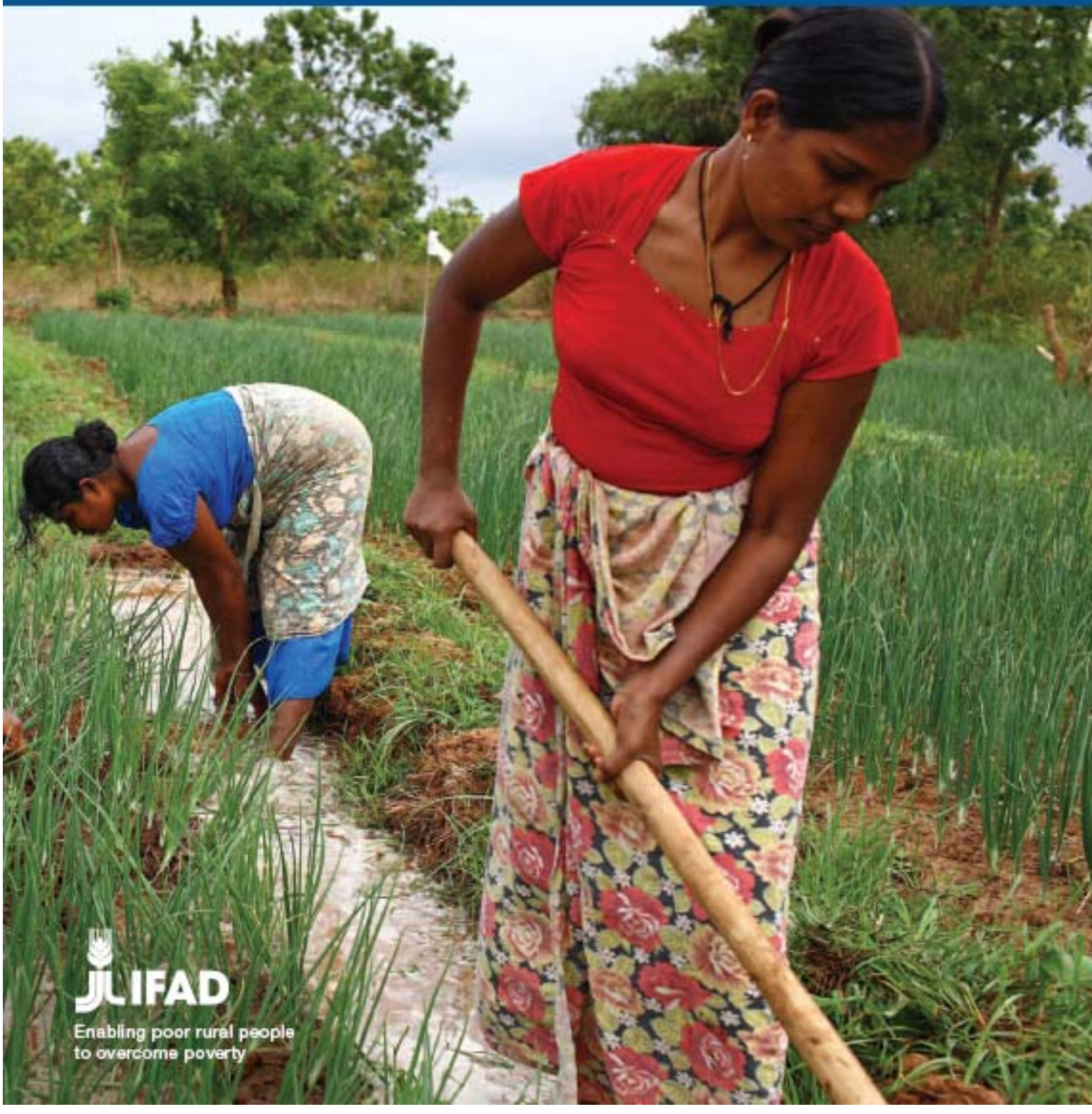
Smallholder Farming in Transforming Economies of Asia and the Pacific: Challenges and Opportunities



