



Is urbanization contributing to higher food prices?

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ABSTRACT Urbanization has been mentioned as one possible cause of higher food prices, and in this paper we examine some of the suggested links between urbanization and food prices. We conclude that urbanization, conventionally defined as the increasing share of the population living in urban settlements, is being conflated with related but separate processes, such as economic growth, population growth and environmental degradation. We discuss factors that affect food prices and conclude that the one important way in which urbanization in poor countries may affect food prices is that it increases the number of households that depend on commercial food supplies, rather than on own production, as their main source, and hence are likely to hoard food if they fear future price increases. One policy option for managing this is larger food reserves. Attempts to curb urbanization, on the other hand, would be ill-advised.

KEYWORDS diets / food prices / food reserves / hoarding / income growth / population growth / urbanization

I. INTRODUCTION

After many years out of the political limelight, agricultural issues returned with a vengeance during 2007. The explosive increase in food prices led to a similarly explosive increase in interest in agricultural policy and agricultural research. This interest has since subsided with the subsequent fall in food prices and with attention shifting to the financial crisis. However, although food prices have fallen again, they remain higher than they have been for a decade.

One concern that has been raised is that the rapid urbanization taking place in many developing countries has contributed to higher food prices. Thus, the Chinese government has set in place a policy to safeguard the overall area of agricultural land available in the country, one part of this policy being to limit the amount of land converted to urban use. Research reports with titles such as "Soil degradation caused by industrialization and urbanization"⁽¹⁾ or "Rapid urbanization in China: a real challenge to soil protection and food security"⁽²⁾ similarly suggest that urbanization is contributing to a loss of agricultural land. A recent UNCTAD policy brief lists the causes of higher food prices as "...population growth, urbanization and rapid economic development...amplified by recent droughts, slow supply response, the fall in the dollar, high energy prices and...increased demand for biofuels."⁽³⁾ Urbanization is clearly seen as one of the drivers of food prices, by policy makers, researchers and others. However, on closer examination, the links are less obvious than it might seem.

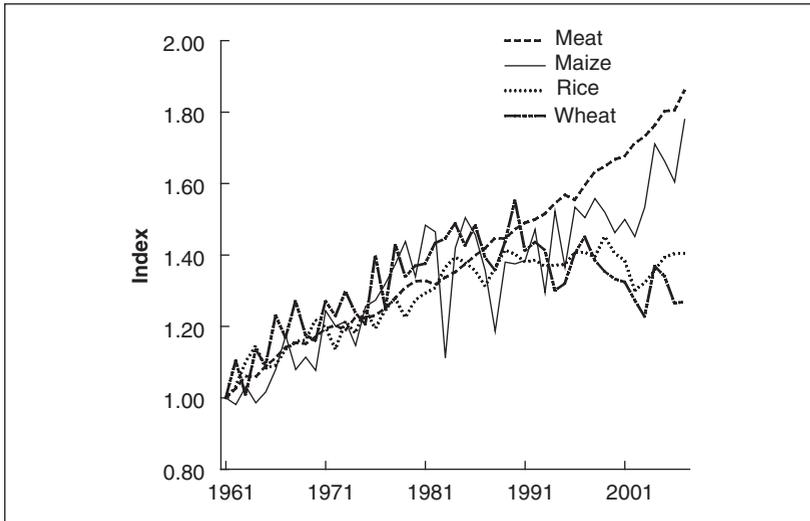


FIGURE 1
World per capita production of meat, maize, rice and wheat (1961–2007) with 1961 as index year

SOURCE: FAO online database, accessible at <http://faostat.fao.org>.

II. TRENDS IN FOOD PRICES

Between 1960 and 1990, world agricultural production per capita increased almost constantly (Figure 1), largely because of increased agricultural productivity. Apart from a spike in the 1970s, linked to the commodities price boom, prices have declined in parallel with the increase in food production (Figure 2).

These trends have partly reversed in the last few years. Productivity growth has slowed for wheat and rice, and per capita production has stagnated. World market food prices rose slowly during 2006 and sharply during 2007 (Figure 3). Even at their peak, food prices remained lower in real terms than at any time before 1980. Nevertheless, the reversal of the long-term trend raised concerns that food prices would remain high, and perhaps even continue to increase.

In countries where food is a large share of household expenditure, the rise in food prices created economic and political chaos. Responses to the food price spike varied; many countries attempted to contain the shock through price controls, export restrictions or other regulatory measures.

Food prices have now declined from their peak levels, but remain higher than they have been in recent years. Moreover, there are important differences between the current food price boom and that of the 1970s. Then, futures prices of food (prices of food sold for delivery at specified points in the future) were substantially lower than the spot prices of food sold for immediate delivery. This indicated that people in the business expected prices to fall, and this was in fact what happened. Currently, on the other hand, futures prices remain considerably higher than the spot prices of 2000–2005. This suggests that the general belief among people with

1. Blum, W E H (1998), "Soil degradation caused by industrialization and urbanization", in H-P Blume, H Eger, E Fleischauer, A Hebel, C Reij and K G Steiner (editors), *Towards Sustainable Land Use: Volume I, Advances in Geocology 31*, Catena Verlag, Reiskirchen, pages 755–766.
2. Chen, J (2007), "Rapid urbanization in China: a real challenge to soil protection and food security", *Catena* Vol 69, No 1, pages 1–15.
3. United Nations Conference on Trade and Development (2008), *Tackling the Global Food Crisis*, UNCTAD Policy Brief No 2, UNCTAD, Geneva.

