Ticker	Currency	Rating	Closing price	Target price	Analyst
Tat Konserve	Food Producer	TATKS.IS	TRY	Neutral	2.2	2.8	Erol Hullu & team
Tiger Brands Ltd	Food Producer	TBSJ.J	ZAR	Neutral	246.5	237.0	Michele Olivier & team
Unilever	Food Producer	UNc.AS	EUR	Overweight	25.3	28.0	Cedric Besnard & team
Astra Agro Lestari	Feed Stock	AALI.JK	IDR	Neutral	22050.0	24962.0	Thilan Wickramasinghe & team
First Resources Ltd	Feed Stock	FRLD.SI	SGD	Overweight	1.5	1.6	Thilan Wickramasinghe & team
Genting Plantations Bhd	Feed Stock	GENP.KL	MYR	Overweight	8.1	9.1	Thilan Wickramasinghe & team
Golden Agri Ltd	Feed Stock	GAGR.SI	SGD	Overweight	0.7	0.8	Thilan Wickramasinghe & team
Indofood Agri Resources L	Feed Stock	IFAR.SI	SGD	Underweight	1.3	1.4	Thilan Wickramasinghe & team
IOI Corp Bhd	Feed Stock	IOIB.KL	MYR	Neutral	5.1	5.1	Thilan Wickramasinghe & team
KL Kepong	Feed Stock	KLKK.KL	MYR	Overweight	23.0	26.5	Thilan Wickramasinghe & team
Mewah Int'l	Feed Stock	MEWI.SI	SGD	Neutral (V)	0.5	0.5	Thilan Wickramasinghe & team
Wilmar Int'l	Feed Stock	WLIL.SI	SGD	Underweight	5.1	5.2	Thilan Wickramasinghe & team
<b>Marketing</b>							
Ahold	Food Retailers	AHLN.AS	EUR	Underweight	9.7	9.0	Jerome Samuel & team
BioTime International Ho	Food Retailers	1112.HK	HKD	Overweight (V)	12.6	20.0	Herald van der Linde & team
Carrefour	Food Retailers	CARR.PA	EUR	Neutral (V)	17.8	19.0	Jerome Samuel & team
Casino	Food Retailers	CASP.PA	EUR	Overweight	63.5	74.0	Jerome Samuel & team
CP All	Food Retailers	CP7.BK	THB	Neutral	51.0	51.1	Sean Monaghan & team
Dairy Farm Intl Holdings	Food Retailers	DAIR.SI	USD	Neutral (V)	9.0	9.3	Mark Webb & team
Delhaize	Food Retailers	DELB.BR	EUR	Neutral	42.9	49.0	Jerome Samuel & team
DIA	Food Retailers	DIDA.MC	EUR	Overweight (V)	3.2	4.5	Jerome Samuel & team
Grupo Comercial Chedraui	Food Retailers	CHDRAUIB.MX	MXN	Overweight	33.3	44.0	Francisco Chevez & team
Grupo Pao de Acucar	Food Retailers	PCAR4.SA	BRL	Overweight	65.2	90.0	Francisco Chevez & team
Jeronimo Martins	Food Retailers	JMT.LS	EUR	Neutral	13.0	14.0	Jerome Samuel & team
Magnit	Food Retailers	MGNTq.L	USD	Overweight (V)	21.1	28.2	Erol Hullu & team
Metro	Food Retailers	MEOG.DE	EUR	Neutral	30.0	36.0	Jerome Samuel & team
Migros	Food Retailers	MGROS.IS	TRY	Overweight (V)	13.7	24.2	Erol Hullu & team
Morrison	Food Retailers	MRW.L	GBP	Overweight	3.2	3.7	Jerome Samuel & team
Ocado	Food Retailers	OCDL.L	GBP	Neutral (V)	0.9	2.3	Jerome Samuel & team
Organizasion Soriana	Food Retailers	SORIANAB.M	MXN				Francisco Chevez & team
Rallye	Food Retailers	GENC.PA	EUR	Overweight (V)	21.4	29.0	Pierre Bosset & team
Sainsbury	Food Retailers	SBRY.L	GBP	Neutral	2.9	3.1	Jerome Samuel & team
Shinsegae	Food Retailers	004170.KS	KRW	Overweight (V)	258500.0	380000.0	Karen Choi & team
Sumber Alfaria Trijaya	Food Retailers	AMRT.JK	IDR	Neutral (V)	4500.0	4049.0	Sean Monaghan & team
Tesco	Food Retailers	TSCO.L	GBP	Neutral	4.0	4.1	Jerome Samuel & team
Wal-Mart de Mexico	Food Retailers	WALMEXV.MX	MXN	Overweight	37.3	43.0	Francisco Chevez & team
Wal-Mart Stores Inc	Food Retailers	WMT.N	USD	Overweight	58.0	70.0	Francisco Chevez & team
X5 Retail	Food Retailers	PJPq.L	USD	Overweight	23.0	37.0	Erol Hullu & team
Bunge	Bulk commodity traders	BG.N	USD	Overweight	61.5	80.0	Pedro Herrera & team
Olam International Ltd	Bulk commodity traders	OLAM.SI	SGD	Overweight	2.3	3.0	Thilan Wickramasinghe & team
Noble Group	Bulk commodity traders	NOBG.SI	SGD	Underweight	1.2	1.4	Thilan Wickramasinghe & team

Source: HSBC estimates

Table 3: Agrochemicals

Sector	Reasons to invest	Risks	Sustainability initiatives
<b>Fertilisers</b>			
<b>K+S</b>	<ol style="list-style-type: none"> <li>1. Farmer economics, though subject to macro economic risk are still positive</li> <li>2. Potential upside from planned Potash One acquisition</li> <li>3. High operating leverage leads to out-performance when volumes and/or prices increase</li> <li>4. Capacity expansions in Germany and especially Canada offer growth potential which many investors have missed</li> <li>5. During the next three years available capacity will increase as less work will be needed to achieve more environmentally-friendly products</li> </ol>	<ol style="list-style-type: none"> <li>1. Potash demand may slow in Europe depending on further macroeconomic slowdown; a warm winter might impact the salt business</li> <li>2. High volatility of potash prices and volumes in the recent years</li> <li>3. European volumes at risk in 2012 subject to macroeconomic and currency trends</li> <li>4. Sharp decline in soft commodity prices</li> <li>5. A further reduction in the c10% stake of EuroChem owner, Mr Melnitschenko, in K+S could weigh on the stock, although this could also lead to renewed speculation, as it did when Mr Melnitschenko previously reduced his stake</li> <li>6. Potash inventory build up at the distribution level due to pre-buying</li> </ol>	<ol style="list-style-type: none"> <li>1. Participates in the Carbon Disclosure Project</li> <li>2. Targets reducing absolute emissions by 77% by 2012 (1990 base year). Progress 2010: 76%.</li> <li>3. Water intensity target 2014: 4m3/tonne product 2010: 4.6m3/tp</li> <li>4. Research on fertiliser and water scarcity. The company has done research on liquid fertilisation (fertigation) and sees this as an increasing business area as soils are drier than before.</li> <li>5. Provides agricultural advice for farmers</li> </ol>
<b>Yara</b>	<ol style="list-style-type: none"> <li>1. Leading nitrogen player well positioned in Urea markets</li> <li>2. More rigid regulations resulting in plant shutdowns in China</li> <li>3. Unparalleled interaction with farmers and customised products results in high marketing profits from what would otherwise be a commodity chemical.</li> <li>4. Plans to increase production volumes 8mt by 2016. Near-term moves could include the tender for Burrup in Australia, and the possible re-opening of operations in Libya.</li> </ol>	<ol style="list-style-type: none"> <li>1. Limited barriers to entry with majority of assets based in high (raw material) cost regions</li> <li>2. High sensitivity to natural gas prices; higher energy prices in Europe may result in increased costs</li> <li>3. Investors may lack conviction after earnings misses as a result of lower-than-expected sales volumes and suboptimal communication of this to the market</li> <li>4. European demand for urea and nitrates may weaken due to macroeconomic uncertainty.</li> <li>5. Excessively cold weather in Europe may reduce demand, and possibly lower prices and volumes</li> </ol>	<ol style="list-style-type: none"> <li>1. Participated in the Carbon Disclosure Project 2010 (declined participation in 2011)</li> <li>2. Reduced CO2 emissions by 45% from 2004-2010 (this was the reduction target for 2013 - new targets to be established)</li> <li>3. Yara developed a N2O catalyst technology (2007) which removes 70-90% of N2O emissions from nitric acid plants. The nitrous oxides are broken down to oxygen and nitrogen</li> <li>4. Water use 2010: 583m3mn. No water reduction target</li> <li>5. Research project reduced phosphorus discharge from agriculture by 60%</li> <li>6. Life-cycle emissions of fertiliser products are measured and shared with farmers. Carbon Footprint Guarantee states that the GHG emissions from Ammonium Nitrate fertilisers have been reduced by 50%</li> <li>7. Member of: WEF Davos Vision for 2020</li> </ol>

Source: HSBC estimates

# Output: disrupted

- ▶ Weather already disrupts output – Thailand lost USD4bn in agricultural revenues as a result of lost rice in the floods
- ▶ In a climate change world cereal production increases 30% to 2050, with no climate change the increase would be 37.5%
- ▶ Agriculture contributes just 3% to global GDP, but the three most climate vulnerable countries are responsible for 40% of that GDP

## Output is weather-dependent

The agricultural system already shows fragility as the conflicting drivers of increased output requirement versus increased environmental degradation and contribution to climate change place pressure on resources. Here, we establish that extreme weather is already impacting output, then identify how output is affected by climate change factors.

Zheng Guoguang, head of the China Meteorological Administration, estimates that “in recent years, extreme weather such as floods, droughts, rainstorms, and low temperatures had caused average grain losses of 50bn kg a year in China, with drought causing the greatest harm.” To put that in context, this is equivalent to approximately 10% of China’s annual grain output.

The recent Thai floods also provide a poignant reminder that weather is a disruptive force. Following the floods, Thailand’s Department of Agriculture revised down its rice forecast for 2011 by 24% from 25m tonnes to 19m tonnes.

