April 16

2012

Food Prices March 2012 update & Annual Review April 2011 to March 2012

Landmarks of the last year: April 2011 to March 2012

International prices for ***maize*** and ***wheat*** fell for most of the last year, owing to reasonably good harvests.

Rice prices, in contrast, have risen a little over the last year, since some harvests have disappointed, while there is uncertainty over Thai policy for rice.

The Annual Review in this bulletin looks at how cereals markets have evolved since the 2007/08 price spike. The lasting change seen concerns ***maize***, for which 2011/12 was an extraordinary year:

- For the first time, more US maize went to distilleries than to feed animals, as prices increasingly correlate with oil prices;
- China has started to import large amounts of maize for animal feed.

Consequently, maize stocks are at their lowest since 1973/74, a year that saw a dramatic spike in commodity prices. If any significant maize harvest fails in 2012, there would probably be a sharp spike in maize prices that would in turn drag up wheat prices as some feedlots switched to that grain.

Production of maize and wheat have, however, responded strongly to higher prices since 2006, mainly by increasing yields. The surprise, however, is the relatively weak response of rice production to higher prices — reflected in rice prices remaining some US$200 a tonne more than in 2006 before the spike.

Contents

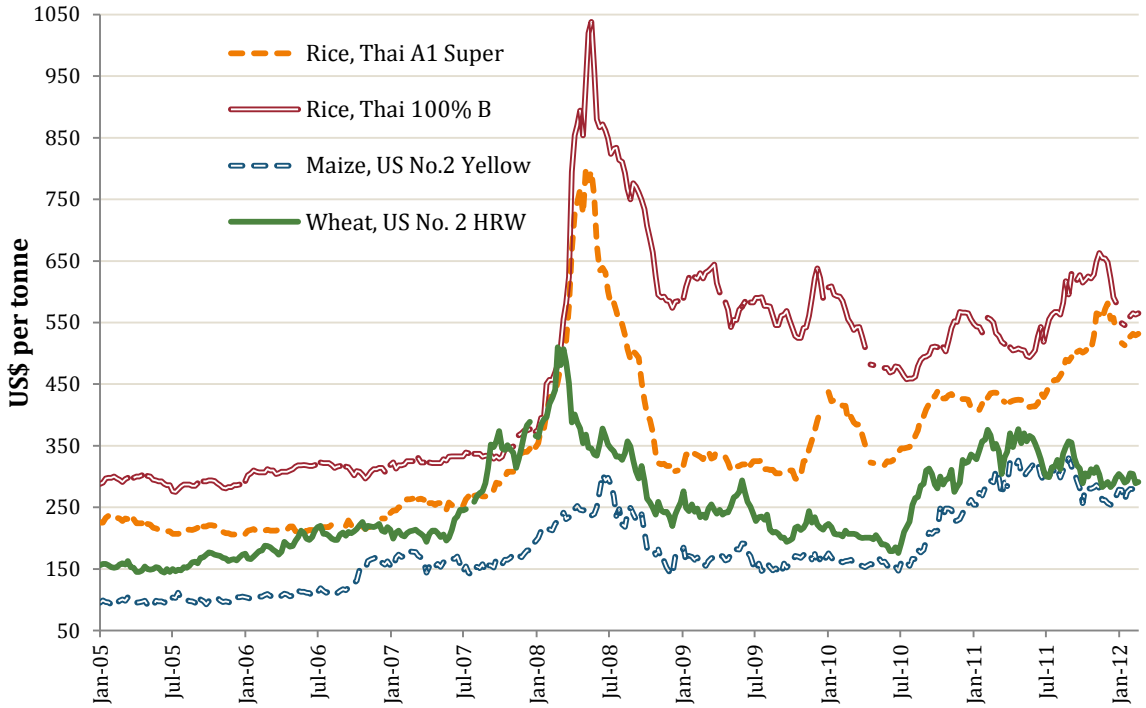
RECAP FROM THE EARLIER UPDATES

- International maize and wheat prices rose sharply from mid 2010, driven largely by poorer than hoped for harvests and strong demand, particularly for maize to make ethanol, then fell back from early 2011 since the main harvests of 2011 were good;
- Rice prices were high in 2011 owing to flood losses in Thailand and concern over the impact of Thai policies on exports from that country;
- High maize prices have seen the premium paid for wheat over maize cut to slim margins. In more than a century, the current margin of under 8% has only been lower in nine years.
- Stocks of both wheat and rice are being rebuilt, sufficient to cope with modest harvest failures in the near future. Maize, however, is the exception, thanks to demand for biofuel and feed in China outstripping production increases. Consequently maize stocks are low, at less than 15% of use: not enough to withstand a harvest failure without a spike in maize prices.

KEY DEVELOPMENTS SINCE FEBRUARY 2012

Cereals prices

Figure A International cereals prices, nominal, Jan 2005 - March 2012

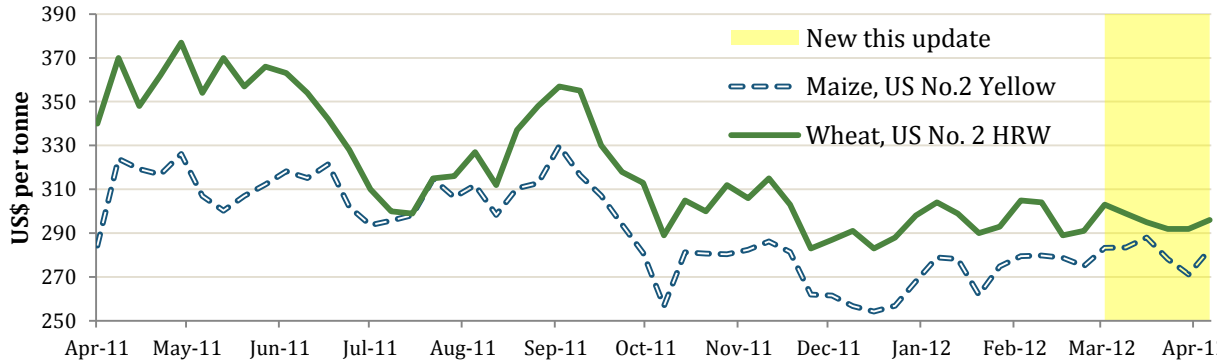


Source: With data from FAO ESC. **Note**: Prices are weekly to week ending April 6, 2012. The last 6 weeks are new for this update

Maize and wheat prices

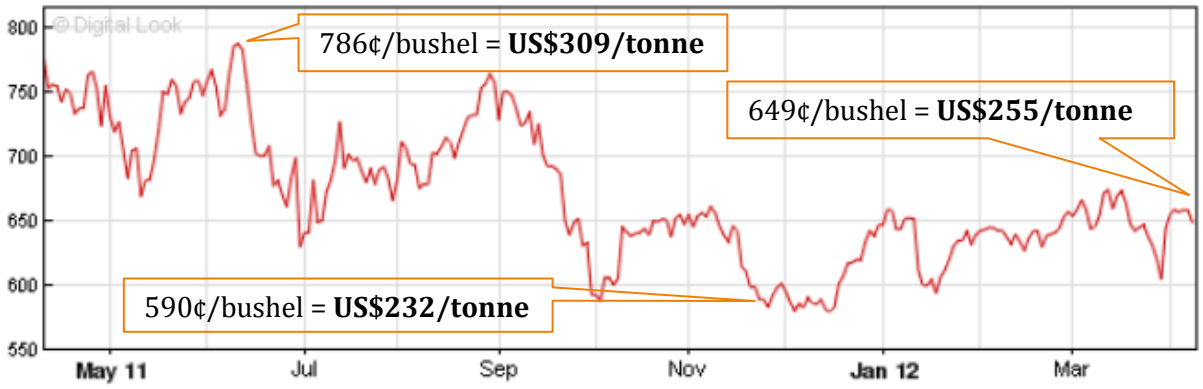
Since the last update in February 2011, ***maize*** and ***wheat*** spot prices have risen slightly, most recently at US$283 and US$296 a tonne, respectively: see Figure B. Futures prices, see Figures C and D, are about US$30 a tonne less than spot prices for maize, and US$60 a tonne less than spot prices for wheat. They have changed little since the New Year.

Figure B Focus on last financial year for US maize and wheat prices



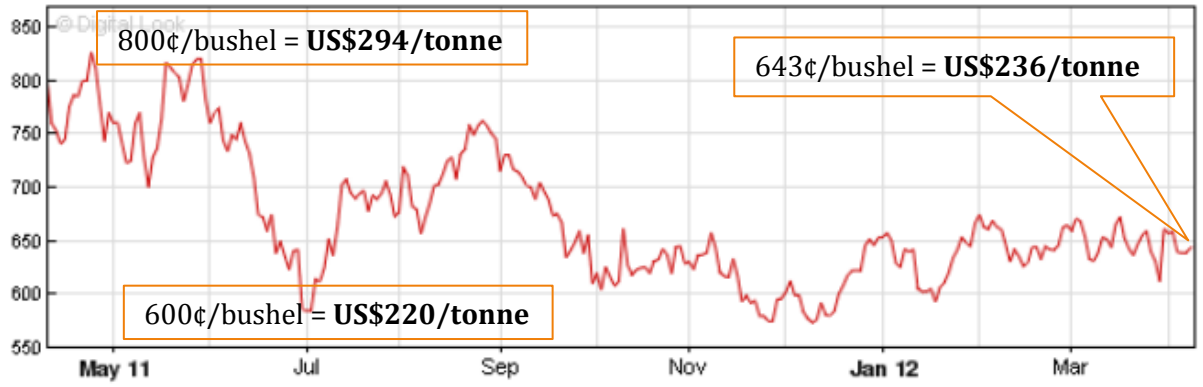
Source: With data from FAO ESC. **Note**: Prices are weekly, from week ending Apr 1st 2011 to week ending Apr 6th, 2012

Figure C CBOT Corn Futures: US cents/bushel, 12 months to April 9, 2012



Source: BBC Market data. US$/tonne added

Figure D CBOT Wheat Futures: US cents/bushel, 12 months to April 9, 2012



Source: BBC Market data. US$/tonne added

Maize prices are kept high by strong demand from the US for ethanol feedstock, and from China for all uses, especially animal feed.

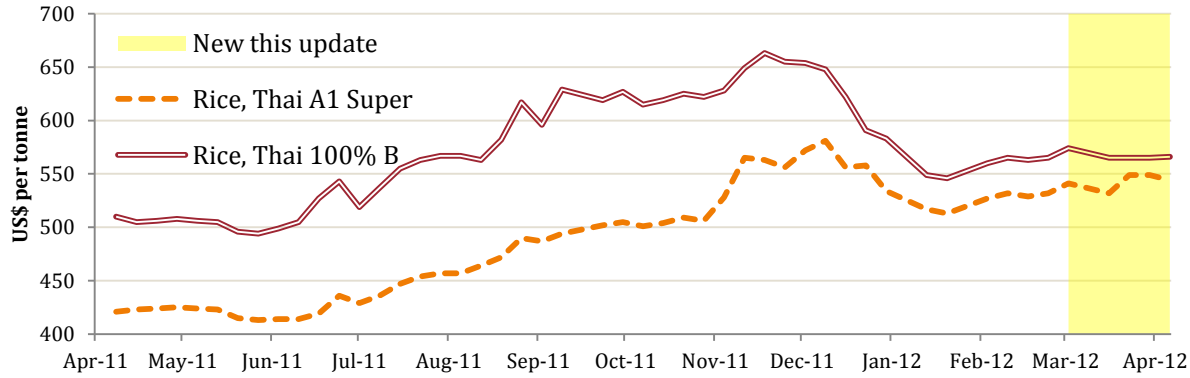
Latest stock-to-use ratios estimated for maize are down to 14.1% globally, from an already low 14.7% in 2010/11.[1] This is lower than the 15.2% seen in 2006/07 going into the food price spike of 2007/08. See figures in Annex 1.

Rice prices

Over the last six weeks, ***rice*** spot prices have moved little: see figure E. Thai A1 Super is US$544 per tonne, while Thai 100% B is US$566 per tonne. Both are good quality grades. Cheaper quality grades are trading at about US$120 per tonne lower.[2]

Heavy losses to flood damage in October 2011 in Thailand contributed to price rises, though they were already on the way up, driven by concern over Thai government policy. Rice prices have also been pushed up by delays to exports in Indian ports[3], below par harvests in Indonesia and the Philippines, and by unexpectedly high demand from China.[4] (IGC, April 2012)

Figure E Focus on last financial year for Thai rice prices



Source: With data from FAO ESC. **Note**: Prices are weekly, from week ending Apr 8th 2011 to week ending Apr 6th, 2012

Harvest prospects

Southern Hemisphere wheat and maize

The news from ***Australia*** continues to encourage, with 2011/12 harvest estimates for wheat at 29.5M tonnes for 2011/12, up from the record 28M tonnes achieved in 2010/11[5]. Australia is also holding large stocks of wheat[6].

Argentine wheat production for 2011/12 is estimated at about 14M tonnes, down about 5% on the previous 5 year average, but not as poor as feared.

Maize is a different story in Argentina, with heavy harvest losses to dry weather feared. Only 27% of Argentine maize was harvested by early April 2012, so estimates from *Bolsa de Cereales*

[1] USDA figures: revisions to the 2010/11 WASDE estimates mean that the global maize stock-to-use ratio estimated in April 2012 has fallen from the February 2012 estimate of 15.3%

[2] IGC reported Vietnamese 5% broken rice, and Pakistan IRRI 25% March prices at US$435 and US$410 per tonne respectively.

[3] 'Amid logistical difficulties at India's ports, renewed buying interest underpinned solid gains in Pakistan, while big purchases by China and the Philippines supported increases in Vietnam.' IGC, April 2012

[4] USDA projected China would be a net exporter of 120k tonnes of rice for 2011/12, but the latest figures [April WASDE] were revised to project China as a net importer of 500k tonnes of rice. China is expected to import 1M tonnes of milled rice in 2011/12, double the year before — the highest since 1994/95, when they were close to 2M tonnes.