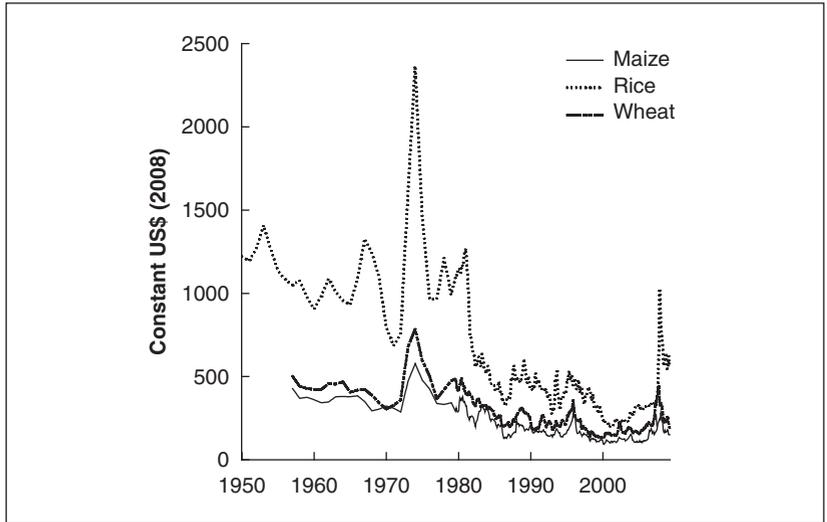


FIGURE 2
Price per tonne of the three main staple crops in constant 2008 US\$ (1950–2009)

SOURCE: IMF online database, accessible at <http://www.imf.org/external/np/res/commod/index.asp>.

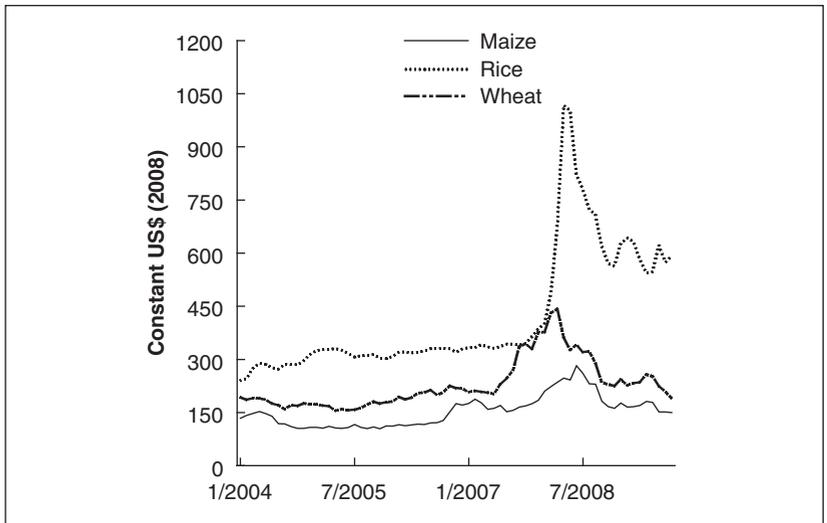


FIGURE 3
Price per tonne of the three main staple crops in constant 2008 US\$ (January 2004–September 2009)

SOURCE: IMF online database, accessible at <http://www.imf.org/external/np/res/commod/index.asp>.

insight into agriculture is that prices will not decline to past levels of their own accord. Thus, exploring the drivers of food prices remains important.

III. WHAT ARE THE LONG-TERM DRIVERS OF FOOD PRICES?

Food prices came into the limelight with the sharp price spike of 2007–2008; it is nonetheless useful to first consider long-term issues, as it seems likely that part of the price spike was caused by more long-term trends. Since prices also rose (although more slowly) during 2006, the spike of 2007 cannot be explained exclusively by events during that year.

a. Demand-side factors affecting food prices

i. Population growth

Needless to say, population growth leads to increased demand for food, pushing prices up. Currently, most of the world's population increase is taking place in urban areas. However, it would be incorrect to conclude from this that urbanization is driving urban population growth, and to blame the increasing impacts of urban populations on urbanization. In most developing countries, overall population growth accounts for half or more of overall urban growth, with the urbanization rate accounting for less than half, and often far less. Demographers widely believe that urbanization leads to slower population growth.⁴ Given that urbanization only explains part of urban growth, and may reduce overall population growth, it is misleading to blame population-induced increases in food prices on urbanization.

Therefore, the real question is whether the impacts of population growth would be smaller if the population growth mostly took place in rural areas instead. Unfortunately, simply comparing the impacts of rural and urban populations does not provide an answer, since the differences between these populations are not the result of their locations only. Nevertheless, rural–urban comparisons must be part of any assessment of the impacts of urbanization.

ii. Diets in rural and urban areas

Diets differ considerably between rural and urban areas, with urban households usually eating a more varied diet that includes more expensive food such as meat. Moreover, households tend to change their diets after moving from rural areas into cities. This is frequently seen as an example of a cultural shift induced by urbanization.

To some extent this is correct. Urban areas provide larger markets for food retailers and more options, both for specialization among retailers and for individual retailers marketing a more diverse range of foods. The variety of foods available to consumers therefore tends to be greater in urban areas,⁵ so that urban households often have more varied diets.

However, the frequently seen shift towards more expensive food is not caused by urbanization per se; the reality is more straightforward. Households frequently move into cities in the hope of getting higher

4. See, for example, Mace, R (2008), "Reproducing in cities", *Science* Vol 319, pages 764–766.

5. Regmi, A and J Dyck (2001), "Effects of urbanization on global food demand", in A Regmi (editor), *Changing Structure of Global Food Consumption and Trade*, Agriculture and Trade Report WRS-01–1, Market and Trade Economics Division, Economic Research Service, US Department of Agriculture, Washington, DC.

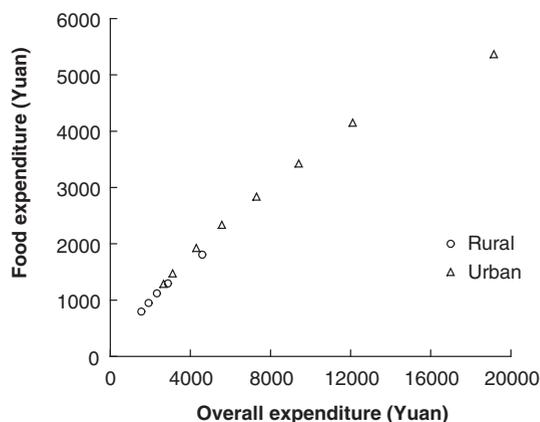


FIGURE 4
China: average annual expenditure on food in yuan as a function of overall expenditure for various income quintiles and deciles in rural and urban areas (2005)

SOURCE: National Bureau of Statistics of China (2006), *China Statistical Yearbook 2006*, China Statistics Press, Beijing.

incomes. If they succeed, their consumption patterns change and they consume more high-priced goods, including meat, just as higher-income households in rural areas do.