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Smallholder Farming in Transforming Economies of Asia and the Pacific: Challenges and Opportunities

Discussion Paper prepared for the side event organized during the Thirty-third session of IFAD's Governing Council, 18 February 2009

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I. Introduction

Small farms, also known as family farms, have been defined in a variety of ways. The most common measure is farm size: many sources define small farms as those with less than 2 hectares of crop land. Others describe small farms as those depending on household members for most of the labour or those with a subsistence orientation, where the primary aim of the farm is to produce the bulk of the household's consumption of staple foods (Hazell et al., 2007). Yet others define small farms as those with limited resources including land, capital, skills and labour. The World Bank's Rural Development Strategy defines smallholders as those with a low asset base, operating less than 2 hectares of cropland (World Bank, 2003). An FAO study defines smallholders as farmers with limited resource endowments, relative to other farmers in the sector (Dixon et al 2003). In this paper, small farms have been defined as those with less than 2 hectares of land area and those depending on household members for most of the labour.

Number and contribution of small farms in Asia and the Pacific

It is estimated that about 87 per cent of the world's 500 million small farms (less than 2 ha) are in Asia and the Pacific region (IFPRI, 2007). China and India alone account for 193 million and 93 million small farms, respectively. Three other Asian countries with a large number of small farms are Indonesia (17 million), Bangladesh (17 million) and Viet Nam (10 million).

Agriculture in Asia is characterized by smallholders cultivating small plots of land. The average size of operational holdings (actual area cultivated) is only 0.5 hectares in Bangladesh, 0.8 hectares in Nepal and Sri Lanka, 1.4 hectares in India and 3.0 hectares in Pakistan. About 81 per cent of farms in India have land holdings of less than 2 hectares, whereas their share in total cultivated area is about 44 per cent (NCEUS, 2008). The situation is similar in many other countries of Asia. In China 95 per cent of farms are smaller than 2 hectares. In Nepal 93 per cent of operational holdings are operated by small farmers (<2 hectares) covering 69 per cent of the cultivated area. In Bangladesh, small farms account for 96 per cent of operational holdings with a share of 69 per cent of cultivated area. Pakistan is an exception, with a relatively high concentration of large landholdings. Fifty eight per cent of farms in Pakistan are of less than 2 hectares but they operate only 16 per cent of the farm area. In contrast, farms of more than 10 hectares occupy 37 per cent of total farm area.

Smallholders' contribution to the total value of agricultural output is significant in many countries of the region. For example, in India their contribution to total farm output exceeds 50 per cent although they cultivate only 44 per cent of land. Many studies have also confirmed the inverse relationship between farm size and productivity per hectare. Small farmers are characterized by smaller applications of capital but higher use of labour and other family-owned inputs, and a generally higher index of cropping intensity and diversification. The inverse relationship between farms size and productivity is a powerful rationale for land reform policies, including land redistribution for both efficiency and equity gains. Experience has shown that Asian countries such as India that promoted small family farms were able to launch the Green Revolution. Countries like China started supporting smallholder farming after collective farms could not provide adequate incentives to increase production and productivity.

Trends in farm size, number of small farms and their share in cultivated area

The overall trend in Asia has been that of declining farm size over time. For example, in China farm size decreased from 0.56 hectares in 1980 to 0.4 hectares in 1999 (Fan and Chan-Kang, 2003); in Pakistan it declined from 5.3 hectares in 1971-73 to 3.1 hectares in 2000; in the Philippines the average farm size fell from 3.6 hectares in 1971 to 2 hectares in 1991; and in India it declined from 2.2 hectares in 1950 to 1.8 hectares in 1980, to 1.4 hectares in 1995-96 and to 1.33 hectares in 2000-01 (Nagayets, 2005; Government of India, 2008).