[5] Estimate for 2011/12 from March 2012 ABARES report

[6] See Annex 2 for distribution of maize, rice, and wheat stocks by region. Australian statistics appear in Oceania

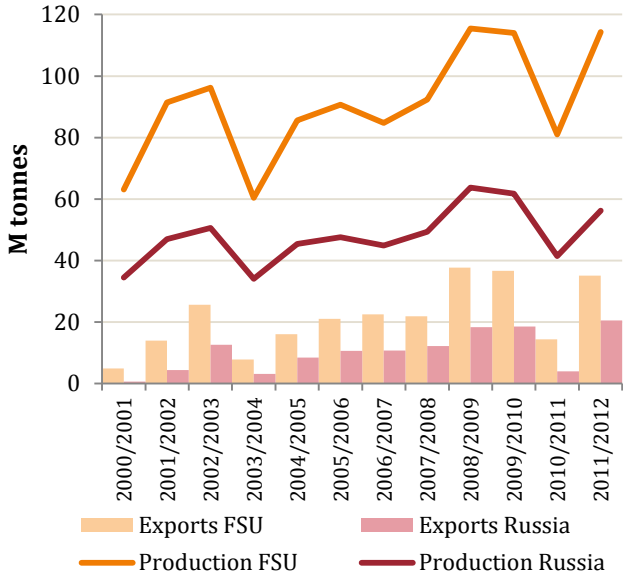
are not yet available. USDA has however revised its estimate for Argentina's maize production progressively downwards since the start of the year, from 29M to 22M to 21.5M (as at April 2012). Not disastrous, but disappointing considering the large area planted to maize in Argentina for 2011/12 — 3.6M hectares.[7] Yield per hectare is expected to be only 6 tonnes per hectare, the lowest since 2000/01, well below the previous 5 year average of over 7 tonnes per ha.

Exports of 14M tonnes are expected: below the 16M tonnes exported in 2010/11, and the 16.5M tonnes in 2009/10; but only 600k tonnes below the previous 5-year average of 14.6M tonnes (USDA FAS & WASDE April 2012 data).

Winter wheat

In ***Russia***, where drought dramatically reduced wheat production in 2010/11, latest estimates for 2011/12 are much improved:[8] up from 41.5M tonnes in 2010/11 to 56.2M tonnes in 2011/12, an increase of about 35%. For the Former Soviet Union region as a whole — that is largely Kazakhstan, Russia and the Ukraine — wheat harvests are expected to rise by 41% over last year: See figure F.

Figure F Production and exports in Russia and the Former Soviet Union 2000/01 to 2011/12



Source: With data from USDA FAS

Observers had hoped this production would be even better in 2011/12, however weather has not been entirely cooperative. Nonetheless, the harvests predicted are almost as high as the levels reached in 2008/09 and 2009/10 — 8% above the previous 5-year average for Russia, and 17% above the previous 5-year average for the FSU as a whole.

Wheat exports from Russia are predicted to exceed 20M tonnes in 2011/12; a sharp contrast from the less than 4M tonnes exported in 2010/11 when exports were banned.

In the ***EU***, a relatively good harvest is expected in spite of some drought damage, with USDA estimating EU wheat harvests to rise about 1.3% from 2010/11 to 2011/12.

Elsewhere, prospects for winter wheat also appear favourable, with most ***US*** crops reportedly in good condition, especially for wheat in Kansas and Oklahoma, the largest wheat states.[9]

Overall, prospects for less than hoped-for production in ***Europe and the Black Sea region*** are offset by better prospects of a good winter crop in the US (IGC).

[7] Since 1960, in only 2 years did Argentina devote more area to maize —1969/70 and 1970/71

[8] Bloomberg, April 11, 2012 Wheat Seen Declining as Stockpiles Expand to Record: Commodities
http://www.bloomberg.com/news/2012-04-10/wheat-seen-declining-as-stockpiles-expand-to-record-commodities.html

[9] Bloomberg, April 9, 2011 U.S. Corn Seeding Speeds Up as Warm Weather Aids Fieldwork.
http://www.bloomberg.com/news/2012-04-09/u-s-corn-seeding-speeds-up-as-warm-weather-aids-fieldwork-1-.html

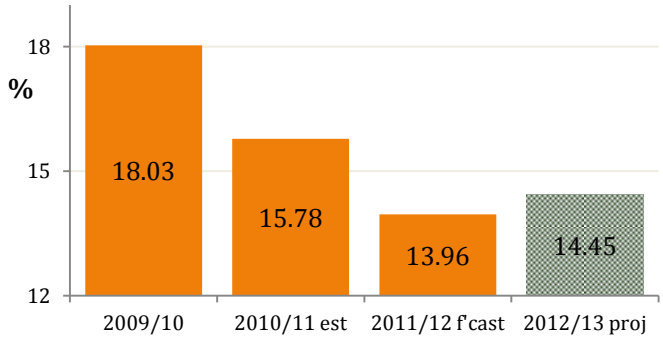
India continues to allow unrestricted exports of wheat. A 650k tonne export restriction on wheat flour exports, was lifted with effect from April 1st (IGC, April 2012).

New maize planting

US maize is being planted at a record pace owing to clear weather in the Midwest, so that the largest area since 1944 is expected to be planted.[10]

This may offset the principle fear over cereals: the very low stocks currently held, with a ratio of use of around 14%. If the large area planted in the US grows well, then there may be room for a modest rise in maize stocks (IGC, 2012) [11] — see Figure G.

Figure G Maize stock-to-use ratios



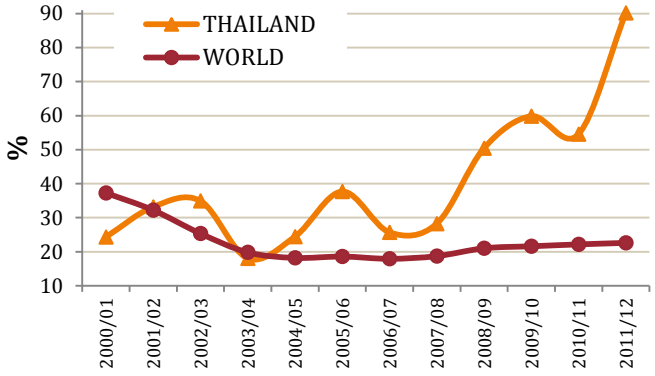
Source: From IGC, April 2, 2012

Rice

The good news is that India, expecting a bumper crop in 2011–12, continues to allow exports of non-basmati rice.

Since India exports rice at lower prices than Thailand, albeit for lower quality grades, this may reduce Thai exports. These may in any case be limited by public schemes to support domestic prices for growers, that may see Thai rice stock-to-use ratios to rise from 55% in 2010/11 to 90% in 2011/12, see Figure H, according to USDA. Globally, the rice stock to use ratio is expected to be slightly up in 2011/12.

Figure H Rice stock-to-use ratios: 2000/01 to 2011/12



Source: From USDA FAS data

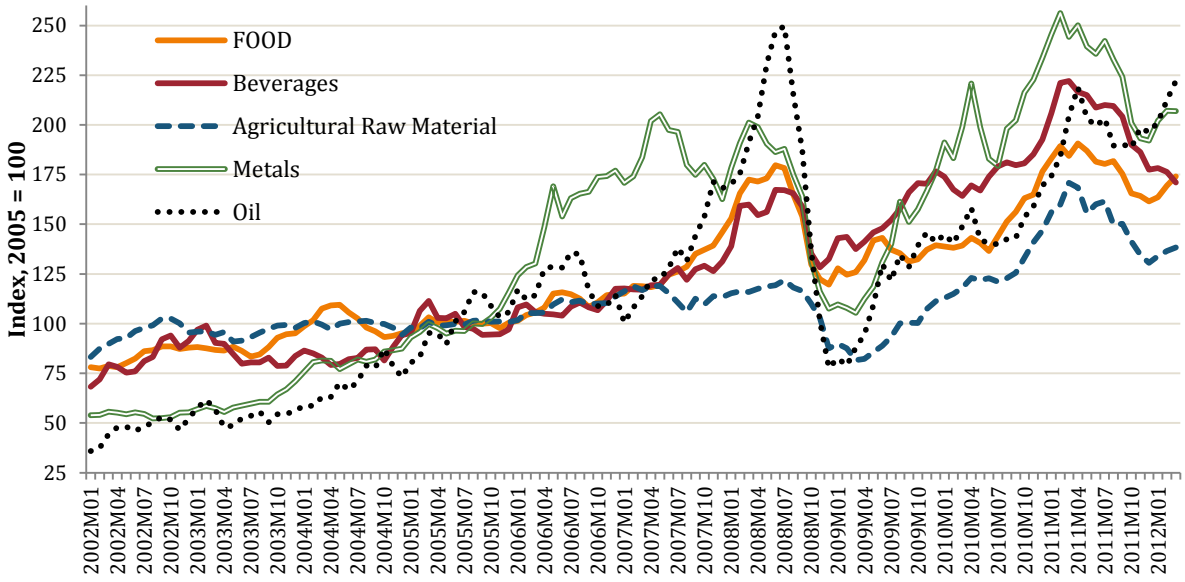
IMF commodity indices: commodity price resurge?

Prices of most commodities peaked in February to March 2011, ending a surge that began two years earlier, and subsequently have been falling. That may be changing, since the oil price index turned upwards again in November, and from January 2012 to March 2012 the other indices also rose, except for beverages.

[10] USDA NASS Crop Progress, Bloomberg, April 9, 2011 (see earlier footnote).

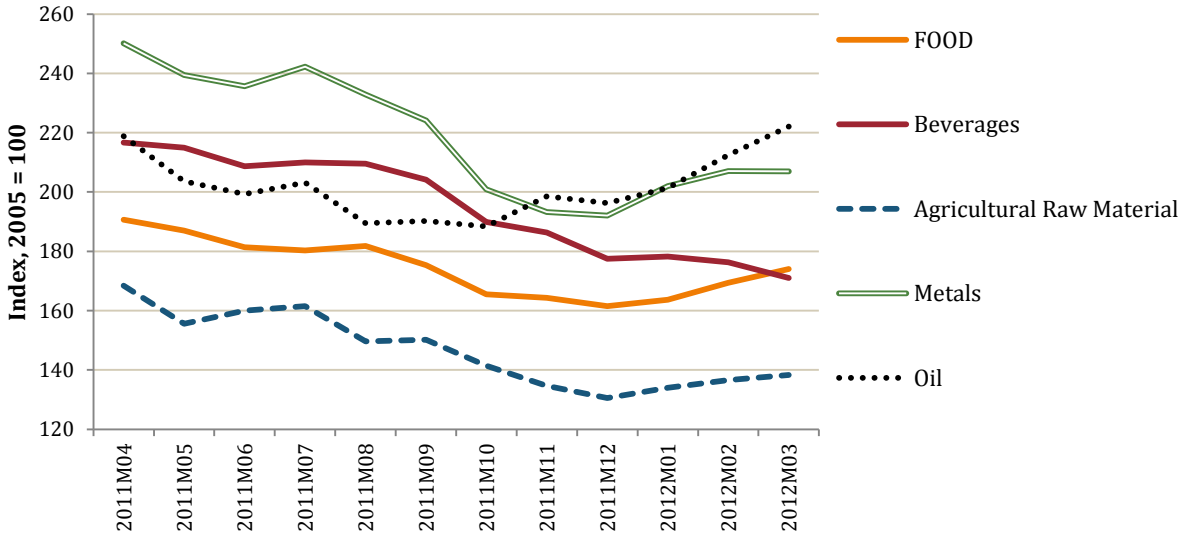
[11] IGC projects 2012/13 harvests at 900M tonnes, an increase of 4% on 2011/12.

Figure J IMF commodity indices to Jan 2002 to Mar 2012



Source: IMF Data

Figure K Focus on the last financial year for IMF commodity indices, April 2011 to March 2012



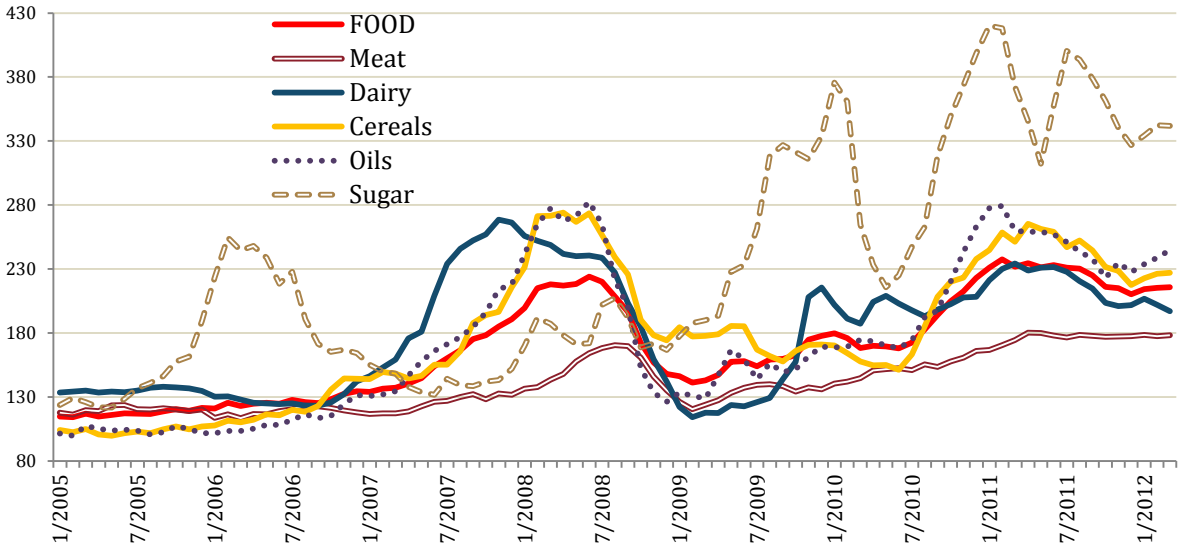
Source: IMF Data

Oil appears to lead the other commodities, just as it did in early 2009 — with metals not far behind. Oil is the commodity most sensitive to economic swings and roundabouts, and to any risks in global affairs. Oil prices then affect food prices through costs of fertiliser, transport and machinery operations; plus, increasingly important, maize prices through the ethanol link. With oil above US$100 a barrel, ethanol from maize should be profitable — at least while room for ethanol to be blended with gasoline remains.

FAO food price indices

FAO's food price index, in decline since early 2011, rose a little from December 2011 to March 2012, pulled up by oils, sugar, and cereals, see Figure L.

Figure L FAO Food Price Indices to March 2012

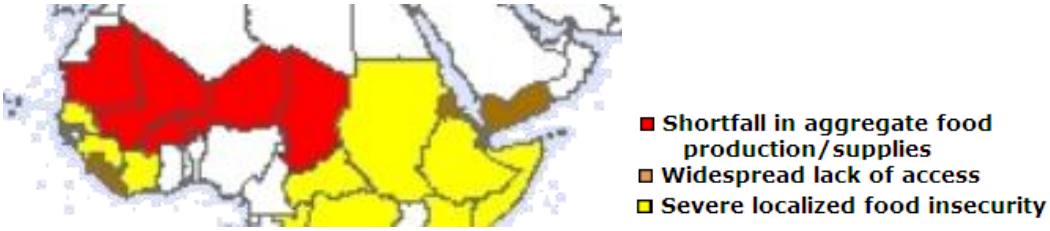


Source: FAO **Note**: 2000 – 2004 = 100

Food crises

Reports continue to warn of a food crisis in the ***West African Sahel,*** affecting people in Mali, Niger, Burkina Faso, Chad, Mauritania, and Senegal.