In this case, it is relatively easy to disentangle the effects of higher income from the effects of urbanization. Data from household expenditure surveys allow us to see what expenditure patterns look like for different household categories. From these statistics there is little indication that urbanization per se, rather than changes in income, is causing diet shifts.

Published Chinese statistics do not allow easy comparisons of spending on individual food categories between rural and urban areas; however, looking at overall food expenditure (Figure 4), we see that rural and urban households with the same levels of income have the same expenditure on food. There is no indication that urban households purchase more expensive food than rural households at the same level of income.

Similarly, looking at Indian data (Figure 5) on consumption of meat, fish, eggs and dairy products (meat consumption is low overall in India but consumption of dairy products is widespread), we see that although urban areas mostly have higher consumption levels, they also have higher incomes, and for those areas where incomes are comparable to rural incomes, the difference is negligible.

In other developing countries, the picture is similar. Economic growth in Vietnam has translated into increased consumption of luxury foods in both rural and urban areas.⁽⁶⁾ Mafuru and Marsh,⁽⁷⁾ studying urban and rural Tanzanian households at comparable levels of income, found little

6. Hoang, X T, T T P Dinh, T H Nguyen and Cecilia Tacoli (2008), *Urbanization and Rural Development in Viet Nam's Mekong Delta: Livelihood Transformations in Three Fruit-growing Settlements*, Rural-Urban Interactions and Livelihood Strategies Series, Working Paper 14, IIED, London, 64 pages.

7. Mafuru, J and T Marsh (2003), "An analysis of household food expenditure systems in Tanzania", unpublished manuscript.

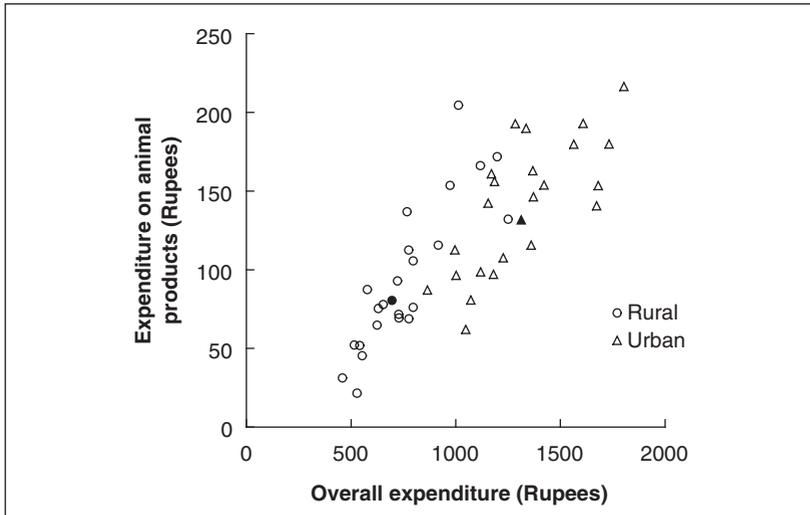


FIGURE 5

India: average monthly expenditure per household in rupees on meat, fish, eggs and dairy products as a function of overall expenditure for average urban and rural households in each Indian state (2006–2007)

NOTE: Filled symbols denote national rural and urban averages, respectively.
SOURCE: National Sample Survey Organization (2008), *Household Consumer Expenditure in India, 2006–2007*, Report No 527, Ministry of Statistics and Programme Implementation, National Sample Survey Organization, New Delhi.

difference in meat or fish consumption; the main difference was that urban households tended to consume more rice and less maize than rural households.

Thus, the difference between urban and rural households' patterns of food consumption is not caused by urbanization and cultural change; it is caused by income differences. Income changes in rural areas have the same impact on consumption as they would in urban areas.

iii. Income growth

However, this does mean that income growth leads to changed consumption patterns. The increased incomes seen in China over the past two decades have led to increased meat consumption. In India, where income growth has been less rapid, consumption of milk and dairy products has increased; meat consumption has also increased, but remains low.

This also means that although productivity per hectare has risen for all major staple crops, there has been a simultaneous shift in production from staple crops to other crops valued by high-income households, and to the growing of livestock feed. Meat production in particular is highly land intensive; on average, producing one calorie's worth of meat demands seven calories' worth of crops. Thus, agricultural land has been transferred to production that yields higher monetary returns but is less

productive in terms of calories per hectare. As we saw in Figure 1, world meat production has risen even faster than production of staple crops.

There are several reasons to keep urbanization and income growth conceptually distinct when considering the impacts of urbanization on food prices. First, while they are related, their interrelations are complex and it is misleading to imply that urbanization causes the economic changes that often accompany it.⁽⁸⁾ Second, if the impacts on food prices are in fact caused by income changes rather than by urbanization itself, this needs to be made explicit. It makes an enormous difference to policy making whether the alternative to urbanization is rural affluence or rural poverty. Third, there is often more economic inequality in urban than rural settlements, and this too needs to be made explicit when making rural–urban comparisons.⁽⁹⁾ Measures to prevent rural–urban migration are most likely to target informal settlements and slums, but this is not where the affluent urban dwellers with “urban” diets are likely to live.

b. Supply-side factors affecting food prices

i. Trends in agricultural productivity

When people abandon agriculture and move from rural to urban areas, larger farming units become possible. Larger farms can use machinery more efficiently; they usually also have better access to credit, so that they can more easily afford capital equipment as well as greater quantities of the inputs needed at the beginning of the planting season. This makes efficiency gains and increased production possible. Thus, rural–urban migration can contribute to increased productivity in agriculture, at least if the migration is large enough to reduce rural populations. Looking at actual agricultural productivity trends, there is certainly no indication that higher urbanization rates have been linked to reduced agricultural productivity on any continent.

