

Proceedings of the Governing Council Round Tables

Smallholder Agriculture and Food Security in the 21st Century

in Conjunction with the Thirty-second Session
of IFAD's Governing Council, February 2009



Enabling poor rural people to overcome poverty



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Introduction

The number of poor and hungry people has been increasing, and the world now faces a major economic downturn. Climate change, growing competition for land, and the volatility of prices for food and inputs are having a negative impact on rural women and men in developing countries, and particularly on the poorer and most vulnerable households. At the same time, all over the world, family farmers, local communities, private enterprises, governments and development partners are bringing new responses to these challenges and new reasons to believe in a future without hunger and poverty.

IFAD, in preparation for the publication of its Rural Poverty Report later in 2009, held three round-table discussions on the challenges and opportunities for smallholder agriculture. The discussions focused on identifying policies and strategies that can be applied at the national level to ensure that the needs of smallholder agriculture are met, and on the research and technology needed to advance smallholder agriculture.

The limited capacity of resource-poor farmers to respond quickly to price incentives, combined with price volatility and higher costs for inputs, poses a great challenge for rural women and men as they struggle to feed their families and make agricultural production a more profitable enterprise.

Price volatility may continue in the future, since climate change is likely to increase the level of uncertainty about food production, especially in lower-latitude regions. The prospect of ongoing food price volatility is likely to discourage smallholder farmers from making essential agricultural investments, particularly since they are already overburdened by the increased cost of inputs such as fertilizers and by higher transport costs. The world population is projected to grow from 6.8 billion in 2009 to nearly 9.1 billion by 2050, with consequences that will affect demand for food and agrofuels.

Thus it is critical to generate adequate policies to encourage investments and increase agricultural productivity, particularly among smallholder farmers. Innovative solutions are needed at all levels to mitigate the impact of price volatility on small-scale agricultural producers and enable them to respond to the growing demand for food, feed and fuel.

In recent years, there has been a rapid increase in demand among foreign and domestic investors for land in rural areas of developing countries. The scale and nature of this demand is not yet fully understood. Initially, demand for land among both public and private investors was for cash crop production. With the energy crisis, large-scale plantations of agrofuels have become attractive. Most recently, the food and financial crises have spurred an interest, on the part of rich or transition countries dependent on food imports, in investing in foreign farmland for food production to guarantee the food security of their populations. And food cultivation has increasingly been identified by food corporations and private investors as an important new area of investment.

There is a growing concern in the international community that this rapid increase in demand could threaten food security and the land and water rights of poor rural people and indigenous communities. There is also concern that the overexploitation of land could exacerbate environmental

problems. At the same time, this increased investment in the rural areas of developing countries has the potential to contribute to economic growth and poverty reduction. To minimize the risks, ensure the protection of poor people's land rights and maximize opportunities, there is a need to establish guidelines and best practices and to build mutually beneficial partnerships among private sector investors, rural communities and governments.

Poor rural people in developing countries are the most vulnerable to the effects of climate change. The negative impact on their crop yields will be severe, especially in sub-Saharan Africa and other tropical regions. Desertification and land degradation processes are being exacerbated by changes in rainfall patterns, and livelihoods of coastal communities are being negatively affected by sea-level rise. In many areas, natural resource productivity is at risk and biodiversity might be irreversibly lost.

Since rural people manage vast areas of land and forest, they are important players in natural resource management and carbon sequestration, but do not usually receive significant compensation. Policy research is required to develop systems to reward rural communities for the environmental services they provide. Technologies that reduce exposure to shocks and enhance carbon capture and storage include reforestation, conservation tillage, soil and water conservation, agroforestry, rehabilitation of degraded land, and better livestock management practices.

The Consultative Group on International Agricultural Research (CGIAR) and its National Agricultural Research System (NARS) partners have an important role to play in this area. At the same time, the effectiveness of public-private partnerships in developing and promoting new technologies needs to be enhanced to address the demand for planting material of elite varieties.

It is in this context that three round-table discussions were held in conjunction with the thirty-second session of IFAD's Governing Council, the overall theme of which was "Smallholder Agriculture and Food Security in the 21st Century":

- Round Table 1 – **Food price volatility – how to help smallholder farmers manage risk and uncertainty**
- Round Table 2 – **The growing demand for land – risks and opportunities for smallholder farmers**
- Round Table 3 – **Research and innovation for smallholder farmers in the context of climate change**

The sections that follow describe the proceedings of each of these round tables. Discussion papers were prepared in advance to inform the debate. Annex II provides the three discussion papers in their entirety.

I. Food price volatility – how to help smallholder farmers manage risk and uncertainty

Questions to guide the round-table discussion:

- How have volatile international food prices been transmitted to domestic markets and to smallholder farmers over the past two years?
- How is price volatility affecting the investment decisions of rural producers, and what is the impact on household food security?
- What successful measures have been taken by governments, farmers' organizations and the private sector to reduce price volatility on domestic markets or to reduce its negative effects on producers and trigger investments by smallholder farmers?

Chairperson: Matthew Wyatt, Assistant President, IFAD

Panellists:

1. Mustafa Abubakar, President, Bureau of Logistics (BULOG), Indonesia
2. Ajay Vashee, President, International Federation of Agricultural Producers (IFAP)
3. Gonzalo Fanjul Suárez, Head of Research, Intermón Oxfam
4. David Stevenson, Director, Policy, Planning and Strategy Division, World Food Programme (WFP)

Opening remarks

The round table was opened by Matthew Wyatt, Assistant President, IFAD, who highlighted the topicality of the subject in the wake of the volatile food prices of 2008 and of their major impact on all consumers and producers. He listed three aims of the round table: (i) to try to understand the mechanisms underlying the transmission of volatile commodity prices on the global markets to smallholder producers and to consumers; (ii) to share ideas about the ways that price volatility is affecting decisions that smallholders make to attain livelihoods and to feed themselves and their families; and (iii) to consider actions taken by policymakers and farmers themselves to address the issues. Mr Wyatt underscored the primary role of women in food production and the need to keep a focus on gender aspects and how women and men are coping with food price volatility.

Panellist presentations

The first presentation was given by **Gonzalo Fanjul Suárez**, Head of Research, Intermón Oxfam. Mr Suárez opened his presentation with two premises. The first was that the issue is not so much whether prices are higher or lower than the producers' production costs but rather the actual vulnerability of farmers due to volatile food prices. Producers in poor countries have lost out with both high and low prices because of the lack of equitable access to markets and safeguard mechanisms to shelter them from market shocks. The second premise was that the problem needs to be addressed on two fronts: reducing the causes of price volatility, and protecting poorer consumers and farmers from the impact of volatility.

Mr Fanjul Suárez then spoke about appropriate measures, highlighting the fact that they are extremely complex and touch upon all levels of decision-making – from local markets up to

negotiations at the World Trade Organization level. He described two areas that Oxfam is concentrating on. The first is guaranteeing the public investments necessary to counterbalance producer vulnerability and setting up traditional mechanisms to counterbalance volatility alongside new systems, such as creating physical and virtual reserves to allow countries and producers to intervene when there is an unexpected variation in food stocks. One major concern is that industrial countries are not honouring on the commitments they make, which is very serious when the other costs are factored in.

The second area Oxfam focuses on is creating a legal and political environment that is favourable to the political measures needed to face the crisis. Mr Fanjul Suárez expressed great concern over the trade negotiations taking place, particularly the World Trade Organization talks, Economic Partnership Agreements and other regional agreements. Ongoing trade negotiations should allow for: (i) the creation of some policy space for developing countries so that measures in favour of small-scale producers can be introduced; (ii) the reintroduction of subsidies when needed; and (iii) the inclusion of a list of special products and negotiation of special safeguard measures for developing countries. He also mentioned that during recent weeks, some European Union politicians have requested that the small reforms that had taken place in the Consolidated Appeals Process be reversed, thereby reinstating the old system that created market distortions. He stated that any measures that imply going back to policies that distort markets and do not consider radical reform will only contribute to increasing food price volatility.

The second presentation was given by **Dr Mustafa Abubakar**, President, Bureau of Logistics (BULOG), Indonesia, who explained how Indonesia's policy responses helped prevent the effects of food price volatility over the past two years. He first described BULOG, a logistics agency that was established almost 42 years ago and whose main objectives are to support domestic rice producers and stabilize rice prices for consumers and producers.

Mr Abubakar explained that rice is consumed by 97 per cent of households, and that poor households spend 25 per cent of their income on rice. Therefore increases in rice prices have a significant impact on overall food price inflation, poverty and food security. When the global price of foodstuffs rose early in 2008, the Government responded quickly and succeeded in dampening the inflation. He added that, in the case of rice, four important measures were taken to respond to the increase in its price: (i) expanding procurement of domestic rice (by almost twice the volume of the previous year) and avoiding imports; (ii) expanding BULOG's rice stock as the market stabilized and speculation lessened; (iii) enlarging the distribution of rice for the rice subsidy programme (in terms of number of beneficiaries, amount of rice per household and length of distribution period); and (iv) accelerating the production of domestic rice by using superior and hybrid seeds and subsidized fertilizer. As a result of these measures, combined with good rainfall, Indonesia was one of the few developing countries able to increase rice production significantly during the last two years – by almost 5 per cent in 2007 and 5.5 per cent in 2008. These measures also meant that procurement and stockpile levels could be increased, protecting Indonesia from being affected by the instability of rice prices on the international market. Given the role of BULOG in the procurement of rice for domestic consumption, the volatility of wholesale rice prices in Indonesia was limited to 6 per cent between January 2007 and December 2008. This fluctuation is much lower than the volatility on international markets, which peaked at 41 per cent.

Mr Akubakar concluded by stating that the stability of rice prices in Indonesia also contributes to the stability of the prices of other foodstuffs.

The third presentation was given by **David Stevenson**, Director, Policy, Planning and Strategy Division, World Food Programme (WFP), who described a strategic shift in WFP that aims to break the cycle of hunger at its root and not merely to provide food aid. He opened his presentation by stating that in Africa 300 million farmers – 70 per cent of whom are women – live and work

on marginal lands at risk of droughts, floods, storms and pests. Their production is vulnerable to shocks and failures and most have perilously thin coping mechanisms. Hence they are susceptible to hunger. Reducing risks and uncertainty for them involves challenges to increase food production and sales in good years and to ensure access to food in bad years.

Mr Stevenson went on to describe WFP's strategic shift, which involves working with partners, primarily farmers, in analysing the root causes of hunger and overcoming risk and vulnerability. This means a new and wider variety of tools is required. The starting point is the observation that farmers often do not invest in production because of the risks associated with agriculture in developing countries. As a result, their returns are low. One way to reduce risk is to secure a return on production through the provision of seeds, fertilizers, roads and cash. He then introduced the Purchase for Progress (P4P) programme, which includes a range of innovative procurement and programme practices that will reduce the risks faced by small-scale farmers – such as forward contracting and warehouse receipt programmes that can serve as collateral for loans, and supporting value added production and local food processing, in addition to adjustments in WFP's tendering system, so that small-scale farmers are in a better position to compete for the contracts that are issued locally. He emphasized the need to make more payments directly to women farmers, since they conduct 70 per cent of the work, and to ensure that women are represented in farmers' groups and associations. He also highlighted P4P's focus on sharing lessons with partners from the public and the private sector to find market-friendly solutions to the food security situation today.

Mr Stevenson described a number of other ways to create win-win situations, including cash transfers, voucher programmes, weather-based risk insurance and contingency financing mechanisms at the global level. He added that other alternatives for sourcing food assistance internationally - such as forward contracts, swaps, and options on international market exchanges - were being explored. He concluded his presentation by underscoring the importance of practical partnerships on the ground. He described how in Mozambique WFP works in partnership with FAO and IFAD to address risks faced by small-scale farmers, with IFAD providing support for agricultural infrastructure and exploring credit instruments for poor rural producers, FAO providing technical assistance and WFP supporting markets through P4P.

The fourth speaker was **Ajay Vashee**, President, International Federation of Agricultural Producers (IFAP). Mr Vashee began by stating that there will always be food price volatility because of crop failure, natural disasters, conflict and logistic issues of supply and demand. He added that the issues and solutions have been known to farmers for a long time, but perhaps they have not been articulated well enough to be heard by those who make decisions. He described the outcomes of a workshop organized by IFAP on the determinants of domestic food price volatility. The determinants that emerged were (i) low productivity of smallholder agriculture and the difficulties the farmers face in marketing their products; (ii) limited capacity to appreciate and exploit the multiple forms of income generation available to small-scale farmers beyond cereal production; (iii) low membership of farmers' groups; (iv) poor market information; (v) post-harvest losses due to inadequate storage facilities and assembling points; and (v) weak consultative mechanisms for government policy formulation among various stakeholders. Combined with climate change and the financial crisis, a new agricultural model is necessary. There are no longer global stocks of surpluses to be moved around. Moreover, the cost of transportation will be critical in the very near future, as will the need for more domestic food production closer to consumption centres. The key to addressing these challenges is investment in smallholder business by donors and other institutions. In addition, political goodwill at all levels needs to be matched by concrete commitment, such as in Malawi and Viet Nam.

Mr Vashee explained that helping smallholder farmers deal with risk and uncertainty encompasses three broad cross-cutting areas: (i) minimizing risks (national policies to minimize risks and mitigate their consequences); (ii) coping with risks (risk management strategies and

tools used by farmers); and (iii) support after a crisis (humanitarian assistance, compensation for the impact of a crisis, and recovery measures). Measures to minimize risks include developing irrigation schemes, granting secure land tenure, providing affordable and accessible finance, and promoting research, technology transfer and strengthened extension services through existing and new farmers' groups. He added that there is a need to secure public and private support for producers' organizations in accessing market information systems, and to address the problem of speculation in commodity markets through stricter regulations. He emphasized that smallholder farmers need to form organizations to improve their position in the value chains that produce food. He also observed that there is a need for regulations to govern quality standards. Among the strategies to cope with risk, Mr Vashee mentioned public-private partnerships for delivering insurance and risk management schemes to farmers, life insurance programmes for farmers, and social safety nets. With respect to support provided after a crisis, he stated that the usual response is humanitarian but a more holistic approach is needed. He suggested that developing countries could build a vulnerability fund.

Mr Vashee concluded his presentation by highlighting the importance of a coordinated public policy response at the national and regional levels, and the call for constructive engagement to bring smallholder farmers into the mainstream – in short, a balance between public and private sectors, with farmers at the centre.

Round-table discussions

There were approximately 75 participants in the round table. The main issues that emerged during the discussions are summarized below.

Political commitment at the local level. Food has always been a political issue. Nevertheless, political authorities often do not believe they have any responsibility for it. The fact that many governments do not make food security a high priority is unjustifiable. While international organizations can make a contribution, the commitment of local politicians, and corresponding budgetary support, is key to attaining food security. Without this commitment, more and more people will be discouraged from practising agriculture.

An integrated approach to value-chain development. Price volatility is normal. When prices go up it is not necessarily bad for business. It could be what farmers need to encourage investment in production. What is important is an integrated approach to value-chain development – addressing agroprocessing, storage and market development – and not just looking at ways to reduce the effects of volatile food prices. Such an approach, combined with establishing a guaranteed minimum price, can be extremely effective in terms of market selfregulation and stability.

Multi-stakeholder coordination led by good local governance. An important issue is the interchange between public investment, good governance and the balance between private and public investment. Good governance also implies ensuring coordination within a country to bring together different stakeholders – for example millers, agents, traders, international agencies – to talk through price volatility and create a win-win situation that can also mitigate civil strife. This needs to be led by solid local governance. Moreover, there are no templates or stock solutions. The needs of different producers vary according to their circumstances. It is up to governments to engage in dialogue with farmers' and producers' organizations in order to determine the most appropriate solutions. What must be guaranteed is the economic and political opportunity and space to do that.

Global stability versus protectionism. Price stability is closely linked to world market performance. A search for stability invites protectionism. However, in such a process, policymakers must ensure that the cure is not worse than the disease.

Volatility versus stability from both producer and consumer perspectives. Price volatility damages the producer, who is left not knowing which direction to take or what investments to

make, and it thus has a negative influence on growth. It is also damaging to consumers, who have to contend with markets where prices vary. There is a lot of experience in managing and stabilizing agriculture prices that needs to be tapped. For example, Indonesia used traditional ways of interacting on the market to stabilize prices – managing available stock and, in certain cases, limiting exports. Other approaches have recently been adopted to reduce the impact of soaring food prices on consumers and producers.

Waning political interest in food price volatility. With the advent of the global financial crisis, the political importance of the food crisis has receded considerably, resulting in greater difficulty in mobilizing resources to address it. Measures should be adopted to elevate political interest in food price volatility.

Harmonizing local, national and regional needs and priorities. One of the major difficulties faced is the poor coordination of decision making within and among governments. Issues pertaining to small-scale farmers are primarily local. Efforts to articulate at the national level what is happening locally can be extremely challenging. There is a similar tension among governments. For example, Niger cannot make decisions on its own without having a consultation process to consider what is happening in Nigeria because the two countries are intimately linked. Regional networks are intensifying, which is necessary for external trade and customs duties. Whether or not this process leads to protectionism, customs duties are an important element of control. Moreover, decision-making processes need to be quick – six months of discussions and negotiations should not be necessary. Often adjustments and adaptations must be made on a daily basis.

Nutrient management. The management of fertilizers must be given priority. The world has only a 20-year supply of phosphate left, and this is a non-renewable mineral. Moreover, the cost of producing most fertilizers is extremely high. Technologies must be developed that use fewer precious minerals but are able to increase yields, as is the case with technologies being used in Bangladesh.

Increasing knowledge of liberalization processes, especially among smallholder farmers. Many developing countries have insufficient knowledge of how liberalization works. Everyone has a different explanation for the various trends and anomalies that emerge. Smallholder farmers and those who are addressing issues of market prices and volatility often cannot see early on what is happening in the world market. Smallholder farmers do not have knowledge of that world market – who is pulling the strings, who has the power. This is a serious problem. If smallholder farmers are to become effective players in the market, three fundamental conditions must be met: adequate storage capacity, access to up-to-date market information, and access to credit.

Access to food. ‘Fixing’ agriculture is very important but it does not necessarily fix access to food. Access to food is not simply an issue of availability. It is primarily an issue of poverty. In this sense, farmers must be looked upon as entrepreneurs and not as passive recipients of assistance.

Resilience of smallholder farmers. The most promising reality is that smallholder farmers are extremely resilient. They face enormous challenges when there are droughts, floods or other shocks. But as soon as the situation subsides, they are back out in their fields producing, day in and day out. We need to tap into that effort and resilience.

II. The growing demand for land – risks and opportunities for smallholder farmers

Questions to guide the round-table discussion:

- What are the impacts on rural communities of the growing demand for land for large-scale food and fuel production? Are poor rural people losing out in terms of their rights to land and water? Are they gaining from being engaged as out-growers or contract farmers, or from new employment or marketing opportunities? Are there any cases in which they have benefited substantially? What lessons can we draw?
- What has characterized effective management of large-scale investments that have resulted in win-win arrangements for all parties? What has been the policy environment for such experiences? What has been the role of civil society? What has been the involvement of rural communities? What other specific features can we point to? What characterizes evolving best practices?
- What can the various stakeholders (governments, civil society and investors) do to develop transparent and inclusive mechanisms to guide and manage investments in agriculture? What role of value can an organization such as IFAD play in this regard?

Chairperson: Jean-Philippe Audinet, Acting Director, Policy Division, IFAD

Moderator: Tumi Makgabo, Broadcaster and Independent Producer

Panellists:

1. **Noel De Luna**, Deputy Permanent Representative, Embassy of the Republic of the Philippines
2. **Pär Oscarsson**, Land/Agriculture Manager, SEKAB BioEnergy (T) Ltd
3. **Stephen A. Ruvuga**, Executive Director, National Network of Farmers' Groups (MVIWATA), United Republic of Tanzania
4. **Sonja Vermeulen**, Programme Director, Business and Sustainable Development, Sustainable Markets Group, International Institute for Environment and Development
5. **Eckart Woertz**, Program Manager Economics, Gulf Research Center

Opening remarks

Mr Jean-Philippe Audinet, Acting Director of IFAD's Policy Division, opened the discussion by noting that the theme of the round table is considered by IFAD staff and management to be very relevant to the Fund's mandate and one that merits discussion with IFAD's Member States.

After providing an overview of the phenomenon, which was accentuated in 2008 in the context of the food price crisis and the economic downturn, Mr Audinet highlighted the fact that investments in land could translate into the development of infrastructure, processing industries and financial services in rural areas. These, in turn, could provide opportunities for poor rural people in terms of, inter alia, increased agricultural income, new employment opportunities and overall rural development. Such opportunities, however, should be accompanied by policies and mechanisms that would guard against risks related to the alienation of land rights and the marginalization of poor rural people. Mr Audinet also stressed that public policy choices and

approaches, accompanied by inclusive consultations with local communities and farmers' organizations, are critical for the prospects of poor rural people. Finally, he noted that – thanks to the different backgrounds of the selected panellists – the round table would provide an opportunity to analyse the phenomenon from the various perspectives of all the stakeholders involved and reflect upon the challenges and implications of these recent trends for rural communities. Mr Audinet assured the participants that the inputs derived from the discussion will ultimately contribute to guide the Fund in its future policy and operational engagements with the land issues of its target groups.

