



C. NEW CHALLENGES AND THREATS

68

VI. The Role of Speculation in the 2008 Food Price Bubble

Peter Wahl

78

VII. Deepening the Food Crisis?

Climate change, food security and the right to food

Thomas Hirsch, Christine Lottje and Michael Windfuhr

Peter Wahl

VI. THE ROLE OF SPECULATION IN THE 2008 FOOD PRICE BUBBLE

"Speculators create the bubble which lies above everything. They increase prices with their expectations, with their bets on the future, and their activities distort prices, especially in the commodities sector. And that is just like secretly hoarding food during a hunger crisis in order to make profits from increasing prices."

George Soros

1. INTRODUCTION

"Hunger revolt in Haiti!" "Bread rebellion in Cameroon!" These and similar headlines shook the media in the spring of 2008. What happened? The food prices increased drastically worldwide (see Figure 1). The FAO food price index, which covers the prices of the most important food commodities, showed a price increase of 71 percent during the 15 months between the end of 2006 and March 2008. The increase was particularly dramatic for rice and cereals: prices hit a peak of 126 percent over 2006 in the same 15-month period.

The poor are affected the most. In an industrial country, the proportion of expenditure for food in a typical household budget amounts between 10 and 20 percent, whereas it is between 60 and 80 percent in the low-income countries (FAO 2008). According to a U.S. Department of Agriculture calculation, a 50 percent price increase on basic food leads to a mere 6 percent rise in expenditure for a high-income country, but it amounts to 21 percent for a low-income, food-importing country (USDA 2008, 25).

Apart from the misery they cause to individuals, food price increases also have negative macroeconomic effects, particularly for the balance of payments in food importing countries. The FAO estimates that food costs of the LDCs in 2008 have increased by 37 to 40 percent, after having risen by 30 to 37 percent in 2007. This trend will persist in 2009: "An analysis of domestic food prices for 58 developing countries shows that in around 80 percent of the cases food prices are higher than 12 months ago, and in around 40 percent higher than three months ago. In 17 percent of the cases, the latest price quotations are the highest on record." (FAO 2009) The danger of debt is also increased again. Additionally, the increases in food prices stimulate inflation. According to UN estimates, the rise in food prices accounts for be-

tween one-third to more than half of the nominal rate of inflation in developing countries, particularly in Asia.

Behind the macroeconomic indicators there is a horrible human tragedy. The price excesses are a threat to millions of human lives. They undermine the basic human right to freedom from hunger and malnutrition. As a result of the food price crisis and the global economic crash, the number of people threatened by hunger has reached more than one billion. In 1990 the figure was 822 million. According to the Millennium Development Goals (MDGs), the figure should go down to 412 million by 2015. Everyone who is dealing seriously with this issue knows this target will not be reached.

But there are also those who profit from this misery. Thus, in May 2008, one could read the following advertisement on the bread roll bags of Frankfurt bakers: "Are you happy with increasing prices? The whole world is talking about resources – the Agriculture Euro Fund offers you the possibility of participating in the growth of seven of the most important agricultural commodities." The offer was made by the Deutsche Bank in an effort to gain customers for one of its investment funds. And how does participation in the "growth" of commodities work? Speculation.

2. SPECULATION, THE MAIN CAUSE OF THE SHARP INCREASE IN PRICES

The factors governing the pricing of agricultural commodities are complex. No single factor alone determines the price.

Firstly, one must distinguish between long-term and short-term factors.

The long-term factors include:

- a. Increasing demand, predominantly through the economic rise of emerging economies, especially through the adoption of western consumption habits by the middle classes. The Chinese, for example, are increasingly consuming dairy and meat products;
- b. Agricultural productivity. The trend in productivity is stagnating in many developing countries. This is due to under-investment and structural adjustment programs, which gave priority to export production rather than to national food security. The pressure to liberalize markets under WTO and bilateral trade agreements has also contributed to a decline in interest in local food production, as has the drop by half in the official

development aid (ODA) available for agricultural promotion since the 1980s (World Bank 2008b, 41).

- c. The production of agrofuels. Over the last ten years, the U.S. and the EU, but also Brazil, have started to cultivate renewable agricultural commodities (among others, rape (also known as canola), sugar cane and maize) to produce ethanol and bio-diesel on a large scale in the search for alternatives to oil. The cultivation of agrofuels requires agriculturally productive land, which is finite and expensive to develop from virgin land, and thus comes at the expense of crops produced for food and feed.
- d. The reduction of food stocks, particularly in the EU and the United States.

The short-term factors include:

- e. The increase in oil prices in 2007-08, as well as in fertilizer prices;
- f. Bad harvests, particularly for wheat, in 2006 and 2007 in Australia and some other food exporting countries, – one of the world's biggest grain exporters – and other key grain exporters;
- g. Fluctuations in the U.S. dollar (USD) exchange rate (the USD is the lead currency in international trade) as well as changes in the value of national currencies, such as the temporary decrease vis à vis the dollar as a result of the financial crisis;
- h. Export restrictions on food by governments that want to guarantee food self-sufficiency for their own countries due to the explosion in food prices (or to take advantage of the higher prices to increase government tax returns, as was the case in Argentina). Such measures contributed to the shortage of food on the world market and consequently increased prices
- i. And, finally, speculation.

When food prices sky-rocketed in 2007, the role of speculation was mentioned as an afterthought or completely ignored by mainstream economists. Instead, mainly long-term factors such as the increase in demand and the production of agrofuels were blamed for the drastic price increases. A World Bank study even claimed that agrofuels contributed as much as 70 percent to the food price increase (World Bank 2008a).

In a study on the food crisis, even before the food price reversal, UNCTAD pointed out that agrofuels could not be so important that prices more than doubled in such a short time period. For example, the price of rice increased by 165 percent between April 2007 and April 2008, but rice cannot be used for agrofuels, and there

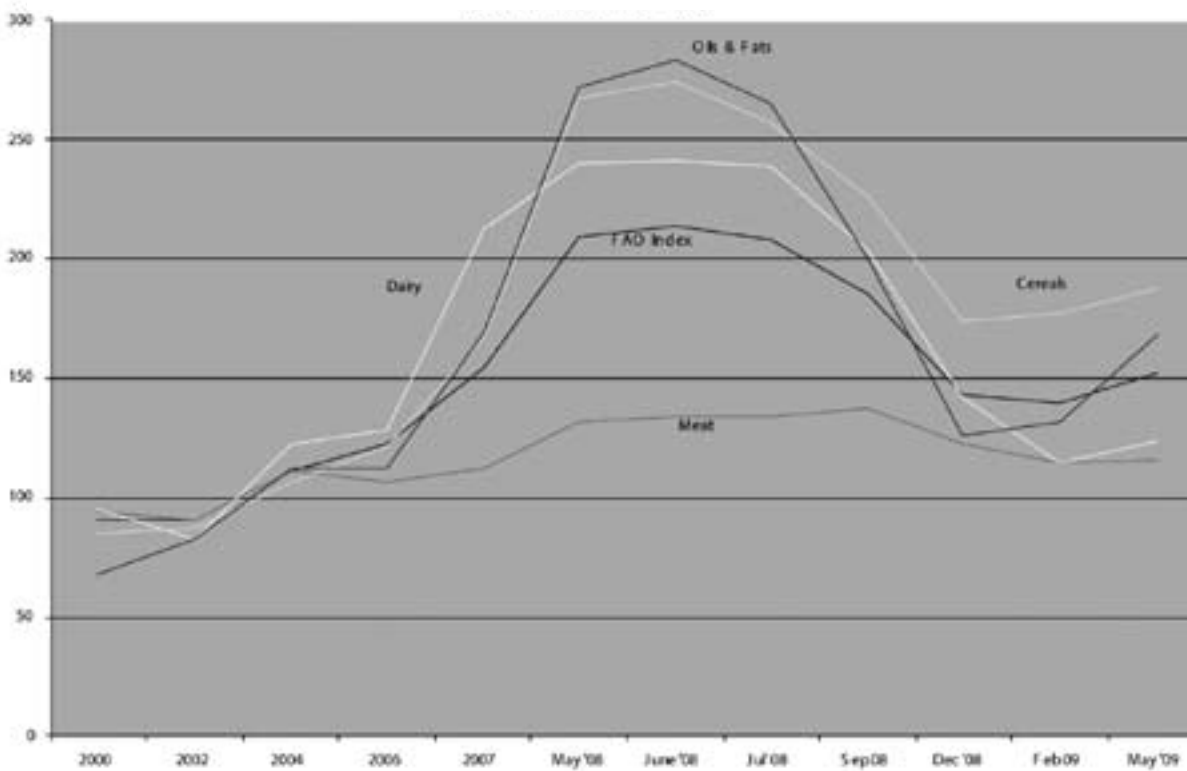
is little substitution of acreage in the countries where it is grown (that is, rice paddy was not converted to the production of agrofuel feedstock, as was the case in the U.S. with the conversion of soy bean acres to maize).

