



# NTS ALERT

*“What makes wars start? Fights over water. Changing patterns of rainfall. Fights over food production, land use.. There are few greater potential threats to our economies too ... but also to peace and security itself”*

*- British Foreign Secretary Margaret Beckett, during the UNSC Climate Change debate, 2007*

*This edition of NTS Alert takes a look at the effects of climate change on food security and what some Asian states have been doing about it.*

## Asia’s Food Security Threatened

In India, climate change would only add to further misery, given the existing rising prices of cereals and wheat. According to R.K. Pachauri, chairperson of the Intergovernmental Panel on Climate Change, global warming is set to further reduce crop production in the subcontinent. A rise in 0.5 degrees celcius during winter, for instance, would result in a 0.45ton drop in wheat production per hectare. Moreover, total agricultural land is expected to reduce as the land may not remain suitable to grow present crop in the future. Farmers would therefore need to change or diversify their crop production to guarantee their livelihood. Without such livelihood and food security, it is likely that the rate of rural to urban migration will increase therefore giving rise to the number of slums in cities.

In addition to this, the UN’s second working report noted that huge coastal erosions due to rising sea levels, as a result of melting glaciers in the Himalaya Hindu Kush ranges, can adversely affect half a million people in India. Not only would they be victims of excessive flooding in coastal areas, it would also threaten their water security due to the

**Climate Change Threatens Our Food Security**

increase in groundwater salinity. Pauchuri notes that India’s per capita water availability is expected to fall from 1820 million cubic metres per year in 2001 to 1140 in 2050. This inevitably would have an adverse effect on food and crop production as there is less water to work with, let alone use for every day life.

Flooding of coastal and low lying areas also threatens the food security of Bangladesh by destroying its rice paddy fields. According to Krishibid Md. Shahjahan General Secretary of Seedmen’s Society of Bangladesh, the situation is further exacerbated due to the fact that by the year 2020, Bangladesh would require 35.5 million tones of rice to meet the food demand of its population, which is expected to increase from 132 million to 173 million.

In China, six federal departments and academic organizations, including the Ministry of Science and Technology, China Meteorological Administration and the Chinese Academy of Sciences have jointly released a report highlighting the negative impact that global warming would have on China’s

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ecological, social and economic systems. This is especially so with regards to farming, animal husbandry and water supply, out of which some damage will be irreversible.

According to the report, the average temperature in China has risen by 0.5 to 0.8 degree centigrade in the past century and is expected to go up another two to three degrees centigrade in the coming 50 to 80 years. As such, it is estimated that the country's output of major crops, including rice, wheat and corn, could fall by up to 37 percent in the second half of the 21st century if no effective measures are taken to curb greenhouse gas emissions in the next 20 to 50 years.

In addition to this, China's central and western regions will suffer an annual water shortage of about 20 billion cubic meters from 2010 to 2030. Eventhough annual rainfall in northern China may increase 7 to 10 percent, longer drier seasons would still result in water scarcity. The resulting increased demand for water for agriculture would therefore have an impact on the cost of farm produce. The effects of climate change have already been evident. Early 2007 was marked by the country's worst drought in more than 50 years in China's southwestern Chongqing Municipality and Sichuan province.

In Malaysia, the Initial National Communication report noted that national food security is at risk. Similar to China and India, there would be lower crop yields. For every degree of temperature rise, rice yields may decline by 10 per cent. Prolonged droughts may force Malaysia and other rice producing countries to abandon flooded rice planting systems and develop dry land systems

Moreover, as much as six per cent of land planted with oil palm and four per cent of land under rubber may be flooded and abandoned as a result of rising sea levels. Rising sea levels could also inundate and destroy most coastal aquaculture activities while warmer temperatures mean livestock could suffer heat stress, leading to reduced meat production. Increasing temperatures will also result in higher evaporation and transpiration, thereby increasing water scarcity. The cost of alleviating water scarcity problems is immense. According to the report, 20

### **Food Security Exacerbating Climate Change?**

As much as we have noted the adverse effects that climate change poses on Asia's food security, such as rice, discussions at the recent Intergovernmental Panel on Climate Change meeting in Bangkok suggest that the production of rice actually exacerbates climate change. Methane emissions from flooded rice paddies contribute to global warming just as coal-fired power plants, automobile exhausts and other sources do with the carbon dioxide they spew into the atmosphere. The IPCC report from the Bangkok meeting indicated that rice production was a main cause of rising methane emissions in the 20th century and therefore called for greater controls in rice production.