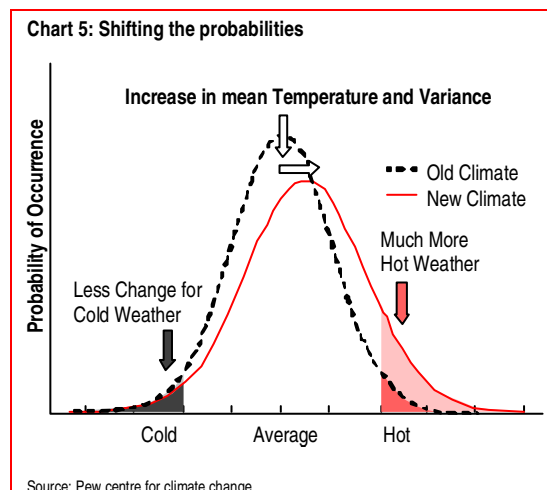
Elsewhere, in 2011 the hottest summer since 1955 has caused drought and falling corn yields in the

US Midwest, the country’s main corn region. On the back of this, production forecasts were reduced by 27.4m tonnes on average – equal to around 8% of US production and greater than output from the world’s second biggest corn exporter, Argentina.

Last year in the wheat markets, Kazakhstan, Ukraine and Russia (10.5% of global wheat production) suffered from drought-driven volume declines in excess of 15%, and the Canadian crop (3.6% of world production, second-largest exporter) fell 17% as a result of flooding.

Climate change disrupts historical patterns of ‘average weather’ and ‘extreme events’, making the ‘normal’ processes of agriculture harder. The key for managing future output volatility is how well agriculture will cope with how climate change shifts the balance of weather probabilities. ‘Average weather’ is expressed in terms of temperatures, seasonal variations, rainfall, as well as extreme events such as floods, storms and droughts. But the Pew centre for climate change talks about “climate change widening the probability distribution for temperature extremes and shifting the mean and the low-probability tails

toward more frequent and intense heat events”, as illustrated in chart 5 below.



In the absence of climate change impacts, an assessment of how global production levels might evolve requires regional analysis of soil characteristics, crop variety, the cropping calendar, CO<sub>2</sub> fertilisation effects, irrigation and nutrient levels. Adding the climate angle means first making an assessment on how emission levels will change going forward (which impacts CO<sub>2</sub> fertilisation) and secondly identifying how increasing emission stocks will play out through the global climate system to change regional rainfall patterns, soil and air temperatures.

Several research institutes and organisations have published on the structural drivers facing food demand and supply. But one of the most cited and comprehensive quantitative studies is IFPRI's 'Food Security, Farming and Climate Change to 2050 – scenarios, results, policy options' (2010).

#### **Climate change specifics are temperatures, CO<sub>2</sub> fertilisation and water availability**

Volumes for agricultural output vary depending on weather conditions during the growing season. Even at moderate levels, the effects of heat can be significant for agricultural based economies, where, on average, for every 1°C temperature gain

above the optimum during the growing season, yields decline by 10%.

The yield effects of climate change are not always negative. Rising carbon dioxide in the atmosphere can enhance fertilisation (up to a certain point), which would boost productivity in some regions, due to increased photosynthesis and increased efficiency of water use.

The CO<sub>2</sub> fertilisation effect is highly species-dependent, however, and tends to benefit some crops (such as wheat and rice) more than others (such as corn). The extent to which carbon fertilisation is used in the assumptions can result in significant variation in yield forecasts.

In a warmer world crops may suffer due to increased evaporation and evapo-transpiration losses, as soil moisture gets lost quickly and it requires additional water for irrigation. Rainfed agriculture uses around 80% of arable land to produce 60% of agricultural output. Irrigated agriculture produces the remaining 40% of agricultural output using c20% of global arable land area.

In terms of water, climate change impacts agriculture through destabilising rainfall patterns, but it is difficult to know how and where. Indeed, the FAO noted that “while temperature can be projected by global circulation models with a high degree of ‘convergence’, the same cannot be said of water vapour”.

IFPRI forecasts cereal production to 2050 using a variety of emission and climate scenarios. There are three broad steps in the forecasting methodology – emissions, temperature and rainfall changes – and then productivity analysis, which all have a variety of more detailed sub assumptions. The drivers of the methodology are set out below.

### (1) B1 Emissions scenario

In 2000 a Special Report on Emissions Scenarios (SRES) was published by the IPCC. SRES projects 40 different emissions pathways to 2050 based on population, GDP and energy framework assumptions. The summary drivers of the B1 scenario are:

- ▶ Population peaks mid-century, then falls
- ▶ Economic structures rapidly change towards services and information
- ▶ Material intensity is reduced
- ▶ Clean and resource-efficient technologies are introduced
- ▶ The emphasis is on global solutions to economic, social and environmental sustainability
- ▶ No additional climate initiatives

Within B1 there are also pessimistic, baseline and optimistic assumptions for the level of GDP per capita (2.1-2.6%).

**‘Pessimistic’** assumes low GDP growth and high population growth, leading to a low GDP per capita.

**‘Baseline’** assumes medium levels of both GDP and population growth.

**‘Optimistic’** assumes high GDP growth and low population growth, so a high GDP per capita.

For crop modelling wealth levels provide an indication of potential price effects (through demand change). Prices are a determinant of planting volumes, ie with higher prices more is planted, which will result in higher production (excluding all other factors). We have used the baseline assumption for the results overleaf.

### (2) Temperature and rainfall changes

Climate scientists use general circulation models (GCM) to simulate oceanic and atmospheric processes. As yet, there is no ‘consensus’ GCM for projecting climate change, so IFPRI ran simulations using four GCMs to analyse how the emission levels from B1 could translate into regional temperature changes and precipitation rates.

The results of the four models are broadly consistent in terms of the direction and magnitude of temperature gains by region to 2050. However, there is more variation in the regional forecasts for precipitation change, both in terms of direction (more or less in the future) and magnitude in mm.

The data presented overleaf is based on the MIROC GCM (Model for Interdisciplinary Research on Climate) developed by the Center for Climate System Research, University of Tokyo, National Institute for Environmental Studies and Frontier Research Center for Global Change, Japan.

We have taken the MIROC modelling result because it predicts relatively high average temperature and precipitation increases, which is in line with our view that mitigation policy will not be implemented quickly enough to restrain temperature rises to within 2°C.

### (3) Productivity analysis

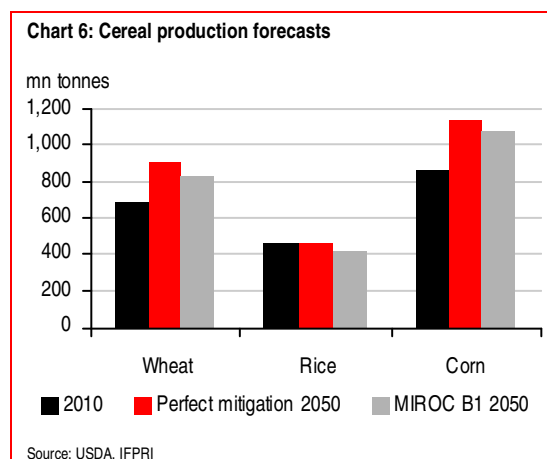
IFPRI models how crop output is influenced by changes in temperatures and precipitation using its IMPACT (International Model for Policy Analysis of Agricultural Commodities and Trade) framework. The modelling incorporates the values generated by steps 1 and 2 above with other factors assessing productivity (soil characteristics, crop variety, cropping calendar and rain fed or irrigated water sources). The model is also used for forecasting trade flows.

Indeed, scientists have already conducted studies isolating the climate change effect on yields. A study published in the Journal of Science in May



2011 concludes that between 1980 and 2008 production of wheat and maize declined by 5.5% and 3.8% due to climate change, while rice posted a 0.1% fall.

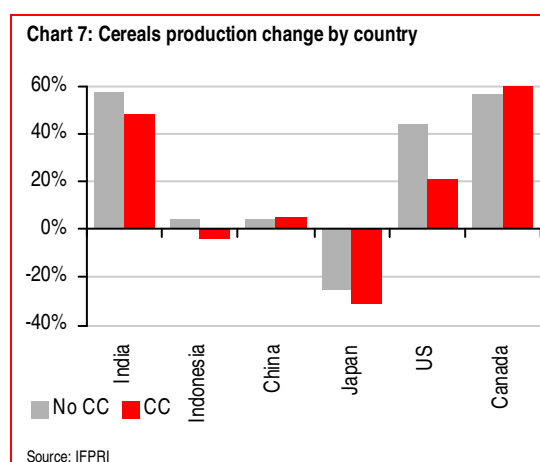
Chart 6 below shows the global total production changes expected for wheat, rice and corn, under both a scenario of perfect mitigation and incorporating climate change factors according to the 'B1' MIROC model. It highlights that lower volumes are expected in the unrestrained climate change scenario than if mitigation occurs. For rice, production levels remain broadly flat to 2050.



IFPRI expects global cereal production to increase 37.5% in a scenario of perfect mitigation (ie no climate change), compared with a 30% increase with climate change to 2050.

A wide range of cereal production forecasts are generated from incorporating all the variables above. For us the important point is to establish how production will vary under a changing climate for the most and least climate change vulnerable countries, which together contribute around 62% to global GDP and 67% to agricultural output value.

Chart 7 summarises production changes and shows that for the three most and least climate change vulnerable countries, climate changes worsen the production position in all cases in production terms except China (which is marginally better off) and Canada, where production growth from 2010 to 2050 is better with climate change than without.



The challenge for the most climate change vulnerable countries is that their economies are more dependent on agriculture revenues than their least vulnerable peers. Given that demand for cereals will increase simply from population growth before other wealth effects are taken into account, countries that post decreasing production values will likely have to increase imports.

#### Agricultural output matters more to climate change vulnerable countries

In '[Scoring Climate Risk](#)' (9 August 2011), HSBC devised a framework for ranking the relative vulnerability of G20 countries to climate change impacts. The rankings are summarised below.

**Table 4: Overall ranking by country and indicator (1 indicates most vulnerable, 19 least vulnerable)**

		Exposure	Sensitivity	Adaptive potential	Adaptive capacity
1	India	2	1	1	3
2	Indonesia	6	6	2	1
3	China	9	2	9	2
4	Saudi Arabia	1	9	11	4
5	Brazil	8	7	3	7
6	South Africa	3	11	8	5
7	Turkey	4	16	6	8
8	Italy	5	10	5	11
9	Russia	19	3	7	10
10	Mexico	12	12	10	6
11	Argentina	16	14	4	9
12	France	11	8	13	12
13	Germany	15	5	15	14
14	Australia	10	4	19	19
15	South Korea	7	17	16	15
16	UK	13	13	18	16
17	Japan	14	18	14	13
18	US	17	15	17	17
19	Canada	18	19	12	18

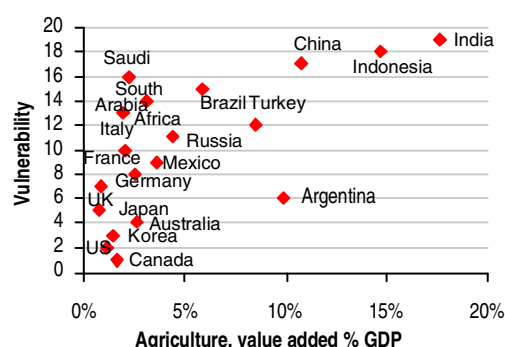
Source: HSBC

The contribution of agriculture to global GDP is small compared to other industries, at just 3%. However, although low value in monetary terms the agricultural sector employs around 1.068bn people representing 35% of the global labour force.