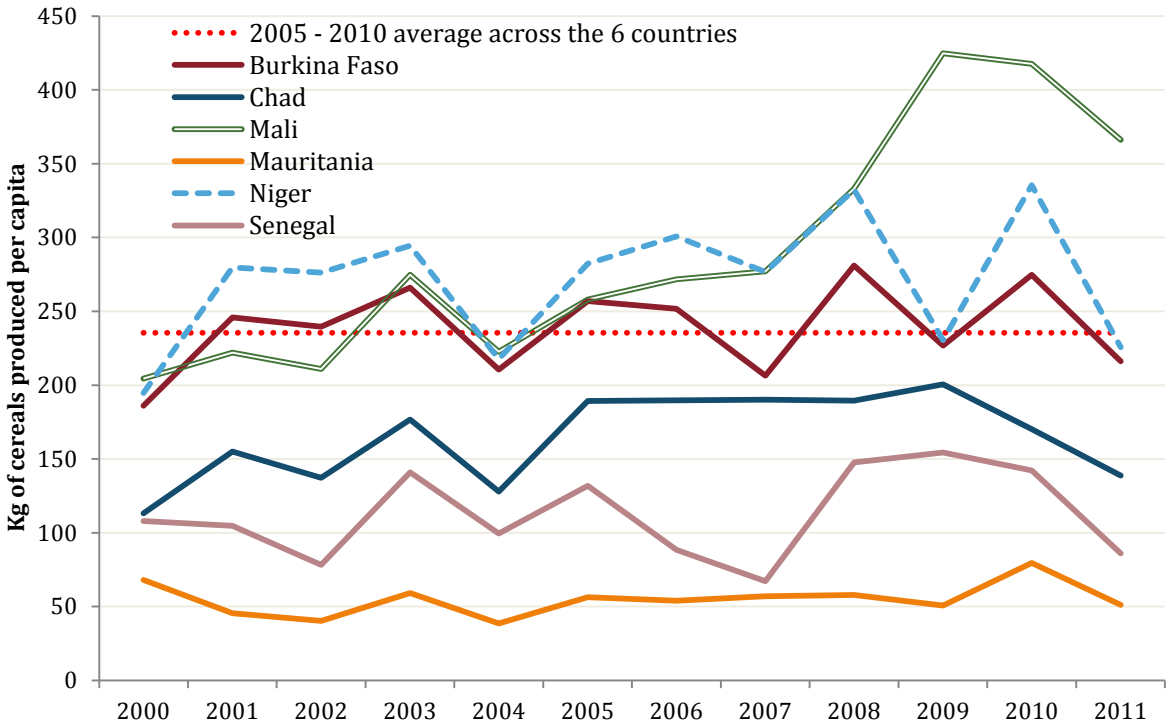
Figure M Countries requiring external assistance for food: focus on the Sahel



Source: March 2012, FAO GIEWS

Harvests across the region in 2011 were worse than the year before: cereals production is down by 19% in Burkina Faso, 16% in Chad, 10% in Mali, 34% in Mauritania, 30% in Niger, and 38% in Senegal — according to FAO GIEWS estimates [Country Briefs] compared to FAO statistics for the 2010 cereals harvest. Across these six countries, production per capita is down nearly 30 kg in 2011 compared to the previous five-year average for 2005 to 2010, see Figure N.

Figure N Cereal production per capita in selected Sahelian countries, 2000 to 2011



Source: From FAOSTAT data for 2000 to 2010, FAO GIEWS Country Briefs for 2011 estimates, converted to per using UN population estimates.

Reports indicate that prices in the 2011 to 2012 marketing season rose very soon after harvest; but some of that increase may be owing to demand from aid agencies and governments concerned to assure relief supplies in anticipation of a food crisis. In Niger, prices have subsequently fallen, according to FEWSNET.

Four points are evident in the emerging crisis:

- The extent to which food prices rise in specific markets, making it difficult for the poor to afford a sufficient diet, will depend on how much food is traded towards the areas with largest reductions in local supply. There are now ECOWAS accords to allow free movement of cereals, but there great temptations arise at times like these for governments to prevent export of grains;
- Insecurity in the region will make it harder for the vulnerable to cope and for relief to be supplied to them. Northern Mali is currently virtually inaccessible to humanitarian agencies — although some of those vulnerable from this area have already fled to camps in Mauritania and Niger. Fears over Boko Haram have led to much of the border between Niger and Nigeria being closed, save for a small corridor leading to Niamey. In most years, southern Niger is a net importer of cereals from northern Nigeria, and especially when harvests are poor, so any constriction of trade across the border could see prices rising sharply in Niger;
- Early warnings of the likely crisis were sounded months ago,[12] yet responses have been delayed; and,

[12] Warnings began in the last quarter of 2011

- The crisis presents a familiar dilemma in that the reduced harvest of late 2011 was not necessarily disastrous so that current observations of distress in the region may be little more than usually can be seen as the hungry season leading to the next harvest in September/October begins. That, of course, does not make suffering acceptable — surveys of pre-schoolers in Niger, for instance, in any year show chronic and unacceptably high rates of Global Acute Malnutrition; but it does prompt questions over the response. Emergency food aid to treat symptoms of acute crisis does not tackle the chronic problems of poverty and malnutrition[13] that beset vulnerable households and especially their young children.[14]

Equally disturbing are reports from ***East Africa and the Horn*** where the first food crops of the year have been planted. Early signs are of poor weather hindering growth. Were these harvests to fail, the impact could be catastrophic given that the region went through a severe crisis last year, assets have been run down, stocks are low, and coping strategies are limited.[15]

[13] See Eilerts, G., April 10, 2012. Niger 2011-12: An exceptional crisis? Presentation at Oxfam/Partnership for Africa Workshop.FEWSNET.

[14] Niger for instance has chronic and unacceptably high rates of Global Acute Malnutrition in preschoolers.

[15] See FEWSNET, April 6, 2012. East Africa Food Security Alert: Poor forecast suggests that increased food insecurity is likely in the eastern Horn. http://www.fews.net/docs/Publications/East%20Region_Alert_2012_04_06_final.pdf

Annual review, April 2011 to end March 2012

Last year in brief

Most cereals harvests were good in 2011, the main exceptions being some of the rice harvests. Consequently the high prices of maize and wheat seen a year ago fell from April 2011 to March 2012, by 14% for wheat and by 5% for maize.

Rice prices have risen over the year, by 12% for premium grades, pushed up by a combination of poorer than expected harvests in Thailand and the Philippines, anxiety over the policies introduced by the new government in Thailand to support farmer prices, and stronger than expected demand for imports from China.

Emerging trends since the price spike of 2007–08

Trends on the world cereals markets since the 2007/08 price spike are becoming clearer. Increasingly it seems that lasting change can be found in the maize market. For so long maize was the jobbing cereal: cheap — the world price got as low as US$75 a tonne in July 2000 — and hence used more than any other grain for animal feed and for processing to starch and syrup. But rising oil prices, biofuel mandates and subsidies, and increasing demand for animal feed have changed that. With a colossal 125M tonnes or more of the US maize harvest going to ethanol distilleries, while countries like China begin to import significantly more maize to feed pigs, maize prices have moved to US$150 and US$200 a tonne or more: levels that a decade ago would have been difficult to imagine.

As the maize price has risen, it seems that demand for wheat as a feed has increased as well, since when maize prices reach the levels seen in the last year, wheat in some markets competes on price with maize. Hence the wheat market, that otherwise shows every sign of getting back to the low prices seen before the price spike, has seen prices supported by this substitution effect.

This prompts the question of supply response: the high prices seen since 2007 and the indications of substantially higher demand for maize should provoke a supply response in cereals production. Almost five years since the price spike began, enough time has passed to overcome any short term rigidities. So what response has been seen?

Supply response: reacting to higher prices

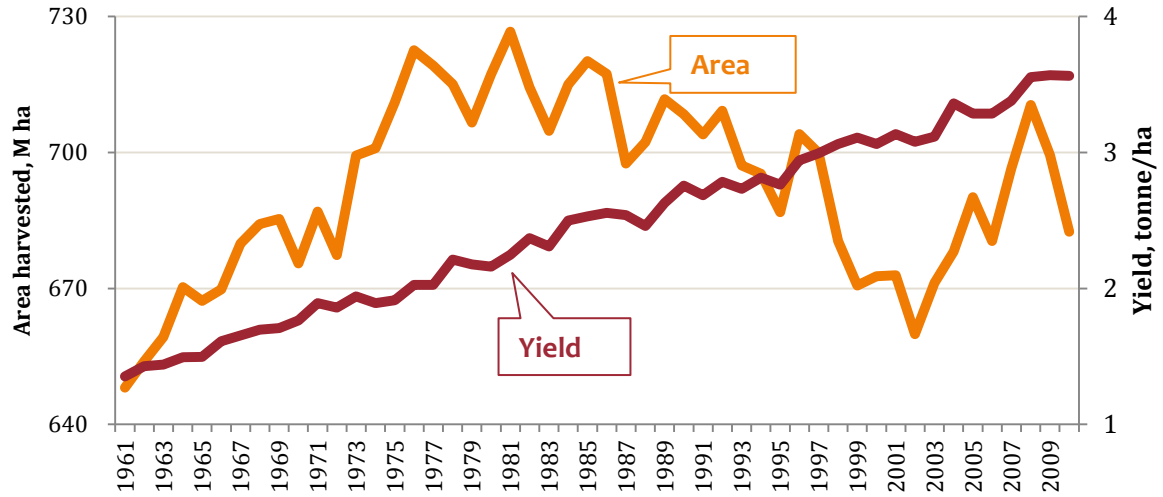
Perspectives from the long and medium terms

To set the scene, Figure P shows the last fifty years of the area planted to cereals and yields per hectare. The growth of yields has been remarkably consistent: every decade almost half a tonne per hectare has been added to cereal yields.[16] What does change is the area planted to crops. The early 1980s were the high water mark for cereals, with as much as 726M hectares sown. Subsequently the area planted fell by 9% to 660M hectares in 2002: in part a response to

[16] Since this increase is arithmetic, the average annual growth rate of yields has fallen over the half century under review — from an average of 3% in the 1960s to 1.86% in 2000s.

considerable fall in real prices for cereals seen over those two decades. Since 2002, the area planted has once again expanded, above all in 2008 in response to the very high prices seen early that year. Hence it seems that in the long run much of the supply response comes through changes in area planted, rather than yield.

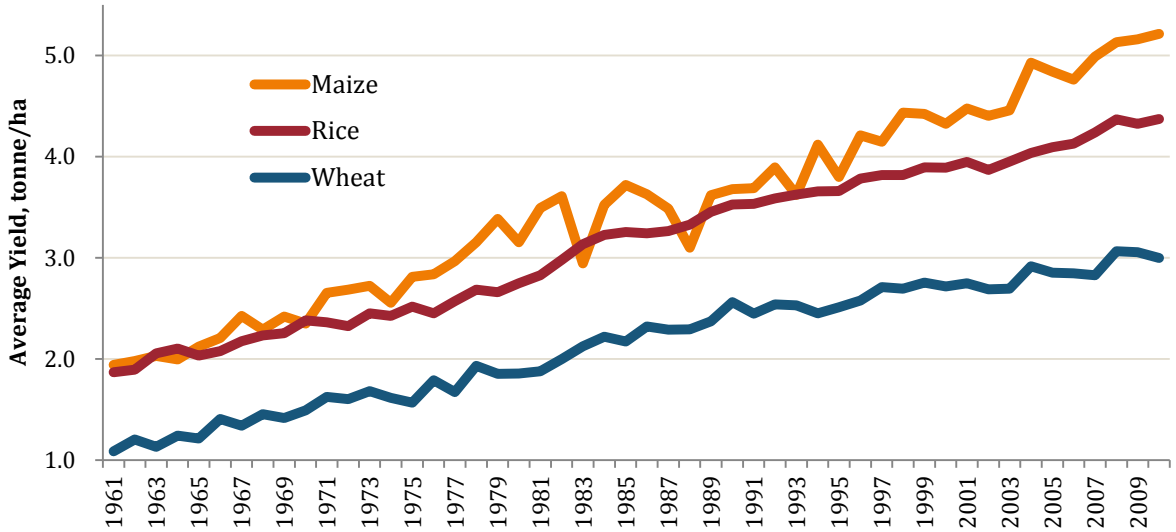
Figure P World cereals, are planted and yields per hectare, 1961 to 2010



Source: Constructed from FAOSTAT data

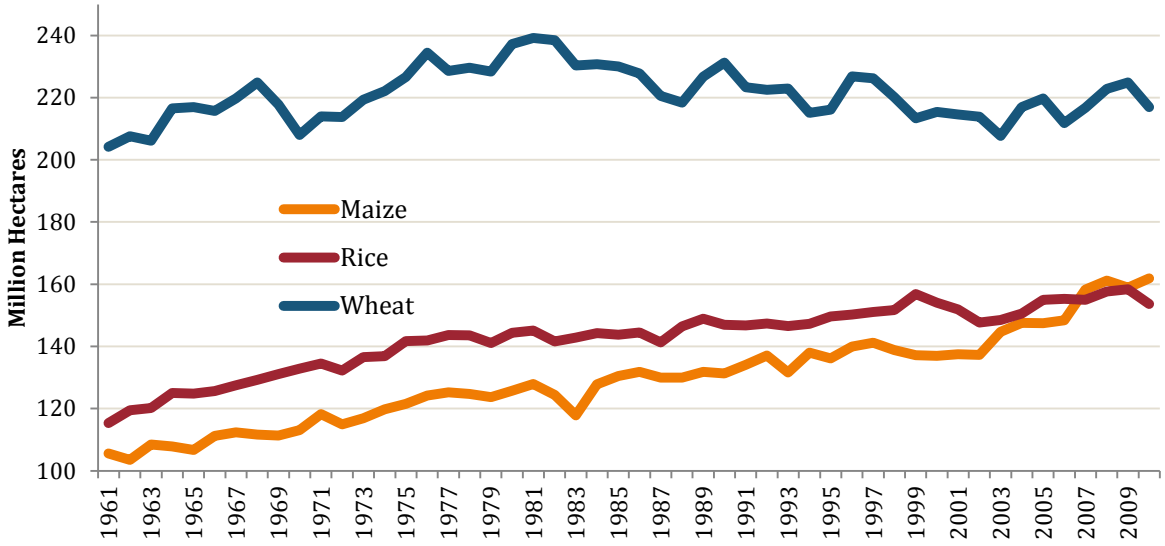
What does the record for each of the three main cereals show?