In contrast, the number of small farms and their share in total cultivated area has been increasing over time in several Asian countries. For example, in Pakistan, the number of small farms more than tripled between 1971-73 and 2000. In India, small farms accounted for almost 81 per cent of operational holdings in 2002-03 compared to about 62 per cent in 1960-61 (NCEUS, 2008). Correspondingly, the area operated by small farms increased from about 19 per cent to 44 per cent during this period.

Objectives and scope of the paper

This paper aims to provide background information for a discussion on the role of smallholder agriculture and family farming in Asia and the Pacific, and Latin America and the Caribbean regions, organized in conjunction with the thirty-third session of IFAD's Governing Council. It first gives a brief account of the transformation of the agriculture sector in Asia from the mid-1960s to the mid-1990s, which was characterized by a dramatic increase in agricultural production and productivity through major breakthroughs in technological innovations, and the more recent transformation, which is characterized by significant changes in diets brought about by increases in incomes, urbanization and globalization, and the resulting changes in production of high-value commodities and major transformation in the agrifood industry. The paper then discusses the challenges faced by smallholders in addressing the problems related to sustainability of food production as well as agricultural diversification. Following this, the paper highlights some of the technological and institutional innovations that have been tested to address such challenges. It identifies some measures that the governments, the private sector and international development partners can take to support small farmers in dealing with emerging challenges and to promote south-south cooperation for mutual learning and sharing experiences. Finally, the paper proposes a set of questions to guide the discussion.

II. Transformation of agriculture

The Green Revolution

The Green Revolution in Asia, which mainly comprised a dramatic increase in the production of three important cereal crops – rice, maize and wheat – between 1965 and 1990, was driven by rapid advances in the sciences and substantial public investments in and policy support for agriculture (Hazell, 2009). This represented the first major transformation of the agriculture sector in Asia in its modern history. Cereal production more than doubled in Asia between 1970 and 1995, from 313 to 650 million tons per year. As a result, per capita calorie availability increased by about 30 per cent and real prices of wheat and rice decreased. Higher production of all three major cereal crops was realized mainly through yield growth. Between 1965 and 1982, average rice, maize and wheat yields increased by 2.54 per cent, 3.48 per cent and 4.07 per cent per year, respectively. During the same period, cultivated area expanded by only 0.7 per cent, 1.09 per cent and 1.3 per cent, respectively.

The success of the Green Revolution in raising food production and productivity, broadening economic growth and reducing poverty has been impressive. Nevertheless, in recent years

agricultural production has experienced a number of challenges that have cast doubts on the sustainability of past gains.

Recent transformations in agriculture

Growth in domestic consumption of high-value commodities

Rapid economic and income growth, urbanization and globalization are leading to a significant shift in diet in Asia and the Pacific region, away from staples and increasingly towards livestock and dairy products, fruits and vegetables, and fats and oils. Rapid income growth is a key factor in the rising demand for high-value agricultural products. In most Asian countries urbanization is increasing rapidly and studies have shown that urban households spend more on meat, fish and sugar and less on rice than rural households, even after taking into account income and household characteristics (Minot et al., 2003).

Trade liberalization has also contributed to the growth of high-value agriculture. The reduction in import barriers in industrialized countries has favoured the growth of high-value exports such as fish and seafood products. Likewise, foreign direct investment has also facilitated the transformation of agricultural production in developing countries. It has facilitated the expansion of food processing, animal feed production, exports and food retailing. The entry of foreign companies into the agriculture sector has put competitive pressure on domestic agribusiness companies (Gulati et al., 2005).

A recent study by the International Food Policy Research Institute (IFPRI) analysed the growth of high-value agriculture in Asia and its implications on the restructuring of the agricultural supply chain, and on the role of small farmers (Gulati et al., 2006). These countries include the largest and most important transforming countries of Asia – Bangladesh, India and Pakistan in South Asia; Indonesia, the Philippines, Thailand and Viet Nam in Southeast Asia; and China in East Asia.