Productivity increases have been lowest in Africa. Many African countries, where land ownership is not clearly defined, have insecure property rights. Among other things, this means that households moving into cities frequently cannot sell their land and can only maintain claims to it by continuing to farm it on a part-time basis. This may create a situation where urbanization can lead to reduced food production, because households that have moved to urban areas will have less time available for farming activities. In addition to this, limited access to credit for investment and limited access to important inputs such as fertilizer (and, in some cases, limited access to output markets as well) means that the economies of scale from larger farming units are not necessarily realized. In such cases, even if larger units are created, productivity may not increase much.

ii. Trends in agricultural research funding

Part of the increased productivity has been caused by improved farming methods and by improved crop varieties. Agricultural research has played a major role in improving yields per hectare in Asia, America and Europe. But these higher-yielding crop varieties are frequently unsuitable for

8. Bloom, D E, D Canning and G Fisk (2008), “Urbanization and the wealth of nations”, *Science* Vol 319, pages 772–775.

9. Tacoli, C, G McGranahan and D Satterthwaite (2008), “Urbanization, poverty and inequity: is rural–urban migration a poverty problem or part of the solution?”, in G Martine, G McGranahan, M Montgomery and R Fernández-Castilla (editors), *The New Global Frontier: Urbanization, Poverty and Environment in the 21st Century*, Earthscan, London, pages 37–53.

African agriculture, and although a fair amount of agricultural research has taken place for Africa as well, little has translated into changed agricultural practices. Agricultural productivity has increased in Africa, but considerably less than on other continents.

Moreover, even for those countries in the rest of the world where agricultural research has translated into increased productivity, much of this builds on research that took place decades ago. Funding for agricultural research has declined substantially in recent decades and this is now beginning to show. Agricultural productivity is no longer increasing at the pace that it did in the past. This is not directly due to urbanization, of course, but the shift of population from rural to urban areas may have led to a reduced interest in rural issues, to the extent that the productivity slowdown in agriculture translates into higher food prices in the cities. This reduced interest in agricultural productivity has been short-sighted.

iii. Loss of agricultural land due to urban expansion

Concern has been raised that urbanization may displace agricultural production through the expansion of urban areas onto agricultural land, so that less land is available for farming. Yet the area devoted to urban settlement is small compared to the land available for agriculture. In the Millennium Ecosystem Assessment,⁽¹⁰⁾ urban areas were estimated to cover about 7 per cent of the area within cultivated system boundaries. We should note that a significant part of this urban area remains cultivated; other studies⁽¹¹⁾ have produced far smaller estimates of the land actually covered by urban settlements. However, even if the 7 per cent estimate is used, one should remember that the world's agricultural productivity per hectare has been increasing by, on average, 2 per cent per year since 1960. Thus, a few years of normal productivity growth would be more than enough to replace all cultivated land lost to urban settlements in all of human history.

Chinese policy aims to secure enough cultivated land to support its anticipated future population peak of 1.6 billion (expected in 2030); urban expansion onto arable land is constrained as part of this policy. However, Chinese agricultural productivity has increased immensely in recent decades (Figure 6). If these productivity increases continue, China will not even need all of its current cultivated land area to maintain its current per capita production levels through the population peak years and beyond.

It is also highly questionable whether the building-over of arable land is caused by urbanization per se, rather than by population and/or income growth. Urbanization increases the amount of arable land covered by urban construction, but it also reduces the amount of arable land covered by **rural** construction; urbanization almost invariably involves the movement of people from less to more dense settlements. Moreover, urban expansion is not merely occurring because of urbanization and population growth but also because of declining urban densities.

Estimates of the distribution of built-over land in cities with populations over 100,000 are summarized in Table 1. The average built-over area in urban regions is 185 square metres per capita, but there are huge disparities between different income categories and between

10. McGranahan, G, P J Marcotullio, X Bai, D Balk, T Braga, I Douglas, T Elmqvist, W Rees, D Satterthwaite, J Songsore and H Zlotnik (2005), "Urban systems", in R Hassan, R Scholes and N Ash (editors), *Ecosystems and Human Well-Being: Current Status and Trends*, Island Press, Washington DC, pages 795–825.

11. See, for example, Angel, S, S C Sheppard, D L Civco, R Buckley, A Chabaeva, L Gitlin, A Kraley, J Parent and M Perlin (2005), *The Dynamics of Global Urban Expansion*, Transport and Urban Development Department, World Bank, Washington DC.

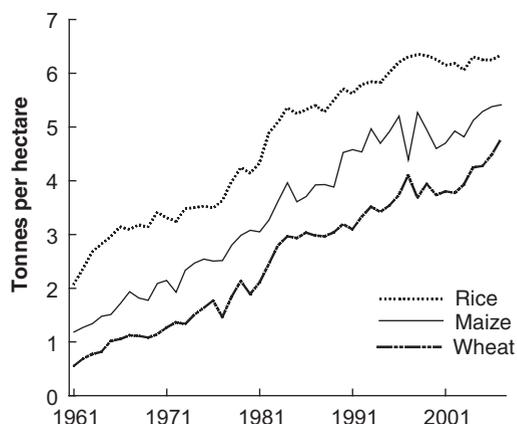


FIGURE 6
Chinese agricultural production (1961–2007)

SOURCE: FAO online database, accessible at <http://faostat.fao.org/>.