Panellist presentations

The first presentation was given by **Mr Noel De Luna**, Deputy Permanent Representative of the Republic of the Philippines, who spoke on behalf of **Mr Narciso Boy Nieto**, Undersecretary of the Finance Management and Administration Office and Project Implementation Office in the Department of Agrarian Reform of the Philippines. Mr Nieto was obliged to remain in Manila for the hearings at the Parliament of the Philippines on the agrarian reform programme.

Mr De Luna described initiatives under way in the country to develop the agribusiness industry, in some cases through joint ventures with investing countries. He estimated that at least two million hectares of land have been targeted in the Philippines for new agribusiness investments, and joint ventures with other countries are being formed for the Philippines to supply both biofuel and food crops. He provided information on the national medium-term plan for development for 2004-2010, which is undertaken within the framework of the programme for agrarian reform. Under this plan, the Biofuels Act of 2006 called for a mandatory 2 per cent biodiesel blend in diesel and 5 per cent bioethanol in gasoline by 2009, and a 10 per cent bioethanol blend in gasoline by 2011.

Mr De Luna went on to provide some examples of investments in land committed by different countries for the production of different crops: (i) China committed to developing 1 million hectares for hybrid corn, rice and sorghum; 40,000 hectares for sugarcane and cassava; and 200,000 hectares for organic food and agritourism; (ii) Spain committed to developing 100,000 hectares for *Jatropha*; and (iii) Japan committed to developing 200,000 hectares for coconut. While noting that these investments bring opportunities for the Philippines – such as new markets, technology, development of rural infrastructure, additional jobs and higher incomes – and thus can contribute to poverty reduction and revitalization of local economies, he recognized that there are also serious risks. These include loss of prime agricultural land for food production, degradation of forest land and other natural resources, alienation of land rights of rural communities, further marginalization of the landless and powerless, displacement of indigenous peoples, and expansion of the plantation-type model to the detriment of the family farm. Such risks could ultimately lead to lower incomes and reduced food security. Mr De Luna emphasized that the Government's approach to this phenomenon is to address it in the broader context of the agrarian reform, which over the past ten years has achieved 80 per cent of its objectives and therefore still needs to be promoted. In doing so, Mr De Luna noted that agrarian reform, instead of being interrupted or delayed in the attempt to attract external investments, should indeed be further strengthened. In his words, "Land should be distributed first. After that, the beneficiaries can decide what to do with it. But whatever they do, we honestly believe that land should be given to them first."

Dr Eckart Woertz, Program Manager Economics at the Gulf Research Center in Dubai, United Arab Emirates, brought the perspective of the Gulf countries, which are expected to increase their investments in land in developing countries over the coming years in order to secure their domestic food supplies. Dr Woertz explained some of the main reasons behind such increased investments: (i) population growth, which is projected to double from 30 million in 2000 to 60 million in 2030; and (ii) decline in agricultural production mainly

due to lack of water. These trends will lead to a reorientation of agriculture in the Gulf countries away from cereals and towards more value-added crops such as fruit and vegetables, and to an increased need for food imports.

According to Dr Woertz, Saudi Arabia, for example, will phase out wheat production by 2016, although it was still a wheat net exporter at the beginning of the 1990s. The already high reliance of Gulf countries on food imports – as much as 60 per cent of food commodities is imported – has recently spurred the interest on the part of Gulf countries in engaging in agro-investments overseas. Negotiations have been held with governments of various developing countries, particularly with countries that are geographically close and with which there are political relations and cultural proximities. These countries include Pakistan, The Sudan, *in primis*; other Asian countries such as Indonesia, the Philippines and Thailand; Central Asian countries and Eastern European countries such as Ukraine; and some countries in Africa and South America.

Dr Woertz went on to provide the perspective of countries that are receiving such investments. He briefly described the different contexts that are likely to shape the evolution of these investments and determine their potential benefits for local communities. For example, Central Asian countries and Pakistan have “physical” water shortages. This makes them less suitable for investments in agriculture, and competition between export industries and local food security is likely. On the other hand, many African countries only face an “economic” water shortage, which could be overcome by large investments in countries such as the United Republic of Tanzania and Mozambique.

Dr Woertz concluded by raising the issue of possible conflicting interests that may emerge with respect to the food security of rural people in developing countries, which are in many cases net importers of food themselves. Policies have an important role to play here. For example, policies have been put in place by governments of developing countries to ensure that the food security of local people is not compromised (e.g. export quotas; exemption from export restrictions only in special agricultural free trade zones). Finally, Dr Woertz stressed the importance for Gulf countries of avoiding a top-down approach in negotiations with developing countries. Local governments, local communities and smallholder farmers should actively participate in such negotiations to assess business propositions, job opportunities or reimbursements, thereby ensuring that large-scale investments by Gulf countries lead to win-win situations.

Mr Stephen Ruvuga, Executive Director of MVIWATA, the National Network of Farmers’ Groups in the United Republic of Tanzania, focused his presentation on investments in land for agrofuel production. He started by observing that the issue of agrofuel is a critical and “hot” issue at all levels (local, national, international) and is widely covered by the press. Mr Ruvuga suggested that some questions should be asked and reflected upon in the course of the debate, including (i) can agrofuels be a solution to poverty; (ii) which has to be considered as a priority – energy or food security; (iii) what is the reason behind such investments; and (iv) is there a balance between the interests of rural poor people and those of the investors that would allow a win-win situation for both.

Mr Ruvuga also highlighted a number of concerns linked to agrofuel development:

- *The enormous scale of production.* A number of rural people have been adversely affected by large-scale investments in mining, wildlife and fishing in the United Republic of Tanzania and have become the victims of such developments. About 700,000 hectares has been earmarked in the country for the production of agrofuels, and this will gradually be expanded to about 2 million hectares over the next 20 years.
- *The modality of land acquisition.* In many cases, there is a violation of procedures and law, with local communities powerless against governments and investors. This should also be seen in light of the importance of land as a major asset for the livelihoods of rural communities – with land also encompassing water endowment and other natural resources.

- *Diversion of land, water and the workforce from food to agrofuel production and risks to food security.* In the case of the United Republic of Tanzania, for example, what would happen to the price of sugarcane if production is increasingly devoted to making fuel?
- *Loss of biodiversity.* In many projects for agrofuel production, there is no clear evidence of any environmental impact assessment; if one has been conducted, there is no public awareness of it.

Mr Ruvuga concluded by stating that there is a need for policies that take into account the rights of local communities, review the inconsistencies in laws, increase transparency in the acquisition of land, regulate compensation modalities for rural people conceding their land to outside investors, and support the option of share-holding.

The fourth panellist was **Mr Pär Oscarsson**, Land/Agriculture Manager for SEKAB BioEnergy, a Swedish company investing in agrofuels in some countries, including the United Republic of Tanzania, the country on which his presentation focused.

Mr Oscarsson highlighted the enormous opportunity and, at the same time, the enormous challenge associated with agricultural investments in developing countries. In bringing the point of view of the investors and making some preliminary considerations, Mr Oscarsson pointed out that the most important factor for investors is securing a certain amount of supply to ensure financial viability and minimize the risks – which are very high in remote rural areas – of their investments. This is the main reason why investors are seeking ways to gain secure access to land, and in many cases purchasing or leasing it is the easiest and most effective way to secure supply. He noted that attempts have already been made to find alternative ways to obtain secure supply, for example by promoting out-grower schemes that have the potential to involve smallholder farmers on a more equal basis. However, the problem is that private companies still lack experience of such models.

Mr Oscarsson went on to describe the approach and work of SEKAB in the United Republic of Tanzania. Today, 80 to 90 per cent of SEKAB's investments are based on a large percentage of own estate production of sugarcane, with a gradual increase in sugarcane delivered from out-growers. Land is leased from the United Republic of Tanzania Investment Centre. However, SEKAB is exploring other options to develop profitable and effective production models that could be based on a mix of the following:

- *sub-lease of land from villages*, which offers the opportunity to secure land needed for long-term investments while communities can retain land ownership and receive an annual rent instead of a one-off payment;
- *local shareholding*, through which land is held in a village trust in return for an equity share of the company; and
- *out-grower schemes*.

In particular, SEKAB is looking into an out-grower-based block farming franchise model, which envisages a continuous, integrated farming area operated under shared ownership that enables smallholders to cooperate with large-scale farmers, take advantage of economies of scale, and receive assistance through a management company in the form of farming knowledge, mechanization and infrastructure. According to Mr Oscarsson, the scheme provides a win-win opportunity in which small-scale farmers participate in commercial farming, investors obtain a stable supply and governments an increased tax-base. Additionally, it can facilitate the balanced production of both sugarcane and food crops (thus minimizing the risks to the food security of local communities) and can also contribute to the development of a more productive and competitive agricultural sector. Mr Oscarsson stressed the importance of the latter, in view of the very low productivity of small-scale farming and the unsustainable use of land, both of which are attributable to poverty. He reiterated that investments in land for agrofuel production, also with

the participation of the private sector, could be an opportunity to improve agricultural practices and land management of small-scale farming.

In concluding his presentation, Mr Oscarsson highlighted that a well-integrated investment, fully accepted and understood by all parties, will guarantee long-term support from both communities and government, creating the long-term conditions for sustainable business and win-win situations. He also highlighted that this kind of investment is becoming compelling for private companies, which must make sure that agrofuels are produced and certified according to standards established by the European Union in order to sell the product in this market.

The final presentation was given by **Dr Sonja Vermeulen**, Director of the Programme on Business and Sustainable Development at the International Institute for Environment and Development (IIED), who highlighted three main issues:

- *Lack of reliable information on the phenomenon.* Land issues connected to the increasing investments in land in developing countries are reported almost on a daily basis by the media and often referred to as “land grab”. However, reliable information is limited and the picture of the situation is fairly disjointed, with a lot more hype than substance around the scale of these investments. Most countries – whether in their land registries or sometimes through their investment promotion agencies – are not closely monitoring what is happening in terms of large-scale land acquisitions by either foreign or domestic investors. It is known that some land acquisitions are taking place on a very large scale and that there are certainly land deals made in excess of 500,000 hectares. It is also known that these acquisitions are mainly private and in some cases government-to-government deals. In order to collect reliable information on the phenomenon, IIED is involved in two research projects: one in collaboration with IFAD and FAO, which is looking at some of the government-led land acquisitions that are taking place internationally; and the other headed by the World Bank, to obtain a first-base quantification of the scale of land acquisitions in selected countries worldwide.
- *Land availability.* Dr Vermeulen stressed that “available land is not running out. It has already run out.” All land throughout the world is under some kind of competing demand. There is no land that can be considered completely unused or underutilized. In many cases, the areas where large scale investments are being made are already used by small-scale farmers, pastoralists and other marginalized groups. Even when investments are made in lands of very low population density or with very low levels of use, these lands are critical in light of conservation needs and climate change effects. In Madagascar, for example, land that is now being used for a 500,000-hectare *Jatropha* project by the agrofuel company GEM was already being used by Malagasy people on a small scale. This does not necessarily mean that these people are going to be worse off, but just that the land was already being used. In addition, it should be kept in mind that Madagascar is one of the world’s major endemic biodiversity hot spots. Thus, the interest – both internationally and on the part of the Malagasy themselves - in conserving that land and the claims to it is enormous.
- *Scale of impacts on local communities.* A distinction should be made among three levels of impacts on rural communities: direct impacts, indirect impacts and national-level macro impacts. Direct impacts relate, for example, to whether communities affected will be able to continue farming and to have access to water, grazing lands and other natural resources. If not, will such communities be compensated – either directly by financial means, or indirectly through new jobs or infrastructure that will come to rural areas through these investments in land? Indirect impacts may include displacement of local communities and farmers from the areas they are occupying or using. Finally, at the macro/national level, large-scale land allocations will mean fundamental changes to the agricultural system as a whole. Small- and large-scale farming do not exist in isolation. Dr Vermeulen provided the example of tomato supplies in supermarkets of South Africa, one of the countries where there is highly inequitable land distribution. As much as 80 per cent of tomatoes

come from four big producers in the country. Even though small-scale producers may be producing excellent tomatoes, they find it difficult to be competitive by producing consistent volumes and quality at consistent costs. According to Dr Vermeulen, in considering how to handle large-scale investments, governments and policymakers should think about how to integrate large-scale and small-scale farming and make sure that market opportunities and land access opportunities remain open to smallholder farmers.

Round-table discussions

There were approximately 100 participants in the round table. The main issues that emerged during the discussions are summarized below.

Lack of reliable, accessible and transparent information. The issue is not whether information exists per se, but its accessibility and the reliability of its sources. Governments and private investors are sometimes unwilling to fully disclose information on negotiations and deals made, while in many cases villagers are unaware that their land is registered with the registries or that negotiations have taken place between the government and outside investors.

New trends in the global investments in land. Investments in agriculture have always taken place and always involved large tracts of land. What seems to be new is the magnitude of the phenomenon. Additionally, land transactions are now being made not only at the local or national level (as was mostly the case in the past), but also at the international level. Furthermore, they are often government-led, with the private sector involved at a second stage. Governments of Gulf countries, for example, made a strategic choice in targeting not the countries they traditionally import from, but underdeveloped/developing economies where, they believe, there is greater potential for win-win situations to materialize.

Large-scale versus small-scale production models. Growing demand for, and acquisition of, land by outside investors might be but one expression of what could be considered as a broader restructuring of agriculture to fulfill the requirements of other more powerful sectors of the economic system, such as growing urban and non-agricultural interests. Such interests perceive large-scale production modes as being better suited to meet the growing demand for food and fuel at the global level. However, it is important to bear in mind that small- and large-scale farming do not exist separately and independently, but are very much interrelated. Additionally, successful experiences show that such demand does not necessarily have to be satisfied by industrial, large-scale plantations, but can indeed be met by small-scale, family farming. In the 1970s, 1980s and 1990s, countries such as China, India, Indonesia and Viet Nam moved from being food-deficit countries to being exporters of food. This evolution was achieved on the basis of the production of very small farms, of an average size of less than 1 hectare. More recently there is the case of Nigeria. The country is the world's largest producer of cassava and cowpea, and these crops are mostly supplied by small-scale farmers.

Control over land and land tenure security. Poor rural people can influence choices regarding priorities and production models only if they have control over their land. Control over land is ultimately the decisive factor. The willingness of governments to secure rural communities' access to and rights over the land they occupy and use will enable rural people to become informed and active partners in the process, to decide themselves how to invest in their land and protect their most important asset, while taking advantage of opportunities.

The need for investments. There is no question that investments are needed in the agricultural sector of developing countries for rural development and poverty reduction. Especially in light of the progressive decline of public investments, private investments can represent an enormous opportunity, particularly for African agriculture. In fact, issues such as land degradation and low agricultural productivity characterizing many small-scale farms in remote rural areas are not the result of a lack of capacity and knowledge on the part of rural communities but, on the contrary, are attributable to poverty. If properly supported, smallholder farmers would be the best investors

in their land and would have the capacity and incentives to sustainably manage it, thus improving agricultural productivity. Again, land tenure security is a critical factor, but not the only one. Provision of credit, agricultural inputs, access to markets, infrastructure, and demand for agricultural produce to ensure higher incomes are all needed to enable smallholder farmers to revitalize agriculture and rehabilitate their land. Given the capacities of rural communities, also from a business point of view, they must be party to the process of land acquisitions.

The human dimension and the need for people-centred and rights-based approaches. What often seems to be missing in the debate on these investments in land is the human dimension. As there is no land that is empty or unused, it can generally be claimed that land that is being acquired is already occupied and used by people, who are often overlooked. As stated above, these people are also potentially the best investors in their land. Additionally, it is not only the economic dependence of rural women and men on land that should be taken into account in the process of land acquisition, but also the strong social and cultural relationship between rural people and their land. Reintroducing the human element in the discussion facilitates the recognition of the issues involved as social issues linked to the rights of people and communities. In this perspective, the rights of land users need to be protected and people always have to be given priority in the process, which has to be first and foremost ethical.

Consultation with and inclusion of rural communities in decision-making processes. It is absolutely essential that people occupying and using land are involved from the very beginning in the consultations and negotiations so that they can decide themselves what to do with their land on the basis of comprehensive information and their free and fully informed prior consent. People should not be viewed as potential labourers and input suppliers, but as business partners.

Social and environmental sustainability impact assessments. In many cases, no feasibility analyses or social and environmental sustainability impact assessments are undertaken before engaging in land acquisitions; or if undertaken, they are not always thorough and reliable. Such analyses and assessments should be carried out to prevent any detrimental effects on local people and the environment, including depletion of water and threats to the food security of local populations.

The important role of policies in guiding the process. Policies have an important role to play in orienting the process, minimizing risks for poor rural people and maximizing opportunities for them. Investments in agrofuel production, for example, should not be made on prime agricultural land, on land used for food production or in protected areas, but on land of limited use or quality that can be rehabilitated, provide an additional value, and be reused productively. Out-grower schemes should be promoted to prevent local communities from losing their land. Governments can engage as intermediaries in the negotiation process to support rural communities. Deals and contracts could be signed that specify the conditions of investments made by the private company, which should be reviewed regularly to check whether such conditions and commitments are being fulfilled. A certain percentage of the company shares could be offered to national investors.

Certification requirements and standards. The European Union and a number of countries (including developing countries) are formulating certification mechanisms and standards to ensure that agrofuels are produced in a sustainable way, with no adverse impacts on local populations and the environment. Such procedures also look at the process through which land has been acquired. In addition, FAO and IFAD are developing the voluntary Guidelines on Responsible Governance of Tenure of Land and Other Natural Resources.

Some recommendations to IFAD. IFAD could contribute its experience in working with rural communities to address this new phenomenon in the broader context of rural development and poverty reduction. International organizations such as IFAD and FAO could assist in carrying out proper social, environmental and sustainability impact analyses and assessments. They could also assist governments and rural communities in organizing inclusive and multi-stakeholder negotiation processes and identifying risks and opportunities for poor people.

III. Research and innovation for smallholder farmers in the context of climate change

Questions to guide the round-table discussion:

- How can investments in agricultural research be significantly increased to improve the resilience of smallholder farmers to the effects of climate change, raise their productivity in a context of risk and uncertainty, and contribute to rewarding communities for the environmental services they provide?
- What is needed to sharpen international research focus on the challenges of the regions that are most vulnerable to climate change, which are also the least prepared in terms of institutional capacity, and which are for the most part in Africa? How can the concerns of marginalized rural communities be voiced and influence the research agenda?

Chairperson: Rodney Cooke, Director, Technical Advisory Division, IFAD

Panellists:

1. **Hans R. Herren**, President, Millennium Institute
2. **Ma. Estrella A. Penunia**, Secretary General, Asian Farmers' Association for Sustainable Rural Development (AFA)
3. **Michel Griffon**, Director General, National Research Agency, France
4. **Eija Pehu**, Senior Advisor, Agriculture and Rural Development Department, World Bank

Opening remarks

This round table was opened by **Dr Rodney Cooke**, Director of the Technical Advisory Division of IFAD, who highlighted the enormous challenges to humanity of continuing to feed itself in the face of demographic pressures, changing dietary patterns and increasing scarcity of land and water, and in a context of increasing climate volatility and unpredictability. These challenges are forcing farmers to innovate to respond to changing market conditions and to become more productive in riskier conditions. Concomitantly, resource-poor agricultural communities are becoming more and more marginalized, particularly in terms of their access to knowledge, technologies and resources. He stated that there are about 500 million small-scale farms, and that is where many of the almost 1 billion people existing on less than one dollar a day are living. Smallholder food production is therefore essential to the survival of both rural and urban communities.

Dr Cooke stressed that these new challenges call for new solutions and hence the need for research and innovation for rural development. Although a considerable amount of research has been conducted on genetic improvement – and improved varieties are an essential part of innovative approaches – it is not enough. Even the most elite crop varieties cannot extract water and nutrients from the soil where they do not exist. Hence the focus on integrated farming systems and natural resource management approaches – variously known as the Doubly Green Revolution, Conservation Agriculture, or the Evergreen Revolution – which have proved to be adaptable to climate change and trigger increases in productivity at the same time. The question is how to extend these positive results and go further in promoting

agricultural innovation systems. Dr Cooke concluded his opening statement by drawing attention to the fact that many opportunities for mitigating climate change are not available to smallholder farmers under existing mechanisms.

Panellist presentations

The first presentation was given by **Dr Hans R. Herren**, President, Millennium Institute and co-chair of the International Assessment of Agricultural Science and Technology for Development (IAASTD). He began by stating that climate change is fairly recent, but is having an enormous effect on agriculture. At the same time, natural resources and the environment as a whole are increasingly endangered by agriculture and by industry. The challenges identified by the IAASTD, which are not new, relate to reduction of hunger and poverty; improvement of rural livelihoods and human health; and facilitation of equitable and socially, environmentally and economically sustainable development. These global challenges are interlinked and need to be addressed with new knowledge, science and technology.

Dr Herren emphasized that new thinking is required: no more business as usual, neither in the North nor in the South, because the type of agriculture practised in both leads to problems. It is necessary to search for a new paradigm and this is up to the farmers, but also to those working in agricultural extension, the scientists and the policymakers. African agriculture in particular is extremely vulnerable, and the African continent has already experienced a series of droughts, floods and, in general, more extreme weather patterns. Aside from extreme weather events, rising sea levels will affect many highly fertile coastal areas.

