Proceedings of the Governing Council Round Tables

Challenges and opportunities for smallholder farmers in the context of climate change and new demands on agriculture

SULLIS

in Conjunction with the Thirty-first Session of IFAD's Governing Council, February 2008



Enabling poor rural people to overcome poverty

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I. Background

Climate change, biofuel expansion and rising food prices are growing challenges for poor rural people. But these trends also present opportunities. IFAD held three round table discussions on these new challenges and opportunities for smallholder agriculture at its Governing Council on Thursday, 14 February 2008.

Three quarters of the world's one billion extremely poor people live in rural areas and depend on agriculture and related activities for their livelihoods. These are the people who will be hardest hit by climate change. They are also major food producers as well as users and custodians of natural resources.

According to the Intergovernmental Panel on Climate Change, agricultural production and access to food in many regions may be severely compromised by climate variability and change. The area suitable for agriculture, the length of growing seasons and the yield potential of some mainly arid areas are expected to decrease. Episodes of heavy rainfall and drought are likely to become more frequent and severe. Under such circumstances, the prospects of achieving the Millennium Development Goals may be seriously compromised.

The women and men involved in agriculture have always evolved and adapted to ever-changing environments. They have developed farming systems in response to different opportunities and constraints faced over time. Adaptation measures that help people and ecosystems reduce their vulnerability to the impact of climate change are important.

But poor rural people could also play a major role in mitigating climate change through the sustainable management of land, forests and other natural resources. And climate change mitigation policies can represent a historic opportunity to acknowledge and remunerate them for providing environmental services that benefit us all.

There are also concerns about the potential impact of the expansion of biofuel production and its impact on the poor rural people. These concerns include a possible diversion of agricultural land from food to biofuel, the impact on food prices and availability, and the impact on the environment.

However, soaring energy prices and the role that fossil fuels play in global warming provide a compelling rationale for looking more closely at biofuels. Multipurpose crops that can grow on marginal lands and whose components can be used for biofuels, animal feed and human consumption, could become a new source of income for small farmers.

International agricultural commodity prices are rising because of a combination of factors: an increased demand for food due to rapid growth in emerging countries like India and China; unprecedented and rapid migration from rural to urban areas; recent poor harvests in some countries that may be a result of climate change; and the conversion of land use from food crops to biofuel crops. These will have enormous consequences for poor rural people, particularly for women, who often are responsible for providing food for the family. But rising commodity prices could improve the incomes of smallholder farmers if more remunerative prices are realized at the farm gate and if supporting policies and investments are put in place to ensure they can respond to the demand.

It is in this context that three round table discussions were held:

- Round Table 1 *Climate change and the future of smallholder agriculture*: How can the rural poor people be part of the solution to climate change?
- Round Table 2 *Biofuel expansion*: Challenges, risks and opportunities for rural poor people
- Round Table 3 *Growing demand on agriculture and rising prices of commodities*: An opportunity for smallholders in low-income, agriculture-based countries?

The sections that follow describe the proceedings of each of these round tables. Concept notes for each round table were prepared before each of the discussions. Annex 1 provides the three concept notes in their entirety.

II. Climate change and the future of smallholder agriculture: How can the rural poor people be part of the solution to climate change?

Questions to guide the round table discussion:

- How can poor rural people be helped to adapt to a new magnitude of climate change?
- How can poor rural people benefit from mitigation mechanisms and be paid for the environmental services they provide?

Chairperson: Paulo Cento, Government of Italy Facilitator: Francesco Tubiello, Columbia University Panellists:

- 1. Saleemul Huq, International Institute for Environment and Development
- 2. Vicky Tauli-Corpus, United Nations Permanent Forum on Indigenous Peoples
- 3. Ajaykumar Vashee, Southern African Confederation of Agricultural Unions
- 4. Alexander Muller, Food and Agriculture Organization of the United Nations (FAO)

Opening remarks

The round table was opened by the **Honourable Paolo Cento**, Under-Secretary of State, Italian Ministry of Economy and Finance, who welcomed the delegates and drew their attention to the issues paper which underlines the challenges and opportunities that farmers, particularly smallholder farmers, face with respect to climate change. He suggested that discussions focus on how poor rural people can be helped to adapt to the very significant impacts of climate change, how agriculture can be used as an instrument to mitigate the effects of climate change, and how poor farmers can receive benefits from their role as custodians of the land.

He also drew attention to the link between the problems of energy, the environment and their effects on climate change, highlighting rising energy prices and pollution, and the threat the bio-energy production is posing in terms of the food security and food sovereignty of the poorest countries. He spoke about the biotechnology revolution and its impact on agriculture, as well as the use of information technologies which are both threats and opportunities for agriculture.

Mr Cento described the financial accounting system that the Italian Ministry of Finance has put in place to have an environmental impact accounting system

that will provide transparency a time when the issue of climate change and the impact on agriculture is so pressing. He closed his remarks by expressing his hope that the round table would feed into the thinking processes of IFAD and other international agencies.

The round table facilitator, **Mr Francesco Tubiello**, a research scientist at Columbia University and a visiting scientist at International Institute for Applied Systems Analysis (IIASA) in Vienna, highlighted three issues for the panellists to keep in mind as they gave their presentations:

- impacts of climate change on poor rural people and agriculture, with particular attention to implications for food security and development in a context of increased pressures from other sectors
- opportunities for adaptation and mitigation, and identifying technical and financial tools for smallholders and farmers
- roles to be played by IFAD in collaboration with the relevant agencies, in particular the Rome-based agencies.

Panellist presentations

The first presentation was given by **Mr Saleemul Huq**, Director of the Climate Change Programme at the International Institute for Environment and Development in London. Mr Huq opened his discussion with three points:

- The fourth assessment of the Intergovernmental Panel on Climate Change (IPCC) has stated that climate change impacts are being observed already and will continue to affect the poorest and most vulnerable countries, sectors and communities, including small farmers in Asia and Africa.
- In its last meeting in Bali, Indonesia in December 2007, the United Nations Framework Convention on Climate Change (UNFCCC) decided on a road map that would enable it, when it meets again in December 2009, to come up with a new climate change regime to replace the Kyoto Treaty. The new agreement has significant implications for small farmers.
- Two aspects of the climate change regime are of significance to small farmers in developing countries: opportunities for carbon sequestration and funding for mitigation action; and the possibility of new funding for adaptation.

Mr Huq suggested that IFAD, as well as other agencies engaged with small farmers in developing countries, should begin to engage with the climate change issue, in particular with the negotiations for the new regime being negotiated under the UNFCCC.

The second presentation was given by **Ms Victoria Tauli-Corpuz**, Chairperson of the United Nations Permanent Forum on Indigenous Peoples. She spoke about climate change from the perspective of indigenous peoples, highlighting that indigenous peoples have been living with climate change and have traditional knowledge systems that have enabled to them to cope in the past. She stated that the impacts of climate change are becoming more severe in recent times, but underscored that indigenous peoples and their knowledge systems have a significant role to play in addressing this issue, both in terms of mitigation as well as adaptation. She also talked about the adverse impacts of mitigation measures being taken under the Kyoto Protocol such as carbon sinks, the expansion of mono-crop plantations for biofuels (e.g. palm oil, soya, sugar cane, jatropha) and the building of large hydroelectric dams. These undermine small-scale traditional livelihoods of indigenous peoples (e.g. rotational agriculture, pastoralism, hunting and gathering) and lead to their displacement from their ancestral territories. She called on IFAD to take the issue of climate change into its plan of action and to enhance the role of indigenous peoples in its activities.

The third presentation was given by **Mr Ajaykumar Vashee**, a livestock and crop farmer from Zambia and President of the Southern African Confederation of Agricultural Unions. Mr Vashee shared the outputs of the Farmers' Forum held at IFAD during the two days preceding the round table. He emphasized that small-scale farmers are key stakeholders in the solution to the climate change problem. However, they suffer from major handicaps in fulfilling their potential, including lack of financial resources, lack of incentive to innovate, lack of policies to help them, and pressure on resources leading to degradation and short-term time horizons. He recommended that more research be conducted on the needs of the poor and small farmers and that such research needs to link the research organizations and small farmers' groups. He further recommended that IFAD take up the issue of small farmers and climate change and support efforts to enable small farmers to mainstream climate change into their regular practices. He concluded by stressing the importance of early warning and disaster risk reduction for small farmers.

The final presentation was given by **Mr Alexander Müller**, Assistant Director-General of the Natural Resources Management and Environment Department of FAO Mr Muller highlighted three points:

- What does climate change mean for small holders? Here he explained that it meant dealing with greater uncertainty and fluctuations in climatic conditions, as well as additional burdens and complexities with respect to both short- and long-term development in the sector.
- What adaptation strategies are needed? Here he emphasized the need to have context-specific solutions but within an enabling policy context. He also mentioned the importance of social and cultural factors and the need for a participatory approach or "social learning".
- Are there new opportunities in climate change? Here he explained that there were opportunities but that great effort would be required to exploit them. He suggested that IFAD should join with FAO and become involved in the UNFCCC negotiations on climate change as it related to issues of small farmers in developing countries.

Plenary discussions

There were approximately 170 participants in the plenary. The main issues that emerged during the plenary discussions are summarized below.

Adaptation vs. changes in agricultural practices. To speak about adaptation and mitigation is to ignore the fact that climate change signifies that current agricultural practices are not working and are leading to degradation of the natural resource base. Therefore, the issue of climate change needs to be challenged at a much more fundamental level.

Importance of pastoralists. Pastoralists help safeguard and protect the environment and are significantly affected by climate change impacts. They tend to be ignored by governments and development specialists and need to be brought in as partners of development.

Maximizing local knowledge. The knowledge of small-scale farmers in coping with climate change must not be lost in global efforts to promote larger-scale agriculture and more modern agriculture. At the same time, small-scale farmers do need to be trained in new techniques, particularly those that can help mitigate the effects of climate change. For example, if farmers can be given tools to address seasonal variability (drought and dust storm early warning systems, and the like), they would be better able to cope with climate change.

Coordination among agencies. Although there is great willingness to support and invest in interventions addressing climate change, there is a need to coordinate the efforts amongst the various agencies as well as measure the impacts of their investments.

Carbon market and small-scale farmers. Ways need to be found to link small-scale farmers to the global carbon market, but without creating bureaucracies or additional burdens for them. In addition, clear indicators must be established for brining carbon into the soil and providing payments to poor farmers for such environmental services. In this, networks of national farmers' organizations and international federations of agricultural producers can play an important role.

Specialization vs. diversification. On the one hand there is discussion of increasing productivity. In this regard, for example, the Gates Foundation has allocated USD900 million into African agriculture to increase productivity. At the same time efforts are being made to promote specialization, high-yield varieties and commercialization. If these two approaches are not brought together, there is a great risk that rural poverty and issues of climate change will not be addressed effectively, if at all.

Funding specifically for smallholders and climate change mitigation.

Can smallholder producers make a significant contribution to the mitigation of climate change? If they can, should international development agencies explore the possibility of establishing a fund directed specifically at smallholder producers, poverty reduction and climate change mitigation? In

addition, smallholders have significant coping capacities with respect to climate change adaptation, and financial assistance should be provided directly to them so that they can help themselves adapt to the negative effects.

Education of the young. In programmes involving youth (for example WFP's school feeding programmes), issues of climate change should be included in the national curriculum so that children can be taught how to face and mitigate the effects of climate change.

Displaced populations. Climate change, and its potential for food insecurity, is likely to increase displacement of food-insecure people and contribute to an increase in conflicts, since so often conflicts are rooted in land issues. As small farmers are amongst the most vulnerable, special attention needs to be given to them.

Local capacity building. In order for farmers and their organizations to influence or participate directly in policy- and decision-making processes, they will need to be trained to become organizationally and institutionally strong. Moreover, capacity building needs to be provided with both short- and longer term perspectives.

Clean development mechanism. There are opportunities for clean development mechanism (CDM) projects for carbon sequestration by farmers, and projects should be identified and brought to the private-sector buyers. In this regard, there should be more cooperation among the Rome-based agencies to put together a forum that could develop project portfolios and work with the private sector to gain access to carbon finance. Voluntary markets should also be explored, since they are increasingly looking at projects in the agricultural sector.

The chairperson closed the session by stating that there are those who pollute, primarily wealthier developed countries; and they are also the ones who propose solutions that they then impose on poorer developing nations. In order to have an effective policy on climate change, this paradox needs to be turned on its head. There need to be innovative, social participation models that genuinely bring pressure to bear on negotiations and that enable the voices of those who live on and work the land to be heard.

The role of international agencies has become central. They must transfer knowledge, resources and technology, but also have effective coordination mechanisms among themselves and present a united front.

III. Biofuel expansion: Challenges, risks and opportunities for rural poor people

Questions to guide the round table discussion:

- What are the risks and possible opportunities for rural poor people?
- What are the policy and other conditions for enabling poor rural people to seize opportunities and yet be protected from the risks?

Chairperson: M.S. Swaminathan, M.S. Swaminathan Research Foundation

Facilitator: Eric Kueneman, FAO

Panellists:

- 1. Peter Hazell, Centre for Environment Policy
- 2. Jeff Tschirley, FAO
- 3. Rodney Cooke, IFAD
- 4. B.S. Chaware, Happy India

Opening remarks

The Round Table was facilitated by **Mr Eric Kueneman**, Service Chief, Crop and Grassland Service, FAO, who presented the main issues, including the ongoing food-vs.-fuel debate; the increase in food prices; the challenges of the agricultural sector in trying to meet growing biofuel demand without compromising food security; and diversion of land and water from food for biofuel production. He also noted that notwithstanding these issues, biofuels presented opportunities for the small farmers and governments need to develop and implement certain pro-poor policies, for which the three Romebased agencies could provide assistance. FAO is engaged in providing both technical assistance and policy advice to FAO Member Governments, including for issues related to bioenergy and food security strategies.

Professor M.S. Swaminathan, Chairman of the M.S. Swaminathan Research Foundation, opened the round table by noting that the topic was not on biofuels per se but their potential impact, both positive and negative, on poor rural people. He added that this was particularly relevant with respect to IFAD's mandate and stated that any biofuel development needs to be propoor, pro-nature, pro-women and pro-livelihoods.

In guiding the round table, Professor Swaminathan emphasized the following points:

- Impact of biofuels on food prices and food security. One of the most discussed consequences of the growing demand for feedstock for ethanol production is the increase in prices of some food commodities. There are a number of reasons linked to this, but there is no doubt that biofuels are one of the main drivers. In most developing countries, this has implications for food security, especially the poor net food-consuming farming households, urban consumers and landless labourers. There is a need to identify and adopt appropriate options and policies to mitigate these adverse effects.
- Enabling poor rural people to access basic tools to benefit from biofuels. As with any other opportunity for development, poor rural people would need to have access to a number of tools and services to ensure that they benefit. These include: (a) access to technologies, including the emerging second-generation technologies (which may require another five to ten years before they are ready for adoption); (b) basic infrastructure to ensure the economic development of biofuels; (c) training to facilitate the transfer of the technologies promoted; and (d) opportunities for producer-oriented and remunerative fair trade.
- Organization of smallholder farmers and producers. This is fundamental in the "bio-energy revolution" to facilitate their access to markets and enable them to commercially interact with large private entities engaged in the energy markets.

Panellist presentations

The first presentation was given by **Mr Peter Hazell**, Visiting Professor, Centre for Environment Policy, Imperial College. Professor Hazell noted that rapid growth in demand for biofuels will raise world food prices. Prices have already increased 50-100 per cent in the last two years, although not all this increase can be attributed to conversion of food crops to biofuels. But he noted that even at today's prices, food is still only about half as costly in real terms as it was in the early 1970s.

History suggests that food price increases will be tempered in the longer term by increased production as countries expand agricultural capacity through new investments. With the right investments, the world has lots of capacity to grow both more food and more energy. But how high food prices stay in the longer term will depend on the aggregate demand for biofuels. The current consensus amongst world food modellers seems to be that if the major oil consuming countries strive to replace 5 per cent of their transport fuels with biofuels, the price increase should be manageable. But if they strive to replace 10 per cent or more, this could induce a longer-term world food crisis. The rapid development of second-generation technologies for biofuels that can exploit non-food crops will help reduce the pressure on food prices.

Higher food prices will benefit countries that produce food surpluses that can be exported. They will also benefit farmers who are net sellers of food or who can shift into the production of feedstock for biofuels. The potential losers to worry about are:

- Poor consumers, including many small farmers who are net buyers of food. Because poor people spend large shares of their budget on basic foods, and thus they are especially vulnerable to food price increases. Each 1 per cent increase in world food prices adds another 16 million hungry people to the world.
- Food-deficit countries with limited capacity to expand agricultural production. These countries face the double burden of higher food and oil import prices, and will need special help from the wealthy countries and international financial institutions.
- The many African countries that have under-invested in agriculture in recent decades. These countries are already suffering from higher food prices and reductions in concessionary food aid. Turning this around to seize the new market opportunities that higher agricultural prices offer will require rapid changes in agricultural policies and much higher levels of public investment in agriculture. The imperative for a Green Revolution in Africa has never been greater.

Professor Hazell concluded his presentation by speaking about the great concern for the poorest countries in Africa. However, largely due to a general neglect of agriculture for the last 20 to 25 years, the problems in this continent are broader and precede biofuel development. Such problems include low investment in agricultural technology, weak infrastructure and weak marketing institutions. The main challenge and aim of Africa is not to become a big producer of biofuels/bio-energy, but to increasing productivity and production of food staples, as population growth will double in the next 20 years. He added that high prices in the agricultural sector stimulated by biofuels could provide an enormous economic incentive to invest in agriculture and improve its production.

