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A UNEP RAPID RESPONSE ASSESSMENT

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PREFACE

In 2008 food prices surged plunging millions back into hunger and triggering riots from Egypt to Haiti and Cameroon to Bangladesh. Whereas fuel prices, which also surged, have fallen back sharply food prices remain problematic with wheat, corn and soya still higher than they were 12-18 months ago.

In order to understand the factors underpinning the food crisis and to assess trends, UNEP commissioned a Rapid Response team of internal and international experts. Their conclusions are presented in this report launched during UNEP's 25th Governing Council/Global Ministerial Environment Forum.

Several factors have been at work including speculation in commodity markets, droughts and low stocks. The contribution of growing non-food crops such as biofuels is also discussed. Importantly the report also looks to the future. Was 2008 an aberration or a year foreshadowing major new trends in food prices and if so, how should the international community respond?

The experts argue that, unless more sustainable and intelligent management of production and consumption are undertaken food prices could indeed become more volatile and expensive in a world of six billion rising to over nine billion by 2050 as a result of escalating environmental degradation. Up to 25% of the world food production may become 'lost' during this century as a result of climate change, water scarcity, invasive pests and land degradation.

Simply cranking up the fertilizer and pesticide-led production methods of the 20th Century is unlikely to address the challenge. It will increasingly undermine the critical natural inputs and nature-based services for agriculture such as healthy and productive soils; the water and nutrient recycling of forests to pollinators such as bees and bats.

The report makes seven significant recommendations. These include real opportunities for boosting aquaculture and fish farming without intensifying damage to the marine environment alongside ones highlighting the opportunities for minimizing and utilizing food wastes along the supply chain right up to consumers.

In response to the food, fuel and financial crises of 2008 UNEP launched its Global Green New Deal and Green Economy initiatives: food is very much part of the imperative for transformational economic, social and environmental change. We need a green revolution but one with a capital G if we are to balance the need for food with the need to manage the ecosystems that underpin sustainable agriculture in the first place.

This report will make an important contribution to the debate but equally it needs to trigger more rational, creative, innovative and courageous action and investment to steer 21st Century agriculture onto a sustainable Green Economy path.

Achim Steiner
UN Under-Secretary General and Executive Director, UNEP

SUMMARY

The surge in food prices in the last years, following a century of decline, has been the most marked of the past century in its magnitude, duration and the number of commodity groups whose prices have increased. The ensuing crisis has resulted in a 50–200% increase in selected commodity prices, driven 110 million people into poverty and added 44 million more to the undernourished. Elevated food prices have had dramatic impacts on the lives and livelihoods, including increased infant and child mortality, of those already undernourished or living in poverty and spending 70–80% of their daily income on food. Key causes of the current food crisis are the combined effects of speculation in food stocks, extreme weather events, low cereal stocks, growth in biofuels competing for cropland and high oil prices. Although prices have fallen sharply since the peak in July 2008, they are still high above those in 2004 for many key commodities. The underlying supply and demand tensions are little changed from those that existed just a few months ago when these prices were close to all-time highs.

The demand for food will continue to increase towards 2050 as a result of population growth by an additional 2.7 billion people, increased incomes and growing consumption of meat. World food production also rose substantially in the past century, primarily as a result of increasing yields due to irrigation and fertilizer use as well as agricultural expansion into new lands, with little consideration of food energy efficiency. In the past decade, however, yields have nearly stabilized for cereals and declined for fisheries. Aquaculture production to just maintain the current dietary proportion of fish by 2050 will require a 56% increase as well as new alternatives to wild fisheries for the supply of aquaculture feed.

Lack of investments in agricultural development has played a crucial role in this levelling of yield increase. It is uncertain whether yield increases can be achieved to keep pace with the growing food demand. Furthermore, current projections of a required 50% increase in food production by 2050 to sustain demand have not taken into account the losses in yield and land area as a result of environmental degradation.

The natural environment comprises the entire basis for food production through water, nutrients, soils, climate, weather and insects for pollination and controlling infestations. Land degradation, urban expansion and conversion of crops and cropland for non-food production, such as biofuels, may reduce the required cropland by 8–20% by 2050, if not compensated for in other ways. In addition, climate change will increasingly take effect by 2050 and may cause large portions of the Himalayan glaciers to melt, disturb monsoon patterns, and result in increased floods and seasonal drought on irrigated croplands in Asia, which accounts for

25% of the world cereal production. The combined effects of climate change, land degradation, cropland losses, water scarcity and species infestations may cause projected yields to be 5–25% short of demand by 2050. Increased oil prices may raise the cost of fertilizer and lower yields further. If losses in cropland area and yields are only partially compensated for, food production could potentially become up to 25% short of demand by 2050. This would require new ways to increase food supply.