In addition, countries with a higher dependency on agriculture in their economic mix are also the most vulnerable countries from a climate change perspective, as shown in chart 8.

In 2008 agriculture as a percentage of GDP was 17.6%, 14.7% and 10.7% for India, Indonesia and China respectively according to the World Bank. This compares with just 1.6% for Canada<sup>5</sup>, 1.2% for the US and 1.5% for Japan, the least climate change vulnerable countries among the G20.

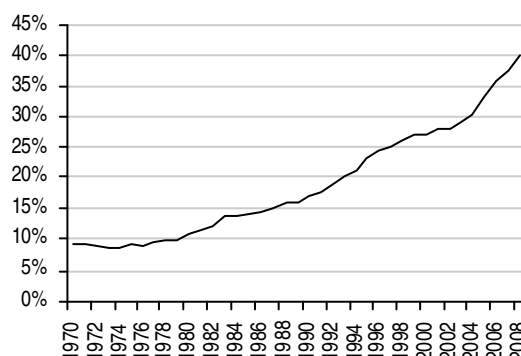
**Chart 8: Vulnerability and agriculture dependence (19 = high relative vulnerability, 1 = low relative vulnerability)**



Source: HSBC, Thomson Reuters Datastream, World Bank

India, Indonesia and China also contribute a significant proportion to global agricultural value add, at almost 40%, up from just 10% in 1970, as shown in chart 9 below.

**Chart 9: Contribution of India, Indonesia, China to world agriculture value add**



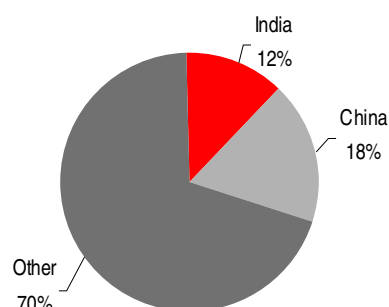
Source: HSBC, World Bank

The significance of the three countries in terms of global cereal production volume is also noteworthy at 30% share for wheat, 60% for rice and 24% for corn, as shown in charts 10, 11 and 12.

<sup>5</sup> For Canada agriculture as a percentage of GDP refers to 2006

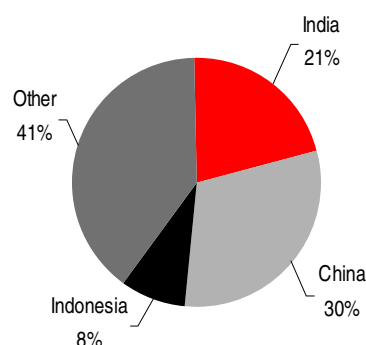


**Chart 10: Share of India and China's wheat production, 2010/11**



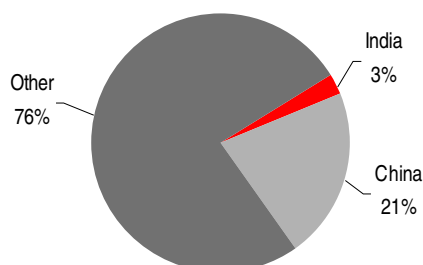
Source: USDA

**Chart 11: Share of India, China and Indonesia's rice production, 2010/11**



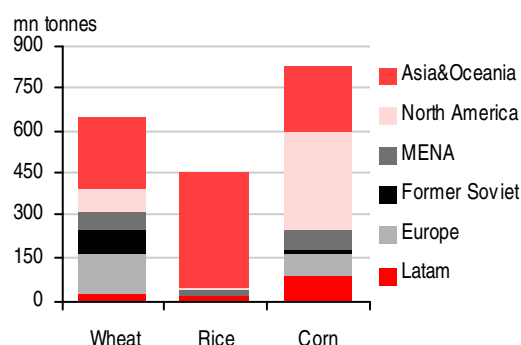
Source: USDA

**Chart 12: Share of India and China's corn production, 2010/11**



Source: USDA

**Chart 13: Global cereal production 2010/11**



Source: USDA

The IFPRI analysis provides a detailed breakdown of production forecasts by country for the main cereals. The results are summarised in table 5.

**Table 5: Summary of production changes from 2010-2050**

	Increase	Decrease
Wheat	India, Brazil, Japan, US, Canada	China, South Korea
Rice	India, US	Indonesia, China, Brazil, South Korea, Japan
Corn	India, Indonesia, China, Brazil, South Korea, US, Canada	Japan

Source: IFPRI

The table makes the point that while production globally will increase in the next 40 years, by region and commodity in some cases there will be production falls from 2010 to 2050 – and companies operating in those regions will likely find it more costly to source product.

In Appendix 2 we map the country forecasts for wheat, rice and corn, showing the production volumes under a climate change and non-climate change scenario.

To put this into context, we illustrate the volume of global production of wheat, rice and corn by region in chart 13 below.

## Conclusions

We think the direction of potential production volumes (ie more or less than today), using simulations of climate change impacts by country, provides an insight into the likelihood of location of structural shifts in agricultural economics. This is useful for several reasons:

- 1 To help investors determine whether companies along the agricultural value chain are integrating long-term climate risks/opportunities into growth plans
- 2 To identify regions of potential new market opportunity (crop protection, pesticides)

- 3 To establish where inflationary pressures may create margin squeeze in the supply chain
- 4 To identify where food security may be a factor which could create civil unrest and/or price and wage inflation.

It should be noted, however, that many different variables, with varying degrees of predictive power, are used in forecasting crop productivity. Global circulation models are a relatively new discipline, which, although improving dramatically as computer processing power increases, have not yet developed into a unified framework. Inevitably, this gives rise to a wide variation in the parameters which could be used to determine crop output. Ultimately though, the inevitable demand supply imbalance will trigger an economic adjustment, which we look at in the next chapter.

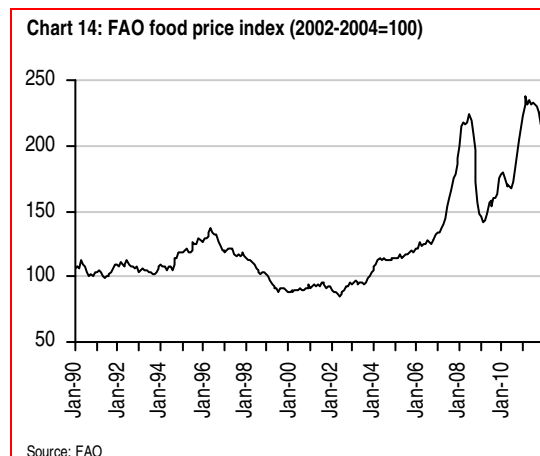
# Adjusting to change

- ▶ Prices: short-term price volatility, high prices reduce the need for producer support payments, but consumers retaliate with riots
- ▶ Trade: Over time trade flows could adjust to iron out imbalances, but not if food security is threatened
- ▶ High prices are negative from a climate change view because they provide incentive for deforestation and more fertiliser use

## Food price volatility likely to continue

In a world where temperature rises are in excess of 2°C, cereal output will be worse than otherwise expected in most cases for the countries we looked at. Yet the backdrop is one of increasing demand. There are short-term and longer term economic responses to deal with this. The obvious short-term response is price, which has been widely documented following price increases in 2008 and 2010. Chart 14 shows food price moves. The OECD-FAO agricultural outlook expects commodity prices to average up to 20% higher for cereals over the 2011-2020 period in real terms compared to the last decade.

In addition, IFPRI forecasts prices to 2050 as part of their crop output modelling. Table 6 shows IFPRI forecasts of price moves without and with climate change.

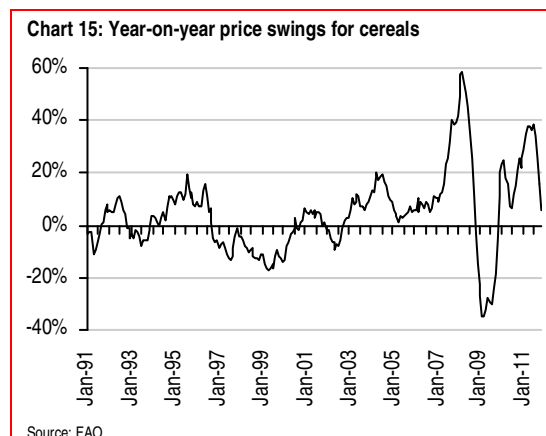


**Table 6: IFPRI projections of price increases 2010-2050**

Scenarios	Corn % price change, 2010 mean to 2050 mean	Rice	Wheat
No climate change	33.1	19.2	23.6
Pessimistic	106.3	78.1	58.8
Baseline	100.7	54.8	54.2
Optimistic	87.3	31.2	43.5

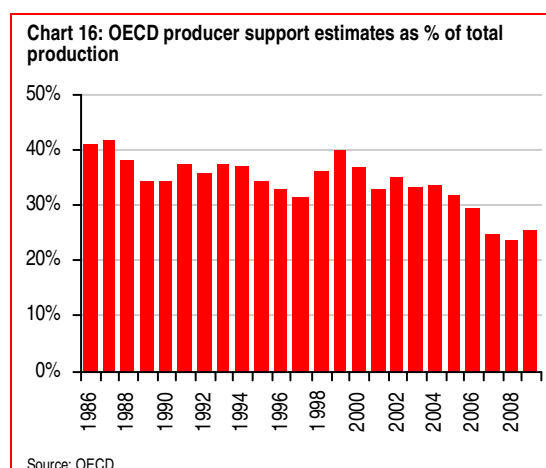
Source: International Food Policy Research Institute, including climate change factors

Significant food price swings are already occurring, as shown below.

