

Short Article

Biofuel Development at the Crossroads

The dependence on foreign non-renewable sources of energy has been urging most countries to find paths to energy independence such as those that promote the expansion of biofuel production. The primary forces behind the continued surge in biofuel production and capacity expansion were a combination of blending mandates and tax subsidies in several countries, with strong support from agricultural interests. Many countries such as the USA, the United Kingdom, Japan, China, and the European Union (EU) have targeted to expand biofuel production and have enacted mandates for blending biofuels into vehicle fuels in the future. Consequently, the production of biofuel will increase consistently.

The Worldwatch Institute stated that global production of fuel ethanol derived primarily from sugar or starch crops increased 18 per cent to 46 billion litres in 2007, whereas production of biodiesel made from feedstock such as soy, rape and mustard seed, and palm and waste vegetable oils rose an estimated 33 per cent to 8 billion litres. This implies that the world production of biofuels in 2007 rose about 20 per cent to an estimated 54 billion litres or 1.5 per cent of the global supply of liquid fuels (Monfort, 2008).

The United States, which produces ethanol primarily from corn, and Brazil, which primarily uses sugar cane, account for 95 per cent of the world's ethanol production. Germany maintained its lead in biodiesel by increasing production capacity. Other European countries such as Austria, Belgium, Greece, Italy, the Netherlands, Poland, and Portugal also expand biodiesel production capacity (Monfort, 2008). Malaysia and Indonesia also seek to capture some proportions of biodiesel market by expanding their palm oil plantations.

In spite of the fact that the oil price in 2009 is much lower than that in 2008, it seems that biofuel production will continue developing. Biofuel development, however, has been criticized for its possible negative social, economic and environmental impacts. In this relation, it is worthwhile to present the key findings of the OPEC Fund for International Development (OFID) study prepared by IIASA (2009) as follows: First, factors that cause the increase in food price include increased demand for biofuels' feedstocks and rising agricultural fuel and fertilizer prices. Biofuel development scenarios indicate a strong relationship between agricultural prices and the share of first generation biofuels in total transport fuels. For example, with biofuel share of 4 per cent, the cereal price index increases by 20 per cent; with a 7 per cent biofuel target, the cereal price index increases by 40 per

cent. Thus, biofuel development will seriously affect food security and this is a factor in rising hunger. Second, biofuel development absorbs cereal production. For different biofuel scenarios, about 66 per cent of cereal used for ethanol production in 2020 will be obtained from increased crop production, 24 per cent from reduced feed use and 10 per cent from reduced food use. Third, biofuel development provides modest benefits for rural development. The increase in agricultural value-added induced by first generation biofuel production is relatively small. Fourth, the net greenhouse gas savings resulting from expansion of biofuels can only be expected after 30 years. For shorter periods, net greenhouse gas balances are dominated by carbon debts due to direct and indirect land use changes. Fifth, the impact of biofuel development scenarios will be the increase in net expansion of cultivated land during 2000-2020 by 20-40 per cent. Sixth, biofuel development fuels deforestation. The analysis of biofuel development scenarios suggest that any prolonged dependence on the first generation biofuels will result in increased risk of deforestation with the inherent consequences of substantial carbon emissions and biodiversity loss.

Finally, the OFID study concluded that the development of second generation of biofuel using biomass residues from agricultural crops and forestry is imperative to minimize, if not to eliminate, the negative impacts of the first generation of biofuels. However, while the technology development of second generation of biofuels seems to take a relatively long period of time to be economically feasible, the development of first generation biofuels that can compete with fossil fuel and minimize the negative impacts remains necessary.

The International Water Management Institute (IWMI) stated that not only will the development of biofuel crops have impact on food, energy and the environment, but it also affects water use. In countries where water is already scarce, like India and China, growing biofuel crops will aggravate existing problems (IWMI, 2008). For this reason, it is necessary to find less thirsty crops such as jatropha and sweet sorghum which have much less impacts on food production and the environment than others. In the case of Indonesia, *nyamplung* (*Callophylum inopileum*) is another potential biofuel feedstock. ■

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(Reference available upon request)

Breaking News

Investing in the Farm

The Economic Survey 2008-2009 points out that the agriculture sector in India, which clocked an average growth of over 4.9 per cent over three years (2005-2006 to 2007-2008), was responsible for a larger part of the overall growth in the year's GDP. Although the prices of agri-commodities have remained high in the wholesale and retail markets, the farmer gets less than half the retail price. The Minimum Support Prices (MSP) is available only to the producers of a few crops, notably wheat, rice and, to some extent, cotton. Easy access to cheap credit, which is critical for boosting private investment in agriculture, is not available to the bulk of the farm community. Induction of new technology is essential for agriculture to be economically-viable and investment-worthy. Such issues, obviously, need to be addressed to boost private investment in agriculture and put it on a sound footing.