TABLE 1
Estimates of average built-up area (in square metres) per person for different regions and income groups for cities over 100,000 (1990–2000)

Category	1990	2000	Annual change (%)
Low- and middle-income countries	105	125	1.7%
Developed countries	280	355	2.3%
Region			
East Asia and the Pacific	65	105	5.1%
Europe	190	230	1.9%
Latin America and the Caribbean	145	145	0.3%
Northern Africa	100	110	0.8%
Other developed countries	360	435	2.0%
South and Central Asia	55	75	2.7%
Southeast Asia	40	60	4.4%
Sub-Saharan Africa	105	150	3.6%
Western Asia	155	170	1.0%
Income category			
Low income	65	85	2.6%
Lower-middle income	80	115	3.3%
Upper-middle income	155	170	0.7%
High income	280	350	2.2%
Global average	155	185	1.7%

SOURCE: Angel, S, S C Sheppard, D L Civco, R Buckley, A Chabaeva, L Gitlin, A Kralley, J Parent and M Perlin (2005), *The Dynamics of Global Urban Expansion*, Transport and Urban Development Department, World Bank, Washington DC.

different regions. For low-income groups in urban areas, the ones which low-income groups in rural areas should be compared to, the average built-over area per capita is only 85 square metres. Where land is scarce, the built-over land area per capita is even less.

The built-over area per capita is more difficult to estimate for rural areas, and to the authors' knowledge no such estimates have been made for the world as a whole. However, at least in richer countries, the land per unit of new housing is often far higher in rural than in urban areas.⁽¹²⁾ There is no evidence that the built-over area for groups at comparable income levels is generally lower in rural areas than in urban areas. We may note that the built-over land area rises dramatically with increasing incomes; thus, at least some of the building-over of land frequently associated with urbanization is in fact linked to income growth rather than to urban population growth.

iv. Environmental degradation

Urbanization is often linked to economic growth which, in turn, is often linked to increased environmental degradation. Again, however, there is not necessarily a causal link. Some environmental degradation linked to water pollution and poor sewage treatment tends to increase with urbanization, because the increased concentration of people strains the natural environment's capacity to assimilate the human population's waste products. However, such localized problems are usually dealt with when incomes rise.⁽¹³⁾

Other environmental degradation, such as increasing emissions of particulate matter, SO₂ or CO₂, can more appropriately be attributed to economic growth, or at least to the growth of specific economic activities and/or consumption, rather than to urbanization. That the overall environmental problems are usually worse in cities is partly because urban populations are more concentrated and partly because incomes are frequently higher.

In China, loss of soil quality caused by environmental degradation is far more important than loss of arable land to urban expansion.⁽¹⁴⁾ Less than 2.8 million hectares of arable land have been converted to urban use in the last 20 years; 20 million hectares are estimated to suffer from reduced productivity due to heavy metal contamination alone. Not surprisingly, environmental problems are greatest near urban areas, where most manufacturing is located. As a result, Chinese authorities have tightened pollution regulations in recent years; one effect of these regulations has been to push industries into rural areas where regulations are more lax and where pollution problems are now growing faster than in most urban areas.⁽¹⁵⁾ The impacts of pollution on soil quality are important for many other countries as well; however, if one is worried about these impacts, it does seem better to address pollution directly rather than to reduce urbanization in the hope that this will indirectly lead to improved soil quality.

v. Biofuel production

As we saw earlier, many farmers have shifted from staple food crops to other types of food production, such as meat, where the number of

12. See, for example, for the US, Heimlich, R E and W D Anderson (2001), *Development at the Urban Fringe and Beyond: Impacts on Agriculture and Rural Land*, Agricultural Economic Report 803, Economic Research Service, US Department of Agriculture, Washington DC.

13. For recent examples of the literature dealing with economic growth and environmental degradation, see reference 10; also see Marcotullio, P J and G McGranahan (editors) (2007), *Scaling Urban Environmental Challenges: From Local to Global and Back*, Earthscan, London, 366 pages.

14. See reference 2.

15. Alford, W P, R P Weller, L Hall, K R Polenske, Y Shen and D Zweig (2002), "The human dimensions of pollution policy implementation: air quality in rural China", *Journal of Contemporary China* Vol 11, pages 495–513; also Economy, E C (2007), "The great leap backward?", *Foreign Affairs* Vol 86, pages 38–59.

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calories provided for humans per hectare is substantially lower. Farmers have also shifted to other types of agriculture that do not contribute at all to the world's food supply. The most notable such shift is the dramatic increase in biofuel production that has taken place since 2000.

The development of biofuel production has meant that agricultural markets and energy markets are now far more closely linked than ever before. This is a new phenomenon and it makes it difficult to analyze the long-term drivers of food prices statistically, as the underlying structure of the markets involved has changed completely. It also means that policies aimed at affecting one of these markets, e.g., agricultural policy, climate policy or transportation policy, will spill over into the other markets and affect behaviour there as well.

In practice, policy makers in developed countries were slow to respond to the rising food prices during 2006; US subsidies to farmers for leaving farmland idle reached peak levels during 2007, with 8 per cent of cropland taken out of production during that year. Biofuel expansion was mandated by policies in the USA and the EU, and continued despite higher food prices; 23 per cent of the US maize crop in 2007 was used for ethanol (up from 6 per cent in 2006). Thus, even though global maize production increased by more than 7 per cent during 2007, less maize was sold as food than in 2006.

c. Increased reliance on commercially traded food

Historically, many countries have stored large quantities of food in government reserves for reasons of agricultural policy and food security. However, storing food is costly; funds are tied up in the meantime, and if prices fall the food will be sold at lower prices than those at which it

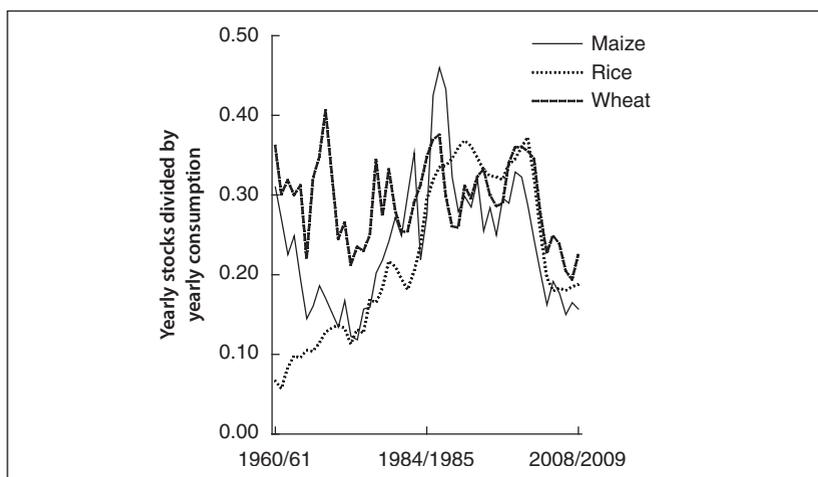


FIGURE 7
World stocks of maize, rice and wheat as shares of annual consumption, measured as stocks at the end of each year divided by that year's consumption of the crop (1960–2008)

SOURCE: United States Department of Agriculture online database, accessible at <http://www.fas.usda.gov/gats/>.