Figure Q Yields for three main cereals, 1961 to 2010, tonnes/ha



Source: Constructed from FAOSTAT data

Figure R Area planted to three main cereals, 1961 to 2010, M hectares



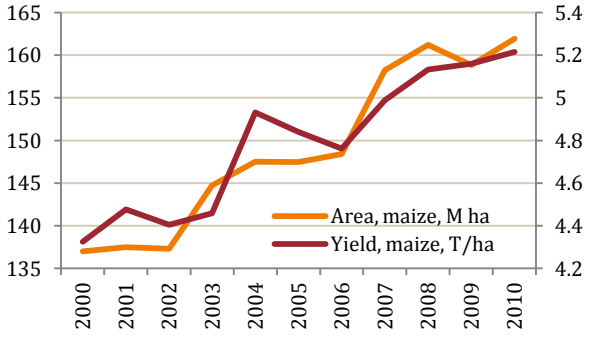
Source: Constructed from FAOSTAT data

Globally, ***maize*** yields have risen consistently since the 1960s, improving from about 2 tonnes per hectare in the early 1960s to close to 5.5 tonnes per hectare in 2010 — and over 6.5 tonnes in the major maize exporters [US, Argentina, China, Brazil, Ukraine], see Figure Q. Area planted appeared to level off or even decline from the mid-1990s, but has accelerated sharply after 2002, increasing by about 25M hectares from 2002 to 2010, see Figure R.

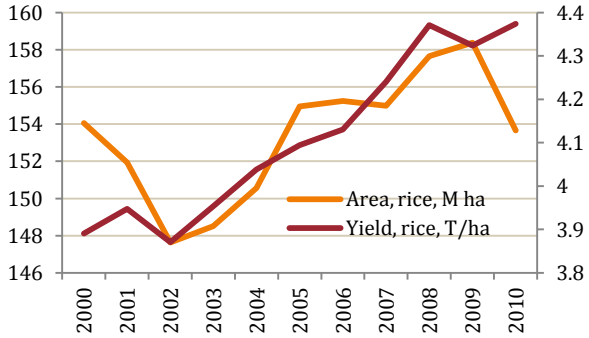
About 60% of the increase in area from 2000 to 2010 came from the top exporters, who also saw yield increases of about 1 tonne per hectare on average from 2000 to 2010, slightly better than the global average yield gain of about 900kg per hectare, see Figure Sa.

Figure S Key staple foods area and yield changes, 2000 to 2010, globally

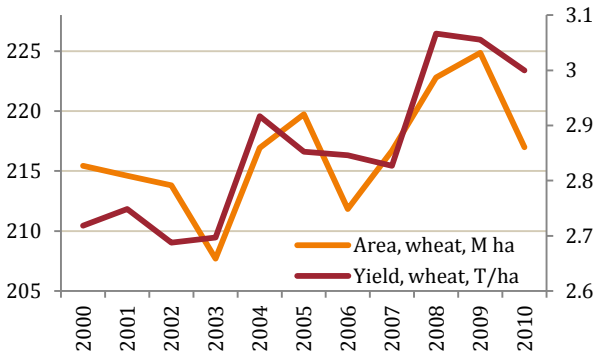
a Maize



b Rice



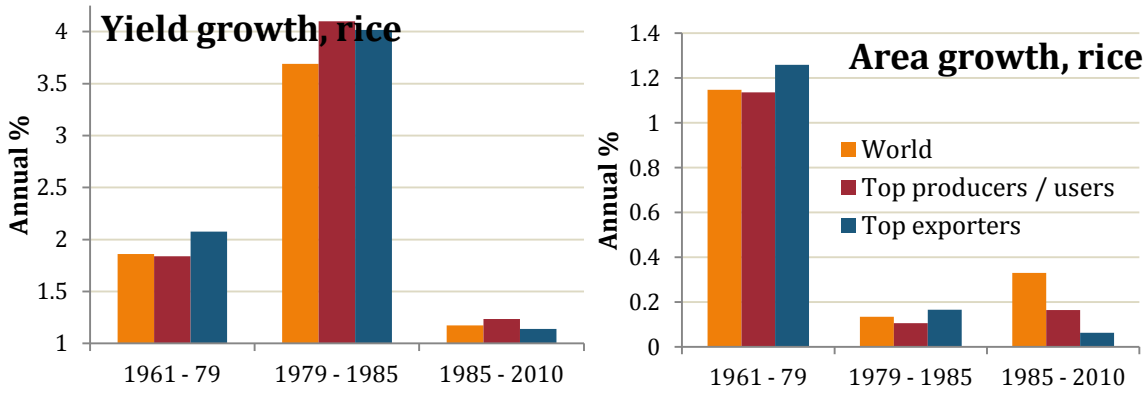
c Wheat



Source: Contructed from FAOSTAT data.

Yield growth in ***rice*** was fairly steady from the early 1960s to the mid 1970s, after which growth accelerated until 1985, see Figure Q. From 1985 to 2010 yield growth slowed markedly, see Figure T. Area planted to rice grew relatively rapidly until the late 1970s, see Figures R and T, after which growth slowed. In recent years most growth in area has come from minor rice producing countries.

Figure T Rice: growth rates of yields and area planted, 1961 to 2010



Source: From FAOSTAT data

Wheat yields have grown since the early 1960s, but slowed notably since the early 1990s, see Figure Q. Area planted to wheat grew from the early 1960s to the early 1980s, after which it declined until about 2003; since when it has been rising again but has yet to regain the peak registered in the early 1980s, see Figure Q.

Response to the price spike of 2007/08

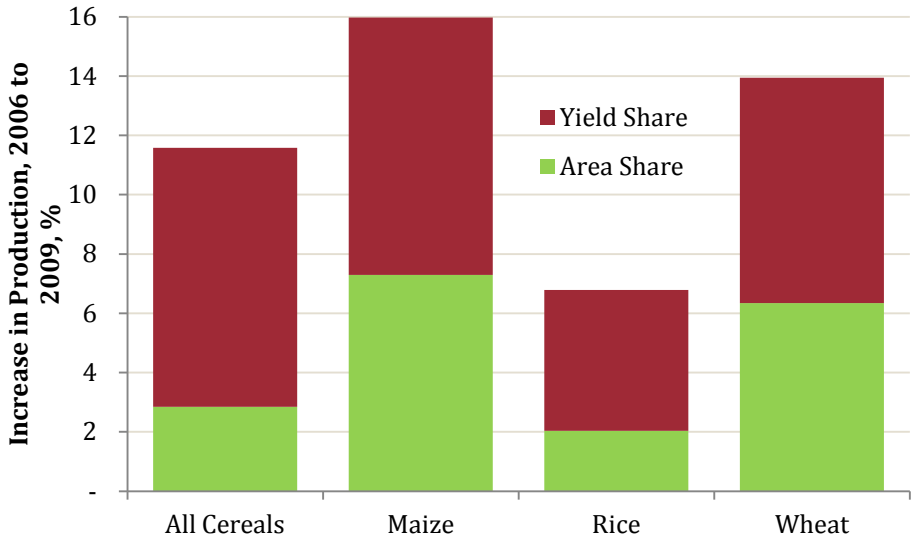
The price spike has led to an acceleration of cereals production: between 2006 immediately before the spike and 2009 by which time farmers had a chance to react to the higher prices, world cereals harvests rose by more than 11%, well ahead of consumption, see Figure U. Most of the increase, fully three-quarters, has come from higher yields rather than from an expanded area. By crop, the largest increase was almost 16% for maize, followed closely by wheat at 14%.

Rice has seen a surprisingly weak response, at less than 7% increase: surprising since it was the rice price that spiked most sharply in 2008, and it is the rice price that remains so much higher than in 2006 — prices since late 2008 for rice have been US$200 a tonne or more higher than before the spike. Is this because in the main rice producers, there is little suitable land to add to rice? Perhaps: but even allowing for that possibility, the yield response for rice has been roughly half that seen for other cereals.

This is puzzling: a possible reason for this is that high world rice prices may not have translated back into higher prices for farmers, as may be the case in several of the main Asian producers, where governments intervene considerably in rice markets.

The lack of supply response to higher rice prices explains why the rice price has remained so high.

Figure U Increased cereals production, share by area and yield, 2006 to 2009

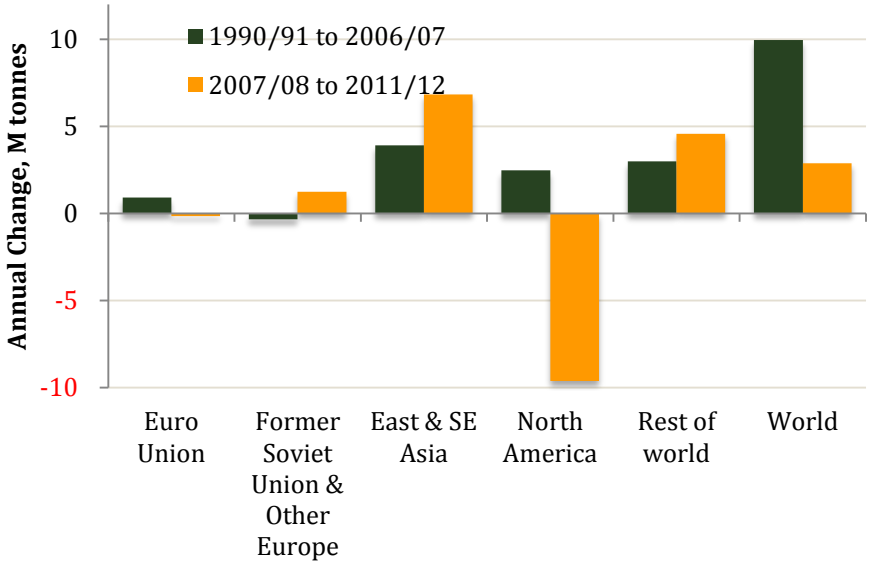


Source: Using data from FAO

Higher maize prices: so more use of other feeds for livestock?

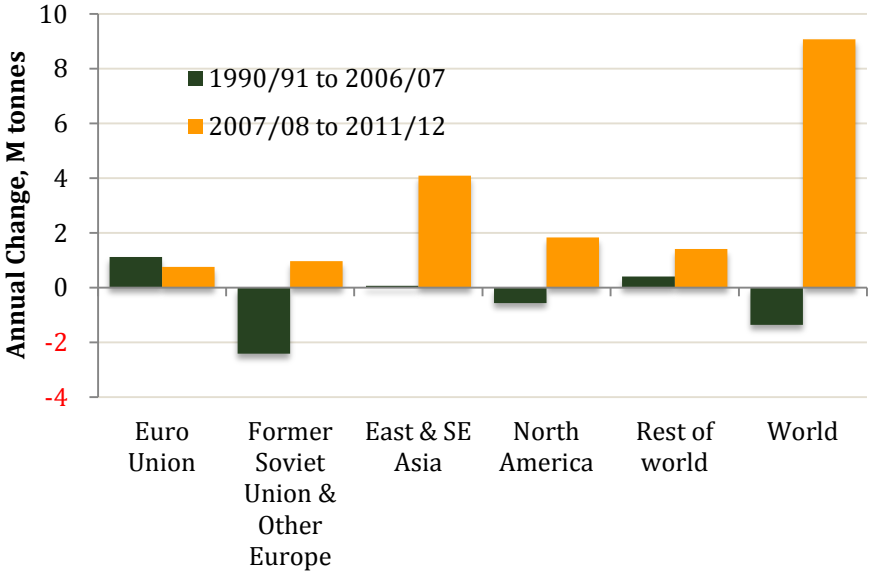
Most the world's maize is fed to livestock to satisfy demand for meat. As maize prices have risen since the price spike, has this led to maize being substituted by other feeds? Yes, to judge by the statistics on maize and wheat used for animal feed presented in Figures V and W.

Figure V Change in maize fed to livestock since 1990/91, annual average, M tonnes



Source: from USDA data

Figure W Change in maize fed to livestock since 1990/91, annual average, M tonnes



Source: from USDA data

In the 16 years from 1990/91 to 2006/07 before the price spike, maize use for feed increased by an average of almost 10M tonnes a year: in the four subsequent years, that slowed to less than 3M tonnes. For wheat used to feed livestock, the change has been the reverse: in the 16 years before the spike, wheat used for feed actually fell; after the spike, it has risen by an average of more than 9M tonnes a year. It thus seems that wheat is being substituted for maize: to be expected given the erosion of the premium in price that wheat has had over maize.

The story is more complicated when disaggregated by some of the main consuming regions.[17] North America shows an extraordinary change in maize used for feed: growing before the spike,

[17] Annex 4 shows how cereals used for feed have evolved by region since 1990/91.

the amount used has fallen heavily since then — by an average of almost 10M tonnes a year. This has arisen partly because of the growing use of maize for ethanol.

The diversion of maize to ethanol, however, does not affect livestock feed as strongly as might be expected, thanks to the substitution of ***dried distiller's grains with solubles (DDGS),*** a by-product from ethanol distillation, for maize and soybean meal. Roughly one-third of every tonne of corn distilled to ethanol returns as livestock feed in the US as DDGS, replacing corn and soya meal, mostly for beef or dairy cattle.[18]

Against the recent fall in maize being used for feed in North America can be set the strongly growing use in East and Southeast Asia, and in the rest of world, with South America prominent.

For feed wheat, every region other than the European shows increased growth in use since the spike, with absolute decline in use changing to increases in the Former Soviet Union and Other Europe[19] and in North America.

What of other feeds that might substitute for maize? There are no signs of other grains substituting for maize: use of barley, oats and sorghum for livestock has been in decline for the last two decades, with no sign that the price spike has changed that.