It has become incontestably clear since the decrease in food prices (more or less from July 2008 or a little sooner) that neither increasing demand in the emerging econo-

mies nor agrofuel production were the major roots of the food price trend. It cannot be that the Chinese suddenly started to eat much more yogurt only to stop again just a few months later. Neither has agrofuel cultivation risen so sharply only to decrease again just as abruptly. Short term factors, such as poor harvests, did not play a major role in the price upswing either.

Figure 1: FOOD PRICES 2000 – MAY 2009

(average 1998-2000=100)



Source: FAO

In accounting for the very sharp, short-lived spike in agricultural commodity prices it is speculation in connection with the financial crisis that is the decisive factor. We are dealing with a classic case of a speculative bubble – visible graphically in the figure above – which built up in the second half of 2007 and burst in the middle of 2008. The crisis in the mortgage sector in the U.S., which was also the result of a huge speculative bubble, started to spread across the whole financial sector. People in the financial market sought alternatives in the commodity sector and the bubble started to form. It reached its maximum in the summer of 2008 and then burst (see the more detailed section 4.1.2.).

Mainstream economists no longer deny that speculation at least contributed to this bubble. Thus, the German

Ministry of Development describes speculation as early as in April 2008 as one of the reasons for high food prices, “the international capital markets have become aware of the agricultural markets again in their search for lucrative and relatively safe investment areas of the future. This causes more volatility, especially when participants act in a strongly speculative way.” (BMZ 2008) UNCTAD also identified speculation as a factor behind the agricultural commodities price bubble early on (UNCTAD 2008a). In the meantime, the World Bank acknowledges that speculation played a role in the price increases even if it considers speculation to have been a subordinate factor (World Bank 2008a). The IMF added its voice to the chorus, albeit in vague terms, writing, “pure financial factors, including the mood of the markets, can have short term effects on the price of oil and other commodities” (IMF 2008).

The U.S. supervisory authority very clearly speaks out against the trade in commodity derivatives. The Commodity Futures Trading Commission (CFTC) probably possesses the best expertise with respect to U.S. markets, and observes, “the commodity markets have begun to set the price of commodities as an asset instead of setting the price solely according to factors of supply and demand. They have therefore created price distortions, or possibly even a speculative bubble.”

In plain language:

- j. The commodity market has detached itself from the fundamental data of the economy;
- k. Commodity prices, as can be seen in the futures market, have become a source of accumulation of financial assets;
- l. Prices have thus become a target of speculation; and,
- m. This led to a bubble, in the form of excessive food commodity prices, i.e. speculation has added a price bubble on top of the price increases resulting from factors in the real economy.

A complex package of countermeasures is therefore necessary. The price increases led directly to increased hunger and threatened the well-being of hundreds of millions of people who could no longer afford their daily bread. The package should deal with all the factors causing the price increases. The industrial countries carry a special responsibility for measures to counter speculation. Whereas the solutions to the challenges posed by the cultivation of agrofuels in Brazil or the long-term increasing demand for meat and dairy products are complicated and will take time to take effect-swift and direct measures can be taken against speculation. Speculation takes place in the commodity markets of industrial countries and the instruments

for regulation exist there as well. For example, on September 18, 2008, both the U.K. and the U.S. banned a certain type of speculative business, so-called short selling (see details below). This was part of the crisis management in view of the financial crash. If the financial crisis is a reason to use this set of instruments, then the threat to the livelihoods of millions of people in the developing countries is surely at least a strong reason for governments to act.

3. WHAT IS SPECULATION?

Speculation has always existed in capitalist economies and probably even before. When we deal with speculation, we don't do it from an ethical point of view, although this is a legitimate perspective. Our focus is on the economic impact of speculation. There are different types of speculation, each having a different effect. For instance, hedging in agriculture with the help of futures has an economically useful function, although this effect could also be reached through other mechanisms (see chapter 4). In this case speculation serves as a kind of insurance for producers against price risks. Of course, hedging increases prices to a certain extent, but this is justified by the positive effect of risk management and price increases are not excessive.

However, if speculation leads to excessive increases in prices – in other words, if it produces prices that have lost any relation to the real economy, or if it becomes the dominant type of business – it creates economic imbalances and leads inevitably to crises and has a destructive impact. As Keynes put it: “Speculators may do no harm as bubbles on a steady stream of enterprise. But the position is serious when enterprise becomes the bubble on a whirlpool of speculation. When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done.” (Keynes 1936, 159)

The concept of speculation does not occur in neo-classical theory in mainstream economics. At most, speculation is dismissed as an obsolete category, discussed in Keynesian, Marxist or other heterodox positions.

Instead, what neoclassical theories consider “speculation” to be “investment.” Any use of assets based on the expectation of a profit at a future date is considered to be an investment. Thus, for example, the neoliberal stock exchange dictionary of the Frankfurter Allgemeine Zeitung (the leading news paper in Germany) defines speculation as follows: “in the explicit meaning of the

word, an anticipatory action taken in relation to the future with the aim of forestalling future developments in one's own dispositions and achieving an (economic) profit."

The same dictionary entry continues, "expressions such as 'speculation' and 'speculator' etc. are used rather in a negative sense and speculation is not recognised as one of the most decisive incitements behind economic behaviour."

Thus, according to this definition, there is no difference at all between building a factory, a farm or starting up a trading or services business – that is, everything that is considered as part of the real economy – and the design and sale of a Collateral Debt Obligation (CDO), one of those toxic derivatives which played an essential role in the financial crash. To the neoliberals, everything is an investment.

However, there is a fundamental difference between investment and speculation. Although a future expectation applies to both as a starting point, their respective logics diverge. Added value is made possible with a real economic investment. A business is established (or an existing one is expanded), and with a successful investment it is capable of extended reproduction through its own means, it is self-supporting and sustainable. The corporate profits are then nurtured by the permanent appropriation of the surplus value.

The objective of speculation, however, is to profit from a future difference in the prices of assets. Speculation can occur with commodities as well as with businesses and financial assets. If, for example, a farmer does not place his potato crop on the market as soon as it is harvested, but hoards it for a couple of weeks because he expects that the price will be higher, this is speculation. No real, additional value is created, there is merely speculation on a higher price. If a lot of potato farmers do this simultaneously, a speculative bubble is formed, i.e., the potato price increases during six weeks because the hoarding causes supply shortages.

Speculation can occur with all kinds of goods. There are, of course, differences in extent depending on the characteristics of the object of speculation. After a couple of months, potatoes turn bad and cannot be sold. There are no such limitations on gold, or even black gold (crude oil), for instance.

Speculation with companies occurs via the Private Equity Fund (PEF) business model as well as partially through

mergers of companies and takeovers. PEFs buy a company and restructure it in order to then sell it for a profit after a maximum of five years. There is no interest in the long-term future of the company such as expanding market shares, technological innovation, employment, etc.

The economically most important form of speculation has developed in the financial sector during the past two decades. Bets are made on the future development of price differences in strategic areas such as interest rates and exchange rates or the price trends of securities (shares, private and public bonds, derivatives etc.).

Among institutional investors – strictly speaking, they should be referred to as "institutional speculators" just as it should be "speculation banking" instead of investment banking – the search for such price differences has become extremely sophisticated and specialized: computer programs facilitate completely automatic searches every second to detect possibilities of profiting from price differences, even by thousandths of a unit. By investing huge sums, as the "institutional speculators" do, exorbitant profits – or losses – can result.

Another important feature of speculation is that profits are not only possible with rising prices and rates but also when they decrease (see section 4.4).

Speculation creates no added value. In contrast to the real economy, gains are not sustainable or self-supporting, but can only be repetitively achieved through new speculation activities.

Investment and speculation are also fundamentally different when they fail. When a company goes bankrupt, the fixed assets, the machines, the production procedures, etc., remain and can be used for further wealth creation. When a speculation fails, the assets dissolve into nothing.

This is the greatest problem with speculation: the macro-economic consequences for stability. When speculation has become an important part of wealth accumulation the system will be highly unstable. Even in times when there is no crisis, volatility has a structural impact.

4. HOW DOES FOOD SPECULATION WORK?

Speculation on the food markets is not new. In the 17th century, already, speculators bought the harvests of Japanese rice farmers even before they were harvested. The original motive was safeguarding, virtually an

insurance (“hedging”). The logic was as follows: a farmer negotiates with a speculator in January that the speculator will buy the harvest at a fixed price in August. The arrangement is fixed by a contract. Such contracts are called derivatives (from the Latin word “derived”). And since the contract concerns a future business arrangement, this derivative is called a “future.” Insiders call this kind of speculation “commercial trading.” The most important stock exchanges for commercial trading are in Chicago, New York, Kansas and London.

For the farmer, the advantage of futures lies in the security provided by the fixed price. He has transferred the risk to the speculator. However, security is not available for free. On the one hand, the farmer must pay a fee for the derivative. On the other hand, the derivatives trader will also try to sell a corresponding future to the miller who buys the harvest in August to mill flour. This also creates planning reliability for the miller.

The final price of the harvested grain is thus higher than it would have been if the farmer had sold directly to the miller, given the same conditions, because the derivatives trader’s risk premium has influenced the price twice.