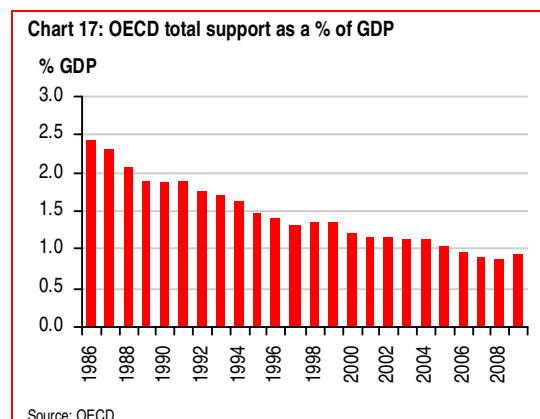


### High prices lower need for producer subsidies

Currently, support is given to agricultural producers through subsidies, but as noted by the OECD “the significant spike in prices (in 2008) reduced the rationale for all forms of broad-based income support to producers and raised concerns about the negative impact on consumers, particularly in less developed countries”. Then the collapse of prices at the end of 2008 raised concerns about the ability of farmers to expand output on an environmentally sustainable basis in response to growing global demand. In any case, output-based support has been declining over time as a percentage of the total value of production, as shown in chart 16 below.



In terms of overall OECD output, subsidy costs are minimal and have fallen to less than 1% of GDP in recent years.



### But increased concerns on food security

Although higher producer prices are good for the public purse since the state can reduce subsidy payments, the knock-on effect on consumer prices is not so welcome. Food prices rises have already resulted in civil unrest in various regions, as shown in table 7 below.

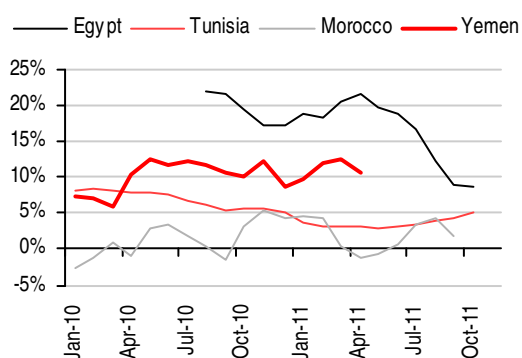
**Table 7: Food riots 2007-2011**

Date	Country	Comments
2007	Mexico	"Tortilla riots" in Mexico city after 400% price spike
2007	India (West Bengal)	Corrupt government officials held back food rations of rice, wheat and sugar when prices were rising and sold them on the free market
2007	Italy	Boycott against rising pasta prices
2007	Morocco	Unrest over rising bread prices
2007-2008	Yemen	Bread and other food prices more than doubled: at least a dozen people killed
2008	Morocco	34 people to prison after food price unrests
2008	Haiti	Unrests due to a 50% price increase of rice, beans, cooking oil and other staples. 5 killed, prime minister fired shortly after.
2008	Indonesia	Demonstrations after soybean prices rose 50% during the month to Jan 2008, a year on year increase of 125%
2008	Bangladesh	Rice price rises of more than 30% led to demonstrations for wage increases for textile workers
2008	Egypt	Bread subsidies were cut, and prices rose by 37% from February 2007 to 2008
2010	Mozambique	10 people died during three days of civil unrests over a 30% increase in bread prices, following large increases in water and energy prices
2010-11	Algeria, Tunisia, Egypt, Morocco, Yemen	Rising food prices one of the reasons for protests against governments

Source: HSBC

Most recently, food price inflation has been cited in the press as one of reasons behind civil unrest in North Africa and the Middle East. Chart 18 shows mixed evidence of this. In Egypt and Yemen, food price inflation has been running at double-digit levels for around a year with Egyptian food price inflation running above overall CPI, but increases have been more muted in Morocco and Tunisia. Nonetheless, the wider political ramifications of food price fluctuations, such as civil unrest and the potential for trade restrictions should not be underestimated.

Chart 18: Double-digit food price inflation in Egypt

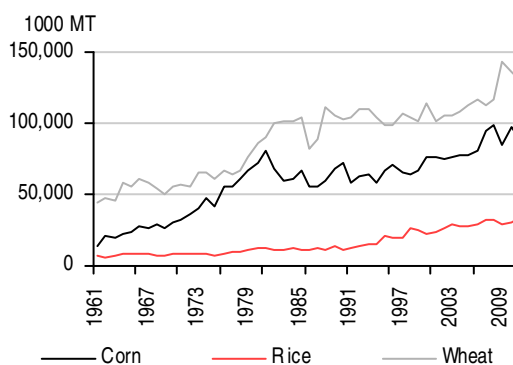


Source: Thomson Reuters Datastream

### Trade is (hopefully) the solution facilitator

Over the longer term, changing trade flows are, in theory, the mechanism to iron out cereal demand and supply imbalances. Since 1961 total volumes of cereal exports have increased 295%, facilitated by improved infrastructure and economic integration.

Chart 19: World cereal export volumes



Source: USDA

The top exporters of cereals are not necessarily the top producers, suggesting room for change in cereal trade flows. An interesting example is China, which is the number 2 wheat producer globally, but it only features in 13th place for exports. Similarly for rice Thailand produces only the 6th largest rice harvest but is the highest volume exporter. The exception is corn, where the US is both the top producer and exporter. Table 8 below shows the current country rankings for exports of wheat, rice and corn. For the three commodities, the top five exporters represent 78%, 79% and 87% of the market respectively. The values in brackets denote world production rankings.

Trade dominance between countries in terms of share of exports can shift over time. For example, the US is the long-term dominant player for wheat exports, and still holds a 27% share, but its peak share was 50% in 1974. The charts in Appendix 3 show country export shares over time.

Table 8: Top exporters of cereals 2010/11

Wheat				Rice			Corn		
Country	% world exports	Production m tonnes (rank)	Country	% world exports	Production m tonnes	Country	% world exports	Production m tonnes	
1	US	26.8%	60.1(4)	Thailand	31.3%	20.3 (6)	US	52.1%	316.2 (1)
2	EU-27	17.4%	135.6 (1)	Vietnam	20.9%	25.8 (5)	Argentina	16.8%	22 (5)
3	Australia	14.0%	26 (6)	United States	10.4%	7.6 (11)	Brazil	9.5%	57.5 (3)
4	Canada	12.6%	23.2 (8)	India	8.3%	95.3 (2)	Ukraine	5.6%	11.9 (9)
5	Argentina	6.9%	15 (12)	Pakistan	8.3%	4.7 (13)	India	3.1%	21.3 (6)
6	Kazakhstan	4.2%	9.7 (13)	Myanmar	3.0%	10.7 (7)	South Africa	2.8%	12 (8)
7	Ukraine	3.3%	16.8 (10)	Cambodia	3.0%	5.2 (12)	Serbia	2.2%	6.8 (13)
8	Russia	3.0%	41.5 (5)	Uruguay	3.0%	1.2 (28)	Canada	1.9%	11.7 (10)
9	Turkey	2.3%	17 (9)	Brazil	2.5%	9.4 (9)	Paraguay	1.6%	2.1 (26)
10	Brazil	1.9%	5.9 (16)	Argentina	1.9%	1.1 (29)	EU-27	1.1%	55.9 (4)
11	Pakistan	0.8%	23.9 (7)	China	1.5%	137 (1)	Myanmar	0.3%	1.2 (41)
12	Paraguay	0.8%	1.2 (31)	Australia	1.0%	0.6 (35)	Cambodia	0.3%	1 (46)
13	China	0.7%	115.2 (2)	Guyana	0.8%	0.4 (41)	Malawi	0.3%	3.4 (21)
14	Mexico	0.6%	3.7 (19)	EU-27	0.7%	1.9 (21)	Zambia	0.3%	2.8 (25)
15	Uruguay	0.6%	1.2 (31)	Japan	0.6%	7.7 (10)	Thailand	0.3%	4 (18)
16	Iran	0.6%	15.5 (11)	Paraguay	0.6%	0.3 (46)	Laos	0.3%	1.6 (36)
17	Serbia	0.4%	1.7 (24)	Russia	0.4%	0.7 (34)	Croatia	0.2%	2.1 (26)
18	South Africa	0.3%	1.5 (26)	Egypt	0.2%	3.1 (15)	Uruguay	0.2%	0.5 (59)
19	Sri Lanka	0.3%	NA	Guinea	0.2%	1.0 (30)	China	0.1%	173 (2)
20	Japan	0.2%	0.6 (39)	Turkey	0.2%	0.5 (38)	Mexico	0.1%	20.6 (7)

Source: USDA, Note the numbers in brackets denote country rank in global production of commodity

### But not if food security takes priority

However, if food security becomes a problem, trade restrictions could be implemented. Notably, the third largest wheat producer, India, does not feature in the top 20 exporters, because it banned wheat exports in 2007 to improve domestic food security under the pressure of rising global food prices. The ban was lifted in July this year, as production volumes exceeded expectations and storage facilities had reached capacity. As the biggest producer and exporter of corn, US policy

is a watch point. The US has previously restricted exports of grain and soyabean – in the 1970s when prices spiked. Nonetheless, food security will always come first.

### The alternative is land grab

Countries are increasingly looking at acquiring land overseas as a pre-emptive measure for agricultural commodities, with water availability, as well as land availability a key driver. China, and Saudi Arabia among our most climate change vulnerable countries have done this, but so has

Table 9: Production and trade flow changes 2010-2050 (↓ denotes production/import/export levels are less in 2050 than they are in 2010, ↑ denotes production/import/export levels are more in 2050 than they are in 2010)

	Production			Net trade			Comments
	Wheat	Rice	Corn	Wheat	Rice	Corn	
India	↓	↓	↑	Imports to exports	Exports ↑	Exports to imports	Rice exports currently go to Saudi Arabia, UAE, Iran Kuwait and Yemen, corn exports currently go to Vietnam, Bangladesh and Malaysia
Indonesia		↓	↑	Imports ↑	Imports ↑	Imports ↑	Indonesia currently imports wheat from Australia and Canada, rice from Thailand and corn from Thailand and India
China	↓	↓	↑	Self-sufficient to imports	Self-sufficient to imports	Imports to exports	China top corn imports are from the US, Brazil, and Laos
Brazil	↑	↓	↑	Imports ↓	Imports ↑	Exports to imports	Currently 4th largest corn exporter. Countries that currently import corn from Brazil are Iran, Malaysia, Colombia, China and Saudi Arabia
S Korea		↓		Imports ↓	Imports ↑	Imports ↑	Imports corn from Brazil, Argentina, Australia. Rice from China and the US
Japan	↑			Imports ↓	Imports ↓	Imports ↓	Imports wheat and corn from the US
US	↑	↓	↑	Exports ↑	Exports ↑	Exports ↓	The US exports the most corn to Japan
Canada	↑		↑	Exports ↑	Self-sufficient to imports	Imports ↑	Exports wheat to the US, Iraq, Saudi Arabia, and imports corn from the US

Source: HSBC estimates

South Korea, one of the least vulnerable countries. Top purchase destinations (for broad agricultural use, not just cereals for food) are Africa and Asia.