Reiner Wassmann, a climate change specialist at the International Rice Research Institute (IRRI) in the Philippines noted that it would be important for Asian countries to look into rice production as a way of reducing greenhouse gas emissions. The bacteria that thrives in flooded paddies produces methane, by decomposing manure used as fertilizer and other organic matter in the oxygen-free environment. The gas is emitted through the plants or directly into the atmosphere.

A molecule of methane is 21 times more potent than a molecule of carbon dioxide as a heat-trapping gas. Although carbon dioxide is still the bigger problem, representing 70% of the warming potential in the atmosphere, rising levels of methane now account for 23%, reports the U.S. Environmental Protection Agency (EPA). A 2005 study by U.S. scientists focused on China, which produces a third of the world's rice and where rice fields have shrunk by 24 million acres in the past decade as farmers shifted to other crops and abandoned marginal land. The study also found that nitrogen-based fertilizer has replaced manure, and many Chinese farmers are using less water on their fields.

For many Asian countries, modifying rice production might prove to be easier and cheaper than some of the other fixes proposed in the IPCC draft report, such as switching from coal to solar, wind power or other renewable energy sources. But despite the recent leveling off, the EPA projects that global methane emissions will rise again, as rice fields expand with growing populations.

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per cent loss of domestic and industrial water supply would cost Malaysia about RM152 million.

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Moreover, few rice producing communities in Asia are equipped with the knowledge and capacity to change their production techniques as yet. Wassmann said few countries have followed China's example, instead ignoring such solutions as periodically draining their fields or shifting to locations that need less water.

According to Pete Smith of the University of Aberdeen in Scotland and lead author of the IPCC report's section on agriculture, people in the developing world hardly prioritize climate mitigation over providing food for their families.

What is therefore needed is increased awareness amongst rural communities regarding the benefits of the new sustainable cultivation techniques as well as sufficient compensation for the farmers to effectively adopt the new methods of production.

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### **What has been done?**

Negotiations are underway between **Japan and China**. Japan has noted that it will offer China assistance in curbing greenhouse gas emission and Beijing will agree to resume importing Japanese rice. China banned Japanese rice in 2003, saying insects were found in a shipment. Negotiations to resume exports had for sometime been bogged down due to political discord.

Despite China's claims that it is self-sufficient on its rice yields, this would be hard to believe given the disastrous impact of the droughts inflicted on the country in recent years. The proposed agreement between China and Japan is therefore beneficial to both parties as well as the international community. Not only would Japan maintain its economic growth via rice exports and China be able to provide better food security for its impoverished communities, the transfer of clean technology in addressing global warming.

In **India**, the Cabinet Committee on Economic Affairs (CCEA) has announced measures to ensure

adequacy of food grains stocks in the country by enhancing the procurement of rice paddies from the farmers. The CCEA is to extend the period of incentive bonus of Rs. 40 (USD 1) per quintal above the minimum support price of Rs. 580 (USD 14) per quintal and Rs. 610 (USD 15) per quintal of rice beyond 31<sup>st</sup> March 2007.

States such as Andhra Pradesh, Chattisingarh, Orissa, Tamil Nadu and West Bengal, where paddy crop production is immense, the bonus will be extended till 30<sup>th</sup> September 2007. Other states like Bihar and Kerala, however, will only have the bonus extended till 31<sup>st</sup> May 2007.

**Thailand**, the world's largest rice exporter, has also shown some promise in addressing greenhouse gas emissions from its rice industry. Large mills, such as the Patum Rice Mill and Granary outside Bangkok, have utilized leftover rice husks as a source for power instead of leaving them to decompose in the fields and further emit methane gas. Not only are these rice husks a clean source of energy – as compared to burning coal or other fossil fuels — it also allows excess power to be sold back to the state.