The second presentation was given by Mr Jeff Tschirley, Chief, Environmental Assessment and Management Unit (NRCE), Climate Change and Bio-energy Division, FAO. Mr Tschirley began his presentation by stating that the fundamental shifts in agriculture are not necessarily related to bioenergy/biofuels, but rather to prices, investment in agriculture and land use. He said that the main question in relation to biofuels and land is whether there is enough land to produce the bio-energy required. In general and theoretical terms, there is, but in practical terms, if the US and EU are planning to meet their energy requirements through renewable sources at a 10 per cent blending by 2020, there would be considerable additional pressure on land. This is already being seen in cases of developing countries converting land to produce biofuels in response to a significant market demand in the EU and US. He explained that this is a general consideration, valid at the global level. There is a need for a case-by-case, country-level analysis of land use issues as they are affected by biofuels, for which there is currently very limited information. The necessary analyses have just been initiated to build knowledge about the potential of African, Asian or tropical countries, which have the greatest comparative advantage in producing biofuel feedstock, to increase feedstock production and to what extent.

Mr Tschirley went on to speak about Africa, where only 25 per cent of good agricultural land used to cultivate permanent crops. Even if biofuels were eliminated, it is recognized that additional land must come into development in order for Africa to continue its economic development. If the bioenergy/biofuel market demand is added, the land requirements would increase. However, even when the bio-energy market demand is added, no significant pressure on land is expected in Africa. Mr Tschirley then described the situation in Asia, where less land is available, most of the best land is already in use, and the governments have already started tapping their smallholders to produce some biofuel feedstock as a channel for developing a national sector for producing ethanol or bio-diesel. He emphasized that the model is very different in Africa than it is in Asia, which underscores the need for analysing the land use issues on a county-by-country basis.

Mr Tschirley asked whether it made much sense from the point of view greenhouse gas (GHG) to produce ethanol from maize, which is a marginal crop, when sugar cane (especially in Brazil) can produce ethanol at a very high level of efficiency and with very high positive GHG balances. He stated that GHG balances vary from crop to crop and the choice of crop for biofuel production is important from the point of view of the GHG mitigation agenda. He added that it will become increasingly important for countries wishing to export biofuels, as they will need to demonstrate and certify that the energy balances are positive in the next three to five years. Mr Tschirley then mentioned two other issues: expanding lands to promote biofuel cultivation could cause soil degradation or loss of bio-diversity; water resources may not be sufficient and could be diverted away from food crops to fuel crops, threatening food security. He added that IFAD, FAO and other agencies are looking at these environmental problems, which are not new, but need to be given a high priority to develop a sustainable biofuel sector.

Mr Tschirley concluded his presentation by speaking about the important role that policy plays in shaping biofuel crop development. He brought up the trade barriers being established in the EU and US, and distortions in the way the bio-energy market is developing. He explained that in order to protect poor rural people and enable them to participate in biofuel opportunities, governments in many developing countries need to address the problem of land use and tenure, as traditional land use practices often constrain development of markets. Policies in developing countries also need to ensure that lower-income groups, more vulnerable groups, and poor farmers are not penalized by the development of bio-energy/biofuels but, on the contrary, are protected from larger interests and can benefit from this opportunity.

The third presentation was given by **Mr Rodney Cooke**, Director of IFAD's Technical Advisory Division. In his opening statements Mr Cooke noted that IFAD is not about biofuels – IFAD is about rural poverty reduction. Whatever IFAD does, it has to be pro-poor, pro-women, pro-environment and pro-livelihoods. He also stated that we must look at ways biofuels can be the latest cash crop opportunity for poor rural people, since biofuels represent a fast-growing market for agricultural products. He added that many developing countries are suffering from the costs of rising fuel imports and some are spending six times more on fuel than on health.

Mr Cooke described the need for IFAD to understand how to optimize the "biofuel revolution" to make it truly pro-poor. The type of approach that should be taken is to look at biofuel production *not* in prime land, but in marginal land, and look at crops that can avoid the food-vs.-fuel issue. He described a research grant that IFAD is implementing to test how to develop sustainable farming and production systems with selected biofuel crops, and to ensure that rural people engaged in biofuel production can improve their livelihoods. The grant also aims to test processing systems and technologies at the local level, and to establish effective but responsible public-private sector partnerships. He added that IFAD is trying to empower the dryland poor with "smart" biofuel crops, under three cropping systems: sweet sorghum, which has a strong "pro-poor advantage" because it can be used for food, animal feed and ethanol; jatropha curcas and pongamia pinnata, whose seeds produce vegetable oils that can be converted into bio-diesel; and second-generation technologies, which would allow feedstock production to move away from principally sugar/starch-producing crops and minimize competition for land uses for food and fuel.

Mr Cooke concluded by highlighting that policies are crucial to take these innovative ideas from research to action that will have a socio-economic impact. Policies are needed that will favour local processing of feedstocks rather than heavily concentrated large-scale operations. Schemes for the mutual benefit of farmers and processors, the link between technology, training and trade, as well as the public-private sector partnerships need to be developed.

The final presentation was given by **Mr Babasaheb Chaware**, Managing Director of Happy India, a small farmers' organization that produces biofuels. He opened his presentation by stating that the increased demand for biofuel and associated price of feedstocks can benefit farmers, who, if the price is right, are more than willing to invest in agriculture to increase their income. There is a strong rationale for India and other developing countries to promote biofuels. He explained that with its rapidly growing economy and strong dependence on imported oil, India's oil import is mounting and exceeds USD70 billion annually. Any policy to develop a domestic biofuel industry will substantially reduce the oil import bill and the resulting savings could be diverted directly into rural areas to produce biofuels and green oil.

Mr Chaware then described the history of Happy India, which was created as a farmer-owned corporation to produce bio-ethanol from tropical sugar beet, sweet sorghum and sugarcane, with a view to increasing farmers' incomes. After a series of initial meetings, as many as 12,300 raw material-supplying farmers joined the scheme as shareholders. Of these 9,500 are small and marginal farmers. The inclusion of farmers as shareholders ensures that their interests are protected. He said that Happy India hopes to generate employment opportunities for nearly 25,000 people in rural areas. Mr Chaware then went on to explain the advantages of tropical sugar beet versus sugar cane for bio-ethanol as it requires only one-fifth of the water and grows more quickly. Being a short-duration crop, it frees up land to produce food crops in a crop rotation system. He then went onto to describe some of the challenges to smallholders in developing the scheme, in particular raising the equity capital. He added that if farmers are to gain larger benefits from the biofuel market they need to be encouraged to acquire shares in such ventures. However, funding is always in short supply. There is a need for support from the governments and organizations like IFAD and from nongovernmental organizations (NGOs), which can bring their considerable experience and expertise to work with, and organize, poor rural communities and smallholder farmers.

Like Mr Cooke, Mr Chaware also emphasized the need for appropriate policies to be in place to ensure that the producers receives a fair share of the price. At present most of the margins are accruing to the oil distribution and marketing companies. Governments should support measures that would either allow a more equitable sharing of profit margins between the producers and the distributors or, alternatively, change policies to allow companies like Happy India to enter upstream marketing. These measures will allow producers and not just large corporate enterprises to gain a fair share of the financial benefits from the sale of biofuels.

Plenary discussions

There were approximately 200 participants in the plenary. Soaring food prices due to a complex interaction of multiple factors, including diversion of land from food crops to bioenegy production, is creating a worldwide-felt crisis. But large increases in demand for agricultural products in growth countries like India and China, low food stocks, and adverse weather resulting in poor harvests, are also major drivers resulting in global price increases. The main issues that emerged during the plenary on bioenergy and food security discussions are summarized below.

Food security vs. energy security. Competition between food and fuel is part of the complex of factors putting many poor rural and urban people in great danger. Some developing countries may consider diverting resources for food production to an export-oriented business that will benefit developed countries while adversely affecting their own food security. The basis of production and income sources of farmers need to be protected as a fundamental issue. In this regard, policies need to be devised that do not pit food against energy security and take into consideration the kind of agriculture, energy, water and land use at country level, so that both energy security and food security are achieved. They should look at import substitution through the development of their domestic biofuel industry.

Increased price of commodities vs. increased farm incomes. Increases in prices of agricultural commodities are often perceived to be detrimental to poor rural people and the consumer. However, higher prices benefit farmers. Artificially keeping these prices low mainly benefits urban consumers, some of whom can afford to pay higher prices, but prefer not to, often at the expense of the rural producers. Adding value to manual labour, whether for farmers or urban workers, is the appropriate approach to increasing the income of the poor. The impact of price increases due to biofuels has been exaggerated. Higher prices offer farmers a significant opportunity to increase their incomes and need not be viewed as necessarily negative.

Land tenure and biofuels. Decisions on land use for biofuels are being taken by governments without consulting farmers. In some cases large areas of land are being made available to big corporations. Many of these lands will be used for production of export-oriented biofuel crops. Biofuel development could, without appropriate policy guidelines, increase pressure on land to the disadvantage of poor rural people. However, the problem of secure access to and ownership of land is a much broader issue in most developing countries and biofuels are not its main driver.

Water. One cannot discuss the issue of land without looking at water issues as well. There have been problems in quantifying the amount of water required for biofuel crops. Despite what it is often said about growing biofuel crops on dry and marginal lands, irrigation in low-rainfall ecologies is required for optimal yields. Low input gives low output. In addition, water salinity is a problem in many regions. Investing in irrigation, particularly in Africa, remains a crucial issue as it was 30 years ago when IFAD was founded. Not all bio-energy crops have the same level of water demand. For example, new sweet sorghum and tropical sugar beets can produce high sugar outputs with far less water than can sugar cane.

First- vs. second-generation technologies. Second-generation technologies are expected to replace first-generation technologies in the next five to ten years. Therefore, their careful analysis is required to determine, on a case by case basis, whether it makes sense to focus on first-generation technologies.

GHG emissions from biofuel crops. Whether biofuels decrease or increase GHG emissions is still under debate. It is important to appraise the entire energy chain when comparing options and it is equally important to analyse the production and emissions based on best practices, including innovative ways to manage crops and soils, such as zero-tillage approaches; and also examine forestry management that includes judicious forest use without burning and other activities that generate high emissions.

Importance of full participation by and support for smallholders. In some cases, countries have made available to investors hundreds of thousands of hectares of land without consulting small farmers and rural communities. Such gaps need to be addressed. At the same time, small farmers do not have the financial capacity or risk-taking ability to invest in crops such as *jatropha*, which have long gestation periods before they become economically productive. Small farmers will need financial support before they can enter into such risky ventures.

Private-sector involvement, but at fair conditions for farmers and producers. Large private companies are increasingly entering the biofuel market and want to sign contracts with poor farmers and producers. However, large companies often take the lion's share of profits. More transparency is required from the processing and distributing companies, and farmers will need to understand the value-added to their produce so that they may claim a fair share of it. Organizations such as IFAD need to find solutions to protect the farmers, who risk losing their lands or signing contracts under adverse terms of trade. Policies must be implemented to ensure rights to tenure by rural communities, transparency and a mutual benefit between the smallholders and private companies.

Coherent country-specific national policies. For rural development to be effectively implemented, national policy frameworks must be favourable to pro-poor growth – a factor that is not just applicable to biofuels. In the context of biofuels, policymakers need to decide on issues such as allocation of water for food and fuel; how to handle losers in the biofuel market, such as poor consumers and the landless; and how to help people take advantage of new opportunities. Mechanisms are needed to deal with these issues.

International cooperation. International cooperation is a major subject that has not been adequately addressed. The powerful agricultural countries (US, EU, India, China and Brazil) need to take into account the effects of their policies on smaller countries. In addition, south-south cooperation needs to be expanded and supported by organizations such as IFAD.

Mr Swaminathan closed the round table by reiterating that the biofuel revolution must ensure food security, livelihood security, environmental security and energy security. There can be no compromise on sustainable food security. He added that the international dimension of biofuel development requires that agencies such as IFAD assist its Member Countries to find appropriate solutions when one major country's policy ultimately harms other countries.

IV. Growing demand on agriculture and rising prices of commodities: An opportunity for smallholders in low-income, agriculture-based countries?

Questions to guide the round table discussion:

- ✓ How are recent trends in world prices of food and agricultural commodities transmitted to local rural markets and farm gates in low income agriculturalbased countries?
- ✓ What are the policy conditions for a rapid and successful smallholder response to this evolution, particularly in food-deficit countries?

Chairperson: H.E. Suleiman J. Al-Herbish, OFID Facilitator: Gunilla Olsson, IFAD Panellists:

- 1. Hafez Ghanem, FAO
- 2. Bruno Losch, World Bank/CIRAD
- 3. Ibrahim Assane Mayake, West Africa HUB
- 4. Olgerio Carillo Meza, National Union of Farmers' Regional Autonomous Organizations of Mexico

Opening remarks

This round table was opened by **Mr Suleman J. al-Herbish**, Director-General of the OPEC Fund for International Development. He began by stating the OFID has been a strategic partner of IFAD's for 30 years and then briefly described OFID, highlighting that it is run by ministers of finance and not oil, and is therefore independent. He stated that energy and food are competing for arable land, and that small farmers are benefitting little from increases in agricultural prices, since they are at the lower end of the agricultural chain and suffer from unfair trade practices, such as subsidies. He concluded by saying that this competition was one of the major issues contributing to rural poverty.

Panellist presentations

The first presentation was given by **Mr Hafez Ghanem**, Assistant Director-General, FAO, who opened his presentation by providing statistics on food increases: the FAO Food Price Index rose 36 per cent between December

2006 and December 2007, with the most significant increases in dairy products, oils and grains. He explained that increases are not uncommon but that this episode is different for a variety of reasons, most importantly because the increase is across so many commodities rather than just one or two. He added that higher price volatility was another difference. He attributed the price increases to a number of a number of supply and demand issues. On the supply side there is the decline in production from 2004 to 2006, in terms of aggregate world output and more importantly with respect to the eight major exporting countries. Another supply issue is the very low level of stocks in the world. Since mid 1990s countries have been reducing stocks of food commodities for a variety of reasons, but the reduction has been much more significant in the last ten years. (For example, in 2000 the world stock level of cereals was 630 million tons; today it is about 400 million tons.) With this low level of stock, it is difficult to cope with production shortages, which are translated and magnified into price increases. Another supply issue is the increase in fuel prices, which results in a significant push effect on agricultural commodity prices because of fertilizer, energy and transport costs. High fuel prices also have an effect on demand for agricultural commodities, with many countries pursuing policies that encourage greater biofuel production, thus diverting commodities into biofuel. Another reason for price increases is the higher demand for food, especially cereals, and particularly in developing countries that are experiencing income growth.

Mr Ghanem went on to speak about the future, and what we can expect. He explained that prices will not fall back to their original levels, since much of what we are seeing is not only due to shocks, but to structural changes in the market. One immediate impact will be on developing countries and the cost of imports and the balance of payments. He estimated that cost of imports had risen by 20 per cent in the last year and said that projections for next year are 37 per cent. Some countries respond by reducing imports, which translates into fewer commodities for consumption. Another impact is on households in developing countries, in both urban and rural areas. Net consumers of food who are poor will be more vulnerable to poverty and hardship. Mr Ghanem concluded by stating that policies have to address this situation and provide safety nets for the most vulnerable groups. He also stated that farmers must be helped to seize the opportunities created by higher food prices.

The next presentation was given by **Mr Bruno Losch**, Senior Economist, The World Bank/CIRAD, who opened his remarks by saying that we are dealing with an old question – the question of managing food supply, which has always been a main concern of societies and governments, since the management of food is a key to stability and civil peace. He reminded the participants and observers that the organization of trade today is the result of changes that have occurred since the launch of the Uruguay Round in 1986, especially with respect to the organization of international markets. He mentioned that before the Uruguay Round and its outcome – the Marrakech Agreement - food markets were managed outside the paradigm of liberalized markets and that food and food security were at the centre of public policies. Under the exceptions granted to agriculture by the General Agreement on Tariffs and Trade (GATT), food and food security were managed through

public policies such as supply management, input subsidies, price controls and marketing boards. Now times have changed and public policy options are clearly limited to tariffs (with many international constraints related to the World Trade Organization framework) and exchange rates. Consequently price transmission is more direct. Parallel to trade reform, Mr Losch also insisted on the structural dimensions of the globalization process and its consequences on the agro-food system, with deeper integration at both levels of value chains and distribution of food (better known as the supermarket revolution). Progressive concentration occurs with new oligopolies – the root cause of tortilla crisis in Mexico – which are now increasingly dominating the food chain with a deeper connection between domestic and international levels. This large integration facilitates more demand-driven markets, resulting in higher requirements, with new standards and norms. This major change represents important opportunities for access to new and fairer markets, but also many constraints for those who cannot comply with the new rules of the game.

Mr Losch went on to talk about the current market situation. He reiterated that changes in world prices present opportunities for producers, provided they can adapt to a more competitive environment. He stated that the pillars of competitiveness are the well-known cost of production, and also the quality of products and the volume of production itself. In this regard there is a huge asymmetry among farmers, since only a limited number of them can enter competitively in the market in terms of cost, quality and quantity. Additionally, transaction costs and poor infrastructure are hampering access to markets and only those producers who are in a better position from the capital and technical points of view will be able to benefit. Today, the challenge is to give access to these market opportunities to the greatest number of farmers possible – which means inclusive public policies providing public good and technical support.

Mr Losch concluded by stating that world agriculture is primarily family farming, with 1.3 billion people working in agriculture and providing livelihoods to 45 per cent of the world's population. These are the people who need targeted public-sector support in terms of special programmes, credit, extension services, farm insurance and risk management, which will help smooth the transition towards a more diversified economy.

The next presentation was given by **Mr Ibrahim Assane Mayake**, Director of West Africa HUB, who focused on public policy in western Africa. He mentioned that the causes of price increases can be classified in three categories – demand, supply and transportation – but that in western Africa an analysis grid is needed that that takes into account other points, given the context of increased uncertainty and the need for strong impact analyses. He then asked whether price increases be a factor for reform in agricultural policies and, if so, under what conditions, since the phenomenon is illustrative of what is happening in our public policies, and the way we react to it will reveal our institutional capacities. He also stated that traditional reactions and measures for managing such phenomena do not favour poor rural households, which are the most adversely affected. Rather, they define short-term actions that are not exhaustive or comprehensive and do little to help poor households. Mr Mayake spoke about aid systems, and the way they normally

operate, asking whether it is possible for aid systems to have more finely tuned instruments to face this problem. He explained that aid systems have to be placed in the right position with respect to upstream and downstream effects, and that the idea of direct aid to smallholder farmers needs to be explored, as well as social protection for the poorest segments society. He also mentioned the building up of regional markets in western Africa following the Common Agricultural Policy (CAP), and how there is a need for it to advance further in order to help public reaction to price rises. Mr Mayake concluded his presentation by reiterating that the impact of price increases and the way we handle them is extremely revelatory of our public policy, and shines a glaring light on our policies and their shortcomings and inadequacies.