The table above summarises the production and trade data for most and least vulnerable countries, with summary comments on their position. Countries with lower production but a larger share in world exports may stockpile if there is a domestic shortfall, leaving importers vulnerable. To that end, identifying key current trade partners gives an insight into how flows may change.

### Conclusions

There is no doubt that economic adjustment will have to occur in response to changing demand and supply dynamics. From a climate change perspective, higher producer prices are negative, because they incentivise greater use of fertilisers to improve productivity quickly (to take advantage of high prices) and thus generate higher volumes. Similarly, it becomes more expensive to protect the forest through a REDD mechanism, increasing the likelihood of emissions resulting from deforestation. Fertiliser companies are ‘winners’ because higher prices allow farmers to spend more on fertiliser to create short-term productivity gains (in economies with a certain level of wealth). In this case food producers and retailers suffer because of higher costs.

A framework to tackle emissions in agriculture would be positive from a climate change perspective. This would be where independent industry associations are successful at implementing sustainability strategies to mitigate GHGs in agriculture, and governments adopt carbon regulation. In this case investors need to position themselves to anticipate risks to companies from regulation (such as in the fertiliser or agriculture equipment industries). The winners are companies which fully incorporate climate change risk into their understanding of operations globally, to minimise the risk of rising costs, and are anticipating new market opportunities.

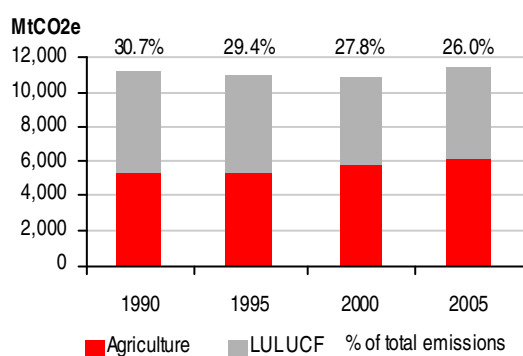
# Appendix 1: GHGs

- ▶ 26% of emissions come from agriculture and use change annually
- ▶ REDD+<sup>6</sup>: preserving the forests' ability to serve as a carbon sink
- ▶ USD4bn pledged, but no carbon market mechanism in sight

## Perpetrating climate change

Agricultural output is dependent on land quality and water availability and is therefore natural resource reliant. Generally, natural resources are also carbon sinks (an entity that absorbs more carbon than it releases) and therefore disturbing ecosystems will change carbon flows, either contributing to the accumulated stock of emissions or reducing it.

Chart 20: Volume of GHGs from agriculture and LULUCF



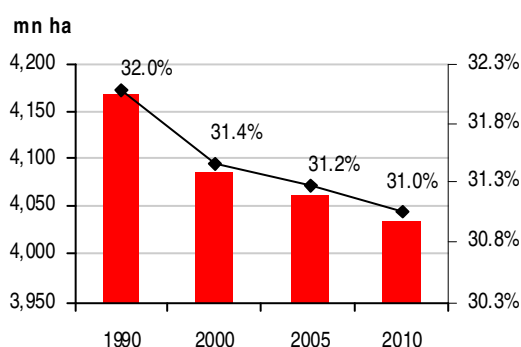
Source: World Resource Institute (2005, most recent data)

The majority of emissions in agriculture come from N<sub>2</sub>O from soil and manure and CH<sub>4</sub> from cattle, as shown in chart 2 on page 5. Around 65% of annual emissions from agriculture and land use

change come from soil and livestock, which are difficult to actively monitor and regulate (although there are studies in the UK on using different diets for livestock as a means of reducing methane). The world's soils are estimated to contain 1,500GT of organic carbon, which is roughly twice that in the atmosphere.

Deforestation accounts for 86% of the annual GHG's arising from land use, land use change and forestry (LULUCF). 1% of the world's tropical forest was harvested between 1990 and 2010.

Chart 21: Global forest area is shrinking



Source: Forest Resource Assessment 2010, FAO

This represents some 135m hectares in total, an area the size of Peru. Or to put it another way, an area just under the size of the world's vineyards is cut down each year, thus losing the future ability of the forest to act as a carbon sink, and making land more vulnerable to soil erosion. Brazil and

<sup>6</sup> Reducing emissions from deforestation and forest degradation plus forest management, conservation, restoration and afforestation



Indonesia accounted for two-thirds of the world's deforestation in 2005. In three out of four cases of forest clearing, agriculture (livestock, commercial, or subsistence) is the cause.

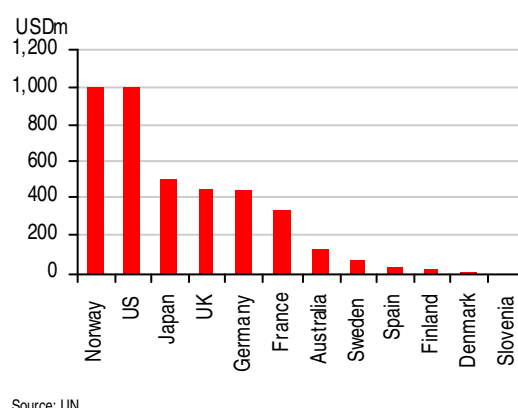
The other emissions come from changes to peat and wet lands. Organic soils, for example peatland soils in Indonesia and Malaysia contain high densities of carbon, accumulated over many centuries. Draining the soils releases the CO<sub>2</sub>.

## REDD+: Pricing deforestation

First introduced as a proposal in 2005 at COP 11, REDD+ aims to put a value on the forest. The idea is that developed countries provide funds to be used in developing countries for forest preservation. Pledges so far are around USD4bn.

Last year, COP 16 in Cancun agreed that a global REDD mechanism should be established. While there is a lot of support for REDD+ in theory, in practise the mechanism is unlikely to be agreed upon in Durban because it is based on developed countries offsetting emissions by buying carbon permits from developing countries in return for forest protection, and this is reliant on a global deal on carbon reduction commitments.

Chart 22: REDD+ pledges by country



In the absence of a deal there is no transparency on what the fund flow might be from developed countries.

Generally, countries are supportive of REDD+. The BASIC countries (Brazil, South Africa, India, China) highlighted the importance of action on REDD+ in their ministerial meeting in August. Australia and Indonesia are collaborating on actively supporting an agreement on REDD+ within the UNFCCC framework, referring to their own collaboration on REDD+ as an example of how it may be implemented.

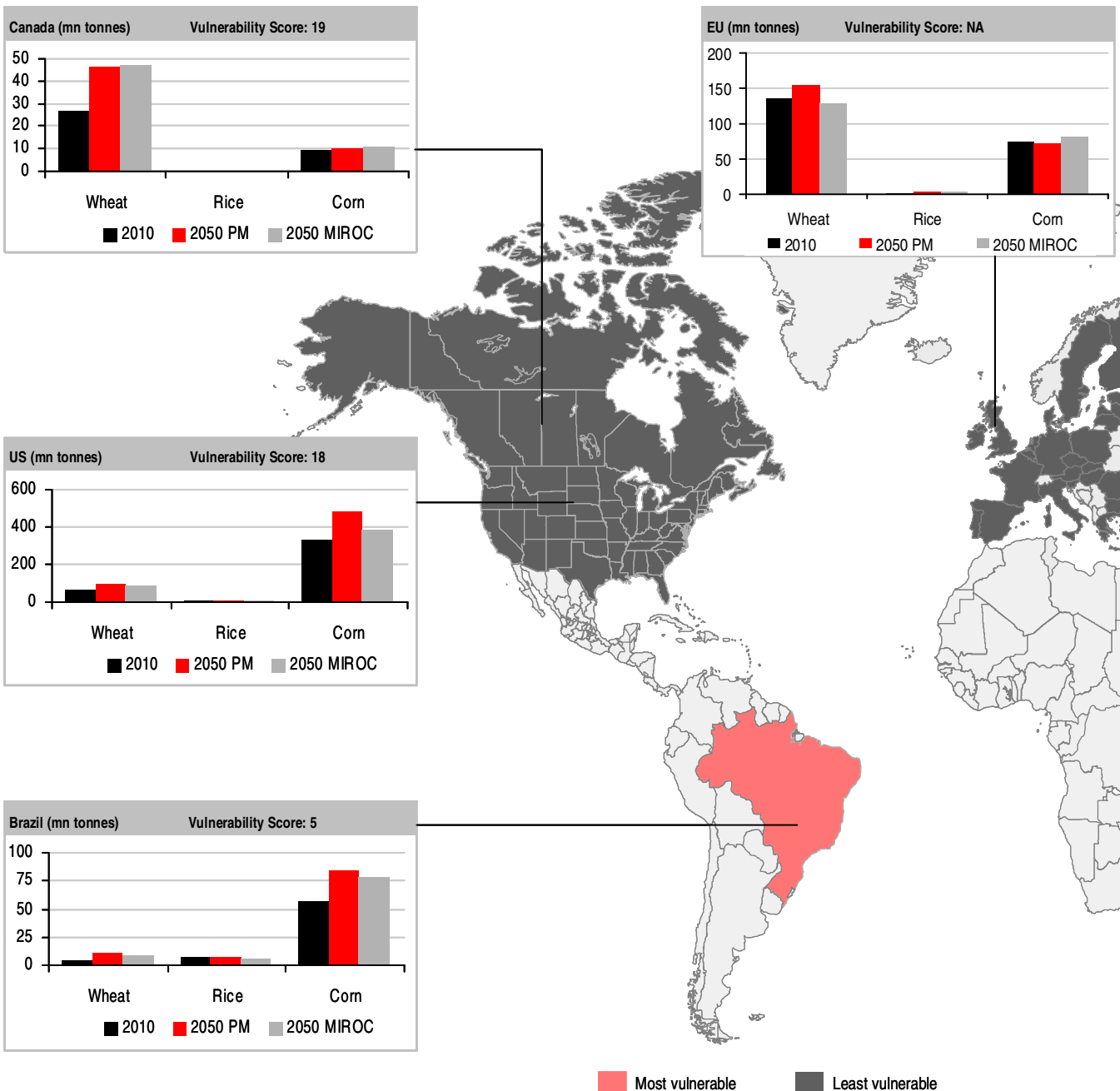
Table 10: Main REDD actors

Group (Y denotes included in REDD+ partnership)	Year established	Funds (USDm)	Parent/affiliated organisation(s)	Comments
REDD+ Partnership	2010	4,000		Work includes establishing a database for financing, programs and results
Forest Investment Program (Y)	2009	557	World Bank, regional development banks	Focus on forest governance and removing deforestation drivers by finding alternative livelihoods
Forest Carbon Partnership (Y) Facility:	2008	447	World Bank	Results based payments, 26 out of 37 partnership countries have undergone REDD preparation
Of which				
- Readiness Fund (Y)	2008	232	FCPF	
- Carbon Fund (Y)	2011	215	FCPF	Currently 5 countries qualify for fund
UN-REDD programme (Y)	2008	97	UNDP, UNEP, FAO	
Global Environmental Facility	1991		World Bank	Grants to developing countries for environmental issues as well as REDD
Amazon Fund	2008	400	Brazilian Development Bank	Aims to monitor, prevent and reduce deforestation. Norway and Germany are contributors to fund, which supports 17 projects
Congo Basin Forest Fund	2008	170	African Development Bank	Donations from Norway and UK, with c19m committed to projects so far