Consequently, two main responses could occur. One is an increased price effect that will lead to additional under- and malnourishment in the world, but also higher investments in agricultural development to offset (partly) decreases in yield. The other response may be further agricultural expansion at the cost of new land and biodiversity. Conventional compensation by simple expansion of croplands into low-productive rain-fed lands would result in accelerated loss of forests, steppe or other natural ecosystems, with subsequent costs to biodiversity and further loss of ecosystem services and accelerated climate change. Over 80% of all endangered birds and mammals are threatened by unsustainable land use and agricultural expansion. Agricultural intensification in Europe is a major cause of a near 50% decline in farmland birds in this region in the past three decades.

Taking into account these effects, world price of food is estimated to become 30–50% higher in coming decades and have greater volatility. It is uncertain to what extent farmers in developing countries will respond to price effects, changes in yield and available cropland area. Large numbers of the world's small-scale farmers, particularly in central Asia and Africa, are constrained by access to markets and the high price of inputs such as fertilizers and seed. With lack of infrastructure, investments, reliable institutions (e.g., for water provision) and low availability of micro-finance, it will become difficult to increase crop production in those regions where it is needed the most. Moreover, trade and urbanization affect consumer preferences in developing countries. The rapid diversification of the urban diet cannot be met by the traditional food supply chain in the hinterland of many developing countries. Consequently, importing food to satisfy the changing food demand could be easier and less costly than acquiring the same food from domestic sources.

Higher regional differentiation in production and demand will lead to greater reliance on imports for many countries. At the same time, climate change could increase the variability in annual production, leading also to greater future price volatility and subsequent risk of speculation. Without policy intervention, the combined effects of a short-fall in production, greater price volatility and high vulnerability to climate change, particularly in Africa, could result in a substantial increase in the number of people suffering from under-nutrition – up from the current 963 million.

However, rather than focussing solely on increasing production, food security can be increased by enhancing supply through optimizing food energy efficiency. Food energy efficiency is our ability to minimize the loss of energy in food from harvest potential through processing to actual consumption and recycling. By optimizing this chain, food supply can increase with much less damage to the environment, similar to improvements in efficiency in the traditional energy sector. Firstly, developing alternatives to the use of cereal in animal feed, such as by recycling waste and using fish discards, could sustain the energy demand for the entire projected population growth of over 3 billion people and a 50% increase in aquaculture. Secondly, reducing climate change would slow down its impacts, particularly on the water resources of the Himalayas, beyond 2050. Furthermore, a major shift to more eco-based production and reversing land degradation would help limit the spread of invasive species, conserve biodiversity and ecosystem services and protect the food production platform of the planet.

SEVEN OPTIONS FOR IMPROVING FOOD SECURITY

Increasing food energy efficiency provides a critical path for significant growth in food supply without compromising environmental sustainability. Seven options are proposed for the short-, mid- and long-term.

OPTIONS WITH SHORT-TERM EFFECTS

1. To decrease the risk of highly volatile prices, price regulation on commodities and larger cereal stocks should be created to buffer the tight markets of food commodities and the subsequent risks of speculation in markets. This includes reorganizing the food market infrastructure and institutions to regulate food prices and provide food safety nets aimed at alleviating the impacts of rising food prices and food shortage, including both direct and indirect transfers, such as a global fund to support micro-finance to boost small-scale farmer productivity.

2. Encourage removal of subsidies and blending ratios of first generation biofuels, which would promote a shift to higher generation biofuels based on waste (if this does not compete with animal feed), thereby avoiding the capture of cropland by biofuels. This includes removal of subsidies on agricultural commodities and inputs that are exacerbating the developing currently used for aquaculture feed directly to human consumption, where feasible.

4. Support farmers in developing diversified and resilient eco-agriculture systems that provide critical ecosystem services (water supply and regulation, habitat for wild plants and animals, genetic diversity, pollination, pest control, climate regulation), as well as adequate food to meet local and consumer needs. This includes managing extreme rainfall and using inter-cropping to minimize dependency on external inputs like artificial fertilizers, pesticides and blue irrigation water and the development, implementation and support of green technology also for small-scale farmers.

5. Increased trade and improved market access can be achieved by improving infrastructure and reducing trade barriers. However, this does not imply a completely free market approach, as price regulation and government subsidies are crucial safety nets and investments in production. Increased market access