



IPC Conference Report
June 2008

**Food, Fuel and Forests:
A Seminar on Climate Change, Agriculture and Trade**

*Proceedings from the 41st IPC Seminar, May 12, 2008
Bogor, Indonesia*

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IPC finds practical solutions that support the more open and equitable trade of food & agricultural products to meet the world's growing needs.

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Food, Fuel and Forests: A Seminar on Climate Change, Agriculture and Trade

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Food, Fuel and Forests

A Seminar on Climate Change, Agriculture and Trade

Bogor, Indonesia
May 12, 2008
Hotel Novotel Bogor

Seminar Description

The scale of carbon emissions from deforestation has been estimated to be greater than that of the fossil-fuel intensive global transport sector, and discussions continue about how the international community can best reverse alarming trends of deforestation. Global food demand, however, is expected to double by the year 2050 due to population and income growth. Agricultural producers will benefit from this increased demand, but agricultural expansion will likely become an even greater contributor to deforestation.

Climate change concerns have also led many countries to incorporate a significant percentage of bio-fuels in their transport fuel. Questions are being raised about just how much certain biofuels contribute to greenhouse gas reductions, in particular when their production may cause deforestation.

Please join us to examine these food-fuel-forest linkages and consider how best to promote income and food security and mitigate climate change.

Seminar Participants

This seminar will bring together international experts on deforestation, agriculture and trade:

1. Indonesian government officials
2. Private sector grain shippers, food processors, and biofuels producers
3. Experts from the Center for International Forestry Research (CIFOR)
4. A team of Asian and Latin American agricultural trade and biofuels experts
5. Agricultural trade experts and farm leaders from Indonesia, Argentina, Brazil, China, Europe, India, the Philippines, and the U.S.

Seminar Objectives

1. Participants will identify climate change, agricultural production, and trade linkages.
2. Participants will issue recommendations on how the agricultural sector can best meet the enormous demands it is facing with decreasing arable land and water availability.
3. Participants will issue recommendations on how best to promote environmental, social, and economic sustainability and how to craft and implement sustainability criteria.

Seminar Agenda

8h30-8h45 **Opening Session**

- Piet Bukman, Former Dutch Minister of Agriculture, Trade, and Development Cooperation, IPC Chairman
- Harbrinderjit Singh Dillon, Chair, Center for Agriculture Policy Studies, IPC Member

8h45-10h15 **Trade and the Environment**

Despite some attempts to paint the goal of trade – economic growth – in juxtaposition to environmental stewardship, they are in fact interdependent. Liberalized trade creates economic growth and increases incomes: countries are better able to safeguard the environment when they have the means to do so. Liberalized trade also allows production of agricultural commodities in places of comparative advantage, which translates into energy savings (i.e. less fertilizer use and less greenhouse-gas intensive cultivation) and protects the environment (less cultivation on marginal land, less over-intensive cultivation).

Moderator: Carl Hausmann, President and CEO, Bunge North America, IPC Member

- **How Trade Liberalization Can Benefit the Environment**
Robert Thompson, Gardner Endowed Chair in Agricultural Policy, University of Illinois at Urbana-Champaign. Former Director, Rural Development, World Bank, IPC Member
- **Reconciling the Trade and Environment Agendas**
Michel Petit, Professor, Institut Agronomique Méditerranéen, Montpellier. Former Director, Rural Development, World Bank, IPC Member
- **Paying Attention to Environmental, Social and Economic Sustainability**
Rina Oktaviani, Head, Department of Economics, Bogor Agricultural University
- **Opportunities to Advance Trade Liberalization and Environmental Stewardship in the Doha Round and Beyond**
Tim Groser, Former Chair of WTO Agricultural Negotiations, IPC Member

10h15-10h30 **Coffee/Tea Break**

10h30-12h00 **Improving Production Practices**

The use of agricultural crops for biofuels driven by large subsidies is feared to bring more fragile land into cultivation. In developing countries it might impact adversely on agricultural sustainability. Given the demands placed on the agricultural sector, in light of shrinking availability of arable land and water, as well as concerns about climate change, it is imperative that producers “get more from less.”

Moderator: Raul Montemayor, National Manager, Federation of Free Farmers Cooperatives, Philippines, IPC Member

- **Sustainability Considerations for Biodiesel**
J.W.T. Bottema, Head, UN Center for Alleviation of Poverty through Secondary Crops
- **Promoting Good Agricultural Practices**
Hans Jöhr, Corporate Head of Agriculture, Nestlé, IPC Member
- **Technological Innovations in Agriculture**
Keith Jones, Manager, Stewardship & Sustainable Agriculture, CropLife International
- **Challenges and Opportunities for Agricultural Producers**
Malcolm Bailey, Dairy Farmer and Member of the Board, Fonterra Cooperative Group, Ltd., IPC Member

12h00-13h30 **Lunch**

Sponsored by PT Astra Agro Lestari

Keynote Address: Climate Change and Trade

The Honorable Dr. Mari Pangestu, Minister of Trade

At Minister Pangestu’s urging, a first Trade Ministers’ Dialogue on climate change issues took place in conjunction with the third Meeting of the Parties of the Kyoto Protocol on December 8-9, 2007, in Bali, Indonesia. Minister Pangestu will speak about her initiative and the conclusions and recommendations emerging from this Dialogue and about the way forward.

13h30-15h00 **Biofuel Trends**

Panelists will undertake an examination of present and projected biofuels production trends in Asia and Latin America to determine their impact on environmental, social and economic sustainability respectively.

Moderator: Ann Tutwiler, Managing Director for Trade and Development, William and Flora Hewlett Foundation, IPC Member

- **Biofuel Trends in Asia**
Bustanful Arifin, Institute for Development of Economics and Finance, ALARN
Tian Wei-ming, China Agricultural University, ALARN
- **Biofuel Trends in Latin America**
Marcelo Regúnaga, Former Secretary of Agriculture, Argentina, IPC/ALARN

15h00-15h15 **Coffee**

15h15-16h45 **Climate Change, Deforestation, and Poverty**

The 2006 Stern Report concluded that land use change accounts for one fifth of total annual carbon emissions. Deforestation adds more carbon to the atmosphere than the fossil-fuel intensive global transport sector. Agricultural expansion, driven in part by increased global demand and trade flows, is one of the major factors driving deforestation. This in turn could further erode the production base of marginalized societies and indigenous peoples.

Moderator: Robert Thompson, Gardner Endowed Chair in Agricultural Policy, University of Illinois at Urbana-Champaign. Former Director, Rural Development, World Bank, IPC Member

- **Reducing Emissions from Deforestation and Forest Degradation: Will Trees Grow on Money?**
Frances Seymour, Director General, CIFOR
- **Direct and Indirect Causes of Deforestation in Indonesia**
Daniel Murdiyarso, Senior Scientist, Environmental Services and Sustainable Use of Forests, CIFOR
- **A Perspective from the Government of Indonesia**
Wahjudi Wardoyo, Director General of the Forestry Research and Development Agency, Ministry of Forestry

16h45-18h00 **Sustainability Standards**

What kinds of standards are needed to promote sustainable agriculture and how can these be best implemented? How do we promote environmental as well as economic sustainability?

Moderator: Charlotte Hebebrand, President and CEO, IPC

- **Perspectives on Indonesian Palm Oil Production**
Didiek Hadjar Goenadi, Chair, Indonesian Inventor Society; Executive Director of the Indonesian Palm Oil Association
- **Sustainability Considerations for Ethanol**
André Nassar, President, ICONE
- **EU Sustainability Criteria and WTO Considerations**
Carlo Trojan, Former Secretary General, European Commission, IPC Member
- **Lessons from Roundtable on Sustainable Palm (and Soya) Oil**
Willem-Jan Laan, European Director External Affairs, Unilever, IPC Member

19h30-21h00 **Dinner**

Location: Bogor Botanical Gardens

Hosted by HE Dr. Sofyan Djalil, Minister for State-Owned Enterprises

Executive Summary

Owing to the recent rise in food prices, the impending boom in the world's population, the persistence of poverty in rural areas, and the increased investment in biofuels, agriculture is finally receiving the attention it deserves. Appropriate agricultural policies, coupled with responsible decisions on trade and the environment, have the ability to address all these challenges. Done correctly, world food production could grow over the next 50 years to meet the world's needs while still maintaining the earth's resources. However, careless policies could exacerbate food insecurity and degrade the environment further.

This was the conclusion of the discussions of the 2008 spring seminar held by the International Food & Agricultural Trade Policy Council (IPC). By focusing on the competing demands of food, energy, and the environment, IPC sought to generate dialogue and ideas for creating agricultural policies that could meet the future's challenges. The meeting was held in Indonesia, a fitting location since the country is unfortunately already experiencing many of the negative effects of resource competition.

Participants concentrated their discussion and recommendations for agricultural and related policies around three themes. First, liberalized trade can help protect the environment and ensure an adequate food supply at the same time. The projected 50 percent growth of the world's population by 2050 and the increased demand created by growing incomes in developing countries will severely stress the ability of farmers to produce enough food. Furthermore, to avoid environmental degradation, more food will have to be produced with fewer inputs and without using much more land or water than is already available. Liberalized trade will help alleviate this pressure by facilitating the production of crops where it is most efficient. By reducing the need for inputs and the use of carbon, this efficiency will benefit the environment. Combined with investments in research that increase crop yields through better use of water and nutrients, trade liberalization will help secure future food needs without exploiting the environment.

Second, food security, forests, and biofuels can coexist, but policies need to be carefully crafted. There is presently legitimate concern that biofuels are being produced at the expense of forests and cropland for food production. This is detrimental not only to the food supply, but also in terms of greenhouse gas emissions and rural livelihoods. Forests capture carbon dioxide, preserve biodiversity, and prevent erosion. They are also the source of jobs and resources for the rural poor. The conversion of forests to biofuel production releases more carbon dioxide than the burning of biofuels can save over several decades. Policies must be structured in a way that encourages the production of biofuels from non-food feedstocks on marginal lands. Ideally, countries should come together to agree on sustainability criteria for biofuels, so that these alternative fuels can help provide energy options without competing with forests and food.

Third, there is a large role for governments to play in ensuring a balance among food, energy, and the environment. This is explicit in the previous two points, but in addition to implementing trade regulations that support efficiency and energy and environmental policies that account for the value of forests, governments must cooperate with each other and with the private sector to promote technology and innovation in agricultural production practices. Governments have overlooked research and investment in agriculture for far too long. By devoting financial resources to research and development and by cooperating with other governments and companies to adopt existing technology to local conditions, governments can help improve the food security outlooks of their constituents.

Farmers and consumers are already feeling the effects of climate change. Action must be taken now to address the impending challenges of food and energy demands without harming the environment. With appropriate policies for agricultural production, trade, and investment, governments and other stakeholders can meet the food, fuel, and forest challenges of the next 50 years.

Opening Session

Piet Bukman, Chairman of IPC, welcomed the seminar participants. He set the scene for today's challenges in agricultural policy: the doubling of demand for food in the next 40 years, the current rapid increase in food prices and its effect on the poor, the new market for fuel from food crops. Regarding food prices, he emphasized that action is needed to avoid devastating humanitarian, social, and political fallout from food insecurity. Food aid can address some of the need, but more importantly, governments must prioritize agricultural policies. For too long, agriculture has been overlooked by policymakers, when in fact, research and investment in this field is key to lifting people out of poverty.

Unfortunately, many governments are implementing trade barriers as a means of dealing with the increase in food prices. A number of countries have reduced or stopped the export of some agricultural products in order to guarantee food security for their own populations. This is understandable to a certain extent, but it is not without consequences as it severely disrupts global markets. The argument for national food self-sufficiency frequently goes hand in hand with the more protectionist elements in international negotiations. At a time when the Doha Round is struggling to conclude, export taxes and the like will not advance the negotiations. And more liberalized trade would actually help address food security concerns rather than heighten them.

Supply typically reacts positively to higher prices. Bukman observed that there will certainly be plenty of demand to keep prices high: growing incomes and changing diets in developing countries, a 50 percent increase in the world's population by 2050, and a market for biofuels. However, supply cannot react immediately or automatically. While we wait for supply to respond, affordable food surpluses are plummeting. Furthermore, land that was once used for agriculture is being claimed by industrialization, urbanization, and conservation. Available water resources are also shrinking due to wasteful use and competition with urban areas. These circumstances decrease farmers' ability to respond to demand.