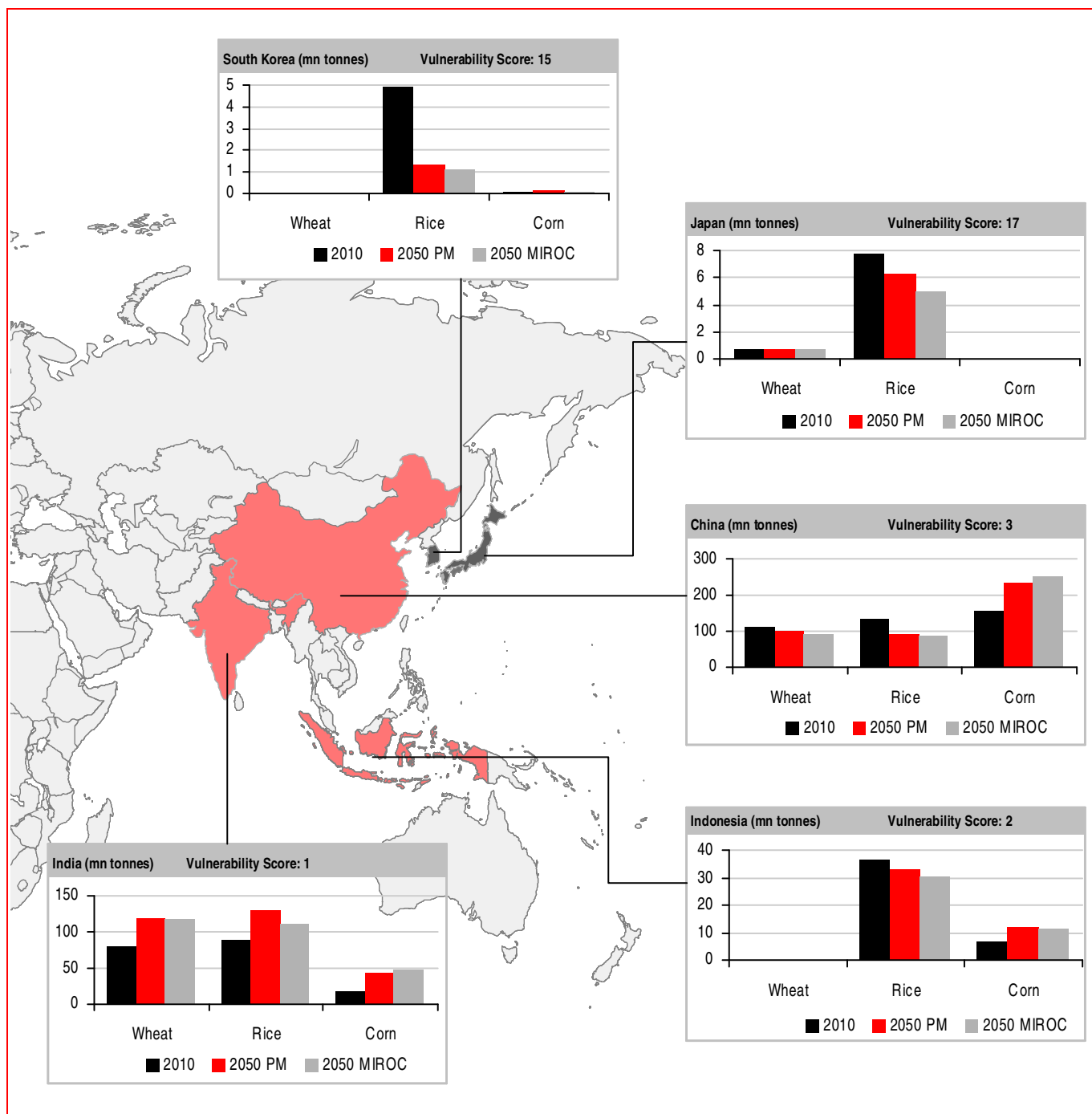
Source: HSBC, UNEPFI, \*Funds committed at initiative launch

## Appendix 2: Cereal production

Chart 23: Production volumes 2010 and 2050 with climate change (MIROC B1) and without climate change (Perfect Mitigation – PM)



Source: USDA, IFPRI 2010



## Appendix 3: Exporting countries for agricultural commodities

Chart 24: Wheat: Country export market share over time

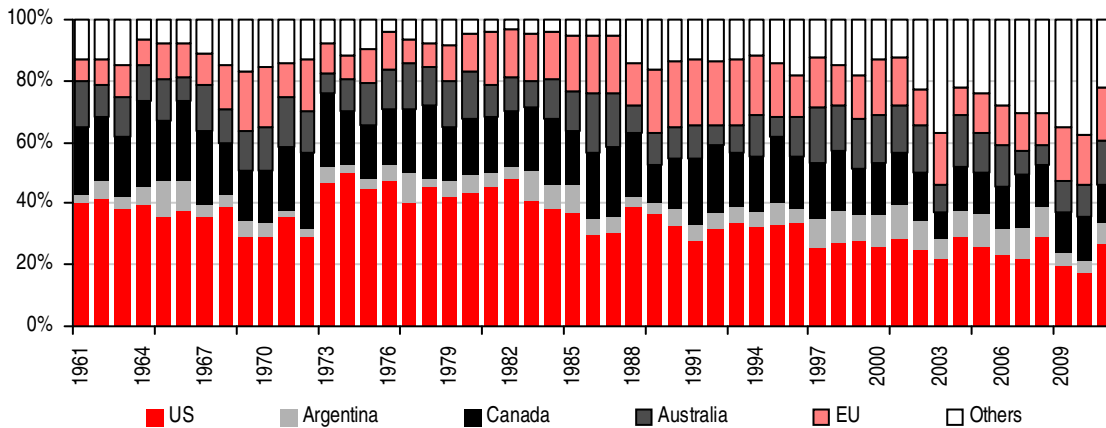


Chart 25: Rice: Country export market share over time

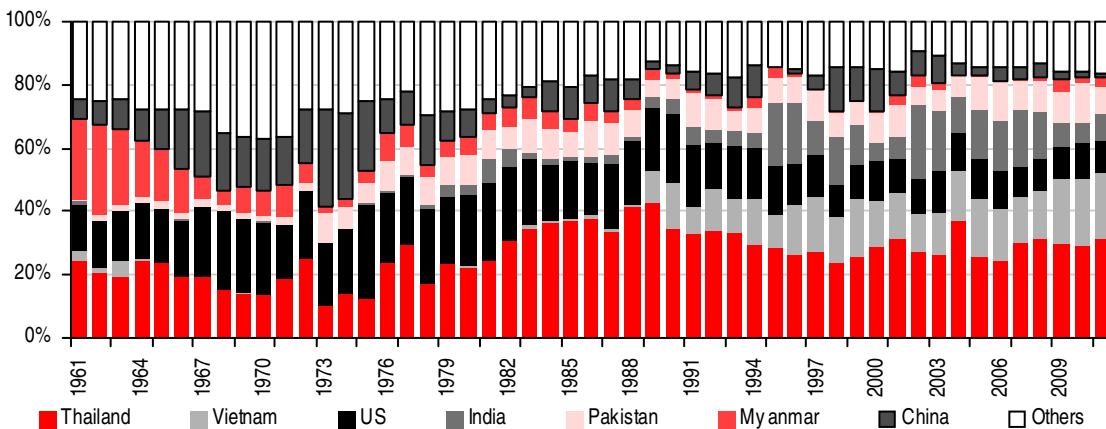
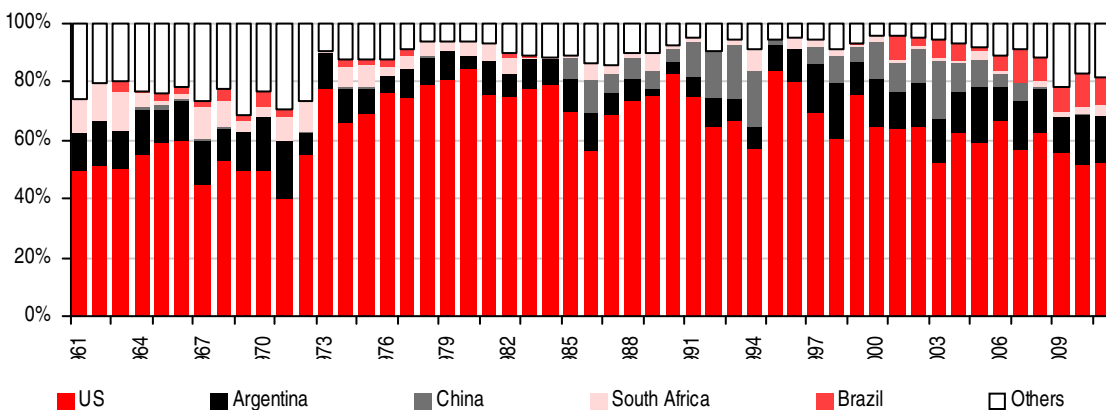
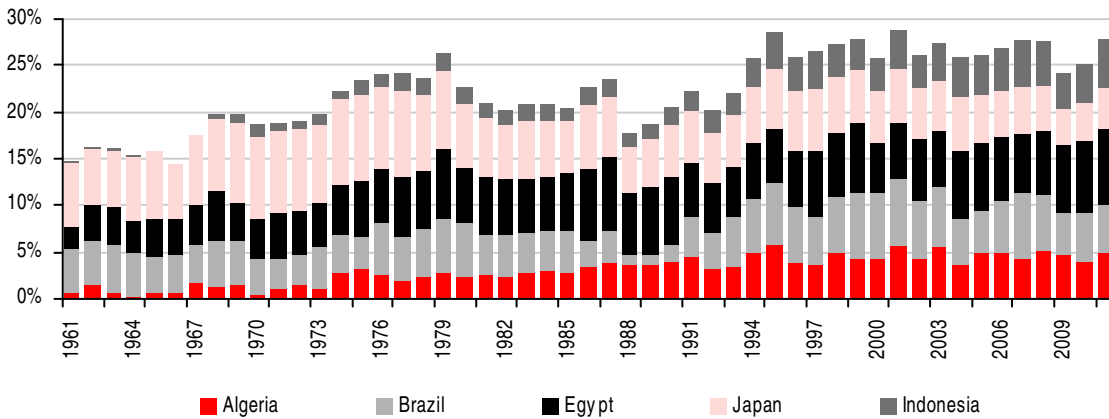