However, without the futures, the farmer would have had to bear the risk of price fluctuation himself. If the harvest is good, the supply is huge and the prices fall. The farmer would receive less than he would have obtained with futures. The derivative trader then takes the loss. In the reverse situation, the farmer would have received more without the futures and would have benefited from supply scarcity (and higher prices). In this event, the profit goes to the speculator.

Usually, the commercial trader doesn’t physically receive the product when the futures are due. He has negotiated the contract with the miller that he redeems as a countertrade with the farmer (called “evening up”). The harvest physically goes directly from the farmer to the miller. The profit (or loss) of the commercial trader (apart from the fees) arises from the price difference when the contract is made and the market price when the futures are due.

At the same time, countertrade reduces risk for the speculator. Since the miller is contracted to buy the harvest at a fixed price, the risk is confined to the price difference between the two futures.

This system is rational under the conditions of a market economy and its unknowns. Especially when the speculators know the markets well and can more or less estimate

the risks involved. The prices of futures lie slightly above those of direct trade (described as a “cash” or “spot” market), but in general they are stable unless something unusual happens (such as a catastrophic harvest). The profits or losses achieved by the speculators are kept within limits. For all these reasons, commercial trading is often described as “good” or “useful” speculation. The CFTC describes these traders as “hedgers”, as opposed to “speculators” (see below).

This does not mean that there is no alternative to this kind of speculation. The insurance function and the reliability can also be achieved with other instruments, for example, producer and/or consumer insurance (mutual insurance) or price guarantees by the state. If these options work, they are also more efficient than derivative trade. Commercial trading has enabled other forms of speculation which have had an extremely negative effect on food prices, as described in the following sections.

4.1. HOW THE BUBBLE EVOLVED

The spot market and the “good” speculation described as “commercial trading” above, have been daily business on the food markets since the 19th century. The traders are well-established experts in the market. They possess expertise and information systems with which they can provide relatively reliable forecasts on price trends. Commercial trade is quite closely linked to the fundamentals of these markets.

The costs of their activities influence pricing and thus increase the price. In general, however, the price is largely determined by the fundamentals of the real economy, e.g., product quality, transport costs and availability of supplies.

4.1.1. The role of index funds

On the other hand, there is a category of speculators who for some years have played an increasingly large role in speculation on resources: the commodity “index funds.” Such funds speculate on a basket of up to 20 or more commodities, primarily oil and metals (ores), but also agricultural commodities. Agricultural commodities usually account for 10 to 20 percent of the index.

A study by the Lehman Brothers investment bank, which has since gone bankrupt, shows that the volume of index fund speculation increased by 1,900 percent from January 2003 to March 2008 taking it from \$13 billion to \$260 billion U.S. dollars. As can be seen in Figure 1, prices actually

start to increase in 2003, even if only moderately compared to the price explosion of 2007.

In contrast to commercial trade speculation, index fund speculation is no longer linked to the fundamentals of the food markets. They exclusively follow the trends of the stock exchange indices and their strategies are based on these trends. Trade is largely automated, so that low transaction costs are incurred. Therefore, the investment or speculation behavior of the funds is extremely pro-cyclical. Consequently, the contribution of the index funds to the food markets price bubble is not restricted to the period from 2003 to 2007, but also contributed to the rapid increase in 2007. However, as UNCTAD has shown, the 2007 spike can only be fully explained with the addition of another factor: the flight of institutional investors in hedge funds and other instruments from the crisis-ridden financial markets into the commodity markets. According to the Trade and Development Report 2009, the 2008 food price bubble is part of a general trend, which UNCTAD calls “financialisation of commodity markets” (UNCTAD 2009, 57).

4.1.2. Speculation by hedge funds and other institutional investors

The curve in Figure 1 displays a sharp increase in prices over the last quarter of 2007. This was also the moment when the subprime crisis in the U.S. turned into a credit crisis. Whole market segments collapsed, such as, the so-called structured products or certificates – e.g., the Collateral Debt Obligations (CDOs) – and the first bankruptcies occurred. Whoever had purchased large quantities of these derivatives now faced problems.

Many hedge funds, as well as pension funds and insurance companies, had also speculated in CDOs and other derivatives, especially in categories containing high proportions of subprime securities. These were extremely risky, but also yielded especially high returns. Possible profits for the funds were lost when these markets collapsed.

The crisis situation was aggravated by the general credit and bank crisis, which is what the mortgage crisis had become. Hedge funds were affected to a large extent, since high leverage is a basic element of their business model. This means that they acquire borrowed capital for their operations that exceeded their equity by 30 or 40 times. When credit resources dried up, the possibilities for leveraged speculation diminished.

Since speculative business in the financial sector increasingly became more difficult or even impossible, the in-

stitutional investors desperately looked for new markets. They now entered the commodity markets, primarily oil and minerals, but also agricultural commodities. This is where the above mentioned advertisement on the bread roll bag comes in. The “possibility of participating in the growth of seven of the most important agricultural commodities” relates to the Deutsche Bank fund investing in food speculation. Agrofutures were created and sold in the expectation of continually increasing prices, so that they could be sold later at a profit.

When institutional investors turned to the commodity markets, this affected the price trends. The demand for futures suddenly increased. The established commodity market traders and index funds who were dealing with commodity derivatives were now joined by hedge funds and other institutional investors seeking high yields.

In 2007, the trade in agricultural futures and options warrants increased by 28.6 percent for energy and by 29.7 percent for industrial metals. The strongest rise occurred in agricultural derivatives, however, where the increase amounted to just under a third at 32 percent (UNCTAD 2008b, 21). At the same time, the value of over-the-counter (OTC)¹ commodity derivatives increased by almost 160 percent between June 2005 and June 2007. From October 2007 until the end of March 2008, the number of contracts at the Chicago Mercantile Exchange (CME) increased by 65 percent without any real production increase.

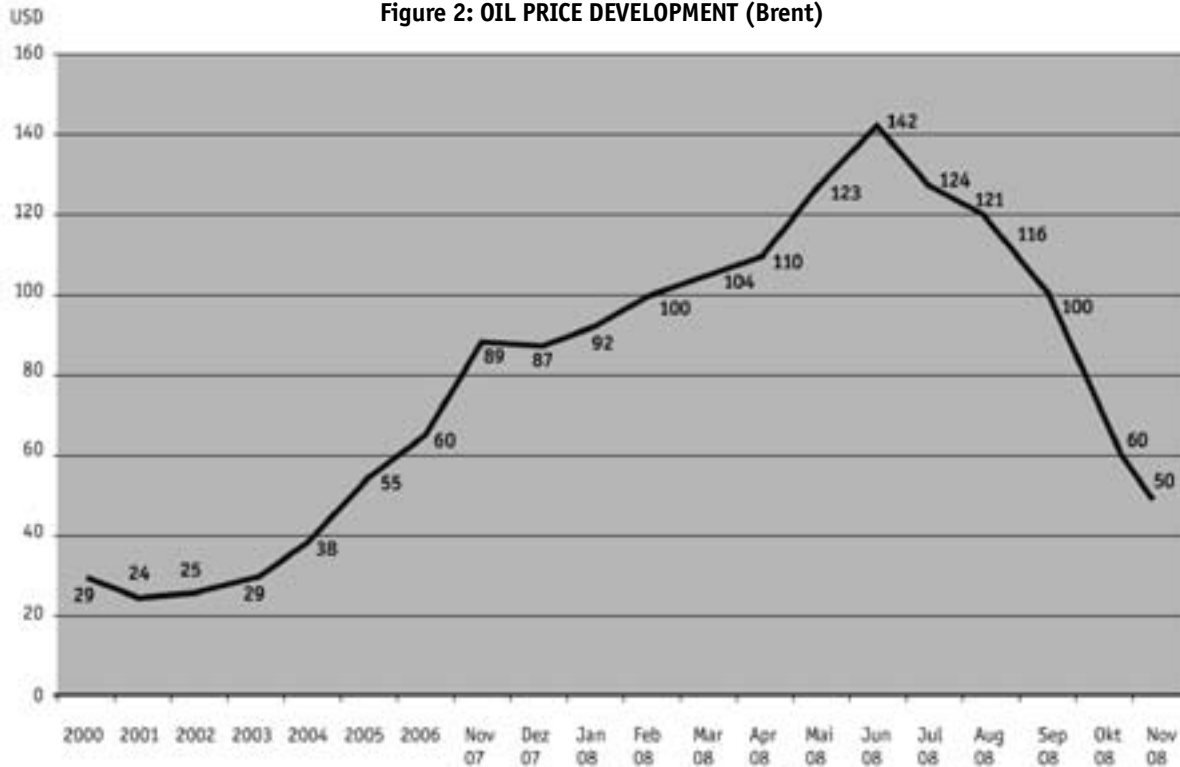
A speculative bubble started to emerge. Prices increased, again uninfluenced by the fundamentals, because institutional investors were entering the market.