One of the main issues related to agriculture is water availability and use. The foreseen decrease in the quantity of available water in the future could have serious implications for irrigation. Water tables are being lowered everywhere as a result of excessive pumping of water for agriculture. Soil quality is also critical. Dr Herren stated that humans have been “raping” the soil, both in the South and in the North, by overexploiting it, overfertilizing it and using bad rotation practices. However, very little is known about how the soil works, the function of its different organisms and the ecological mechanisms at play.

There are a number of actions that can be taken both in the immediate future and in the longer term. Above all, it is necessary to think more about infrastructure that is more conducive to sustainable agriculture. More institutional development is required and farmers need to have the opportunity to mobilize, particularly smallholder farmers because they have the capability and incentives to take care of the environment.

Dr Herren went on to speak about risk. Since their assets are meagre, smallholder farmers are risk-averse, but if no risks are taken, little progress can be made. It is therefore vital to consider how to reduce risks and how to create more safety nets for smallholder farmers. It is also fundamental to increase the resilience of farms. Again, this starts with fertile soil. In addition, as crop diversity increases, so does resilience. Having more diversity is important, but it is also important to understand the role and impact of this diversity. He mentioned conservation agriculture and integrated crop production as important areas of research required to close the carbon loop as far as possible. He also highlighted the need for technologies, including biotechnologies. Information technologies are particularly valuable in increasing the knowledge that should reach the farmers. In an era of dramatic development of the internet and mobile phones, information available thanks to early warning systems can be forwarded to farmers and help them prepare for and adapt to forthcoming climate events.

There is no point in the farmers producing more if they cannot sell their produce. It is thus important to invest in relevant, effective and efficient value chains and in agricultural product processing, through which rural people, and particularly smallholder farmers, can increase their income and enhance their employment opportunities. Dr Herren concluded by underscoring that the multifunctionality of agriculture must be internalized at the policy, research and farm levels.

The second presentation was given by **Ms Ma. Estrella A. Penunia**, Secretary General, Asian Farmers' Association for Sustainable Rural Development (AFA). Ms Penunia emphasized the timeliness of the round table, given the issues currently faced by smallholder farmers. For example, in the Philippines, the people are now experiencing extensive rainfall, and even flooding in the traditionally dry months from December to April. Climate change affects everyone on the planet, but men and women who are smallholder farmers face the greatest impact because they rely so heavily on natural resources for their livelihoods.

At the same time, smallholder farmers serve as responsible stewards of their land. They are most likely to use sustainable farming techniques to protect their natural resources and health. For centuries they have been developing their own culture and practices within their environment to meet their nutritional needs, to reduce their risks and to maintain soil fertility. Ms Penunia gave an example of smallholder farmers in Thailand who have intercropped rice and cowpeas or soybeans for many decades. NGOs in the Philippines have been supporting the development of integrated farming systems on plots of 1 hectare of irrigated land, from which a farmer's family can obtain its fish, rice, vegetables and organic fertilizers and still have some surplus to sell to finance their children's education.

On the basis of this understanding, Ms Penunia outlined AFA's responses to the questions posed for this round-table discussion:

- AFA is concerned about the increasing interest of private companies, especially transnational corporations, in agriculture and notes that the public sector is investing little in agricultural research and development. Efforts should be made to develop innovative, public-private partnerships to raise funds for the public research agenda.
- Research should aim at improving crop resilience, diversity and adaptability through traditional and modern breeding techniques. Smallholder farmers and their organizations should be involved in the research programmes.
- Documentation should be collected on local knowledge and on practices in crop breeding, seed banking, pest management, organic fertilizers and energy-efficient mechanisms. For example, Indonesian farmers can produce charcoal briquettes from coconut. This technology should be fully described and shared with coconut farmers in the Philippines.
- Links among research, advisory and extension services should be strengthened to promote sustainable and organic agriculture, particularly targeting women. Agricultural extension workers are not there when needed, primarily because they are few in number and have many areas to cover or tasks to undertake. Sometimes their advice is not aligned with smallholder farmers' needs and often they do not have the knowledge to answer smallholder farmers' questions. Furthermore, it is only when farmers are empowered that they can claim accountability and command an adequate response to their requests from the extensionists. For example, in Taiwan, the production of rice and wax apples increased significantly as a result of the close cooperation among the research institute, the extension services, the National Pingtung University of Science and Technology and the farmers themselves.
- Efforts should be made to support farmer-led and civil society initiated research and development efforts, such as participatory plant breeding and community-based genetic resource conservation efforts. AFA members in the Philippines were part of the initial group that conducted participatory research in 1986 on the effects of the Green Revolution on incomes and on the health of soils and animals. This research made farmers realize that chemical-intensive farming, while increasing incomes, also increased production costs, killed certain fish in farms producing rice, contaminated water, increased risks to health and depleted soils. Based on this research, farmers set as one of their goals the promotion of sustainable agriculture and partnerships with scientists to establish a traditional rice seed bank and develop organic rice farming practices so as to gradually phase out chemical fertilizers.

In closing, Ms Penunia stated AFA's belief that sustainable organic agriculture, which is owned, controlled and managed by smallholder men and women farmers and supported by government policies and programmes, is a strategic agricultural measure to adapt to and mitigate climate change, ensure food security and reduce poverty among smallholder farmers. AFA advocates for strong support for this kind of agriculture through funding public research and development, communication and information dissemination, and the scaling up of initiatives. She stated that AFA looks forward to the establishment of meaningful partnerships among all the stakeholders: government, business, civil society and farmers' organizations.

The third presentation was given by **Dr Michel Griffon**, Director General, National Research Agency (ANR), France. Dr Griffon presented the concept of "ecologically intensive agriculture" as one possible solution to the following equation: how to feed the developing world in 2050 (8 billion people, compared with the present population of 5.7 billion, mostly in megalopolises), and help poor people overcome poverty while protecting natural resources, particularly forests and biodiversity, in the increasingly unpredictable context of climate change. Smallholder farmers, who have few alternatives to agriculture for emerging from poverty, constitute the centre of the solution to this equation.

Dr Griffon stated that production increases can only come from a moderate expansion of acreage if forest areas and biodiversity are to be preserved. This means that yields have to be upgraded considerably. The Green Revolution was based on high-input technologies and genetic improvements of seeds placed in optimal conditions. Its success was enormous and may still prove useful in the future in certain contexts, but its ecological and economic costs have proved to be considerable and are unaffordable for smallholder farmers. Therefore, new technologies are needed that are more respectful of the environment: causing less pollution through chemical fertilizers, using fewer pesticides that pollute soils and water, and costing less. In terms of costs, he gave the example of nitrogen-based fertilizers, the price of which is closely linked to that of oil and will become more expensive. The price of phosphate-based fertilizers will also rise because phosphate is a limited natural resource and increasingly hard to find.

Dr Griffon explained that a more holistic approach is needed that takes into account the productivity of the entire ecosystem. This is what is referred to as integrated agriculture, including the management of soil, water, plants, animals, diseases and pests, and the management of the landscape as a whole. Ecologically intensive agriculture intends to go further than integrated agriculture by imitating natural phenomena and using them as an inspiration for the development of new inputs. For example, much still needs to be understood about the way soils function and live. Too often, soil has been seen as a physical substrate, but it is first and foremost a biosphere, a living ecosystem. Biomass decomposition, humus generation and mineralization all give rise to soil nutrients and are very complex processes that are little understood. They make use of earthworms, nematodes, microscopic mushrooms, protozoa, arthropods, and billions of bacteria we know nothing about.¹

Dr Griffon went on to describe different techniques. For example, water retention in soil or in an ecosystem can be enhanced by using mulch covering, which prevents the run-off of rainwater and facilitates infiltration. The role of earthworms, which penetrate deeply into the soils and facilitate aeration and mineral exchanges, can be enhanced to produce a high fertility level. Another innovative area is that of "soil cover technologies": as the soil is not covered by plants during the intercropping seasons, programmes are being developed to improve the use of plants to collect solar energy and to enhance the production of biomass and, through its further decomposition, overall soil fertility. Programmes based on biomimetics are also promising. Certain algae and bacteria can capture the nitrogen from the air and convert it into fertilizer.

¹ ANR has proposed the establishment of an international consortium to sequence the genome and metagenome of soil bacteria and thus improve the understanding of how the soil actually operates so that better use can be made of its capacity as a renewable resource. (See <http://www.agence-nationale-recherche.fr> for further details.)

This can be enhanced, for example, by genetically modifying the bacteria, which entails using an existing physiological or biological process and upgrading it through biomimetics.

For pest and disease control, Dr Griffon explained that it is also possible to create new molecules imitating those found in nature. For example, molecules emitted by plants that repel insects can be transferred to other plants to prevent insect infestation. A new generation of insecticides, which would mimic or imitate the existing molecules already found in nature, could be developed. For weed control, a solution could be found through the promotion of a natural phenomenon known as allelopathy: certain plants prevent others from growing in their immediate vicinity, through the production of molecules produced by their roots or by bacteria that are intermingled within their roots. A better understanding of molecules having such allelopathic properties could provide alternatives to chemical herbicides.

Dr Griffon concluded by underscoring the two main components of ecologically intensive agriculture: (i) the very simple technologies already available and built on observation, which are knowledge-intensive and labour-intensive technologies but require minimal investment and are accessible to poor farmers; and (ii) ecologically intensive agriculture, which is a realm for high-technology research, including genomics, chemical synthesis, transgenesis and functional ecology. Ecologically intensive agriculture is already under way, with initiatives being implemented in many countries by smallholders and wealthier farmers alike. This movement needs to be enhanced and research scientists must accompany the movement.

The final presentation was given by **Dr Eija Pehu**, Senior Advisor, Agriculture and Rural Development Department, World Bank. Dr Pehu presented six pragmatic points related to the type of institutional arrangements required for moving forward.

- *Innovation systems context.* It is important to view research and innovation in an innovation systems context, rather than looking at investments in agricultural research institutions as such, or even through the triangulated farmer/extension/research entities, and then going beyond to involve the private sector, local communities, smallholder farmers, NGOs and others in the innovation process. More understanding is needed of how to retain a dynamic innovation system – for example, when to use an innovation fund, when to use a technology fair, when to invest in the research institutions in a particular country. In the context of climate change, it is not enough to rely solely on local in situ knowledge. Traditional knowledge gathered from other locations, similar ecosystems or from South-South collaboration is pivotal.
- *Agricultural biotechnology.* There is scope for agricultural biotechnology to play an important role. Climate change is causing increasing variation in rainfall patterns, temperature stress, onset of drought, etc. Much can be done with conventional breeding or crop management, but the toolkit also includes agricultural biotechnology, which is underutilized as a pro-poor tool generally and for crops that are important for the food security of smallholder farmers, such as roots and tubers and cereals. Because this is a new technology, it is important to support countries in biosafety, food safety regulations, and in developing the necessary regulatory and enforcement capacity. The public sector needs to increase investment in biotechnology research; the private sector, which is now very much driving the agenda and doing very good work, is often focused on goals that do not necessarily match those of smallholder farmers.
- *National science and technology agenda.* Agricultural research needs to be viewed in the context of the science and technology agenda in developing countries. There is good momentum driven by science ministries, some research-oriented companies, and university and academic research. But it is often divorced from the agricultural research that is supported by land or agricultural ministries. Much can be learned through information technology and virtual networks about using diasporas in innovation or South-South collaboration. There is an opportunity to bring high-technology knowledge and

information systems to the sphere of agricultural research as well, and to link it to the challenges that smallholder farmers are facing.

- *CGIAR reform process.* The CGIAR system is expected to become more effective and efficient. It is important to harness that system and to identify technologies that would be useful for smallholders in responding to the issues presented by climate change. There is a need to have an instrument dedicated to agricultural research for development. However, the CGIAR should not reach too far into development, but rather retain its comparative advantage in the research sphere. Nevertheless, the interface with development could be enhanced further.
- *Strong producers' organizations.* In order to achieve economies of scale and articulate and request research and advisory services, strong rural producer organizations are required, with independent resources to make resource allocations based on their own priorities
- *Gender mainstreaming.* Managing mainstreaming of gender into agricultural innovation, research and advisory services is fundamental. It is important to identify who will benefit from (or be harmed by) proposed technologies, and to promote women's leadership and active participation in the research organizations, extension services, producers' organizations and the range of intermediary organizations. The commitment of leaders from donor and national organizations is required, as are incremental resources that are explicitly earmarked. Technical advice is also needed; in this regard the Gender in Agriculture Sourcebook (<http://worldbank.org/genderinag>) is useful.

Round-table discussions

There were approximately 120 participants in the round table. The main issues that emerged during the discussions are summarized below.

Organic farming and sustainable agriculture. Even if some participants expressed the opinion that organic farming cannot feed the world, there is evidence that organic agriculture can have large-scale impacts: for example, farmers who practise sustainable organic rice farming in Asia proved that their production is higher and more stable than when they used chemical-intensive farming. Conversion of large-scale production to organic farming could also be relevant, for example to enhance soil fertility and reduce water pollution. However, organic farming is not always synonymous with sustainability. For example, there are very large farms that are labelled organic but are not sustainable. Broader conservation technologies are needed in which all components of the ecosystem are taken into account. Ecologically intensive agriculture can go beyond organic farming and develop integrated solutions based on organic approaches, while also requiring, in certain conditions, external inputs or even biotechnologies.

Research linkages with climate change 'hot spots.' It is important for agricultural research to recognize the hot spots for climate change and the number of smallholder farmers concerned. The Intergovernmental Panel on Climate Change provides climate change scenarios, but it is essential to scale them down to these hot spots and then concentrate research here in order to help the smallholder farmers in these areas. Agricultural research needs to establish collaborative linkages with meteorological services in order to develop early warning systems, and to learn more about extreme events and their impacts in terms of natural disasters, which demonstrably have a greater impact on smallholder farmers than on large-scale farmers. Research must take cognizance of these forecasts and inform smallholder farmers of preventive action or preparedness strategies that they can adopt. Hot spots are related to agriculture but also to water and sanitation for human health. It is therefore important to work in collaboration with the health research community.

Adaptation and genetic improvement. Smallholder farmers need specific research and innovation on adaptation. Adaptation can come through genetic improvement, and farmers' own

practices should be considered first. Farmers in developing countries usually cultivate a large number of varieties, thus mitigating risks arising from potential climatic events or sudden insect attacks and diseases. This diversity needs to be maintained and even increased to enhance the resilience of agricultural systems.

Putting agriculture on the Copenhagen table. In view of the forthcoming Climate Conference in Copenhagen (December 2009), it is fundamental to introduce agricultural issues into the mitigation agenda, which is currently focused on deforestation and reforestation. Strategic partnerships are needed to build the negotiation capacity of parties going into the Copenhagen talks, in order to integrate the points that relate to smallholder agriculture into the Kyoto mechanisms and biocarbon markets.

Empowerment of smallholder farmers. Smallholder farmers are highly vulnerable to the impacts of climate change. Capacity development must not only increase the number of scientists in research organizations but also include additional extension workers and smallholder farmers. The latter in particular must be directly involved in identifying research needs and priorities, and be part of all research and development programmes. There is a need to set up more vocational schools for farmers. Farming is becoming more and more complex, which means that knowledge accumulated over the years is of crucial importance, but new science and technology are also required. In this regard, the experience of farmers' field schools is very relevant. More needs to be done in this direction, as it is a key element in providing farmers with more knowledge and information.

Political will and investment in public research. Political will and commitment are fundamental if research and innovation are to be effective. Investments in public research have been dramatically reduced in recent decades. It is critical for governments to reinvest in agriculture. The research undertaken by the private sector can be useful, but it often becomes locked in patents and is not focused on the priorities of smallholder farmers. The results of public agricultural research must be regarded as a public good, available to everyone and therefore supported by the public sector. The donor community is recognizing the need for investment in agriculture. Donors should work together with the national governments to enhance their political will, and make available the required investments for agricultural research.

Institutional support. More research and innovation are needed, but serious consideration needs to be given to determine which appropriate institutions can deliver which appropriate technologies. Research on institutional innovation should be undertaken to define how to invest in local institutions and develop their absorptive capacity to facilitate technology exchange among them, and how to enhance their ability to work with the various stakeholders, particularly smallholder farmers. The critical priorities of these local institutions need to be identified, as do the barriers they face at the local level, so that they are more able to engage with the newly reformed CGIAR system, developed at the national and global levels.

Summary of the round-table discussions presented to the Governing Council

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

Round Table 1:

Food price volatility - how to help smallholder farmers manage risk and uncertainty

- High volatility of food prices is a major risk factor for poor consumers and for food deficit countries. It is also a major obstacle to agricultural development and investment. Smallholder farmers with no access to storage facilities and financial services are particularly vulnerable.
- National and regional agricultural policies must be at the centre of rural development and poverty reduction strategies. These policies should aim to: (i) reduce the volatility of agricultural prices and (ii) mitigate the impact of price volatility (e.g. through security stocks, insurance schemes, food safety nets) on resource-poor rural people, particularly women.
- It is essential to develop and strengthen farmers' and producers' organizations so that they are able to participate effectively in policymaking.
- There is a need to establish constructive linkages among all stakeholders involved in the value chain (at the production, marketing, processing and export levels) in order to reduce uncertainty and improve market price information and predictability.
- International policy frameworks for agricultural markets and trade should be more conducive to the development and implementation of national agricultural policies that respond to the needs of food producers and smallholder farmers in particular.
- Modern policies must build upon the lessons learned from past successes and failures in government intervention in agricultural and food markets. Particular attention should be given to sustainability.
- Public policy aimed at market regulation must also bear in mind significant new developments such as the linkage between the food and energy markets, and the environmental consequences of climate change.
- Significantly, more investment is needed in agriculture – and especially smallholder agriculture.
- The world's 500,000 smallholder farmers can make an even bigger contribution to food security.

Round Table 2:

The growing demand for land - risks and opportunities for smallholder farmers

- The rapid increase in the demand from foreign and domestic investors for agricultural land to be used for agrofuel production or – more recently – outsourced food production is bringing about opportunities for poor rural people in terms of financial resources,

infrastructure and technology, and new markets. However, there is also the risk that they could lose their land, which is their major – and sometimes only – asset.

- No land is unused or underutilized, the rights of land users must be recognized and protected, and the food security of rural people should not be compromised.
- Policies are needed that strengthen land tenure security for small-scale farmers and are developed through multilevel, multistakeholder dialogue.
- Rural communities and small-scale farmers should be fully involved in the process, and influence decisions and choices about modes of production and terms of agreement.
- Pro-poor investment guidelines should enable rural communities to participate fully in and benefit from outside investments.
- There is a need for capacity building of rural communities, increased access to rural finance, and agricultural inputs.
- There is a lack of reliable public information on the purchasing of large-scale agricultural holdings. This can and must be improved in order to allow local communities, governments, investors and civil society organizations to improve their interaction in the search for win-win solutions.

Round Table 3:

Research and innovation for smallholder farmers in the context of climate change

- Agricultural producers, in particular smallholder farmers of developing countries, are facing unprecedented challenges in the twenty-first century. They will have to feed 9.1 billion people in 2050 while they have little scope for increasing the amount of land they can cultivate without cutting down forests, and while climate change can irreversibly damage the natural resource base on which future harvests depend. Therefore, most of the increased production must come from higher productivity on existing farmland, in a context in which adaptation and resilience to climate change has to be enhanced.
- Those new challenges require renewed effort and fresh approaches in research and innovation. They also require a stronger commitment from governments and the international community to support public agricultural research and improve the productivity and resilience of smallholder farmers.
- Modern scientific knowledge needs to be integrated with the traditional knowledge of rural communities that is too often neglected. In that regard, conservation agriculture has shown its efficiency in various contexts, increasing the productivity and resilience of agricultural systems. Research needs to go further through providing a better understanding of the ecological processes and the promotion of an “ecologically intensive agriculture”, less dependent on external inputs, and more productive as a result of using biological processes to better advantage.
- There is a need to go beyond the traditional “farmer/researcher/extensionist” triangle to encompass a dynamic and multidisciplinary innovation system that links various and diverse stakeholders at the local, national, regional and global levels. Supporting smallholder farmers’ organizations is key to enabling them to identify research needs and priorities, and empowering them to implement research results.
- Because women play a primary role in agriculture, mainstreaming gender is pivotal in the various stages of research (e.g. priority setting, monitoring and evaluation), and in the staffing of research institutions.

Annex 1: Profiles of moderators and panellists

Round table on food price volatility – how to help smallholder farmers manage risk and uncertainty

Mr Gonzalo Fanjul Suárez is Head of Research, Oxfam Spain (Intermón Oxfam), one of the largest NGOs in Spain and one of the largest members of Oxfam International. In 1994 he joined the Campaigns and Policy Department of Oxfam Spain. For two years (1996-97) he ran the Projects Department of CCAIJO (a rural development organization in Cuzco, Peru). He returned to Oxfam Spain in 1998, where he has been Head of Research ever since. Mr Fanjul Suárez is one of the key policy and campaign strategists in Oxfam International, and has played a particularly strong role in the economic justice campaigns. He was part of the Oxfam International team that developed the arguments and proposals for the Make Trade Fair campaign, which has been implemented in more than 40 countries since 2002. He has a bachelor's degree in economics, a master's degree in international cooperation and development and is an MC/MPA 09 candidate at Harvard's Kennedy School of Government.