Other than cereals, ***cassava*** would be prime candidate to replace the energy component of animal feedgrains.[20] Although there has been an increase in both area planted and yields in the 2000s, see Figure W, almost all of this occurred before the spike began in 2007. So far there are few signs that high maize prices may be stimulating cassava as a replacement, although FAO estimates cassava production in 2011 to be up by 6%. (FAO Outlook Nov 2011, 5)

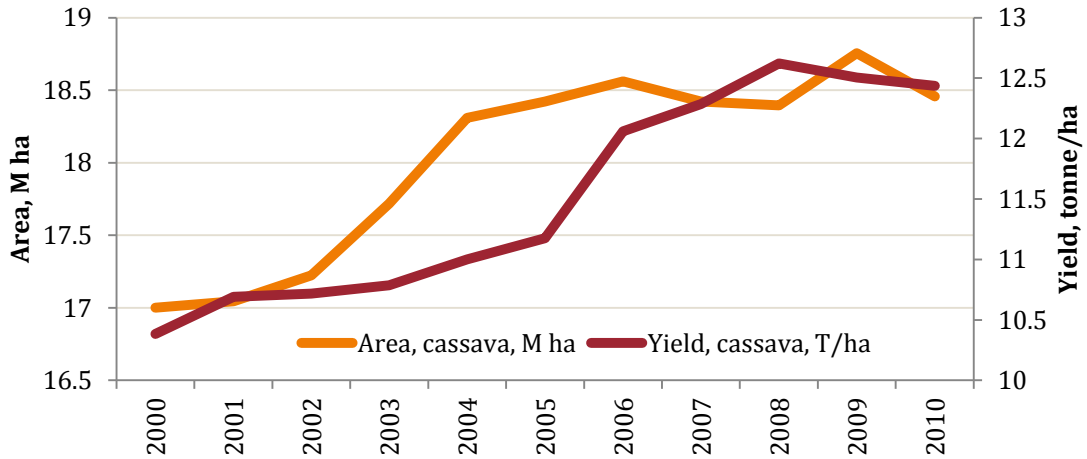
[18] Hoffman, Linwood A., & Allen Baker. Oct 2011. Estimating the Substitution of Distillers' Grains for Corn and Soybean Meal in the U.S. Feed Complex. USDA.

The rising importance of DDGS as a feed means that when computing the greenhouse gas emissions from maize grown for distilling, an offset may be made for the by-product, subtracting avoided production of soybeans. If it is claimed that DDGS reduces the area that might have been converted to soybeans in South America, the offset can very large. Ethanol plants in the UK claim that their emissions footprint is thereby negative.

[19] There was an abrupt fall in the use of wheat and to a lesser extent of maize in the old Eastern Bloc in the early 1990s as economies ceased to be centrally planned and moved to markets. Since the late 1990s, use of grains for livestock has started to grow again, but remains well below its former levels.

[20]Cassava used to make starch also produces by-products that can be used for feed. For instance, in Thailand, animal nutritionists recently examined the viability of dried cassava pulp (a byproduct of starch processing) as a maize substitute in poultry diets, prompted by the higher maize prices and lower availability. They found that dried cassava pulp can be used as an energy source for poultry, and blended to be up to 8% of broiler diets. [S. Khempaka; W Molee & M. Guillaume, 2009. Dried cassava pulp as an alternative feedstuff for broilers: Effect on growth performance, carcass traits, digestive organs, and nutrient digestibility. The Journal of Applied Poultry Research. http://japr.fass.org/content/18/3/487.full]

Figure W Cassava, yields and area 2000 to 2010

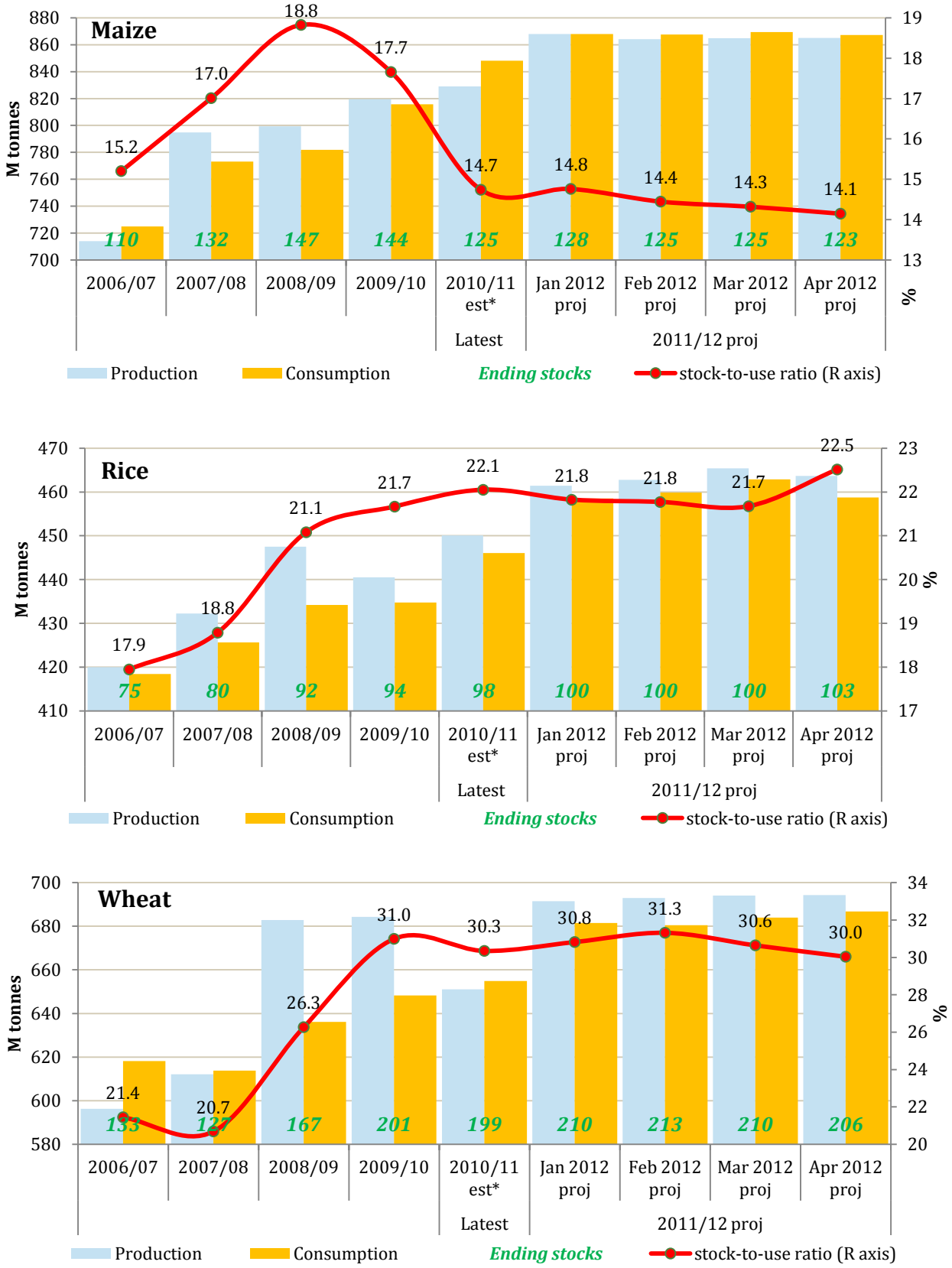


Source: Constructed with FAOSTAT data

In ***sum***, then, there has been a move away from maize and in favour of wheat as a consequence of the higher prices of maize that have prevailed since the 2007/08 price spike. The surprise here is the apparent lack response by cassava, a crop that grows well across large parts of the tropics. That delay, however, may owe something to the longer production cycle of cassava compared to cereals: cassava can take 18 to 24 months to develop its full yield. It will be interesting to see how much land is planted to cassava in the coming years.

Annex 1 Maize, rice, wheat — latest annual projections from USDA

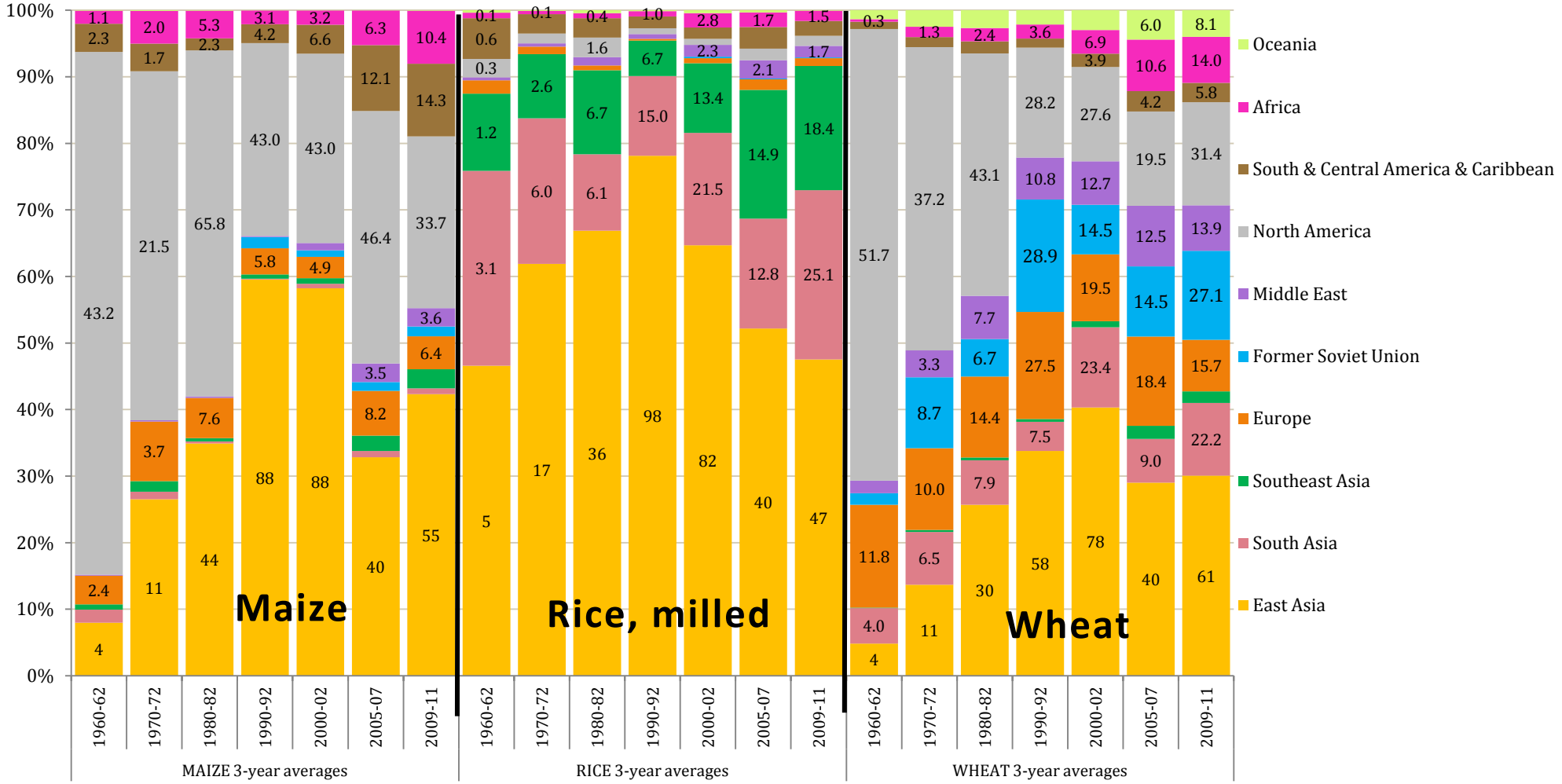
Figure A1.1 Global production, consumption, stock-to-use ratios, ending stocks



Source: USDA FAS and USDA WASDE, Jan to April 2012. **Note:** For maize, the 2010/11 estimate is revised from the Feb 2012 WASDE figure used in the last update, so that the stock-to-use ratio changes from 15.3 to 14.7% for 2010/11

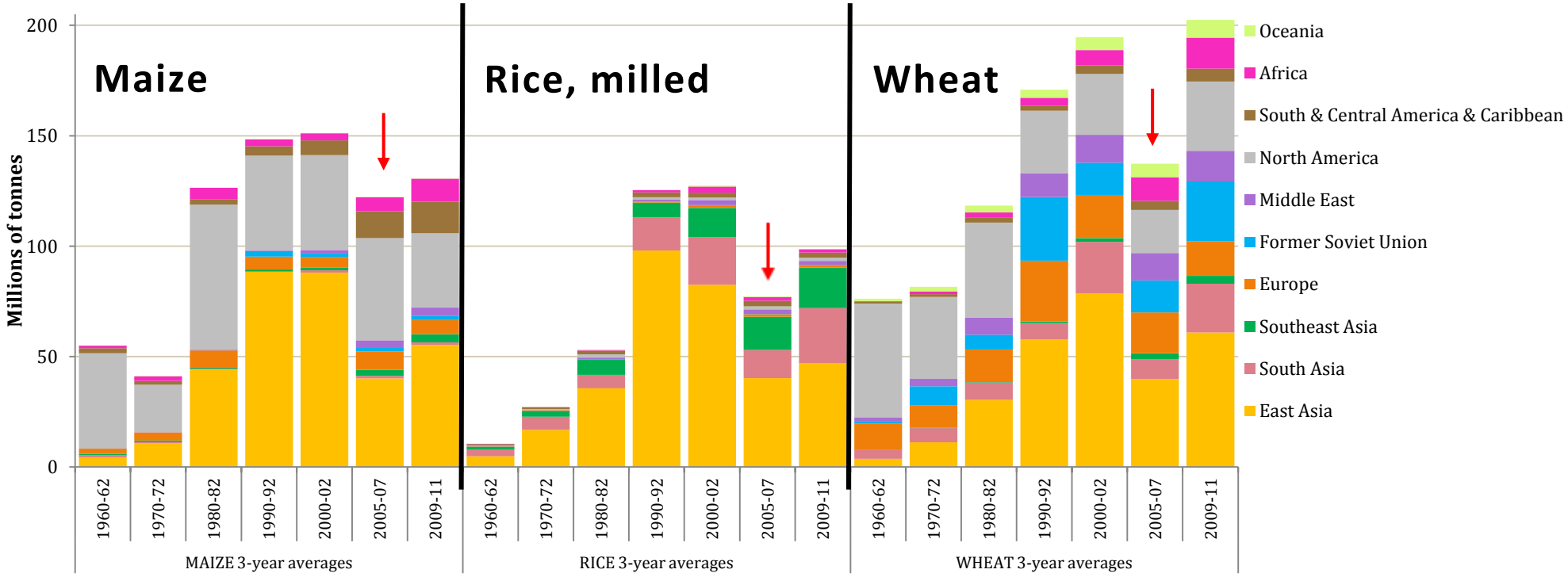
Annex 2 Stocks — where are they now, compared to historical distribution & levels

Figure A2.1 Relative distribution of key cereal stocks held by region



Source: With data in USDA FAS. **Note**: Labels are in millions of tonnes. Rice is on a milled basis

Figure A2.2 Distribution of key cereal stocks through time, levels



Source: With data from USDA FAS

Table A2.1 Stock to use ratios for key cereals by region (maize, rice, wheat aggregated)

	1960-62	1970-72	1980-82	1990-92	2000-02	2005-07	2009-11
East Asia	11.9	21.5	37.6	64.8	58.2	27.7	33.6
South Asia	10.7	12.6	10.7	12.1	20.4	9.2	17.8
Southeast Asia	4.8	7.2	11.3	9.0	13.6	15.2	17.3
Europe	13.7	9.8	13.5	20.8	13.1	13.7	11.4
Former Soviet Union	2.0	8.4	5.3	26.0	20.8	18.3	31.1
Middle East	9.9	15.9	23.7	24.5	25.7	24.7	24.3
North America	80.7	38.6	59.7	30.8	25.0	20.3	17.8
South & Central America & Caribbean	12.1	8.3	9.4	11.2	12.7	16.2	17.3
Africa	5.8	8.9	13.2	9.0	11.7	14.3	16.6
Oceania	42.8	57.8	88.3	75.8	84.8	72.8	99.9
WORLD	**24.0**	**17.8**	**26.2**	**32.0**	**29.4**	**19.0**	**22.2**

>20 – 30
>30 – 50
>50

Relative to other periods, stocks (and stocks relative to use), which dropped over the 2005/07 period have been rebuilt for the 2009/11 period; though this has happened to a much greater extent with wheat and rice than with maize.