In the *Mekong region*, agriculture ministers of Cambodia, China's Yunnan Province and Guangxi Zhuang Autonomous Region, Laos, Myanmar, Thailand and Vietnam have met for the first time to discuss a far-reaching programme in agricultural cooperation. The meeting is part of the Greater Mekong Subregion (GMS) Economic Co-operation Programme initiated by the Asian Development Bank (ADB) since 1992.

New issues on the table include the possible effects on national and subregional food security on the rural poor due to the switch from food to bio-energy crops. Emerging animal and crop disease risks are also an issue given the recent outbreaks of avian influenza in several countries in the subregion.

Dealing with these issues would require greater capacity in science and technology, as well as formulating new policies and regulations and food safety standards. Over the past few years a Working Group on Agriculture has been collaborating with various stakeholders to create the Core Agriculture Support Programme. These stakeholders include governments, donor agencies, international and regional research and development organisation, non-governmental organizations and civil society. The programme focuses on cross-border issues to encourage cross border trade and investment in agriculture while contributing to food security and poverty reduction and ensuring the protection of the environment and sustainable use of natural resources. Other areas include the use of advanced agricultural science and technology in biosafety and biotechnology areas, policy and investment cooperation in biofuels and rural renewable energy, and the establishment of emergency response systems for agriculture-related crises.

In the *Philippines*, President Arroyo initiated the *Tindahan Natin* project, which aimed to provide the public with greater access to affordable good-quality rice. The project is part of the government's initiatives in its the hunger mitigation master plan that aims to provide more social services for the poorer stratas of Filipino society. According to Information Officer Edna Artates of the National Food Authority (NFA) some 124 *Tindahan Natin* outlets (or rice outlets) in the Capiz province are now flooded with government rice to stabilize the

price of commercial rice in the market. This has already exceeded the initial target of setting up 110 rice outlets in the province. Military and religious organs are also engaged in the project – the 3rd Infantry Division of the Armed Forces of the Philippines (AFP) and 5 parishes also sell the government rice at P18.00 (0.38 USD) per kilogram.

In addition to this, key agribusiness players in the southern region of Mindanao aims for stronger public-private sector partnership in addressing food and agri-industry concerns. The Mindanao Business Council noted that the theme for its annual Mindanao Food Congress in 2007 will be “Enhancing Food Production and Profitability in Mindanao” and aims to define specific and doable interventions that would complement governmental efforts at increasing Mindanao's food productivity and profitability. Topics to be discussed include organic farming, halal food, technologies to improve food production and processing, improved market access, models of effective agricultural development programs and government support programs for trade and market promotion.

Undersecretary Virgilio Leyretana, chair of the Mindanao Economic Development Council, lauded the private sector for sustaining the efforts to enhance food production as a means to achieving peace and development in the island. “This reminds us that when we speak of peace and development, we need food security,” said Leyretana, adding that the national government under the Super Region Strategy gives high priority to Mindanao's agricultural productivity by positioning the island-region as the main convergence zone for food production, high-value crops and agri-fishery products. Since 1998, the Mindanao Food Congress upholds the island-region's position as the nation's food basket and provides a venue for policy discussions affecting the food industry.

There have also been further advances in rice production technology. The Tamil Nadu Agricultural University (TNAU) in *India*, for instance, has developed a new drought tolerant rice culture that is capable of yielding 3.7 tonnes per hectare and suitable for rainfed areas of Tamil Nadu. According to Dr. T S Raveendran, Director of the Centre for Plant Breeding and Genetics at TNAU, this culture has been developed by combining conventional and

## Two Thirds of the World's Poor Lives in Asia

Asia is home to two-thirds of the world's poor. Every fifth person in the region lives in extreme poverty - commonly measured as income below one dollar a day. In India, Bangladesh and Cambodia, more than 30 percent live below the poverty line.