The final presentation was given by Mr Olegario Carrillo Meza, National Executive Director, National Union of Farmers' Regional Autonomous Organizations of Mexico. Mr Meza stated his conviction that poverty, inequality and the exclusion of millions of farmers and small producers are the result of the design and application of public policies that have been decided upon by governments. He then described the situation in Mexico, the maizegrowing centre where there is enormous concern about the appropriation of all the sources of energy, water and land that are taking place. He explained that in recent months there has been a new movement on the rise to protest the total commercial opening of Mexico that started in January 2008. In 1994, the Mexican government signed an agreement with the US and Canada which should not have included the agricultural sector, and protests were held before the agreement against the corruption taking place to benefit large companies. He added that between 1994 and 2006, the prices for producers of maize increased 27 per cent, and incomes increased as well. But production has increased 450 per cent, and the price for the tortilla has increased 750 per cent. He also explained that credits to the farming sector have decreased enormously. Commercial banks have invested only 1.6 per cent in agriculture, and the so-called development banks only 0.3 per cent. This has an enormous impact on small producers, as do the higher interest rates. He went on to explain that migration from farms has increased enormously – in 1994 30,000 farmers migrated to the US, whereas today there are 500,000 farmers trying to migrate. In addition, purchasing power is much less. All of these impacts are the result of the so-called free trade agreement.

Mr Meza stated that the free trade agreement and the price of fuel are the main contributors to the social and economic crisis in Mexico, and stated that biofuel will have an additional negative effect on the poorest families. He concluded by saying that this imbalance is not acceptable and that policies are needed that address it, with perhaps a new economic model that upholds food sovereignty and helps people regain purchasing power.

Plenary discussions

Approximately 165 people participated in this round table. The main issues that emerged during the plenary discussions after the presentations are summarized below.

Increasing smallholder production and competitiveness. High prices could serve as an incentive for small farmers to produce more. At the same time, an increase in production could lower prices. Production potential of small farmers is very significant, but they must be assured that high prices will trickle down to them. One means of achieving higher production is through producers' organizations. If we actually want the smallholder to benefit from increased commodity prices, there is need for us to examine how we can enable them to be included in input markets, to increase their power at the marketplace. Again, this revolves around getting them organized. Do we see organizations of smallholders as an important infrastructure? This is what governments and international institutions need to focus on and invest in.

Investments at farm level. To increase production farmers need better access to land, water, low-cost technology, markets and microcredit in order to move from subsistence agriculture to a market economy to diversify the production to include high-value crops. Issues of quality also come into play, as well as the entire realm of infrastructure, including roads and market outlets. Clearly quite a bit financial and technical investment will be required, along with an enabling policy framework.

Enabling policies. Setting up public policy is not based on one rationale. It has many rationales, some of them good and some of them bad. It is fundamental to look at the role of all actors in setting up public policy. We must work with all the actors, and in this regard strengthening producers' organizations is critical. So many countries are dogged by public policies designed by international agencies and not by the countries themselves. Moreover, producers are not taken into account and do not participate in policy design.

Impact of higher prices on food security. Many smallholders are net buyers who sell during harvest, but are forced to buy during the lean season, when prices are higher. Many poor people spend up to 70 per cent of their income on food, and clearly high food prices will have a negative effect on their food security and nutrition. The cost of food and fuel has increased by over 70 per cent over last five years.

Price stability boards vs. social safety nets. Price stability boards have worked fairly well, and these could be an option for the future, rather than social safety nets, which are very costly and oriented toward the short term. The CAP has been working toward this, as well as the Southern Common Market (MERCOSUR) and the Economic Community of West African States (ECOWAS); if they were better managed, they could be a more viable option. Are there any other policy options? For example, is urban agriculture an option or is it simply "pie in the sky"?

Capacity building of public authorities. In addition to strengthening the capacity of farmers and their organizations, capacity building is also necessary for public authorities. They need support from the United Nations and other agencies to formulate policies, create vertical partnerships and develop effective policy analysis instruments.

Short- vs. long-term orientation. The substantial, the fundamental, can only be solved in the long term. There is a need for short-term solutions when there is a crisis, and on a pragmatic level this means a reallocation of resources. Money will have to be taken from somewhere – from health or education. The choice in the short term is never a choice that guarantees there will be a consistent long-term policy to follow.

V. Summary of the round table discussions and recommendations presented to the Governing Council

Based on the three round tables, a summary statement and recommendations was prepared and presented to the Governing Council. The summary is provided below.

Round table 1 – Climate change and the future of smallholder agriculture: How can the rural poor people be part of the solution to climate change?

- Climate change will bring major negative impacts to smallholder agriculture in developing countries. Some of these impacts are already being felt by smallholder farmers and indigenous peoples around the developing world.
- While smallholder farmers have traditional adaptation capacities, they are likely to be overwhelmed in the light of future climate change.
- Actions and solutions are required at the global, national and local levels, with inclusive participation by linking government agencies, smallholder farmers and their organizations, United Nations agencies, researchers and others in effective ways of sharing knowledge and coordinating action.
- Adaptation to climate change impacts for small farmer agriculture needs to be a process of "social learning".
- The ongoing negotiations under the UNFCCC on the post-2012 climate change regime (due to be concluded in December 2009) will be critical in addressing the short- and long-term impacts of climate change.
- The carbon market , both regulated and voluntary, has opened a new resource dimension for smallholder farmers to access.

Recommendations for IFAD:

- Examine ways of promoting insurance for smallholders as a means of adaptation to climate change
- Develop coordinated efforts with UN and other agencies to promote and support the capacity of smallholder farmers to cope with the impacts of climate change through adaptation.
- Join with other agencies and producers' groups to influence the ongoing climate change negotiations in favour of agreements (and new funds) that favour small-scale farming.
- Include an examination and assessment of climate change (in terms of adaptation and mitigation possibilities) in all future projects.

• Undertake, in collaboration with FAO, a rapid assessment of carbon market opportunities for smallholders.

Round table 2 – Biofuel expansion: Challenges, risks and opportunities for rural poor people

- Biofuel touches on diverse issues at local, national and global levels, including including food security, the effect of increasing food prices on the poor, international trade, and domestic agricultural policies to protect the poor, especially issues pertaining to land tenure security and land rights.
- Development of biofuels can present opportunities for poor rural people, provided that development embraces the following conditions:
 - investment in research and appropriate technologies to develop competitive value chains
 - provision of services for transferring the technology
 - implementation of policies that would ensure that smallholders receive appropriate prices for their products
 - provision of credit and other financial services such as insurance to protect smallholders from natural disasters and other unforeseen events.

Recommendation for IFAD:

• Biofuels represent an opportunity for some poor rural people. In order for IFAD to help enable them seize these opportunities, all of its strategic priorities should be pro-poor, pro-nature, pro-livelihoods and pro-women as well as ensure food security.

Round table 3 – Growing demand on agriculture and rising prices of commodities: An opportunity for smallholders in low-income, agriculture-based countries?

- Commodity prices will remain high for at least a decade owing to structural changes in supply and demand. Therefore responses must address the short-, medium- and long term challenges and opportunities. Negative impacts will be felt strongly among poor producers, the majority of whom are net buyers and not net sellers.
- Historically, smallholder producers have shown resilience in commodity price increases, and their potential to increase production is significant. The key is to ensure that price increases are transmitted to the level of smallholder producers.
- Policy options for increasing opportunities for smallholders include reducing transaction costs (e.g. through infrastructure), creating safety nets, and

boosting productivity through public research, extensions services, and credit schemes.

- At the policy level, it is fundamental that organizations of poor rural people are active participants in the shaping of these public policies.
- Organizations of poor rural people need to be strengthened in order for them to increase their volumes going to the markets and to increase their bargaining power in the value chain.

Recommendations for IFAD:

- Provide institutional space for dialogue over public policies among government representatives and organizations of poor rural producers.
- Provide support to the organizations of poor rural producers to enable them to negotiate equitably with other stakeholders such as governments and representatives of urban elites.

Annex 1: Discussion Paper for Round Table 1

Climate change and the future of smallholder agriculture

How can rural poor people be a part of the solution to climate change?

Discussion paper prepared for the Round Table on Climate Change at the Thirty-first session of IFAD's Governing Council, 14 February 2008.

IFAD Policy Reference Group on Climate Change

The preparation of the paper was co-ordinated by Mr. Atiqur Rahman

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Questions guiding the round-table discussion

- How can poor rural people be helped to adapt to a new magnitude of climate change?
- How can poor rural people benefit from mitigation mechanisms and be paid for the environmental services they provide?
- What can the global development community do to help the small holder farmers adapt to and mitigate the effects of climate change?

1. The impact of climate change on agriculture and smallholder farmers

The evidence from the Intergovernmental Panel on Climate Change (IPCC) is now overwhelmingly convincing that climate change is real, that it will become worse, and that the poorest and most vulnerable people will be affected first and most.¹ One of the sectors most sensitive to global warming is agriculture.² Under a "business as usual scenario", agricultural productivity in general could decline between 10 to 25 per cent by 2080. For some countries, the decline in yield in rainfed agriculture could be as much as 50 percent.³ Such trends clearly threaten the achievement of the Millennium Development Goals (MDGs).⁴

Rural households engaged as subsistence and smallholder farmers in developing countries are most vulnerable to the impacts of climate change on agriculture.⁵ Understanding the impacts in different locations and the potential responses to cope with them is still at a very early stage, even amongst researchers and governments. Nevertheless, there are some indications of the ways in which climate change will affect small holder farmers.⁶ These include

- increased likelihood of crop failure;
- increase in diseases and mortality of livestock, and/or forced sales of livestock at disadvantageous prices;
- increased livelihood insecurity, resulting in assets sale, indebtedness, out-migration and dependency on food aid; and
- Downward spiral in human development indicators, such as health and education.

Such impacts will further aggravate the stresses already associated with subsistence production, such as isolated location, small farm size, informal

¹ IPCC 2007(a,b).

² Cline 2007a.

³ Ibid.

⁴ UNDP (2007a) depicts many ways in which climate change may adversely affect human development.

⁵ Easterling et al. 2007.

⁶IPCC (2007a).

land tenure, low levels of technology and narrow employment options, in addition to unpredictable and uneven exposure to world markets that smallholder farmers particularly risk-prone in the face of climate change. Moreover, the integration of smallholder farmers to the emerging structures and mechanisms to deal with climate change has been limited. They have little access to resources and scientific knowledge, which could enable them to meet the emerging challenges of climate change effectively.

2. Response options: adaptation and mitigation

Any comprehensive strategy for addressing climate change must include both mitigation and adaptation.

For the most vulnerable people, whose livelihoods are being impacted now, adaptation is urgent. However, concerted and sustained mitigation efforts worldwide, starting with the largest contributors to greenhouse gas (GHG) emissions, are also urgent to prevent further deterioration in the medium term. Among the many mitigation measures currently under development, some could provide new opportunities to hundreds of million of smallholder farmers, pastoralists and forest dwellers, through their roles as sequesters of carbon, through the changes they can make in their land use and cultivation practices to reduce GHG emissions, and as small scale producers of clean energy.

Adaptation

Adaptation can be both autonomous and planned.⁷ *Autonomous* adaptation is the ongoing implementation of existing knowledge and technology in response to the changes in climate experienced; and *planned* adaptation is the increase in adaptive capacity by mobilizing institutions and policies to establish or strengthen conditions that are favourable to effective adaptation and investment in new technologies and infrastructure.⁸

Autonomous adaptations are highly relevant for smallholder farmers. Mostly located in areas of ecological fragility, they tend to have an extensive knowledge base to draw upon in coping with adverse environmental conditions and shocks. Autonomous adaptation options can be, for example:

- changing inputs such as crop varieties and/or species and using inputs with increased resistance to heat shock and drought; altering fertilizer rates to maintain grain or fruit quality consistent with the climate; and altering amounts and timing of irrigation and other water management practices;
- making wider use of technologies to 'harvest' water, to conserve soil moisture (e.g. crop residue retention) and to use water more effectively in areas where there is a decrease in rainfall;
- utilizing water management to prevent waterlogging, erosion and nutrient leaching in areas where there is an increase in rainfall;
- altering the timing or location of cropping activities;

⁷ *Autonomous* adaptation is the ongoing implementation of existing knowledge and technology in response to changes in climate. *Planned* adaptation, on the other hand, is the increase in adaptive capacity through mobilizing institutions and policies to establish or strengthen conditions favourable for effective adaptation and investment in new technologies and infrastructure. Easterling et al. (2007)

⁸ Easterling 2007

- diversifying income by integrating into farming activities additional activities such as livestock raising⁹; and
- using seasonal climate forecasting to reduce production risk.

Many rural communities and indigenous peoples have been maintaining a balance between natural resource use and sustainable development for centuries, adapting autonomously to natural climate changes.

However, while many of these measures are effective against a degree of climatic variability, they may become insufficient in the face of accelerating climate change.

A longer-term planned approach for adaptation is therefore needed to secure sustainable livelihoods of smallholder farmers. It has to incorporate additional information, technologies and investments, infrastructures and institutions and integrate them with the decision-making environment. Insurances, safety nets and cash transfers to reduce vulnerability to shocks are also part of the solution.

In terms of technical options, the planned approach has to include many forms of land use and land use change, new cultivation practices, new seed varieties, etc. It must include an appropriate incentive structure, such as targeted payment for environmental services, which can expand the options that poor communities and indigenous peoples can have for both adaptation and mitigation.

Adaptation strategies can vary, and may be very location specific. They can also involve significant costs and, if the measures are not properly targeted, can produce negative impacts on the poorest and those with insecure access to land. Some adaptation options may increase competition for existing resources – for example, improving plant productivity may increase water demand for irrigation systems in dryland areas, which decreases the availability of water for those who have no access to irrigation schemes. Some adaptation measures may also increase the price of land, particularly in the rental market, thus affecting landless smallholders.

Such potential outcomes make adaptation a complex and a variable undertaking. A number of issues emerge:

How can the capacities of smallholder farmers and their organizations be enhanced so that they can go beyond autonomous adaptation and engage in

⁹ The autonomous adaptation through diversification extends far beyond integration of other farming activities with agriculture into seeking market opportunities. These include petty trading and emigration induced by 'push' factors.

longer-term planned adaptations to effectively address the uncertainties of climate change?

What specific options are there to make planned adaptation a part of a longer-term development process?

Mitigation

Agriculture is a significant contributor to GHGs.¹⁰ It is estimated that about 10 to 12 per cent of total anthropogenic emissions of GHGs are directly generated in agriculture (mostly nitrous oxide from fertilized soils and methane from livestock). If indirect emissions from the fertilizer industry and emissions from deforestation and land conversion are added, the total contribution of the agriculture sector is increased to about 26-35 per cent. About 80 per cent of these emissions come from developing countries.¹¹

A variety of options for mitigation (reduction of GHGs) exist in agriculture. They fall into three broad categories:

- <u>Reducing emissions</u> of methane, carbon dioxide and nitrous oxide through efficient management of the flows of these gases in agricultural ecosystems for example, through managing livestock to make more efficient use of feed;
- <u>Enhancing removals (of carbon</u> <u>dioxide</u>): carbon recovery and carbon storage through improved management of agro ecosystems. Carbon storage can also promoted through agro-forestry systems and perennial plantings on agricultural lands.
- <u>Avoiding (or displacing)</u> emissions: crops and residues from agricultural lands can be used as a source of fuel, either directly or

Use of biomass for producing energy

The West Guangxi Poverty Alleviation Project in China, supported by IFAD, is promoting the use of biomass. In 2002, the project designed 22,500 biogas tanks for poor rural households. The biogas units turn human and animal waste into a mixture of methane and carbon dioxide that can be used for lighting and cooking. As a result, over 56,000 tons of firewood is saved every year in the project, which is equivalent to the recovery of 7,500 hectares of forests.

after conversion to fuels such as ethanol or diesel. GHG emissions, notably carbon dioxide, can also be avoided by agricultural management practices that forestall the cultivations of new lands now under forest, grassland or other non-agricultural vegetation.¹²

¹⁰ This is largely because agriculture is the main source of two major greenhouse gases, nitrous oxide and methane. Of global anthropogenic emissions in 2005, agriculture accounted for about 60 per cent of nitrous oxide and 50 per cent of methane emissions. Globally, agricultural methane and nitrous oxide emissions have increased by nearly 17 per cent between 1990 and 2005. IPCC (2007b)

¹¹ World Bank (2007), p. 201.

¹² These generic options are complemented by specific options such as those put up by IFAP (adoption of more sustainable agricultural practices and technologies, and sustainable land management such as zero

Of particular relevance to smallholder agriculturalists is the potential of agroforestry in mitigation. Agro-forestry systems contribute simultaneously to buffering farmers against climate variability and changing climates, and to reducing atmospheric loads of GHGs.

The agriculture sector's contribution to achieving GHG reduction goals will depend on economics as well as available technology and the biological and physical capacity of particular soils to sequester carbon.¹³ In particular, smallholder farmers from developing countries must be given incentives to adopt GHG mitigation practices.

As with adaptation, along with opportunities mitigation presents many difficulties for smallholder farmers in particular. Not all mitigation options are favourable to smallholder farmers. For example, some options may lead to new demands for land by urban-based elites and carbon investors, which is then taken out of short-term production in the interests of long-term carbon sequestration practices (such as plantation forestry). This will have an impact on the amount of land available for livelihood activities, and will have major implications for access rights of poor rural people.¹⁴ Mechanisms to buffer smallholders against such negative impacts associated with mitigation are therefore essential.