Source: With data from USDA FAS

Annex 3 Maize, rice, wheat, and cassava – production and area harvested

The following figures show how much production, yield, and harvested area for maize, rice, wheat, and cassava has evolved from 1961 to 2010. Data is shown for global totals as well as for 3 aggregates — by the top 10 producers, exporters, and users for each crop. Table A3.1 shows the groups used to calculate the top 10.

Table A3.1 Country groups used to produce figures A3.1 to A3.16

Top 10 by production (Avg 2006-2010)

Cassava	Maize	Rice	Wheat
Nigeria	USA	China	China
Brazil	China	India	India
Thailand	Brazil	Indonesia	USA
Indonesia	Mexico	Bangladesh	Russia
DR Congo	Argentina	Viet Nam	France
Ghana	India	Myanmar	Canada
Angola	Indonesia	Thailand	Germany
India	France	Philippines	Pakistan
Viet Nam	Canada	Brazil	Turkey
Mozambique	South Africa	Japan	Ukraine

Top 10 by exporters (Avg 2005 - 2009)

Cassava	Maize	Rice	Wheat
Thailand	USA	Thailand	USA
Viet Nam	Argentina	Viet Nam	Canada
Indonesia	France	India	France
China, Hong Kong SAR	Brazil	USA	Australia
Netherlands	China	Pakistan	Russia
Costa Rica	Hungary	China	Argentina
Paraguay	Ukraine	Egypt	Germany
China	India	Uruguay	Ukraine
Belgium	Paraguay	Italy	Kazakhstan
Brazil	South Africa	Argentina	UK

Top 10 by use (2005 - 2007)

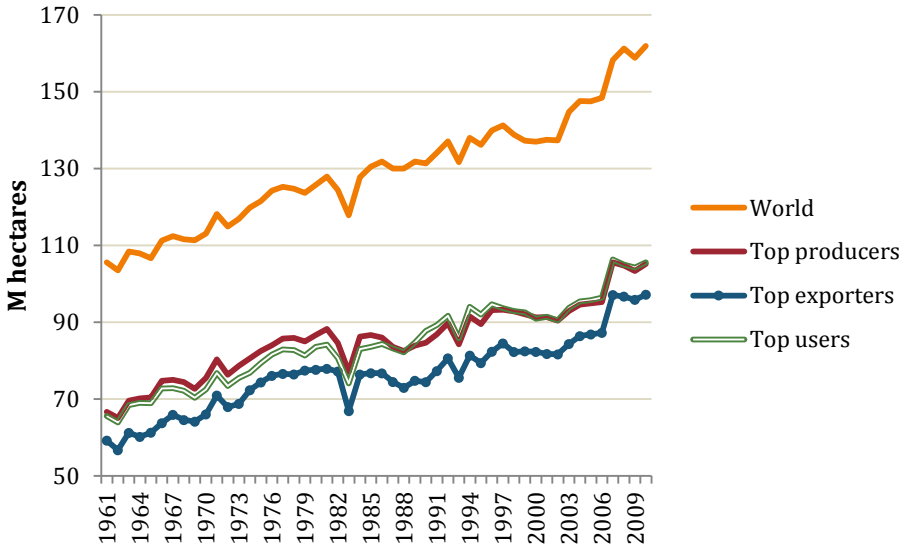
Cassava	Maize	Rice	Wheat
DR Congo	Mexico	China	China
Nigeria	China	India	India
Indonesia	Indonesia	Indonesia	USA
Brazil	India	Bangladesh	Russia
India	South Africa	Viet Nam	Pakistan
U Rep Tanzania	Brazil	Philippines	Turkey
Mozambique	Egypt	Myanmar	Iran
Ghana	United States of America	Japan	Egypt
Uganda	Nigeria	Thailand	Brazil
Angola	Ethiopia	Brazil	Italy

Source: Constructed with data from FAOSTAT

Note: For cassava export, where Thailand accounts for over 80% of exports, figures are aggregated for 7 countries, as 3 of the top 10 exporters recorded in FAOSTAT are non-producers (Hong Kong, the Netherlands, and Belgium).

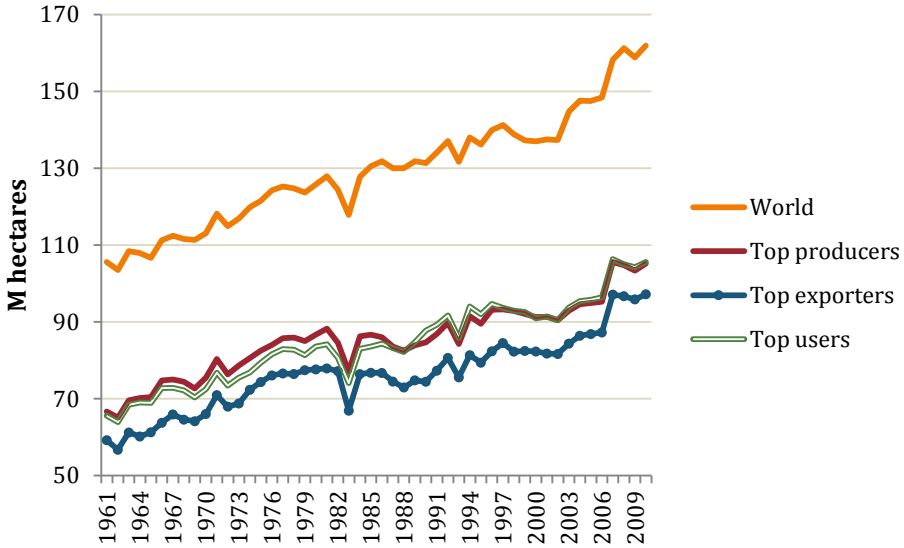
Maize production, area, and yield figures

Figure A3.1 Maize production, 1961 - 2010



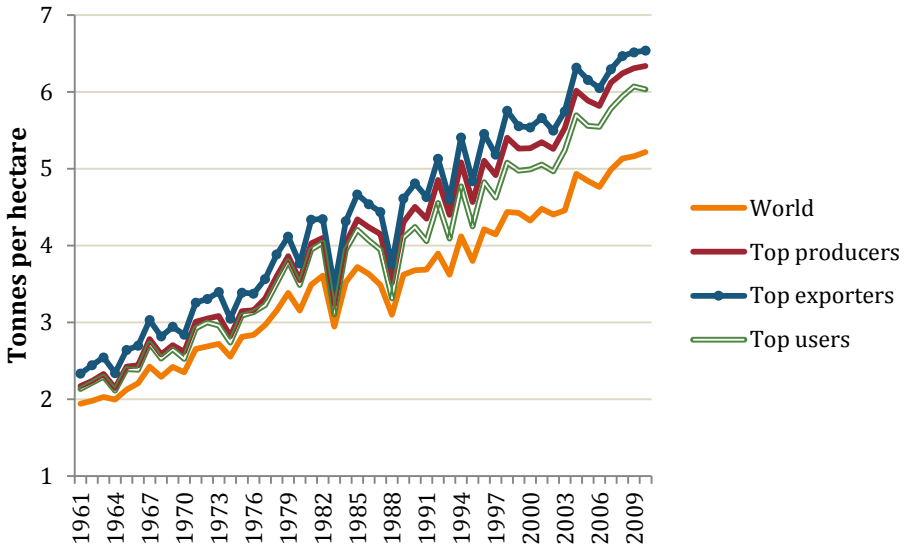
FAOSTAT

Figure A3.2 Area under maize production, 1961 - 2010



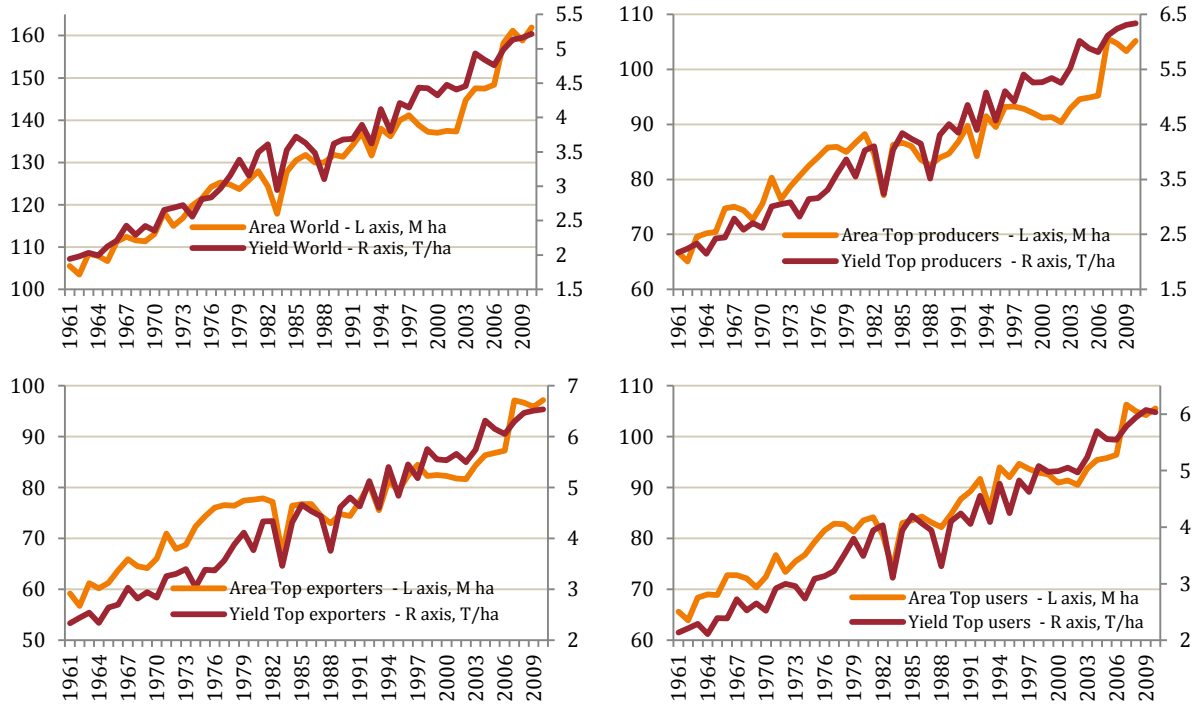
FAOSTAT

Figure A3.3 Maize yield, 1961 - 2010



FAOSTAT

Figure A3.4 Area and yield arranged by country cluster: MAIZE

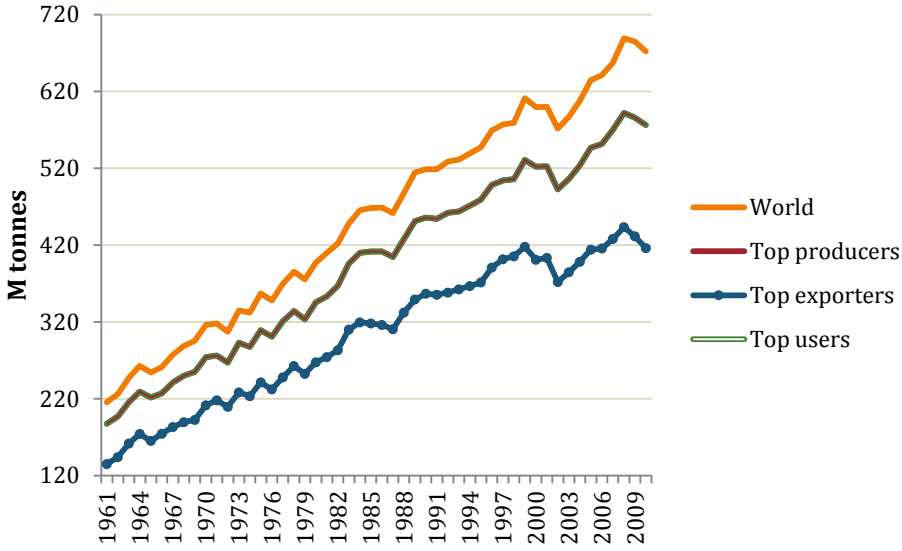


FAOSTAT

Rice production, area, & yield figures

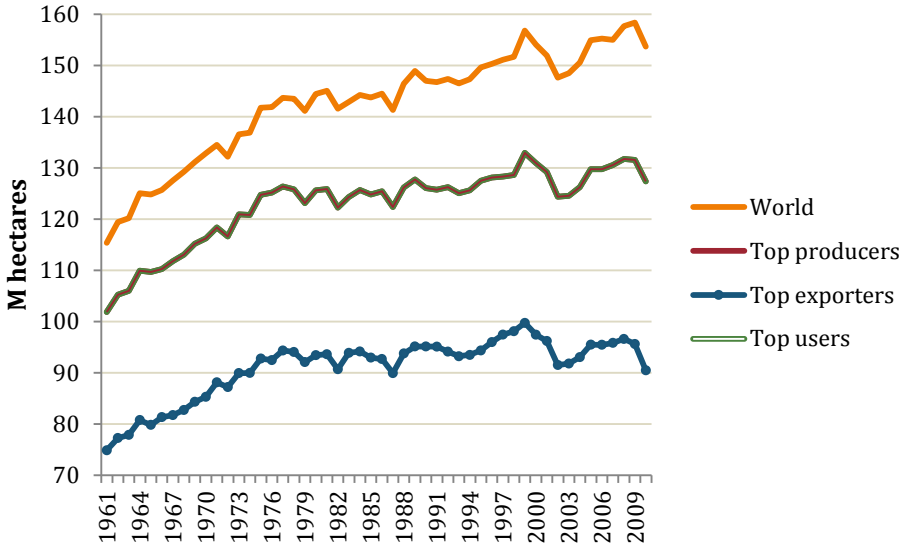
Figure A3.5 Rice production, 1961 - 2010