Chart 26: Corn: Country export market share over time



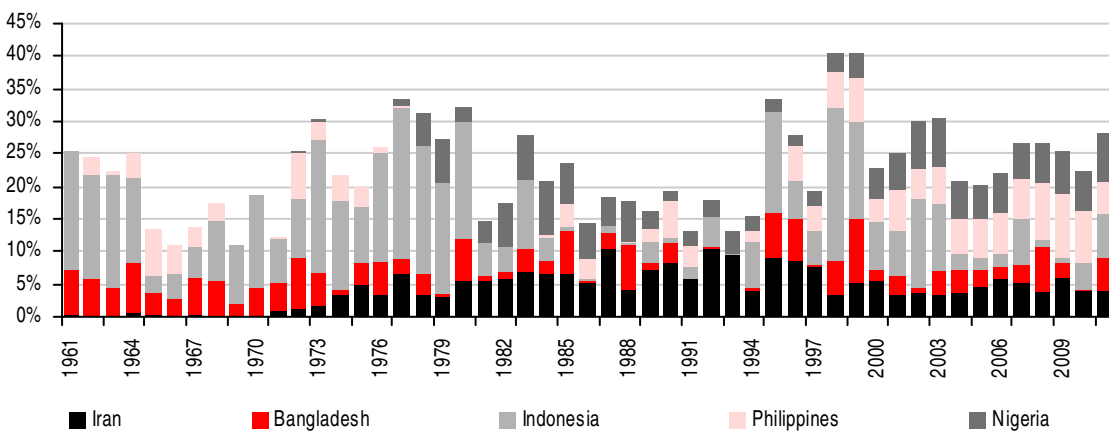
## Importing countries for agricultural commodities

Chart 27: Wheat: Country import market share over time



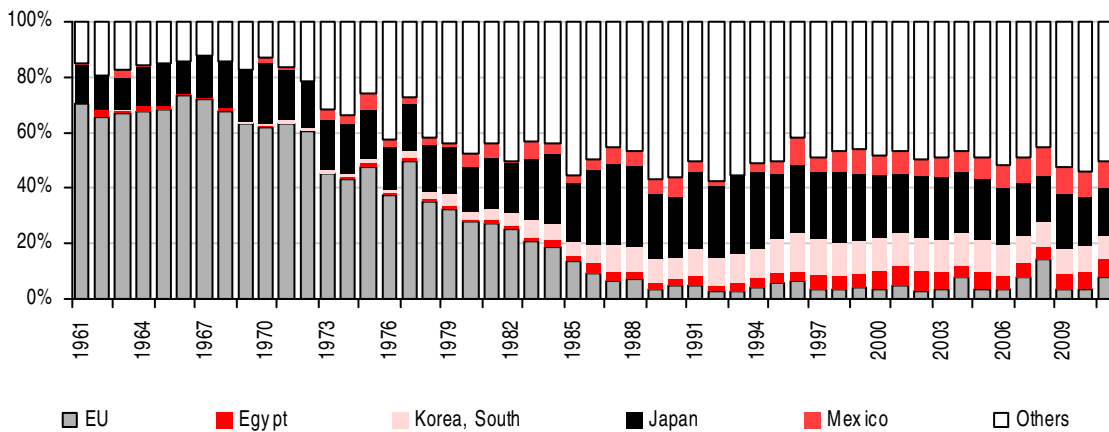
Source: USDA

Chart 28: Rice: Country import market share over time



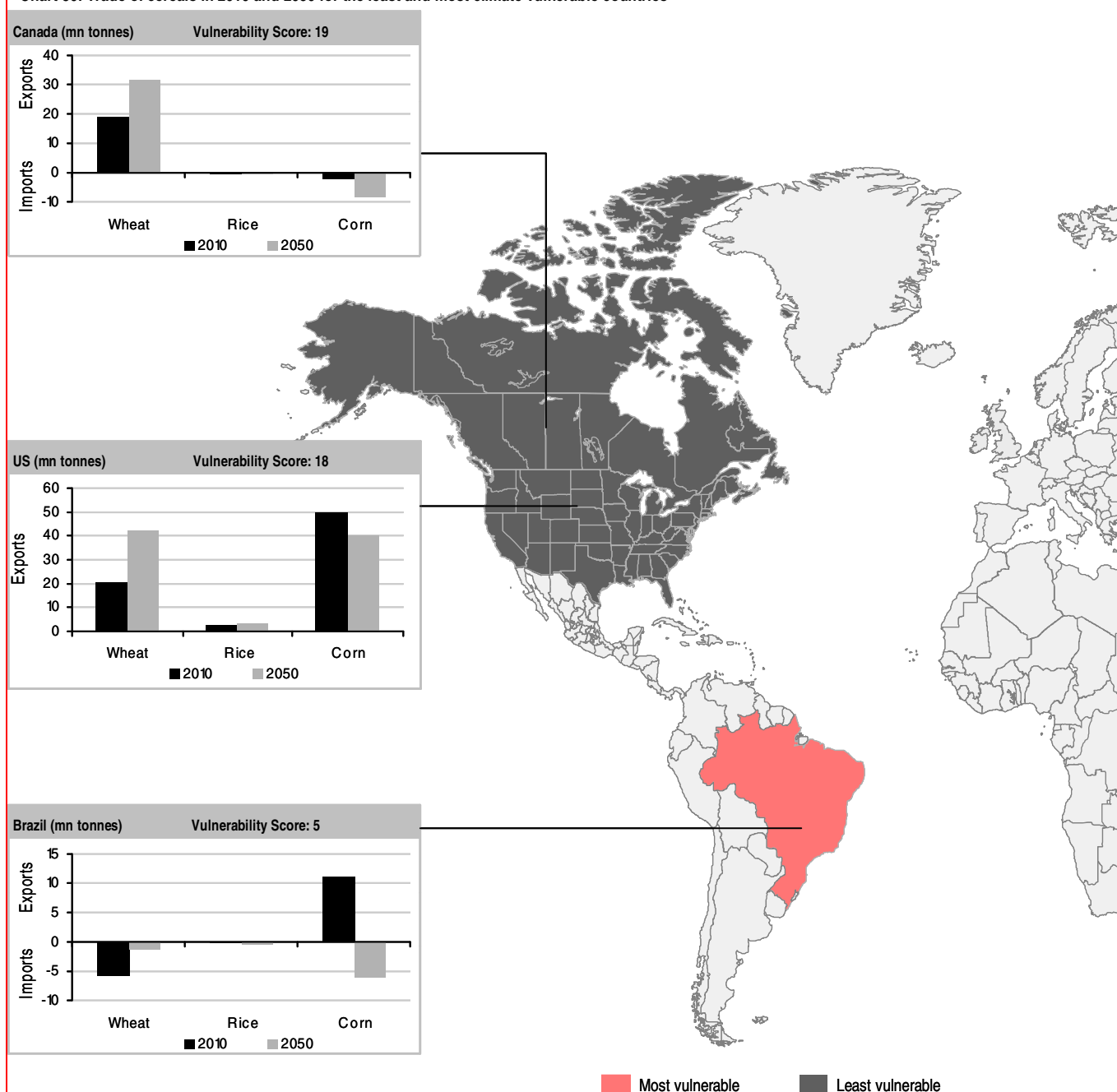
Source: USDA

Chart 29: Corn: Country import market share over time

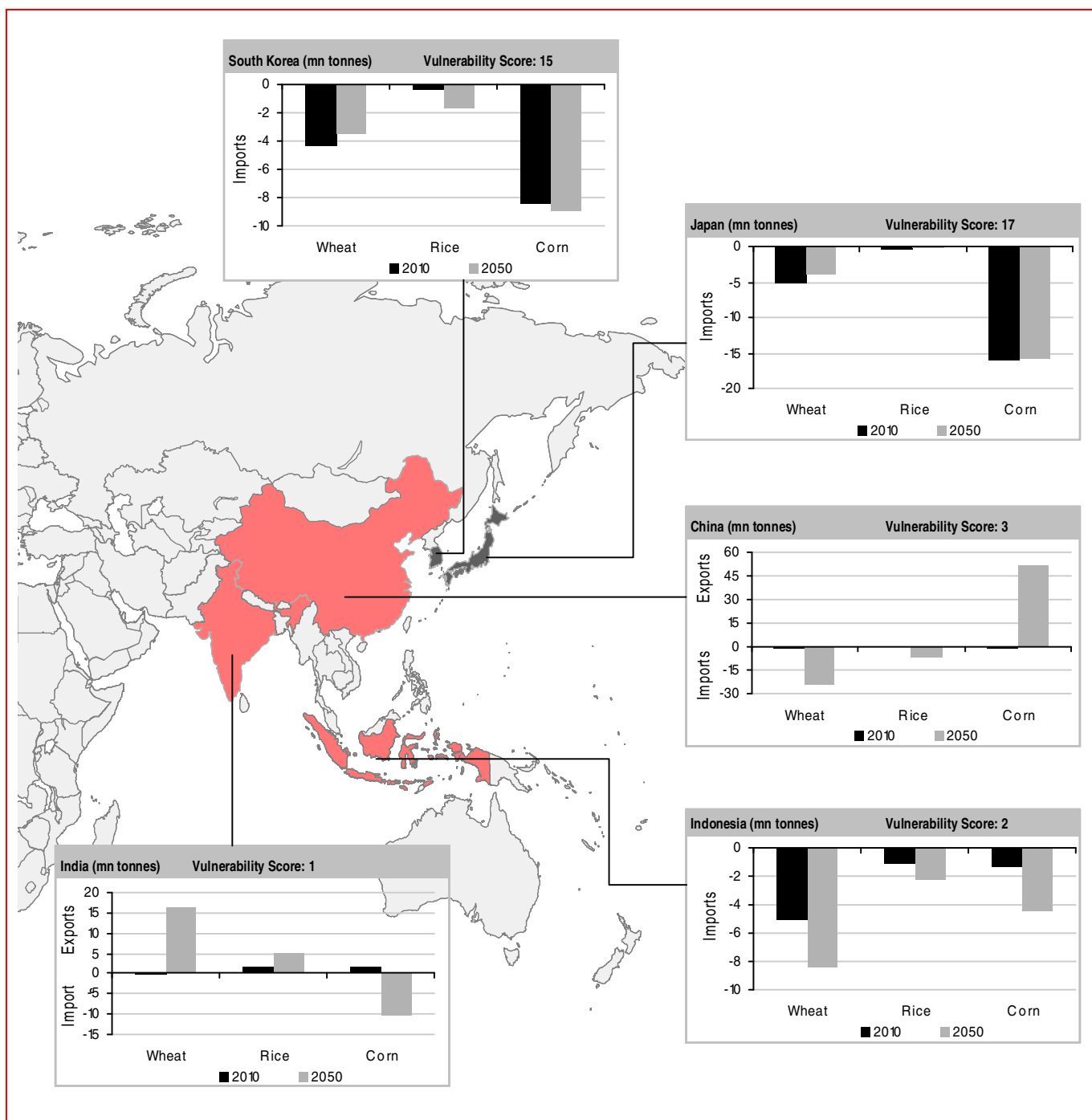


## Appendix 4: Trade

Chart 30: Trade of cereals in 2010 and 2050 for the least and most climate vulnerable countries