Overcoming these impacts will require action on many fronts. Governments, donors, international agencies, the private sector and others that focus their efforts on the agricultural and rural sectors and work towards poverty reduction could be useful partners in developing and supporting win-win situations.

In light of the discussion above, the issues for smallholder farmers for mitigation are:

Which option(s) (see the bullet points above) has(ve) the most potential for smallholder farmers?

How can payment for environmental services be employed to give incentives to smallholder farmers to provide natural resources conservation and mitigation services?

What support will smallholder farmers need beyond these from international agencies?

What potential win-win options are there for smallholder farmers? What are the specific constraints in promoting them, and how these can be removed?

tillage, agro-forestry, direct seeding, etc.). See address by President of IFAP at the COP – MOP 13, December 14

¹³ Paustian et al., 2006

¹⁴ Brown et al., 2007

3. Financing adaptation and mitigation activities of smallholder farmers

Both adaptation and mitigation will need additional¹⁵ resources. Unfortunately, financial support for smallholder farmers for implementing adaptation and mitigation options has been too little and too slow in reaching them.

OXFAM estimates that the total cost of adaptation could be about USD50-80 billion each year (Raworth 2007).¹⁶ UNDP (2007) puts the figure at additional USD86 billion. The investment needs in year 2030 for reducing mitigation in agriculture also runs into billions of USD.¹⁷ Current estimates of costs are tentative,¹⁸ and depend on the climate change scenario, and how ambitious the adaptation regimes are expected to be.

Detailed financial assessments by the United Nations Framework Convention on Climate Change (UNFCCC, 2007) and others show that the current availability of additional resources is much smaller than the need.

Adaptation

The Global Environment Facility (GEF)¹⁹ is the primary institutional structure through which most of the funds set up under the UNFCCC and the Kyoto Protocol are channelled. There are four financial resources for adaptation currently managed by the GEF: the Least Developed Countries Fund (LDCF), the Special Climate Change Fund (SCCF), the Strategic Priority on Adaptation (SPA) under the GEF Trust Fund and the Adaptation Fund.²⁰

Through the SPA, the LDCF and the SCCF, the GEF has provided (as of 2007) USD289 million for adaptation.

The Adaptation Fund was formally set up at the 13th Conference of Parties (COP13) in Bali.²¹ It is intended to support "concrete adaptation activities" and is based on private-sector replenishment through the 2 per cent levy on Clean Development Mechanism projects, plus voluntary contributions. The

¹⁵ Additional to the current level of Official Development Assistance, which in 2006 stood at about USD 104 billion?

¹⁶ UNFCCC (2007) estimates that in the agriculture, forestry and fishery sectors, a sum of about USD 14 billion will be needed to meet adaptation cost in 2030.

¹⁷ *Ibid.* Reduction of NO2 and methane (20.2 billion USD), agroforestry (15 billion USD), reduction of deforestation (12.2 billion USD), forest management (7.2 billion), which are just a few of a long list of costs in the agro-forestry sector. Note that these are not cumulative figures.

¹⁸ On the basis of 13 NAPA budgets, Oxfam estimates that for all developing countries an additional USD7.7 billion (projection on population basis), USD33.1 billion (projection on GDP basis) and USD14.4 billion (projection on land area use basis) are needed. See Oxfam briefing paper 104 (2007). An UNFCCC-sponsored study on financial flows estimates the cost of adaptation in the AFF sector in 2030 at about USD14 billion, but warns about the tentative nature of its estimates.

¹⁹ The Global Environment Facility (GEF) is the primary financial mechanism of the UNFCCC. It provides the structure for the transfer of financial resources from developed to developing countries.

²⁰ GEF (2007b).

²¹ The management structure of the Adaptation Fund was finalized at COP13 to the UNFCCC in Bali in December 2007, and the fund is expected to become operational in June 2008. The fund will be located at the Global Environment Facility (GEF) and will be administered by a 12-member committee.

Adaptation Fund is expected to become the largest and most reliably funded of the existing funds. The World Bank estimates that the amount of money available may total from USD100 to 500 million by 2012.²²

In addition, a number of bilateral funding agencies from countries such as Canada, Germany, the Netherlands, Japan, the United Kingdom and the United States have allocated funding for adaptation activities such as research and pilot projects. To date, bilateral donors have provided about USD110 million for more than 50 adaptation projects in 29 countries.²³

In addition, the World Bank, UNDP and others (such as the Asian Development Bank) have initiated facilities to meet the growing funding needs for adaptation, mitigation and technology development. UNDP's MDG Carbon Facility is a mechanism, inter alia, to increase access of developing countries to carbon finance and leveraging networks, expertise and management capabilities to support the development of quality projects in poor developing countries to support the achievement of the MDGs, specifically the goal of sustainable development.

Access to most of these funds by smallholder farmers so far has been rather limited.²⁴ Among various barriers to access, the complexity of project design and implementation, and the need to comply with overwhelming administrative and financial management requirements have been identified as most critical.²⁵

<u>Mitigation</u>

In mitigation, options for financing are much broader and are emerging rapidly. The growing market for carbon for projects and activities, through both the Clean Development Mechanism (CDM) and voluntary markets, demonstrates that the sequestration of carbon could offer opportunities for smallholder agriculturalists to gain from the mitigation potential of the agriculture sector. However, the participation of developing countries, and particularly the poorest communities within them, in the global carbon market, has been extremely challenging, because the modalities and procedures of the CDM in particular are complex and present many barriers to action.

Part of the problem lies in the detailed set of standards for CDM verification, which results in high transaction costs for CDM certification, and this excludes small-scale projects. Smallholders would tend to be uncompetitive sellers in carbon markets because of such high transaction costs. Smallholder farmers are also less likely to be competitive in terms of abatement costs of producing carbon sequestration services in general, as compared to plantations. Efforts to overcome these barriers are important in engaging small holder farmers in

²² World Bank 2006

²³ Reid and Huq 2007

²⁴ Some of the funds are relatively new and therefore it is too early to judge their accessibility. However, most of the funds which are set up for some time are judged to have very limited accessibility by poor smallholder farmers.

²⁵ Solomon 2007
mitigation efforts and in making sure they benefit from the opportunities presented.

One way of effectively engaging smallholders in the mitigation process is to expand the concept of carbon trading to include compensating rural communities for soil conservation and reforestation. Again, payment for environmental services, through which poor rural people are paid for protecting biodiversity and the environment, is another option.

A number of issues arise from the foregoing discussion:

How can smallholder farmers increase their access to these resources?

How can smallholders (and their organizations) benefit from the emerging carbon market?

How can private-sector interests be linked with the needs of smallholder farmers to develop win-win situations?

4. Building partnerships to enable poor rural people to engage in adaptation and mitigation

Meeting the challenge of climate change requires the support and coordinated action of the international community as a whole. International organizations such as IFAD, FAO, WFP and other development agencies can bring their collective expertise and resources to support smallholder farmers, based on the principles of common but differentiated responsibility.

IFAD has a history and experience of working with poor rural people in a wide variety of developing country settings. Its past projects on natural resources management, on relieving water stress, aridity, flood control and desertification have produced a body of experience of doing things at the field level in meeting weather induced challenges. On the institutional side, it is further strengthening the common and inclusive framework for regular interaction between itself, governments and Farmers Organisations to work together in the field, in development programmes and in shaping pro-poor policy frameworks. IFAD houses the Global Mechanism and is an executing agency of the GEF. With its network of partners, both national and international, IFAD is well placed to bring these experiences to respond to climate change challenge through building capacities at the national and local levels, designing climate proof investments, and mobilizing resources...

FAO has long-term experience in dealing with agriculture in general and in the forestry sector in particular. It is an important source of global technical expertise and information related to coping with climate change. Its work in the agro-forestry sector has yielded a rich body of experience that can be used for strengthening and developing effective adaptation and mitigation mechanisms for poor rural people. WFP has been at the forefront of providing support to people when climate-related disasters, and conflicts, cause mass displacement of poor people and push people into severe food insecurity. The

civil societies have been very active and vocal in supporting poor rural people in meeting the challenge of climate change. And the private sector is fast becoming the major source of funds for both adaptation and mitigation.²⁶

The food agencies in Rome, on their own and working together with governments, the private sector and organizations of poor rural people, can be a formidable force to support smallholder farmers to meet the challenge of climate change. They could have a wide reach and influence at the local, national and international levels. Working together they could support better assessment of climate related risks and vulnerabilities, design pro-poor projects which could qualify for support from various existing adaptation and mitigation facilities, fund research and develop technologies. In general, a partnership of the UN food and agriculture agencies in Rome and governments, broadened to include farmers' organizations and CSOs, could create a more conducive environment for helping poor rural people to be a part of the solution of climate change, an environment in which measures to address climate change could converge with and support the achievement of the first Millennium Development Goal.

What do IFAD and the other food and agriculture agencies need to do differently from what they are doing now to move in the direction of increased collaboration on climate change issues?

 $^{^{26}}$ According to UNFCCC (2007), a large part of the additional resources will be generated in the private sector.

References

- Boko, M., I. Niang, et al. 2007. "Africa". In Climate change 2007: impacts, adaptation and vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden and C. E. Hanson (ed). Cambridge, Cambridge University Press.
- Brown, D., T. Slaymaker, et al. 2007. *Access to assets: implications of climate change for land and water policies and management.* Overseas Development Institute (ODI).
- Cacho O.J., G. R. Marshall, et al. 2003. "Small holder agroforestry projects: potential for carbon sequestration and poverty alleviation" FAO ESA working paper:_03-06.
- Chambers, R., A. Pacey, et al. 1989. *Farmer first: farmer innovation and agricultural research.* London, Intermediate Technology Publications.
- Cline, W. R. 2007a. *Global warming and agriculture. Impact estimates by country.* Washington DC, Centre for Global Development and the Peterson Institute for International Economics.
- ———W. R. 2007b. *Global warming and agriculture: new country estimates show developing countries face declines in agricultural productivity.* CDG Brief, Centre for Global Development.
- Easterling, W. E., P.K. Aggarwal, et al. 2007. "Food, Fibre and Forest Products". In *Climate change 2007: impacts, adaptation and vulnerability.* Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. M. L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C. E. Hanson (ed). Cambridge, Cambridge University Press: 273-313.
- FAO. 2003. "Strengthening coherence in FAO's initiatives to fight hunger", Conference at thirty-second Session, 29 November to 10 December, Rome.
- GEF (Global Environment Facility). 2007a. "Status Report on the Climate Change Funds as of April 30, 2007".
- GEF (Global Environment Facility) 2007b. "GEF Financing in Action".
- Helmuth, M. E., A. Moorhead, et al. 2007. *Climate risk management in Africa: Learning from practice.* New York, Columbia University.
- IFAD. 2001. *Rural poverty report 2001: the challenge of ending rural poverty.* Rome, International Fun d for Agricultural Development.
- ——2007. *Climate change: policy issues and options for IFAD*. Rome, International Fund for Agricultural Development.
- ——2008. Climate change: what can IFAD do to help the poor rural people adapt and mitigate? (draft). Rome, International Fund for Agricultural Development.
- IPCC. 2001. *Synthesis Report 2001.* Contribution of Working Group I, II and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge, Cambridge University Press. .
- ——2007(a). "Summary for Policymakers" In *Climate change 2007: impacts, adaptation and vulnerability.* Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C. E. Hanson (ed). Cambridge, Cambridge University Press: 1000.

2007 (b) Fourth Assessment Report, Working Group III.

- Luttrell, C., K Schreckenberg, et al. 2007. *The implications of carbon financing for pro-poor community forestry.* Forestry briefing. London, Overseas Development Institute.
- McGray et al., 2007. *Weathering the storm: options for framing adaptation and development*, World Resource Institute.
- O'Briend, K. and R.M. Leichenko. 2000. "Double exposure: assessing the impacts of climate change within the context of economic globalisation." *Global Environmental Change* 10: 221 232.
- Paustian K, J. M. Antle, et al. 2006. <u>Agriculture's role in greenhouse gas</u> <u>mitigation</u>, Pew Centre on Global Climate Change.
- Raworth, K. 2007. Adapting to climate change: what's needed in poor countries, and who should pay. Oxfam briefing paper 104. Oxford, Oxfam.
- Reid and Alam 2005: Millennium Development Goals, Tiempo 54 and Oxfam (2007): Adaptation to Climate Change: What's needed in poor countries and who should pay, Oxfam briefing paper 104. Oxford, Oxfam.
- Reid, H. and S. Huq 2007. *Adaptation to climate change.* IIED briefing. London, International Institute for Environment and Development (IIED).
- Richards, M. and M. Jenkins 2007. *Potential challenges of payments for ecosystem services from tropical forests.* Forestry briefing._London, Overseas Development Institute (ODI): 26.
- Smit, B., I. Burton, et al. 2000. "An Anatomy of Adaptation to Climate Change and Variability," *Climatic change* 45(1): 223-251.
- Smith, P., D. Martino, et al. 2007. "Agriculture". <u>Climate change 2007:</u> <u>impacts, adaptation and vulnerability</u>. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. M. L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C. E. Hanson. Cambridge, Cambridge University Press.
- Solomon, I. 2007. *Compensating for climate change: principles and lessons for equitable adaptation funding.* Washington DC, Action Aid USA.
- Sperling 2003: *Poverty and climate change: reducing vulnerability of the poor through adaptation.*
- Taiyab, N. 2006. Exploring the market for voluntary carbon offsets. London, IIED.
- UNDP (2007): Human Development Report 2007-2008, New York .
- UNFCCC (2007): Investment and Financial Flows to address Climate Change.
- Venema, H. D. and M. Cisse 2004. *Seeing the light: adapting to climate change with decentralized renewable energy in developing countries.* Canada, IISD.
- Waste Concern. 2004. *CDM and its opportunities in Bangladesh.* Dhaka, Waste Concern.
- World Bank. 2006. An investment framework for clean energy and development: a progress report. Washington DC, World Bank.
- World Bank (2007). World Development Report 2008, Washington.
- Wunder, S. 2007. "The Efficiency of Payments for Environmental Services in Tropical Conservation." *Conservation Biology*_21(1): 48-58.

Annex 2: Discussion Paper for Round Table 2

Biofuel Expansion: Challenges, Risks and Opportunities for Rural Poor People

How the poor can benefit from this emerging opportunity

Paper prepared for the Round Table organized during the Thirty-first session of IFAD's Governing Council, 14 February 2008

Prepared by: Vineet Raswant, Nancy Hart and Monica Romano

DISCLAIMER The opinions expressed in this paper are those of the author(s) and do not necessarily reflect official views or policies of the International Fund for Agricultural Development. *Food versus fuel*: Can the agriculture sector meet biofuel demand without compromising food security? Farmers might benefit from high commodity prices but what about net purchasers of food?

Climate change and environment: How effective are biofuels in mitigating climate change? Are we using the right yardstick to determine the amount of energy required to produce biofuels in developing countries where farmers are less likely to use nitrogen fertilizers and practice mechanized farming?

Land use and tenure security: Will the increase in biofuel demand increase land use competition between food and fuel crops and result in tenure insecurity for small farmers?

Impact on poverty alleviation: How does biofuel development affect the food security, energy needs and employment opportunities of poor rural people?

INTRODUCTION

On 2 January 2008, the cost of crude oil crossed US\$100 a barrel for the first time, raising global concerns. Continuing near-record oil prices, fears of unaffordable and rapidly depleting sources of fossil fuel and the desire to achieve energy security and mitigate climate change have combined to heighten interest in biofuel production as a cost-effective, alternative source of energy.

Many governments have developed policies meant to promote affordable, alternative energy sources capable of maintaining current energy consumption standards, supporting further economic growth and reducing oil dependency. In addition to producing energy from solar, wind, nuclear and marine sources, the policies also aim at producing biofuels to meet the ever expanding demand of the transportation sector, mainly bio-ethanol from grains, and bio-diesel from vegetable oils and animal fat.

In 2006, bio-ethanol production was around 40 billion litres globally with 90 percent produced in Brazil and the United States, and bio-diesel production was more than 6 billion litres with 75 percent produced in the EU – mainly in France and Germany. Brazil, the most competitive producer with the longest history of bio-ethanol production, uses about half its sugarcane to produce bio-ethanol.

Spurred by many of the same considerations as the developed countries, many developing countries are now launching biofuel programmes based on agricultural feedstocks: bio-diesel from palm oil in Indonesia and Malaysia as well as from oil-rich, inedible plants such as jatropha and pongamia in India; and bio-ethanol from sugarcane in Mozambique and in several Latin American countries, such as Honduras, Nicaragua and Panama.

Although assessments of the global economic potential of biofuels have just begun, current biofuel policies could, according to some estimates, lead to a fivefold increase of the share of biofuels in global transport energy consumption – from just over 1 percent today to 5 to 6 percent by 2020.²⁷

²⁷ World Bank, World Development Report (WDR) 2008.

With increasing demand for biofuels, considerable land could be diverted from food to feedstock production. FAO estimates that the amount of land that would be used for the development of biofuels – at present about 1 percent of the world's arable land – could increase up to 3 percent by 2030 and as much as 20 percent by 2050.

Governments have provided substantial support for biofuel development to enable it to compete with conventional gasoline and diesel. The measures included consumption incentives (fuel tax reductions), production incentives (reduced taxes and direct subsidies) and mandatory blending standards. The private sector responded to these incentives, setting up processing plants for converting crops into energy in a relatively short time. Alarms were raised when the resulting increased demand for fuel crops contributed to increased commodity prices with adverse effects on consumers and environmentally sensitive land that was cleared for planting palm oil. These excesses raised some valid concerns about the impact of biofuel production on local environments, livelihoods of the displaced people and the global greenhouse gas (GHG) emissions.