But the region has made enormous progress in the past two decades. Although 35 percent of Asians lived below the poverty line in 1990, the figure dropped to 19 percent in 2003. Developing countries in East Asia were most successful, with the rate dropping from 29 percent to just eight percent in the same period. The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) says China alone moved 150 million people out of poverty in the past decade. Ravi Ratnayake, director of UNESCAP's trade and investment division, says the region's economic growth is the most important reason poverty rates are dropping.

Nonetheless, Shiladitya Chatterjee, head of the Asian Development Bank's poverty unit, notes that being poor is not just a matter of having a low income. It can mean a lack of access to services - such as education, health, sanitation and water - and a lack of political participation. In this respect, Asia's track record has not been so positive.

'While Asia's record in income poverty has been remarkable and extraordinary, our record in terms of non-income poverty, while it has been good, has not been as impressive,' said Chatterjee. 'There are still large numbers of people living with major deprivations, human deprivations, and we are concerned that we are not making as much progress.'

In some countries, the benefits of economic growth have not reached the poorest people. Inequality remains a major problem, particularly the growing income gap between urban and rural populations. Poverty experts, such as UNESCAP's Ratnayake, say governments need to make sure the poor enjoy the benefits of growing economies.

A recent report by the Asian Development Bank predicts that extreme poverty could be eliminated in Asia by 2020. The non-profit lender also expects several countries in the region to become donors to their poorer neighbors - something China has already started to do.

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molecular breeding methods following a novel participatory research approach by involving farmers.

Scientists at the International Rice Research Institute (IRRI) in the Philippines, have, for many years, been developing rice paddy strains resistant to environmental changes. Other rice cultivating countries such as Bangladesh, have benefited from these new strains of rice – resistant to floods for several weeks and increasing crop yields – since the 1960s.

The IRRI has also formulated its strategic plan for the year 2007 to 2015. In the plan, it has set out five goals

1. reduce poverty through improved and diversified rice-based systems
2. ensuring the sustainability and stability of rich production, which is able to cope with climate change
3. improve the nutrition and health of poor rice consumers and farmers
4. provide equitable access to information and knowledge on rice and help develop the next generation of rice scientists
5. provide rice scientists and producers with the genetic information and material needed to develop improved technologies to enhance rice production

Another little known yet simple method of reducing greenhouse gas emissions is no-till or minimum-till agriculture, where fields are ploughed and disturbed as little as possible. This keeps carbon in the soil rather than sending it into the air as carbon dioxide. Nitrous oxide (N<sub>2</sub>O) is a more potent greenhouse gas than CO<sub>2</sub>, and is released when fertiliser breaks down. As such, scientists with **International Maize and Wheat Improvement Center** (CIMMYT) and the International Center for Tropical Agriculture (CIAT) have developed a hand-held sensor using light and infra-red radiation which can tell farmers whether plants require more fertiliser or not; less fertiliser use means less N<sub>2</sub>O produced.

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South Asia faces a bigger challenge, but a separate report by the World Bank says the region has a chance of attaining single-digit poverty rates within a generation. Shekhar Shah is economic adviser for the World Bank's South Asia region.

'Now you ask - how can we make such a claim or put forward such an ambitious proposal,' said Shah. 'I think for a variety of reasons, but principally because economic growth is creating a political space for much-needed policy and institutional reforms, both to accelerate this growth and to sustain it and then going on from there to be able to tackle the other aspects of poverty and deprivation in South Asia.'

Poverty experts agree that the region needs to accelerate and sustain economic growth to further reduce poverty. But this alone is not enough. Challenges remain. Experts say inequality in growth must be addressed, particularly the issue of lagging sectors such as agriculture, and the poorest regions, such as India's state of Bihar. Countries need to expand opportunities for the poor - for example through better regulation of labor markets and the creation of jobs for the rapidly growing labor force in many countries.

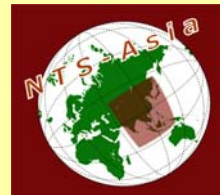
There are also continuing challenges of human development - such as providing adequate health care and education. Shah of the World Bank notes that poor governance, corruption and conflict also hurt anti-poverty efforts.

**Source**

Two Thirds of World Poor Live in Asia, *Asia Bulletin*, 3 May 2007

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