Sud, S., 2009. Investing in the Farm. Business Standard, <http://www.business-standard.com/> (14 July 2009).

The Food Crisis will be Back

The food crisis will be back sooner than expected due to several factors, arising out of the economic and financial crisis, that are generating pressure on our capacity to supply food. First, there has been increase in areas dedicated to biofuels, which is taking up land used for food production. Second, the growth of world population, expected to reach 9 billion people in 2050. At least 50 per cent more food is needed to be produced in the next 15 years. Third, with oil prices up again, there are economic incentives for biofuel projects and possibilities. Finally, farm production shortages due to lower margins, climate, droughts and diseases are a major concern. This year's agricultural output will be lower in several countries, and global production is expected to fall by 5 per cent. According to FAO, even with the reduction of global hunger, food prices in some countries are still 80 per cent higher than they were two years ago.

Neves, M.F., 2009. The Food Crisis will be Back. China Daily, <http://www.chinadaily.com.cn/> (7 July 2009).

Events

The 3rd International Conference on Integrated Approaches to Improve Crop Production Under Drought Prone Environments

11-16 October 2009

Shanghai, China

<http://www.interdrought.org/>

15th Triennial Symposium of the International Society for Tropical Root Crop

Tropical Roots and Tubers in a Changing Climate: A Convenient Opportunity for the World

2-6 November 2009

International Potato Center, Lima, Peru

<http://www.cipotato.info/>

G8 Pledges \$US 20 billion for Agriculture

The world's most developed economies G8 leaders meeting in L'Aquila, Italy, unveiled a plan to commit US\$ 20 billion of funding to the development of agriculture and tackle persistent food shortages in developing countries. There is an urgent need for decisive action to free humankind from hunger and poverty. Food security is closely connected with economic growth and social progress as well as with political stability and peace. By linking the efforts of partners and stakeholders around the world, the leaders agreed to design and implement a food security strategy whose core principles will be country ownership and effective management. The three-year initiative will also help developing countries develop scientific research in agriculture; foster international collaboration and improve the dissemination of research.

Chege, K., 2009. G8 Pledges \$US 20 billion for Agriculture. Science and Development Network, <http://www.scidev.net/> (11 July 2009).

Agricultural Co-operatives as Part of the Financial Stimulus Package

On the UN International Day of Co-operatives (4 July 2009) celebrating the theme "Driving Global Recovery through Co-operative Enterprise", International Federation of Agricultural Producers (IFAP) is encouraging the adoption and strengthening of the co-operative business model as part of national financial and social stimulus packages around the world. Co-operatives, specifically in agriculture, are the business model most resilient to crises. Farmers and their co-operatives can respond to many of the concerns of society in providing the link to the land, local culture, food security, nutrition, the struggle against poverty, renewable energy on certain types of land, creating jobs, improving the economy and rural development. Financial stimulus packages of governments should promote an environment in which agricultural co-operation can function and develop their aptitudes, realizing that co-operatives are the most resilient business model to face a fluctuating financial market. All stakeholders are called to seriously consider co-operatives as a multi-faceted solution to the economic recovery for a sustainable future.

IFAP, 2009. Agricultural Cooperatives as Part of the Financial Stimulus Package, <http://www.ifap.org/> (2009).

COP 15 and CMP 5

Conference of the Parties (COP), Fifteenth session and Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP), Fifth session and sessions of the Subsidiary Bodies - UNFCCC

7-18 December 2009

Copenhagen, Denmark

<http://unfccc.int/>

International Conference on Food Security and Environmental Sustainability – FSES 2009

17-19 December 2009

Kharagpur, India

<http://www.agri.iitkgp.ernet.in/>

Population Growth, Environment and Food Security: What Does the Future Hold?