The study documented a clear shift in food consumption from grains and other starchy staple crops such as cassava and sweet potatoes to meat, milk, eggs, fish, fruits and vegetables mainly due to income increases. In these countries, per capita grain consumption either increased very slowly or even decreased between 1990 and 2000. In contrast, per capita demand for vegetables, fruits, and animal products increased substantially in all countries.

Growth in exports

In addition to rising domestic demand, these high-value commodities have also experienced high export demand. High-value products such as fruits, vegetables, livestock products and fish constitute a rapidly growing share of international trade in agricultural products. In these countries as a group, the share of high-value exports in total agricultural exports increased from 47 per cent to 53 per cent.

Growth in production

Due mainly to the high growth in domestic demand and, to some extent, an increase in exports, the production of high-value commodities in many Asian countries has grown more rapidly than that of food grains. The production of food grains in the eight countries under study increased by 1.3 per cent per year during the 1990s, slightly below the population growth rate of 1.5 per cent. In contrast, the production of high-value commodities grew much more rapidly during this period. For example, fruit and vegetable production increased by 7.7 per cent in these eight countries. China, in particular, achieved a very high growth rate in the production of fruits and vegetables. Between 1980 and 2004, 58 per cent of the increase in global horticulture production came from China, 38 per cent from all other developing

countries and the remaining 4 per cent from developed countries (Ali, 2006). India, Indonesia, Pakistan and Viet Nam also recorded an annual growth rate of more than 3 per cent in the production of fruits and vegetables in the 1990s.

The production of livestock products also increased impressively in many Asian countries during the 1990s. Milk production grew by 4.6 per cent per year in these eight countries during this period. Most countries also achieved high growth rates in the production of eggs, meat and fish.

Transformation of agrifood industry

The growth in domestic consumption and production of high-value agricultural commodities in Asia was accompanied by a transformation of the agrifood industry, which includes processing, wholesale and retail. Governments contributed to this mainly through investment in municipal wholesale markets, parastatal processing firms and state-run retail chains. However, the main new developments are private-sector investment in and consolidation of processing and retail (Reardon et al., 2009).

An important element of this transformation is the restructuring of the wholesale sector, which started with the public investment phase in the 1970s-1980s in many parts of Asia and in the 1990s in China. This phase was characterized by public investment in the expansion and upgrading of wholesale markets, and investment in market information systems to reduce transaction costs for small farmers to gain access to growing urban markets. In the 1990s and 2000s, more attention was paid to deregulation of wholesale markets to allow greater entry and competition.

The second element of this transformation is the restructuring of the processing sector. In the 1990s, private small and medium-sized processing companies grew due to liberalization in the processing sector. This growth was facilitated by a rapid increase in the consumption of processed foods spurred by rising incomes and urbanization, and a concomitant increase in the number of women working outside their homes.

The third element is the restructuring of the retail sector, which is mainly characterized by the supermarket revolution and a rapid spread of fast-food chains in many countries of Asia. The growth in supermarkets, which started in the early to mid-1990s, was driven by a massive flow of foreign direct investment and competitive domestic private investment, privatization of retail parastatals, rising incomes and urbanization, and procurement system change (Reardon et al., 2009). The spread of modern retail took place in Asia in three waves, first in East Asia outside China, then in Southeast Asia and finally in China, India and Viet Nam. Within a given country, supermarkets first sold processed products, then semi-processed and recently fresh produce.

III. Challenges faced by small farms

Farmers are facing a number of challenges in producing food in a sustainable manner as well as in diversifying from their dependence on cereal production to the production of high-value commodities. Although some of these challenges affect both large and small farms, there is evidence that they apply more strongly to small farms. For example, small farmers cannot take advantage of higher food prices by expanding production if they have difficulty in accessing services and credit. Similarly, when new technologies require higher capital inputs or mechanization, small farmers may be at a disadvantage unless they are helped in reducing their transaction costs to access inputs, credit and marketing facilities.