The impact of increased food prices, especially on the poor, has drawn considerable attention. Yet, the potential for biofuel production to enhance the national energy security for most of the low-income countries that are also net oil importers has had relatively little attention. According to FAO, "biofuels accounted for the fastest-growing market for agricultural products around the world and was a billiondollar business. Increasing oil prices in recent years had had devastating effects on many poor countries, some of which spent six times as much on fuel as they did on health. In that regard, the modern form of bioenergy could create great opportunity".

These negatives notwithstanding, as a renewable energy source, biofuels can help mitigate climate change and reduce dependence on oil in the transportation sector. They can also have a positive impact on the limited foreign exchange reserves of many developing countries. When well managed, they also offer large new markets for higher prices products for agricultural producers that could stimulate rural growth and farm incomes.

This paper considers the pros and cons of the debate over the potential social, economic and environmental impact of the increase in biofuel production. It also recognizes that the developing world has its own set of bio-energy issues, which can be different from those of the developed world.

ISSUES

1. Food versus fuel – high food prices

Biofuel production has pushed up prices of some food crops, an expected outcome when they are also used as feedstock. For example the price of maize increased by 23 percent in 2006 and some 60 percent during the past two years, largely because of the U.S. bio-ethanol program.²⁸ The U.S. is the world's largest maize exporter and when its biofuel expansion contributed to a

²⁸ WDR, 2008.

decline in grain stocks, it also, inadvertently, contributed to an increase in world cereal prices. Similar price increases have occurred for oil crops such as palm, soybean and rapeseed because of bio-diesel production.

Some food price increases are anticipated but, as with most aspects of biofuel, estimates vary. The International Food Policy Research Institute (IFPRI) projects maize prices to rise 20 percent by 2010 and 41 percent by 2020, with similar increases for oilseeds (26 percent by 2010, and 76 percent by 2020), and wheat (11 percent by 2010 and 30 percent by 2020). FAO, on the other hand, projects that prices of coarse grains will increase by 15 percent by 2016, whereas the price of wheat would remain unchanged.

It should be noted, however, that although price increases are blamed on increased biofuel production, issues such as stock levels, exchange movements and weather, as well as intangible factors such as speculation also affect price increase in commodities.

Historically, agricultural prices have been affected by energy prices, especially in countries that employ intensive farming practices, because the increased cost of fossil fuel based inputs, such as diesel, fertilizers and pesticides eventually lower output. Now, with rising energy prices and improved bioenergy conversion technologies, energy prices and feedstock prices are increasingly being linked. These linkages are more readily visible in the more integrated markets of sugar and bio-ethanol in Brazil but most probably will soon emerge in other feedstock prices as well.

However, as these markets become linked, the energy prices will place a "ceiling price" on feedstock prices, because feedstock prices account for more than 70 percent of biofuel costs. Thus, in order to remain competitive for the energy market, agricultural feedstock prices cannot rise faster than energy prices, which will limit price increases.

Moreover, the new second-generation technologies currently being developed would lead to efficient conversion of ligno-cellulosic biomass (from grasses and other biomass) into liquid and gaseous energy forms. This would allow use of cellulose-rich biomass to be grown on marginal lands that do not compete with food. It would also make many more species of plants potential sources of energy.

Impact on the poor. The development of biofuel as a source of energy, when grown on a large scale, could represent a paradigm shift in agricultural development. As with all shifts, there will be both winners and losers. Urban and rural landless households, wage-earning households, rural households that are net purchasers of food and urban consumers are all expected to suffer as food prices increase.

The general price increase in most commodities has led to some concerns about the impact on the poor. Usually, as one staple becomes more expensive, people replace it with a cheaper one. But, if the prices of nearly all staples go up, consumers are left with no alternatives. If this remains the trend, some nutrition studies show that the number of food-insecure people in the world would rise by more than 16 million for every percentage increase in the real prices of staple foods, meaning that 1.2 billion people could be chronically hungry by 2025 – 600 million more than previously predicted.

However, whether the impact of a rise in food price would be as severe as noted by the nutrition studies is uncertain. There could be considerable offsetting benefits from development of biofuels. From the point of view of poor farmers who have dealt with declining commodity prices for more than 40 years (see Chart 1), increasing food prices provide an opportunity for increasing benefits and intensifying production which could lead to increased food output.

Moreover, bio-fuels can also contribute to alleviating poverty through employment creation. Because biofuel production is labour intensive, there

could be significant employment creation, offsetting the overly negative picture of the food security estimates quoted above. If mechanisms are introduced to ensure that much of the increase in prices accrues to the farmers, both biofuel and increased food prices can stimulate rural economic growth through additional capital inflows, create demand for

Biofuel production would add an estimated 9 million jobs in China, 1 million jobs in Venezuela by 2012 and up to 1.1 million jobs in Sub-Saharan Africa (S. De Keiser and H. Hongo, 2005).

goods and services that provide employment, reduce rural-urban migration, and create linkages and multipliers.

This has been observed in Brazil where biofuel production in sugarcaneproducing regions stimulated rather than competed with the other food crops and the income generated through agro-industrial activities related to sugarcane helped "capitalize" agriculture and improve conditions for producing other crops.²⁹

²⁹ S. Zarrilli, 2006, "Trade and Sustainable Development Implications of the Emerging Biofuels Market" in International Centre for Trade and Sustainable Development *Linking Trade, Climate Change and Energy: Selected Issue Briefs* www.ictsd.org

Chart 1

The traditional market paradigm



Source: World Bank, "Pink Sheets"

2. Climate change and the environment

One of the big selling, but most debated, points of biofuel is its carbon neutrality. This means that the growing plants absorb carbon and, when harvested, release only the amount of carbon they absorbed. There is little doubt that most biofuels emit fewer greenhouse gasses than fossil fuels when used for energy, thus mitigating the effect on climate change.

The debate is over the *net* carbon savings which means factoring in the amount of fossil-fuel energy needed to produce the biofuel energy throughout its entire production cycle. At issue is whether the calculation should include only inputs used directly for growing the feedstock such as the nitrogen fertilizers or the energy used by farm machinery or if it should include even the energy used to make the agricultural machinery.

The results will vary, depending on the type of feedstock, cultivation methods, conversion technologies and energy efficiency.³⁰ Sugarcane-based bio-ethanol saves between 80 and 90 percent of GHG emissions per mile while bio-diesel from soybeans can save 40 percent.³¹ In general, biofuels from grains have lower performance, reducing carbon emissions by 10 to 30 percent per mile or, in some cases, even producing higher emissions than fossil fuels.³²

³⁰ P. Hazell, *Bioenergy: Opportunities and Challenges*, presentation, Sweet Sorghum Consultation, IFAD, Rome, November 2007.

³¹ Ibidem.

³² Ibidem.

Energy parameters have been well researched for carbon savings based on agricultural practices in developed countries, but would it be correct to apply these analyses to developing countries without further study? Clearly, less use of fertilizer and labour-intensive farming feedstock production in developing countries is comparatively advantageous from the point of view of the mitigation agenda. However, the degree of advantage would need to be substantiated through further analysis.

The labour-intensive biofuel production capability of the developing world's small farmers appears to be relatively more environmentally friendly than large-scale, commercial, monocropping operations in the developed world. Due to, inter alia, low commodity prices, poor farmers of the developing world have had no funds and few incentives to buy fertilizers that emit GHGs, and they rarely use mechanized farm equipment that consumes polluting fossil fuels.

Expansion of the agricultural frontier. When land is cleared for planting biofuel crops, the effect can be harmful to the environment, because expansion of biofuel crops can displace other crops or threaten ecosystem integrity by shifting from biodiverse ecosystems and farming systems to industrial monocultures. In Brazil, it is feared that future sugarcane expansion might involve fragile areas. In Indonesia and Malaysia, 14 to 15 million ha of peat lands have been cleared for the development of oil palm plantations. According to the EU, a change in land use such as cutting forests or draining peat land can cancel GHG emissions savings "for decades".

Measures to control indiscriminate land use changes are underway. The EU is contemplating a policy proposal to ban imports of biofuels derived from crops grown on forestlands, wetlands or grasslands. Any country developing biofuels policy also needs to consider similar legislation to address indiscriminate expansion of land.

Soil and water management. Some feedstocks, such as sugar cane, require considerable quantities of water³³ while others such as jatropha require less. In dry areas, the competition between food and fuel crops may become the overriding issue in the fuels vs food debate and the issue could be addressed by investing in soil management and water saving technologies, some of which are uneconomical under present circumstances with declining commodities prices. Improvement in crop productivity as well as the shift from high water-use bio-fuel crops (such as sugarcane) to drought-tolerant crops (such as sweet sorghum) are also options to address the issue of water scarcity.

The processing of energy crops into biofuels also requires water and, though new conversion plants offer options for controlling water pollution, existing processing facilities can discharge organically contaminated effluent. All agrochemical runoff and sediments are problematic, but these problems apply as much to food crops as they do to biofuel crops.

³³ WWF, 2006, Sustainability Standards for Bioenergy, Germany.

Impact on soil is another environmental concern that, again, is not unique to biofuels. For rural areas that fertilize with crop wastes and manure rather than external inputs, biomass production could lead to dramatic declines in soil fertility and structure. But, *there are also exceptions*. Biofuel plants such as jatropha and pongamia that grow on marginal lands have potential to improve soil quality and coverage and reduce erosion while their oilcakes can provide organic nutrients for improving soil.³⁴ There are many different scenarios and rigorous lifecycle analysis of potential environmental impacts is needed of different biofuel production systems to ensure the development of environmentally friendly biofuel programmes.

Local-level environment. Amid concerns that biofuel cultivation, refining, combustion and transport can result in significant environmental problems that are likely to become more acute as biofuels production and trade expand, there is also belief that biofuel cultivation can have positive impacts in rural areas where poor people have limited options to meet their energy needs. Fuelwood is usually their primary household energy source, but its harvesting is usually unsustainable and can contribute to deforestation. Burning animal dung – another important energy source – can cause serious health problems. Substituting biofuels for fuelwood and dung can increase energy efficiency and decrease health risks. At the same time, biofuel cultivation, if combined with appropriate technologies, can open the door to sustainable, low-cost, off-grid electricity generation, with the added benefits of reducing women's domestic chores and increasing opportunity for rural industry and employment.

3. Land use and tenure security

In reality, biofuels are not different from other cash crops but high demand and rapid expansion of biofuel production could increase conflict over land rights and utilization.

If land tenure systems are weak, there is risk of appropriation of land by large private entities interested in the lucrative biofuels markets. The poor, who often farm under difficult conditions in remote and fragile areas and generally have little negotiating power, may be tempted to sell their land at low prices or where land is "*de jure*" owned by the state (typical in most African countries), find their land allocated to large, outside investors.

Appropriate policies for biofuels should be developed and integrated into a broader strategy of protecting land rights of the poor and disadvantaged, including Indigenous People, who are mostly at risk of becoming "bio-fuel refugees", to ensure that they retain ownership or usufruct rights to their land. Prioritizing improvement of land policies and land administration systems will be important to maximize the extent to which poor smallholder farmers can benefit (particularly those with insecure or customary tenure) or, in some cases, to protect them.

³⁴ S. Kartha, 2006, "Environmental Effects of Bioenergy" in Hazell, P. and Pachauri, R.(eds) *Bioenergy and agriculture: promises and* challenges Focus 14, Brief 5, December. Washington, DC: IFPRI.

It should be noted that competition for land uses between food and fuel is not as much an overriding issue in many developing countries, where land patterns, conditions and uses are different from those in the developed world.³⁵ Africa's population density is lower than in Europe and the U.S., and land use is less a factor in production than the competing use of water.

Moreover, many developing countries have large areas of land better suited for biofuel production than for food crops. Marginal and unused lands in developing countries are suitable for cultivation of biofuel crops that grow under adverse agro-ecological conditions. India's Ministry of Rural Development reports that, of the 306 million ha of land, 173 million ha are under cultivation with the rest classified as eroded farmland or non-arable wasteland.³⁶ A study conducted in the country determined that more than 30 million ha could be used to produce bio-diesel. Similarly it is claimed that by producing biofuel on 300 000 ha of its 4.6 million ha under crop, Tanzania could "match current fuel imports."³⁷

While some of the aforementioned claims are perhaps exaggerated and the production from these areas may be uneconomic unless more productive varieties of suitable crops are developed, the central point remains that there are other options in pursuing biofuel development. It is important to develop biofuel policies that avoid land use competition between food and fuel crops by producing biofuels from non-edible crops such as pongamia and jatropha that are suitable for degraded lands or from tropical sugar beet that can grow in alkaline and sodic soils, or by using multi-purpose crops such as sweet sorghum that allow both food and fuel to be harvested from the same crop.

There are other options to growing bio-fuel crops (other than food crops) and the issue in many developing countries, especially those that are both net importers of food and fossil fuel, is not food *versus* fuel. Instead, the issue is managing limited water and land resources to promote both food *and* fuel production.

4. Impact on poverty alleviation

Poverty alleviation and energy provision are linked: availability of local energy is fundamental to intensifying agriculture and agricultural development is essential to poverty alleviation. Impact of rural electrification on poverty is best demonstrated by comparing the stastistics between in India and China (see Chart 2). In this context, FAO notes the insufficient emphasis on bio-energy as a solution to the needs of the 1.6 billion people who lack access to electricity and on its potential to improve the lives of the 2.4 billion who use traditional biomass, which accounts for 90 per cent of energy consumption in poor countries but is often unhealthy, inefficient and environmentally unsustainable.

³⁵ R.Slater, 2007, *Biofuels, Agriculture and Poverty Reduction*, Overseas Development Institute (ODI).

³⁶ D. Fairless, "Biofuel: The Little Shrub that Could – Maybe", *Nature*, October 10, 2007.

³⁷ S. De Keiser and H. Hongo, 2005, "*Farming for Energy for Better Livelihoods in Southern Africa – FELISA*", Paper presented at the PfA-TaTEDO Policy Dialogue Conference on the Role of Renewable Energy for Poverty Alleviation and Sustainable Development in Africa, Dar-es-Salaam, 22 June 2005.

Chart 2: Population without access to electricity, selected countries



Two thirds of the low-income food-deficit countries (LIFDCs) for which data exist are also energy-deficit, with 25 of the 47 poorest countries totally dependent on imported fuels, again showing the impact of energy (or lack thereof) on poverty. These countries use much of their available funds to import oil with little left to support economic growth. Oil-importing poor countries have been hit hardest by soaring oil prices that are worsening their balance of payments. Biofuels development can improve foreign exchange reserves of most of these countries, either by substituting for imports of oil or by generating revenues through biofuel exports. Eitherway, it would contribute to the economic development of many of foreign-exchange strapped economies of many developing countries.

Biofuels provide an opportunity for developing countries to enhance national energy security by reducing their expenditures and dependence on oil imports

and exposure to the volatility of international oil prices. Brazil initiated its biofuel programme when oil prices increased in the late 1970s, primarily because it could not afford the high cost. The initial programme cost about US\$4 billion and required sustained

It is estimated that global biofuel production could expand from 50 billion litres to more than 250 billion litres by 2025, offering tremendous opportunity for the poor to participate in this vast global market. (Prakash, 2007).

government subsidies, but they have since been removed. Today, the programme has resulted in savings of more than US\$100 billion and made Brazil the world's largest exporter of bio-ethanol.

Biofuel production can be *especially* beneficial to poor producers, particularly in remote areas that are far from the consumption centres, where inputs are more expensive and prices lower, making food production, by and large, noncompetitive. In addition, agro-climatic conditions usually do not favour increasing the intensity of cropping systems. The challenge of providing poor rural people with meaningful income-generating opportunities remains largely unaddressed. Seeking solutions, projects often support niche products (apiculture, medicinal and aromatic plants, etc.), but these products usually have limited demand, long marketing chains and low producer prices.

Many of these farmers can benefit from the production of biofuels, especially from crops that do not compete with production of food crops (such as jatropha and pongamia) or multiple-use, low water-usage crops (such as sweet sorghum and cassava) that can meet the varied needs of small producers for food, cash income and animal feed. Other biofuel crops, such as tropical sugar beet, are as efficient as sugar cane in producing bio-ethanol but require far less water and, most importantly, can grow in alkaline or sodic soils that are basically unsuitable for food crop production.

POLICIES AND ISSUES IN SMALLHOLDER BIOFUEL DEVELOPMENT

Biofuel offers small farmers development opportunity...

While biofuels offer a potential source of renewable energy and large new markets for agricultural produce, the issue is how to meet the energy and food needs of developing countries, many of which are both net food and fuel importers and suffer from acute shortages of foreign exchange. Agricultural policy encouraging growth of biomass in marginal rather than prime agricultural areas would serve the dual purpose of meeting national energy and food needs. It would also require: (a) improving both food and energy crops to ensure that the plants selected for production in remote areas have the productivity to be competitive: and (b) investing in soil and water conservation practices and infrastructure to ensure competitive development of biofuels. Such policies should also aim to develop an active rural energy policy as this would provide the basis for intensifying agriculture and with it, food security.

One challenge is to design and implement policy measures to ensure that the growing use of bio-energy is conducive to reducing poverty and hunger and, thus, that "bio-energy becomes pro-poor". This will be the case if the production is labour intensive, the processing technology for provision of local energy is simple and there is promotion of public-private sector partnerships when producing for national or international markets.

Economies of scale are necessary for farmers and developing countries to take advantage of biofuel opportunity. Yet, small-scale farmers face obstacles in accessing supply chains, transporting crops to processing plants or selling through middlemen and policy measures would be required to ensure that small farmers are part of the national drive to promote biofuel production.

Existing institutions also have a crucial role in making bio-energy pro-poor. Cooperatives or producer companies, for instance, can bundle the interests of the poor, accumulate and attract capital and partnerships for the necessary investments, organize feedstock supplies in large quantities and, in turn, create a countervailing power to the larger firms operating in the energy market.

... but not without risks

Loss of access to land. The sheer speed of biofuel expansion may generate new pressures on land tenure arrangements, leading to alienation. There is considerable fear that the poor may either sell or be forced to relocate as the rush to meet increasing demand gathers momentum.

As biofuel development is taking place rapidly, this issue needs to be addressed as a matter of urgency – to move beyond debate and advise farmers and governments of the opportunities and risks associated with biofuel production.

