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The Food Crisis, Climate Change and the Importance of Sustainable Agriculture

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Note

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CHAPTER ONE

THE FOOD SECURITY CRISIS

THIS paper deals with the crisis of food prices and shortages, and also the issue of agriculture and climate change. The importance of food security and of expanding sustainable agriculture practices in its economic, social and environmental aspects is stressed.

The current global crisis of high food prices, and of food shortages in some countries, has given prominence once again to food security concerns. In recent years there was complacency about food security and national self-sufficiency, as it was thought that cheaper imports would be always or usually available and local food production was not so necessary as previously thought. Many developing countries reduced food production, many of them under the advice of the international financial institutions.

The rising world prices of many food items in the past couple of years have meant more expensive imports and inflation of food prices in local markets. There have also been cases of shortages, as some countries placing orders for rice, for example, have found that the supply is not forthcoming or guaranteed, sometimes because of export restrictions by the exporters of the food items. Many developing countries have been caught in this situation, resulting in street protests as families found it difficult to cope.

Because of this new situation, the paradigm of "food security" has suddenly shifted back to the traditional concept of greater self-sufficiency, instead of prioritizing the option of relying on cheaper imports. It is now recognized that in the immediate period, there is a need for emergency food supplies to affected countries, but that a long-term solution must include increased local food production in developing countries. This raises the question of what constitute the barriers to local production and how to remove these barriers.

Factors for this crisis include climatic factors (such as drought, for example, affecting wheat production in Australia), the rising cost of agricultural inputs especially oil and oil-based products, and the switch of land use from production of food to biofuels. However, a longer-term reason is the decline in agriculture in many developing countries, in most cases due to the structural adjustment policies of the International Monetary Fund (IMF) and World Bank. The countries were asked or advised to: (1) dismantle marketing boards and guaranteed prices for farmers' products; (2) phase out or eliminate subsidies and support such as fertilizer, machines, agricultural infrastructure; and (3) reduce tariffs on food products to low levels.

Many countries that were net exporters or self-sufficient in many food crops experienced a decline in local production and a rise in imports, which had become cheaper because of the tariff reduction. Some of the imports are from developed countries which heavily subsidize their food products. The local farmers' produce was subjected to unfair competition, and in many cases could not compete. The effects on farm incomes, on human welfare, and on national food production and food security were severe.

The Ghanaian experience

The case of Ghana illustrates this. Policies of food self-sufficiency and government encouragement of the agriculture sector (through marketing, credit and subsidies for inputs) had assisted in an expansion of food production (for example, in rice, tomato and poultry). The policies were reversed starting from the mid-1980s and especially in the 1990s. The fertilizer subsidy was eliminated, and its price rose very significantly. The marketing role of the state was phased out. The minimum guaranteed prices for rice and wheat were abolished, as were many state agricultural trading enterprises and the seed agency responsible for producing and distributing seeds to farmers, and subsidized credit was also ended.

Applied tariffs for most agricultural imports were reduced significantly to the present 20%, even though the bound rate was around 99%. This, together with the dismantling of state support, led to local farmers being unable to compete with imports that are artificially cheapened by high subsidies, especially in rice, tomato and poultry.

- Rice output in the 1970s could meet all the local needs, but by 2002 imports made up 64% of domestic supply. Rice output fell from an annual average of 56,000 tonnes (in 1978-80) in the Northern Region alone to only 27,000 tonnes for the whole country in 1983. In 2003, the US exported 111,000 tonnes of rice to Ghana. In the same year, the US government gave $1.3 billion subsidies for rice. A government study found that 57% of US rice farms would not have covered their cost if they did not receive subsidies. In 2000-03 the average cost of production and

milling of US white rice was $415 per tonne, but it was exported for just $274 per tonne, a price 34% below its cost.