[Note: *top users & top producers the same for rice]



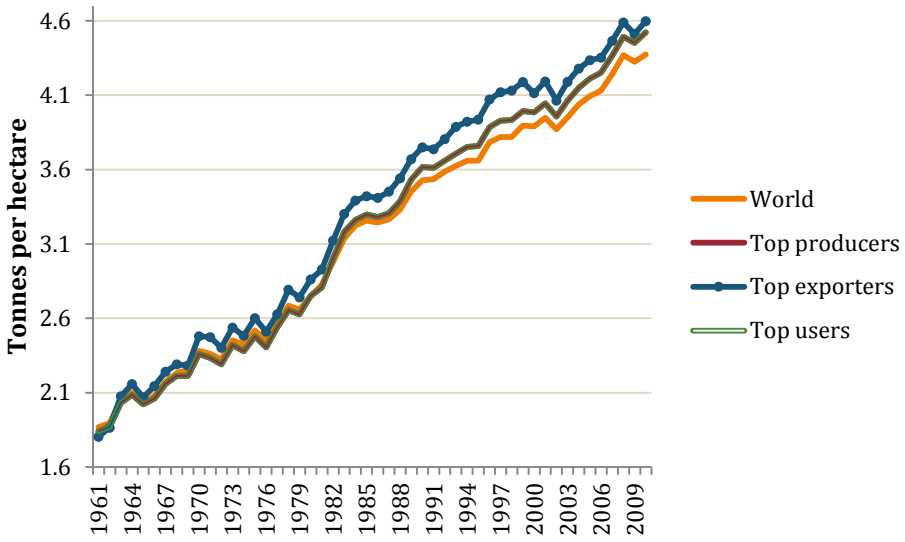
FAOSTAT

Figure A3.6 Area under rice production, 1961 - 2010



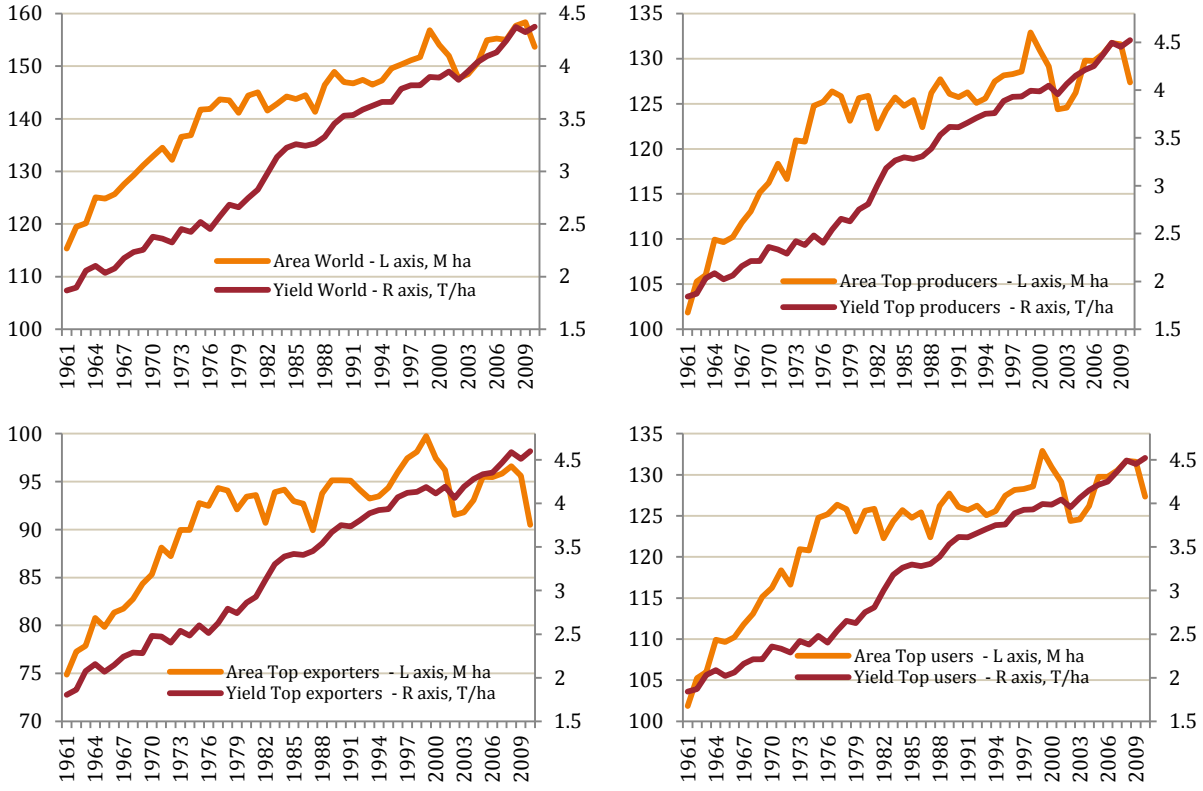
FAOSTAT

Figure A3.7 Rice yield, 1961 - 2010



FAOSTAT

Figure A3.8 Area and yield arranged by country cluster: RICE

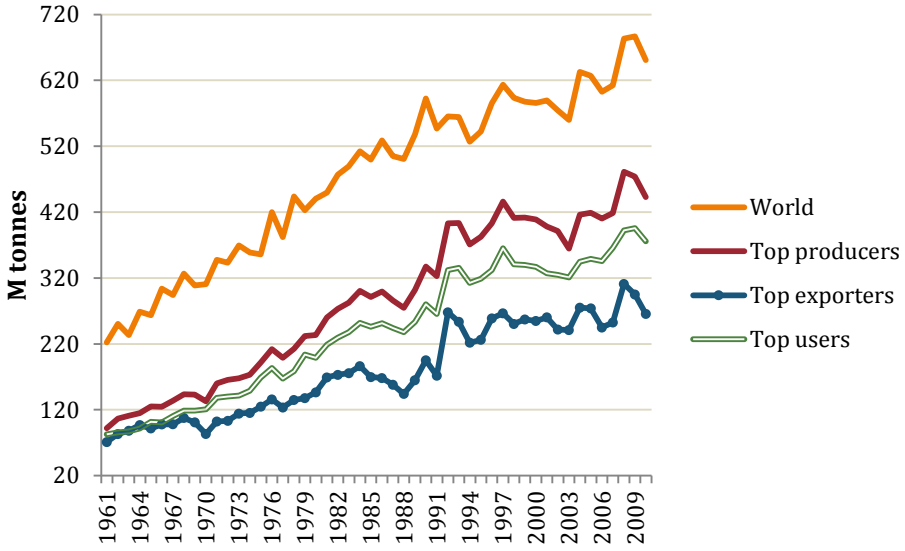


FAOSTAT

Wheat production, area, & yield figures

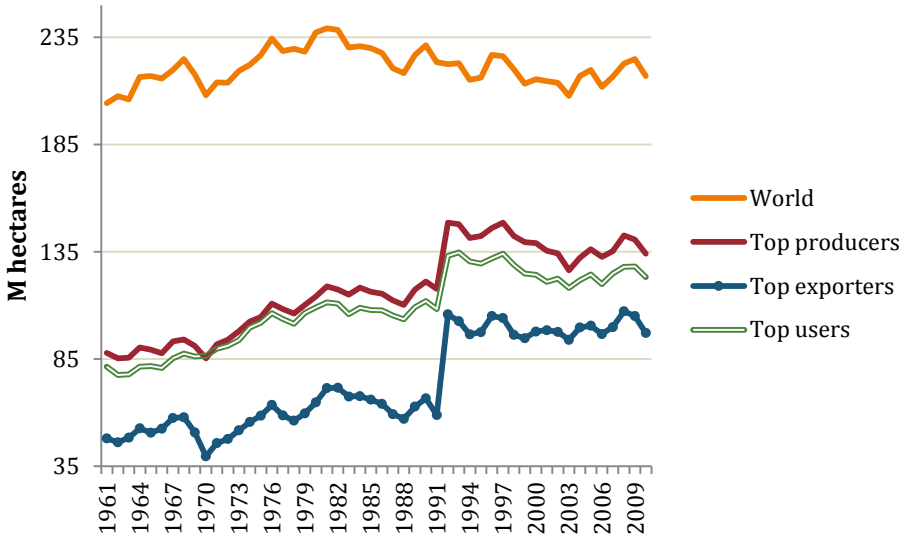
Figure A3.9 Wheat production, 1961 - 2010

[Note: Wheat statistics appear to have breaks around 1992 owing to inclusion of Russia]



FAOSTAT

Figure A3.10 Area under wheat production, 1961 - 2010



FAOSTAT

Figure A3.11 Wheat yield, 1961 - 2010

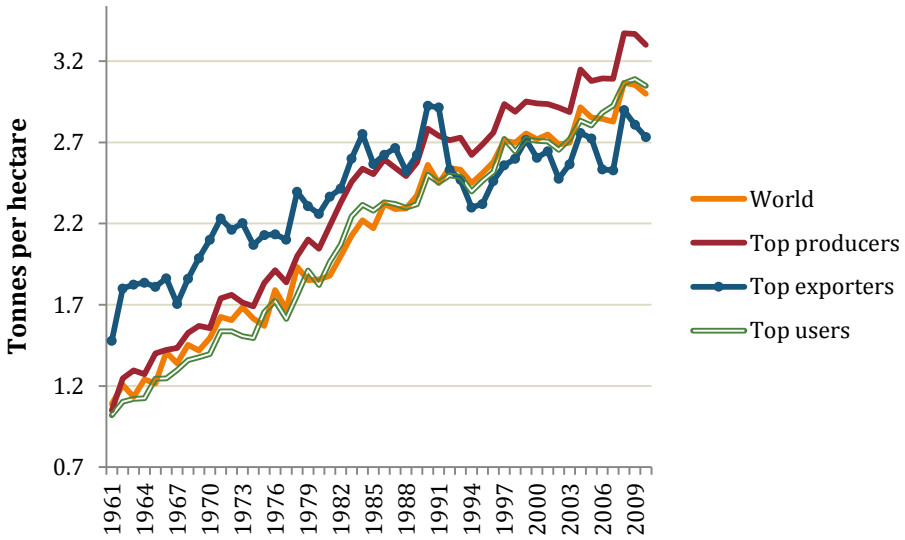


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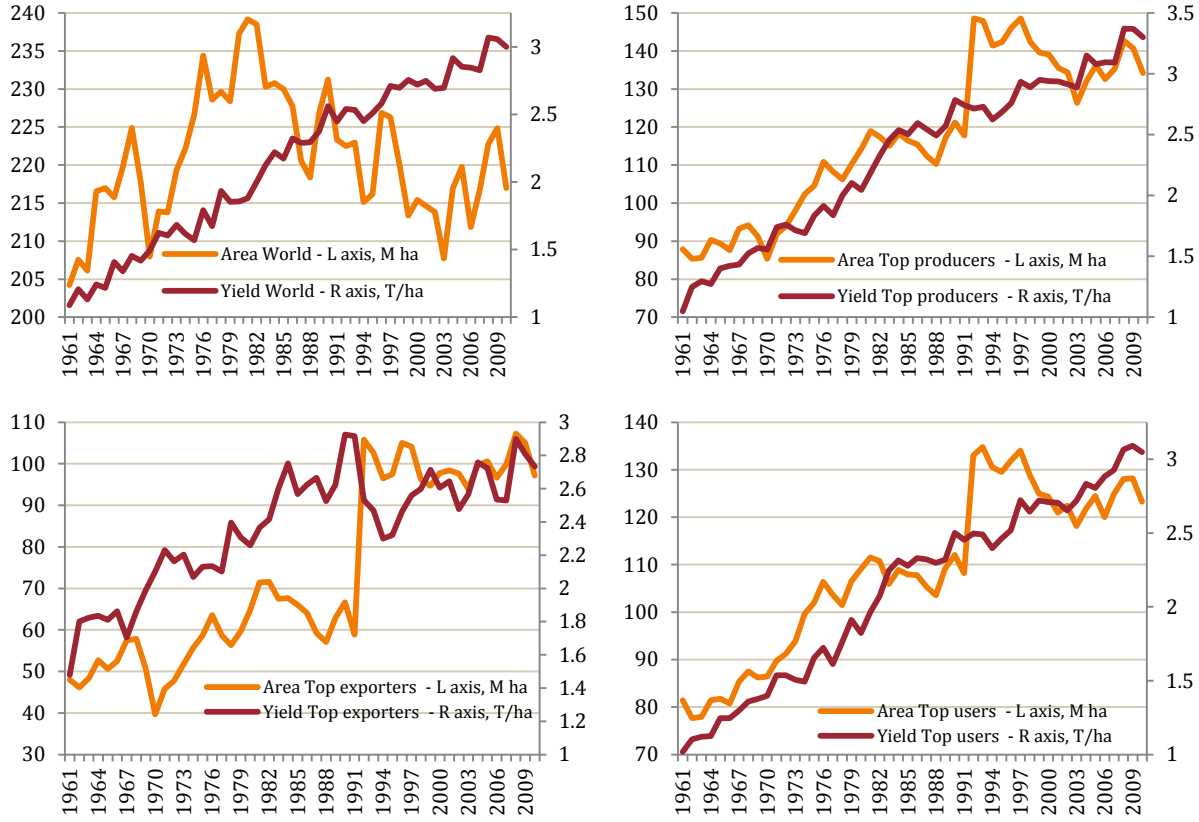
Figure A3.12 Area and yield arranged by country cluster: WHEAT



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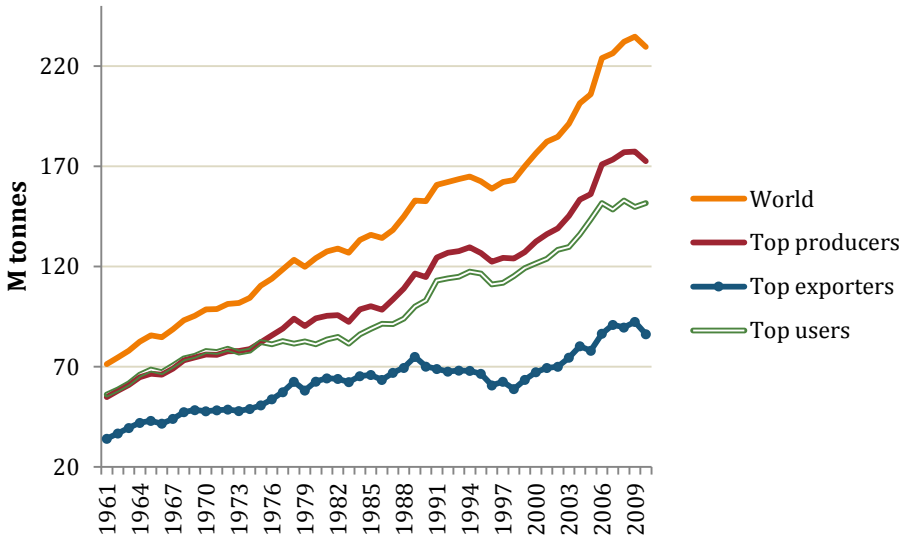
Cassava production, area, and yield figures