Unfair business practices. Smallholder farmers and rural people engaged in supplying private companies with raw materials for biofuel processing often lack legal recourse in the event of reneged contracts. Pro-poor organizations are needed that can provide countervailing power to the affluent companies involved in up-stream processing and distribution.

Environmental risks. Agricultural practices that are not environmentally friendly could lead to soil degradation and depletion of natural resources. Policies promoting sustainable farming activities, such as conservation agriculture, can protect the natural resource endowments of the poor and avoid bad practices such as deforestation that would increase GHG emissions. The relative advantage of reducing GHG emissions following less intensive farming indicates that incentives need to be provided to developing countries, especially poor farmers, to encourage them to mitigate the effect of climate change.

Natural risks. Farmers involved in biofuel production are subject to the effects of extreme weather situations such as droughts or floods. These are natural risks and, as with all other crops, measures need to be considered to mitigate their effects through insurance mechanisms.

Advent of new technologies. As new second-generation technologies are developed, first-generation technologies may become noncompetitive. This is a normal business risk and, as with any other product, measures should be considered to ensure that value chains have the means and resources to adapt to emerging opportunities.

Decrease in price of fossil fuel. There is some risk that the price of fossil fuels could decline, rendering biofuels noncompetitive, although experts generally agree that with rising demand and depleting reserves, there is little probability of this occurring.

Paradigm shift could create losers. It is important for the donor community and governments to ameliorate the impact as biofuel production gathers momentum.

Gender-differentiated risks. As it often occurs due to pre-existing gender inequalities, there is risk that women benefit less than men. Bio-fuel development policies should be consistent with the promotion of gender equality and women's empowerment, to ensure that women engage in, and benefit from, this emerging opportunity.

Energy markets are much larger than the food markets. The emerging markets for biofuels offer an unparalled opportunity to benefit the poor on a large scale through agriculture. While there are some risks, the key question is: Are they so insurmountable to deprive many of the poor from taking advantage of this opportunity to improve their livelihoods? In this context, is it time to move beyond the "food vs Fuel" debate and not view it as just another trade-off.

WHAT IS IFAD DOING TO ENSURE PRO-POOR BIOFUEL DEVELOPMENT?

IFAD's new Strategic Framework (2007-2010) recognizes biofuel as an emerging market opportunity for the poor, especially those living in remote areas where almost 70 percent of IFAD's projects are located. In these areas, food production is challenging because the areas are remote from the consumption centres, inputs are more expensive and prices lower, making food production for commercial purposes, by and large, noncompetitive. In addition, agroclimatic conditions do not favour increasing cropping system intensity, and the challenge of providing meaningful income-generating opportunities for people remains largely unaddressed.

IFAD has financed, *inter alia*, two research grants to address these issues and enable poor rural people to take advantage of the huge market demand for biofuel production and meet their varied needs, while expanding employment and income-generating opportunities.

The first grant, which was approved by the Executive Board in September 2007 is being implemented by ICRISAT and other partners, focuses on biofuel crops, such as jatropha, pongamia, sweet sorghum and cassava, that can grow under adverse agro-ecological conditions that prevail in remote areas. It explores the potential for improving plant productivity and integrating these crops into smallholder farming systems. The grant will also study the economics of rural electrification and assess its impact on poverty. The second grant, which is being implemented in partnership with the Asian Development Bank, will identify strategies for developing biofuel crops to benefit rural poor households in the Mekong sub-region.

A third research grant will link smallholder farmers to agro-industrial processors in Cambodia, the Lao PDR and Viet Nam, using feedstock crops, such as cassava. This will be presented to the April 2008 Executive Board.

Other efforts to explore pro-poor options for biofuel development include: (a) establishment of private sector links to promote biofuel crops of special relevance to the poor living in areas affected by salinity and (b) global

consultations organized in partnership with UN Foundation, FAO and ICRISAT to guide the research programme.

Other planned activities will focus on building partnerships with bi-lateral and multi-lateral donors and research institutions to mainstream biofuel development, and working closely with other International Land Coalition (ILC) members and other UN agencies to address land issues that might arise as biofuel development gains momentum. IFAD is also in the process of finalizing a corporate land policy and developing operational guidelines that can help guide the integration of activities aimed at strenghtening land tenure security of its target group into new grant and loan projects and programmes

REFERENCES

Abassian, A., 2007, *Food Security with Biofuels? An FAO Perspective*, presentation made at the Governing Council of the Common Fund for Commodities.

Clark, G., "EU Comissioner [sic] Rejects UK Government Report on Biofuels", in *Biofuel Review*, 22 January 2008, www.biofuelreview.com/content/view/1425/

De Keiser, S., and Hongo, H., 2005, *Farming for Energy for Better Livelihoods in Southern Africa – FELISA*, presented at the PfA-TaTEDO Policy Dialogue Conference on the Role of Renewable Energy for Poverty Alleviation and Sustainable Development in Africa, Dar-es-Salaam, 22 June 2005.

Fairless, D., "Biofuel: The Little Shrub that Could – Maybe", *Nature*, October 10, 2007.

- FAO Press Conference on Sustainable Energy Report, Rome, May 2007.
- Hazell, P., *Bioenergy: Opportunities and Challenges*, presentation made for the Sweet Sorghum Consultation at IFAD, Rome, November 2007.
- Kanter, J., "EU Considers Banning the Import of Certain Fuel Crops", in International Herald Tribune, 14 January 2008.

Kartha, S., 2006, 'Environmental Effects of Bioenergy' in Hazell P. and Pachauri R. (eds) *Bioenergy and agriculture: promises and challenges*, Focus 14, Brief 5 of 12, Washington, DC: IFPRI.

Lazarus, M., *et al.*, *Renewables to Support Rural Development and Climate Mitigation*, Stockholm Environment Institute, October 2000, Vol. 13, No. 3.

Naylor, R.L., *et al.*, "The Ripple Effect. Biofuels, Food Security and the Environment", in *Environment*, Volume 49, No. 9, November 2007.

OECD and FAO, 2007, OECD-FAO Agricultural Outlook 2007-2016, Paris.

Prakash, A., 2007, Grains for food and fuel – at what price?,

Intergovernmental Group on Grains and Rice, meeting, Istanbul, Turkey.

Runge, C., *et al.*, "How Biofuels Could Starve the Poor", in *Foreign Affairs*, Volume 86, Issue 3, 1 May 2007.

Sagar, A.D., *et al.*, "Bioenergy and Sustainable Development?" in *Recommend*, July 2007, Volume 4.

Schmidhuber, J., 2006, *Impact of an Increased Biomass Use on Agricultural Markets, Prices and Food Security: A Longer-term Perspective*, paper prepared for the International Symposium of Notre Europe, Paris.

Slater, R. *et al*, 2007, *Biofuels, Agriculture and Poverty Reduction*, Overseas Development Institute (ODI).

Von Braun, J., *The World Food Situation: New Driving Forces and Required Actions*, prepared for the IFPRI's Biannual Overview of the World Food Situation presented to the CGIAR Annual General Meeting, Beijing, December 4, 2007.

- World Bank, 2007, *World Development Report 2008: Agriculture for Development*, Washington, D.C.
- WWF, 2006, Sustainability Standards for Bioenergy, Germany.
- Zarrilli, S., 2006, "Trade and Sustainable Development Implications of the Emerging Biofuels Market" in International Centre for Trade and

Sustainable Development *Linking Trade, Climate Change and Energy:* Selected Issue Briefs <u>www.ictsd.org</u>

Annex 3: Discussion Paper for Round Table 3

Growing demand on agriculture and rising prices of commodities

An opportunity for smallholders in low-income, agricultural-based countries?

Paper prepared for the Round Table organized during the Thirty-first session of IFAD's Governing Council, 14 February 2008

Prepared by: the Trade and Markets and Agricultural Development Economics Divisions of the Food and Agricultural Organization of the United Nations

DISCLAIMER

The opinions expressed in this paper are those of the author(s) and do not necessarily reflect official views or policies of the International Fund for Agricultural Development.

INTRODUCTION

The recent rapid increases in the international prices of many basic food commodities have raised many questions from policy-makers, the media, the public, and the farmers who have the opportunity to benefit from the situation. Those who have the most reason to be concerned are the vulnerable people who have to adjust to the consequences of their decreased purchasing power, which in some cases, affects their ability to buy enough food to feed their families. The most frequently asked questions have been:

- Why are food prices rising?
- What role has increased demand for biofuels played in the increases?
- What kind of influence do "emerging economies" exert on the global food markets?
- Has climate change played a significant role in influencing those developments?
- Are the prices likely to continue rising in the future?
- What is the impact of high world food prices who benefits (e.g. producers) and who loses (e.g. consumers)?
- How are the policy-makers responding in order to cope with negative consequences of those developments?

This paper, prepared as background to the Round Table discussions at IFAD's 31st Governing Council, provides a framework for focusing the discussions around the challenges identified and the policy options available to address those challenges.

The sections have been order as follows: a brief description of the developments; a qualitative assessment of the various factors that may have underpinned those developments; a brief look into the likely future developments highlighting the uncertainties surrounding such an exercise; the nature of possible impacts at the country and household levels; and finally, some policy options that may instigate and guide the discussions at the Round Table.

A BRIEF ASSESSMENT OF RECENT DEVELOPMENTS IN GLOBAL FOOD MARKETS:

1. The facts

Agricultural commodity prices rose sharply in 2006 and continued to rise even more sharply in 2007. While the FAO food price index rose on average 9 percent in 2006 compared with the previous year, in 2007 it increased by 23 percent compared to 2006. In fact, comparing December 2006 to December 2007, the increase in the value of the index was 37 percent. The surge in prices has been led by dairy, which on average increased by nearly 80 percent, then by oils with nearly 50 percent and grains with 42 percent. The only exception was the price of sugar, which *declined* by 32 percent, after having increased by over 20 percent over the 2005-2006 period. High price events, like low price events, are not rare occurrences in agricultural markets, although often, high prices tend to be short lived compared with low prices, which persist for longer periods.³⁸ What distinguishes the current state of agricultural markets is the concurrence of the hike in world prices of not just a selected few, but as noted above, of nearly all major food and feed commodities (Figure 1) and the possibility that the prices may continue to remain high after the effects of short-term shocks



dissipate. The price boom has also been accompanied by much higher price volatility than in the past, especially in the cereals and oilseeds sectors, highlighting the prevalence of greater uncertainty in the market. Yet the current situation differs from the past in that the price volatility has lasted longer, a feature that is as much a result of supply tightness as it is a reflection of ever-stronger relationships between agricultural commodity markets and other markets.

Figure 1: Monthly FAO price indices for basic food commodity groups (1998-2000=100)

These differences compared to the previous periods of agricultural price hikes suggest that the observed long-term decline in *real* prices could come to halt, signalling a structural change in agricultural commodity markets. Deflating the FAO price index with the index of unit value of global exports of manufactured goods indicates that there has been a gradual recovery of real food prices beginning in 2000 and increasing sharply from 2006: the average growth rate over the 2000-2005 period of 1.3 percent per year jumped to 10 percent over the past two years. However, it is too early to determine whether the observed change is permanent or temporary. Perhaps a

³⁸ The last significant price boom for agricultural commodities began in early-1995 affecting mainly cereals, peaked in 1996 and dissipated quickly afterwards, bottoming out at the beginning of 2000.

qualitative assessment can be made by analyzing the changes in the fundamentals underpinning the developments observed over the past two seasons. However, it must be stressed at the outset that there is no single factor that can be identified as being the main one responsible. Nor is it possible to make a quantitative assessment of the contributions of the factors that have been influential over the past two seasons.



Figure 2: Annual FAO Food Price Index 1998-2000=100

2. Factors underlying the current state of the markets

Nevertheless, it is possible to identify the important contributors. It appears that a confluence of different forces has created the unique developments that have been observed over the past two seasons. These can be summarized as follows:

On the supply side

Weather-related production shortfalls. Although global cereal output reached record levels in 2004, it declined by 1 and 2 percent respectively in 2005 and 2006. But more importantly, from the perspective of the international markets, the output in eight major exporting countries, which constitutes nearly half of global production, dropped by 4 and 7 percent during the same period. However, there was a significant increase in cereal output in 2007, responding to the higher prices. The production of major exporters of all the other major food commodity groups, on the other hand, was not affected in a similar way during the same period. The quick supply response for cereals in 2007 came at the expense of reducing productive resources to, and hence output of, oilseeds, especially soybeans.

Table 1: Production	in major exporters	of basic food	commodities
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		2004	2005	2006	2007
a 1	'000 tonnes	1,038,325	1,001,221	932,527	1,041,992
Cereals	% change		-3.6	-6.9	11.7
2	'000 tonnes	281,589	293,097	306,387	288,762
Ollseeds	% change		4.1	4.5	-5.8
•	'000 tonnes	196,050	203,317	208,057	209,601
Meat ³	% change		3.7	2.3	0.7
4	'000 tonnes	370,986	378,730	383,840	394,459
Dairy ⁴	% change		2.1	1.3	2.8
-	'000 tonnes	76,882	93,451	103,101	102,139
Sugar ⁵	% change		21.6	10.3	-0.9

¹ Includes Argentina, Australia, Canada, EU, India, Pakistan, Thailand and USA. Rice is in milled equivalents.

² Includes Argentina, Australia, Bangladesh, Canada, China, EU, India, Pakistan, Russian Federation, South Africa, Turkey and USA. The total includes only soybeans, rape seed and suflow er seed production.

³ Includes Argentina, Australia, Canada, China, EU, India, New Zealand, Uruguay and USA.

⁴ Includes Argentina, Australia, Canada, EU, India, New Zealand, Ukraine, and USA. The

production is expressed in milk equivalents.

⁵ Includes Australia, Brazil, Colombia, Cuba, EU, Guatemala, India, South Africa, Thailand

Stock levels³⁹. Another factor on the supply side that has had a significant impact on the markets recently is the gradual reduction in the level of stocks, mainly of cereals, since the mid-1990s. Indeed, since the previous high-price event in 1995, global stock levels have on average *declined* by 3.4 percent per year (Annex Figure A1).

There have been a number of changes in the policy environment after the Uruguay Round Agreements that have been instrumental in reducing stock levels in major exporting countries: the size of reserves held by public institutions; the high cost of storing perishable products; the development of other less costly instruments of risk management; increases in the number of countries able to export; and improvements in information and transportation technologies.. When production shortages occur in consecutive years in major exporting countries under such circumstances, as happened in 2005 and 2006 for cereals (Figure 3), international markets tend to become tighter and price volatility and the magnitude of price changes become magnified when unexpected events occur. This is one of the important reasons why the international prices of cereal prices spiked so sharply in 2005. And it is expected to continue to remain at these high levels, at least until next season. By the close of the seasons ending in 2008, world cereal stocks are expected decline a further 5 percent from their already reduced level at the start of the season, reaching the lowest level since 1982, when the level of utilization was much less than it is today.

The stock situation for oils/fats and meals/cakes began to deteriorate after the spillover effects from developments in the cereals markets, especially of wheat and coarse grains, which started in late 2006.

³⁹ The summary in this section for cereals comes from FAO (2008) and FAO (2007).



Figure 3: Cereals stocks and ratios of major exporters

Increasing fuel costs. The increases in fuel prices have also raised the costs not only of producing agricultural commodities, but also of transporting them. The increase in energy prices have been very rapid and steep, with the Reuters-CRB energy price index more than doubling over a period of three years since the middle of 2004. Freight rates have also doubled, mainly within a one-year period beginning February 2006.⁴⁰

On the demand side

Changing structure of demand⁴¹. It is widely accepted that economic development and income growth in important emerging countries have been gradually changing the structure of demand for food commodities (especially in China and India). Diversifying diets are moving away from starchy foods towards more meat and dairy products, which is intensifying demand for feed grains and strengthening the linkages between different food commodities.⁴² It takes seven to nearly eight-and-a-half kilos of grain to produce one kilogramme of beef, and five to seven kilogrammes of grain to produce one kilogramme of pork. In China, for example, per capita meat consumption has increased from 20 kg in 1980 to 50 kg now. However, these changes are taking place gradually and are not likely to the cause of the sudden spike that began 2005. Indeed, looking at China and India, since 1980, the imports of cereals have been trending down, on average by 4 percent per year, from an

⁴⁰ For both IGC Grain Freight and Baltic Dry indices see International Grains Council, as quoted in FAO (2007, *ibid.* p. 45).

⁴¹ Not only change in structure of demand but also the continuing increase in population, and the process of urbanization, especially in developing countries, play an important role in intensifying demand for food over the long term. For example, global population has been increasing by 78.5 million annually (mostly in developing countries).

⁴² FAO (2004).

average of 14.4 million tonnes in the early 1980s to 6.3 million tonnes over the past three years. This means that the growth in feed demand in these two countries, at least up to now, has been met from domestic sources.⁴³ This is not to downplay the importance of the impact of changing consumption patterns on the global cereal markets over the longer term: the growth rate of cereal production during the 1980-2007 period increased on average 2 percent per year, while the increase for feed use, without any structural breaks, has averaged over 3.5 percent per year.

Biofuels and agricultural commodities. The emerging biofuels market is a new and significant source of demand for some agricultural commodities such as sugar, maize, cassava, oilseeds and palm oil. These commodities, which have predominantly been used as food, are now being grown as feedstock for producing biofuels. Significant increases in the price of crude oil allow them to become viable substitutes in certain important countries that have the capacity to use them. This possibility is increasingly leading to the implementation of public policies to support the biofuels sector, which further encourages the demand for these feedstocks.

Analyses of the links between weekly prices of gasoline, ethanol, maize and sugar, and between diesel and important vegetable oil such as palm, soybean and rapeseed, suggest that there are statistically significant inter-linkages between the relevant markets. The schematic below summarizes those relationships and contains information about the empirical paths of influence revealed by the analysis. It is obvious that fossil fuel markets appear to exert direct influence on the feedstock markets in all cases.⁴⁴

Price discovery in bio-fuel markets*



*Solid line refers to significance at the 5 percent level, dashed refers to significance at the 10 percent level. The arrow signifies the direction of causality.