Mr Mustafa Abubakar currently serves as the President Director of BULOG, an Indonesian food logistics agency established in 1967 that was transformed into a state-owned enterprise in 2003. BULOG engages in domestic rice procurement, distribution of rice to the poor, maintenance of government rice reserves for price stabilization, and management of food insecurity during natural calamities and social unrest. Before his assignment in BULOG, he was Inspector General in the Ministry of Marine Affairs and Fisheries, and the Acting Governor of Aceh Special Province (Nanggroe Aceh Darussalam).

Mr Ajay Vashee is President of the International Federation of Agricultural Producers (IFAP), which represents farmers at the global level. Elected at the Thirty-eighth IFAP World Farmers' Congress in June 2008, he is the first President from a developing country in IFAP's 62-year history. He also served as the IFAP Vice-President from 2006 to 2008, during which time he led IFAP's work on environmental issues, speaking at numerous international events, such as the United Nations Commission on Sustainable Development. Mr Vashee is a founder and current President of the Southern African Confederation of Agricultural Unions (SACAU), which represents 14 national farmers' organizations in Southern Africa. Previously, he served as President of the Zambia National Farmers Union, where he united diverse national farming interests under its umbrella for the first time in the history of the nation.

Mr David Stevenson is Director of the Policy, Planning and Strategy Division of the United Nations World Food Programme. His responsibilities include policy guidance for WFP's new strategic plan, which sets out the objectives for food assistance in about 80 countries in a variety of interventions, including humanitarian relief and post-conflict support, prevention and mitigation of disasters, nutrition and HIV/AIDS programmes. Prior to this assignment, Mr Stevenson served as Coordinator of Purchase for Progress, a WFP initiative using the organization's purchasing power to contribute to agricultural production and market development. He has also held posts in seven countries throughout Africa, including responsibility for regional and local food purchase operations in Ethiopia, the United Republic of Tanzania, Uganda and West Africa. From 2002 to 2007, he served as WFP Representative and Country Director in Rwanda and in Zambia. Before joining WFP in 1992, he held a number of positions with private-sector and not-for-profit organizations in Canada.

Round table on the growing demand for land – risks and opportunities for smallholder farmers

Ms Tumi Makgabo (moderator) has been a broadcaster for more than a decade in South Africa and for the global network CNN International. As a news anchor she has covered world events and issues and interviewed world leaders, including Nelson Mandela, George W. Bush, Tony Blair, Colin Powell and Archbishop Desmond Tutu. At CNN International's headquarters in Atlanta, Ms Makgabo co-produced and hosted the network's award-winning programme "Inside Africa," providing global viewers with a fresh look at the economic, social and cultural affairs and trends on the continent. She served as Media Advisor and Commentator on the African Union, the New Partnership for Africa's Development (NEPAD) and Africa's International Media Summit, and sits on a number of advisory panels, including for the European Commission and the African Union. She launched her own media company upon her return to South Africa in 2006. Last year, Ms Makgabo was selected as a Young Global Leader by the World Economic Forum.

Mr Noel De Luna is the Deputy Permanent Representative to FAO and IFAD at the Embassy of the Republic of the Philippines in Rome. He has been Agricultural Attaché and Acting Alternate Governor for the Philippines to IFAD for the past 15 years. He also sits on the Executive Board of WFP. Mr De Luna has been extensively involved in land issues at FAO, playing an active role during the International Conference on Agrarian Reform and Rural Development (ICARRD) in Porto Alegre, Brazil, two years ago. At present, he is also active in the evaluation and reform process of FAO.

Dr Eckart Woertz is the Program Manager Economics at the Gulf Research Center (GRC). His research interests include the political economy of the Middle East, financial markets, energy issues, gold and commodity markets, development economics, economic history and the social impact of structural adjustment policies. Dr Woertz has authored several publications on these subjects. In 2008, he focused his research on food inflation in the Gulf countries and their agro-investments abroad. He holds a master's degree in Middle Eastern studies and a doctorate in economics from Friedrich-Alexander University, Erlangen-Nuremberg, where he conducted research into structural adjustment politics in Egypt.

Mr Stephen Ruvuga is the Executive Director of MVIWATA, the National Network of Farmers' Groups in the United Republic of Tanzania. He has 18 years of experience in rural development. Mr Ruvuga was involved in research on farming systems at the Ministry of Agriculture. He also worked in rural development training at the pan-African NGO INADES Formation and at the International Centre for Research in Agroforestry (ICRAF).

Mr Pär Oscarsson has been working as Land and Agriculture Manager for SEKAB BioEnergy Tanzania Ltd for the last two years. He holds a master's degree in agricultural engineering and has been an organic vegetable and livestock farmer in Sweden for 15 years. He also worked for ten years in Zambia and the United Republic of Tanzania with the Swedish International Development Cooperation Agency on conservation agriculture.

Dr Sonja Vermeulen is the Director of the Programme on Business and Sustainable Development at the International Institute for Environment and Development (IIED), a non-governmental, non-profit policy research institute based in London. Dr Vermeulen is from Zimbabwe, where she was a staff member at the University of Zimbabwe. She has been with IIED for eight years, during which time she has collaborated with a variety of NGOs, government agencies and companies in Africa and Asia in research and stakeholder processes to help improve governance and market-based solutions for natural resource management.

Round table on research and innovation for smallholder farmers in the context of climate change

Dr Hans R. Herren has been, since May 2005, President and Chief Executive Officer of the Millennium Institute (MI) USA, which provides tools and capacity development services to empower developing countries in designing ex ante evaluations of sustainable development strategies and supporting policies for the medium and long terms. From 1994 to 2004, Dr Herren was Chief Executive and Director General of the International Centre of Insect Physiology and Ecology, which addresses research and capacity development in insect and ecosystem sciences in support of sustainable development. As Director of the Plant Health Management Division of the International Institute of Tropical Agriculture, he developed and implemented one of the world's largest and most successful biological control programmes ever carried out: the cassava mealybug biological control programme, which has saved over 20 million lives and the livelihoods of 200 million people in the African cassava belt. In recent years, Dr Herren co chaired the International Assessment of Agricultural Science and Technology for Development.

Ms Estrella Penunia is Secretary General of the Asian Farmers' Association (AFA), a regional alliance of national farmers' organizations in Asia. Established in 2002, AFA comprises nine farmers' organizations in eight countries, representing around 10 million smallholder men and women farmers. AFA carries out programmes on policy advocacy, capacity building, management of on the ground initiatives and governance. It provides technical and managerial support to members' initiatives on the organization and empowerment of farmers, access to natural and production resources, sustainable agriculture, equity-led marketing and trading. As a social development worker, Ms Penunia has spent all her professional years in the field of rural development, working with Filipino men and women farmers in various capacities – as community organizer, participatory action researcher, trainer, campaign coordinator, NGO manager and networker.

Dr Michel Griffon, an agricultural engineer and economist, is currently the Deputy Director General of the National Research Agency (Agence Nationale de la Recherche) in Paris. Much of his career was as a researcher with the Centre of International Agricultural Research Cooperation for Development (Centre de Coopération Internationale en Recherche Agronomique pour le Développement – CIRAD), where he served as Scientific Director and created an agricultural policy research unit. His research activities focused primarily on the promotion of sustainable agriculture and techniques that are accessible to poor producers. His book *Nourrir la planète* (Feeding the planet), published in 2006, explores a positive scenario to ensure that by 2050 there is enough food for the world population, rural poverty is eliminated and the environment is preserved. He is President of the French Global Environment Facility (Fonds Français pour l'Environnement Mondial) and President of the Institute for the Study of Economic and Social Development at the Sorbonne.

Dr Eija Pehu joined the Agriculture and Rural Development Department of the World Bank in 2000 as an Advisor on Science, Technology and Innovation. She leads the Department's programme on sustainable agriculture, with a special focus on agricultural research and innovation including biotechnology and biosafety. She is also the leader of the Gender in Agriculture Programme of the World Bank. Prior to joining the World Bank she was Professor of Agronomy at the University of Helsinki and the founder and science director of two start-up companies in the Helsinki Science Park.

Annex II: Discussion papers

Food price volatility – how to help smallholder farmers manage risk and uncertainty

Discussion paper prepared for the Round Table organized during the Thirty-second session of IFAD's Governing Council, 18 February 2009

Prepared by R. Blein and R. Longo

The opinions expressed in this paper are those of the authors and do not necessarily reflect official views or policies of the International Fund for Agricultural Development, except as explicitly stated.

Acronyms

| | |
|-------------|---|
| CIRAD | Centre de coopération internationale en recherche agronomique pour le développement |
| FAO | Food and Agriculture Organization of the United Nations |
| FEWSNET/MSU | Famine Early Warning Systems Network/Michigan State University |
| LDC | least developed country |
| LIFDC | low-income food-deficit country |
| RESIMAO | Réseau des Systèmes d'Information des Marchés en Afrique de l'Ouest |
| UNCTAD | United Nations Conference on Trade and Development |

Following a period of soaring prices for virtually all agricultural commodities, prices for many of these commodities have fallen dramatically since August 2008, although they still remain relatively high compared with previous years. Rural producers are facing greater uncertainty, and food price volatility has become a major issue because of its impact on the investment decisions of agricultural producers and thus on long term world food security.

Price volatility may increase in the future, since the effects of climate change are likely to compound the uncertainty and instability of food production, especially in lower-latitude, tropical regions.

This paper, prepared as background to the round-table discussions at IFAD's Thirty second Governing Council in 2009, provides a framework for focusing the discussions around the challenges identified and the policy options available to address those challenges.

I. Food price volatility on international markets: trends and transmission to domestic markets

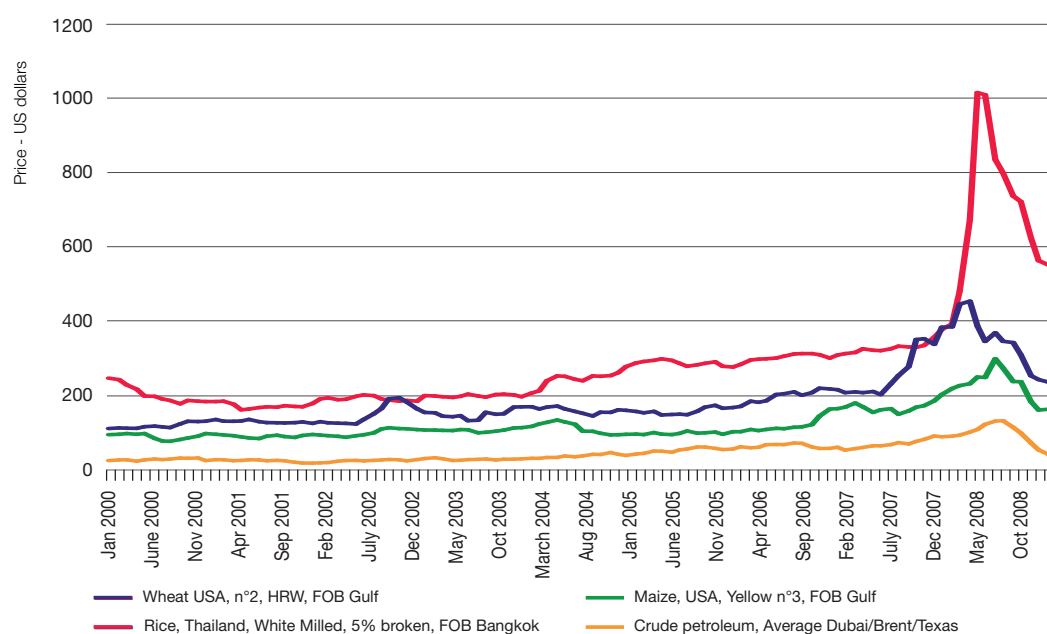
After a low and stable 25-year trend,² agricultural commodity prices showed a moderate rise between 2004 and 2005, followed by an accelerated increase between the end of 2007 and the summer of 2008. During the period from October 2006 to June 2008, commodity prices (expressed in constant dollars – base year 2000) were multiplied by 3.2 for rice, 2.1 for wheat and 2.5 for corn.

Table 1
Index prices of rice, wheat and corn (2000-2008)

| | Rice | Wheat | Corn |
|-------------------------------|------|-------|------|
| Average (Jan 2000 – Dec 2003) | 100 | 100 | 100 |
| February 2005 | 145 | 136 | 106 |
| December 2006 | 151 | 183 | 183 |
| September 2007 | 161 | 294 | 188 |
| March-April 2008 | 498 | 380 | 278 |
| November 2008 | 276 | 204 | 179 |
| January 2009 | 297 | 215 | 196 |

Source: Elaboration Bureau Issala on UNCTAD and FAO data

Graph 1
The evolution of international prices (2000-2008)



Source: Elaboration Bureau Issala on UNCTAD and FAO data

² Following the spike in food prices during the food crisis of the 1970s, agricultural prices (expressed in constant dollars – base year 2000) dropped below US\$ 200 per ton for corn and wheat and below US\$ 300 per ton for rice during the period 1982-2006 (see Appendix 1).

Following the dramatic rise, the prices for rice and wheat fell 55 per cent in the second semester of 2008, while corn prices fell 64 per cent, in spite of an appreciation of the dollar during the same period. In January 2009 prices increased slightly.

It appears that a confluence of factors has led to the unique developments of the past two seasons: (i) the reforms in public policies for the agriculture sector over the last two decades; (ii) unexpected shortfalls in food production; and (iii) unforeseen rises in demand. Another factor that has had a significant impact on the volatility of markets is the gradual reduction in the level of stocks, which can no longer function as a means of adjustment. Markets are therefore more exposed to speculative operations. (Appendix 2 provides an analysis of the factors underlying recent trends on global commodity markets.)

I.1 Uncertainty dominates the medium- to longer-term outlook

FAPRI³, IFPRI⁴ and OECD-FAO⁵ studies identify the recent trends on the international commodity markets as a structural break that will create further market tensions and is likely to increase the volatility of commodity prices for the next 10 to 15 years. The factors underlying the tensions on commodity markets can be summarized as follows:

- the impacts of climate change on agriculture, including land degradation, growing uncertainty about crop yields and the intensification of floods and droughts in tropical areas;
- demographic dynamics: population growth and increasing urbanization;
- the state of natural resources and the conditions of their use, in particular: (i) the growing demand for land in developing countries from outside investors; (ii) the degradation of land due to unsustainable agricultural practices; and (iii) ineffective management of water resources for agricultural use;
- agricultural outputs increasingly being used for the twofold objective of providing food and providing feedstock for biofuels, thus linking the volatility of oil markets to the volatility of commodity markets;
- the potential negative long-term impacts of short-sighted agricultural public policies put in place hurriedly in response to food price increases and the associated risk of a return to agricultural protectionism;
- the slow rate of restocking at the household, state, regional and international levels; and
- the interests of financial investors (e.g. hedge funds, sovereign wealth funds) on commodity markets seeking to diversify their portfolios.

I.2 Transmission differentiated according to local contexts

It is still too early to fully assess the extent to which price movements on the international markets over the last two years have been transmitted to developing countries – and too early to define the different impacts on consumers and producers. Most of the studies (FAO⁶, CIRAD⁷, OXFAM⁸, IFPRI⁹, FEWSNET/MSU¹⁰) analysing the transmission to domestic markets were undertaken in 2008, and data gathered at micro and meso levels are just beginning to emerge.

3 Food and Agriculture Policy Research Institute.

4 International Food Policy Research Institute.

5 Organisation for Economic Co-operation-Food and Agriculture Organization of the United Nations, Agricultural Outlook 2008–2017.

6 Dawe D. Have recent increases in international cereal prices been transmitted to domestic economies? The experience in seven large Asian countries. ESA working paper n° 08-03, April 2008, FAO, p. 12.

7 Daviron B. et al. La transmission de la hausse des prix internationaux des produits agricoles dans les pays africains, November 2008, FARM-CIRAD, p. 61.

8 Blein R. et al. The impact of price increases on the food situation in Sahelian countries. OXFAM GB-Save the Children, August 2008, p. 114.

9 IFPRI. An assessment of the likely impact on Ugandan households of rising global food prices, WFP-UNICEF, June 2008, p. 49.

10 Kelly V. et al. Potential food security impacts of rising commodity prices in the Sahel: 2000-2008, Fewsnet/MSU, May 2008, p. 36.

Nonetheless, two parameters appear determinant in explaining the transmission of food price trends to domestic markets:

- the relative shares of domestic demand satisfied either by domestic food production or by food imports; and
- the ability of public policy to regulate the domestic markets through trade policy at the borders and/or the instruments of domestic policy (consumer subsidies, social safety nets, price surveillance policies and competition policies).

Countries dependent on food imports and suffering poor harvests in 2006-2007 (e.g. Senegal) have experienced a more marked transmission of international commodity prices to their domestic markets. Countries with food imports representing a minor part of local consumption (most Asian countries, Madagascar, Mali, Uganda) have experienced a limited

Box 1: The impacts of the soaring food prices between 2006 and mid-2008

On rural producers. Price rises can benefit producers. However, a distinction needs to be made between net food buyers and net food sellers. For net buyers, soaring food prices mean that a higher share of the family income is devoted to buying food. A similar situation is faced by poor urban populations. The additional costs in purchasing food erode the financial reserves of the family and their production capacities. Net sellers are in a better position to benefit from the rise in food prices. However, the impact will vary depending on (i) the evolution of the costs of production; (ii) the availability of cash to buy the inputs and tools for additional cropping; and (iii) the organization of cooperative efforts to store products until selling is opportune.

On the food security of vulnerable populations. The rise in food prices has been associated with similar trends in energy prices and transport costs, which together are increasing the cost of goods for family consumption. The impact varies according to (i) the degree of transfer from international prices to domestic prices; (ii) the extent of consumption subsidies; and (iii) the level of dependence of families on imported food products. The most recent estimates from FAO indicate that 75 million more people were thrust below the hunger threshold as a result of the impact of high prices in 2007, and another 40 million in 2008, bringing the total number of undernourished people to 963 million. (FAO, 2008 - The State of Food Insecurity in the World.)

On public finances. This takes effect through the suspension of customs duties and value-added tax on the principal food products imported. According to a report issued by FAO, 43 developing countries have applied these measures. For the eight countries in the West African Economic and Monetary Union (Benin, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo), the loss of revenues is estimated at between US\$ 690 million and US\$ 1,380 million. (See Soulé B.G., Blein R. Hausse des prix alimentaires en Afrique de l'Ouest: revue et analyse des mesures engagées à court et moyen terme. Fondation FARM. 2008.)

On the imports bill. According to FAO, the cost of food imports for the developing countries increased by 85 per cent between 2006 and 2008, with the cost for the low-income food-deficit countries (LIFDCs) increasing by 35 per cent. These percentages show that the least developed countries (LDCs) and LIFDCs have reduced their volume of imports (contraction of demand, insufficiency of hard currency, lack of cash reserves for importers).

Table: Evolution of food import bills

| | 2006 | | | 2008 | | | Evolution 2008/2006 (%) | | |
|----------------------|----------------------|---------------|---------------|----------------------|---------------|----------------|-------------------------|-----------|-----------|
| | Developing countries | LDCs | LIFDCs | Developing countries | LDCs | LIFDCs | Developing countries | LDCs | LIFDC's |
| Cereals | 69,410 | 5,683 | 29,450 | 147,776 | 9,154 | 34,055 | 113 | 61 | 16 |
| Vegetable oils | 35,050 | 1,945 | 22,884 | 90,299 | 6,444 | 35,916 | 158 | 231 | 57 |
| Milk products | 12,930 | 801 | 4,924 | 25,947 | 1,450 | 6,857 | 101 | 81 | 39 |
| Meat | 16,806 | 810 | 6,013 | 24,093 | 831 | 4,210 | 43 | 3 | -30 |
| Sugar | 13,871 | 1,753 | 7,587 | 13,712 | 1,710 | 5,819 | -1 | -2 | -23 |
| Food products | 185,529 | 13,362 | 86,473 | 343,121 | 23,667 | 117,079 | 85 | 77 | 35 |

Source: Food Outlook - FAO

and slower transmission of food prices to their domestic markets, if compared with food-deficit countries.

Countries with domestic markets characterized by a high degree of protection (mostly Asian countries) have been able to soften the transmission of rising food prices by lowering customs duties for imported goods and/or banning exports (Indonesia, Viet Nam). Countries with active public food policies were able to dilute the impact of rising international food prices by subsidizing food consumption or providing targeted social transfers for the most vulnerable populations (Bangladesh, Brazil, Ethiopia, Mexico).

The transmission to domestic consumer prices for rice, wheat and corn has been sizeable for many food-importing countries. For example, in Senegal, where 83 per cent of annual needs of rice are imported, between 95 and 100 per cent of international rice prices were transmitted to consumer prices; the increase in the consumer price of locally produced rice was 69 per cent of the international increase.¹¹

The pass-through to rural producers is variable and dependent upon the local contexts. Rice producers seem more exposed to price transmission; at the same time, they benefit from an increase in marketing margins, in spite of the rise in production costs. The transmission to producer prices for the other cereals is partial and conditioned by local factors (e.g. degree of substitution between products, market structure). An analysis of the dairy sector¹² in Senegal and Niger shows that the increase in the price of milk powder provided an opportunity for a more competitive domestic dairy sector.

The results of an analysis comparing price volatility on domestic markets (at both the consumer and producer levels) with the volatility on global markets for the period 1992-2008 are presented in Appendix 3. They show that the volatility of producer prices is generally greater than that of consumer prices. Similarly, the volatility of domestic prices is greater than that of international prices. The notable exception is the comparison of global price volatility with domestic price volatility for the period 2004-2008; during this period, global price volatility is greater. This attests to the incomplete transmission of the rise in prices and a partial disconnection of domestic price trends from those observed on international markets.