The price increase in derivatives caused a rise in the spot prices. On the one hand, buyers on the spot markets bought more ahead to put in stock for fear of further price increases. This increased demand and caused an upward pressure on prices. On the other hand, sellers delayed sales in anticipation of higher prices, and caused supply shortages. Speculation by hedge funds and others set in motion a whole chain of speculative behaviour by other participants.

The prices then started to decline drastically in July 2008. This can also be attributed to the financial crisis which, in turn, experienced further aggravation in this period. Speculation in commodities became too risky for hedge funds and other institutional investors, and a renewed flight was initiated, this time into U.S. Treasury bonds, virtually the last safe haven to which capital could flee.

4.2. THE INFLUENCE OF OIL PRICE SPECULATION ON FOOD PRICES

Figure 2: OIL PRICE DEVELOPMENT (Brent)



Source: BP 2008

Speculation has its effects not only on the food stock markets directly, but also indirectly through oil price speculation. The oil price is a strategic price since it influences the prices of all other products where oil is involved as fuel in production and distribution. This also applies to agricultural commodities. The production of these goods requires tractors and other machines that need petrol, and petrol is also needed to transport them to the consumer. Similarly, fertilizers also need oil.

Until July of 2008, the high oil price was explained by commentators as the result of the huge petrol demand of the Chinese economy and other emerging economies as well as by the Peak Oil thesis (that as oil supplies begin to run dry, prices will go very high). But a drop from almost \$150 to \$45 U.S. dollars per barrel showed that general speculation and capital flight from financial markets to commodity markets was an important fact as well. Such an extreme fluctuation can only be explained as a result of a speculative bubble. From the third quarter of 2008, the expectation of a worldwide recession with a corresponding drop in demand for oil also played an important role. There is a strong resemblance between the course of the oil price trend and food prices. There is also a sharp

increase in the first half year of 2008 followed by an equally sharp fall. The second capital flight which started with the aggravation of the financial crisis is also evident. The oil speculators also turned to U.S. treasury bonds at that point.

4.3. THE EXTENT OF PRICE INCREASES CAUSED BY SPECULATION

For several reasons, the exact extent of the effect of speculation on price increases is impossible to determine. This also applies to the other factors involved in pricing. For example, statistics do not distinguish between established traders and new speculators. Hedge funds operate in a completely non-transparent way, and are generally located in offshore centers and tax havens where there is no supervision. The over-the-counter traded derivatives are an incalculable factor, as the investment banking crash in September 2008 has shown. Food pricing is also affected indirectly by the oil price and the price increases caused by the decline in the dollar exchange rate.

When prices have fallen again, this provides a certain ex post (e.g., after the fact) indication of the quantitative

contribution of speculation. This has recurred with almost all commodities, including oil and food, after the peak of July 2008. Long-term factors, such as Peak Oil, increasing demand by emerging markets, and agrofuel, cannot have this kind of effect. Analyzing the 2008 bubble, when prices virtually doubled at first and then fell to about half the price, leads to the conclusion that the lion's share of the price increase 2008 was due to direct and indirect speculation.

Note that bets are not only made on rising prices, but also on declining prices.

4.4. SPECULATION ON FALLING PRICES

How does this work?

First phase: On September 1, I complete an over-the-counter contract (forward) obtain the right to sell ten thousand tons of rice at the current daily price of \$1,000 dollars per ton one month later (October 1). The fee for the forward contract amounts to 0.1 percent of the face value of the underlying business, i.e., \$100,000 dollars.

Second phase: In September the price of rice declines by 20 percent.

Third phase: On October 1, I purchase ten thousand tons of rice (on the spot market or, usually, with another derivative) at the current daily price. (i.e., 800 dollars per ton.) Total cost: \$8 million dollars.

Fourth step: I then transfer the thousand tons I acquired at a cheaper rate to the trader from whom I bought the forward contract the previous month, and receive the agreed price of \$10 million dollars. Gross profit: \$1.9 million dollars.

This form of speculation is called short selling, since I do not yet possess the product at the time of sale. I speculate that I can acquire the product at a cheaper rate when it is due. A variant of short selling with shares consists of borrowing the shares that are expected to decline and then putting them on the market. If this occurs on a massive scale, a decline in share prices will occur. Then the borrowed shares can be bought back at a cheaper rate.

Whereas hedge funds in general made a loss of 3.55 percent in 2008 (on average), short selling averaged a profit of 10 percent.

Some could argue that speculation is good and useful in causing prices to decline. However, the problem is that speculation on falling prices is detached from the real economic data and leads to an exaggerated decline in prices. This then leads to losses on the supply side, i.e., primarily for the producer; practically the opposite of a bubble a slump.

Exaggerated price declines contributed to the downfall of the large investment banks (Lehman Brothers, Merrill Lynch, etc.). Hedge funds speculated on falling share prices of these banks when they perceived the first difficulties of the banks. This reinforced and accelerated the share price collapse to such an extent that the supervisory authorities of Great Britain and the U.S. decided to prohibit short selling.

This will not work over the long term, and encourages speculators to again speculate on rising prices. In this interplay of imbalances and distortions, volatility and instability is not only the breeding ground that enables speculation to prosper, but speculation itself increases and exaggerates the already existing factors of uncertainty. Short selling is therefore part of the overall problem. Therefore speculation distorts prices whether they are falling or increasing. It reinforces instability and causes additional costs, consequently increasing market inefficiency and periodically leading to the formation of bubbles. Therefore policies are now, more than ever, necessary against speculation, especially if speculation contributes to endangering the livelihoods of millions of people in developing countries.

5. ALTERNATIVES

As shown above, price hikes in 2007 and 2008 have caused a historical increase in the number of hungry people. As speculation is identified as the main factor for these price hikes, it has contributed to the violation of the right to adequate food of at least 100 million people worldwide. The responsibility for this lies with the speculators themselves, of course, but more notably with the states which had deregulated financial and commodity markets and thereby opened the door for excessive speculation. From a human rights perspective the same states have not only a responsibility but a legal obligation to take decisive measures to prevent such speculation and reduce the volatility of agricultural commodity prices. The formation of speculative bubbles linked to food prices can be prevented by the combination of two relatively simple measures:

- a. the introduction of a trade register at the stock exchanges, and
- b. corresponding regulation of authorized traders.

All those who trade in food on the spot or derivative markets would need to be registered. Only those traders who enable hedging, know the market and are subject to stock exchange supervision would be permitted. Hedge funds and other speculative business models would not be admitted. Highly speculative activities such as short selling, dealing in OTC derivatives and index derivatives would have to be prevented. As the most important stock exchanges for food are in Chicago, New York, Dallas and London the governments of the U.S. and the U.K. bear a special responsibility.

Speculation would then be restricted to its security function (hedging) for buyers and sellers, and the formation of speculation bubbles would be prevented. Political will is decisive if this is to be achieved. The chances are not too illusory. The present crash has shaken the financial markets so that the casino-capitalism which has emerged since the end of the Bretton Woods system has been discredited to an unprecedented extent. New political regulations, especially emanating from the U.S., are not out of reach any more.

This offers a unique opportunity to civil society, especially to the development NGO community, to exert corresponding political pressure and present proposals on a development-friendly restructuring of the financial system. Civil society should not just suggest reforms in line with the market. This crash of financial-market capitalism which has spread rapidly across the whole globe since Bretton Woods requires a more far-reaching answer. The ideology that the markets are best left to regulate themselves has finally completely disgraced itself before history. Now, this is no longer a question of making the casino safer for the players but of closing it down.

¹ Over the Counter means that trade is effectuated outside of any exchange or other central counterpart. Therefore, such transactions are particularly intransparent and cannot be controlled effectively by supervision.

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VII. DEEPENING THE FOOD CRISIS? CLIMATE CHANGE, FOOD SECURITY AND THE RIGHT TO FOOD

Climate change threatens to worsen the already critical situation of global food security. The Fourth Assessment Report (FAR) of the Intergovernmental Panel on Climate Change (IPCC) has made a critical assessment of the possible impacts of climate change on agriculture, livestock and fishing. Poor and vulnerable people in developing countries who are already threatened by or suffering from hunger and malnutrition will be worst hit, as numerous studies and first hand experience show.

The steep and scandalous increase of the number of hungry people in the world from 852 million up to at least 1.02 billion people, which has been reported by the UN Food and Agriculture Organization (FAO) and various other UN agencies for the years 2007 to 2009, is extremely alarming. It needs to be countered by fast and effective corrective action at the local, national and international level. Sufficient food is still available. Overcoming hunger is not so much a question of increasing production (yet), but rather a question of political will to address hungry people's lack of access to food, primarily because they cannot afford to buy it. Climate change risks worsening poor people's access to food and water by leading to new price hikes. If the current trends of increasing global temperature, changing rainfall patterns, glacier melting, rising sea levels and more frequent and intense meteorological disasters such as droughts, floods and storms continue, global food production will be severely threatened in the years and decades to come. While negative effects have already become increasingly visible in tropical and subtropical areas, in particular in Central, South and Southeast Asia as well as in drought and flood prone areas in sub-Saharan Africa, many more agricultural regions, including temperate climates, might come under pressure in the near future.