Source: IFPRI 2010



## Appendix 5: Valuation and risks

**K+S: SDFGn.DE, EUR36.05, Overweight, target price EUR59.0**

### Valuation

We value K+S using a DCF model and an EV/IC vs ROIC/WACC multiple. Our DCF model (RFR 3.5%, ERP 5.3%, beta of 1.04, terminal growth 1.0%) generates a value of EUR62.9 from EUR62.4 (including Potash One; 80% weighting); and our historical EV/IC valuation is EUR43.5 (20% weighting).

Under our research model, for stocks without a volatility indicator, the Neutral band is 5 percentage points above and below the hurdle rate for Europe ex-UK stocks of 8.5%. Our target price of EUR59.0 provides a potential return of 64%, above the Neutral band of our model; therefore, we rate the stock Overweight. Potential return equals the percentage difference between the current share price and the target price, including the forecast dividend yield when indicated.

### Risks

Downside risks include a sharp decline in soft commodity prices; potash inventory build-up at the distribution level owing to pre-buying; concerns about the medium-term outlook for the potash industry and a warm winter for the salt business. In addition, a further reduction in the c10% stake of EuroChem owner, Mr Melnitschenko, in K+S could weigh on the stock, although this could also lead to takeover speculation as when Mr Melnitschenko previously reduced his stake (*Financial Times Deutschland* and *Handelsblatt*, 13 July 2011).

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**Yara: YAR.OL, NOK237.8, Overweight, target price NOK347.0**

### Valuation

We value Yara using two different methodologies, a PE-based valuation and a DCF model. Our DCF model (assumptions: beta 1.0, risk-free rate: 5.3%, ERP: 8.3%) produces a fair value of NOK328. For our multiple-based valuation we use a one-year forward (2012e) target PE multiple of 13.5x, which is just above the mid-point between the average peak (15.4x) and average mean (10.7x) – one-year forward PE ratios achieved by Yara shares during the last agricultural boom of 2006-08 and bust of 2008-10. Applying our target PE multiple of 13.5x to our 2012 diluted pre-exceptional EPS estimate of NOK26.4, we arrive at a fair value of NOK356. We assign a weight of two-thirds to the multiples valuation and one-third to the DCF valuation to arrive at our target price. This results in a target price of NOK347.0

Under our research model, for stocks without a volatility indicator, the Neutral band is 5 percentage points above and below the hurdle rate for Norwegian stocks of 10.5%. Our target price of NOK347 provides a potential return of 46%, above the Neutral band of our model; therefore, we rate the stock Overweight. Potential return equals the percentage difference between the current share price and the target price, including the forecast dividend yield when indicated.

### Catalysts

Libyan operations: Yara may restart its shuttered Libyan plants if political stability returns to that country. The Libyan joint venture has annual capacity of 900k tonnes of urea and 700k tonnes of ammonia. Yara has 50% equity ownership of its Libyan affiliate, and has marketing rights for 100% of production, which is primarily exported. Yara's share in the Libyan production of urea and ammonia constitutes 5% and 11% of Yara's overall 2010 production capacity, respectively.



**FX risk:** Most of Yara's revenues and costs are linked to the US dollar, even though Europe contributes around 50% of sales by value. A weakening Norwegian krone would therefore increase the value of revenues and profits denominated in NOK.

#### **Risks**

**Energy prices:** Approximately 40% of Yara's overall energy consumption is from European spot sources, with around another 20% at European oil-linked prices (contract). Higher energy prices in Europe may result in a higher than-expected increase in Yara's costs. We see this as one of the main risks facing the company in the year to come.

**Poor demand:** Weak sales volumes in 2011 hint to possible further drops in 2012. European farmers may order less urea and nitrate fertiliser due to macroeconomic concerns.

**Bad weather:** Excessively cold weather in Europe may dampen demand, which could result in lower volumes and possibly lower prices as well.

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## References

- Baker, J. M.; Ochsner, T.E.; Venterea, R.T., Griffis, T.J. 2007: Tillage and soil carbon sequestration – What do we really know? *Agriculture, Ecosystems and Environment* 118 (2007) 1–5
- Defra 2011: New diets for cows could cut climate emissions. Available from: <http://www.defra.gov.uk/news/2011/04/01/cow-emissions/>
- FAO 2011: Climate Change, Water and Food Security
- FAO 2011: Save and Grow – Chapter 5. Available from: <http://www.fao.org/ag/save-and-grow/en/5/index.html>
- FAO, IFAD, UNCTAD and World Bank 2010: Principles for Responsible Agricultural Investment that Respects Rights, Livelihoods and Resources.
- Foresight 2011: The Future of Food and Farming Final Project Report. Government office for science, London
- Huddleston, M. 2010: Managing weather risk in a Changing climate: Opportunities from the Developing Science, The Met Office
- International Food Policy Research Institute (IFPRI) 2010: IFPRI Food Security CASE maps. Generated by IFPRI in collaboration with StatPlanet. Available from: <http://www.ifpri.org/climatechange/casemaps.html>
- IIASA/FAO. 2010. Global agro-ecological zones (GAEZ v3.0). Laxenburg, Austria, IIASA and Rome, FAO
- Nelson GC et al 2009: Climate Change, Impact on Agriculture and Costs of Adaptation. International Food Policy Research Institute
- Nelson, G et al 2009: The Role of International Trade in Climate Change Adaptation. International Centre for Trade and Development, International Food & Agricultural Trade Policy Council
- Sustainable Agriculture Initiative Platform 2010: The State of Agricultural Commodity markets, 2009
- OECD 2010: Agricultural Policies in OECD Countries – At a glance
- Trenberth, K.E 2011: Attribution of climate variations and trends to human influences and natural variability. *WIREs Climate Change* 2011. doi: 10.1002/wcc.142
- Schlesinger, WH and Andrews, JA 2000. Soil respiration and the global carbon cycle. *Biogeochemistry* 48, 7-20
- UNEP 2010: The Emissions Gap Report
- US Department of Agriculture (USDA): Production, Supply and Distribution Online Statistics.
- World Economic Forum 2010: Realizing a New Vision for Agriculture: A Roadmap for Stakeholders.

# Disclosure appendix

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Our ratings are re-calibrated against these bands at the time of any 'material change' (initiation of coverage, change of volatility status or change in price target). Notwithstanding this, and although ratings are subject to ongoing management review, expected returns will be permitted to move outside the bands as a result of normal share price fluctuations without necessarily triggering a rating change.

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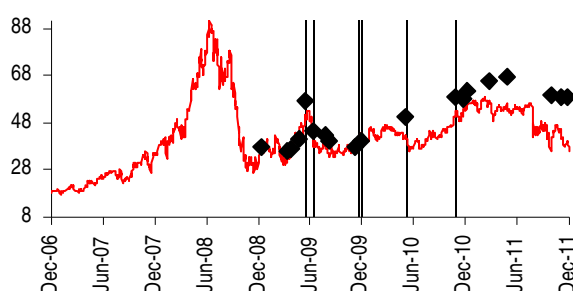
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As of 09 December 2011, the distribution of all ratings published is as follows:

Overweight (Buy)	54%	(27% of these provided with Investment Banking Services)
Neutral (Hold)	35%	(21% of these provided with Investment Banking Services)
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## Share price and rating changes for long-term investment opportunities

K+S (SDFGn.DE) Share Price performance EUR Vs HSBC rating history



Source: HSBC

Recommendation & price target history

From	To	Date
Neutral (V)	Overweight (V)	20 May 2009
Overweight (V)	Neutral (V)	23 June 2009
Neutral (V)	Restricted	25 November 2009
Restricted	Neutral (V)	03 December 2009
Neutral (V)	Overweight (V)	10 May 2010
Overweight (V)	Overweight	03 November 2010
Target Price	Value	Date
Price 1	37.92	17 December 2008
Price 2	36.03	17 March 2009
Price 3	36.97	02 April 2009
Price 4	40.77	28 April 2009
Price 5	56.88	20 May 2009
Price 6	44.08	23 June 2009
Price 7	42.66	31 July 2009
Price 8	39.82	14 August 2009
Price 9	37.92	16 November 2009
Price 10	Restricted	25 November 2009
Price 11	40.00	03 December 2009
Price 12	50.00	10 May 2010
Price 13	58.50	03 November 2010
Price 14	58.00	01 December 2010
Price 15	61.00	13 December 2010
Price 16	66.00	03 March 2011
Price 17	67.00	03 May 2011
Price 18	60.00	04 October 2011
Price 19	58.50	11 November 2011
Price 20	59.00	30 November 2011

Source: HSBC

Yara (YAR.OL) Share Price performance NOK Vs HSBC rating history



Source: HSBC

Recommendation & price target history

From	To	Date
N/A	Neutral (V)	01 December 2010
Neutral (V)	Overweight	13 September 2011
Target Price	Value	Date
Price 1	330.00	01 December 2010
Price 2	355.00	13 September 2011
Price 3	347.00	04 October 2011

Source: HSBC

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Company	Ticker	Recent price	Price Date	Disclosure
K+S	SDFGn.DE	36.05	08-Dec-2011	1, 4, 5, 11

Source: HSBC

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