II. Determinants of domestic food price volatility

In Asia, domestic food prices are less volatile because supply is more stable and markets are more regulated (see Appendix 2). Conversely, in sub-Saharan Africa the volatility of domestic food markets is high – particularly for rural producers – and in most cases disconnected from the dynamics of global commodity markets. The main factors underlying the instability on domestic markets are the following:

- **Supply-side variability due to the impact of natural factors on harvests.** Agrarian systems in LIFDCs are generally extensive, use few inputs (fertilizers, seeds) and are very vulnerable to climatic shocks or weather variations.
- **The decrease in stock volumes.** At the family and local community levels, stocks have diminished markedly.
- **The lack of organization of producers in the value chain.** In many African contexts, for example, lack of storage facilities, absence of access to credit and unreliable linkages within the value chain often imply lower post-harvest prices and higher prices in the months preceding the harvests, with negative repercussions on smallholders' income.
- **The small share of marketed smallholder production.** The portion of smallholder production commercialized is generally quite limited compared with the totality of production. The size of the share of marketed crops is linked to: (i) family cash needs;

11 Daviron et al. op. cit.

12 Iram-Gret. Etude de l'impact de la hausse des cours du lait et des produits laitiers sur les producteurs et les consommateurs. Etudes de cas au Niger et Sénégal, Alimenterre, 2008.

(ii) the reimbursement of debts to retailers (in cash or goods); and (iii) the availability of surpluses of production once family requirements are met. Production can also vary significantly from one year to another.

- **Segmentation of regional and domestic markets.** In many African contexts, for example, weak infrastructure (such as poor roads) creates critical bottlenecks in the marketing of foodstuffs. Sizeable customs duties pose additional obstacles. As a result, market transactions are limited between areas that have surplus and those that are food-deficit, thus contributing to higher retail costs for goods to consumers and impacting negatively on the price paid to producers.¹³
- **Non-tradability of local foodstuffs.** In some cases, local food produce is unsuitable for trading, which excludes the possibility of exports being used as a policy tool to adjust supply to domestic demand.

The determinants of the food price volatility faced by smallholder farmers in developing countries are multiple. Nonetheless, predictable market interactions and stable input and output prices are not sufficient, if considered in isolation, to promote pro-poor agriculture-based development processes. It is also necessary to address the key constraints poor rural people must contend with in dealing with markets: high transaction costs (due to inadequate transport infrastructure and storage facilities); supply-side limitations (access to agricultural services and inputs, access to and control over natural resources) and the difficulty in complying with quality and safety standards requirements.

Food price volatility hampers the development of smallholder farmers. It contributes to keeping them in poverty and deters smallholders from investing in agriculture. Family agriculture has enormous potential for agricultural development. To encourage these families to reinvest in agricultural production, the full set of technical, economic, institutional, environmental and marketing risks that they face must be addressed simultaneously.

III. The policy dimension of food price volatility and smallholder farmers

III.1 Policy options

Public policies dealing with food price volatility have the twofold objective of (i) reducing short- and long-term volatility; and (ii) limiting the impact of volatility on the production and income strategies of rural families and, more broadly, on the income, food security and nutrition of poor rural and urban households.

Supply-side policies and investments are commonly being developed to respond to growth in demand. There are many areas of policy intervention that can have an impact on domestic, regional and global food supply, including access to credit; management of and control over natural resources; access to research and extension services; and supply management in order to keep prices stable at the producer and consumer levels. Complementary to supply-side policies, policies being developed to reduce the risks associated with climatic shocks also address price volatility, in particular the issue of the variability of domestic supply and the related demand for imports.

Trade and market policies can also play a crucial role in reducing food price volatility. Countries with tariff structures and related policies are able to protect strategic products so as to shelter producers from price swings on the international markets. The regional free trade agreements¹⁴ between developed and developing regions often exclude agricultural products from full liberalization, at least in the short term, and allow some policy space for states to

¹³ See MSU, FEWSNET and Africa Trade Centre studies.

¹⁴ For example, the Economic Partnership Agreements between the European Union and the African, Caribbean and Pacific countries.

ensure the regulation of domestic markets, including through direct intervention on the markets to ensure minimum prices for producers (institutional procurements, public purchase, constitution of stocks).

Most Asian countries have maintained ambitious and comprehensive supply-side and trade and market policies over the last three decades. For example, Indonesia and Malaysia have articulated comprehensive policies ranging from subsidized inputs and setting floor and ceiling prices, to supply management of food stocks and investments for land management and irrigation programmes. These policies have been able to triple rice production over thirty years in Indonesia and double it over ten years in Malaysia, while promoting increases in productivity and markedly decreasing the incidence of poverty.¹⁵

Policy instruments for food security aim to (i) reduce the cost of food; (ii) lower the impact of price volatility; and (iii) predict and manage food crises when they occur. Two important approaches have been developed. The first concerns the African countries (mainly Sahelian countries) and is based on information and warning systems to prevent crises and limit their impacts on the most vulnerable populations. This approach is focused above all on the endogenous mechanisms of resistance to shocks (e.g. cereal banks, income-generating activities). In the event of a crisis, a number of instruments are mobilized, including public security stocks, food-for-work or cash-for-work programmes and food aid. The second approach is based on social transfers (safety nets) and consists of a form of redistribution of income in favour of poor people, through food vouchers or cash transfers.

Within this second approach, the Brazilian *Programa de Aquisição de Alimentos da Agricultura Familiar* (Programme for the Acquisition of Food from Family Agriculture) links the cash/food transfer programme with a public purchasing programme based on local procurement from family farming. The public purchasing programme has created a stable demand and supports over 100,000 small-scale farmers. It redistributes their agricultural output by providing food, through municipal programmes, to food-insecure households (accounting for 4.7 million people). Public procurement provides better and more stable prices for producers. Social transfers to vulnerable people linked with their economic or social inclusion (e.g. through schooling, access to health facilities) provide the opportunity to reduce vulnerability and thus limit the impact of high food prices on poor consumers.

During the 2006-2008 food crisis, many developing countries increasingly considered the adoption of policy measures to avoid negative impacts of international food price volatility on domestic markets. Several countries declared food self-sufficiency as their strategic objective. For example, the Government of the Philippines, the largest rice importer in the world, is seeking to achieve 98 per cent self-sufficiency in rice by 2010. Senegal, another major importer of rice, has unveiled an ambitious plan to make the country self-sufficient in food staples, especially rice. Many Latin American and Caribbean countries, which commonly rely on food imports, have pledged to give greater attention to domestic food production, rather than focusing their agriculture sector to export crops such as coffee and fruits. Additionally, policies to increase domestic food security and support vulnerable households have been oriented towards providing productive safety nets. National programmes are being articulated to target input subsidies (e.g. distribution of seed and fertilizer), and to improve access to credit for resource-poor farmers (e.g. Bangladesh, Dominican Republic, Indonesia and Madagascar).¹⁶

15 Stockbridge M. Agricultural Trade Policy in Developing Countries During Take-Off, Oxfam GB Research Report, July 2006; Timmer, C.P. 'Food Security and Rice Price Policy in Indonesia: The Economics and Politics of the Food Price Dilemma,' Indonesian Food Policy Program, Working Paper No. 14, 2002.

Dawe D., 'How Far Down the Path to Free Trade? The Importance of Rice Price Stabilization in Developing Asia,' 2001, Food Policy 26(2), pp. 163-75.

16 Demeke M., Pangrazio G. and Maetz M. Country responses to the food security crisis: Nature and preliminary implications of the policies pursued, FAO, Initiative on Soaring Food Prices, Rome, 2009.

III.2 From local to global markets

Food price volatility faced by smallholders is principally linked to the organization of local and domestic markets. Such volatility may be further exacerbated by “imported” volatility from external markets – regional and global commodity markets.

Local and national markets. Local and national agricultural and food security policies are critical in shaping the markets and, consequently, the investment decisions of smallholder farmers. There are six domains to be taken into account in reducing food price volatility:

- **Supply-side constraints and the source of instability.** Policies and investments supporting smallholder access and the capacity to take advantage of agricultural services, inputs and natural resources need to be combined with policies aimed at reducing the risks for family agriculture, such as climatic shocks (as detailed in section III.1).
- **Public purchase combined with safety net programmes.** Public purchase programmes promoting local procurement combined with the distribution of subsidized or free food to food-insecure households can be a win-win strategy for stabilizing prices and promoting food security for the most vulnerable (see Brazil programme in section III.1). Recently, WFP introduced a pilot programme (Purchase for Progress – P4P) in 21 countries that seeks to buy food from local farmers and then distribute it locally for emergency needs and food security.
- **Supply-management and price stabilization policies.** Both policies have the aim of reducing food price volatility and require import controls to prevent “imported” price fluctuations. Additionally, supply management is based on collective marketing and production planning adjusted to the needs of the domestic market.
- **Value-adding for agricultural products.** Commodity price volatility is often higher if compared with processed products. Therefore, investments and programmes for the processing of agricultural commodities – developing partnerships along the value chain – could both result in more stable prices and higher returns and profits for the stakeholders involved in the partnerships.
- **Price information for farmers and buyers.** Information gaps for both buyers and farmers result in asymmetric market relations and sub-optimal market outcomes. Redressing those gaps and asymmetries can be an important element in promoting market relations that enable farmers to make informed decisions based upon market incentives, thus lowering the unpredictability of market prices. At the same time, buyers can rely upon producers who are able to adapt and produce in compliance with market requirements (in terms of, for example, products and standards).
- **Storage facilities combined with access to credit for smallholder farmers.** Output prices for producers vary considerably during the cropping season. The provision of storage facilities for smallholder farmers combined with access to credit may be an effective means of enabling vulnerable households to meet their immediate cash needs while storing their outputs until prices are more favourable (see Box 2).

Regional markets. The regional level is key in developing the value chains and relevant sectoral policies. To support strategic regional value chains, trade policy measures at the borders (e.g. customs duties and safeguard mechanisms) can be created and enforced to regulate and control the prices of imported products. Regional security stocks can be constituted to complement global stocks (see below). In addition, chain partnerships (*organisations interprofessionnelles*¹⁷) can be set up to facilitate dialogue and negotiations among all actors along the value chain and build long-term alliances centered on shared interests and mutual benefits.

16 Demeke M., Pangrazio G. and Maetz M. Country responses to the food security crisis: Nature and preliminary implications of the policies pursued, FAO, Initiative on Soaring Food Prices, Rome, 2009.

17 Royal Tropical Institute (KIT) and International Institute of Rural Reconstruction (IIRR). Trading up: building cooperation between farmers and traders in Africa and Inter-Réseaux – Working Group on Organisations Interprofessionnelles - http://www.inter_reseaux.org/rubrique.php3?id_rubrique=328.

International markets. There are two main dimensions to be taken into consideration to reduce food price volatility at this level:

- **International trade agreements.** Global and bilateral trade agreements need to take into account the possibility for developing countries to stabilize prices of agricultural products that are strategic for their food security and agriculture development processes.¹⁸
- **Negotiations on international stocks.**¹⁹ The gradual reduction of international stocks has eliminated the buffer that enables adjustments to be made on the basis of quantity rather than price. Negotiations at the global level should focus on (i) minimum volume of stocks; (ii) governance for the management of stocks, including the role to be played by developing countries and the engagement of the large producers/exporters; (iii) international stock financing modalities; and (iv) possible innovations (e.g. virtual global food reserves²⁰).

The articulation of policies and investment programmes, from the local to the global level, should always consider the following two general principles:

- **Policies and investments need to take into account the livelihoods of smallholder farmers and the complexity of farming systems.** Smallholder farmers' livelihood strategies are centred on a range of income sources – agricultural production, off-farm labour, remittances – with the aim of simultaneously maximizing their revenue and minimizing their risks. Farming systems, in particular African farming systems, are often based on a

Box 2: The warehouse receipt system in the United Republic of Tanzania: generating additional income and investment

The warehouse receipt system allows small-scale farmers to store their produce (primarily maize and rice) collectively during harvest time, when prices are low; receive credit, using the product as collateral; and wait until prices are more favourable for selling. Through this system, some farmers have been able to double their income.

The warehouse receipt system is the result of the collaboration between two IFAD-funded programmes: the Agricultural Marketing Systems Development Programme (AMSDP), the aim of which is to empower smallholders to engage more actively in markets; and the Rural Financial Services Programme (RFSP), which is designed to strengthen grassroots microfinance institutions.

The AMSDP built the warehouses and managed them initially, with responsibility shifting fully to the districts from the third year of operation. The RFSP built up Savings And Credit Cooperative Organizations (SACCOs) so that farmers are able to use their warehouse receipt as collateral for credit. The warehouse receipt system has benefited from the linkages to markets established by the First Mile Project. Farmers have access to up-to-date market information, which allows them to negotiate better deals for their produce with buyers or at the marketplace. The Warehouse Receipt System Act, passed by the Government in 2005, provided a legal framework for the system.

The results of the warehouse receipt system have been very positive: the Government of The United Republic of Tanzania is promoting the system nationwide. The RFSP has generated a solid approach to increasing the access of the rural poor to financial services through the SACCOs. These membership cooperative societies have enabled poor farmers to pool their savings, extend credit to one another and use the group capital to access loans from financial institutions for on lending to members. By September 2008, female membership in the SACCOs and the number of borrowers had both reached the 40 per cent mark. As the project is expected to end in 2010, the Government has requested the project management to prepare a roll-out plan for extending SACCOs nationwide.

Farmers now have sufficient experience of using the warehouse receipt system to be able to replicate it without government support.

18 Negotiations are currently taking place at the World Trade Organization in the context of the definition of special and differential treatment for strategic agricultural products, special products and special safeguard mechanisms.

19 Von Braun J., Torero M. Physical and Virtual Global Food Reserves to Protect the Poor and Prevent Market Failure, IFPRI Policy Brief, June 2008.

20 A virtual reserve and intervention mechanism would be based on a coordinated commitment by the group of participating countries. Each country would commit to supplying funds, if needed, for intervention in grain markets (Von Braun J., Torero M. IFPRI. op. cit.).

variety of products: cereals, roots and tubers, livestock and dairy products, forestry and artisanal fisheries. The almost exclusive recent focus of the international debate on cereals – a focus replicated in domestic and regional policies on cereals – is too narrow to tackle the livelihood problems of smallholder farmers and can be counterproductive as a measure to increase food security and promote agricultural development.

- **Public policies for reducing food price volatility need to be negotiated and articulated with the active involvement of organizations of farmers, consumers and market intermediaries.** Policies aimed at reducing food price volatility must reflect a social, economic and political “compromise” at the national and regional levels that accommodates the needs of both producers and consumers. The leading role has to be played by public authorities, while the private-sector farmers’ organizations, and market intermediaries, together with associations of consumers, must play an active and supportive role in the design and implementation of these policies.

Questions to guide the round-table discussion:

- How have volatile international food prices been transmitted to domestic markets and to smallholder farmers over the past two years?
- How is price volatility affecting the investment decisions of rural producers, and what is the impact of price volatility on household livelihoods and food security?
- What successful measures have been taken by governments, farmers’ organizations and the private sector to reduce price volatility on domestic markets or to reduce its negative effects on producers and trigger investments by smallholder farmers?
- What policies and investment programmes can be implemented at the global, regional, national and local levels to reduce food price volatility?
- What processes should be put in place to promote negotiated policies with the leadership of public authorities and the pro-active involvement of organizations of poor rural producers, market intermediaries, other private sector stakeholders, and urban and rural consumers?

Annexes

Appendix 1:

Long-term trends of international food prices (1960-2008)

Appendix 2:

Main factors underlying the rise and peak of world prices
(2006-2008)

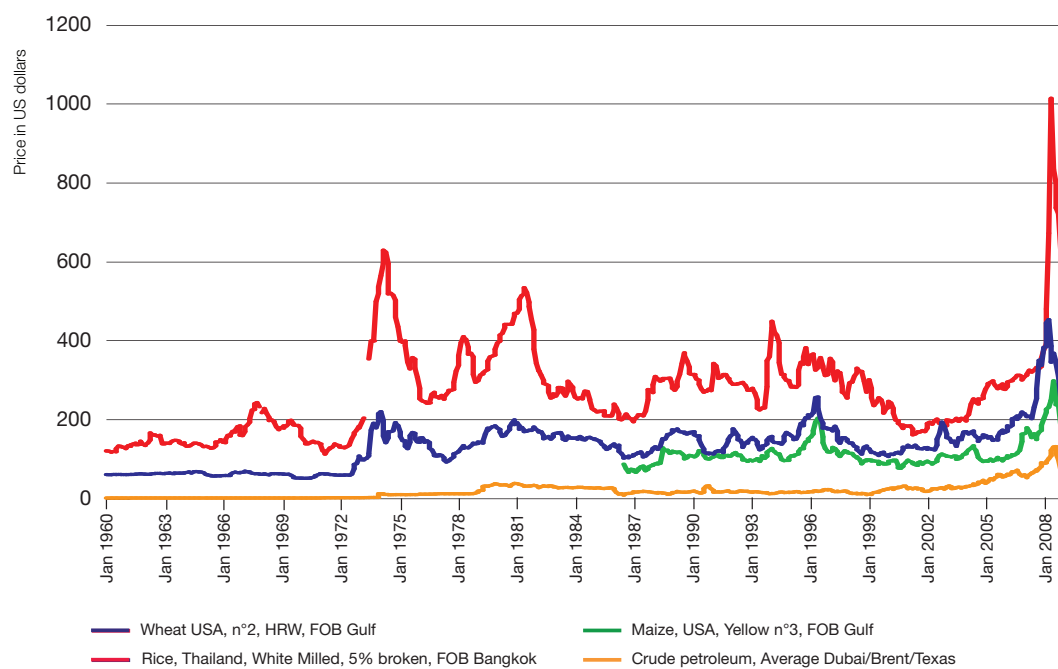
Appendix 3:

Internal instability of Sahelian and Malagasy domestic markets

Appendix 1:

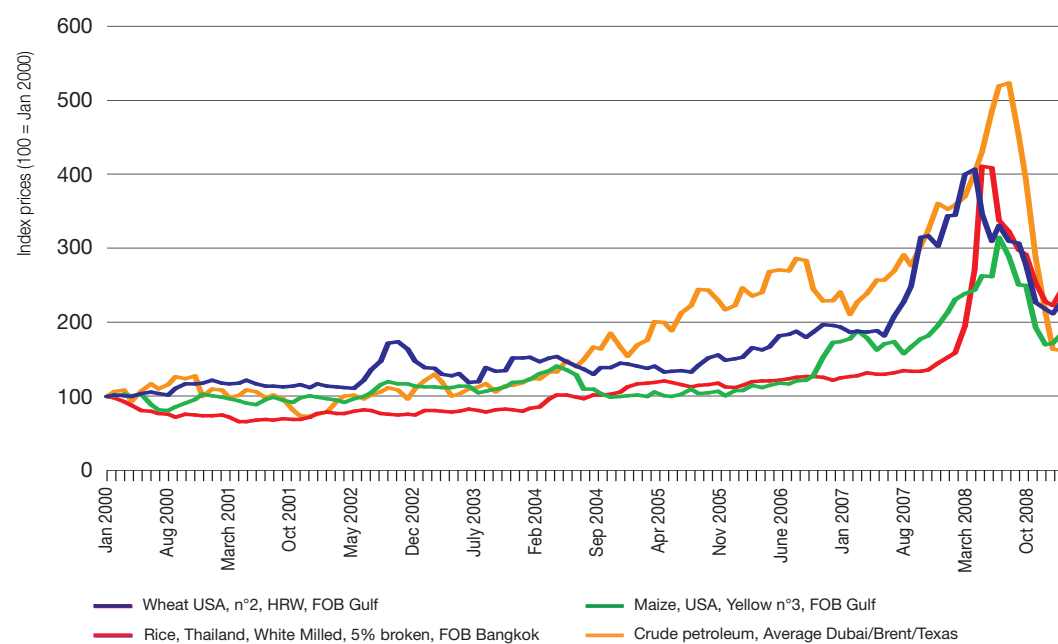
Long-term trends of international food prices (1960-2008)

Graph 1: International commodity and oil prices (1960-2008)



Source: Elaboration Bureau Issala on UNCTAD and FAO data

Graph 2: Commodity and oil index prices (2000-2009)



Source: Elaboration Bureau Issala on UNCTAD and FAO data

Appendix 2:

Main factors underlying the rise and peak of world prices (2006-2008)

The role of public policy reforms

Agricultural and trade reform policies of the large exporting countries. The 1980s were marked by major production surpluses exported to international markets by the principal producers/exporters. In part, these exports were boosted by agricultural support policies, especially in Europe and the United States, but also in Asia (rice) and the former Union of Soviet Socialist Republics (USSR). The United States and what was then the European Community used different support instruments to pursue a twofold objective: (i) to regulate their domestic markets, which were fairly well protected; and (ii) to conquer a market share in countries with deficits. Asian countries, whose food systems are based on rice, used the global market as a variable of adjustment on domestic markets (notably India and China). Others claimed to be structural exporters (Thailand and Viet Nam). Most major producing countries "exported" their instability onto international markets by dumping surplus production that could otherwise destabilize their domestic markets and depress prices.