By 2050, the world's population will have grown by 2.7 billion to 9 billion. Human population growth is perhaps the most significant cause of the complex problems the world faces; climate change, poverty and resource scarcity complete the list (Foresight, 2009b). Greenhouse gas emissions are expected to grow by 52 per cent by 2050 (Millennium Project, 2008a). Water is increasingly scarce. If current trends continue, 90 per cent of freshwater supplies will disappear by 2030 (OECD, 2003). Already, 700 million people face water scarcity. By 2025, this number could grow to 3 billion, with two-thirds of the world's population facing water shortages (Millennium Project, 2008a; OECD, 2003). World energy demands could double in 20 years. Oil demand is projected to grow nearly 40 per cent from 2006 to 2030 (Millennium Project, 2008a). Changes in land use are affecting biodiversity. The effects of population growth, climate change, land degradation, crop and cropland losses to non-food production, water scarcity, desertification, resource-depleting subsistence strategies and urban expansion means food production could be as much as 25 per cent less than demand by 2050 (UNEP, 2009). Subsequently, world food prices, which recently reached crisis level, are expected to increase by a further 30 to 50 per cent. Although the world has the resources to address our common challenges, coherence and direction are lacking. Therefore, it is urgent to encourage more serious collaborative policies, useful scientific breakthroughs and the adoption of preventive measures including population, environment and food specific policies. ■

Based on Horizon, 2009. Population Growth, Environment and Food Security: What Does the Future Hold? <http://www.eldis.org/> (Pilot issue - July 2009).

Investing in Poor Farmers Pays

The 20th century witnessed unprecedented growth in agricultural productivity for one primary reason: strong government commitments to invest in agricultural research and development (R&D) and supporting sectors. Ironically, these successes contributed to public complacency that manifested itself in decades of faltering public commitment to investing in agriculture in developing countries. And this complacency has hampered farmers' ability to cope with price volatility, climatic and economic shocks. Although investments did occur, they were insufficient in magnitude, inadequate in scope, and inequitably distributed, and therefore unable to address the needs of many agricultural communities, particularly those of smallholders, women and workers in marginalized areas. In poor countries whose economies depend on agriculture, agricultural growth can reduce poverty through broad-based demand for labour, rural goods and services. With relatively few opportunities for profitable investments by private sector investors in many of these areas, the public sector and voluntary sector must play stronger roles. When measured against poverty reduction indicators rather than returns on investment, investing in poor people pays. It should be noted that since agriculture is a diverse and dynamic industry 'one size' will not 'fit all.' To address poverty, investments must be made in, in support of, and outside of agriculture. Together, investments must aim to reduce poverty; respond to the needs of poor people; promote environmental sustainability; and empower women and rural communities to build sustainable rural livelihoods. Indicators of success for donors and governments alike must be measured against these criteria. ■

Based on Oxfam, 2009. Investing in Poor Farmers Pays: Rethinking How to Invest in Agriculture. Oxfam Briefing Paper No. 129, <http://www.oxfam.org.uk/> (June 2009).

World Food Crisis: The Other "Pandemic"

The United Nations estimated that more than one billion people are now permanently hungry, most of them in Asia (62 per cent), and around 80 per cent either farmers or farm labourers. Despite efforts to address the food crisis, more than a year on, the picture is rather depressing. Throughout the latter part of 2008, donors and UN agencies called incessantly for 'more investment in agriculture' as the solution to the food crisis. It is true that more donors are talking about the importance of small farmers and family farms in this new investment rush. In reality, most of the investment is going into agribusiness development. The investments are not so much about producing more food but about changing the way food is produced and who it is produced for. This food system is being sold as the answer to the global food crisis, and these corporations are being tasked, and financed, to carry out the job. In 1996, the World Food Summit committed to halve the number of hungry people in the world by the year 2015, and to implement policies to improve nutrition and food safety, but things have been heading in quite the opposite direction. A fundamental reason why this is happening is that the view and participation of farmers' organizations and social movements are not considered. Local communities are being expelled at an alarming rate. In the future, the leadership and change emerging from the grassroots should be encouraged. The grassroots has genuine capacity and know-how in producing and marketing food that not only respects the environment but really feeds people and promotes social justice. ■

Based on GRAIN, 2009. The Other "Pandemic", <http://www.grain.org/> (July 2009).