TABLE 2
World trade in grain (July 2004–June 2005)

Share of world exports	Maize	Rice	Wheat
Largest exporter	59.7%	24.9%	25.1%
Three largest exporters	87.8%	58.7%	52.5%
Five largest exporters	92.9%	82.4%	77.4%
World exports as share of world consumption	11.0%	7.1%	18.7%

SOURCE: United States Department of Agriculture, Foreign Agricultural Service online database, accessible at <http://www.fas.usda.gov/gats/>.

TABLE 3
Share of average annual household consumption expenditure on food in Eritrea's urban areas (1996–1997)

All urban areas	Asmara	Other highland cities	Western lowland cities	Assab	Massawa
36%	32%	47%	52%	49%	47%

SOURCE: Arneberg, M W and J Pedersen (2001), *Urban Households and Urban Economy in Eritrea: Analytical Report from the Urban Eritrean Household Income and Expenditure Survey 1996/97*, Fafo Institute for Applied Social Science, Oslo.

was purchased. Since food prices have in fact declined for decades, many governments have lost money in this way.

With increased international food trade and liberalized agricultural policies, food reserves have been reduced considerably (Figure 7). Twenty years ago, most countries managed the effects of a poor harvest on domestic prices by selling food from national reserves; today, most countries meet such shortfalls by purchasing food on the world markets.⁽¹⁶⁾ This means that, as long as there are no major supply disruptions in the global market, governments save money from reduced stockpiling. Moreover, the greater reliance on the world markets allows agricultural specialization and makes a shift towards higher-value crops possible for many farmers.

However, the world markets for the important food crops are all dominated by a few large exporters (Table 2). This means that poor harvests in a few of these countries can affect substantially the world market price of a crop. A World Bank report on rice warned several years ago that "... the ability of stocks to buffer supply shocks has been markedly reduced. Global rice trade liberalization would make low-income, net rice-importing countries more reliant on world rice trade, likely reducing political and food security."⁽¹⁷⁾

In parallel with this, domestic agricultural markets have been liberalized. Twenty years ago, urban households in developing countries purchased most of their food from stores supplied by government agencies, which in turn used food reserves as buffers to meet supply fluctuations.⁽¹⁸⁾ Currently, most urban households purchase their food through commercial channels instead. As Table 2 also shows, world trade is still limited compared to world

16. Surowiecki, J (2008), "The perils of efficiency", *The New Yorker*, 24 November.

17. Wailes, E J (2005), "Rice: global trade, protectionist policies and the impact of trade liberalization", in M A Aksoy and J C Beghin (editors), *Global Agricultural Trade and Developing Countries*, World Bank, Washington DC, pages 177–193.

18. See reference 16.

TABLE 4
Share of household income (including value of own production) spent on food in Namibia by urban and rural households (2003–2004)

	80% or more share	60–79% share	40–59% share	39% or less share
Urban households	0.6%	6.0%	18.3%	75.0%
Rural households	6.1%	36.2%	33.4%	24.3%

SOURCE: Central Bureau of Statistics (2006), *Preliminary Report. Namibia Household Income and Expenditure Survey 2003/04*, Central Bureau of Statistics, National Planning Commission, Windhoek.

TABLE 5
Per capita expenditure on food (including value of own production) in mainland Tanzania (2007) (nominal Tanzanian Shillings)

	Dar es Salaam	Other urban	Rural
Food – purchased	18,731	12,650	5,944
Food – not purchased	418	1,717	4,612
Total expenditure	42,074	16,418	16,418

SOURCE: National Bureau of Statistics (2008), *Tanzania Household Budget Survey 2007*, Analytical Report, National Bureau of Statistics, Dar es Salaam.

consumption; most food is still produced and consumed domestically. However, overall food reserves have dwindled and most countries now rely on the world markets to meet any shortfall in domestic supply.

As long as there are no sudden disruptions in supply, these liberalized agricultural markets are considerably more efficient than the government procurement agencies that came before them. However, the current set-up does mean that if several countries simultaneously need to meet additional demand for food by purchasing food on the world markets, this can have a huge impact on world market prices because overall trade is so limited compared to overall consumption. The current set-up also means that if this happens, and world market prices for food increase as a result, urban food prices will rise immediately; there is no longer much scope for using stored food from reserves to buffer price increases.

The household expenditure surveys referenced earlier can also be used to analyze the importance of food expenditure in household budgets; for many poor urban households, food accounts for more than half of the household expenditure, even with the food prices of the 2000–2005 period. Table 3 shows figures for Eritrean cities; these are average figures, so poorer households spend even larger shares of their income on food. More detailed data from Namibia (Table 4) show that a quarter of urban households spend more than 40 per cent of their income on food. The proportion is even higher for rural households; however, a large share of this “expenditure” is consumption of own-produced food rather than food purchased commercially. In Tanzania (Table 5), the average urban

household spends about half of its income on food and acquires 90 per cent or more of it through commercial channels. The average rural household spends even more, almost two-thirds, of its income on food; again, however, almost half of this food is own production rather than commercially purchased.

Moreover, it is important to note that in many developing countries, rural food prices are less sensitive to world market fluctuations than urban food prices. Changed world market prices will translate into changed urban food prices almost instantaneously, but may take months to translate into changed prices in rural areas. Thus, although rural food prices are often volatile for reasons linked to local conditions, they tend not to be very sensitive to world market fluctuations. Consumers in urban areas are highly sensitive to changes in world market prices; rural consumers, considerably less so.