The reforms introduced in the 1990s aimed for a return to agricultural market equilibrium by means of a cutback in public subsidies: reduction of institutional prices, supply regulation, fewer public interventions in the markets and an increase in direct payments. Such action was motivated by (i) the cost to the consumer and taxpayers; and (ii) the mandatory engagements undertaken in the Marrakesh Agreement (World Trade Organization), notably the progressive reduction of subsidies having distortionary effects on trade. In the case of the former USSR, the upheaval caused by the dissolution of the Union severely affected the production and marketing structures.

Liberalization of agricultural and food economies in the developing countries. The economic and financial adjustments begun in the early 1980s resulted in a withdrawal of the state from the agricultural sector, notably in Latin America and Africa. This withdrawal was accompanied by full trade liberalization, conducted on a unilateral basis, in the context of negotiations with the international financial institutions, and in a global context marked by the persistence of protectionist policies in the markets for foodstuffs and agricultural products. The outcome was, on the one hand, significant liberalization, accelerated in the markets of many developing countries and, on the other, a slower and much less pronounced liberalization in the developed countries.

Preference for imported goods. In a situation of international prices depressed by the public policy support of developed countries with production surpluses, the liberalization of imports in developing countries resulted in a preference for imported goods. Rapid urbanization and the increase in urban poverty prompted a number of governments to prefer international suppliers. This facilitated food access for poor urban people.

Dismantling of instruments for public policy interventions. The dismantling of public policy instruments in numerous LDCs, particularly in Africa, focused on eliminating instruments supporting value chain developments. Public instruments for policy interventions were limited to warning systems, food destocking, and food aid to prevent and control food crises.

Regulated agricultural markets. In most Asian countries the aim of achieving food self-sufficiency, the struggle against rural poverty and the stability of prices for consumers have led to a continuing high level of state intervention. In India, the state has maintained minimum price supports, guaranteeing profitable prices for producers, and ensuring the regulation of consumer

prices, a high level of control at the borders, storage facilities, and subsidized inputs. Indonesia also pursues an active intervention policy on rice (e.g. price supports for production, market interventions, control and restrictions of imports). In the same way, Bangladesh has conserved a strong tradition of public intervention in the food products market, in spite of the liberalization of access to raw materials. In these countries, state procurement is aimed simultaneously at regulating the markets, guaranteeing revenue for the producers, and developing food programmes for the poorest populations.

Food supply trends

The 1990s were characterized by a significant deceleration in the growth of world rice production (1.7 per cent per year compared with 2.5 per cent during the previous decade) and wheat (0.7 per cent compared with 1.8 per cent). However, corn saw a higher increase in growth (2.7 per cent in the 1990s compared with 0.9 per cent in the previous decade). These trends continued in the early 2000s. Over the last two years a succession of poor cereal harvests (due to climatic shocks) has negatively affected the overall production of world cereal exporters.

Another factor on the supply side that had a significant impact on the markets recently was the gradual reduction in the level of stocks, mainly of cereals, from the mid-1990s onwards. Indeed, since the previous high-price event in 1995, global stock levels have on average declined by 3.4 per cent per year.²¹

Changing demand

Recent years have witnessed structural changes in the composition of demand for cereals. The emerging biofuels market was a new and significant source of demand for some agricultural commodities such as sugar, maize, cassava, oilseeds and palm oil. These commodities, predominantly used as food, have over the last two years been grown increasingly as feedstock for producing biofuels. Significant crude oil price rises allow them to become viable substitutes in certain important countries that have the capacity to use them. In a recent study (Alex Evans - *The Feeding of the Nine Billion: Global Food Security for the 21st Century* – a Chatham House Report, January 2009), it is claimed that the demand for biofuels has been the single most significant driver of higher prices. According to Evans, data suggest that while global demand for cereals is increasing, this is only true as long as biofuels are included – and that once they are taken out, the growth in global demand is actually slowing down. For example, data from Goldman Sachs show that while historically the growth in global demand for food crops has been around 1.5 per cent a year, this now stands at 2.0 per cent (and is likely to rise to 2.6 per cent within a decade). Yet World Bank data show that with biofuels excluded, global grain demand increased by only 1.3 per cent a year between 2000 and 2007 – and in East Asia (including China) grain demand rose by just 0.3 per cent a year over the same period. The Goldman Sachs analysis also suggests that biofuels have been the principal driver of rising food prices in recent years.

²¹ See "Growing demand on agriculture and rising prices of commodities" – paper prepared for the round table organized during the IFAD Governing Council in 2008.

Appendix 3:

Internal instability of Sahelian and Malagasy domestic markets

This analysis compares domestic price volatility (consumer and producer prices) with the food price volatility on global markets over three time periods (1992-1999, 2000-2003 and 2004-2008). In order to measure price volatility, the coefficient of variation (the ratio of the standard deviation to the average value of a series) was calculated on the series of prices over the three periods. This coefficient is 20 per cent for imported rice in the first period (1992-1999), lower than that of consumer prices for locally produced cereals in Niger (where it reaches 48 per cent), Mali, and Senegal. In the early 2000s, at 6.7 per cent the coefficient of variation is much lower in the world market for rice, while it is still over 25 per cent in the market for local cereals at both the consumer and producer levels. Finally, from 2004 onwards, significant variability can be observed in international rice prices (51 per cent), while the variability for locally produced cereals fluctuated between 20 per cent and 26 per cent for consumers, and between 26 per cent and 39 per cent for producers (except for the case of Malian rice). This indicates that there has been an incomplete transmission of the rise in prices and a partial disconnection of domestic price trends from those observed on international markets.

Table 1
Comparison of monthly price instability on domestic and international markets

| Zone | Consumer prices | 1992-1999 | 2000-2003 | 2004-2008 |
|--------------|-----------------|-----------|-----------|-----------|
| | | | | |
| World market | Rice A1 Super | 20.1 | 6.7 | 51.0 |
| Madagascar | Local rice | 36.3 | 10.3 | 20.7 |
| Mali | Local rice | 17.1 | 4.6 | 9.7 |
| Senegal | Imported rice | 30.2 | 5.9 | 24.2 |
| Mali | Sorghum | 28.1 | 25.8 | 23.8 |
| Niger | Millet | 48.5 | 28.5 | 25.0 |
| Senegal | Millet | 27.2 | 25.9 | 20.1 |

Source: Elaboration Bureau Issala on RESIMAO and UNCTAD data

Table 2
Comparison of instability of monthly producer prices and international market prices

| Zone | Production prices | 1992-1999 | 2000-2003 | 2004-2008 |
|--------------|-------------------|-----------|-----------|-----------|
| | | | | |
| World market | Rice A1 Super | 20.1 | 6.7 | 51.0 |
| Burkina Faso | Maize | 33.2 | 31.4 | 37.0 |
| Burkina Faso | Sorghum | 35.6 | 29.9 | 39.1 |
| Mali | Maize | 38.1 | 38.3 | 32.2 |
| Mali | Rice | 21.2 | 10.2 | 14.7 |
| Senegal | Millet | 35.0 | 26.3 | 25.9 |

Source: Elaboration Bureau Issala on RESIMAO and UNCTAD data

The Growing Demand for Land - Risks and Opportunities for Smallholder Farmers

Discussion Paper prepared for the Round Table organized during the Thirty-second session of IFAD's Governing Council, 18 February 2009

Prepared by S. Haralambous, H. Liversage and M. Romano

The opinions expressed in this paper are those of the authors and do not necessarily reflect official views or policies of the International Fund for Agricultural Development, except as explicitly stated.

Acronyms

| | |
|------|---|
| FAO | Food and Agriculture Organization of the United Nations |
| OECD | Organisation for Economic Co-operation and Development |
| WFP | World Food Programme |

I. Overview

In many countries of Africa, Asia and South America, over the past few years there has been a rapid increase in the demand by foreign and domestic investors for land suitable for agriculture. Large-scale investments in land, which are typically in the range of tens of thousands to hundreds of thousands of hectares,²² are either for agrofuel production or – more recently – outsourced food production.

This new demand from outsiders is generating financial resources, infrastructure and technology, but also increased pressures and competition over land and water in rural areas, where the local population is still growing²³ and where the average size of family farms is declining. Such pressures and competition may disproportionately affect poor rural people whose livelihoods depend on agriculture, livestock and forests, eroding their already precarious ability to gain and maintain access to natural resources.

The choice of approaches taken by local and national governments in considering this demand is critical for the prospects of rural communities. Massive foreign investments in rural areas can be an opportunity for development. At the same time, it might well be that direct acquisition of land by outsiders is not necessary for the products – food and feed – that this demand aims to secure. If the price for these products is remunerative, then the supply can be organized by the current owners or users of the land, most of whom are smallholder farmers. Public investments in infrastructure and other public goods, private investment in processing industries and financial services and organization of producers and local communities can result in win-win situations. Such situations can maximize opportunities in terms of, inter alia, increased agricultural income, new employment opportunities and overall rural development, while minimizing risks related to the alienation of land rights and the marginalization of poor rural people. In this connection, public policy choices and, in particular, the systematic and inclusive consultation of local communities and farmers' organizations have a critical role to play and could make all the difference.

The present paper aims to provide background information for the discussion at the Round Table on The Growing Demand for Land – Risks and Opportunities for Smallholder Farmers, organized in conjunction with the thirty-second session of IFAD's Governing Council. It provides an overview of the emerging phenomenon,²⁴ its trends and drivers. It also reflects on the challenges associated with these trends and on their possible implications for rural communities, in terms of both risks and opportunities. Finally, it suggests some options for good practices that could enable smallholder farmers and rural communities – in particular, poorer people – to benefit from the growing global demand for food, feed and agrofuel and to partner with private and public stakeholders in the food and energy sectors without alienating their rights to and control over their land and territories. The paper closes with a set of questions to guide the round-table discussions.

II. Growing Demand for Land in Developing Countries by Outside Investors

II.1 Context, Drivers and Trends

The demand for land for agrofuel production has increased significantly over the past few years. A number of countries dependent on oil imports have established targets for the mandatory blending of traditional transport fuels with biodiesel and bioethanol. Developing countries,

22 To give a sense of the proportions involved, there are 23 low-income food-deficit countries (LIFDCs) with less than 700,000 hectares of land classified as arable or under permanent crops. More than half (58 per cent) of the total of 81 LIFDCs have less than 3 million hectares of land that is arable or under permanent crops (FAOSTAT data for 2005). In sub-Saharan Africa, 98 per cent of agricultural holdings have less than 10 hectares, and in Asia 88 per cent have less than 2 hectares.

23 According to the United Nations Department of Economic and Social Affairs (UNDESA), the rural population of sub-Saharan African countries will continue to grow until 2045, reaching a maximum that is expected to be between 50 per cent and 80 per cent higher than the rural population of 2000.

24 Most of the information provided is from media reports.

dependent on oil imports and in search of new profitable markets, have increasingly engaged in agrofuel production for both domestic use and export. Attracted by this substantial demand and market, domestic and foreign investors – mainly from the private sector and OECD member countries – are targeting vast tracts of land to produce agrofuels in developing countries, which generally have a comparative advantage in such production, for example, because of low labour and land costs and, in some cases, land availability.

The second main driver of this global demand for land in developing countries is the recent food crisis, combined with the financial crisis. In response to the soaring food prices, 25 countries²⁵ imposed export bans or restrictions in 2008 so as to safeguard their food security. Similarly, in order to guarantee the food security of their own populations, a number of food-importing nations started to purchase or lease land in developing countries, sometimes through sovereign wealth funds, to actually outsource their own food production. Through this alternative and long-term strategy, they aim to secure food supplies at lower costs, reduce their exposure to high prices and uncertain supplies, and overcome protectionist barriers.

Negotiations between investing and recipient countries are increasingly being conducted to secure land concessions in exchange for oil contracts, soft loans, infrastructure development and development funds, thereby creating favourable conditions for private investors to step in. Several countries are amending national laws to assist domestic investment companies in buying land overseas – including through provision of loans – or to attract foreign investors to purchase land within the country.²⁶ Recipient countries have generally welcomed or even sought out such investments in land, which would channel capital flows into rural areas and the agricultural sector, together with technology, inputs and infrastructure.

II.2 Large-scale Investments in Land for Agrofuel Production

In response to market and policy signals, large-scale commercial agro-fuel production – whether for internal use or export – is rapidly expanding in all developing regions.²⁷ Land investors seem mostly to be outsiders to the local milieu, mainly from European countries. Brazil is also a major investor in African, Caribbean and Pacific countries.²⁸ In China and India investors are national firms or joint ventures between national and foreign companies.

Existing documentation does not allow for a full assessment of the magnitude and conditions of the investments involved – e.g. area of land, scale of investment, contractual arrangements with local smallholder farmers and communities, if any. Moreover, most investments are still in a planning and negotiation phase or at an early stage of implementation, and no mechanisms are in place to monitor developments.

Investments in land are pursued by public and/or private companies, sometimes through joint share-holding arrangements. In some cases, local communities are involved through contract farming/out-grower schemes, as providers of wage labour and/or by becoming themselves shareholders in a joint venture. From the information available, it seems that the scale of investments by private companies is quite substantial in terms of land acquired and capital invested. Land requests for agrofuel production can range between 5,000 and 50,000 hectares; in some cases, requests are for 100,000 hectares or even more.

The United Republic of Tanzania, for example, is attracting a number of national and multinational companies from Europe, facilitated by the United Republic of Tanzania Investment Centre, which advises on investment opportunities in the country. According to some reports,²⁹ Sun Biofuels Tanzania acquired 9,000 hectares of land to plant *Jatropha* in Kisarawe District,

25 Demeke M. et al., 2008, p. 6.

26 Sharma D., 2008.

27 Major countries involved include Ethiopia, Ghana, Mozambique, South Africa, Swaziland, the United Republic of Tanzania and Zambia (Africa); Cambodia, China, India, Indonesia, Malaysia and Papua New Guinea (Asia and the Pacific); and Brazil and Colombia (Latin America).

28 Action Aid, 2008, p. 11.

29 Cotula L., et al., 2008, pp. 37, 46; Kamanga K.C., 2008, pp. 52-53; OXFAM International, 2008, p.22; Knaup H., 2008.

Coast Region, with the approval of the village assembly. Compensation is envisaged for people losing their land. However, the project has stalled because of allegations that the villagers were not consulted and their compensation was not adequate.³⁰ The UK-based CAMS group, operating locally as CAMS Agri-Energy Tanzania, was reported to have invested between US\$ 450 million and US\$ 600 million and acquired 45,000 hectares of untended land in Handeni and Bagamoyo Districts.³¹ According to the media report, farmers will be provided with seeds and inputs to grow sweet sorghum, will keep the grain for food and will not be displaced.

In Mozambique, according to the World Bank, applications for land by foreign investors amount to more than twice the total area of land cultivated in the country.³² Earlier last year, President Armando Guebuza declared, "We do not want the production of biofuel to disinherit Mozambicans from their land or to have a negative impact on food production."³³

Local media in the Philippines reported that according to the Department of Agriculture, the Spanish biodiesel company Bionor Transformación S.A. is to invest US\$ 200 million to develop at least 100,000 hectares of land under *Jatropha*.³⁴ On Mindanao, Sarangani Bio Corporation, a consortium of investors from Japan, Republic of Korea and the Philippines, plans to develop 50,000 hectares under the same crop.³⁵

II.3 Outsourcing Food Production in Developing Countries

The countries outsourcing food production have a limited amount of arable land to meet their food security needs through domestic agricultural production and are increasingly reliant on food imports. Recipient countries are often selected on the basis of geographical or cultural proximity,³⁶ and include Madagascar, Mozambique, The Sudan; Cambodia, Indonesia, the Lao People's Democratic Republic, Myanmar, Pakistan, the Philippines; Paraguay, Uruguay; and Central Asian Republics. Major investors are reported to come from Gulf countries, transition economies such as China, and some OECD member countries such as Japan and Republic of Korea.

Harsh climatic conditions, poor soils and scarce land and water – combined with economic and demographic growth, a large community of migrant workers, the recent food price crisis and consequent increasing import bills and inflation rates – are impressing upon the Gulf States the need to take appropriate measures to secure their food supplies. One approach can be through acquisition of land abroad in exchange for capital and oil. Important partner countries are reported to include The Sudan and Pakistan, and others in Southeast Asia, Central Asia, Eastern Europe and Africa.

The Government of Pakistan is reportedly introducing some measures to attract investments, such as "tax exemptions, duty free equipment imports and 100 percent land ownership in specialised free zones in its agriculture, livestock and dairy sectors".³⁷ According to a media report, a group of public and private firms from the United Arab Emirates has recently invested in the Baluchistan Province of Pakistan to begin mechanized farming under irrigation.³⁸ Additional investments in agriculture are reported to be under discussion.

Saudi Arabia's private company Hail Agricultural Development Company is reported to have invested in the north of Karthoum.³⁹ The BinLadin Group is reportedly planning to make large investments to grow basmati rice in the Indonesian islands of Papua New Guinea, Sulawesi and

30 Ibidem.

31 Reuters, 2008.

32 Songwe V., Deininger K., 2009, p.1.

33 Mozambique News Agency, 2008.

34 Palawan Sun, 2008.

35 Renewable Energy Magazine, 2008.

36 Woertz E. et al., 2008, p. 9.

37 Khan S., 2008.

38 Ibidem.

39 Grain, 2008, p.7; Wallis W. et al., 2009.

Western Java.⁴⁰ According to Grain, "The Saudi rice venture is part of a larger agricultural development project involving a total of 1.6 million hectares for not only rice but also maize, sorghum, soya beans and sugar cane, much of which will be converted to biofuels."⁴¹ In Ethiopia, 240 Saudi companies that have obtained investment licences are expected to invest US\$ 2.5 billion in unused agricultural land to grow cereals.⁴²

Qatar and Kuwait are reportedly negotiating land concessions in Cambodia in exchange for investments in agricultural technology and infrastructure development.⁴³

About 15 Indian companies, led by the public-sector State Trading Corporation, are reported to be leasing 10,000 hectares of productive farmlands in Brazil, Paraguay and Uruguay to cultivate soybeans and oilseeds.⁴⁴ Other private agribusiness companies and public corporations are leasing farmland in Myanmar in exchange for funds to upgrade the port infrastructure.⁴⁵

A number of media sources covered the news that the firm of the Republic of Korea Daewoo is negotiating the lease of 1.3 million hectares of land in Western Madagascar to grow 5 million tons of maize by 2023 and produce palm oil from an additional 120,000 hectares.⁴⁶ The possibility of such a deal created a tremendous backlash in the country, with demonstrations and violence. An official press release denied that the deal had been sealed.⁴⁷

The US Jarch Management Group is reported to have gained leasehold rights to 400,000 hectares of fertile land in Southern Sudan.⁴⁸

III. The Local Context: Land Availability and Use

Secure access to land is critical for the millions of rural people relying on agriculture and related activities for their livelihoods. However, poor people's access to land is limited and insecure; access by some groups – such as women and indigenous populations – is even more precarious.

III.1 Limited Availability of Land

The growing demand for land in rural areas of developing countries is taking place in a context of increasing land scarcity and land degradation, mainly due to demographic pressure and the effects of climate change.

According to FAO data, out of the world's total 13.5 billion hectares of land, the amount that is potentially available for expanded rainfed crop production is estimated to be about 2 billion hectares, 80 per cent of which is located in sub Saharan Africa (especially Western and Central Africa) and in South America.⁴⁹ Of this "global land reserve", it is estimated that at least 500 million hectares must remain protected from agriculture for environmental reasons.⁵⁰ Half of these cultivable land reserves are found in just seven developing countries: Angola, the Democratic Republic of the Congo, The Sudan; and Argentina, the Plurinational State of Bolivia, Brazil and Colombia.⁵¹ Land availability also needs to be understood in relation to population increase. In fact, while FAO data show that in Africa, between 1960 and 2000, the amount of arable land under cultivation rose, the population engaging in agriculture tripled, thus reducing the land-to-population-ratio.⁵² For example, in Ethiopia, Kenya and Zambia – which are among the developing countries particularly attractive to potential investors – this ratio is about half as

40 Grain, *ibidem*; Zeenews.com, 2008.

41 Grain, *ibidem*.

42 Chebsi M., 2008.

43 Minder R., 2008.

44 Sharma D., *op.cit.*

45 Grain, 2008, pp. 5-6.

46 Bokhari A., 2008; Ryall J. and Pflanz M., 2009; Blas J., 2008a; Borger J., 2009.

47 *Economie*, 21 November 2008; C. Oliver, 2008.

48 Blas J. and Wallis W., 2009; Wallis W. et al., 2009.

49 FAO, 2008, p.60.

50 Griffon, M., 2006, p. 363.

51 Fischer G. et al., 2001, p.21.

52 FAOStat database; Jayne T. S., et al., 2006, p. 104.

large as it was in the 1960s.⁵³ In Ethiopia, projections indicate that the rural population will grow from 79 million in 2006 to 183.4 million in 2050, in Madagascar from 18.6 million to 44.4 million, and in United Republic of Tanzania from 38.5 million to 85.1 million.⁵⁴

Landlessness and land fragmentation are increasing worldwide. For example, in India, average landholding size fell from 2.6 hectares in 1960 to 1.4 hectares in 2000 and is still falling.⁵⁵ In Cambodia, rural landlessness rose from 13 per cent in 1997 to 20 per cent in 2004, and analysts believe that the current figure is close to 30 per cent.⁵⁶ Similarly, in East and Southern Africa, cultivable land per capita has halved over the last generation, and in a number of countries, the average cultivated area amounts to less than 0.3 hectares per capita.⁵⁷

Land in the rural areas of developing countries is limited not only in quantity but also in quality, which reduces its productive potential. According to FAO, land degradation is increasing in severity and extent in many parts of the world, involving more than 20 per cent of all cultivated areas, 30 per cent of forests and 10 per cent of grassland. By 2020, an estimated 135 million people may be driven from their land as a result of soil degradation, with 60 million in sub-Saharan Africa alone.