From the food security perspective, climate change comes on top of long-standing problems regarding food security in many world regions. It bears a huge potential to deepen the marginalization of vulnerable populations and to make hunger persistent instead of overcoming it step by step as projected by the UN Millennium Development Goals (MDGs). Thus, climate change poses a big challenge to global, national and local food security. What is needed – technically, economically and politically – to ensure the realization of the fundamental human right to adequate food and water today and tomorrow? How can agriculture adapt to changing climate conditions? How can the resilience of local and regional food production systems be improved?

In 2006, Brot für die Welt (Bread for the World) together with Diakonie Katastrophenhilfe (DKH, Humanitarian Aid Germany) and Germanwatch have initiated an intensive study process on the impacts of climate change on food security. As a result, a comprehensive study was published in 2008. The study focused on the particular risks for those persons and groups who are malnourished. It systematized how the global mega-trend of climate change might impact on these marginalized groups. For this purpose a cover study and regional studies in Africa, Asia and Latin America were carried out. This paper presents an updated version of the conclusions from these studies.

Since the publication of the main study, the issues of climate change and food security have gained increased attention within the climate negotiations under the United Nations Framework Convention on Climate Change (UNFCCC), but also within other UN agencies. The Food and Agriculture Organization of the United Nations (FAO) warns about the negative consequences, in particular for small-holder subsistence farmers in what are already marginalized regions of Africa, Asia and Latin America. In recent submissions to the UNFCCC, FAO stresses the importance of the agricultural sector in combating climate change, but also the necessity of climate change mitigation and adaptation for achieving food security.

The impacts of climate change on human rights, and the relevance that human rights have for a future climate treaty, have long been neglected by the climate negotiations. At the climate change conference in Poznan (Poland) in December 2008, Brot für die Welt, Germanwatch and Care International presented a submission on a human rights-based approach to adaptation at a time where such an approach did not feature within the negotiations. Since then, especially non-governmental organizations (NGOs) have picked up on the idea and have started to integrate human rights as a principle that should guide a post-2012 climate treaty to be agreed upon at the climate change conference in Copenhagen in December 2009. In view of the threat of more famine, the UN Human Rights Council (HRC) also discussed human rights and climate change at its tenth session in March 2009, based on a study that will be presented in Copenhagen. In June 2009, a panel discussion was held on this issue, the results of which will also feed into the UN climate negotiations.

However, to date these discussions remain largely separate, and integration and cooperation have hardly begun. As a next step the different strands and actors

need to be brought together and should continue their discussions. Coherence between policies on adaptation, food security and human rights needs to be improved and should incorporate the rapidly growing knowledge on agriculture and climate change.

1. CHANGING CLIMATE CONDITIONS

The impacts of climate change are relevant for food security at the global, national and local levels. The IPCC Fourth Assessment Report (FAR) Working Group II summarized some major trends which show that many natural systems are affected by similar processes of climate change, particularly those related to temperature increase (IPCC 2007):

- (1) There is strong evidence that natural systems are affected on all continents by changes in snow, ice, and frozen ground, including permafrost. This conclusion includes the enlargement and increase of glacial lakes, increasing ground instability in permafrost regions, rock avalanches in mountain areas, as well as substantial changes in Arctic and Antarctic ecosystems.
- (2) With regard to hydrological systems, there is strong evidence, that many glacier- and snow-fed-rivers will experience increased run-off and earlier spring peak discharge. A warming of lakes and rivers in many regions is projected.
- (3) There is also strong evidence that recent warming is greatly affecting terrestrial biological systems, with effects such as earlier timing of spring events, including leaf unfolding, bird migration, and egg-laying.
- (4) Substantive new studies have shown that rising water temperatures will impact marine and freshwater biological systems. It will lead to range changes and earlier migrations of fish in rivers, and it will contribute to shifts in ranges and changes in algal, plankton and fish abundance in high-latitude oceans and high-altitude lakes.
- (5) Climate zones will be move towards the poles. Linear trends can go hand in hand with the quickly growing possibility of non-linear – and potentially catastrophic – changes. The relationship between the earth's climate and the earth's ecosystems is a complex one, particularly due to the fact that climate and non-climate drivers are interrelated. Additionally, non-linear processes include several feedback

loops, and these loops are very difficult to predict. The history of the earth shows that non-linear processes have happened quite often, particularly in the Holocene epoch (e.g., the most recent 10,000 years). Ocean streams have frequently stalled abruptly, ice shields have suddenly melted, or monsoon systems have unexpectedly collapsed. Often small disruptions are sufficient to entail fundamental changes. Simulations based on the knowledge of abrupt climate change in the past and the scientific school of analyzing highly complex processes that was established in the 1970s support the finding that the earth's climate and ecological systems might react very strongly to the increasing temperature from anthropogenic climate change.

The main driver for climate change is the increase in surface temperatures, which in turn influences most other factors contributing to changing climate conditions such as precipitation, water availability and weather extremes. As can be seen in figure 1, climate change will have major effects on food security through the increase of variability of weather patterns, particularly the expected increase in extreme weather events.

The impact of climate change can be summarized in the following way: Countries and groups of countries will be affected differently. Many studies indicate that the impacts of climate change will fall disproportionately upon developing countries and the poor persons within all countries. Populations in developing countries are generally exposed to relatively high risks of adverse impacts from climate change (IPCC 2001, 12). It is anticipated that this will lead to higher levels of food insecurity in many vulnerable, developing countries. They will need support to cope with and finance the necessary adaptation measures.

The study of Brot für die Welt and partners is therefore based on the assumption that a two-dimensional response to climate change is necessary: Avoiding the unmanageable and managing the unavoidable. Avoiding the unmanageable means mitigating the impact of climate change and avoiding dangerous climate change from happening. An emerging consensus among scientists states that global warming must be limited to a temperature increase well below 2°C compared to pre-industrial levels. In order to reach that goal, industrialized countries need to take the lead in drastic emissions reductions. Globally a 50 to 85 percent reduction of emissions by 2050 is necessary and actual CO₂ emissions should start to decrease, at the latest,

by 2017. Managing the unavoidable means that sound adaptation policies are needed to deal with the inevitable consequences of climate change, some of which are already visible and immense.

2. THE IMPACT OF CLIMATE CHANGE ON FOOD SECURITY, AND HOW TO ADAPT TO IT

The impact of climate change will be particularly substantial for smallholder and subsistence farmers, who represent the majority of the people suffering from hunger. Their livelihood systems, particularly in low latitudes around the equator, will be affected by major changes due to climate change. The farming system will be affected by changes in temperature and precipitation as well as elevation of CO₂ with impacts on yields of both food and cash crops. The productivity of livestock and fishery systems will also be affected, as well as potential income gained from collecting activities in forests. Figure 2 summarizes the relationship between climate change impacts and food security for the rural poor.

Figure 1: CLIMATE CHANGE AND FOOD SECURITY



Source: based on Boko et al. 2007, 455

The impact of climate change on food security will be substantive, and better regional and local assessments will further clarify these impacts at scales and scopes that are suitable for developing coping mechanisms and adaptation strategies. So far, the debate has been biased towards global food security concerns, i.e., the global balance of how much and where food can be produced. However, it is of the utmost importance that household effects are taken into consideration when predicting the impacts on hunger and malnutrition. Climate change will affect people and groups already vulnerable to food insecurity, but new groups will also be affected by climate change.

Regional impacts of climate change on food security 1

In Asia a 2.0 to 4.5°C net global average surface warming is expected by the end of the present century. Increases in the amount of precipitation are very likely in high-latitudes, while decreases are likely in most subtropical land regions (Christensen et al. 2007). Glaciers in Central Asia, western Mongolia, northwest China, and the Tibetan Plateau are reportedly melting faster in recent years than ever before (Pu et al. 2004). Changes have also been observed in extreme climate events like the frequent occurrence of more intense rainfall, increasing frequency and intensity of floods, drought, and tropical cyclones.

The FAR (fourth assessment report) of the IPCC projects an increased risk of hunger in South Asia due to a 30 percent decline in cereal yields. That might lead to 266 million Asians facing the risk of hunger in 2080. A decline of the net productivity of grassland and milk yields is predicted. The agricultural water demand will increase between 6 and 10 percent per 1°C rise in temperature. The water system might be strongly affected. Overall, a decline in water availability is expected. Close to 1 billion people will be affected by this reduction in India and South Asia. The melting of the Himalaya glaciers will change the pattern of river runoff in the region. In coastal areas, the water quality might suffer from the intrusion of salt water, which might then also affect fish larvae abundance. Bangladesh (3), Vietnam (4) and India (7) are among the 10 most affected countries by extreme weather effects in the decadal Climate Risk Index (CRI) for 1997-2006 (Harmeling 2007). In the future, food scarcity projections show that South and Southeast Asia are highly vulnerable with strong evidence, while East Asia is highly vulnerable with a very high degree of confidence. The densely populated mega deltas of Asia and relevant mega cities (e.g., Bangkok, Shanghai,

Tianjin) are vulnerable to both direct effects of climate change and sea-level rise. 2,500 km² of mangroves in Asia are likely to be lost with 1 meter of sea-level rise. Approximately 1,000 km² of cultivated land and sea product culturing area in Bangladesh are likely to become salt marsh (Cruz et al. 2007).