Improved technology that enhances productivity, distribution, and post-harvest care will combat some of these negative influences on supply. The wider adoption of biotechnology in agriculture will also positively influence yields and input use. Bukman therefore concluded that the world's food problems are solvable, provided there is enough political will. He urged national government, multilateral organizations, non-governmental organizations, and the private sector aid in this effort by giving agriculture the priority it deserves.

H.S. Dillon, IPC member and Chair of the Center for Agricultural Policy Studies in Indonesia, also offered his words of welcome to the participants. He then elaborated on the social justice and environmental elements of competition between food, fuel, and forests. The inequitable distribution of wealth in the world leads to the depletion of resources, either because of over-consumption in rich countries or by the unsustainable use of resources by the poor to meet their basic needs. Too much condemnation has been focused on the behavior of the poor, who are just trying to survive. More attention needs to be paid to the destruction of resources caused by the consumption habits of the wealthy.

Aggravating the problem of rampant consumption are three major shortcomings of international markets. First, they do not adequately protect the environment. The price of goods and services does not reflect the clearing of forests, the loss of wildlife habitat, or the consequences that such actions have for global warming and climate change. Second, markets do not sufficiently account for the needs of future generations. They do not capture how choices made today will affect the earth's future. Third, market prices do not reflect social preferences for fairness, reasonable measures of equity, and the eradication of absolute poverty. The social impacts of efficient economic exchanges are not taken into account.

Dillon surmised that these points indicate the failure of the market to serve the broader interest of the public. To correct this situation, new forms of democratization are needed to ensure that market transactions lead to outcomes that are socially desirable. Such outcomes include equitable distribution of wealth and power, patterns of consumption more in line with the carrying capacity of the world, and the rational use of forests and other natural resources.

The failure of markets to address social concerns is compounded by governments' failure to promote equity along with efficiency. Therefore, Dillon recommended governments improve their functioning in five areas. First, governments need to be stewards of natural resources. For example, they should be responsible for formulating socially correct prices for forest concession licenses, plantation licenses, and land use taxes and incentives. Second, governments have a role to play as market makers. This entails adopting environmental taxes and incentives as well as promoting green certification and labeling. Third, governments should act as market regulators, demanding promulgation of enlightened industrial policies to mitigate monopolistic market practices. Fourth, governments can act as major market players, dictating pro-green and pro-poor guidelines in their fiscal expenditures. Finally, governments must support public education through campaigns to fight wasteful expenditures and promote moderation in consumption.

Dillon closed by calling upon the participants to help remake the world with institutions and relations that cultivate trust, restraint, and morality. These are necessary to address the food security challenges of today and create a sustainable civilization for future generations.

Panel I – Trade and the Environment

Moderator **Carl Hausmann** of Bunge North America observed that trade and environmental goals have been separated from one another. Regrettably, this tension is playing out at a time when greater agricultural production is needed. Today's challenge, which the panelists addressed in their comments, is to find a balance between these two agendas.

Professor **Robert L. Thompson**, IPC member and Gardner Endowed Chair in Agricultural Policy at the University of Illinois, Urbana-Champaign, illustrated how trade liberalization can benefit the environment. He gave a brief overview of the economic and environmental benefits of trade. Economically, trade increases each country's standard of living because a country can obtain goods that others can produce at a lower cost in exchange for goods that it can produce relatively cheaper. This exchange strengthens households' purchasing power and increases a country's GDP by employing its land, labor, and capital where they are most productive. Environmentally, trade helps avoid environmental degradation caused by attempts at local self-sufficiency that over-exploit a region's natural resources. Trade can also reduce the "carbon footprint" of products, by encouraging goods to be produced in areas that use the least carbon. For example, agricultural goods from warmer climates can be produced with less carbon than those in cooler climates requiring greenhouses, even if the carbon consumed in transport is included.

However, trade's benefits to the environment are not fully realized today because of inefficiencies and trade-distorting policies. Most high income countries subsidize their agriculture, which distorts the relative return of producing various outputs and induces larger production in these countries than would occur otherwise. At the same time, many low-income countries enact food policies that turn the terms of trade against agriculture. The objective is to keep urban food prices low, but these policies also create a disincentive for farmers to invest in their fields. Protectionist import policies and export subsidies reduce the efficiency of global agricultural production.

The failure of agriculture to meet its potential because of poor trade policies is deeply concerning at a time of rapid population and income growth. The United Nations projects the world's population will increase by 50 percent, or 9.1 billion people, by 2050. By that time, the world will need twice as much food as it did in 2000. Half of this demand will come from population growth, but the other half will be due to the rise of incomes in developing countries. In 2000, 352 million people in low-income countries had household incomes greater than \$16,000 per year. The World Bank estimates that that number will grow to 2.1 billion by 2030.

Not enough arable land remains untapped to meet this demand. At most, there is 12 percent of the globe remaining that could be possibly be used for agriculture without causing deforestation, erosion, or desertification. Most of this additional soil is in South America and Africa. To meet the growing need for food, investments must be made in adaptive agricultural research that will enable production on presently unusable land.

The same forces of population and income growth will also increase demand for other products from the land. People need things made from wood, such as paper, furniture, and building materials. Fuel is also now being required from the land, in the form of ethanol and biodiesel. Furthermore, as incomes grow, the demand for environmental amenities and the preservation of forested areas will increase.

Asia Likely to Import Larger Fraction of Its Food Supply

- Rapid growth in demand for food from population and income growth is outstripping environmentally sustainable production capacity.
- Most not presently forested arable land is already in ag production. Without destroying forests, there is little ag expansion potential.
- Most irrigation potential is already exploited, and in some areas the aquifers are being drawn down faster than recharge rate.
- Fertilizer application rates are high by international standards.

Source: Thompson presentation, Bogor, 2008.

Therefore, with little land left to bring into production and competing uses for land, the only environmentally sustainable alternative is to double productivity on fertile, non-erodible soils already in crop production or to increase the fertility and avoid greater erosion on depleted soils. Because the world's arable land distribution does not correspond to global population centers, trade is necessary to meet people's needs without damaging the environment. This strategy will also help maximize use of water, which is already in short supply and currently used inefficiently in agriculture. Along with investment in research and development to improve productivity, trade liberalization can help agriculture meet the world's growing demands without harming the environment.

Michel Petit, IPC member and Professor at the Institut Agronomique Méditerranéen in Montpellier, France, emphasized the need for communication between the trade and environment "camps." These two agendas have unfortunately become ideologically opposed to one another. Those that view trade liberalization negatively worry about the effects of globalization on smallholders and the environment. Proponents of trade liberalization conversely think that the environment is frequently used as an excuse for protectionism. Petit recommended a reconciliation strategy that would lead to an understanding between the two sides and perhaps to the discovery of some commonalities amongst the opposing positions.

Petit suggested the need for an epistemic community, that is, an international group of persons, usually scientists, government experts, and civil society representatives, knowledgeable about the issue and in a position to act or to spur action. The activities of these communities typically precede international action. For example, the international trading system of today grew out of the consensus of experts gathered at Bretton Woods in 1944, who agreed that escalating border protection and competitive devaluations in the 1930s had contributed to the start of the Second World War. On the environmental side, the Intergovernmental Panel on Climate Change is representative of the epistemic community relevant to climate change issues.

In terms of trade and the environment, an epistemic community may need to be formed that can reach consensus on the link between trade liberalization and sustainability. Effective action on this issue at the world level would require that the relevant existing epistemic communities on either side at least communicate with each other and attempt to reach a consensus on what kind of trade liberalization would be desirable for agriculture in poor countries. Such a dialogue might be difficult to organize and to conduct because of the difference in scientific disciplinary bases and implicit ideologies.

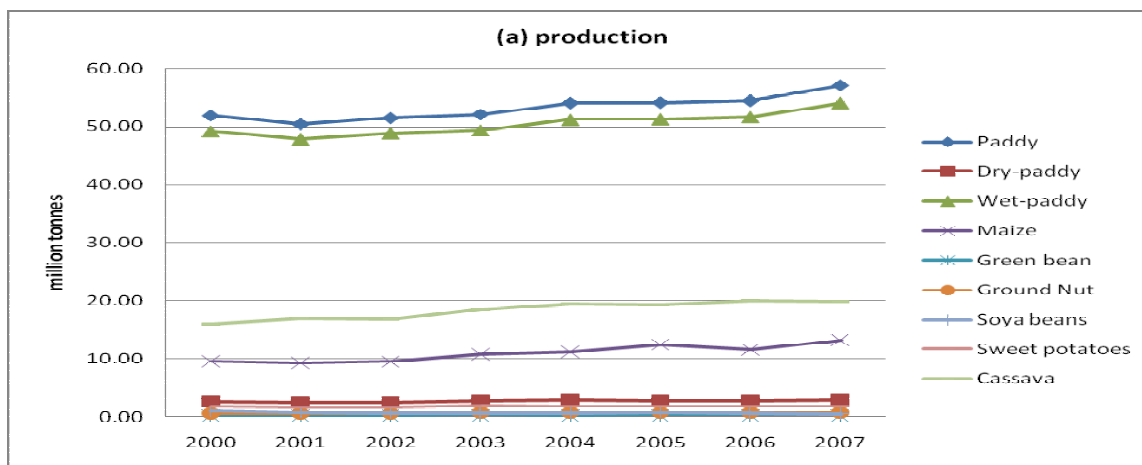
This type of venture is uncharted territory. It may turn out that an epistemic community is helpful for understanding the issue of trade and sustainability, but not for reaching consensus between the two camps. Yet, working to establish an epistemic community to consider the linkages between trade and the environment appears to be a critical precondition if progress on reaching an international consensus regarding trade and sustainability is to be made.

Dr. Rina Oktaviani, Head of the Department of Economics at Bogor Agricultural University, gave a quick overview of the supply and demand side drivers currently affecting food prices. Weather events, smaller stocks, and increasing fuel prices are diminishing the supply, while greater consumption in developing countries, the use of crops as biofuels, and the diversification of diets into meat and dairy products are all driving demand. These changing circumstances will affect developing countries because the higher food prices may encourage increased agricultural productivity, but this could come at the cost of water and land resources. To determine the effect on Indonesia, Dr. Oktaviani provided an overview of Indonesia's agricultural economy as it relates to environmental sustainability and poverty reduction in Indonesia. She also assessed the impact of the rises in food production and fuel prices on Indonesian welfare.

Indonesia's agricultural sector contributed 13.8 percent to GDP in 2007. There has been a slight, but steady fall since 2002, when it was 15.5 percent of the total GDP. Food crops are the largest part of the agricultural economy, while the forestry sector is the smallest. Forestry's contribution to the economy has been falling because of the high loss of forest area, much of this due to illegal logging.

Paddy rice is Indonesia's largest crop. Land area planted to rice has been increasing, and this is predicted to continue because of the rise in food prices. However, productivity is low, averaging 45.3 quintal per hectare. Maize production has accelerated the most rapidly due to the demand for ethanol.

Production of farm food crops from 2000 to 2007



Source: CBS - Statistics Indonesia and Directorate General of Food crops, 2008 in Oktaviani paper prepared for IPC seminar, Bogor 2008.

Rice productivity has fluctuated with changes in government policies. Average yields increased from 1975 to 1985 largely because of government support programs that involved the dissemination of technology, subsidies on pesticides and fertilizers, the provision of capital, and a guaranteed floor price for rice. When these programs were scaled back after 1985, productivity fell. Inconsistencies in government programs have continued to affect rice yields and cause market distortions.

Most of Indonesia's population, 43.3 percent, works in agriculture. Tourism and manufacturing follow agriculture as the main employment sectors. A large percentage of the population still lives below the poverty line. In 2006, 17.8 percent of Indonesians suffered from poverty. The rate was higher for rural areas, 21.9 percent. However, these percentages are determined by Indonesia's Central Bureau of Statistics. According to the World Bank, more than half of Indonesia's population lives on less than \$2 a day. Therefore, most households are in danger of falling below the poverty line.

Land distribution could be central to income inequality and poverty in Indonesia. The average holding by small farmers has steadily decreased over the last 25 years, from 1.99 hectares to less than .5. Without a policy to address this fragmentation, Oktaviani predicts further division in land holdings. Labor productivity in agriculture as well as household income will fall as a consequence.