In recent years, productivity growth of major food crops has declined quite significantly. However, funding has shifted from public to private research, particularly in biotechnology. This change is reportedly disadvantageous to small farmers because private research companies lack incentives to address small farmers' concerns (Pingali and Traxler, 2002). Also, the impacts of both environmental degradation and climate change are usually more severe for small farmers than for large farmers because small farmers have less access to human, social and financial capital and information than large farmers (Hazell et al., 2007).

Declining productivity growth

A number of studies have confirmed a slowdown in productivity growth in cereal crops such as rice and wheat in major irrigated areas of Asia such as the Indo-Gangetic plain and East Asia (Bhandari et al., 2003; Pingali et al., 1997). For example, rice yield growth in irrigated areas of Asia declined from 2.31 per cent per annum in 1970-90 to 0.79 per cent in 1990-2000 (Hossain, 2006). The major reasons for this decline in yield growth include: the displacement of cereals on better lands by more profitable crops; diminishing returns to modern varieties when irrigation and fertilizer use are already at high levels; and the recent low price of cereals relative to input costs, making additional intensification less profitable (Hazell, 2009). In intensive monocrop systems such as the rice-wheat system of the Indo-Gangetic plains, deteriorating soil and water quality is an important problem; degradation of soils and build up of toxins have been reported in intensive paddy systems in several Asian countries (Pingali et al., 1997; Ali and Byerlee, 2002).

Researchers have documented stagnating or even declining levels of total factor productivity in some of these production conditions (Janaiah et al., 2005). An analysis of data from long-term yield trials in several countries of South Asia found stagnating or declining yield trends in rice and wheat when input use was held constant (Ladha et al., 2003). One of the reasons for slow yield growth has been reported to be pest and disease resistance of modern varieties to chemical pesticides.

Environmental problems

Poor water management in many countries of Asia has resulted in land degradation in irrigated areas through salinization and waterlogging. It is estimated that almost 40 per cent of irrigated land in dry areas of Asia are affected by salinization (Millennium Ecosystem Assessment, 2005).

Inappropriate use of fertilizers and pesticides has led to water pollution and damage to larger ecosystems, where excess nitrates from agriculture enter water systems. Fertilizer nutrient runoff from agriculture has become a major problem in intensive systems of Asia, causing algal bloom and destroying wetlands and wildlife habitats.

Serious soil and water degradation has taken place in the rice-wheat system of India and Pakistan due to intensive and continuous monoculture of rice in summer and wheat in winter (Ali and Byerlee, 2002). The effects of soil nutrient mining, salinization and declining organic matter have been exacerbated by depletion of groundwater aquifers and build-up of pest and weed populations and resistance to pesticides.

Land and tenure security

In many countries of Asia, marginalization is linked to the lack of access to land and land-use rights. Improving poor people's access to land is important to improve equity as well as production, as small farms tend to be more productive than large farms (Lipton, 1993). The political prospects for redistributive land reform are not bright for many Asian countries. Also, land scarcity has become acute, and rapid urbanization is reducing the area available for agriculture (Cassman et al., 2003). Crop land per capita of agricultural population is only 0.23 hectares in East Asia and the Pacific and 0.27 hectares in South Asia, compared to 0.48 hectares in Sub-Saharan Africa, 0.74 hectares in Middle East and North Africa, 1.55 hectares in Latin America and the Caribbean, and 3.53 hectares in Europe and Central Asia.

Some aspects of land reform, such as the extension of tenurial security, may be less difficult to implement than other aspects, such as land ceilings. IFAD-supported tribal development projects in India provide examples illustrating the importance of security of tenure. For example, the Orissa Tribal Development Project in India provided titles to land above 10 degrees in slope to tribal groups. Land occupied by tribals became transferable to women in the form of inheritable land titles in perpetuity. Such land titling led to major improvements in natural resource management, with the incentives derived from clear property rights.