Global Financial and Food Crisis: A Malaysian Perspective

The food and financial crisis 2007-2008 generated serious implication on food security and the availability of capital in developing countries when accelerated investment in agriculture is needed. Agriculture growth is a crucial element in resolving food price instability, enhancing food security and accelerating pro-poor growth. However, the variability of food prices often poses a problem to medium and long-term planning. Banks cut lending because of the financial crisis, broader plans for investment in agriculture on a sectoral basis or along entire supply chains are also at risk of being scaled back. Malaysian Government has adopted a pragmatic strategic approach linking food security and economic growth. The government focused on rice, which is a basic staple and political crop and generates growth distribution at both macro and micro level. With regard to the challenge of food and financial crisis, the dynamic interplay between agri-food supply systems and agri-biotechnology and evolving innovative work and ideas can and should be harnessed to generate wealth, income and stability and hence ensure food security at local, national, regional and global levels. A key challenge is to continuously address the fundamentals of population growth, the nutrition transition, energy, land, water, labour, and climate change as well as emerging trends, new ideas and innovations. Another challenge is to mount multidisciplinary empirical studies to better understand the interplay and impacts and guide policy so that future development and progress can be more balanced and sustainable. ■

Based on Wong, L.C.Y., 2009. Global Financial and Food Crisis: A Malaysian Perspective. Institute of Strategic and International Studies, <http://www.isis.org.my/> (2009).

Agricultural Impact of Climate Change: A General Equilibrium Analysis with Special Reference to Southeast Asia

Fan Zhai and Juzhong Zhuang, ADBI Working Paper No. 131, Asian Development Bank Institute (ADBI), Tokyo, 2009.

One of the most vulnerable sectors to climate change is agriculture. Scientific research results have demonstrated that increasing concentration of greenhouse gases in the atmosphere will significantly impact the Earth's climate. Weather and climate greatly impact agricultural productivity. The predicted changes in temperature, rainfall patterns, water availability, extreme weather events, pests and diseases will all impact agricultural production. Research results suggest that global warming will unevenly affect different regions; some benefiting and some losing. What will be the situation in South-East Asia? This paper tends to investigate the potential impacts of climate change on agriculture and the world economy, with a special focus on South-East Asia.

The introduction (section 1) presents the issue of climate change and the importance of agriculture in South-East Asia. It is predicted that the average global surface temperatures will increase by 2.8 degrees Celsius during this century. This will alter natural climate and environmental systems with serious implications for humans' well being. Agriculture plays an important role in South-East Asia, weighing over 10 per cent of its gross domestic product (GDP) and providing employment for over one third of the working population. Nearly 3 poor out of 4 in the region live in rural areas and depend on agriculture. For the sake of poverty reduction, it is important to understand how global warming will affect agriculture.

Section 2 discusses the relationship between climate change and agricultural production. Researches demonstrate that there are thresholds for climate variables like temperature, radiation, rainfall and carbon dioxide (CO₂) for crop yields. Moderate to medium increases in mean temperature (1 to 3 degrees Celsius) with associated CO₂ increases and rainfall changes are expected to benefit crop yields in temperate regions. Yet, in low-latitude regions, even moderate temperature increases (1 to 3 degrees Celsius) are likely to have negative impacts on cereals. Warming of over 3 degrees Celsius will have a negative impact in all regions. Beside temperature and CO₂, global warming will increase extreme weather events like drought and flood as well as the patterns of pests and diseases which will negatively affect agricultural production. The authors' calculations based on crop

estimation model suggest that South Asia and Africa will be the two regions most harmed by climate change. In South-East Asia, the damages to agriculture will be severe, ranging 15.1 per cent to 26.2 per cent depending on the country.

Furthermore, the global impact of climate change has been investigated. Section 3 presents the characteristics and assumptions of the dynamic model used in the estimation and section 4 presents the results. Global real GDP would decline by 1.4 per cent by 2080 as a result of the predicted impacts of climate change on agricultural productivity. New Zealand is the only country to expect a real GDP increase according to the estimates. Developing countries will suffer the largest GDP loss. Crop production in South Asia, Latin America and Sub-Saharan Africa would be the most adversely affected by climate change. Consequently, processed food and livestock production would also decrease with rising input costs. Domestic productivity reduction would be the major source of welfare losses in Indonesia, Philippines, Thailand and Viet Nam. In South-East Asia, the share of agricultural value added in volume terms would decrease from 10 per cent in 2004 to 4.1 per cent in 2080. The loss in real GDP would be 1.4 per cent for the region, in line with the global loss. However, due to the deterioration of terms of trade, most South-East Asian economies would have a larger welfare loss.

The paper is a good contribution to the debate on climate change impact on agriculture and the real economy. Some of the assumptions used in the estimates might look fair from the actual situation in many countries and it is important to be reminded that there are great uncertainties in economic prospects and projections. However, the paper has the merit to provide an illustration of the long-term impact of climate change. It underscores the importance of environmental protection policies for long-term economic growth. Agricultural technological progress will be of importance to cope with the potential risks from climate change and to reverse the declining agricultural productivity currently observed in South-East Asia. ■

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