Dr. Oktaviani presented the results her studies, which seek to assess the impact of the rise in food production, the increase in fuel prices, and the implementation of environmental sustainability on Indonesia's economy and welfare. Warr and Oktaviani (2008) hypothesized that income distribution emphasizes the factor biases of the technical change as a determinant of the distributional consequences of productivity growth. If a technical change is labor augmenting, for example, real wages may rise or fall, depending on the elasticity of the factor substitution in production. To explore the hypothesis, four simulations were conducted: 1) labor augmenting technical change increases by 10 percent; 2) capital augmenting technical change increases 10 percent; 3) land augmenting technical changes increases by 10 percent; and 4) each primary factor's productivity increases by the amounts estimated for the period 1975 to 2000 – labor by 1.97 percent, capital by 1.24 percent, and land by .25 percent.

The result of this research reveals that the growth in primary factor productivity increase national income and aggregate consumption. However, their effects on factor prices – the functional distribution of income – are not uniform. The most poverty-reducing form of technical change is land augmenting. It raises

unskilled wages by increasing the marginal product of unskilled labor used in agriculture. Skilled wages also go up.

THE IMPACT OF THE RISE OF FOOD PRODUCTION (CONTINUED)

The result of this research reveals that the increases in primary factor productivity raise national income and aggregate consumption. But their effects on factor prices – the functional distribution of income – are not uniform

Labour-augmenting technical change (Simulation 1) → Supply of unskilled labour increased → average real wage of unskilled labour decreased → return to capital and land rise considerably → Poverty incidence declines in both rural and urban areas.

Capital – Augmenting Technical Change (Simulation 2) → real consumption for every socio-economic category → Reduces poverty incidence

THE IMPACT OF THE RISE OF FOOD PRODUCTION (CONTINUED)

Land-augmenting (Simulation 3) is the most reducing poverty simulation. All socio-economic groups gain except the richest urban households

Technical change at the econometrically estimated rates (Simulation 4)
Raising real consumption for every one of the 1,000 socio-economic sub-categories and reduces poverty incidence at the rate of 0.18 per cent per year.
Declining both, rural poverty at 0.16 % per year and urban poverty incidence at 0.13 per cent per year

Source: Oktaviani presentation, Bogor 2008.

Oktaviani et al. (2007) looked at the impact of fuel prices on Indonesia's welfare. The study evaluated the implications of the reduction in the government's fuel subsidy for the poverty rate. It found that the general wage of skilled labor declines steadily with the decrease in the fuel subsidy. Household welfare will fall because prices will increase not just for fuel but for several other commodities. Some agricultural sectors will contract with the higher fuel prices, so the demand for rural labor will decrease. The number of rural households living below the poverty line is therefore likely to increase with the reduction of fuel subsidies.

Referencing the results of a study from 2002, Dr. Oktaviani noted that urban air quality will be three times worse in 2020 than in 2000 and the number of air pollution health problems will grow by a factor of six during that time. Therefore, pollution abatement policies should be implemented immediately. The study found that these policies will not have a large impact on household income.

Based on this analysis, Dr. Oktaviani recommended greater compensatory programs for supporting education, health, and market access for poorer households. She also suggested land reform as a way of increasing equity, improving production, and reducing environmental degradation.

Tim Groser, IPC member and former Chair of the WTO Agricultural Negotiations, illustrated the similarities and differences between the WTO and climate change negotiations. New Zealand's Shadow Minister of Trade noted that there are strong similarities and negotiating linkages between WTO commitments and obligations made under the Kyoto Protocol. Both agreements involve domestic policy changes, and therefore are very sensitive and tough to negotiate. There is also commonality between the Special and Differential Treatment clause of the WTO and the Kyoto Protocol's different level of commitment for development countries. It is this similarity that lies at the heart of many of the difficulties in negotiating both these agreements.

Regarding trade agreements, negotiations were much simpler when developed countries dominated world trade and output. But since the Uruguay Round, developing countries have experienced a huge transfer of economic power, matched by an enormous growth of trade amongst them. Therefore, the concept of special and differentiated treatment cannot be overlooked. Also, developing countries can no longer be treated as a single entity.

Special and Differential Treatment in the WTO does have some important distinctions from the common but differentiated responsibilities of the Kyoto Protocol. In trade, reciprocity for trade liberalization clearly gives a better economic result. This helps to sell trade to the electorate in developed countries. However, most governments know that liberalizing, even if it is unilaterally, is economically beneficial.

The same is not true for unilateral action on environmental issues. There is a real risk that such a domestic policy response to climate change will not yield an economic advantage. Groser noted that New Zealand is struggling with this conflict right now. Given the increase in food prices and New Zealand's role as one of the breadbaskets of the world, it would be expected that the country would increase its food production. However, doing so also increases its greenhouse gas emissions at the very time the government is asking that agricultural emissions be included in a national greenhouse gas emissions scheme. Does its responsibility lie with the world's need for food or with the environment? If New Zealand complies with its Kyoto commitment, it could mean a 60 percent decline in milk production over the next 20 years.

Furthermore, climate change is a truly global problem. Groser pointed out that the troposphere does not differentiate between methane emitted by New Zealand's 30 million sheep and that emitted by China's 400 million sheep. However, New Zealand has Kyoto commitments and China does not. Therefore, New Zealand's economy will face economic disincentives while little will be accomplished in reducing methane emissions from its sheep.

Different countries standards, even among those with Annex I commitments, also are not effective for emissions reduction. For example, New Zealand is considering implementing a comprehensive Emissions Trading Scheme, which will include agriculture. Europe imports 70 percent of its sheep meat from New Zealand. However, the European Union's Emissions Trading Scheme does not include agriculture. Would

sheep meat from New Zealand, which is produced with a quarter of the greenhouse gases than it takes to produce English sheep meat, therefore be disadvantaged in the marketplace?

Groser observed that this is a lesson about creating policy in times of hysteria. In this case, concerns about energy, climate, and food prices are causing policymakers to look for simple fixes to complex problems. Just as the 'food miles' concept for addressing carbon emissions is overblown and inaccurate, biofuels are now being further scrutinized for their effects on food supply and the environment. Biofuels helpfully provide more income for farmers, but they should not be produced at the expense of food. More research investment needs to be poured into cellulosic ethanol.

Regarding the Doha Round, Groser opined that there is a perfectly acceptable basis on the table for concluding the deal. And while there are many reasons for finishing the Round now, the politics of climate change is yet another strong impetus for doing so. As Pascal Lamy has noted, a successful conclusion to the Doha Round will have positive results for the environment – including facilitating trade in environmentally friendly goods and services and a new set of disciplines on fishery subsidies to decrease over-fishing. Moreover, if the Doha Round can not be completed when the case is so compelling, the precedents so strong, and the technical base of multilateral trade disciplines so well understood and tested, what hope is there for negotiating a timely successor to the Kyoto Protocol? If politicians draw the collective conclusion that the WTO is going nowhere, this will have implications for the politics of climate change.

If progress cannot be made multilaterally, it will be made unilaterally, with much less effective and possibly negative consequences. For example, most of the climate change legislation currently before the U.S. Congress involves border tax adjustments to avoid 'carbon leakage.' Because it is generally accepted in developed countries that something must be done about climate change, politicians are rushing forward to look responsive. Therefore, many are implementing emissions trading schemes. But since these are not international schemes, they need to address 'leakage' – the risk of losing an internationally competitive industry, such as agriculture, to less competitive countries because these latter industries are not subject to the cost impositions of an emissions trade scheme. Such an approach could be interpreted as a device for putting pressure on countries not required to undertake comparable obligations, but it is risky – what if this tactic does not succeed? It may instead lead to an escalation of international bickering. Indeed, the idea of unilaterally imposed border tax adjustments is a time bomb set under the WTO system. Groser asserted that it will breed other conflicts involving issues like processing and production methods. Therefore, the WTO needs to set a precedent for the future Kyoto negotiations by reaffirming the benefit of multilateral agreements with the conclusion of the Doha Round.

Panel II – Improving Production Practices

IPC member **Raul Montemayor**, National Manager of the Federation of Free Farmers Cooperatives, Philippines, introduced the first panelist, Dr. **J.W.T. Bottema**, Head of UN's Center for Alleviation of Poverty through Secondary Crops (UNCAPSA), which is located in Bogor. Bottema considered sustainability issues for biodiesel. He began by pointing out several of the benefits of biodiesel, such as its reduction in greenhouse gas emissions, its compatibility with existing transportation infrastructure, and the diversity of feedstocks from which it can be made. This diversity, in his opinion, is key for large scale biodiesel processing.

However, in order for biodiesel to be produced at a high level, several factors need to converge. Biodiesel must attract the interest of industry and the government. It must benefit from special tax structures and receive research and investment grants. Standards and compliance procedures must also be developed. Bottema observed that the importance of this last point has been very clear with the recent scrutiny applied to biofuels. Therefore, more work needs to be done to develop feedstocks in a truly sustainable manner.

On this note, Bottema gave an overview of the EU's new efforts on sustainability criteria. These guidelines are seeking to establish a greenhouse gas emissions balance, maintain biodiversity, encourage economic prosperity for farmers, ensure social well being for laborers, and preserve the environment.

Establishing sustainably produced biodiesel on a large scale currently encounters many challenges. Energy price fluctuations create uncertainty in the market. Irresponsible production of biofuels to extract quick profits is damaging the environment. It is also hard to get industrial investors interested in rural markets. Moreover, many countries do not yet have tax structures in place that address biodiesel. This alternative fuel presently has many constraints to being a significant provider of alternative energy.

Bottema gave a quick comparison of biodiesel produced from palm oil and from jatropha. Palm oil is the biggest source of biodiesel, in part because it has a well-established industry behind it. Jatropha grows well under dry conditions, but it takes three to four years to mature. Furthermore, farmers can have difficulty getting financial credit to invest in it, and it has the additional drawback in that cattle cannot eat it. Research and technology is also rather rudimentary, so for jatropha to become a viable feedstock for biodiesel, price subsidies would be needed.

Bringing his focus more directly to biodiesel's interplay with the environment, Bottema presented some results from a UNCAPSA study on the environmental effects of land use changes in Indonesia. The study looked specifically at palm oil and cautioned about the negative emissions consequences of land use change. To minimize the emission effect of planting oil palm, new plantings should focus on marginal land. Forest and peat land have been used for most of the oil palm expansion, which has contributed significantly to Indonesia's total greenhouse gas emissions. But to encourage production on marginal land, more support for investments, regulation, and compliance is needed. In conclusion, Bottema urged more diverse investments for biodiesel in terms of scale as well as feedstocks.

Following Dr. Bottema, **Hans Jöhr**, addressed how the retail companies can promote good agricultural practices globally. The Corporate Head of Agriculture of Nestlé and IPC member explained that his company has a global sourcing strategy, adapted to localities and sourcing about two thirds of Nestlé's agricultural materials from emerging markets. Sourcing must contribute to sustainable and profitable business, competitive prices, and overall, safety and quality. It should also encourage low system costs, ideally with zero-loss and zero-waste.

At Nestlé, there are three dimensions of food quality: social, sensory, and health. The social refers to price and performance, convenience, and cultural acceptable. Sensory deals with color, aroma, and flavor. Nutritional value and safety comprise the elements of health.

Nestlé supports Good Agricultural Practices (GAP) because it sees the important role the company can play in addressing increasing food needs, climate change, loss of arable land, and more environmental

regulations. As GAP can lower production costs, increase productivity, maintain food quality, and optimize use of natural resources, it is essential to meeting the future challenges of agriculture.

Jöhr presented an Indonesian example of how Nestlé works with providers to improve agricultural practices. The Nestlé Agricultural Service Department worked with the Kejayan Factory to improve raw milk quality by upgrading cooperatives operations. For example, the department worked with small holders from 45 fresh milk cooperatives to make equipment upgrades, like converting from plastic pales to food grade containers, from long plastic hoses to stainless steel piping, and from open collection centers to proper milk rooms. Nestlé is also working with cooperatives to improve cattle fodder through crop breeding programs, silage training workshops, and machinery to be shared by the farmers.