Operations on financial markets. Market-oriented policies are gradually making agricultural markets more transparent. Derivatives markets based

⁴³ The important emerging countries on the supply side have been Brazil and the Russian Federation, both of which have seen their exports of cereals booming, with a yearly average growth rate of nearly 21 percent since 1991 (rising on average from 1.4 million tonnes in the early 1990s to 18.9 million tonnes over the past three years).

⁴⁴ In the case of maize based ethanol, there is no empirical relationship between the biofuel and its feedstock discovered, most likely because of the heavy policy interventions in the relevant sectors (i.e. border protection, taxation, investment and mandatory blending policies) being applied during the period of analysis, as well as a general lack of development in the systems of distribution and use of the ethanol as substitute for gasoline in most countries. In the case of sugar based ethanol, there is strong two way relationship between the biofuel and its feedstock, as Brazil, the biggest producer and user of sugar-based ethanol, has not been providing strong support to the biofuel related sectors recently and there are well developed and operational systems for distribution and flexible use of the biofuel. Because of lack of consistent price series for biodiesel, the statistical analysis was conducted using those of the fossil fuel and the feedstocks. The discovered relationships also indicate to the closeness of the substitution between different vegetable oils.

Box 1: Effects of the increases in commodity prices on stocks, exports and imports of cereals and input costs in Africa

Generally, production in most major cereal producing countries in Africa has not been adversely affected. However, since most countries in Africa are not food self-sufficient and must rely on imports, the increase in the price of food imports following the steep rise in world agricultural commodity prices will certainly increase their food import bills in the current season. So far the evidence on how countries in Africa are coping with high prices remains unclear. Despite occasional news about street riots and food inflation, it seems that generally imports are not interrupted by high world prices and that in most instances the governments have found the means to secure imports. Notwithstanding this situation, the real impact of importing food at current high prices is likely to be felt mainly on the balance of payment positions of the importing countries, the negative repercussion of which may not surface for still many more months to come.

agricultural markets offer an expanding range of financial instruments to increase portfolio diversification and reduce risk exposures. The abundance of liquidity in certain parts of the world that reflect favourable economic performances - notably among emerging economies, matched with low interest rates and high petroleum prices - make such derivatives markets a magnet for speculators for spreading their risk and pursuing of more lucrative returns. This influx of liquidity is likely to influence the underlying spot markets to the extent that they affect the decisions of farmers, traders, and processors of agricultural commodities. It seems more likely, though, that speculators contribute more to raising spot price volatility rather contributing to price levels.⁴⁵

WHAT CAN BE EXPECTED NEXT?

The market developments observed over the past two seasons, and described above, seem to have been the result of short-term imbalances in some of the markets, spilling over to those that have close linkages, as well as of some factors that may continue to influence the markets for longer periods. The fact that the markets can adjust rather rapidly has already been demonstrated by the supply response observed in the maize and sugar markets, where increases in production at the global level led to temporizing the price increases in the former and to decreasing the prices in the latter in 2007. With many agricultural commodity markets continuing to be tight, and with stock levels low, the possibility of further sharp price hikes and continued volatility as a result of unforeseen events seems to be likely for the next few seasons. As opposed to other instances of sharp increases in agricultural commodity prices that have rapidly dissipated, however, we could be facing higher prices for some time. Of significance in this respect is the possibility of the persistence of demand for biofuels. This would depend on a number of factors, which at this moment cannot be assessed with any certainty:

Since the initial increase in this source of demand has been triggered by the rise in the crude oil prices, sustenance of demand from this source will depend on future developments in energy markets.

⁴⁵ This conclusion is confirmed when comparing the changes in 'implied' volatilities of agricultural commodities calculated using the prices of financial instruments (i.e. options) that are based on them with the historical volatilities calculated using their spot prices. Using the derivates markets for wheat, maize and soybeans at Chicago Board of Trade, it has been observed that both types of volatility measures for these commodities have increased recently (FAO 2007, p. 54).

It will also depend on the rate of increase of both crude oil and feedstock prices. Since 70-80 percent of the cost of biofuels is constituted by the cost of the feedstock itself, if the feedstock prices begin increasing faster than the price of crude oil, biofuels may cease to be competitive with fossil fuels. Thus, there would effectively be a ceiling above which agricultural feedstock prices cannot rise. But, as long as fuel prices increase at a rate above those of agricultural feedstocks, biofuel use will compete with food and other uses of these feedstocks and maintain the upward pressure on their prices.⁴⁶

A great deal of effort is being expanded to develop and commercialize second generation (lignocellulosic) feedstocks that do not compete with agricultural products for land resources. These can be grown on marginal land – for example, switch grass in the USA, sweet sorghum in many developing countries such as India and China. However, many of the technological developments underway have a long way to go before they can be commercialized and used widely to relieve the pressure on demand for agricultural feedstocks.⁴⁷

Other important factors that can be influential over the longer term: land and water resource constraints; the availability of technological developments to increase agricultural yields; the impact of climate change on agricultural yields in different parts of the globe,⁴⁸ and population increase and urbanization. The historic long-term decline in real prices has continued so far because technological changes in agricultural production have always kept up with increases in demand for agricultural products. This is more true in the agriculture sector than in many other sectors of the economy. But those who benefited most from these technological changes have always been the early adopters of new or improved technologies. Others eventually merely caught up with the innovators.

OECD and FAO are in the process of finalizing their annual exercise of deriving baseline medium-term projections using their AGLINK/COSIMO modelling framework. The framework has been expanded recently to incorporate modules for the sugar and biofuel sectors, enabling it to assess the impact of various policies that are being implemented in the biofuels sector. The projection exercise has not yet been completed, but initial estimates indicate that over the next ten years, prices of wheat is expected to increase by 2 percent; maize by 27 percent; rice by 9 percent; oilseeds by 23 percent; and skimmed-milk powder by 6 percent. Sugar is expected to decrease by -2.7 percent, mainly as a result of a record high price in 2005.⁴⁹ This means, in effect, that most nominal prices are not expected to dissipate quickly, but to remain at similar levels to today's prices. These are very similar to those

⁴⁶ Schimdhuber (2006).

⁴⁷ Flavell (2007).

⁴⁸ There are already some estimates available for the impact suggesting that developing countries in general will see their cereal production decline by 3.3 to 7.2 percent between 1990 and 2080. The impact, however, is not expected to be uniform across different developing regions: with South Asia being the biggest loser losing 18.2 to 22.1 percent of its cereal output and Southeast Asia and sub-Saharan Africa losing roughly 3 to 7.5 percent. The only winner seems to be Latin America, with foreseen increase of 5.2 to 12.5 percent (von Braun 2007).

⁴⁹ These estimates are those reflecting the baseline assumptions of the model and compare the projected prices to the average prices for the 2005-07 period. In real terms the changes are as follows: wheat, -6%; rice, +1%; maize, +18%; oilseeds, 14%; SMP, -2%; and sugar, -11%.

obtained by IFPRI from its IMPACT model, using a scenario that reflects 'assumptions based on actual biofuel production plans and projections in relevant countries and regions'.⁵⁰

Table 2: Yearly percentage changes in world prices of feedstock crops and sugar*

	IFPRI projections ¹	OECD/FAO projections ²
Wheat	8.3	2.0
Maize	26.3	27.2
Oilseeds	18.1	23.4
Sugar	11.5	-2.7

¹ IFPRI projections are from their IMPACT model and reflect a biofuel expansion scenario that are based on actual biofuel production plans and projections in relevant countries and regions (von Braun *ibid.* p. 8).

² These are initial estimates and may change significantly when the projection exercise is completed and reflect the assumptions of the base line scenario.

(*) base line 2005-2007 / estimates up to 2017

WHAT ARE THE LIKELY IMPACTS OF RISING FOOD PRICES?

1. IMPLICATIONS FOR VULNERABLE COUNTRIES

Substantial increases in fuel and food prices may have a negative impact on foreign exchange earnings, incomes and the welfare of many vulnerable countries. The extent and nature of the impact will depend on the nature of resources they are endowed with and on the constraints that their economies face. Net importers of both fuel and food will particularly be hit hard, if the constraints are severe.

Substantial increases in the global cost of imported foodstuffs have already occurred, estimated at US\$745 billion in 2007 (Table 3), which is about 21 percent more than the previous year and the highest level on record. Developing countries as a whole could face a year of increase of 25 percent in aggregate food import bills. Among them, the most economically vulnerable countries are set to bear the highest burden in the cost of importing food. Total expenditures by Least Developed Countries and Low-Income Food Deficit Countries⁵¹ (LIFDCs) are anticipated to climb by 20 and 24 percent respectively from last year's level, after both rising in the order of 10 percent between 2006 and 2007. The sustained rise in imported food expenditures for

⁵⁰ von Braun (2007, *ibid.* p. 8).

⁵¹ The list of LIFDCs are maintained and updated by FAO and are determined by three criteria:

[•] Income level of a country where the per capita income is below the "historical" ceiling used by the World Bank to determine eligibility for IDA assistance and for 20-year IBRD terms, applied to countries included in World Bank's categories I and II.

[•] Net trade situation of a country where trade volumes for a broad basket of basic foodstuffs (cereals, roots and tubers, pulses, oilseeds and oils other than tree crop oils, meat and dairy products) are converted and aggregated by the calorie content of individual commodities.

[•] A self-exclusion criterion when countries that meet the above two criteria specifically request to be excluded from the LIFDC category.

both vulnerable country groups is alarming. Today, their annual food import basket could cost well over twice than it did in 2000.

Rising import bills do not necessarily imply more imported foodstuffs. This is especially true for grains, both wheat and maize, where high and volatile international prices could curtail procurement in many countries - a response that does not always consider improved domestic supply prospects. Indeed, given the firmness of food prices in the international markets, the situation could deteriorate further in the coming months, leading to reduced imports and consumption in many LIFDCs, especially in those countries where food inventories are already very low.

	World		Developing		LDC ¹		LIFDC ²	
	2006	2007	2006	2007	2006	2007	2006	2007
Total Food	614 887	744 777	185 529	232 814	13 362	15 937	86 473	107 236
Cereals	174 399	240 784	69 410	93 603	5 683	7 185	29 450	38 258
Vegetable Oils	70 956	96 100	35 050	47 236	1 945	2 659	22 884	32 107
Dairy	43 666	71 916	12 930	21 278	801	1 302	4 924	8 115
Meat	77 865	82 447	16 806	19 034	810	915	6 013	7 317
Sugar	32 975	21 755	13 871	11 263	1 753	1 249	7 587	4 525

Table 3: Forecast i	mport bills of total food and ma	ajor food commodities (U	IS\$
million)			

¹ Least developed countries

² Low-income food deficit countries

Since international food price increases were partly caused by (and were partly incidental to) increases in crude oil prices, it may be illustrative to identify countries that are not only net food importers but also net fuel importers. These countries are essentially in a lose-lose situation that can put severe constraints on their ability to import not only these essential products, which are necessary for the welfare of their populations, but also other goods and services required for future economic development. Another criterion was added by FAO for the selection of the countries to assess their vulnerability to food insecurity: those countries where the proportion of their population who are considered to be undernourished is greater than 30 percent. Table 3 indicates that there are more than 20 important developing countries, most of them located in Africa, which have large undernourished population groups and face significantly high fuel and food costs.

Countries	Petroleum ¹	Major Grains ²
Eritrea	100.0	87.6
Sierra Leone	108.2	84.5
Niger	100.0	81.2
Linberia	100.0	75.5
Botswana	100.0	73.5
Haiti	100.0	67.2
Bangladesh	94.4	65.4
Tajikistan	98.9	44.3
Korea, DPR	97.9	40.4
Madagascar	100.4	33.6
Central African Republic	100.0	26.7
Ethiopia	99.5	22.1
Rwanda	100.0	20.8
Kenya	104.7	16.8
Mozambique	100.0	15.9
Cambodia	100.0	15.8
Burundi	100.0	13.9
Tanzania	100.0	12.2
Malawi	100.0	7.3
Lao	100.0	3.9
Zambia	99.5	3.1
Zimbabwe	100.0	1.0

Table 4: Net importers of petroleum products and major grains*

* Source: FAO (2006) The State of Food Insecurity in the World, Rome.

¹ **Source:** Energy Information Administration *International Energy Annual* 2005, Washington DC., US. Covers crude oil and refined petroleum products.

² **Source:** *FAOSTAT, Archives Commodity Balance Sheets.* Average 2001-2003 for w heat and maize.

*As a percentage of their domestic apparent consumption: Countries that have more than thirty percent of their population undernourished and net importers of petroleum products.

2. THE PASS THROUGH TO THE DOMESTIC MARKETS

Whatever the price level of a commodity imported into the country at its border, the price at which it will be sold in a domestic market will depend on a number of factors. Some of these factors will be influenced by public policies controlling the price of foreign currencies; various border controls such as bans, tariffs, tariff-rate quotas, and taxes; and the transactions costs of bringing the commodity from the border to the market at which it is sold. When significant increases in international prices of basic staples occur, governments in developing countries with large populations of poor consumers and small farmers tend to prefer policies that restrict full transmission in the short-run, but allow transmissions to take place slowly so that domestic prices adjust to external prices over a period of time.

This "typical" pattern of transmission may be illustrated with an example. In a FAO study on the transmission of world cereal prices to domestic markets of eight Asian countries during 1990s, which also included another episode of international price spikes for wheat, maize and rice during the 1995-96

period, it was found that price transmission was strongest for maize, followed by wheat, and least for rice.⁵² Moreover, short-run transmissions were very slow but there was a tendency for transmissions to be stronger in the longer run.⁵³ This result was explained on the basis of cereal policies followed by the eight countries studied. In all Asian countries, rice is a special product for food security, and therefore governments resorted to a range of policies to insulate domestic prices from external shocks, high or low, and as a result estimated short-run elasticities were very low and statistically not significant. However, this was not the case for maize, which is a feed-grain in Asia. The case of wheat was in between – policy interventions were not as usual as was for rice.

Indeed, looking at the period during the occurrence of the spikes and observing the nature of the policy responses,⁵⁴ it is clear that they were designed to impede the process of transmission itself, through border policies, and, at the same time, took measures to offset the effects of the higher prices in the domestic markets. This has been recorded in an FAO survey conducted then to assess the situation.

The policy responses in the current situation are similar, as illustrated by the examples cited in Table 5. For example, the data on domestic prices of some staples that are available for some countries in Africa similarly suggest that the pattern of price developments in the domestic markets of those countries do not exactly follow those observed in the international markets.⁵⁵ If a full statistical study could be undertaken using more recent data also covering the current episode, it may well be discovered that the transmission is relatively stronger and faster now when compared to the earlier period.⁵⁶

First, the natural protection that countries had due to high transaction costs must have fallen considerably since 1995 or 1996. Second, economies are more open now than they were then, for example, as measured by import to consumption ratios. Food import dependency in many developing countries has increased over time. Third, import regimes are now much more liberal than 12 years ago. At the same time, applied tariffs are much lower now than 12 years ago, and economies are more open due to regional trade agreements. Regardless of the type of policies implemented, it must be stressed that if the prices of most of these food commodities remain high, as is suggested might happen, it will be very difficult to sustain some of the policies to protect consumers. This is because the costs associated with maintaining them may be too high, especially for poorer countries, which may in itself improve the transmission of international prices to the domestic markets.

⁵² Sharma (2002).

⁵³ Similar conclusions are noted in Conforti (2004) and an earlier study on price transmission for over 70 countries by Quiroz and Soto (1996).

⁵⁴ Sharma (1996).

⁵⁵ See USAID (2008).

⁵⁶ Some support to this conjecture is contained in Rapsomanikis *et al* (2003).

Countries	Reduce or eliminate tariffs	Reduce or eliminate consumer taxes	Increase export levies	Quotas	Reduce export licences or ban exports	Fix consumer prices
Argentina			Corn levies increased to 25%; Wheat levies to 28%		Stopped maize export permits	
Azerbaijan		Eliminated VAT on grains				
Bangladesh	Reduced tariffs of rice and wheat imports by 5%					
Bolivia	Eliminated import duties on wheat, wheat flour, rice and maize				Banned wheat exports	
Brazil	Considering removal of tariffs on wheat					
Cameroon		Eliminated VAT on rice				Fixed prices of rice
China			Introduced export levies on wheat, buckwheat, barley and oats by 10 % Increased those on wheat flour and starch, maize, sorghum, millet and soybeans	Introduced export quotas on flour made of wheat, maize and rice		
Ecuador	Eliminated tariff on wheat and wheat flour					Fixed bread prices
Egypt						Raised food subsidies
EU	Suspended import duties on cereals (excluding buckwheat, oats and millet)					
Honduras					Introduced export ban on maize	
India	Eliminated tariffs on wheat and wheat flour					
Indonesia	Eliminated tariffs on wheat and soybeans					
Morocco	Reduced tariffs on cereals					
Mexico	Remove tariffs on maize, pulses, milk and sugar			Remove quotas on maize , pulses, milk and sugar		
Pakistan				Imposed levies on exports of wheat and wheat flour	Banned private exports wheat to Afghanistan	
Peru						Considerin g subsidising bread prices
Republic of Korea	Reducing tariffs on wheat and maize; eliminating those on soybeans and feed maize					
Turkey	Reduced tariffs on wheat and maize; eliminated that on barley					

Table 5: Some selected	country p	olicy responses
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3. INCREASED FOOD PRICES: THREATS AND OPPORTUNITIES FOR HOUSEHOLDS

Country-level impacts tend to mask important differences among socioeconomic groups and typologies of households within countries. Higher food prices can substantially hurt poor net food consumers because food accounts for a very large share of their expenditures. Indeed, in many countries, food can account for 70 percent to 80 percent of expenditures by the poorest quarter of the population. In such circumstances, food price increases can have a large negative impact on their purchasing power⁵⁷.