- Tomato was a thriving sector, especially in the Upper East Region. As part of a privatization programme, tomato-canning factories were sold off and closed, while tariffs were reduced. This enabled the heavily subsidized European Union (EU) tomato industry to penetrate Ghana, and this displaced livelihoods of tomato farmers and industry employees. The quantity of tomato paste imported into Ghana rose from 3,200 tonnes in 1994 to 24,077 tonnes in 2002. Local tomato production has stagnated since 1995. Tomato-based products from Europe have made inroads into African markets. In 2004, EU aid for processed tomato products was 298 million euros, and there are many more millions of euros in indirect aid (export refunds, operational funds for producer organizations, etc).

- Ghana's poultry sector started its growth in the late 1950s, reached its prime in the late 1980s and declined steeply in the 1990s. The decline was due to withdrawal of government support and the reduction of tariffs. Poultry imports rose by 144% between 1993 and 2003, and a significant share of this was heavily subsidized poultry from Europe. In 2002, 15 European countries exported 1.147 million tonnes of poultry meat for 928 million euros, at an average of 809 euros per tonne. It is estimated that the total subsidy on exported poultry (including export refunds, subsidies for cereals fed to the poultry, etc) was 254 euros per tonne. Between 1996 and 2002, EU frozen chicken exports to West Africa rose eightfold, due mainly to import liberalization. In Ghana, the half a million chicken farmers have suffered

from this situation. In 1992, domestic farmers supplied 95% of Ghana's market, but this share fell to 11% in 2001, as imported poultry sells cheaper.

In 2003, Ghana's parliament raised the poultry tariff from 20% to 40%. This was still far below the bound rate of 99%. However, the IMF objected to this move and thus the new approved tariff was not implemented. The IMF representative in Ghana told the aid agency Christian Aid that the IMF pointed out to the government that the raising of tariffs was not a good idea, and the government reflected on it and agreed. Many farmers' groups and non-governmental organizations (NGOs) in Ghana have protested on this to the government.

International agricultural trade

Some developments in the trade negotiating arena are also a source of concern. The Doha Round negotiations at the World Trade Organization (WTO) are mandated to substantially reduce domestic agricultural support in developed countries. However, to date, the negotiating offers of the US and EU indicate their overall trade-distorting domestic support (OTDS) would be reduced only at the bound level, but not at the applied level. Also, the figures in the latest text (19 May 2008) drawn up by the chairperson of the WTO agriculture negotiations would not reduce the actual present domestic support for the US. The maximum or bound OTDS level for the US would be $13-16.4 billion, while the actual support in 2007 is reported to be around $7-8 billion.

Another cause for concern is the new US Farm Bill. According to several analyses, including those made by the US administration, the Bill will continue the present system

of subsidies, and in some ways or for several commodities, it will expand the support. For example, the Bill guarantees that 85% of the domestic market for sugar will be met by local production. The Bill also allows a farm family with an income of up to $1.5 million to obtain subsidies, compared to the limit of $200,000 per farmer proposed by the Bush administration. The Bill thus "locks in" the US system and levels of subsidies for the next five years, and it also constrains what the US negotiators can offer in the WTO's Doha Round negotiations.

A major loophole in the WTO's existing agriculture agreement is that countries are obliged to reduce their bound levels of domestic support that are deemed "trade-distorting" but there are no constraints on the amount of subsidies deemed non-distorting or minimally distorting, which are placed in the so-called Green Box category. Recent studies have shown, however, that many of the Green Box subsidies are also trade-distorting. The Doha Round negotiations are unlikely to place new effective disciplines on the Green Box. Therefore, the major subsidizing countries can change the type of domestic subsidies they give and continue to provide similar total levels of farm subsidies even as they reduce the "trade-distorting" subsidies.