The slide features the Nestlé logo and tagline 'Good Food, Good Life' in the top right corner. The main title is 'Building Value in the Community: Helping over 610'000 farmers'. Below the title, it lists 'Milk districts in India, Pakistan, China, Morocco, Brazil, Chile, Colombia, Mexico, Indonesia....'. A bulleted list includes: 'Improved livestock through genetics, feeding, management skills, etc.', '30 million CHF in microcredit', 'Improved milk quality and quantity', 'Bringing whole regions out of poverty (rural development)', and 'Widely known and highly recognized'. The slide contains three small images: a farmer with a cow, a person holding a document, and a group of people. At the bottom, there is a large photo of a group of people standing in front of a building. The date 'May 2008' is visible in the bottom left corner.

By improving the processing facilities and the farmers' resources, these programs increase the earnings of the suppliers and improve farmers' skills and job stability. Nestlé employs 750 sourcing agronomists and over 5,200 technical staff working in the up-stream supply chain. It currently has 150 sustainable agriculture projects running worldwide.

This attention to the supply chain also benefits Nestlé's marketing efforts. Consumers are increasingly asking questions about production methods involving environmental and social issues. To help address consumer concerns about sustainability, Nestlé is a founding member of the Sustainable Agriculture Initiative, a food industry platform to support the development of sustainable agriculture in the food chain by involving all stakeholders.

Source: Jöhr presentation, Bogor 2008.

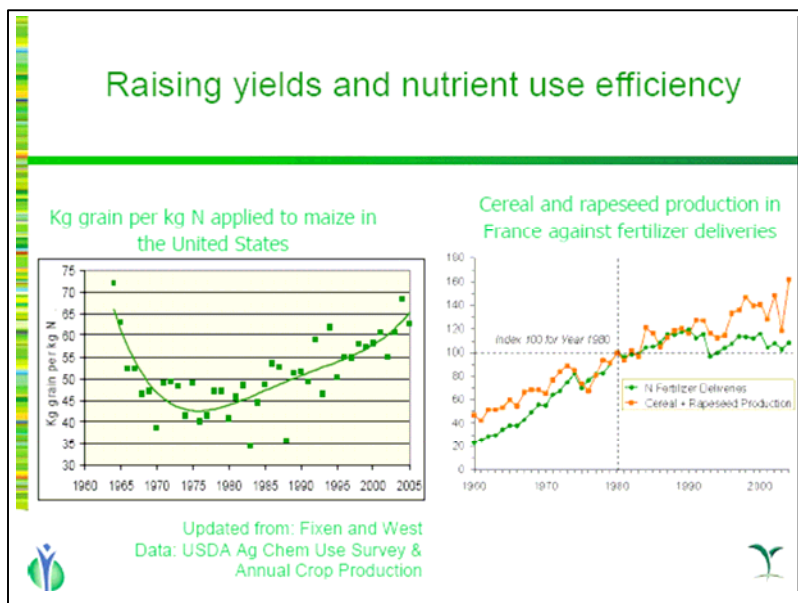
Jöhr closed by emphasizing that efforts are needed by stakeholders in research and development, political institutions, input suppliers, and extension and advisory services to guarantee sustainable agriculture and adequate food for the world's future needs.

The conversation next turned to technology innovations in agriculture. **Keith Jones**, Director for Stewardship and Sustainable Agriculture at CropLife International, emphasized that agriculture will have to produce more food with fewer resources in the future. To address these challenges, more land needs to be put into production, trade liberalization must continue, and more climate and energy policies should be enacted. However, in addition to these items, productivity needs to increase through good practices and the adoption of technology. Better synergy between the private and public sectors will also improve agricultural productivity.

CropLife International is working to raise yields as well as nutrient use efficiency. This means identifying the appropriate product for the soil, the right time for application, the correct application method, and the best rate of application. Plant science can also improve constraints surrounding water contamination and water use efficiency. Drought-tolerant crops, reduced tillage, and best practices can increase yields and reduce run-off and groundwater pollution.

Jones outlined how the plant science industry is contributed to innovation, stewardship, and knowledge services. Regarding innovation, CropLife research aims to protect and increase crop yields while improving nutrition food quality. It is directing plant-breeding efforts towards new sustainable feedstocks for energy and for industrial materials like paints and detergents. By making technologies available to

farmers in developing countries, it is helping to increase food security and preserve soil and water resources.



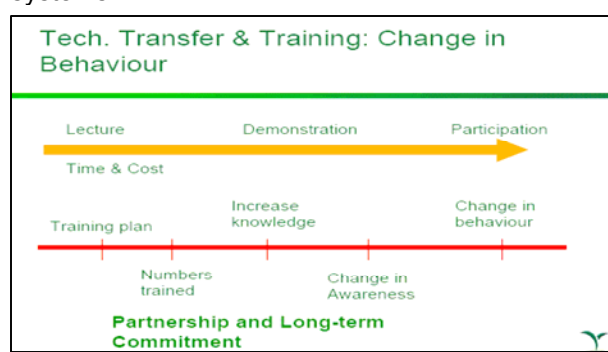
Source: Jones presentation, Bogor 2008.

The plant science industry can address resource management and food security while also providing affordable products because it merges the seed and agrochemical industries. Innovation in this sector is engineering chemicals with improved safety profiles. Better packaging and container management is also increasing safety and reducing waste. More precise application technology of fertilizers and pesticides is also lowering costs for farmers while reducing environmental pollution risks.

To make the “perfect” product, CropLife has four research goals. First, the product should be biologically efficient, meaning it should have an optimal residual effect, a low risk of developing resistance, and a quick impact. Second, CropLife wants the product to be user friendly. Is acute and chronic toxicity low? Is the packaging safe? Is it easy to apply, and can it be stored for a long time? Third, the “perfect” product must be environmentally sound. These qualities include fast degradation in the environment, low mobility in the soil, and no relevant residues in food and fodder. Finally, of course, the product must be economically viable.

Jones reiterated that, in order to meet the growing demand for food, feed, fuel, and forests in the world, the role and benefits of technology need to be recognized. Scientific, risk-based, and workable regulations also must be in place. Protection of intellectual property rights is necessary to encourage more innovation. Fair and free trade rules will similarly help address agricultural productivity and efficiency. At the same time, all stakeholders must be committed to stewardship practices that maximize benefits while minimizing risks. Jones also stressed the needs for partnerships, corporate responsibility, and transparency in advancing food security and resource management. Lastly, Jones noted the need for more technology transfer. Modern technologies can be adapted to local conditions,

and local knowledge and traditional technologies can also be integrated into most high tech systems.



Source: Jones presentation, Bogor 2008.

Malcolm Bailey provided the farmer's perspective on the challenges and opportunities facing agriculture. The Board Member for Fonterra Cooperative Group, Ltd., and IPC member observed that improving production practices on the farm requires farmers to invest in new technology, employ innovation, and improve knowledge systems and best practices. All of this must be done in a way that creates an environment for profitable growth in farming.

With the growing need to address climate change, farmers face a difficult challenge. They need to be profitable and to provide the food the world needs. However, agriculture is a significant contributor to greenhouse gas emissions. New Zealand is particularly affected by this predicament because of its large livestock sector. The average emissions from agriculture for Annex 1 countries in the Kyoto Protocol is 7 percent; however, in New Zealand, agriculture accounts for almost half of its emissions. How does New Zealand address its greenhouse gas levels while still keeping its farmers productive and competitive? Technology and innovation will be key to solving this dilemma.

The need to produce more food with fewer resources does present opportunities for farmers, however. Sustainability and production efficiency are complementary goals. The use of fewer inputs, for example, lowers farmers' costs and reduces the risk of excess nutrients contaminating soil and water. Removing trade barriers and market distortions will also improve resource efficiency by encouraging production of agricultural products in the places where resources are best utilized. With industry leadership in technology and international cooperation on trade, farmers can meet the challenge of the world's growing food needs.

Keynote Address: Climate Change and Trade

The Honorable Dr. Mari Pangestu, Minister of Trade

Minister Pangestu directed her comments to trade's role in addressing climate change. International trade, development, and climate change mitigation can be mutually supportive; however, current policies on these issues are frequently at odds with one another. Policymakers must recognize that environmental and global trade objectives can be aligned to reinforce each other and to spur development.

The minister recounted that a first step was taken in this direction at the UN Framework Convention on Climate Change held in Bali on December 8-9, 2007. Pangestu took the initiative to convene trade ministers from 30 countries for an unprecedented dialogue on how best international trade can support development and climate change objectives. Policymakers considered several ways in which these agendas could come together, such as reducing or eliminating barriers for environmental goods that mitigate or facilitate adaptation to climate change; developing measurement standards for carbon footprint; and improving the transfer of climate change mitigating technology between countries. While the ministers disagreed on the best policy options, there was consensus that policies implemented to combat climate change must have minimal adverse social and economic impacts and must be compatible with international trade rules.

Pangestu suggested that optimizing the current multilateral frameworks for trade and the environment would help policymakers achieve their goal. Reducing barriers to trade will make production more efficient, thereby using fewer natural resources. Moreover, reaching an agreement on environmental goods and services in the Doha Round could facilitate the production and use of more environmentally friendly products. The environment should be mainstreamed into international trade agreements, while at the same time countries should commit to take multilateral action under the Kyoto Protocol (and a post-Kyoto agreement). Such cooperation is more effective in addressing climate change than any unilateral steps an individual country may take.

However, the minister noted that merging trade and environmental objectives should not be an excuse to create new protectionist mechanisms. A plethora of standards and labeling related to carbon emissions could easily become new barriers to trade. These would be particularly damaging to developing countries, which do not have the financial means to comply with such requirements. The effects of climate change will already negatively impact developing countries the most; they should not be further penalized by unilateral environmental standards set by their trading partners.

For this reason, Minister Pangestu emphasized the importance of reaching a balanced conclusion to the Doha Round that will lower trade barriers and help countries utilize their comparative advantages. If this agreement is combined with plans to transfer low-carbon or environmentally friendly technology and to build capacity in developing countries, then trade, development, and climate change mitigation efforts will be working in concert with one another. In this way, sustainable economic development and environmental protection can be achieved.

Panel III – Biofuel Trends

The afternoon session began with an examination of biofuel trends in Asia and Latin America. The analysis presented was a result of the Asia-Latin America Agri-Food Research Network (ALARN), an initiative of the Institution for International Trade Negotiations (ICONE) in Brazil. **Ann Tutwiler** of the Hewlett Foundation moderated the presentations by ALARN researchers Bustanful Arifin, Tian Wei-Ming, and Marcelo Regúnaga.

Dr. Arifin, a senior economist at the Institute for Development of Economics and Finance, explained the trends for biofuel production in Indonesia, Malaysia, and Thailand. He emphasized that energy security is the main driver in all these economies for investment in biofuels. Support to the economy and the environment are also major influences. Biofuel policies date from 2003 for Thailand, 2004 for Indonesia, and 2005 for Malaysia. Palm oil is the dominant feedstock for Indonesia and Malaysia; they are the number one and two producers of palm oil in the world. Thailand is not producing much palm oil, but it is the largest exporter of cassava. These three countries also produce on sugarcane and jatropha, which can be used as biofuel feedstocks.

Indonesia’s biofuel policies prioritize the use of palm oil as a feedstock. The target is to produce about 62,000 kiloliters. Jatropha is considered the secondary feedstock. In 2006, Indonesia established a National Energy Blueprint, requiring 2 percent of total consumption of diesel fuels to be biodiesel by 2010.

Malaysia enacted a National Biofuel Policy in August 2005. The goal is to encourage the production and use of palm oil biodiesel as an environmentally friendly alternative energy source and as a means of stabilizing palm oil prices at a higher level. The government wants to first provide biofuel for domestic transportation. The secondary goal is to produce enough biodiesel for export, primarily to the European market. One plant is currently operating; two more are under construction.

Thailand is interested in ethanol production from sugarcane. However, several constraints currently face this market. First, a large percentage of cars in Thailand cannot operate on ethanol. Second, most biorefineries are not located in places convenient for export. When the plants were built, it was anticipated that ethanol would replace imported MTBE. Now ethanol producers face prohibitive transportation costs to export the fuel. Third, tariff barriers in many countries, such as the EU, China, and Japan, discourage exports.

The research of Arifin and his colleagues, Nipon Poapongsakorn at Thammasat University in Thailand and Fatimah Arshad and Amna Hammeed from Universiti Putra Malaysia, finds that the potential growth for the biofuel industries of all three countries is very high. Production of feedstocks is projected to continue to rise.