This means that higher world market prices for food can be completely devastating for poor urban households in developing countries, and if they believe that prices may rise they are likely to “insure” against this by hoarding food. Richer urban households are hurt less by higher prices because food accounts for less of their overall expenditure, and hence they are less prone to undertaking speculative hoarding as a form of insurance – although if they are reasonably sure of higher prices, they can afford to hoard more easily than the poor.

Rural households will of course also be tempted to hoard food if they believe that prices may go up in future. However, the effects of world market price increases on these households are less disastrous than they are for the urban poor; most rural households grow some of their food themselves, and additional food purchases are mostly made in local markets with weak short-term links to the world markets.

Thus, the large increase in the number of urban poor, and the increase in the share of the world’s poor living in urban areas, also increases the number and share of people who are sensitive to food price increases and who may hoard food if they fear that prices will rise in the future. As we shall see in the next section, such hoarding, combined with the thin markets in several of the main food crops, may have played a role in the recent spike in food prices.

IV. WHAT CAUSED THE 2007–2008 FOOD PRICE SPIKE?

In Australia, the wheat crop has failed repeatedly in recent years. At the end of 2006, world stocks of wheat were at their lowest levels in decades; analysts predicted that one more failed crop in Australia would cause the world market price of wheat to rise sharply. When the Australian wheat crop did fail in early 2007, the dramatic increase in prices was not totally unexpected.

Research is still ongoing on what else happened in food markets during the 2007–2008 price spike.¹⁹ Several researchers have specifically noted that the market structure in many food markets, and the changing linkages between food markets and other markets such as those for fuel, make it more difficult to examine the drivers of food prices statistically than it is to examine the drivers of prices in many other markets. However, it seems likely that some of the long-term factors discussed earlier (notably, the shift towards biofuel production) contributed to the food price spike. In addition, the high oil prices during 2007 increased demand

19. See Organization for Economic Cooperation and Development (2008), *The Relative Impact on World Commodity Prices of Temporal and Longer-term Structural Changes in Agricultural Markets: a Note on the Role of Investment Capital in the US Agricultural Futures Markets and the Possible Effect on Cash Prices*, Trade and Agriculture Directorate, Committee for Agriculture, OECD, Paris; also Timmer, C P (2008), *Causes of Higher Food Prices*, ADB Economics Working Paper Series 128, Asian Development Bank, Manila.

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for all available substitutes for oil, including natural gas and biofuels, thus increasing their prices as well. Expensive oil and natural gas led to higher transportation costs and (more importantly) to higher prices for fertilizer, further discouraging traditional food crop production.

Many people discussing the price boom in late 2007 blamed financial speculators such as hedge funds and pension funds; for instance, the OECD⁽²⁰⁾ suggests that financial speculation played an important role. However, it is not obvious how this would have taken place in practice. It is clear that there was a great deal of financial activity taking place in the markets for future agricultural commodity deliveries. However, speculation about future prices can only have indirect effects on current prices.

Three important points should be noted. First, even if people believe that food prices will rise in the future, the only way in which this can lead to higher current prices (unless production changes) is through increased hoarding of food. Second, futures prices remained lower than spot prices, indicating that most speculators believed that prices would eventually go down (as indeed they did) rather than up. Third, rice, the crop for which prices rose the most, was also the crop for which the financial derivatives trade was the smallest.

Hoarding by individual producers and consumers probably played a greater role. A recent study⁽²¹⁾ estimates that if all households using rice as their staple food increased their holdings from one week's supply to two, this extra demand would correspond to a quarter of the normal world trade in rice over an entire year; the study estimates that this could raise the price of rice by approximately 170 per cent. Obviously, households increasing their holdings of rice from one week's supply to two would go undocumented in official statistics. However, it is well documented that rice reserves were subjected to "runs" by retailers and households seeking to purchase rice while it was still available, suggesting that such hoarding behaviour was an important factor.

In addition to this, there was frantic stockpiling by governments in response to the increases in food prices. Several food-exporting countries regulated exports in order to limit the impact of the food price boom on domestic consumers. These actions contributed to higher world market prices, especially for rice. It should be noted that prices continued to rise in many countries even after they had effectively sealed their borders to trade and should no longer have been affected by world market prices. This suggests that both producers and consumers expected even higher prices and were stockpiling food against this eventuality.

The Japanese government announced in May 2008 that it would sell stockpiles of rice that had been scheduled to be destroyed due to WTO agreements; thus, this represented an addition to the overall supply on the market. This announcement immediately led to lower rice prices, even though the rice was not actually sold until several months later. Thus, when expectations of future prices changed, prices fell even though traded quantities had not changed. This is a clear indication that speculative behaviour, based on expectations of continued price increases, played a role.

V. CONCLUSIONS

Several links have been suggested through which urbanization might be contributing to higher food prices. Farmland lost to urban expansion is

20. See reference 19, OECD (2008).

21. See reference 19, Timmer (2008).

one such link, but we have noted that this is unlikely to be important. Changes in agricultural production due to changing diets are a second proposed link, but we have seen that the dietary changes are caused by economic growth rather than by urbanization. And soil degradation due to pollution is a third proposed link, but again, this pollution is linked to economic growth rather than to urbanization per se.

We have also examined other processes and factors driving food prices, in the short and long term. We have seen that although several of these processes are often linked with urbanization, it is not urbanization per se that is driving those other processes.

However, we have seen that one important effect of urbanization is an increase in the number of people who are dependent on commercially supplied food, and also an increase in the number of people for whom expenditure on commercially supplied food takes up a large part of their overall budget. This raises the risk of hoarding when prices are expected to rise, which itself can contribute to higher prices; it also turns urban food prices into a major political issue in many countries, increasing the risk of poorly considered short-run measures by governments that contribute to higher food prices elsewhere. However, increased stockpiles of food would reduce both these risks substantially.

This suggests that policies aimed specifically at reducing urbanization are unlikely to have much impact on food prices, except indirectly by affecting other processes and factors that do have an impact. This means, in turn, that policy makers who are worried about food prices would do better to address those other processes and factors rather than urbanization.