Meanwhile the developing countries are being asked to reduce their agricultural tariffs further. The chair's proposal at the Doha Round talks is for a maximum 36% tariff cut for developing countries, and 24% for small vulnerable economies. This is sizable, and compares with the 24% cut in the previous Uruguay Round. Most developing countries are advocating that the instruments of Special Products (SPs) and Special Safeguard Mechanism (SSM) be set up as part of the WTO talks to promote food security and farmers' livelihoods and rural development. SPs would exempt important food products

from tariff cuts or at least allow for more lenient cuts. The SSM would enable a developing country to impose an additional duty on top of the bound rates in situations of reduced import price or increased import volume, in order to protect the local farmers. However, there is considerable opposition from some exporting countries to having these instruments that can work in an effective way.

In the bilateral or regional free trade agreements (FTAs) involving developed and developing countries, the developing countries are asked to reduce or eliminate their tariffs by even more. For example, in the Economic Partnership Agreements (EPAs) between African, Caribbean and Pacific (ACP) countries and the EU, the ACP countries are asked to eliminate their tariffs on 80% of their tariff lines over different time periods. Agricultural products are among those affected.

Conclusions and proposals

1. The economic and trade policies followed by many developing countries, often at the advice of international financial institutions, or as part of multilateral and bilateral trade agreements, have contributed to the stunting of the agriculture sector in developing countries. The developing countries must be allowed to provide adequate support to their agriculture sector and to have a realistic tariff policy to advance their agriculture, especially since developed countries' subsidies are continuing at a high level. The developed countries should quickly reduce their actual levels of subsidy.

2. The agriculture policy paradigm in developing countries must be allowed to change. Countries should have the policy space to expand public expenditure on agriculture.

Governments in developing countries must be allowed to provide and expand support to the agriculture sector.

3. Developing countries should place high priority on expanding local food production. Accompanying measures and policies should thus be put in place. The countries should be allowed to calibrate their agricultural tariffs in such a way as to ensure that the local products can be competitive and the farmers' livelihoods and incomes are sustained, and national food security is assured.

4. The proposals of developing countries (led by the G33 country grouping) on Special Products and Special Safeguard Mechanism, aimed at protecting food security, farmers' livelihoods and rural development, at the WTO should be supported. Effective instruments that can meet the aims should be established.

5. The policies of the World Bank, IMF and regional development banks should be reviewed and revised as soon as possible, so that they do not continue to be barriers to food security and agricultural development in developing countries.

6. The actual levels (and not just the bound levels) of agricultural domestic subsidies in developed countries should be effectively and substantially reduced. There should also be new and effective disciplines on the Green Box subsidies to ensure that this category does not remain an "escape clause" that allows distorting subsidies that are detrimental to developing countries.

7. There should be a review of many of the FTAs between developed and developing countries, including the EPAs between the EU and ACP countries. In light of the food crisis and the changing paradigm on food security, developing countries that have signed or are in the process of negotiating FTAs should ensure that the FTAs provide enough policy space to allow sufficiently high tariffs on agricultural imports that enable the fulfilment of the principles of food security, farmers' livelihoods and rural development.

CHAPTER TWO

AGRICULTURE AND CLIMATE CHANGE

CLIMATE change affects developing countries' agriculture, while agricultural practices also contribute to climate change. These problems need to be addressed urgently.

Effects of climate change

According to various studies cited in a paper by Director General of the International Food Policy Research Institute (IFPRI), Joachim von Braun (2008), many poorer developing countries are in tropical and sub-tropical regions that are vulnerable to global warming and in semi-desert areas threatened by water scarcity. By 2080, agriculture output in developing countries may decline by 20% due to climate change and yields could decrease by 15% on average. The number of undernourished people in sub-Saharan Africa may rise from 138 million in 1990 to 359 million in 2050. Responses to climate-related threats in agriculture underestimate the problem and there is little work on how the negative effects can be mitigated, according to IFPRI.