In former socialist countries like China and Viet Nam, land tenure reform has led to significant increases in agricultural production and rural poverty reduction. In Viet Nam under the Doi Moi reform process, in 1988 agricultural collectives were converted to contract land to households for 15 years for annual crops and 40 years for perennial crops (Kirk and Nguyen, 2009). This reform, together with the relaxation of price controls and the opening up of domestic and international trade, promoted entrepreneurship and productivity. Viet Nam passed a Land Law in 1993 that extended land tenure to 20 years for annual crops and 50 years for perennial crops. These reforms generated strong incentives to invest in agriculture, which led to greater food security and better nutrition. Land transactions increased greatly as a result of tenure reforms. There is an active land market in the country, with the percentage of households participating in land transactions increasing from 3.8 per cent in 1993 to 15.5 per cent in 1998. Although land sales are not allowed, with more secure land rights many farmers have diversified their production into aquaculture, livestock and perennial crops such as coffee and cashew. In China land rentals have contributed to rural diversification and income growth. In contrast, Deininger, Jin and Nagarajan (2006) have shown that tenancy restrictions have reduced productivity and equity in India.

Water shortages

In much of Asia, the demand for water for both agricultural and non-agricultural uses is rising and water scarcity is becoming acute, thus limiting the future expansion of irrigation. Irrigated food production in large areas of China and South Asia is being maintained through unsustainable extraction of water from rivers or the ground (UNDP, 2006). The expansion of tubewell irrigation in South Asia has resulted in serious overdrawing of groundwater and falling water tables. In the agriculturally advanced states of India – Haryana, Punjab, Rajasthan and Tamil Nadu – more than one fifth of groundwater aquifers are overexploited (World Bank, 2007). As a result, water pumping has become difficult and too costly. The most affected are small farmers, who have little access to expensive pumps and often have insecure water rights.

Diversification

Small farmers have the potential to raise their incomes by switching from grain-based production systems to high-value agriculture. Although the production of high-value agriculture is labour-intensive and thus more suitable for smallholders, they face a number of constraints. Since high-value agricultural commodities are perishable and their markets are fragmented, there is high volatility in their prices, and thus high market risk. In addition, small farmers have low volumes of marketable surplus and the land they cultivate is mostly located in remote areas with poorly developed infrastructure. As a result, smallholders face high transaction costs and risks in production and marketing of such commodities. They also face poor access to credit, and stringent food safety and quality standards.

Impact of climate change

Researchers have predicted that climate change will have serious consequences for agriculture, particularly for smallholders in poor developing countries. In tropical countries even moderate warming (1 degree C for wheat and maize, 2 degrees C for rice) can reduce yields significantly because many crops are already at the limit of their heat tolerance (World Bank, 2007). In parts of Asia wheat and maize yields could decrease by 20 to 40 per cent as the temperature rises by 3 to 4 degrees, even if farm-level adjustments are made to accommodate higher average temperatures, such as changing the date of seeding or planting drought-resistant varieties (Long et al, 2007). Rice yields would also decline, although less than wheat and maize yields.

In low-lying areas agriculture will be adversely affected by flooding and salinization due to sea level rise and salt water intrusion in groundwater aquifers. Water scarcity will increase in areas such as Nepal, and parts of China and India due to decreasing snow cover over time, where glacial melt is an important source of irrigation water.

Risk and vulnerability

Smallholders face a number of individual risks such as disease, injury and death of animals, as well as common or aggregate risks such as drought, epidemic and economy-wide shocks, affecting everyone in the locality. The consequences of these risks can be extremely severe, potentially leading to malnutrition, disease, starvation or even death. As a result, managing and coping with risks are an integral part of the daily lives of poor rural people.