Urban poorer households, - wage earners and net buyers of food - are likely to be negatively affected by the higher costs of their food consumption. The transmission of price changes is expected to take effect earlier in urban areas, as most of them are close to ports or are well connected to the rest of the world.

While nearly all urban dwellers are net food consumers, not all rural dwellers are net food producers. In fact, farmers with very small holdings and agricultural labourers are often net consumers of food, as they do not own enough land to produce sufficient food for their families. There are many such people in rural areas throughout the world.

Farmers who are net food producers are likely to benefit from higher prices assuming that food price increases "trickle down" to the farm-gate. Since farming is the major source of income for a large part of the rural population in most developing countries, higher prices could help to alleviate rural poverty, provided that producers are integrated into the market, with the benefits being related to the size of farms and the access to other agricultural resources (seeds, fertilizer, machinery, etc.) that will allow farmers to respond to higher prices.

In areas where agriculture is key to overall rural growth, increases in food production and productivity will be translated into secondary multiplier effects to rural non-farm activities and employment in sectors linked to agricultural production. The size of this multiplier effect will depend on the share of the increased agricultural rents that is ultimately invested and spent in rural areas. This benefit will likely be offset by the reduced investment from net food consumers in those same rural areas. The net outcome on employment will depend on the nature of shifts in relative prices for different types of food and the relative labour intensity of the different production systems.

Unless agriculture is a major component of the total GDP of agriculture-based countries, it is unlikely that the beneficial economy-wide effects of increased food production will offset in a major way the negative direct effects of increased prices on the urban poor. In the face of a sustained rise in food prices and in the absence of countervailing measures, the short- to medium-term effects on urban poverty and food security will be negative.

⁵⁷Higher staple food prices cause families to buy fewer more nutritious foods such as eggs, vegetables, meat and milk in a struggle to maintain their caloric intake. This can have potentially detrimental effects on nutrition and health. The adverse effects on children may persist into adulthood, permanently affecting the productive capacity of these people and their countries.
Thus the effects of increased prices on rural and urban poverty and food insecurity should be distinguished from those of a productivity-led growth in the sector that results from improved technologies, especially those geared towards small farmers. The latter having more unequivocal positive effects on poverty and food security directly and through linkages between agriculture and other sectors. It is thus necessary to make sure that price incentives are translated into increased productivity in order to have widespread positive effects.

In order to analyze the implications of increased food prices for the poor, it is necessary to account for the basic livelihood characteristics, since they are expected to drive any welfare outcomes. The effects of soaring prices on household welfare can change in the medium- and long-term. The immediate impact on consumption is expected to be negative and this outcome hurts mainly the poorer households that allocate most of their consumption expenditures to food. The degree of the welfare impact will depend on how the prices of various items change: if they all change in the same direction and magnitude, the effect on welfare will be unequivocally negative, but if they do not, the substitution in consumption between different food items will mitigate some of the loss in welfare. It is not possible a priori to determine the net effect without having complete information about the quantities purchased, and the possibilities to move to other consumption items.⁵⁸ It is also difficult to balance the changes in the production mix of farmers with the effects in their consumption attitudes as a result of price increases.

Finally, the effect on nutrition is not easy to capture. In particular, increases in prices of specific food items may divert households to cheaper and perhaps less nutritious items. Detailed data on shares of food items produced and consumed and their nutrient equivalence, are necessary to identify effects on the nutritional dimension of food security.

Food production in developing countries is usually labor intensive, utilizing mainly unskilled labor. As long as food prices are effectively transmitted at the farm gate then the expanding sector is expected to increase its demand for labor and subsequently wage earners in agriculture are also expected to gain if increases in wages outpace the net decline in real purchasing power. This outcome is particularly important given that poverty assessment analysis frequently recognizes the poorest as the landless, irregular wage earners in agriculture. In regions where land constraints are binding, such as rice production in Asia, increases in the price of the fixed factor should also be considered.

The spatial transmission of changes in prices in the domestic markets in developing countries, although similar in nature to the transmission from the border to the domestic markets, still exhibits certain differences. High costs due to poor internal transportation infrastructure may significantly delay and hinder all the changes in prices to arrive at the farm gate. If districts or communities are sufficiently market-oriented in order to sell food crops, but if the food market is highly concentrated (monopsony), then producers will

⁵⁸ An attempt to measure these different effects is implemented by Son and Kakwani, (2006).

appropriate only a small part of the price increases, allowing only minor welfare improvements.

The underlying risk and the variance of income and consumption that price increases generate in rural areas are also important, as they are not only quite extensive but usually remain uninsured, making consumption smoothing difficult. This makes many households vulnerable to food insecurity, even if they are not food insecure under normal circumstances, which also leads to adopting less risky but low-return strategies that hamper innovation.

Measuring the quantitative impact of price increases on welfare, food security and poverty, especially for vulnerable groups, is a task that can not be done with utmost precision. This is due to the complexity of the factors that need to be considered; the shortage of relevant data, especially in developing countries where information is already scarce; and the difficulty of developing a consistent framework within which all the different interrelationships can be assessed.

Keeping that in mind, the Rural Income Generating Activities (RIGA) database⁵⁹ has been employed in this section to at least identify likely affected groups. The RIGA database includes Living Standard Measurement Survey (LSMS) data that are representative at country level, for more than 15 developing countries. From among them, Bangladesh and Malawi have been employed to serve as illustrative examples for the purposes of this analysis.

A simple methodology is employed below to provide some preliminary evidence regarding the short-term effects of price increases. The methodology accounts for the net market position of the households (seller or buyer of the basic staple), in order to identify the impact on household welfare, and is further described in the appendix.

Quantifying the short-term impact of price changes on welfare

Bangladesh: The short-term impact of a 10 percent increase in the price of rice on the net income of households by expenditure quintile seems to suggest that both urban and rural households face welfare losses. The losses are higher in the lower quintiles. The estimate of -3.19 percent in the lowest per capita expenditure quintile in Table 6, for example, indicates the extent of the decline in the purchasing power of households in that quintile after taking into account the impact of both the increase in the revenue on the production side and the increase in the expenditure on the consumption side of an increase in the price of rice.

It is also observed that a rural household exhibits higher welfare losses than an urban household from the increase in rice prices. In particular, the households in the poorest rural quintile in Bangladesh earn on average 63 percent of their income from on- and off-farm wages. Furthermore the vast majority of them are net food buyers; only 12 percent are net food sellers. These characteristics identify households that are highly vulnerable to increases in food prices, and as expected, experience high welfare losses

⁵⁹ Further information on the database can be found in <u>http://www.fao.org/es/ESA/riga/index_en.htm</u>

when confronted with increases in rice prices. The loss for the urban poorest quintile is somewhat lower and this can be justified by the fact that less than 60 percent of income comes from wages, while 23 percent is derived from crop production.

Further disaggregation of welfare effects on rural households by land quintiles indicate, as expected, that small land holders and the landless face the most serious consequences in terms of welfare reduction.

(per	centages)							
	Per cap	Per capita expenditure quintiles						
	1	2	3	4	5	All		
Rural	-3.19	-2.60	-1.88	-1.64	-1.10	-1.83		
Urban	-2.37	-1.90	-1.45	-1.09	-0.71	-1.26		
Total	-3.02	-2.33	-1.83	-1.36	-0.94	-1.64		

Table 6: Bangladesh: effect of a 1	0% increase in the p	price of rice on welfare
(percentages)		

Table 7: Rural Bangladesh: effect of a 10% increase in the price of rice on welfare (percentages)

	Rural per capita expenditure quintiles							
Land Quintiles	1	2	3	4	5	All		
Landless	-3.26	-2.81	-2.28	-2.02	-1.41	-2.33		
1	-3.72	-2.59	-2.19	-2.14	-1.66	-2.31		
2	-3.10	-2.88	-2.34	-1.66	-1.23	-1.76		
3	-1.77	-2.55	-1.61	-1.45	-0.86	-1.44		
4	-2.49	-1.33	-1.06	-0.85	-0.74	-0.99		
5	-5.09	-2.45	-0.23	-1.09	-0.79	-0.98		

Malawi: An estimate is made of the short-term impact of a 10 percent increase in maize prices on the net income of households by expenditure quintiles. Overall, the results suggest small welfare losses for urban households (-1.2 percent) and marginallosses for rural households (-0.17 percent). The tabulation of welfare losses by expenditure quintiles indicates that the poorest households exhibit higher welfare losses than the wealthiest households. It is also observed that the wealthiest 20 percent of households in rural area gains from the increase in maize price even in the short term. The associated livelihood profile in terms of high contributions of crop income in household earning seems to justify the result, even though market participation is small.

The pattern of losses for the poorest and landless or small landholders is as evident in Malawi as it is in Bangladesh. A noteworthy result is that owners of land that belong to the fifth quintile in Malawi seem to benefit from the staple price increase even in the short run. Also, the underlying production and consumption patterns in Malawi and Bangladesh make the latter country much more vulnerable to increases in the price of their main staple, although both are agricultural-based countries.

	(percentages)								
		Per capita expenditure quintiles							
		1	2	3	4	5	All		
Rural		-1.23	-0.57	-0.23	-0.02	0.53	-0.17		
Urban		-2.56	-1.95	-1.38	-1.19	-0.22	-1.12		
Total		-1.26	-0.64	-0.37	-0.23	-0.13	-0.35		

Table 8: Malawi: effect of a 10% increase in the price of maize on welfare (percentages)

Remarks on welfare impacts at the household level

The findings for Malawi and Bangladesh constitute a preliminary test of robustness regarding the effects of soaring prices on poverty. The results suggest that potential short-term losses and gains in household welfare are country specific. Closer attention needs to be paid to the household characteristics as consumers and producers of any given staple food. Net buying positions in the food markets associated with low market participation that characterizes not only the case studies in this paper but the majority of the developing economies, could explain the welfare losses in rural and urban areas. Household access to resources and household income composition matters significantly in explaining these findings.

Moreover, unless strong substitution effects towards cheaper food items are present, in the short-term, the majority of the households will see their welfare deteriorating. The net food seller position characterizes only a small proportion of relatively wealthier (non poor) and market-oriented rural households of the developing world. Thus poverty rates are expected to increase initially.

However, when the production structure adapts to the price changes, welfare gains for some specific household categories could be significant. The households that earn their livelihood from production of crops, such as selfemployed farmers and pastoralists, will be able to appropriate wider marketing margins. The efforts to increase production could create general equilibrium effects, which may diffuse benefits to household groups that are owners of other production factors necessary to increase production (casual wage labourers in agriculture).

Nevertheless, soaring prices may generate overall economic growth, especially in agriculture-based countries, if there exist sufficiently developed market infrastructure that could allow wider marketing margins to be reaped by small-holder farmers. In view of the expanding opportunities for increased profitability, if the agricultural sector can exploit its comparative advantage, then its expansion linked to other sectors of the economy may contribute to overall growth.

Increasing market participation. The net market position of the household, (seller or buyer of food), appears to be critical in determining the impact of soaring prices on consumption and welfare. Increasing market participation may assist in appropriating benefits and, on the other hand, minimizing losses, especially when farmers or casual agricultural wage earners are considered. The reasons behind low rates of market participation and implications for policy are discussed presently.

Standard explanations in economic literature attribute the issue of small market participation to inadequate levels of investment in the necessary institutions to build free markets and the appropriate infrastructure (market places). Increased transaction costs of this kind are acting as a barrier to entry, reducing market participation. At the household level, evidence suggests that market participation increases with the level of wealth, the use of modern production technologies, access to credit and collective power that may be the outcome of associations of producers.

Reducing volatility may be another reason behind low market participation rates. In particular, it may be that households want to reduce the underlying price volatility that characterizes the commodities they produce. In other words households try to be self-sufficient, since producing for the market may turn out to be harmful if they are not insured against undesired price changes.

Investment in institutions and physical infrastructure in order to develop adequately functioning competitive markets allows the price increases to arrive to the farm gate. Meeting this precondition allows greater market participation. Given the increases in food prices, it also assists in providing to the farmers the incentives to expand their production and increase their productivity.

Furthermore interventions that facilitate producers' organizations to increase collective power, and reduce transactions costs could be beneficial to increase the benefit from prices' increases for smallholder farmers.⁶⁰ If access to assets for the poor is promoted, increasing market participation can be achieved. The benefits from increased market participation refer not only to wider marketing margins (in contrast with self-consumption), but may also motivate further expansion in the scale of production.⁶¹

FACING THE CHALLENGE: POLICY AND PROGRAMME OPTIONS

The mixed effects of soaring food prices on household welfare and food security points to a set of options for policies, programmes and investments to be undertaken by the global community, national governments and other stakeholders. Short-term measures should aim at reducing prices in domestic markets, mitigating their negative effects and boosting supply response to higher prices. At the same time, higher prices provide an opportunity for relaunching agriculture in developing countries through long-term public investments and programmes which will, in turn, catalyze private sector investments in response to higher profitability.

Over the long term, the best way to reduce food prices is to increase agricultural productivity through public investment in agricultural research, rural education, and rural infrastructure to create efficient markets. The

⁶⁰ Barrett C., (2008),.

⁶¹ Empirical research estimated the welfare loss resulting from production of subsistent goods, to reduce income by above 30 percent while the transport cost from local market to the nearest city is greater than 15 percent on average.

design of innovative risk management instruments such as weather insurance can also increase productivity. While these investments will not reduce food prices in the short term, it is important to keep these longer-term measures in mind or else sustainable food security will not be achieved. Thus, whenever possible, short-term measures should be designed to complement long-term investment needs, e.g. targeting food distribution by linking it to education (school meals) or the construction of irrigation or rural roads. Higher prices increase the value of agricultural assets held by the poor and facilitate their access to credit. However, an increase in the value of agricultural assets (such as land) makes them less accessible to the poor and increases the incentives exclusion of the economically and socially weak. Securing access to land and strengthening the rights of the poor to agricultural assets and resources (land, water) should be high on the agenda of all stakeholders, both government and civil society organizations.

In the medium term, to avoid monopsonistic behaviours over the value chain, and to raise the share of price increase for producers, it is important to strengthen the institutions and organizations of smallholder farmers. Empowering smallholders' organizations in the market and in value chain would not be limited to vertical integration by smallholder producer organizations, and to "shortening the chain" for higher added-value to producers. It is also about increasing the control that farmers' organizations have over chain governance to reduce vulnerability vis-à-vis cost/price squeezes, evolving competition and changing consumer preferences.

Distribution of food vouchers or administration of targeted subsidies to the urban poor and to rural non-food (or deficit) producers reduces the negative effects on their diets and nutrition. Use of vouchers may reduce the administrative burden on governments relative to distribution of subsidized food. Such measures presuppose that necessary food supplies are present (for example, through de-stocking or imports) in order to prevent further price increases that will hurt the poor who do not receive vouchers or subsidies. However, such programmes are not always simple to administer and can suffer from leakages and insufficient targeting.

Policies and programmes to increase supply response to higher prices by smallholders (especially net consumers) may have important effects on their production and income and hence their ability to access food. They could also have beneficial impacts on prices in local markets that are not well connected to larger or international markets. Many small farmers, for reasons of risk, lack of properly functioning markets or poverty, use inputs such as seed and fertilizer in suboptimal amounts. One option might be an 'inputs for work' programme, which has a higher probability of being self-targeted. Input vouchers are another option, provided inputs are available in large quantities, or vouchers will simply create inflation in local input prices. It will be essential to consult with the private sector, both for short-term effectiveness and medium-term catalysis: the private sector offers the only realistic hope of being able to scale up successful approaches quickly.

Annex



Figure A1: Global cereal stocks and ratios

Figure A2: Global meal stocks and ratios (including meal contained in seeds stored)





Figure A3: Global oil stocks and ratios (including oil contained in seeds stored)

Table A1: International prices of selected agricultural commodities

Bibliography

- Barrett C. (2008), "Smallholder Market Participation: Concepts and Evidence from Eastern and Southern Africa", Food Policy, forthcoming.
- Conforti, P. (2004) *Price Transmission in Selected Agricultural Markets*, FAO Commodity And Trade Policy Research Working Paper No. 7, Rome, Italy. and an earlier study on price transmission for over 70 countries (see J. Quiroz and R. Soto (1996), *International Price Signals in Agricultural Markets: Do Governments Care?* Unpublished mimeo
- FAO (2004) Cereals and other starch-based staples: Are consumption patterns changing?, Document CCP: GR-RI/04/4, Rome, Italy.
- FAO (2007) Food Outlook, No. 2, Rome, Italy.
- FAO (2008) Crop Prospects and Food Situation, No. 1, Rome, Italy, to be published.
- Flavell, R., *Biotechnology Options for Bioenergy Crops*, paper presented at the "USDA Global Conference on Agricultural Biofuels: Research and Economics, Minnesota, 20-22 August, 2007.
- GERENS and ILADES (Georgetown University).
- Rapsomanikis, G., Hallam, D., & Conforti, P., (2003). *Market integration and price transmission in selected food and cash crop markets of developing countries: review and applications*. In FAO, Commodity Market Review, FAO Commodities and Trade Division, Rome.
- Sharma, R. (1996) Review of Cereal Price Situation in Selected Developing Countries in 1995-96 and Policy Measures to Offset the Price Rise, occasional paper Number 1, 1996, Commodities and Trade Division, FAO, Rome.
- Sharma, R. (2002) *The transmission of world price signals: concepts, issues and some evidence from Asian cereal markets*, paper presented at the OECD Global Forum on Agriculture, May 2002, Rome.
- USAID (2008), WEST AFRICA Food Security Alert and CILSS (2007), Bulletin regional du marché des produits agricoles.
- Son, H. and Kakwani, N., (2006), *Measuring the impact of price changes on poverty*, INDP Poverty Center, Working Paper no. 33.
- Schimdhuber, J. (2006) Impact of an increased biomass use on agricultural markets, prices and food security: A longer-term perspective, paper presented at the "International Symposium of Notre Europe", Paris, 27-29 November, 2006.
- von Braun, J. (2007) *The World Food Situation: New Driving Forces and Required Actions*, IFPRI, Washington DC).