While land is becoming increasingly scarce for smallholder farmers, pastoralists and indigenous peoples, demand for agrofuels and outsourced food production is increasing, with agrofuel production expected to expand significantly over the next few decades. According to the International Energy Agency (IEA), in 2006 about 14 million hectares of land – approximately 1 per cent of the arable land currently available worldwide – was used for the production of agrofuels.⁵⁸ FAO projects that these figures will increase between 2 and 3.5 per cent by 2030.⁵⁹

III.2 The Case of Marginal, “Underutilized” and “Unused” Lands

It is often argued that outside investments – especially for agrofuel production, but not only – will be in lands that are marginal, “underutilized” or “unused”. However, such lands are often important for the livelihoods of poor rural communities. For example, they are used for grazing; livestock transit routes; collection of fuelwood, biomass, wild fruits and nuts, medicinal plants and natural products; and access to water sources. Such lands can contribute up to a quarter of the income of poor households, with the poorest households being most dependent on them.⁶⁰ The role of this land becomes even more crucial in times or conditions of shocks (e.g. crop failure, HIV/AIDS) and for the most vulnerable groups. Furthermore, the tenure status of this land may be very complex, with the state asserting land ownership but exercising little control at local level, and local groups claiming rights based on local customary tenure systems that may lack legally enforceable status. In such a context, outside demand for land may further undermine the land rights of rural communities.

IV. Risks and Opportunities for Smallholder Farmers and Rural Communities

Large-scale foreign investments for agrofuel and outsourced food production could bring a number of opportunities for rural communities. However, they could also carry a number of risks that would undermine their livelihoods.

IV.1 Potential Risks

There is increasing concern that such investments could disproportionately affect rural communities, deprive them of their main asset, land, aggravate environmental problems through

53 Jayne T. S. et al., *ibidem*.

54 UNDESA, 2007.

55 World Bank, 2007, p. 29.

56 Guttal S., 2006.

57 Jayne T. S. et al., *op.cit.*, p.104.

58 International Energy Agency, 2006, p. 8.

59 Rossi A., Lambrou Y., 2008, p. 9; Abassian A., 2007.

60 OXFAM International, *op.cit.*, p. 21.

overexploitation of land and spur conflicts.⁶¹ Victoria Tauli-Corpuz, Chairperson of the United Nations Permanent Forum on Indigenous Issues, estimates that the land rights of 60 million indigenous people worldwide may be at risk as a result of large-scale agrofuel expansion.

Concern has also been raised about the potential impact on the food security of rural populations – who are usually net buyers of food – and investment-receiving countries, most of which have serious national food concerns of their own. In fact, most of these target countries are themselves net food importers and/or food aid recipients. For instance, Madagascar and The Sudan still receive food aid relief from the World Food Programme. Several months ago, Cambodia received US\$ 35 million in food assistance from the Asian Development Bank.

The limited information and empirical research available to date, and the fact that most of these investments are still at an early stage, allow only for preliminary considerations about the potential and anticipated adverse impacts on poor rural people and communities. Some insights can also be drawn from analogous experiences.

In Central America, for example, during the coffee boom of the late nineteenth century, large-scale land acquisition and privatization of previously customary lands led to rapid and massive land concentration, expropriation and – in countries such as Guatemala and El Salvador – even civil war.⁶² FAO reports that in the Philippines, because of the introduction of sugar cane in the Southern Bukidnon Province, many households lost their access to land.⁶³ More recently, “large land transfers to investors in Cambodia and Kenya failed to help modernize agriculture and instead generated conflict”.⁶⁴

Local communities are not always adequately informed about land concessions made to private companies.⁶⁵ In Indonesia, for example, oil palm plantation is expanding rapidly and aggressively, causing massive deforestation. Especially in West Kalimantan, it is alleged that some land acquisitions did not take into consideration the customary rights regarding land and were made without the consent of local people.⁶⁶

Large-scale investments for production of agrofuel feedstock have led to increased land concentration and even to forced evictions. In Colombia, Afro-Colombian communities have been evicted from their land in the north-western region and along the Pacific coast to make way for oil palm plantation.⁶⁷ Some farmers refusing to sell or relinquish their holdings were reported to have been murdered.⁶⁸ In Guatemala, the expansion of land under sugar cane and oil palm cultivation has been accompanied by concentration of land ownership.⁶⁹ When landowners in Fray Bartolomé de Las Casas in Alta Verapaz reorganized their farms to be sold to some agrofuel investors, tenant farmers who had been previously allowed to cultivate small plots of land to meet their household food needs were reportedly displaced.⁷⁰

Especially in contexts of land scarcity, large investments in land may induce land use changes to the detriment of food security, biodiversity and the environment. High-quality land may be diverted from local food production, livestock grazing, and income-generating activities previously carried out by rural communities. As one consequence, smallholders may have no other option but to seek a living on marginal lands. These lands could, in turn, become subject to increased pressure, exploitation, degradation and conflict.⁷¹ In the Alipe village located in the White Volta river basin (Ghana), a project for *Jatropha* production was interrupted as community

61 Media and advocacy groups define this phenomenon as “land grab”, a term first used by the Rights and Resources Initiative, a global coalition to advance forest tenure, policy and market reforms.

62 Songwe V., Deininger K., op.cit., p. 2.

63 FAO, 2008, p. 83.

64 Songwe V., Deininger K., op.cit, p.2.

65 Cotula L., op.cit., p. 40; Eide A., 2008, p. 16; Grain, 2007, p. 29.

66 Cotula L., ibidem, pp. 40-42; Grain, ibidem.

67 Cotula L., ibidem, p. 43; Monahan J., 2008; Balch O. and Carrol R., 2007.

68 Monahan J., ibidem; Balch O. and Carrol R., ibidem.

69 Action Aid, op.cit., p. 15.

70 Ibidem, p. 16.

71 Eide A., op.cit., p. 17.

members realized it was causing the loss of local shea nut trees.⁷² These trees produce a valuable commodity used internationally in soaps and cosmetics and locally as a medical relief, for cooking, and as a source of income for women.⁷³ In the southern province of Gaza, the Government of Mozambique and the London-based Central African Mining and Exploration Company signed a contract to invest US\$ 510 million to grow sugar cane on 30,000 hectares of land. The project attracted criticism as the allocated land had already allegedly been promised to 1,000 previously displaced families, and there were concerns that water resources would be diverted from other agricultural uses.⁷⁴

Land prices are likely to increase, thus threatening poor people's access to land by causing or accelerating individualization of land rights previously held in common. Those who have better access to financial resources are likely to gain and secure their access to land, whereas the poorer and more marginalized groups may be excluded from land or have their rights eroded.⁷⁵

IV.2 Potential Benefits and Opportunities

Increased investments in food and agofuel production flowing to rural areas of developing countries could present important benefits and opportunities for poor rural communities. Such investments have the potential to boost the agricultural sector, promote its modernization and stimulate rural economies by the development of processing industries; livelihood diversification and employment generation; increased agricultural productivity through the provision of improved seed varieties, know-how and new technologies; lowering of production costs and higher returns for the farmers; infrastructure building such as roads and ports which facilitate access to reliable markets; and social infrastructure such as schools, health centres, wells and water services. In order for these opportunities and benefits to materialize, the role of government and public policies is critical, including for the development of mechanisms to link outside investors and local communities in a sustainable and mutually beneficial way.

There is no doubt that private investments – within a conducive policy environment – have brought benefits to local producers. In the 1960s, the Government of Thailand assisted farmers in introducing new crops with the help of private firms that provided a package of services such as extension, credit and marketing support, along with new seeds.⁷⁶ Similarly, private investors, in collaboration with the Government of Madagascar, achieved pest control in rice through new inputs and know-how, farmer awareness, and training of agricultural extension staff, all of which led to higher yields and production.⁷⁷ Particularly successful is the case of Pepsi Foods, which entered the State of Punjab in India in 1989 for production of tomato through contract farming. The company introduced new technologies and seed varieties, accompanied by modern farming practices.⁷⁸ Region-specific research was developed, including adaptation of imported varieties of tomato to the local conditions. The company also provided extension services and training. Contract farming production of tomato has significantly increased employment opportunities (including for women) in the areas involved, thanks to the mechanization of sowing and harvesting operations.⁷⁹ Encouraged by the results, Pepsi Foods has been successfully replicating the model in food grains (basmati rice), spices (chillies), oilseeds (groundnut) and other vegetable crops (potato).

Experience is increasingly showing that partnerships between external investors and small-scale rural producers, within a conducive policy framework, can contribute to poverty reduction, agriculture-led development and economic growth. Provided they are developed with a pro-poor,

72 Action Aid, *op.cit.*, p.17.

73 *Ibidem.*

74 Cotula L., *op.cit.*, pp.35-36.

75 *Ibidem*, p.28, Action Aid, *op.cit.*, *passim*.

76 Singh S., 2001, pp.35-36.

77 *Ibidem*, p.36.

78 *Ibidem*, pp.38-43; SPICE, 2003.

79 Singh S., *ibidem*, p.42.

sustainable and win-win approach that takes into consideration the needs, capabilities and constraints of smallholder farmers, these partnerships can create valuable synergies through knowledge and risk sharing, economies of scale, and resource pooling. Contract farming and out-grower schemes are the most common models to date of such partnerships. They enable smallholder farmers to gain access to extension and financial services, inputs, improved technologies and a reliable market, which are often out of their reach, while investors can acquire a guaranteed supply of produce and overcome land constraints.

As previously mentioned, public policies play a key role in enabling small-scale farmers to engage with major investors in ways that can benefit them. This is the case, for instance, of the Social Fuel Stamp scheme that is part of Brazil's National Biodiesel Production and Use Program (PNPB). Companies purchasing from 10 to 50 per cent of their feedstocks from small-scale family farms in the poorest regions receive a "social label", partial or total tax exemption and the guarantee that their product will be purchased by the state-controlled

Community-Investor Partnerships

In **India**, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) supports a public-private consortium aimed at testing and growing sweet sorghum. The private Indian company Rusni Distilleries contracted about 3,200 small-scale farmers growing sweet sorghum on approximately 2 hectares of land each to meet its target for ethanol production. Kaveri Seed Company provides high-quality seeds to the farmers, while ICRISAT contributes research inputs and technical advice. *Source: ICRISAT*

Again in **India**, since 2005, the joint venture formed by the UK-based D1-BP Fuel Crops and the Indian Williamson Magor has been growing *Jatropha* on 62,000 hectares of uncultivated or waste land, with a further 50,000 hectares targeted for use by 2009. Out-growers agreed on a performance-based buy-back scheme and are provided with technical services and at-cost supply seedlings. Intercropping with food crops is encouraged for food security. *Source: Global Exchange for Social Investment (GEXSI)*

In the **Lao People's Democratic Republic**, the Lao-Japanese joint venture Arrowny Corporation produces organic Japanese rice for export to Japanese people living in South-East Asia. With the approval of the Ministry of Agriculture and Forestry of the Lao People's Democratic Republic, the company plans to farm 18,500 hectares of land across the country through contract farming. The joint venture provides small-scale farmers with a premium price for growing the rice, in-kind credit for high-yield seeds, organic fertilizer and technical assistance. *Source: Asian Development Bank Institute*

In **Mali**, Mali Biocarburant SA – a company partly financed by the Netherlands – is producing biodiesel from *Jatropha Curcas* without acquiring land and developing plantations, for the national market. Small-scale farmers are shareholders in the company. They supply the *Jatropha* nuts to the Union Locale des Sociétés Coopératives des Producteurs de Pourghere a Koulikoro (ULSPP), a farmers' association which extracts the oil and sells it to Mali Biocarburant. The seed cake is sold to the farmers to improve soil fertility. Mali Biocarburant then processes the oil into biodiesel and sells the by-product (glycerol) to a women's cooperative to produce soap. The private company Interagro purchases the fuel and then distributes it. This biofuel model integrates *Jatropha* production into the smallholder farming system, without creating competition over land uses for food and fuel production, by promoting intercropping with food crops or growing *Jatropha* on unproductive land (e.g. along the roadside). Land rights of the people could even be potentially strengthened as – according Malian customary law – land planted with trees belongs to the person or community who planted the trees. Farmers not only earn revenue through the sale of the nuts, but also through dividends and increased share value. *Source: Mali Biocarburant*

In the **United Republic of Tanzania**, the Tanzanian FELISA company - funded by equity contributions mostly from Belgian shareholdings - targets 10,000 hectares of land for oil palm plantation. To date it has acquired 4,358 hectares, set up a large oil palm nursery (42,000 seedlings), installed processing equipment and mobilized 990 out-grower farmers who were provided with 10,000 seedlings at no cost and trained in palm husbandry. The farmers are under no obligation to sell only to FELISA, and the price is negotiable; however, the contractual agreement may bind them to supply a certain amount of a crop of a specified quality over a given period of time. *Source: FAO and Policy Innovation Systems for Clean Energy Security (PISCES)*

company PETROBRAS. Companies provide technical assistance, extension services and agricultural training to the farmers. During negotiations, the presence of a rural union representative must be guaranteed.⁸⁰

The above examples illustrate that, ultimately, what investors actually need in many cases is not land per se, but the agricultural products of the land. Thus, land acquisition may not be necessary to secure the supply of these products. Again, with appropriate public support and the right investments, small-scale farmers themselves can supply them and benefit in the process without compromising their food security or losing their land rights.

V. What Is IFAD Doing?

Over the past few decades, IFAD has implemented various types of activities to improve poor rural people's access to land and tenure security. It also provides support to governments to develop and implement land policies that strengthen the rights of small scale producers and indigenous communities, as is the case, for example, in Georgia and Madagascar. Furthermore, the Fund supports the strengthening of rural institutions and the organizations of its target groups so as to increase their negotiating power, and their capacity to take advantage of economies of scale and enter into beneficial partnerships with other actors.

Building on its experience and that of its partners, IFAD has recently developed a Policy on Improving Access to Land and Tenure Security, which aims to enhance the Fund's capacity to promote equitable access to land by poor rural people and enhance their land tenure security.⁸¹ Among the guiding principles of this policy, two are of immediate relevance to the trend of growing demand for land: (i) adherence to the "do-no-harm principle" at all times; and (ii) adherence to the principle of free, prior and informed consent.⁸² The first requires all interventions on the part of IFAD to "be designed [...] in such a way that they 'do no harm' to the land tenure interests of the rural poor, especially those of women, indigenous and tribal peoples and other vulnerable groups. Careful measures must always be considered to avoid elite capture or forced displacement of people, and to address conflicting claims." The second guiding principle specifies that "[b]efore supporting any development intervention that might affect the land access and use rights of communities, IFAD will ensure that their free, prior and informed consent has been solicited through inclusive consultations based on full disclosure of the intent and scope of the activities planned and their implications."⁸³

IFAD Loans and Grants Mainstreaming Community-Investor Partnerships

The **Partnership for Grains and Oilseed Development (PGOD)** is an IFAD-financed grant recently started in Ghana that aims to pilot and test public-private partnerships in commercial agriculture and develop maize and soybean value chains. The partnership includes Aquafarm (a large importer of maize), Wienco (a large buyer of maize), Ghana Nuts (the largest processor of soybean in Ghana) and other private companies, financial institutions and donors. Farmers work through out-grower schemes.

The **IFAD-supported Vegetable Oil Development Project (VODP)** in Uganda aims to increase small-scale farmers' income by revitalizing national vegetable oil production from oil palm. Implemented in partnership with a private-sector company, Bidco Oil Refineries, it targets an area of 10,000 hectares of land located on Bugala Island, Kalangala District. About 3,500 hectares is cultivated by 1,400 smallholder farmers through out-grower schemes. IFAD's funds supported the establishment of Oil Palm Uganda Limited (OPUL) – a consortium in which Bidco and the small scale producers are partners – and the Kalangala Oil Palm Growers Trust – the local farmers' association which has a 10 per cent share in OPUL. The trust provides farmers with credit and helps them to obtain fair deals when selling their produce. OPUL provides seedlings and fertilizers, technical support, housing and healthy meals to its employees. It also built roads and runs a clinic.

80 Action Aid, op.cit., p. 15; Cotula L. et al., op.cit., p. 54; World Wildlife Fund, 2008, p. 6.

81 IFAD, December 2008, Improving Access to Land and Tenure Security, Rome. The policy was approved by the Executive Board of IFAD in September 2008.

82 Ibidem, pp. 15-16.

83 Ibidem.

IFAD also supports the establishment of mutually beneficial partnerships between external investors and agribusiness companies, small-scale producers and indigenous people. Some loan- and grant-financed projects are testing and promoting these pro-poor partnerships.

Some pilots will also be implemented to strengthen the linkages between the recognition of land rights of rural poor people and the establishment of community-investor partnerships for agricultural and livestock production.

Additionally, the Fund supports several research initiatives, also in collaboration with other institutions. These include research into the impact of agrofuel production on rural people's land rights; a study co-financed with FAO and commissioned by the International Institute for Environment and Development on the implications of the increased demand for land by outside investors on land rights and markets; and a collaborative research project on the commercial pressure on land, coordinated by the International Land Coalition.

In collaboration with FAO, IFAD is also involved in developing the voluntary Guidelines on Responsible Governance of Tenure of Land and Other Natural Resources.

Other ongoing and planned activities include building partnerships with bilateral and multilateral donors, United Nations agencies, research institutions and the private sector to mainstream land access and tenure security for poor rural people.

VI. Some Options for Good Practice

Emerging evidence is showing that an enabling policy and legal environment and good land governance are crucial to ensure that as efforts are made to attract external investments, mechanisms are in place to protect poor rural people and enhance their livelihood prospects.

Greater support is needed for appropriate, affordable and accessible land registration systems to secure the rights of small-scale producers and indigenous communities. These communities and producers also need support in strengthening their involvement in land management planning, and in identifying and responding to their needs so that they are more able to take advantage of business opportunities.

Governments should define precise procedures for land allocation, taking into consideration pre-existing formal or customary land rights. The processes for approving land acquisitions should be made transparent and only after direct and informed negotiation between investors and local communities.

A set of guidelines, certification procedures and codes of conduct should be developed to be subscribed to by investors in order to meet minimum social and environmental standards, with incentives and benefits provided for those adhering to them.

It is important to determine principles and criteria for the establishment of pro-poor partnerships, which should be developed through enforceable and balanced contractual agreements. Additionally, initiatives carried out in such partnerships should be monitored to improve the sharing of information and learning of lessons from successful and unsuccessful experiences.

With regard to agrofuel production, farming practices that can limit land requirements while achieving similar outputs should be promoted, such as (i) integrated food-fuel systems, which allow the use of by-products (e.g. bagasse from sugar cane, wood and agricultural residues); and (ii) mixed cropping systems combining the production of food and fuel feedstock on the same land (e.g. cassava and oil palm trees for three years followed by oil palm plantation for cattle grazing).

Questions to guide the round-table discussion:

- What are the impacts on rural communities of the growing demand for land for large-scale food and fuel production? Are poor rural people losing out in terms of their rights to land and water? Are they gaining from being engaged as out-growers or contract farmers, or from new employment or marketing opportunities? Are there any cases in which they have benefited substantially? What lessons can we draw?

- What has characterized effective management of large-scale investments that have resulted in win-win arrangements for all parties? What has been the policy environment for such experiences? What has been the role of civil society? What has been the involvement of rural communities? What other specific features can we point to? What characterizes evolving best practices?
- What can the various stakeholders (governments, local communities, farmers' organizations and investors) do to develop transparent and inclusive mechanisms to guide and manage investments in agriculture? What role of value can an organization such as IFAD play in this regard?

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Research and innovation for smallholder farmers in the context of climate change

Discussion paper prepared for the Round Table organized during the Thirty-second session of IFAD's Governing Council, 18 February 2009

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The opinions expressed in this paper are those of the authors and do not necessarily reflect official views or policies of the International Fund for Agricultural Development, except as explicitly stated.

Acronyms

CDM Clean Development Mechanism

CGIAR Consultative Group on International Agricultural Research

GHG Greenhouse gas

GMO Genetically modified organism

NARS National Agricultural Research System

Introduction

Agricultural producers, in particular the smallholder farmers of developing countries, are facing unprecedented challenges in the twenty-first century. With an estimated 9.2 billion people to feed by 2050 – of whom 8 billion will be in developing countries – and increasing scarcity of land and water, productivity gains will have to be the main source of growth in agriculture and the primary means of satisfying increasing demand for food and other agricultural products. With globalization and new supply chains, farmers will need to continuously innovate to respond to changing market demands and remain competitive. Moreover, “climate change has the potential to irreversibly damage the natural resource base on which agriculture depends.”⁸⁴ All regions of the world, and especially the diverse and vulnerable rainfed systems of sub-Saharan Africa, need technologies, knowledge and practices that simultaneously increase their productivity, their resilience to climate change and their contribution to its mitigation.⁸⁵

Climate change is increasing production risks in many farming systems and limiting the ability of farmers and rural communities to manage these risks on their own. Around the world, resource-poor farmers and pastoralists are trying to adapt to the effects of climate change, which affect them disproportionately: (i) dwindling crop yields; (ii) desertification and land degradation processes, exacerbated by changes in rainfall patterns; (iii) rising sea levels, affecting in particular the livelihoods of coastal communities; (iv) diminishing natural resource productivity; and (v) in some areas, irreversible loss of biodiversity.