According to the recent report of the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), climate change can irreversibly damage the natural resource base on which agriculture depends. Some negative impacts are already visible in many parts of

the world. Water scarcity and the timing of water availability will increasingly constrain production. Climate change will require a new look at water storage to cope with the impacts of more and extreme precipitation, higher seasonal variations and increased rates of evapotranspiration in all types of ecosystems. Extreme climate events (floods and drought) are increasing and are likely to adversely affect food and forestry production and food security (IAASTD 2008).

On the other hand, agriculture is a major contributor to climate change. Agriculture is the main emitter of nitrous oxides and methane. The total global contribution of agriculture (direct and indirect emissions) is between 8.5 and 16.5 billion tonnes of carbon dioxide equivalent, representing 17-32% of all global human-induced greenhouse gas emissions, including land use changes (Greenpeace International 2008).

Direct contribution to emissions

According to the Intergovernmental Panel on Climate Change (IPCC), the agricultural sector's annual emissions of greenhouse gases are estimated at 5.1 to 6.1 billion tonnes of carbon dioxide equivalent in 2005. Of these: (1) methane (which has 20 times more global warming potential than carbon dioxide) accounts for 3.3 billion tonnes; (2) nitrous oxide (which has 300 times greater global warming potential than carbon dioxide) accounts for 2.8 billion tonnes; and (3) carbon dioxide emissions are 40 million tonnes (ITC and FiBL 2007). This represents 10-12% of total greenhouse gas emissions.

Of the direct emissions, the main forms are: (1) nitrous oxide emissions from high nitrogen levels in the soils from synthetic fertilizers (2.128 billion tonnes), which are mainly associated with nitrogen fertilizers and manure applied to soils. Fertilizers

are often applied in excess and not fully used by the crop plants, and some of the surplus is lost as nitrous oxide to the atmosphere; (2) enteric fermentation of cattle (1.792 billion tonnes); (3) biomass burning (672 million tonnes); (4) rice production (616 million tonnes); and (5) manure handling (413 million tonnes) (Greenpeace International 2008).

According to current projections, total greenhouse gas emissions from agriculture will reach 8.3 billion tonnes of carbon dioxide equivalent in 2030, compared to the current level of about 6 billion tonnes (ITC and FiBL 2007).

Indirect contribution to emissions

Agriculture also contributes indirectly to emissions, through the following:

(1) The production of fertilizers is energy-intensive and adds 300-600 million tonnes of carbon dioxide equivalent per year, or 0.6 to 1.2% of total greenhouse gas emissions. The greatest source of emissions from fertilizer production is the energy required, which emits carbon dioxide. With the intensification of agriculture, the use of fertilizers has increased sharply.

(2) Other farm operations (such as tillage, seeding, applications of agrochemicals and harvesting) also emit 60 to 260 million tonnes of carbon dioxide equivalent, irrigation emits 50 to 680 million tonnes while the production of pesticides emits 3 to 140 million tonnes annually.

(3) Change in land use (from other uses to agriculture) is estimated to be also a major source of emission, accounting for about 2.9 to 5.9 billion tonnes annually (or 6-17% of all greenhouse gas emissions) (Greenpeace International 2008).

Mitigation potential

Greenpeace International (2008) has suggested many mitigation actions. The large mitigation potential can change agriculture from being the second largest emitter to a much smaller emitter or even a net sink. The overall mitigation potential is 6 billion tonnes a year, which is close to all of agriculture's direct emissions. The greatest potential mitigation contribution is from soil carbon sequestration (5.38 billion tonnes annually), followed by reduction of methane emissions (500 million tonnes) and nitrous oxide emissions (120 million tonnes).

Because there is low carbon concentration in croplands, there is great potential to increase carbon content through beneficial management practices. On agricultural lands, restoration of the carbon content in cultivated organic soils has a high per-area potential and is the area of greatest mitigation potential in agriculture (Greenpeace International 2008).