The growth of biofuel production will of course have an impact on food prices and land use. The research indicates that biofuels will directly increase the price of food. In Indonesia, land planted to biofuel feedstock will expand at the expense of forested land, whereas in Thailand there is not enough land to dramatically increase sugarcane production. Indonesia and Malaysia are both working to encourage the production on non-food feedstocks, but these initiatives are coming along slowly.

Biofuels Production in Asia-1			
Characteristics	Indonesia	Malaysia	Thailand
Main feedstocks	Oil Palm	Oil Palm	Sugarcane Cassava
Other feedstocks	Cassava	Cassava	Oil palm
Production feedstocks	High level of exports	High level of exports	Sugar exports
Potential growth	Very high, expanding to Kalimantan-Papua	High, but will slowdown, focus on downstream	Very high, issues of economics of scale
Competitiveness	High biodiesel Medium bioethanol	High biodiesel Medium bioethanol	High bioethanol Low biodiesel

Source: Arifin presentation, Bogor 2008.

Dr. Tian Wei-ming, Professor at China Agricultural University, presented the development of the biofuel sectors in China, India, and the Philippines. These countries are looking to biofuels because of their large dependency on oil imports. They also anticipate great increases energy consumption in the next 20

years. China, India, and the Philippines need energy security to support long-term socio-economic development.

Moreover, biofuels can have other benefits to their economies. In addition to addressing climate change concerns through mitigation of greenhouse gas emissions, biofuel production should alleviate rural poverty by creating employment opportunities. Biofuels can also be a means to bring electricity to rural areas. They may provide clean energy to rural residents and rehabilitate wastelands through the production of biofuel feedstocks.

China has dedicated research efforts to ethanol since the late 1990s. It constructed grain-based ethanol plants from 2001 to 2003, in part to utilize surplus grain. It also introduced an E10 program in selected cities in 2002. E10 gasoline is exempted from the 5 percent consumption tax. However, in 2006, grain shortages caused the government to revise its policy. Construction and expansion of grain-based ethanol plants was halted, although a cassava-based plant was approved. Currently some regional governments are directing their research efforts towards non-grain feedstocks.

The Indian government has decided that vegetable oils and food grain crops should not be used for biofuels in order to avoid added stress to food security. However, the government does have a sugarcane ethanol initiative. It mandated 5 percent ethanol blending in certain areas of the nine major sugarcane-growing states and the four union territories in 2003. Four years later, this policy was extended to all states. It is likely that the blending mandate will be raised to 10 percent in October 2008.

For biodiesel, the government wants to produce 13.38 million tons of biodiesel annually from jatropha planted on 11 million hectares. The majority of this land would be waste or marginal land. However, the current level of activity does not bode well for meeting this goal by 2012.

The Philippines would like to attain 60 percent energy self-sufficiency by 2010. To achieve this, it has mandated 5 percent ethanol blending, starting in 2006. This should increase to 10 percent in 2010. Biodiesel is mandated at 2 percent. No specific tax is applied to biofuels, and raw materials used to produce biofuels are exempted from value-added tax. The government prioritizes financial services for biofuels investment.

The governmental strategies of China, India, and the Philippines share many characteristics. They are all strongly focused on domestic development intended to reduce dependence on oil imports. All three are also exploring how rural households can use bioenergy to improve their access to energy. The production of biofuels using food grain crops as feedstocks is also strictly prohibited. For example, India is prioritizing research on sugarcane and sweet sorghum while China is investigating second-generation technologies. Research in the Philippines is directly towards sugarcane, sweet potatoes, and cassava for ethanol and coconut, palm oil, and jatropha for biodiesel. The governments are addressing long-term strategic considerations rather than short-run responses to surging oil prices.

The research conducted by Dr. Tian, Kavery Ganguly, and Leonardo Gonzales reveals that all three countries face some similar constraints to developing their biofuel industries. First, there is limited feedstock availability due to a shortage of resources. China, India, and the Philippines are densely populated and, to a large extent, the existing biomass is already fully used for food, feed, and raw materials. Marginal lands are often too remote or environmentally fragile to support commercially viable feedstock production. Second, weather-related events can cause large variations in the feedstock supply. Third, inadequate rural infrastructure makes transporting feedstocks from field to production facility difficult and expensive. Finally, poor public and corporate governance favors biofuel companies at the expense of the farmers, diminishing the rural development component of biofuels investment.

Therefore, without significant technological breakthroughs, none of these countries can become a large producer of biofuels. It is also difficult to establish the industry when it is so vulnerable to the volatile price changes of feedstocks and oil. The countries should reevaluate their policies and determine realistic targets based on likely market situations and technological advancements. Institutional frameworks that will provide appropriate incentives to commercial firms and farmers also need to be developed. Ideally,

these will be crafted in a way that balances commercial and non-commercial biofuel production and that does not rely on inappropriate government subsidies.

China, India, and the Philippines also need to adopt policies that acknowledge biofuel production as only a minor remedy for the future need for energy and for addressing environmental problems. To prepare for the long run, it is necessary to change the current mode of economic growth and consumption in order to avoid future crises. These concerns must be balanced with developing countries' right to invest in their economies. Since developing countries have the opportunity not to copy the lifestyles of developed countries, they should benefit from the transfer of knowledge and technologies to help them secure their energy needs and develop with minimal implications for the environment.

Marcelo Regúnaga, Vice Chairman of IPC and a member of the ALARN initiative, provided an overview of biofuel trends in Argentina, Brazil, and Chile. For Brazil and Chile, the primary driver for investing in biofuels is the desire to diversify energy sources. Argentina's main concern is the economic benefits to be derived from biofuels.

Brazil has a long history of biofuel policies while Argentina and Chile have turned their attention in this direction much more recently. The Brazilian government began supported sugarcane ethanol in 1975. It set standards for ethanol and introduced a mandate to blend the alternative fuel into gasoline. It also provided funding for the distribution of ethanol. In 1978-79, the government began supporting the development of vehicles and infrastructure for E100. It decreased some subsidy programs in the early 1990s, but still enforces a mandated blend of over 20 percent. In 2003, flex-fuel vehicles were introduced in Brazil, further facilitating the use of ethanol. The government undertook biodiesel legislation in 2005. A minimum mandated blend 3 percent biodiesel will be in place in July 2008.

Argentina introduced a ten-year tax exemption for biofuel in 2001. Under a 2006 law and a 2007 regulatory decree, a 5 percent mandated blend of ethanol with gasoline will be required in 2010. These regulations also developed standards and quality controls. They placed an emphasis on using biofuels as an economic development tool for farmers, small firms, and disadvantaged regions. In 2007, the government enacted a hefty differentially export tax for biodiesel; the tax on ethanol produced from grains was less severe.

Chile is heavily dependent on imported oil for its energy needs. Fully 98 percent of its liquid fuel demand is met by imports. Therefore, in 2007 the current government committed to a goal of 15 percent energy use from renewables by 2010. While there has been little explicit support for biofuels, recently competitive grants, government research funds, and reduced taxes for biofuels have been introduced.

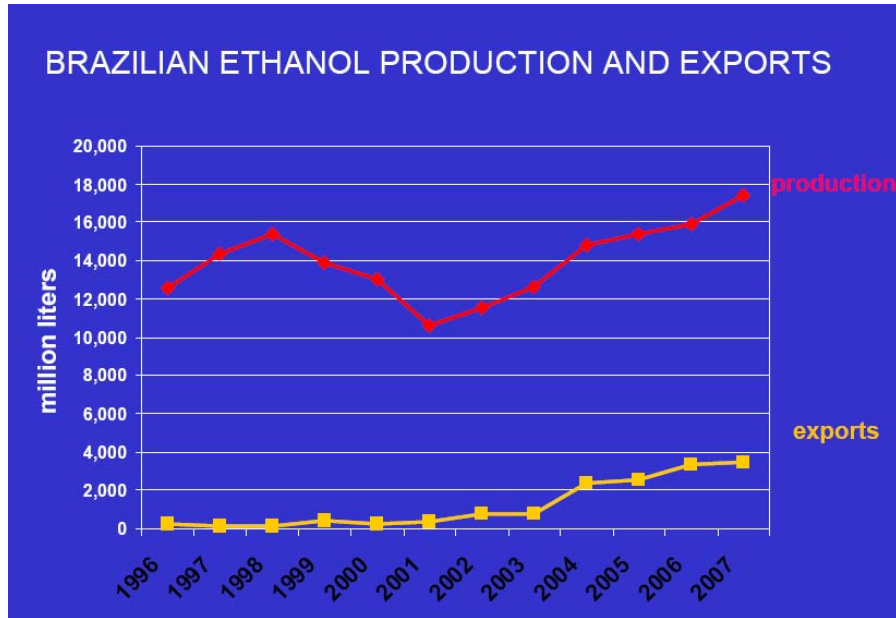
Regúnaga gave an overview of biofuel production in these countries. In Argentina, the main feedstocks are oilseeds, and large firms carry out most of the production. Sugarcane is the primary feedstock in Brazil; here as well large firms dominate. Chile is producing ethanol from corn, which is mostly grown by small producers. Oilseeds are secondary feedstocks in Brazil and Chile, while grains and sugarcane are the alternatives in Argentina. Both Argentina and Brazil are large agricultural exporters, but Chile exports very little. The former also have much better prospects for growth in biofuel production because of the productivity potential of their crops and because of available arable land. Chile does not have these luxuries. Therefore, biodiesel from Argentina and ethanol from Brazil are highly competitive, but biofuel from Chile is not.

Brazil is devoting significant research and investment to increasing sugarcane production and ethanol exports. Productivity of cereals and oilseeds has also skyrocketed in Argentina over the past 25 years.

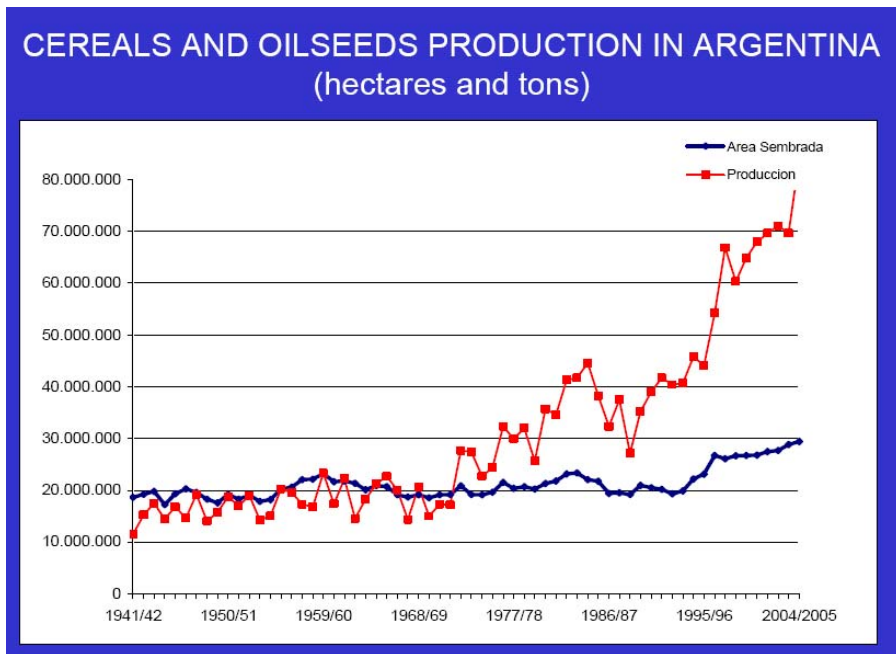
Regarding rural development, the impact of biofuels on food prices should have positive repercussions for farmers in Argentina and Brazil, as their exports will be more valuable. Since Chile's exports are minimal, the impact will be fairly insignificant for that country.

However, the biofuel industries in each country face challenges. For Argentina, controls on domestic fuel prices make it difficult for biofuels to compete with conventional fuel, even with special supports. Similarly, taxes, price caps, and quantitative restrictions on the feedstock markets limit innovation and acreage

expansion of oilseeds and cereals. As in Asia, the lack of adequate infrastructure makes transportation of feedstocks and biofuels prohibitively expensive. Uncertainty about the commitment of the government to biofuels also deters investment.



Source: UNICA and ICONE in Regúnaga presentation, Bogor 2008.



Source: SAGPYA data in Regúnaga presentation, Bogor 2008.