For example, in sub-Saharan Africa, it is projected that an additional 17-50 million people could be undernourished in the second half of the century because of climate change. Extreme wind and turbulence could decrease fish productivity by 50-60 per cent in countries like Angola, Congo, Côte d’Ivoire, Mali, Mauritania, Niger, Senegal and Sierra Leone. Projected sea-level rise along the eastern and western coasts of the continent will cause coastal agriculture, a major source of livelihoods for smallholders in Benin, Côte d’Ivoire and Ghana, to be at risk of inundation, soil erosion and salinization.⁸⁶

The agricultural sector offers opportunities for mitigating climate change. Agriculture has strong potential to reduce greenhouse gas (GHG) emissions by promoting clean and efficient energy, reducing deforestation and developing sustainable agricultural practices such as the rehabilitation of degraded lands, water conservation and management, and increased biomass production. Since rural people manage vast areas of land and forest, they are important players in natural resource management and carbon sequestration. However, they are not usually compensated for their efforts in any significant way.

In the second half of the last century, agricultural research played a major role in rapidly increasing agricultural production and reducing rural poverty in Asia. But after 20 years of disengagement, progress in productivity gains has slowed, environmental damage has increased, global warming has accelerated and the number of hungry people is on the rise. All of these situations call for reinvestment in agricultural knowledge, science and technology to achieve equitable and sustainable development.⁸⁷

The purpose of this paper is to discuss (i) the potential role of agricultural research in improving small-scale farmers’ productivity and ability to adapt to and mitigate climate change; and (ii) how to increase investments in international research and sharpen its focus on the challenges faced by regions that are most vulnerable to climate change.

84 Agriculture at a Crossroads, IAASTD, 2009.

85 World Development Report 2008.

86 Intergovernmental Panel on Climate Change (IPCC).

87 Agriculture at a Crossroads, IAASTD, 2009. See also: <http://www.greenfacts.org/glossary/def/equity.htm>.

I. Role of agricultural research in improving small-scale farmers' productivity and ability to adapt to and mitigate climate change

I.1 Adaptation

The performance of crops, wild plants, livestock and aquatic resources under stress depends on both their inherent genetic capacity and the whole ecosystem in which they grow and are managed.⁸⁸ For this reason, any efforts to increase the resilience of developing-country agriculture in the face of climate change must involve the development of improved crop varieties and animal breeds, in addition to more prudent and integrated management of crops, animals and the natural resource base that sustains their production, while providing other vital services for people and the environment.

The potential of improved varieties, animal breeds and aquatic resources

Since the 1960s, research aimed at adapting improved varieties, animal breeds and aquatic resources to subtropical and tropical conditions has generated high returns and favourable pro-poor impacts. Improved varieties suited to smallholders in subtropical and tropical areas combined with high levels of inputs – two major ingredients of the Green Revolution – has been one of the major success stories of rural development.

Improved varieties are now sown on 80 per cent of the cereal area in India, in irrigated and rainfed areas. Newer generations of improved wheat varieties have provided an annual increase in yields of 1 per cent since 1981, largely in rainfed areas.

With respect to genetic improvement of livestock and fish, improved pig and poultry have been introduced through, for example, cross-breeding of local breeds with exotic breeds mainly from northern countries. Artificial insemination is also playing a progressively more substantial role. Similarly, genetically improved tilapia is changing aquaculture into one of the fastest-growing agricultural sectors in Asia.⁸⁹

However, genetic improvements in crops, animals and fish have reached only a small share of developing-country farmers, particularly in sub-Saharan Africa. This is partly due to constraints on delivery systems for these new varieties and breeds and the lack of assets among the smallholders to apply them.

Furthermore, progress in varieties performing well under drought, heat, flood and salinity has been generally slower than the progress achieved with disease- and pest- resistant varieties. As a consequence, because of water and soil constraints in Africa, the results of genetic improvement have been slower here than in Asia. Only a few improved varieties are finally making an impact on some food staples – for instance cassava in Nigeria, or NERICA (New Rice for Africa) rice in Western Africa. The International Maize and Wheat Improvement Centre (CIMMYT) is only seeing positive results today in Eastern and Southern Africa, after 30 years of research to produce drought-tolerant maize varieties and hybrids.

In a context in which climate conditions are becoming more extreme, genetic improvement of varieties, animal breeds and aquatic resources is increasingly challenging, particularly in less-favoured areas. Rapid advances in the biological and information sciences could be tapped to increase both productivity and resilience, particularly through the first-generation biotechnologies. For example, plant tissue culture for micro-propagation, production of virus-free planting materials, and molecular diagnostics of crop and livestock diseases have already proven their effectiveness in Asia. The second-generation biotechnologies allow the development of molecular markers to help select improved lines in conventional breeding and have the potential of "speeding the breeding", even if they are still costly.

88 CGIAR, *Global Climate Change: Can Agriculture Cope?*

89 World Development Report 2008.

More controversial biotechnologies are those using transgenic or genetically modified organisms (GMOs), because of potential environmental and health risks. The outcomes of GMO use are still questioned: yield gains are highly variable (10-33 per cent) in some places and actually decline in others. Furthermore, the use of patents for transgenes introduces additional issues: in developing countries especially, instruments such as patents may drive up costs, restricting experimentation by the individual farmer or public researcher.⁹⁰

In any case, improved varieties and breeds alone are not sufficient: low soil fertility, lack of reliable water and lack of disease control are some of the major constraints that cannot be overcome solely through genetic enhancement.

Integrated farming systems and management of natural resources

The Asian Green Revolution has shown that if high-inputs technology can be effective in terms of productivity, there is a price to pay in terms of environmental degradation: soil infertility, water depletion and contamination, and a loss of biodiversity. In response, agricultural research for development has focused more on promoting environmentally sustainable systems and on improving the integrated management of crop, livestock and natural resource systems. As an illustration of this trend, the Consultative Group on International Agricultural Research (CGIAR) invests about 35 per cent of its resources in sustainable production systems, twice as much as it invests in genetic improvement.⁹¹

In a context in which the impact of climate change on the natural resource base is dramatically increasing, adoption of location-specific integrated management of natural resources for higher productivity and better resilience to erratic climatic events is becoming even more crucial. The research programmes must be sensitive to local conditions affecting rural people and receptive to local and traditional knowledge. Since small-scale farmers and rural communities are the starting point for efforts to adapt to climate change, the problems and solutions should be defined with their direct and active participation. It is necessary to use participatory processes that empower smallholders to draw on their expertise in ecology and management; overcome the constraints they face; create a sense of ownership; and share their visions and experiences with other partners.

Through different denominations (e.g. Doubly Green Revolution, Conservation Agriculture, Ecoagriculture, Agroecology, Evergreen Revolution), research has implemented many initiatives at the field level to develop integrated management of natural resources, including: soil moisture management practices aimed at improving the capture and storage of water in the root zone; technologies for water harvesting and water storage micro-schemes; small-scale community-based irrigation schemes; and planting pits and demi-lunes⁹² in dryland farming areas to channel runoff and check soil erosion and degradation.

Among the most successful examples of resource management is zero tillage, which minimizes or eliminates tillage and maintains crop residues as ground cover. It has many advantages over conventional tillage, including: savings in labour and energy; conserving and even improving soil fertility and productivity; increasing soil moisture and tolerance to drought; and reducing GHG emissions. In Latin America, it is now used on more than 40 million hectares. Originally adopted by large- and medium-scale farmers, the practice has spread to smallholders in Southern Brazil.⁹³

Where lower population pressure still allows, fallowing remains an important strategy for long-term soil restoration. Improved fallows, using legumes and trees, have been shown to

90 Agriculture at a Crossroads, IAASTD, 2009.

91 World Development Report 2008.

92 These are traditional tillage techniques that were revived and refined during exchanges between organized groups of farmers from Burkina Faso and Niger, with the support of an IFAD project.

93 World Development Report 2008.

have positive impacts on soil fertility and on controlling floods, particularly in coastal areas. Integrating cropping with livestock production has also triggered many spin-off benefits for soil fertility management.

Enhanced water productivity can be promoted through drip irrigation, water harvesting, improved management of rainwater or collective action to protect shared resources. For instance, the International Water Management Institute is working with local partners in Burkina Faso on local low-cost irrigation systems; the International Center for Agricultural Research in the Dry Areas is promoting mechanized construction of traditional micro-catchment ridges to expand water harvesting in degraded rangelands.

Although success stories can be observed in many situations, they cannot be generalized. There are still many constraints to be addressed in effectively scaling up their benefits. For example, measures to address water control and soil structure/organic content take time and long-term investment. Rotation, manuring, composting and other “sustainable agriculture” and “low external input” techniques are valuable, but often require considerable labour and skills, in addition to large volumes of biomass. Fallowing requires extensive areas of land, which is an issue in areas where demographic pressure is rapidly increasing. Conservation tillage approaches can work well, but they may also reduce the availability of crop residues, often a critical source of fodder in mixed crop-livestock systems. Zero tillage requires some use of herbicides that make it unaffordable for poorer farmers.

Therefore, if practices related to conservation agriculture have already demonstrated their effectiveness in specific conditions, much more needs to be done to broadly increase small-scale farmers’ productivity and resilience. In this regard, Michel Griffon,⁹⁴ for example, advocates going further in the understanding of natural phenomena and the way they develop and interact. This would imply new and advanced research in ecology to improve the understanding and application of functional ecology and biogeochemical cycles; population ecology and ecosystem trophic networks; landscape ecology and the complex interactions of its various components; and soil functional biology. Advanced knowledge is also needed in plant and animal genomics, particularly for innovation in varieties and breeding and for identifying natural molecules (for example, to replace chemical pesticides).

I.2 Mitigation of GHG emissions

Carbon trading, carbon tax and other climate change mitigation mechanisms, which are poised to increase dramatically, hold great potential to fund projects and initiatives contributing to mitigation of GHG emissions. They constitute a significant opportunity for developing countries to attract investments and reduce poverty.

Investments and financial flows for developing countries linked to climate change mechanisms are currently dominated by the Clean Development Mechanism⁹⁵ (CDM) market of the United Nations Framework Convention on Climate Change. Project activities under the CDM relate to a broad range of sectors and regions where carbon offsetting is possible. Given the strong correspondence between the location of indigenous peoples and areas with the highest biodiversity and relatively intact natural resources, indigenous peoples have a role to play in designing and implementing mitigation measures, especially those related to preventing deforestation.

However, developing countries, particularly in Africa, do not benefit as much as they could, mainly because of the limited coverage by the CDM of afforestation and reforestation. Most of the win-win mitigation opportunities that can be identified at field level and could benefit small-scale farmers in developing countries are currently not eligible under the existing mechanisms.

94 Nourrir la Planète, 2007.

95 The Clean Development Mechanism is a mechanism allowing the transfer of certified emission reductions to industrialized countries from projects located in developing countries that lead to credible and measurable reductions of GHG emissions or sequestration of GHGs.

Policy research is required in this field to develop systems that reward rural communities for the environmental services they do or could provide. The research should focus on how to support appropriate pro-poor policies to ensure flow of carbon funds, and technologies that enhance, measure and monitor carbon capture and storage. Mitigation opportunities include:

- land use approaches with lower rates of agricultural expansion into natural habitats and sustained efforts to avoid deforestation
- promotion of agroforestry
- implementation of agroecological system approaches
- restoration of underutilized or degraded lands and rangelands
- carbon sequestration in agricultural soils
- reduction in and more efficient use of nitrogenous inputs
- energy-related actions such as promotion of clean energy and reduction of fossil fuel consumption
- in the livestock production system, effective manure management (collection, storage, spreading), management of feed crop production and use of feed that increases digestive efficiency.

Reduction of methane emissions is also possible through improved irrigated rice production and livestock management. For example, the International Rice Research Institute is promoting the development of rice with lower GHG emissions and greater resilience to the impacts of climate change; and researchers at the International Center for Tropical Agriculture (CIAT) have identified leguminous forage species possessing a high tannin content, which suppresses methane emissions.

Payment (or reward) for ecosystem services (PES) is a relatively new approach to conserving and restoring resources through different kinds of contracts between stewards of ecosystems and beneficiaries of ecosystem services. Successful PES projects are being implemented by the International Centre for Research in Agroforestry in Asia (Rewarding the Upland Poor in Asia for the Environmental Services They Provide – RUPES) and Africa (Pro Poor Rewards for Environmental Services in Africa – PRESA). They mainly target hydrological services and biodiversity conservation. However, the application of PES schemes to carbon sequestration implies a number of challenges, including identifying the appropriate market; establishing appropriate policies; addressing transaction costs; building the capacities of farmers to use the approved methodologies and to understand and follow existing regulations; and developing a system to effectively measure the amount of carbon sequestered.

II. Increasing investments in international research and sharpening its focus on the challenges faced by the regions that are most vulnerable to climate change

II.1 Organization of the international research system

Agricultural research first benefits the wealthier farmers in the better agricultural areas. There is a need for a stronger and more explicit focus on poor and disadvantaged farmers in marginal areas, and to involve and engage users throughout the research process – from problem analysis to evaluation of programme and project outcomes. Participatory research that suits local ecological conditions is a must. The approach should promote the incorporation of indigenous knowledge on coping with climate variability into research projects (which, among other things, would lead to better-defined research questions), and facilitate the process of transferring or devolving results and skills to those who will use them.

The innovation-driven activities supported by research should be pro-poor, providing high returns to small-scale rural producers while building on their knowledge and ingenuity.

The communities need to be looked upon as researchers in their own right. In cases where this approach was adopted, significant pay-off has been demonstrated in terms of improvement in the quality and productivity of staple crops, livestock and aquaculture, thus resulting in higher food security and improved living standards.

For example, in Nicaragua, farmers decided themselves to grow sorghum instead of maize (which requires too much water), in response to changes in local climate. Then they expressed their interest in improving their farming system and the varieties they were growing. In partnership with a local NGO,⁹⁶ an international research institute⁹⁷ and the national agricultural research institute,⁹⁸ they began a participatory programme. As a result of this process, farmers have improved their cropping systems and are now growing new varieties of sorghum that are giving higher and more stable yields.

Business as usual for agricultural research for development is not a viable or sustainable option. The lack of linkages between research, education and extension requires a fundamental reorganization in order to break down institutional divides and put the needs of society and of the poor at the very heart of their activity.

Helping poor rural people adapt to the impacts of climate change and enabling them to contribute to mitigation is not a task that can be performed by one agency alone; it requires cooperation and a coordinated approach from the international community. Research needs to draw significantly on the scientific resources of regional and international centres of excellence by commissioning specific poverty-relevant research programmes, with local research and development partners including, in particular, the farming communities themselves. Countries need to learn from one another in order to be able to respond to the challenge of practical innovation and ensure that the best available knowledge reaches poor rural communities so that they can build on the wealth of expertise they themselves possess.

With the rapid growth of the national agricultural systems in Brazil, China, India and South Africa, the space that international research centres occupy has altered. Some of these national programmes have developed the capacity to partner with the CGIAR on equal terms to work jointly towards meeting their food production needs. The entry of strong new actors into the field of agricultural research means that the CGIAR may no longer be perceived as the only provider of solutions for agricultural productivity, natural resource management or policy advice.

Within this context, the CGIAR has undergone an extensive reform exercise, involving virtually all the constituencies that have a stake in agricultural research for development (ARD). A revitalized CGIAR promises to strengthen and position itself and its partners to better serve the billions of people who depend on agriculture. The reform model is being refined during a transition in 2009 towards developing a clear strategic focus; improved research output, outcome and impact; greater efficiency, effectiveness and relevance; simplicity and clarity of governance; enhanced decentralized decision-making; and active subsidiarity to capitalize on complementarities within the CGIAR centres, but more importantly to build on synergies with other partners in the ARD continuum such as the National Agricultural Research Systems (NARS), and with civil society organizations and the private sector through public private partnerships.⁹⁹

The newly reformed CGIAR and its NARS partners have an important role to play in this context. They can improve the efficacy of research and capacity building partnership programmes that involve different stakeholders (including farmers' organizations and the private sector) and interdisciplinary engagement to address adaptation to and mitigation of climate change – building on local knowledge and blending it with the best state-of-the-art formal science.

There is a need to foster a progressive paradigm shift in ARD towards a holistic "knowledge-intensive agriculture", mobilizing the knowledge and experience of small-scale poor farmers and

96 CIPRES: Centro para la Promoción, la Investigación y el Desarrollo Rural y Social.

97 CIRAD: French Agricultural Research Centre for International Development.

98 INTA: Nicaraguan Institute for Agricultural Technology.

99 Cooke et al., CGIAR Change Steering Team.

scientists as partners in Innovation Systems. The Global Forum on Agricultural Research (GFAR) serves as a good platform for this purpose. The GFAR philosophy embraces principles of research that is demand-driven and implemented through productive and meaningful partnerships among key stakeholders; research agenda priorities set with a focus on the perspectives of poor farmers and rural communities; and research design and technology dissemination that fully engages intended users and beneficiaries. These stakeholders include national programmes, agricultural universities, farmers' organizations, the private sector and donors, all promoting the development of promising pro poor technologies, drawing on their comparative advantages and strengthening synergies. The GFAR Plan of Work 2009-2010 identifies climate change as a key strategic theme to be addressed through programmes of concerted action.

II.2 Funding innovations and new commitment to agricultural research for development

Underfunding of agricultural research is pervasive. In most of the developing countries, "research intensity" (agricultural research expenditure as a percentage of agricultural GDP) is less than the global average of around 1 per cent.¹⁰⁰

Underfunding of agricultural research is even more alarming when one considers that the diversity and location-specificity of the impacts of climate change reduce the replicability of technologies from one region to another. In particular, the budget dedicated to agricultural research in Africa has sharply decreased since the structural adjustment programmes, and many NARS lack the resources to work efficiently and maintain adequate staffing. Private research has not compensated for the decrease because it tends to focus more on intensive agriculture with a higher potential return on investment.

Variability of funding is another problem, in view of the long gestation period for new crop varieties and livestock breeds and the desirability of assuring long term employment for scientists and other staff. Underfunding or unpredictable funding encourages an overemphasis on short-term projects or on projects with short intervals between investment, outcomes and adoption.¹⁰¹

In general, the private share of total research funding is small in developing countries and should not be expected to displace public funding to any great extent in the near future. Any significant expansion in private funding, even through public private partnerships, will require a clear and effective system of intellectual property rights (IPR) if the incentive framework is to be successful.

Given this situation, most developing countries will continue to experience negligible private sector involvement in agricultural research and development. Therefore, the role of the state remains central, and public involvement will be required for specific products to be developed for small-scale farmers. As highlighted in the Nairobi Work Programme,¹⁰² it is important for developing countries to (i) improve their understanding and assessment of impacts, vulnerability, and climate change adaptation needs; and (ii) make informed decisions on practical adaptation actions and measures to respond to climate change on a sound scientific, technical and socioeconomic basis.

Governments and regional organizations are already taking action towards climate change adaptation. For example, the Environment Initiative of the New Partnership for Africa's Development (NEPAD) prioritizes climate change as one of ten programmatic areas. National Adaptation Programmes of Action provide an effective means of prioritizing urgent adaptation needs for least-developed countries. They draw on existing information and community-level input to identify adaptation projects to enable such countries to cope with the immediate impacts of climate change.

100 Cooke et al., CGIAR Change Steering Team.

101 IFPRI, 2008.

102 UNFCCC Nairobi Work Programme, 2006.

More needs to be done. National governments in developing countries could also take certain initiatives, including (i) increasing the total amount of government funding for their NARS; (ii) setting up an effective system of IPR to attract private investment and tailoring the institutional and policy details of IPR to fit local circumstances; (iii) introducing institutional arrangements and incentives for private and joint public private funding, such as matching grants and check off funds; and (iv) improving the processes by which agricultural research resources are administered and allocated. They also have an important regulatory role as innovations and new research agendas are being developed. For example, in the case of GMOs, public involvement is required to assess the technical, social, gender, legal, environmental and economic implications.

Such initiatives alone may not be sufficient. Addressing climate change at global level requires resource mobilization beyond the capacity of many national organizations. Another role for developing-country governments and farmers' representatives will be to advocate for more support in rebuilding their research systems from the international community, and particularly from developed countries. No one organization or government can tackle the adverse effects of climate change single-handedly. Partnerships including a broad range of government and non-governmental stakeholders need to be established for various purposes – for instance, funding, technical assistance/research, learning and knowledge sharing, implementation, monitoring and evaluation, strategy formulation. An integrated approach is needed to bridge the gap between local development and the global challenge of climate change.

The issues and options described in the preceding pages are intended to provide some direction for a discussion during the round table. They have been broadly recast below as questions posed to the panellists and discussants for their response.

Questions to guide the round-table discussion:

- How can investments in agricultural research be significantly increased to improve the resilience of smallholder farmers to the effects of climate change, improve their productivity in a context of risk and uncertainty, and contribute to rewarding communities for the environmental services they provide?
- What is needed to sharpen the focus of international research on the challenges faced by the regions that are most vulnerable to climate change, and that are also the least prepared in terms of institutional capacity (and are primarily in Africa)? How can the concerns of marginalized rural communities be given a voice and influence the research agenda?

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