Proposals for mitigation by Greenpeace include: (1) cropland management (avoiding leaving land bare; using an appropriate amount of nitrogen fertilizer; no burning of crop residues in the field; reducing tillage) (mitigation potential of 1.45 billion tonnes); (2) grazing land management (mitigation potential of 1.35 billion tonnes); (3) restoration of organic soils that are drained for crop production and restoration of degraded lands to increase carbon sinks (mitigation potential of 2 billion tonnes); (4) improved water and rice management; (5) set-asides, land use change and agroforestry; (6) increasing efficiency in manufacturing of fertilizer; and (7) consumer behaviour change, in eating less meat.

In the Greenpeace analysis, conventional and intensive agriculture characterized by mechanization and use of agrochemicals (mineral fertilizers, herbicides, pesticides) and reliance on high external inputs (chemicals, irrigation, fossil fuels) has led to high environmental and social costs that may undermine future capacity to maintain required levels of food production.

In April 2008, the IAASTD launched its report in Johannesburg, which was approved by 57 governments. The IAASTD was an inter-governmental process, co-sponsored by the United Nations Food and Agriculture Organization (FAO), UN Development Programme (UNDP), UN Environment Programme (UNEP), Global Environment Facility (GEF) and the World Bank, with over 400 authors involved in drafting the report. It conducted a three-year evidence-based assessment on agricultural science and technology and on the future of agriculture. It made a critique of conventional industrial farming and called for a fundamental change in farming practices so as to better address increasing food prices, hunger, inequities and environmental crises. The report reflects a growing consensus among scientists and many governments that the old paradigm of industrial energy-intensive and toxic agriculture is an outdated concept, while small-scale farmers and agroecological methods provide the way forward.

Its conclusion was that while the past emphasis on production and yields brought some benefits, this was at the expense of the environment and social equity. While promoting agroecological methods, it did not support genetically modified crops, preferring to highlight the doubts and uncertainties surrounding them, rather than the claimed benefits. The report concluded that for poor farmers, genetically modified crops are unlikely to play a substantial role in addressing their needs,

and longer-case assessments of the environmental and health risks and regulatory frameworks are needed (Lim 2008).

A report by the International Trade Centre (ITC) and Research Institute of Organic Agriculture (FiBL) (2007) provides a detailed assessment of the benefits of organic farming regarding climate change. A summary of the benefits is as follows:

- Organic agriculture has considerable potential for reducing emissions.

- In general it requires less fossil fuel per hectare and kg of produce due to the avoidance of synthetic fertilizers. Organic agriculture aims to improve soil fertility and nitrogen supply by using leguminous crops, crop residues and cover crops.

- The enhanced soil fertility leads to a stabilization of soil organic matter and, in many cases, to a sequestration of carbon dioxide into the soils.

- This in turn increases the soil's water retention capacity, thus contributing to better adaptation of organic agriculture under unpredictable climatic conditions with higher temperatures and uncertain precipitation levels. Organic production methods emphasizing soil carbon retention are most likely to withstand climatic challenges particularly in those countries most vulnerable to increased climate change. Soil erosion, an important source of carbon dioxide losses, is effectively reduced by organic agriculture.

- Organic agriculture can contribute substantially to agroforestry production systems.

- Organic systems are highly adaptive to climate change due to the application of traditional skills and farmers' knowledge, soil fertility-building techniques and a high degree of diversity.

- The study concludes that: "Within agriculture, organic agriculture holds an especially favourable position, since it realizes mitigation and sequestration of carbon dioxide in an efficient way…Organic production has great mitigation and adaptation potential, particularly with regard to soil organic matter fixation, soil fertility and water-holding capacity, increasing yields in areas with medium to low-input agriculture and in agroforestry, and by enhancing farmers' adaptive capacity. Paying farmers for carbon sequestration may be considered a win-win-win situation as (a) carbon dioxide is removed from the atmosphere (mitigation); (b) higher organic matter levels in soil enhance their resilience (adaptation), and (c) improved soil organic matter levels lead to better crop yield (production)."