Adaptation requires substantive investment in infrastructure such as dams, flood-resistant storage facilities, and techniques for reducing water loss in distribution systems, etc. It requires monitoring weather extremes and developing disaster preparedness strategies. Higher prices for energy, agricultural inputs, water, and food imports must be expected. Capacity building in communities particularly at risk, as well as in national, regional, and local administrations is of utmost importance and will require resources. Considerable additional costs will be required for appropriate adaptation in developing countries. Cost estimates in the year 2007 ranged from at least \$50 billion USD (Oxfam) to \$28 to 67 billion USD by 2030 (UNFCCC) and even \$86 billion USD by 2015 (UNDP) (for details see Bals, Harmeling and Windfuhr 2008).

Regional impacts of climate change on food security 2

In summarizing the Africa-related conclusions of the FAR, it becomes obvious that climate change has the potential to compromise the ability of many African societies to achieve the different MDGs and to improve food security. The IPCC expects that the area suitable for agriculture and the length of growing seasons and yield potential, particularly along the margins of semi-arid and arid areas, will decrease. The yields from rain-fed agriculture are expected to decrease by up to 50 percent in some countries already by 2020 (IPCC 2007, 13). Also, the number of people under increased water stress will significantly increase from 75 to 250 million people in the next 15 years (with a further increase until 2050). This will primarily take place in southern and northern Africa. In addition, analysts predict that local food supplies will be negatively affected by decreasing fishery resources in large lakes. This result is due to rising water temperatures, which may be exacerbated by continued over-fishing.

In addition to the direct impacts of climate change on food security and the MDGs, recent research pays increasing attention to the role that water scarcity or reduced food availability play in the emergence of conflicts, often through increased competition over scarce resources. These may further aggravate the livelihoods

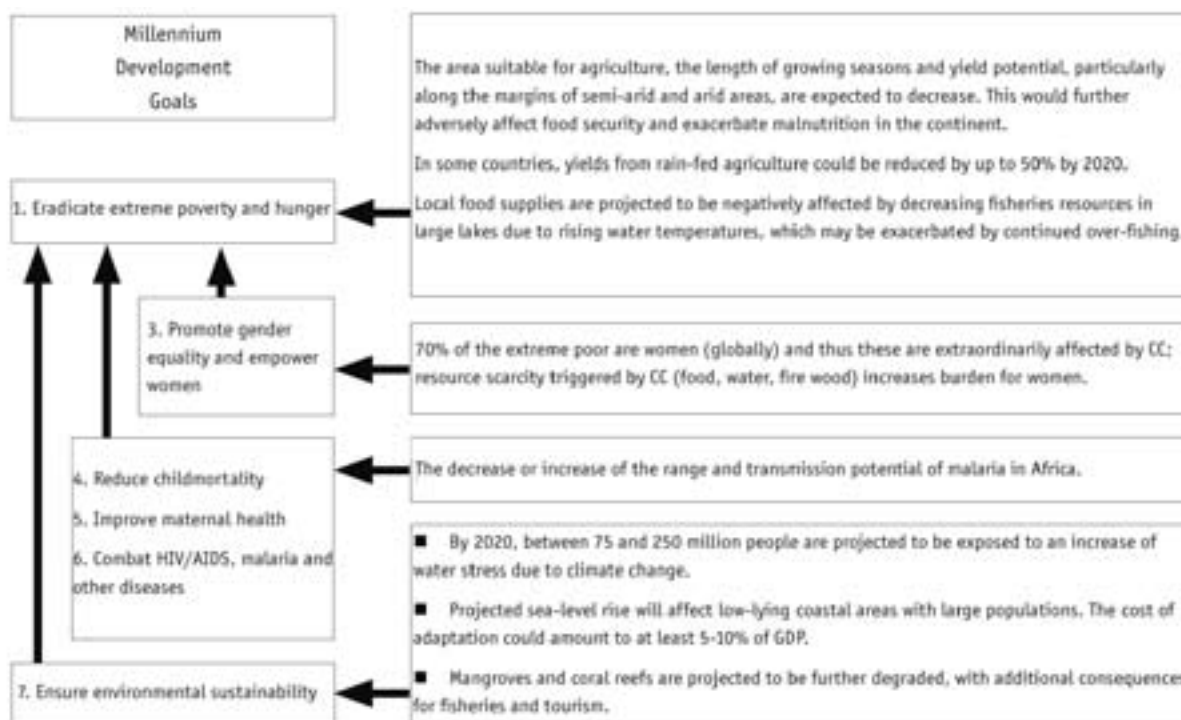
of people. Climate change already represents an important cause for existing conflicts, as several experts have concluded is the case in the Darfur conflict, where a long-term decline in rainfall significantly contributed to the scarcity of available fresh water (Ban Ki-moon 2007). In the southern part of Africa, climate change is expected to further weaken the agricultural potentials of countries belonging to the poorest societies in the world. This would worsen the state of human security and strain the governments' capabilities.

The most vulnerable groups include smallholder farmers who rely on rain-fed agriculture, pastoralists, and the fishing communities. Communities across the continent have developed ways of dealing with impacts of climate-related events over time. Drought and floods are not new to many communities in Africa. However, the increasing frequency and intensity of these events are rendering some of the strategies that have served communities well in the past inadequate. For farmers, mixed cropping served as insurance against total crop failure; rotational cropping allowed for the reju-

venation of soils sustaining production at reasonable levels. Pastoralists migrated to better areas in times of drought, traded animals for cereals and other products from neighboring communities, and kept animals with friends and relatives elsewhere as a form of insurance. With the rapid changes in climate in the recent past, some of the strategies are no longer viable; others might become ineffective in a quickly changing climate. And there is evidence of the erosion of coping and adaptive strategies as a result of land-use changes and socio-political and cultural stresses.

Due to climate change impacts and the resources required to adapt to them, resources that would have otherwise been available to realize the MDGs are at risk for diversion to adaptation measures instead. The realization of the MDGs might further be affected by the direct impact of climate change on food, water and health. "How the world deals with climate change today will have a direct bearing on the human development prospects of a large section of humanity" (UNDP 2007, 8; see Figure 3).

Figure 2: CLIMATE CHANGE IMPACTS AND THE MILLENNIUM DEVELOPMENT GOALS IN AFRICA



Source: Germanwatch illustration based on IPCC 2007b

The recent rounds of climate negotiations have shown that the costs of adaptation and the present underfunding by the perpetrators of climate change remain a key contentious issue. This is true despite the goodwill of many developing and some developed countries to work jointly on developing a new climate regime. However, in the negotiations in Poznan in December 2008 and in Bonn in March and June 2009, the most developed countries – and among them the European Union (EU) – have not been willing to agree on concrete action for scaling up the financing for adaptation as well as support for technology transfer and climate change mitigation in developing countries. At the same time there are encouraging examples from developing countries that show their willingness to take national action on combating climate change. South Africa was the first rapidly developing country to accept that their emissions have to peak between 2020 and 2035. In December 2008, Mexico announced a national target to reduce its emissions to 50 percent below 2002 levels by 2050.

Regional impacts of climate change on food security 3

As in the other continents, crop yields in Latin America are expected to increase in the temperate climates, while in dryer regions it is expected that climate change will lead to processes of salination and a loss of arable land for cultivation and grazing (Magrin et al. 2007). Land use changes have occurred during the last years and have intensified the use of natural resources and exacerbated many of the processes of land degradation. The IPCC reports that almost three-quarters of the dry lands are moderately or severely affected by degradation processes.

Climate variability and extreme weather events have severely affected Latin America. The number of extreme events, be it hurricanes, flooding, or the Amazonian drought (2005), has been high during the past few years. But regular parameters are also changing.

Increases in rainfall have been observed in southeastern Brazil, Uruguay, the Argentinean Pampa, and some parts of Bolivia. While this has increased the frequency of floods, it has also positively impacted upon crop yields. On the other hand, a declining trend in precipitation has been observed in southern Chile, southwestern Argentina, southern Peru, and western Central America. As a consequence of temperature increase, the IPCC notes that the trend in glacial retreat is accelerating, with the exception of the southern Andean region. This issue is critical for Peru, Bolivia, Colombia, and Ecuador, where water avail-

ability has already been compromised due to both consumption and hydro-power generation. It is expected that the net increase of people experiencing water stress due to climate change is likely to increase from 7 to 77 million (Magrin et al. 2007).

Climate change increases the risk that major parts of the Amazon could change from tropical rain forests to savannas in coming decades. This risk is higher in the eastern Amazon and in the tropical forests of central and southern Mexico. It could go hand in hand with the replacement of semi-arid vegetation by arid vegetation in parts of north-east Brazil and most of central and northern Mexico.