Figure A3.13 Cassava production, 1961 - 2010



FAOSTAT

Figure A3.14 Area under cassava production, 1961 - 2010

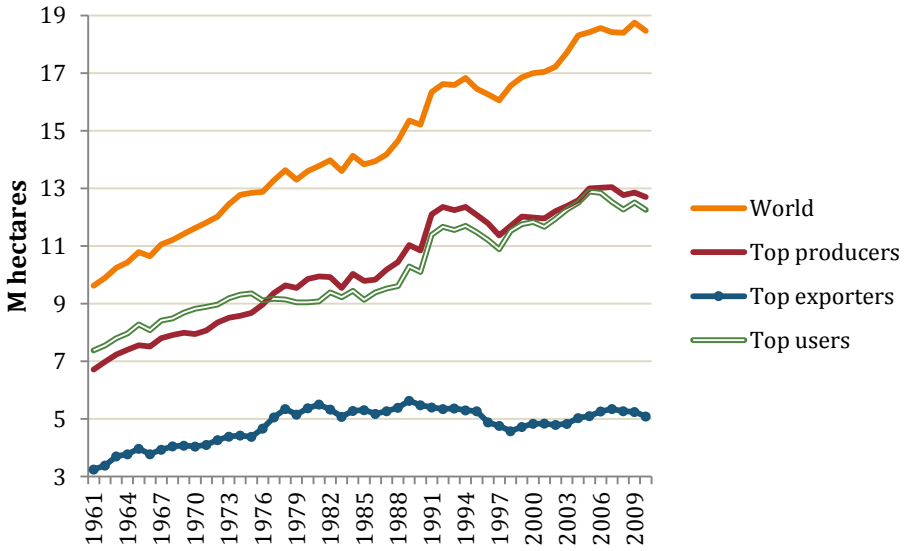


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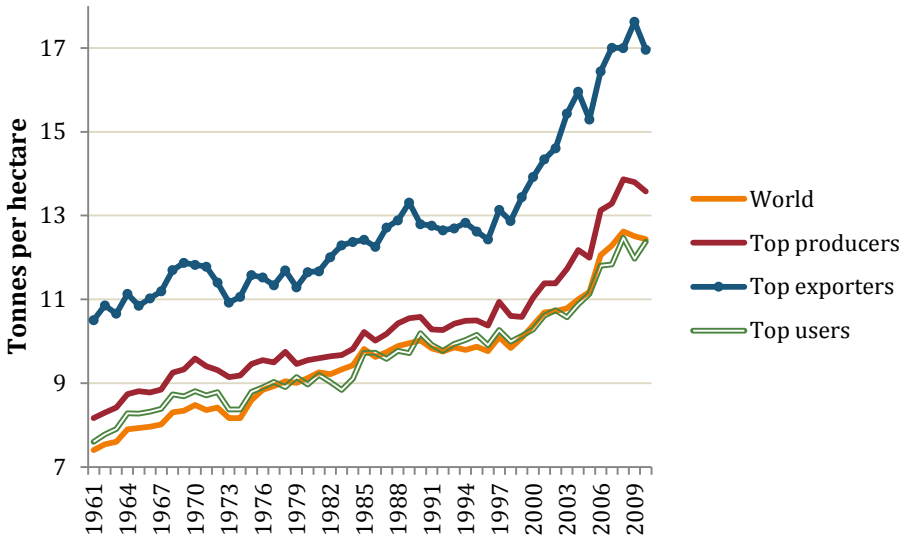
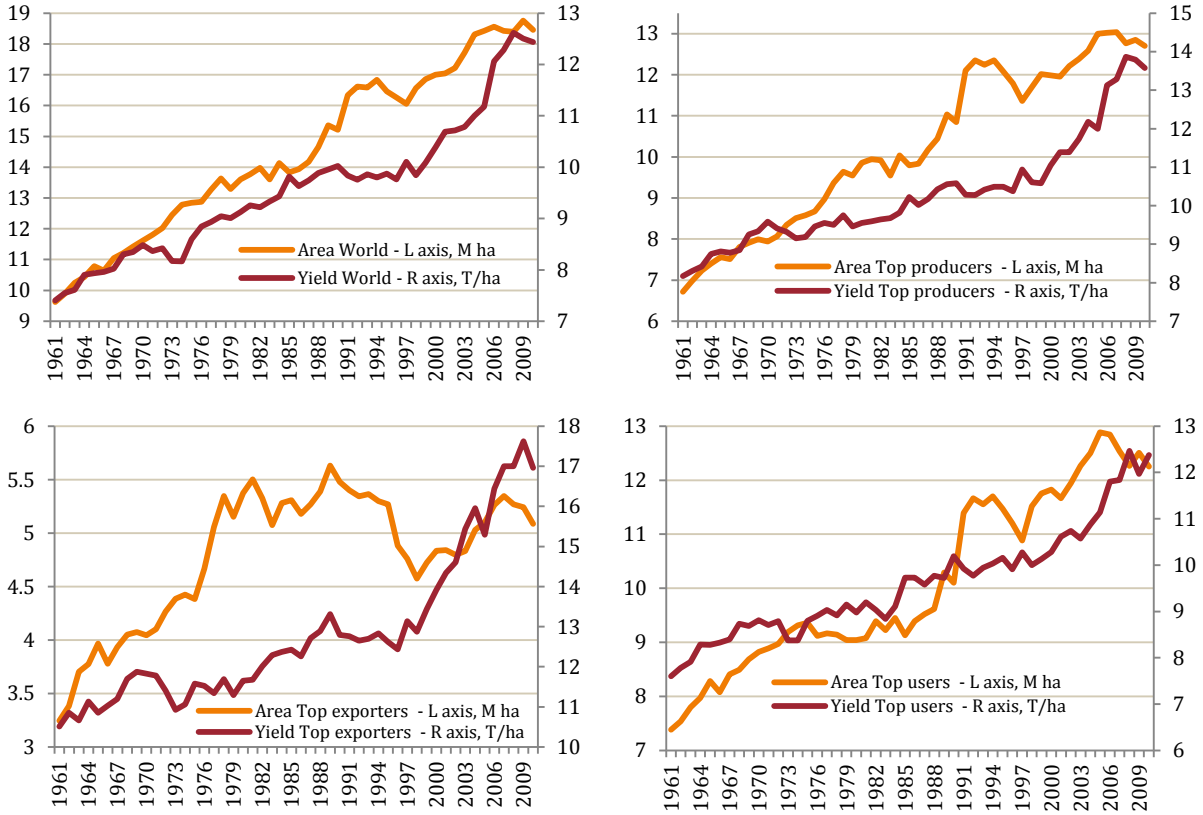
Figure A3.15 Cassava yield, 1961 - 2010



FAOSTAT

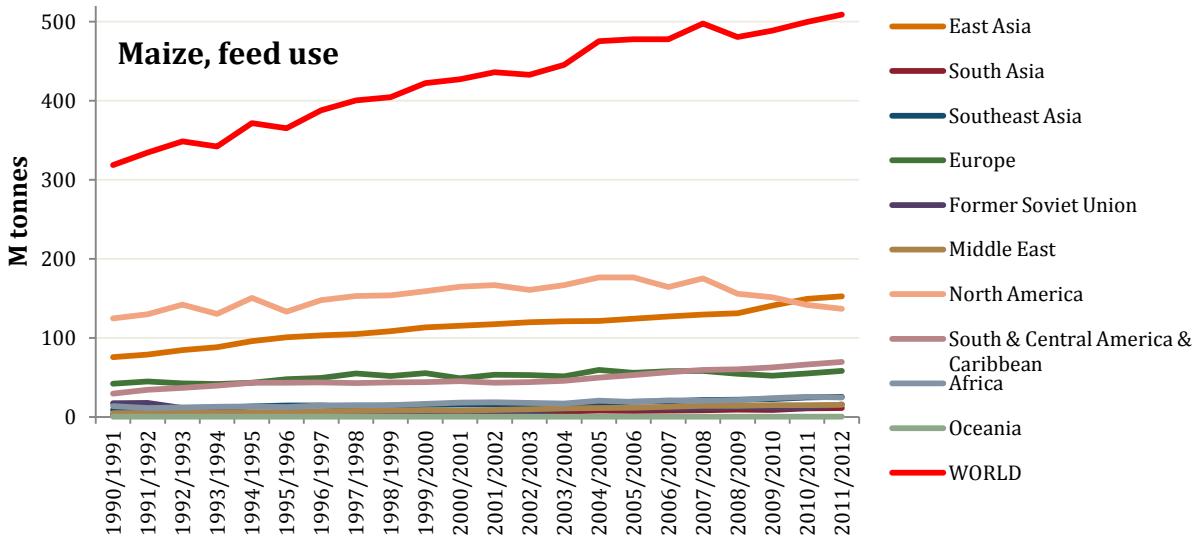
Figure A3.16 Area and yield arranged by country cluster: CASSAVA



FAOSTAT

Annex 4 Cereals used for animal feed, 1990/91 – 2011/12

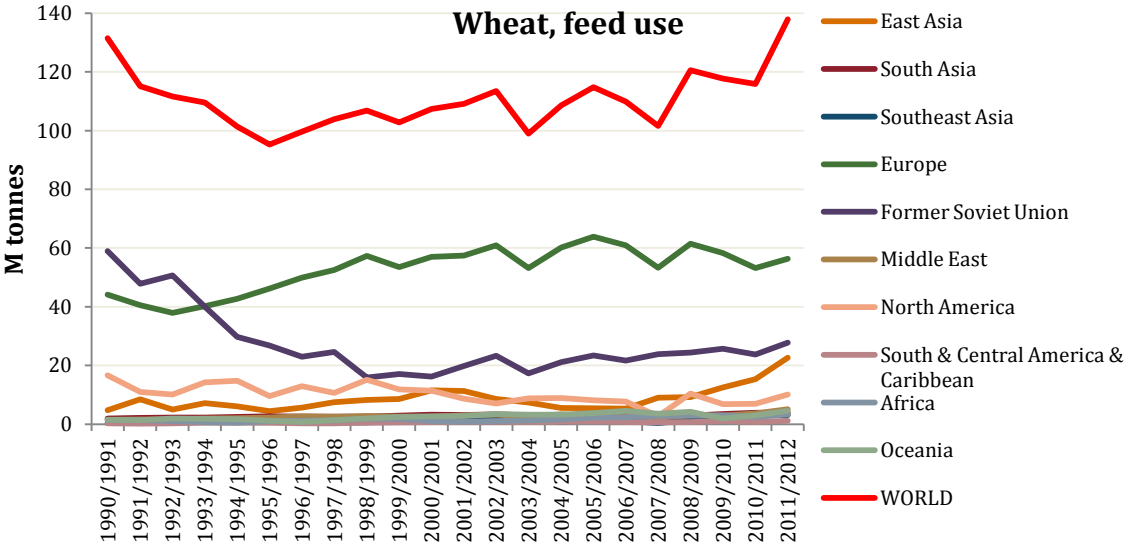
Figure A4.1 Maize used for feed, 1990/91 to 2011/12



Source: From USDA FAS data

Globally, maize used for feed saw a small dip in 2008/09. North American maize use for feed actually decreased from 2007/08 to 2011/12. Other regions saw increases over this period, with the exception of Europe, which saw a very small decline.

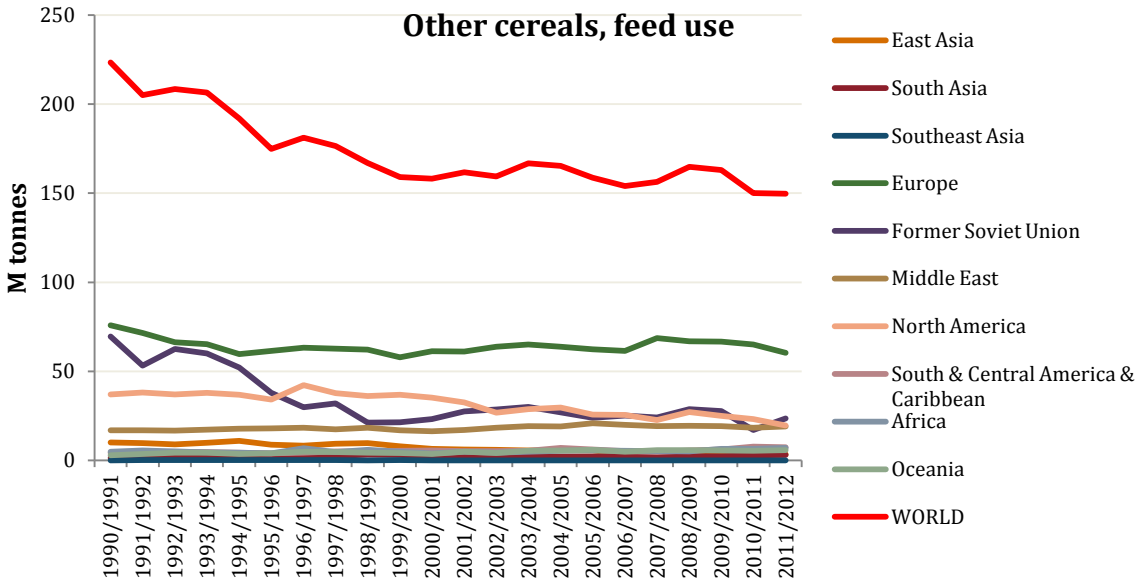
Figure A4.2 Wheat used for feed, 1990/91 to 2011/12



Source: From USDA FAS data

Globally, wheat for feed use appears to have been more than usually volatile from about 2003/04 to the current time. It has also increased over the last few years. These increases have been seen in most regions, except for Europe. East Asia has seen relatively the largest increases in using wheat for feed.

Figure A4.3 Other cereals used for feed, 1990/91 to 2011/12



Source: From USDA FAS data

Feed use of other cereals — such as sorghum, barley, oats, etc. — has been declining over the long-term. After 2007/08 it picked up in some regions, including South & Central America & the Caribbean; Africa (where it was already rising since about 2000); and South Asia.