In addition, there has been a concern that the recent successes of market-oriented policy reforms (e.g. in India and China) or the advance of globalization may have further increased the degree of potential income fluctuations, thereby exacerbating the already precarious position of poor rural people, comprising principally landless and small farmers (Dercon, 2005). Evidence points to high vulnerability of small farmers in the semi-arid region of south India to crop shocks. What is worse, occasionally they are subject to a series of such shocks, making it harder for them to escape persistent poverty (Gaiha and Imai, 2004). Other evidence comes from case studies of the Philippines and Bangladesh confirming significant effects of natural hazards (e.g. El Nino in the Philippines and floods in Bangladesh) on various indices of poverty and anthropometric measures of under-nutrition. Disasters often disrupt food production, resulting in loss of livelihoods and higher food prices. Finally, not only do poor rural people lose assets, but they also lack access to risk-sharing mechanisms such as insurance. It is therefore not surprising that disasters substantially increase poverty levels (e.g. 50 per cent of the increase in the incidence of poverty in the Philippines during the 1998 crisis was due to El Nino). Although the devastation is seldom confined to the poorer segments – including small farmers – in the absence of easy access to credit and insurance they find it harder to recover their previous standard of living (Jalan and Ravallion, 2001).

IV. Opportunities for higher productivity, higher incomes and sustainability

Technological innovations to address environmental problems and yield growth

To address the concerns about the sustainability of Green Revolution technologies and their ability to benefit poor farmers, particularly in less favoured areas, many are advocating new technological approaches (e.g. Pender, 2008). These include low external input and sustainable agriculture approaches based on ecological principles of farming; organic agriculture based on a similar set of agro-ecological principles but without the use of artificial chemical fertilizers, pesticides or genetically modified organisms; and biotechnology. Although biotechnology and agro-ecological approaches seem to be in opposition to one another, both approaches focus on biologically based rather than chemically based technologies, and there may be potential for realizing complementarities between these approaches. In fact, it has been argued that a combination of ecological and biotechnology approaches is needed to bring about a "Doubly Green Revolution" (Conway, 1997). Others have argued that integrated agricultural and natural resource management innovations are needed that combine improved germ plasm (using both conventional methods and biotechnology) and improved and integrated management of soils, water, biodiversity and other natural resources (CGIAR, 2005).

Conservation agriculture/zero tillage

To address the declining productivity growth of the rice-wheat system in the Indo-Gangetic plain, zero tillage has been promoted by the Rice-Wheat Consortium, a partnership of the Consultative Group on International Agricultural Research centres and national agricultural research and extension system and with the support of IFAD and other development partners. This technology involves planting wheat immediately after rice, without tillage, so that wheat seedlings germinate using the residual soil moisture from the previous rice crop. Zero tillage has been reported to have many advantages over conventional tillage in the rice-wheat system. It saves labour, fertilizer and energy, minimizes planting delays between crops, conserves soil, reduces irrigation water needs, increases tolerance to drought, and reduces greenhouse gas emissions (Erenstein et al., 2007).

Organic agriculture

Organic agriculture is a specific type of low external input whose requirements are more restrictive – no use of chemicals or genetically modified organisms. Based on certification, price premiums of 10 to 50 per cent are common for developing country exports of organic products (IFAD, 2005). Organic farming has increased rapidly in many Asian countries in the last few years. In 2000-02, there were about 60,000 farms producing certified organic products on about 600,000 hectares. This increased to more than 90,000 farms on more than 3.8 million hectares in 2005-06 (Pender, 2008). China, India and Indonesia are the major organic producers in Asia.

Several studies have shown favourable impacts of organic agriculture on the costs of production and yields in Asia (IFAD, 2005; Reunglertpanyakul, 2001). However, there are several constraints to the adoption of organic farming. Profit margins usually diminish due to increased competition, and organic producers may face greater market risks as the sector grows. Perhaps the most important concern among smallholder farmers relates to the costs of certification and assuring compliance with organic standards. These problems can be addressed by developing farmer organizations at the local level and through efforts by outside agencies to develop local capacities and facilitate linkages to markets.