3. CLIMATE CHANGE, THE RIGHT TO ADEQUATE FOOD AND HOW TO ASSESS VULNERABILITY

The concept of “food security” is a key concept in the United Nations to measure the food and nutrition situation of people and groups. The latest standard definition used in the FAO reads as follows: “food security exists when all people at all times have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. To achieve food security, all four of its components must be adequate. These are: availability, stability, accessibility, and utilization” (FAO 2007, 6).

The study of Brot für die Welt and partners uses three levels of food security to describe groups and people that are vulnerable to the effects of climate change.

- (1) Food security on a global scale: This is the level to analyze overall trends and to understand which effects climate change might have on agricultural production, fisheries and livestock production at the global level. It is important because these trends will translate into agricultural prices and will influence decisions of producers worldwide.
- (2) Food security on a national level: This is where most agricultural policy decisions are made. It is at this level that governments decide if food security concerns are covered by imports and how much financial resources are made available for national agricultural policies. Central elements of adaptation policies will be defined at the national level.
- (3) Food security on a household level: Without a detailed look at the impacts on the household level, the analysis would lack an understanding of the difficulties and specific necessities each person faces with

regard to food security. This knowledge is crucial in designing adequate adaptation policies that support those groups – particularly marginal producers and vulnerable consumers – which are most likely to become food insecure.

Around 80 percent of the hungry live in rural areas; half of them are smallholder peasants (see Table 1). This situation is expected to persist. While the urban poor are the fastest growing group of food insecure people, more than 50 percent of the hungry are projected to live in rural areas in 2050. The majority of these groups live

in extremely marginal conditions. They often live in remote geographical locations, in ecologically vulnerable areas, or on slopes or drought-prone areas/rainforests, etc. They have difficulties in accessing transportation infrastructure, such as roads, and thus access to markets where they can sell their goods. Most have limited to no adequate access to extension services, credits, or insurance mechanisms. Governments' failure to implement land reform forces poor and marginal farming households to use land that is prone to catastrophes such as floods or droughts. Usually, they are also politically marginalized, without a voice in local or national politics.

Table 1: TYPOLOGY OF HUNGER

Food-producing households in higher-risk environments and remote areas	Roughly 50% of the hungry
Non-farm rural households	22% of the hungry
Poor urban households	20% of the hungry
Herders, fishers and forest-dependent households	8% of the hungry
Vulnerable Individuals	Vulnerable pregnant and nursing women and their infants, pre-school children, chronically ill or disabled
Affected people of extreme events	Approx. 60 million
HIV-related food insecurity	Number of food-insecure households with adults or children affected by HIV: ca. 150 million

Source: UN Millennium Project/UNDP 2003

To deal adequately with the impact of climate change on food security, work has to start with a good analysis of those groups that are already particularly marginal today. Given the crucial role of marginalization in the food security debate, it is clear that agricultural and food production problems cannot be merely tackled at the technical level. The situation of the rural poor has been aggravated by the fact that rural areas have been neglected in regional, national, and international policy making. For a long time, the policy focus was on investments in industry and urban infrastructure, causing budget allocations for rural areas to be substantially reduced – often by more than 50 per cent. The same happened with bilateral and multilateral aid budgets.

A recent study by the FAO and the Organization for Economic Cooperation and Development (OECD) highlighted that food prices should decline from their recent peak, yet they will remain above the average of the past decade (OECD/FAO 2008). The study summarized all of the factors that are contributing to a long term scenario where increasing demand goes hand in hand with limits in food producing resources – particularly soil and water. While this scenario does not necessarily lead to scarcity of food in the coming years, it is an indication that prices for agricultural products will not decrease to the levels that prevailed during the last decades. Climate change will affect several factors that influence the supply side. Governments have to deal with this challenge when designing policies to adapt to climate change and implementing the right to adequate food.

The human right to adequate food is part of the International Covenant on Economic, Social and Cultural Rights (ICESCR). The Committee on Economic, Social and Cultural Rights defines as follows: “The right to adequate food is realized when every man, women and child, alone or in community with others, have physical and economic access at all times to adequate food or means for its procurement.”¹ It was further elaborated in the “Voluntary guidelines on the implementation of the right to adequate food in the context of national food security” developed in November 2004 by the FAO-Council (FAO 2004). Under the human rights conventions, governments have the obligation to respect, protect, and fulfill the right to adequate food, particularly for the most vulnerable groups. In addition it includes criteria for transparency and non-discrimination as well as recourse mechanisms.

It is important to clarify the relationship between the term food security, the right to adequate food and the food sovereignty concept. While food security describes a

goal, the right to adequate food obliges governments to respond to the problem of hunger and malnutrition. Human rights-based monitoring systems measure the level of fulfillment of the human rights obligations through governments. It also analyzes whether governments use their respective resources adequately and most reasonably to fully guarantee these rights while a food security monitoring system analyzes how many and to what degree people are malnourished. A third term gaining prominence within debates of civil society organizations dealing with issues such as hunger, malnutrition, and rural development is food sovereignty. Food sovereignty is a political concept primarily developed in the context of La Via Campesina, a global small farmers’ movement. Food sovereignty has been developed as a concept to protest against the neglect of rural areas and rural development in national and international policies.

Agriculture, forestry and fisheries are all sensitive to climatic conditions. Climate change will thus affect the income of vulnerable groups that depend on resources and products derived from these sectors. The scale of the direct adverse and positive effects varies with the specific geographical situation. Macro-level projections, however, are not sufficient to identify the most vulnerable groups within regions or countries. Vulnerability assessments on the national and community levels are crucial for developing adequate responses to food insecurity. Assessing the vulnerability of a region or a community with regard to non-climate stressors is the necessary first step; the assessment must then be widened to consider vulnerabilities to climate-related factors. This will result in general assessments of vulnerability to climate change, but may also be translated into sector-specific climate change risk assessments, for example with regard to food security.

Climate change will impact groups that are already at risk for food insecurity, but it will also make new groups vulnerable to food insecurity due to changing climate conditions in their region. Many vulnerable groups have already developed traditional strategies to increase resilience, but their ability to adapt to climate change is often restricted because of their extremely limited coping capacities.

4. RESILIENCE AND RESPONSE CAPACITIES IN DEVELOPING COUNTRIES

Adapting to climate change is a huge challenge for developing countries. The IPCC report shows that poorer countries are most vulnerable to climate change. Their limited resilience and response capacities are one important rea-

son for this particular affectedness. Adaptation covers very different fields such as meteorological services, early warning systems, disaster risk management, extension services, infrastructure and many others. Adaptation in agriculture is another important area, covering necessary changes in the use of agricultural crops and varieties, irrigation and watershed management, soil protection, pest control and land use techniques. Poor smallholder farmers in particular need to improve their capacity to cope with change. It is thus important to differentiate adaptation at the different levels and define what can be done at the household level, locally, by national governments, or with international support.

Analytically, the IPCC further differentiates between two categories of adaptation: “autonomous adaptation, which is the ongoing implementation of existing knowledge and technology in response to the changes in climate experienced, and planned adaptation, which is the increase in adaptive capacity by mobilizing institutions and policies to establish or strengthen conditions favourable for effective adaptation and investment in new technologies and infrastructure” (Easterling et al. 2007, 294). The advantage of this IPCC differentiation is that it looks into the coping strategies and capacities available locally to adjust to the changing circumstances without any government interference. This perspective helps to also identify the need for planned interventions as the available coping capacities might be very limited.

Reflecting knowledge on projected impacts of climate change on different sectors enables the identification of likely priority actions for adaptation from a top-down perspective. Initiated and supported by the UNFCCC process, least developed countries (LDCs) have started or even finished elaborating National Adaptation Programs of Action (NAPAs). The guidelines agreed upon under the UNFCCC specifically underline the objective to identify and address the most urgent adaptation needs and priority projects. In principle, these should be developed in a participatory process.² However, these guidelines are much less concrete than the procedural elements from the FAO voluntary guidelines on the implementation of the right to adequate food. Nevertheless, these NAPAs serve as the best and most recent starting point when looking at adaptation priorities. They also provide a reference when assessing likely costs of adaptation, although they only concern the most urgent adaptation needs. Developing countries also highlight some adaptation measures in key vulnerable sectors in their national communications to the UNFCCC (for agriculture see Table 2).

Weather risks destabilize households and countries and create food insecurity. Floods, cyclones, and droughts have been a major cause of hunger affecting more than 30 million people since 2000 in the Southern African Development Community (SADC). Governments and donors only react to these shocks rather than proactively manage the risks. These emergency reactions have been criticized for being ad hoc and, at times, untimely. They are even credited with destabilizing local food markets. Similarly, many highly exposed developing country governments do not have the means to finance the recovery costs of catastrophic disasters. Least-developed countries can hardly afford the technical analyses and other start-up costs for insurance systems. Scaling up will prove costly, especially since disaster risks, unlike health or accident, affect whole regions simultaneously and thus require spatial diversification, reinsurance and/or large capital reserves. Thus, it is very important that risk management mechanisms – including innovative insurance mechanisms – play a role in the UNFCCC negotiations.