Likewise, Brazil is hampered by poor infrastructure. It needs a better pipeline system for ethanol to encourage exports, but investment in this is slow because of the lack of a global ethanol market. While Brazil is not facing any resource constraints as far as available land and water, the labor conditions for harvesting sugarcane and the pollution caused by burning cane leaves does raise concerns.

Because the Chilean government does not mandate the blending of biofuels in conventional fuel and because it has not moved forward with a tax exemption initiative for biofuels, the market for these alternative fuels will not blossom in the near future. Also, in addition to Chile's resource constraints, it cannot produce biofuels as cheaply as its neighbors. The small-scale producers are not competitive with Argentina's and Brazil's firms.

Nevertheless, Regúnaga stressed that biofuels hold opportunities for South American countries. They can improve prices, diversify income, add local value, and assure additional demand for crops. Because of the lack of resource constraints, many areas of the continent are and will be very competitive in biofuel production.

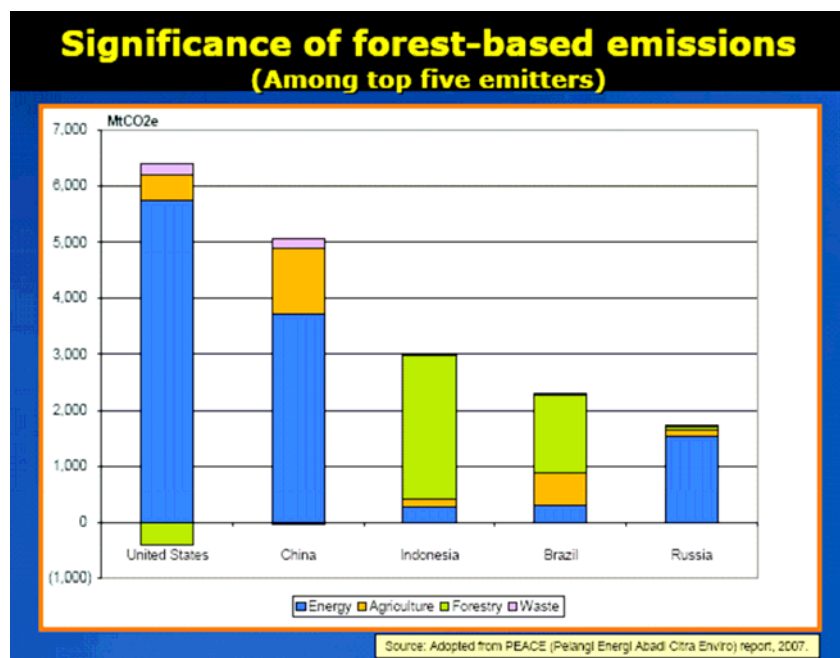
Panel IV – Climate Change, Deforestation, and Poverty

Moderator Bob Thompson introduced **Frances Seymour**, the Director General for the Center for International Forestry Research (CIFOR). CIFOR, as part of the Consultative Group on International Agricultural Research, is committed to conserving forests and improving the livelihoods of people in the tropics. CIFOR's high impact research helps local communities and small farmers gain their rightful share of forest resources while increasing the production and value of forest products. CIFOR is headquartered in Bogor and has staffed based in Brazil, Bolivia, Burkina Faso, Cameroon, Ethiopia, and Zambia. It currently conducts research in more than 40 countries throughout the tropics.

To explain why forests matter, Seymour used the example of Indonesia. Forests play a role in Indonesia's economic, environmental, and social health. Forestry and forest-derived products account for 3-4 percent of gross domestic product and 9 percent of the total export value. There are 600,000 formal sector jobs related to forestry, one third of which are related to furniture. Forests are also a vital component of biodiversity. While the island of Borneo is less than 1 percent of the earth's land area, it contains 6 percent of the world's flowering plants, birds, and mammals. This biodiversity is important to the survival of local people who utilize plants to enhance their health and economic well-being. Because forests are important to ecosystem management, they help keep the environment healthy, which is crucial to people's livelihoods. They also provide up to 80 percent of the primary energy needs met from wood fuels, the dominant energy source of the rural poor. Finally, forests play a role in mitigating the effects of climate change by capturing carbon dioxide from the atmosphere and preventing erosion.

Conversely, forest degradation can severely impact the environment. Indonesia and Brazil are now globally significant sources of emissions due to deforestation and forest fires. Some 20 percent of global emissions are from forest and land use change.

Avoided deforestation is one of the cheapest options for greenhouse gas emissions mitigation. In the Kyoto Protocol there are incentives for afforestation and reforestation but not for preventing deforestation. Reducing Emissions from Deforestation and Forest Degradation (REDD) is a means by which stakeholders can be compensated for not deforesting an area. The Bali Action Plan, which emerged from the UN Framework Convention on Climate Change Conference of Parties in December 2007, includes a road map incorporating REDD in the global climate protection regime.

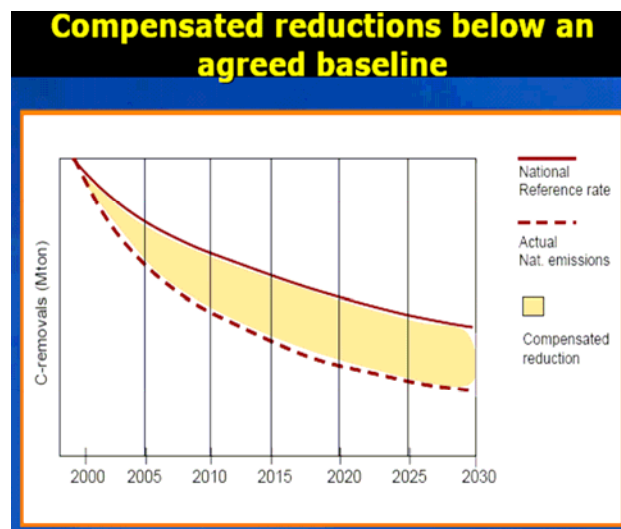


Source: Seymour presentation, Bogor 2008.

Using Indonesia as an example again, Seymour demonstrated what REDD could mean financially to developing countries with forest resources. Working with the assumptions of a baseline of 3 billion tons of carbon emissions per year, a reduction of 20 percent of emissions below the baseline, and a price of \$5 per ton for avoided carbon emissions, Seymour estimated that Indonesia could receive \$3 billion per year. By comparison, development aid to Indonesia's forestry sector over the last two decades has been \$1 billion cumulatively and the loss to the Indonesia economy from "undocumented" timber extraction is \$3 billion per year.

REDD has the potential to succeed because the volume of money that will support forest preservation will be enough to shift the political economy away from the drivers of deforestation and degradation. Furthermore, it will increase the political attention and engagement on this issue. Finally, it will align the interests of multiple

constituencies, such as those that own the land, those who work the land, and the government.



Source: Seymour presentation, Bogor 2008.

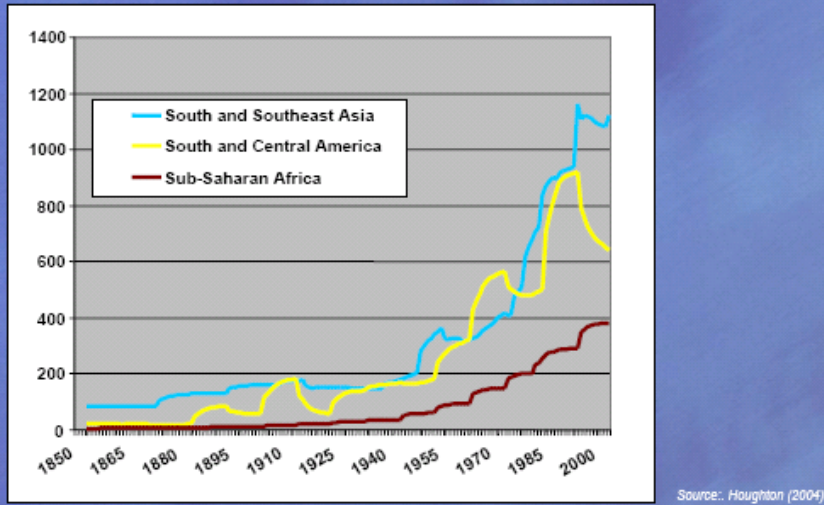
By conserving forests, REDD will help improve local livelihoods, preserve biodiversity, and increase forest governance. However, to be successful, it will need functioning governance mechanisms and institutional capacity. REDD must also manage risks and trade-offs. Most importantly, it needs to establish legitimacy by providing an inclusive process and achieving equitable outcomes for all stakeholders.

As earlier Payment for Environmental Services schemes have shown, REDD will encounter difficult trade-offs between efficiency and equity. REDD will also need to manage the risks it may face, such as corruption and ineffectiveness. Critics are still concerned about its market mechanisms and the risks posed to the voices and priorities of indigenous people. Still, in Indonesia, the national REDD process is underway. The Ministry of Forestry has taken the lead. Fourteen countries have submitted REDD plans to the World Bank's forest carbon facility.

Dr. Daniel Murdiyarso, a senior scientist at CIFOR, built upon Seymour's presentation by outlining the direct and indirect causes of deforestation. Deforestation currently contributes 20 percent of the world's emissions of greenhouse gases, and 11 million hectares of forests are being lost each year. In Indonesia, a great deal of this loss is due to peat land drainage and fires.

In Indonesia, one of the causes of deforestation is cash cropping. Land is deforested to make room for plantations for timber, oil palm, and pulpwood. Because of the revenue generated, this is done with governmental approval. Between 1985 and 1999, for example, the number of hectares in oil palm nearly quadrupled.

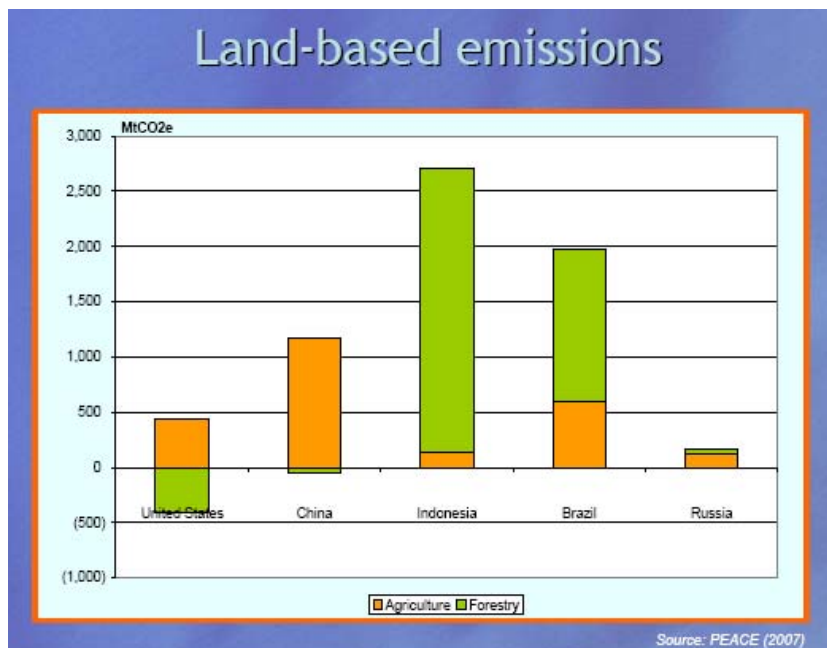
C-emissions from LUC in the tropics (million tons)



Source: Murdiyarto presentation, Bogor 2008.

A recent, vigorous driver of cash crops is the demand for biofuels. However, even if they reduce greenhouse gas emissions, the carbon lost by converting land from forests to plantations is far more significant. Can deforestation be avoided while promoting biofuels? Given that it can take over 70 years to recapture the carbon lost from planting biofuel feedstock on previously forested land, reaching a balance will be quite a challenge. At the very least, strong policies and certification standards need to be put into place to prevent environmental and social damage.

Land-based emissions



Source: Murdiyarto presentation, Bogor 2008.

Murdiyarto noted that agricultural expansion, logging, and infrastructure development are the primary direct causes of deforestation. But these developments are typically driven by economic, political, technological, cultural, and demographic factors that often create unsustainable practices. Poor logging techniques or illegal logging, for example, can cause almost all of the harvested wood to go to waste. Population growth and market development may demand better roads, but this can also provide access for settlement and more timber extraction at the expense of biodiversity. As long as carbon, biodiversity, water, and other ecosystem services remain public goods, political governance systems are opaque, and property rights are unclear, these types of secondary factors will continue to create an impetus for deforestation.