Limiting urbanization, on the other hand, is unlikely to lead to lower food prices. Unless policies to curb urbanization also reduce income growth, the shifts in diet would continue regardless, and the increased pollution often linked to economic growth would simply be emitted in rural areas instead. The building-over of arable land would likely be even worse if people with rising incomes stayed in rural areas, and the productivity gains from larger farms would be foregone. If anything, reduced urbanization might well lead to less agricultural production and higher food prices.

There are many things that we can do to restore the long-term trend towards lower food prices. It would be better to do those things rather than try to limit urbanization, which at best would not have any effect on the problems currently causing higher prices and at worst might actually make them worse.

REFERENCES

- Alford, W P, R P Weller, L Hall, K R Polenske, Y Shen and D Zweig (2002), "The human dimensions of pollution policy implementation: air quality in rural China", *Journal of Contemporary China* Vol 11, pages 495–513.
- Angel, S, S C Sheppard, D L Civco, R Buckley, A Chabaeva, L Gitlin, A Kraley, J Parent and M Perlin (2005), *The Dynamics of Global Urban Expansion*, Transport and Urban Development Department, World Bank, Washington DC.
- Arneberg, M W and J Pedersen (2001), *Urban Households and Urban Economy in Eritrea: Analytical Report from the Urban Eritrean Household Income and Expenditure Survey 1996/97*, Fafo Institute for Applied Social Science, Oslo.
- Bloom, D E, D Canning and G Fisk (2008), "Urbanization and the wealth of nations", *Science* Vol 319, pages 772–775.
- Blum, W E H (1998), "Soil degradation caused by industrialization and urbanization", in H-P Blume,

IS URBANIZATION CONTRIBUTING TO HIGHER FOOD PRICES?

- H Eger, E Fleischauer, A Hebel, C Reij and K G Steiner (editors), *Towards Sustainable Land Use: Volume I*, Advances in Geocology 31, Catena Verlag, Reiskirchen, pages 755–766.
- Central Bureau of Statistics (2006), *Preliminary Report. Namibia Household Income and Expenditure Survey 2003/04*, Central Bureau of Statistics, National Planning Commission, Windhoek.
- Chen, J (2007), “Rapid urbanization in China: a real challenge to soil protection and food security”, *Catena* Vol 69, No 1, pages 1–15.
- Economy, E C (2007), “The great leap backward?”, *Foreign Affairs* Vol 86, pages 38–59.
- Heimlich, R E and W D Anderson (2001), *Development at the Urban Fringe and Beyond: Impacts on Agriculture and Rural Land*, Agricultural Economic Report 803, Economic Research Service, US Department of Agriculture, Washington DC.
- Hoang, X T, T T P Dinh, T H Nguyen and Cecilia Tacoli (2008), *Urbanization and Rural Development in Viet Nam’s Mekong Delta: Livelihood Transformations in Three Fruit-growing Settlements*, Rural–Urban Interactions and Livelihood Strategies Series, Working Paper 14, IIED, London, 64 pages.
<http://faostat.fao.org>.
<http://imf.org/external/np/res/commod/index.asp>.
<http://fas.usda.gov/gats/>.
- Mace, R (2008), “Reproducing in cities”, *Science* Vol 319, pages 764–766.
- Mafuru, J and T Marsh (2003), “An analysis of household food expenditure systems in Tanzania”, unpublished manuscript.
- Marcotullio, P J and G McGranahan (editors) (2007), *Scaling Urban Environmental Challenges: From Local to Global and Back*, Earthscan, London, 366 pages.
- McGranahan, G, P J Marcotullio, X Bai, D Balk, T Braga, I Douglas, T Elmqvist, W Rees, D Satterthwaite, J Songsore and H Zlotnik (2005), “Urban systems”, in R Hassan, R Scholes and N Ash (editors), *Ecosystems and Human Well-Being: Current Status and Trends*, Island Press, Washington DC, pages 795–825.
- National Bureau of Statistics of China (2006), *China Statistical Yearbook 2006*, China Statistics Press, Beijing.
- National Bureau of Statistics (2008), *Tanzania Household Budget Survey 2007*, Analytical Report, National Bureau of Statistics, Dar es Salaam.
- National Sample Survey Organization (2008), *Household Consumer Expenditure in India, 2006–2007*, Report No 527, Ministry of Statistics and Programme Implementation, National Sample Survey Organization, New Delhi.
- Organization for Economic Cooperation and Development (2008), *The Relative Impact on World Commodity Prices of Temporal and Longer-term Structural Changes in Agricultural Markets: a Note on the Role of Investment Capital in the US Agricultural Futures Markets and the Possible Effect on Cash Prices*, Trade and Agriculture Directorate, Committee for Agriculture, OECD, Paris.
- Regmi, A and J Dyck (2001), “Effects of urbanization on global food demand”, in A Regmi (editor), *Changing Structure of Global Food Consumption and Trade*, Agriculture and Trade Report WRS-01–1, Market and Trade Economics Division, Economic Research Service, US Department of Agriculture, Washington, DC.
- Surowiecki, J (2008), “The perils of efficiency”, *The New Yorker*, 24 November.
- Tacoli, C, G McGranahan and D Satterthwaite (2008), “Urbanization, poverty and inequity: is rural–urban migration a poverty problem or part of the solution?”, in G Martine, G McGranahan, M Montgomery and R Fernández-Castilla (editors), *The New Global Frontier: Urbanization, Poverty and Environment in the 21st Century*, Earthscan, London, pages 37–53.
- Timmer, C P (2008), *Causes of Higher Food Prices*, ADB Economics Working Paper Series 128, Asian Development Bank, Manila.
- United Nations Conference on Trade and Development (2008), *Tackling the Global Food Crisis*, UNCTAD Policy Brief No 2, UNCTAD, Geneva.
- Wailes, E J (2005), “Rice: global trade, protectionist policies and the impact of trade liberalization”, in M A Aksoy and J C Beghin (editors), *Global Agricultural Trade and Developing Countries*, World Bank, Washington DC, pages 177–193.