5. RESPONSE CAPACITY AT THE LOCAL AND COMMUNITY LEVEL

Impact analyses underline the importance of studying specific family situations, because livelihood systems are typically complex and include a number of interfering factors. For example, several crops and livestock species are involved in intercropping systems, and many smallholder livelihoods are comprised of a variety of income sources such as the use of wild resources from forests, remittances, and other non-agricultural income strategies. Government support can also play a role, but so far many of the smallholder farmers are faced with a marginalization process in national and international agricultural policies. Therefore, support is often unavailable or insufficient. Effective adaptation policies should start here and support coping and adaptation strategies of poorer groups in rural and urban environments.

The literature on local and community-based adaptation policies is increasing, and several studies are available which provide a good overview of policy options for adaptation at the local level. One example is a case study carried out in Bangladesh. It has developed a useful typology to describe different policy measures and policy areas that need to be involved in local adaptation measures against climate change (FAO and ADPC 2006, 66f; see also Table 3). The authors show that successful local adaptation to climate variability and change is not an easy task. Rather, it requires multiple pathways with well-planned and inter-

related short- and long-term measures. The task ahead in designing meaningful adaptation policies at local levels is the need to find the right combination of these factors. This should give answers to the expected changes in the “geo-physical settings” as well as the necessary adjustments in the “livelihood systems.”

Table 2: POLICY OPTIONS FOR THE DESIGN OF LOCAL ADAPTATION POLICIES

TYPE OF MEASURES	EXAMPLES
Adopting physical adaptive measures	Excavation, re-excavation of canals, miniponds, irrigation, storage facilities for retaining rain water
Adjusting existing agricultural practices	Adjustment of cropping patterns, selection of drought-tolerant crop varieties; better storage of seeds and food; dry seedbeds, or adopting alternative, cash crops such as mango and jujube
Adjusting socio-economic activities	Livelihood diversification, market facilitation, small-scale cottage industries, integration of traditional knowledge
Strengthening local institutions	Self-help programs, capacity building and awareness raising for local institutions
Strengthening formal institutional structures	Local disaster management committees and financing institutions; formulating policy to catalyze enhancement of adaptive livelihood opportunities
Creating awareness and advocacy	
Supporting better research	Farm links to new or improved crops including drought tolerant varieties, and other conducive and adaptive technologies

Source: FAO and ADPC 2006

Adaptation policies need to be embedded appropriately in the local context and should be oriented towards the most vulnerable groups. One of the strengths of using a rights-based approach in the design of adaptation policies is that it helps to set up procedural guarantees for the affected communities and people to ensure participation including access to relevant information (transparency) and the right to complain. The second strength is that a rights-based approach requests a specific outcome. Governments have to prove that their policy and budget decisions are focused towards the most vulnerable groups and that no group is excluded. Governments must prove that their own adaptation policies do no harm, i.e., deprive people of access to food or water.

6. RESPONSE CAPACITY AT THE INTERNATIONAL LEVEL

A particular priority focus and massive support schemes for the long neglected and marginalized majority of agricultural producers – smallholder peasants – are need-

ed now and even more in the future, when the accelerating climate change will hit more and more regions. Support must be directed towards them in a sensitive, coherent and meaningful way, combined with micro-credits, extension services and trainings aiming at improving the production system, securing livelihoods, fostering climate resilience and leading out of poverty.

Development cooperation has a crucial role to play in all stages of adaptation policies. Bi- and multilateral development cooperation can help to integrate adaptation into policy development. Capacity must be built at all stages of the adaptation process in developing countries, from disaster preparation and early warning to insurance schemes and policy design issues. Other stakeholders, such as the scientific community and NGOs, should become integral parts of adaptation planning. Each of these institutions can help to best design adaptation policies. NGOs are often those who reach out to vulnerable groups much better than governmental or international institutions. Hence they can contribute by using their experience in project management and implementation and also by mobilizing knowledge.

The financing of adaptation measures will also need adequate international support. A clear recommendation from this study is that a reliable financial-based mechanism must be created within the UN-climate negotiations if the unavoidable impacts of climate change are to be managed. Substantial additional financial resources are needed to cope with the expected adaptation needs for developing countries. However, more aid does not necessarily mean that more funds will reach the most vulnerable groups. This is one reason why the UNFCCC negotiations must discuss which international and national frameworks are most appropriate for targeted adaptation. Adaptation measures need to be properly designed and focus on particularly vulnerable groups. The rights-based framework is one very promising option to help measure progress, review government activities, and to generate resources.

A rights-based approach to adaptation

This paper has discussed the impact of climate change on the enjoyment of human rights related to food security, particularly the right to adequate food. What are the core elements of a rights-based strategy to adaptation policies that can be drawn from the results?

- (1) *A human rights-based approach has to cover both sets of human rights: civil and political (CP-rights) and economic, social, and cultural rights (ESC-rights).*
- (2) *Human rights create entitlements of persons vis-à-vis their government. These entitlements can be legally claimed, and are a good tool in holding governments accountable. Complaint procedures need to be accessible for everyone.*
- (3) *A rights-based framework better describes government obligations and develops criteria for designing and evaluating policy processes, including on adaptation. It requires governments to follow standards at all different levels of activities.*
- (4) *Not everyone suffering from hunger is automatically a victim of human rights violations due to government policies. The impact of climate change might be so monumental in one country or region that the government will not have the means to adequately help all affected persons to adapt. Therefore, hunger, as a result of natural disasters cannot automatically be judged as a violation of the right to adequate food.*

A violation can only be identified when hunger is caused because of the government's failure to develop a minimum response system for disaster-preparedness, when the adaptation measures are not oriented towards those most in need, or when the government is not using the available resources.

- (5) *A rights-based assessment and framework must not only look into the obligations and responsibilities of national governments, but should also assess the potential impact of government policy on persons living in another country. International support is required for poor countries in the implementation of national adaptation measures, because poorer countries will suffer substantially from climate change and must cope with a high burden of adaptation needs.*
- (6) *Human rights are individual entitlements. They set limits on the restrictions and deprivations that individuals can permissibly bear. Adaptation policies should be designed in a way that at least the core content of human rights is being realized.*
- (7) *A rights-based framework can be a helpful tool to complement climate change adaptation policies. It can help to assess resulting risks of climate change and their possible impact on the fulfillment of human rights of those people who are affected by climate change. A rights-based framework can give orientation in designing adaptation policies in a way that human rights are promoted and protected. It allows individual rights holders to make a rights-based assessment of (adaptation) policy measures and to judge if these policies had a positive, negative or no impact on them and their adaptation needs towards climate change. If used properly, a rights-based approach has a good potential to ensure and improve the quality of adaptation policies.*

7. CONCLUSIONS AND RECOMMENDATIONS

Most likely the impacts of climate change will increase hunger and hinder poverty reduction policies, through changes in precipitation, water availability, the spread of diseases and the increase in extreme weather events. Food security and the human right to food will thus be heavily affected by climate change. Most vulnerable to the impacts will be developing countries in general and in sub-Saharan Africa, South and Southeast Asia, and the South Pacific region in particular. Within these and other affected countries it is the poor people in particular who are most vulnerable towards climate change, e.g., the rural poor, indigenous communities, outcasts, women, children and the elderly. For many of these smallholder and subsistence farmers, landless workers, women, people living with HIV/AIDS, indigenous people and the urban poor, climate change comes as additional stress on top of a variety of other poverty factors. Accordingly, climate change bears the risk to further deepen rather than overcome geographical, societal, economic and political marginalization. It is therefore of the utmost importance to design adaptation policies, frameworks and programs in a way that the priority focus is put on the needs of the most vulnerable people. This includes important aspects such as stakeholder participation, community-based bottom up approaches and cultural appropriateness.

Adaptation policies related to food security need to be tackled at the global, national and local level. Developing countries need broad international support to adequately implement adaptation policies, covering a broad range from infrastructural measures to raising awareness and elaborating and disseminating climate-related information. Industrialized countries need to make financial commitments in compensation for the damage caused by climate change. This should happen through international funds governed under the UNFCCC umbrella, especially the UN Adaptation Fund, but also new instruments such as insurance schemes. National governments need to mainstream adaptation into all government policies. They also need to make sure that the most vulnerable groups within their country are identified and supported in their adaptation.

The UNFCCC should make a strong reference to human rights and especially the right to food as guiding principles for a new climate treaty. It would partly shift the focus of adaptation policies from national states to the individual people who are threatened by climate change in a way that might become existential. The human

rights approach establishes procedural standards for government policies. It also supports vulnerable groups and individuals in holding their government accountable to fulfill their respective obligations towards the people who have individual rights to adequate food, water, health, housing etc. In conclusion, rights-based adaptation policies are one good tool to ensure that money earmarked for adaptation is spent reasonably. The Office of the High Commissioner for Human Rights, the Food and Agriculture organization and the UNFCCC should cooperate more closely and develop a guideline, which helps governments to design adaptation policies accordingly.

¹ CESCR. 2002. General Comment No. 15: The right to water. UN-Doc. E/C.12/GC/15. Geneva.

² UNFCCC. 2001. Guidelines for the preparation of national adaptation programmes of action. Decision 28/CP.7

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