Mr. **Wahjudi Wardjo**, Director General of the Forestry Research and Development Agency for Indonesia's Ministry of Forestry, examined the interlinkages of agriculture, climate change, and forests. Like Seymour, he emphasized that forests are a major source of biodiversity, employment, and economic development in Indonesia. He noted that Indonesia has 123 million hectares of forested area; that comprises about 60 percent of the country's land. Sixteen percent of this area is devoted for conservation, 26 percent is under protection, 47 percent is for production, and 11 percent is convertible.

For 2004-2009, the government has five policy priorities. The first is to combat illegal logging. Second, the government is focused on forest and land rehabilitation and forest conservation. Third, it is encouraging the restructuring of the forestry sector by promoting timber plantations and wood-based industries. Fourth, the government wants rural communities to learn to use the resources of the forest equitably and sustainably. Lastly, strengthening the legal status of state forest land is a priority. These policy priorities will help Indonesia mitigate and adapt to climate change by reducing emissions, enhancing carbon sinks, and encouraging carbon conservation.

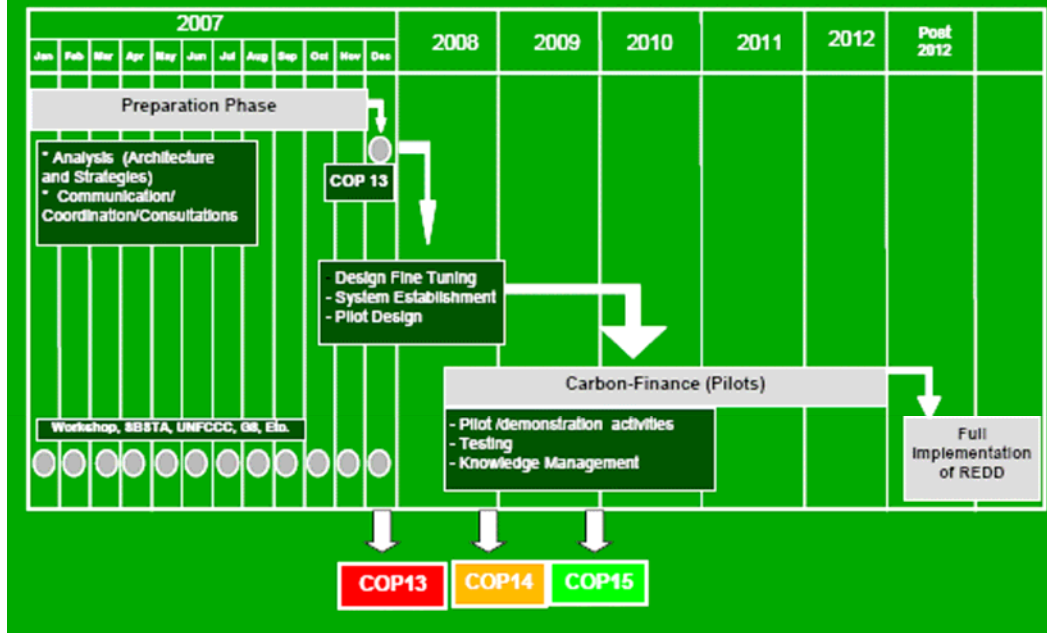
The policies must be effective because Indonesia has already experienced forest degradation and deforestation. This is due to poor governance in the private and public sectors, both at the national and the local levels. Ineffective law enforcement and control as well as insufficient participation and transparency have contributed to forest degradation and deforestation. Poor forest management has also been a factor. Additionally, the rent-seeking behavior of businesses often encourages unsustainable forestry practices. Communities usually lack the institutional capability to protect or preserve forested areas.

Along with these problems of governance, Indonesia's forests are also facing effects of climate change as well as the growing scarcity of food, energy, and water. Forests have the potential help with both challenges, but shortsighted actions, such as cutting down forests for energy, could aggravate the problems.

Wardjo reemphasized Seymour's earlier points about the commitments made in the Bali Action Plan in December 2007. There will be pilot activities for REDD in developing countries, supported by capacity building and technology transfer from more industrialized countries. However, the success of REDD will be very much dependent on whether or not the latter countries increase their targets for emissions reduction.

The key elements of Indonesia's REDD plan is that it establishes a baseline for emissions and includes strategies to reduce emissions. Verifying that leakage is not occurring is also critical to the plan's success. Pilot activities will be selected based on the availability of information, the level of threat for deforestation or degradation, and the social equity and pro-poor dimension of the proposal. Clarity of legal tenure over the land and forests and good governance are also vital.

Indonesia REDD (REDDI) Road Map



Source: Wardojo presentation, Bogor 2008.

Wardojo gave an example of oil palm development and REDD. Oil palm plantations have expanded rapidly over the past decade on the Indonesian islands of Sumatra and Kalimantan. While they have conferred important economic benefits, such as foreign exchange and employment, they have been increasingly planted on peat soil. The disturbance of peat bogs causes oxidation, subsidence, and a large amount of carbon emissions. Furthermore, oil palm plantations are expected to expand by 5-6 million hectares in the next ten years. Most of this planned expansion is on forested or peat lands. REDD could help avoid the environmental drawbacks of oil palm expansion by offering financing large enough to offset the opportunity costs of not converting the forested or peat lands to oil palm. Beyond REDD, Indonesia needs to implement policies like reviewing permit allocations for oil palm development, increasing the yields of smallholders' plantations, and improving water management on plantations on peat lands to decrease the environmental degradation and carbon emissions caused by oil palm production.

Panel V – Sustainability Standards

IPC Chief Executive **Charlotte Hebebrand** moderated the concluding panel. She introduced **Dr. Didiak Hadjar Goenadi**, the Executive Director of the Indonesian Palm Oil Association. Goenadi began his presentation by noting that Indonesia produces 17.2 million tons of crude palm oil from 6.2 million hectares of land. It is one of Indonesia's most important cash crops; the country exported \$12 billion of palm oil in 2007. The employment opportunities from this sector could affect 6 million people positively.

The rapid increase in demand for palm oil due to greater food and fuel needs along with the lack of governance of palm oil production has created an imbalanced situation. Economically, socially, environmentally, and perhaps politically, the country has been affected by the booming palm oil industry. Implementing appropriate policies, particularly those concerning land use and tenure, will be difficult to development since this issue involves so many trade-offs and interests.

Indonesia's resources are well-suited to growing oil palm. Good Agricultural Practices have been in place since the period of Dutch rule. Goenadi observed that growers have no objections to environmentally safe practices designed to achieve sustainable palm oil production. Many cooperate with the guidelines of the Roundtable on Sustainable Palm Oil (RSPO). Larger producers also comply with GlobalGAP. However, this is not the case for the smallholders, which make up a substantial portion of the oil palm producers in Indonesia. Goenadi suggested the government provide guidance and assistance to these farmers. Furthermore, there is concern that the current spike in prices has caused many larger producers to ignore sustainability procedures.

While the RSPO's principles and criteria are helpful for preventing environmental degradation, they can be expensive for producers. Goenadi noted that judging sustainability can be difficult at the commodity level. Crude palm oil and palm kernel oil are processed and traded in bulk. Determining the source of the feedstock can be nearly impossible and sustainability criteria risk rewarding those who do not comply or punishing those that do. This type of standard is difficult to enforce if all the feedstock sources are not certified as conducting sustainable practices.

One way to alleviate environmental concerns is to close the productivity gap. Current breeds available can ideally produce six to seven tons of oil per hectare per year. Unfortunately, the average attainable yield is presently only 50-60 percent of this level. Narrowing the yield gap would allow more palm oil to be produced on less land, reducing the environmental footprint of oil palm.

Goenadi urged Indonesia's government to adopt policies that would encourage the long-term competitiveness of the oil palm sector. He voiced concern over the temptation to heavily tax a commodity that is currently profitable. Disincentives to investment should be avoided. He supported the creation of a government agency that oversees the entire plantation business, from licensing to marketing. More investment also needs to be made in replanting, rehabilitation of land, research and development, and promotion of oil palm. Concerns about deforestation should be balanced by a national program on land reclamation and reforestation.

Dr. André Nassar, President of ICONE, followed Goenadi with a discussion of sustainability considerations for ethanol. Regarding ethanol sustainability, Nassar highlight three primary issues: 1) feedstock efficiency, particularly as it relates to energy balance and to energy production per land unit; 2) greenhouse gas emissions from the feedstock and resulting fuel; and 3) the impacts of biofuel production on the food and feed supply. He noted that sugarcane ethanol and palm oil are the most efficient agricultural feedstocks for ethanol and biodiesel, respectively. Sugarcane ethanol produced in Brazil yields the highest per acre compared to other ethanol feedstocks.

Energy Flow on Ethanol Production: Comparison of Feedstocks

Process	Corn ¹	Switchgrass ¹	Sugarcane ²
	(GJ/ha.year)	(GJ/ha.year)	(GJ/ha.year)
Consumption of energy in agricultural fields	18,9	17,8	13,9
Biomass energy	149,5 ³	220,2	297,1 ⁴
Energy ratio in agriculture	7,9	12,3	21,3
Consumption of energy in ethanol production	47,9	10,2	3,4
Ethanol energy content	67,1 ⁵	104,4	132,5 ⁶
Total energy ratio	1,21	4,43	8,32

Notes: 1-Source: ORNL, 2- Source: Copersucar/UNICAMP, 3-It does not include use of corn straws, 4- It does not include use of leaves, 5- It includes by-product credits, 6-It includes credit for excess of bagasse 8%

Source: Nassar presentation, Bogor 2008.

Nassar made a strong case for the sustainability advantages of sugarcane ethanol. He pointed out that energy balance for this feedstock is even better than switchgrass. Waste from ethanol production also provides energy for running the refinery and creates electricity. Greenhouse gas reduction is also significantly lower compared to grain and sugar beet feedstocks.

Nassar also refuted the claim that sugarcane plantings in Brazil are growing at the expense of the Amazon rain forest. From 2000 to 2008, the area planted to sugarcane has grown about 5 percent per year. This is below the rate of corn and soybean growth in Brazil. Also, Brazil has available arable land in which to expand production, so more sugarcane is not damaging the rain forest.

Land use and land use change have recently become major concerns in the arena of biofuel policy. Nassar explained that this is due to the fact that land has become a scarce resource. The United States, Europe, China, and India all are near the limits of their arable land availability. Brazil and African countries, conversely, will probably reach this limit in the next 50 years. Increased competition between food and fuel production from agricultural crops has also heightened the attention upon land use. Moreover, there is concern about the implications for greater greenhouse gas emissions due to new cultivation of virgin land or forests for biofuels or for crops for food production that have been displaced by biofuel feedstocks. Nassar expressed his concern about the feasibility of reliably measuring indirect land use changes.

ICONE has implemented a strategy to address agricultural land use concerns in Brazil. First, it has estimated the land still available for agriculture. Second, it has created models to project agricultural expansion. Third, it has assessed the distribution of projected crop and pasture area in Brazil and evaluated the competition and substitution effects among crops, livestock, and land availability. By its calculations, Brazil has nearly 36 million hectares of available land that can be used for agriculture without harming the environment.

Therefore, ICONE does not perceive a sustainability concern with sugarcane ethanol. Since 2002, sugarcane production has displaced some pasture and crop land, but this is mostly confined to the south central state of Sao Paulo. Furthermore, almost no original vegetation has been disturbed to grow sugarcane.

In the end, ICONE is convinced of sugarcane ethanol's sustainability. Moreover, calculating the indirect impact of biofuel policy on land use change is exceedingly difficult. Having established this point, Nassar did not address the larger question of sustainability criteria for ethanol; he views this as an ongoing dialogue that is still being developed and explored.

While the need for and parameters of sustainability criteria may still be debated, the European Union has gone ahead with developing such standards. **Carlo Trojan**, IPC member and former Secretary General of the European Commission, presented the EU's proposal for sustainability criteria for biofuels.