The study recognizes that organic agriculture also has weaknesses, mainly related to productivity and yield losses in some crops and production areas, and this highlights the need for research. Total European research funding for organic agriculture currently represents less than 1% of the total food and agriculture research budget.

Moreover in some areas, organic farming performs better, for example in conditions where there are water constraints. Yields from organic agriculture where water is limited during the growing period, and under subsistence farming, are equal to or significantly higher than those from conventional agriculture. The ITC-FiBL report cites a comparison of 133 studies from developing countries which concluded that organic plant

and livestock yields were 80% higher than their conventional counterparts, and for crops only the yield increase was 74%.

Another review of sustainable agriculture practices, covering 208 projects in 52 countries, shows that 9 million farmers have adopted sustainable agriculture practices on 29 million hectares in Africa, Asia and Latin America (Pretty and Hine 2001, cited in Lim 2003). Farmers have achieved substantial increases in food production per hectare: 50-150% for rain-fed crops; 5-10% for irrigated crops. Disaggregated data show:

- Average food production per household rose by 1.7 tonnes per year (up by 73%) for 4.42 million small farmers growing cereals and roots on 3.6 million hectares.

- Increase in food production was 17 tonnes per year (up 150%) for 146,000 farmers on 542,000 hectares cultivating roots (potato, sweet potato, cassava).

- Total production rose by 150 tonnes per household (up by 46%) for the larger farms in Latin America (average size 90 hectares).

Conclusions and proposals

Agriculture both seriously affects climate change and is in turn seriously affected by it. Both these problems should be addressed urgently.

1. There should be more research and action on adaptation measures in agriculture, especially in developing countries in order to assist farmers in developing countries to reduce the adverse effects of climate change on agriculture.

2. Action plans for mitigation measures for agriculture should be urgently researched and implemented.

3. Financing assistance for adaptation and mitigation measures in the agriculture sector in developing countries should be prioritized.

4. Arrangements should be made for the sharing of experiences and the transfer of good practices in agriculture that can constitute mitigation and adaptation.

5. Given the many advantages of organic farming and sustainable agriculture, in terms of climate change as well as social equity and farmers' livelihoods, there should be a much more significant share of research, personnel, investment, financing and overall support from governments and international agencies that should be channelled towards sustainable agriculture. Promotion of sustainable agriculture can lead to a superior model of agriculture from the environmental and climate change perspective, as high-chemical and water-intensive agriculture is phased out while more natural farming methods are phased in, with research and training programmes also promoting better production performances in sustainable agriculture.

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THE FOOD CRISIS, CLIMATE CHANGE AND THE IMPORTANCE OF SUSTAINABLE AGRICULTURE

The recent crisis of high food prices and the serious problem of climate change point to the grave challenges confronting global agriculture. This paper looks at the difficulties the farming sector faces on these two fronts and how it can respond to them.

The food price crisis has highlighted the importance of strengthening food security. Over the years, domestic food production in developing countries has been undermined often as a result of wrong-headed policy prescriptions from international financial institutions and the inequitable provisions of bilateral and multilateral trade agreements. This paper calls for reform in national and international agricultural policies in order to better safeguard food security and farming livelihoods in the developing world.

Climate change poses another serious threat to the agriculture sector, which both affects and is affected by global warming. While climate change can adversely affect agricultural output, current farming methods themselves are a major contributor to climate change. However, as this paper points out, agriculture does have great potential for mitigating and adapting to the impacts of climate change – potential that can be realized with a shift from conventional industrial farming to ecologically sound sustainable agriculture practices.

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TWN ENVIRONMENT & DEVELOPMENT SERIES

is a series of papers published by Third World Network on the increasing challenges to the relationship between the environment and development, in particular those posed by the process of globalization, liberalization and new technologies. It aims to advance a Third World perspective of analyses, strategies and proposals for reforms of policy, practice and institutions, at both the international and national levels – towards greater social justice, equity and ecological sustainability.

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