The EU's primary policy driver for promoting the use of renewable energy is climate change. To reduce Europe's impact on the environment, in the spring of 2007 the European Council set targets of 20 percent reduction in greenhouse gas emissions by 2020 (compared to 1990 levels) and 20 percent share for renewables in EU energy consumption in the same timeframe. This latter target included the requirement that each member state should have 10 percent of their energy from biofuels by the target date. In January 2008, the European Commission proposed a Directive by which to meet these goals. The suggestions included making the 20 percent renewable energy target and the 10 percent goal for biofuels in transport binding for each member state. The focus on transport is due to the fact that the transportation sector accounts for a third of EU carbon dioxide emissions, and demand for fuel is projected to grow.

However, the Directive stipulates that biofuels for transport used toward this target must meet environmental sustainability criteria. These include a 35 percent reduction in greenhouse gas emissions and the preservation of biodiversity. The enacted criteria must be the same for all member states, so that no national criteria may become an obstacle to trade. Because the criteria will be harmonized, the European Commission will have sole responsibility for any disputes or international agreements related to biofuel sustainability standards.

Regarding the construction of the criteria, greenhouse gas emission savings from biofuels will be compared to fossil fuels. To calculate the reduction, member states can opt to accept the default values given by the Commission or to follow a detailed calculation methodology in which most aspects of the well-to-wheel analysis are considered. The default values will only be used for raw material cultivated outside the Community or in those regions designated beforehand by member states. Reduced emissions will be assessed by the mix of renewables, not by individual raw materials.

To prevent biodiversity loss and negative land use impacts, the Directive excludes the production of biofuels from biomass harvested on protected lands, pristine and restored forests, and highly biodiverse grasslands. Land use changes that would result in high carbon losses are also excluded. The latter particularly applies to wetlands and continuously forested areas. Trojan summarized that in practice, these stipulations mean that biofuel feedstock may come from abandoned agricultural areas, natural grasslands with low biodiversity, and moderately degraded soil.

Member states may select their own mechanisms to support this policy. Tax exemptions, mandates, and subsidies are all options. Member states may not discriminate against biofuels from other member states, and they must submit a report to the Commission in 2011 and every two years thereafter. Trojan pointed out that presently some of the national measures in place are questionable both under EU and WTO law, as they favor national producers.

Because cellulosic ethanol is not commercially available and because there is little available arable land in Europe, the EU will rely on either feedstock or first-generation biofuel imports for the foreseeable future. Imports may supply 30-50 percent of EU biofuel needs. Because of the increased demand for food and the food market's competition with biofuel, it may be difficult for EU member states to secure enough

biomass or biofuel to meet the target. Trojan emphasized that this makes the EU's trade policy on these materials very important.

While Trojan acknowledged that there are many legitimate concerns about biofuels, he also noted that there is still a lack of consensus on measuring greenhouse gas emission savings or defining "highly biodiverse grasslands." At the same time, investment in biofuels is proceeding rapidly. The EU proposal may not be perfect, but binding environmental standards need to be put in place now as a starting point for building up experience, sound monitoring, and scientific evidence. As knowledge evolves, the European Commission will adapt and update the standards.

A genuine concern about the EU's present policies and proposed criteria is that they provide incentives for first-generation biofuels, potentially retarding the development of more advanced biofuels. While he agreed that biofuels from waste, crop residues, and lignocellulose offer more energy potential and environmental benefits and do not compete directly with food production, Trojan reiterated that these fuels are not yet available. Further technological advancements may reduce the greenhouse gas emissions of first-generation biofuels while also helping to develop second-generation technologies. National support measures, however, should focus on the latter.

Trojan also touched upon the relationship of biofuel sustainability standards to the WTO. The GATT non-discrimination obligations and the rules on subsidies are particularly relevant to sustainability criteria. On the former, he noted that it applies only to like products. After reviewed a few dispute settlement cases, he concluded that it is necessary to assess whether a measure modifies the conditions of competition in the relevant market to the detriment of important products. One exception is Article XXIV of the GATT, which has been interpreted through a dispute settlement case to allow sustainable development and biodiversity to be used to justify market protection.

In the end, the conclusion may be the same as that found by IPC in its October 2006 paper on WTO disciplines and biofuels: "the key question of compliance with WTO regulation is whether or not the measure is drafted or structured in such a way as to be more burdensome on foreign than on domestic producers." The legality of the EU Directive will depend on whether different treatments of feedstocks and biofuels derives from objective norms, criteria, and methods, or from protectionist motives. The high potential for disputes to arise on this topic argues for internationally agreed sustainability criteria to be developed.

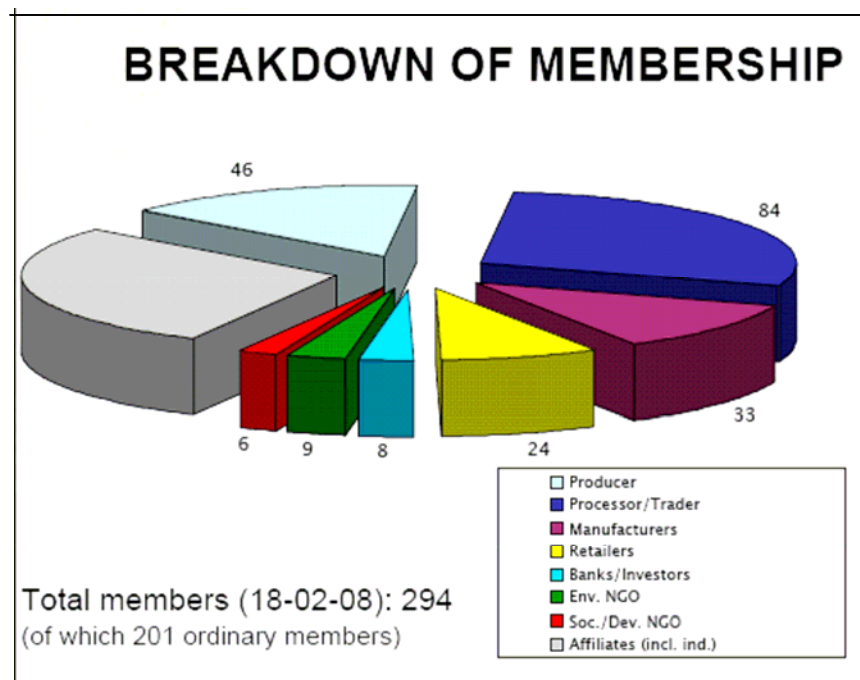
Regarding subsidies to biofuels and the WTO, a subsidy is illegal if it confers a competitive advantage. Tax exemptions for biofuels are certainly a subsidy, but if they apply to all participating in the market, they do not provide an advantage. Subsidies that apply to agricultural feedstocks are more difficult to judge because 1) they are not specific, which is against the Agreement on Subsidies and Countervailing Measures, and 2) it is difficult to argue that they provide a competitive advantage to downstream domestic users. Trojan noted that while national support measures may not formally discriminate between domestic and foreign biofuel producers, the combination of tariffs, tax exemptions, and other support measures may give a competitive advantage to domestic producers in practice.

Trojan repeated that the ideal solution would be the development of internationally agreed norms, criteria, and methods. Realistically this can only be done in the long term. In the meantime unilateral sustainability criteria will be put into place. They will be part of a learning process and should be based on emerging core principles and methodologies concerning sustainable development. Voluntary agreements and platforms amongst stakeholders concerning particular feedstocks can show the way. But ultimately bilateral and multilateral agreements will be necessary in order to ensure mutual ownership and compliance.

The sustainability criteria under discussion in the EU constitute an important step forward, notwithstanding their shortcomings. They should be implemented in a non-discriminatory way without conferring undue competitive advantage to domestic producers and allowing developing countries export opportunities for ethanol and biomass.

Willem-Jan Laan, Unilever’s European Director for External Affairs, concluded the conference with a presentation on lessons learned from the RSPO. The RSPO’s objectives are to promote the growth and use of sustainable palm oil through cooperation within the supply chain and open dialogue with its stakeholders. The Roundtable began with an initiative by the World Wildlife Fund in 2001. The seven founding members, which included Unilever, met the following year, and the first Roundtable meeting was held in Kuala Lumpur in 2003. More than 200 people participated from 16 countries. Development plans moved forward, and the RSPO was officially created in 2004.

Over the next four years, principles and criteria were agreed upon; national working groups were established in Malaysia, Indonesia, Papua New Guinea, Colombia, and Brazil; and a verification framework was launched. The principles and criteria are: 1) transparency, 2) compliance with applicable laws and regulations, 3) economic viability, 4) appropriate best practices used by growers and millers, 5) environmental responsibility, 6) responsibility to the employees of and individuals affected by growers and mills, 7) responsible planting, and 8) continuous improvement. These elements define sustainable palm oil production and are the basis for the certification standard. With this in place and the working groups and verification framework established, the RSPO is now able to start issuing certifications in 2008.



Source: Laan presentation, Bogor 2008.

Laan distilled the lessons learned from Unilever’s years of involvement with the RSPO. First, working together with stakeholders is the best way to build trust. Second, trials engage growers and encourage participation. Third, implementation at the national level is essential for effective involvement. Furthermore, private sector initiatives must have the support of adequate national legislation to be meaningful. Fourth, partners in the supply chain want to work with a system that is practical and actually works beyond the concept mode. This requires a certain amount of time to agree on an approach and to set up a system that functions properly.

That the RSPO has been well received is reflected in the fact that roundtables for other commodities and supply chain have been modeled after it. However, climate change and renewable energy policies have added new challenges to the system. Crop-specific criteria, like those in the RSPO, do not address the reduction of greenhouse gas emissions, food security concerns, or indirect land use change of non-certified production to peat or forested land.

Laan closed by outlining Unilever's commitment to certified sustainable palm oil. The company intends to have all palm oil certified as sustainable by 2015 with a traceability target for Europe in 2012. It also plans to continue partnering with governments, suppliers, non-governmental organizations, and other users of palm oil to promote sustainable production. Laan emphasized that Unilever and the RSPO need to combine efforts to prevent deforestation in Indonesia due to oil palm production.

Conclusions

Agriculture clearly has had an impact on the environment and contributed to climate change. Without policy adjustments, competition between agriculture and the environment could have disastrous consequences. Yet, many of the policy approaches and technological advancements discussed in the seminar could help prevent environmental degradation while also increasing agricultural production.

Liberalizing trade will decrease agriculture's impact on the environment. The removal of trade barriers will enhance efficiency in production by encouraging crops to be grown where it is cheapest to do so. Since fewer inputs will be needed, environmental damage caused by excessive application of nutrients will be reduced. Efficient agriculture will be less demanding on natural resources like soil and water. At the same time, liberalized trade will provide new economic opportunities to many farmers who currently do not have access to markets.

The innovation in agricultural research and technology will also make food security and environmental objectives more compatible. Plant breeding will decrease the amount of nutrients applied to crops, thereby lowering the cost to farmers and to the environment. Technology is also increasing yields, which helps keep agricultural production from expanding into environmentally fragile land. With these evolving technologies and a renewed campaign to sharing scientific advancements with developing country farmers, agriculture should reduce its contribution to climate change.

A great deal of controversy has recently surrounded biofuels' interaction with climate change. From the discussion at the seminar, it is clear that not all feedstocks are the same. Some compete with food production and contribute little to lowering net carbon emissions while others are inedible and compare favorably to fossil fuel emissions. Concerns were raised the displacement of forests in favor of oil palm plantations, particularly in terms of biodiversity and net carbon emissions. While opinions differed on the role of biofuels in future food, energy, and environmental priorities, participants agreed that biofuels should not be produced on land used for food crops. Furthermore, more funds need to be invested into bringing commercially viable second-generation fuels on to the market quickly.

Forests have often been cut down to make way for agriculture. However, the two do not need to be in competition with one another. Forests' biodiversity and resources can be sources of economic opportunity for local populations as well as investors. Combined with programs like REDD, forests can provide income to governments that would otherwise be obtained through agricultural plantation licenses. Preventing deforestation for agricultural use avoids the release of carbon and preserves biodiversity, thereby reducing agriculture's potential effect on the environment.

Since three billion more people will be on the planet by 2050, increased agricultural production is clearly a global priority. However, if it comes at the expense of the environment, it will be a mediocre accomplishment. Through trade liberalization and technological innovation, agricultural efficiency and production can be increased without encroaching on environmentally sensitive land. Policies that promote these investments and a sensible approach to energy from agriculture are necessary for food security and environmental goals to be compatible.