Biotechnology

Broadly defined, biotechnology includes a wide variety of techniques, from traditional methods such as conventional plant and animal breeding to more modern techniques such as tissue culture, embryo transfer, cloning, breeding using marker-assisted selection, genetic engineering of plants or animals, and genomics (ADB, 2001). In current literature, the term biotechnology is used to refer to modern agricultural biotechnology and it is also used synonymously with genetic engineering. Biotechnology is reported to have the potential of incorporating many traits in crop varieties that can address problems faced by smallholders, such as drought resistance, disease and pest resistance, yield improvement and quality improvement.

Since 1996, there has been a rapid adoption of a few genetically modified crops globally. Among Asian countries, an estimated 6.4 million small farmers in China (on an average area of 0.5 hectares) and 1 million small farmers in India (on an average area of 1.3 hectares) were growing Bt cotton by 2005, while more than 50,000 farmers in the Philippines (on an average area of 2 hectares) were growing Bt maize (Pender, 2008). Studies have shown that Bt cotton has contributed to increasing yields, reducing costs of production, increasing farmer incomes and reducing negative health and environmental effects of high pesticide use, particularly in China (Smale et al., 2006; Huang et al., 2002). Other studies conducted in India have also reported reduced pesticide use and increased yields (Bennett et al., 2006; Qaim et al., 2006).

Genetically modified cotton has been adopted by large numbers of smallholders in China and India, indicating that the technology can be adopted equally by large and small farmers. It further confirms the ability of smallholders to adopt new technologies, although there may be lags in adoption due to considerations of costs and risks. The dissemination of biotechnology to developing countries is inhibited by intellectual property rights issues, the lack of interest of multinational corporations in investing in the development of genetically modified crops in poor countries and less-favoured areas, difficulties in establishing public-private partnerships and the lack of investment and leadership in biotechnology by international agricultural research centres (Pender, 2008).

Institutional innovations for productivity enhancement and diversification

Although smallholders face formidable challenges, a number of innovative institutional models are emerging that can help small farmers benefit from the ‘new agriculture’ dominated by value chains. These include: the development of farmer/producer organizations for marketing; the promotion of contract farming; the development of supply chains for high-value exports through an appropriate mix of private- and public-sector initiatives; facilitating private-sector provision of market information through telecommunication; and directing fiscal stimulus to rural areas.

Farmer/producer organizations

To overcome challenges related to high transaction costs, small farmers in many countries have formed producer organizations. These organizations are of various kinds, including cooperatives, associations and societies. They support smallholders in gaining access to markets and public services, and for advocacy. One of the most well-known producer organizations in Asia is the Indian dairy cooperative, which in 2005 had a network of more than 100,000 village-level dairy cooperatives with 12.3 million members and which accounts for 22 per cent of milk produced in the country (National Dairy Development Board, 2006). Sixty per cent of members are landless or smallholders; women make up 25 per cent of the membership. This cooperative model was replicated with the brand name “Safal” for fruits and vegetables to meet the growing demand in the Indian capital Delhi.

Cooperative model for vegetable and fruit marketing, India

To meet the growing demand for fresh fruits and vegetables in the Indian capital city Delhi, the Mother Dairy Fruit and Vegetables Limited (MDFVL) was established in 1988 as a subsidiary of the National Dairy Development Board, which has brought about a milk revolution in India through farmer cooperatives. MDFVL sells 250 metric tons of fresh vegetables and fruits to about 75,000 customers every day. It sources fruits and vegetables from over 150 producer associations comprising 18,000 farmers. These associations are informal cooperatives or self-help groups and are not governed by the State Cooperative Act. MDFVL helps producer associations procure improved seed varieties, fertilizer and chemicals and also provides extension services. It links producers with input dealers for the supply of production inputs at wholesale rates. It also organizes training programmes for farmers on good agronomic practices to increase production and minimise the use of chemicals. MDFVL has established quality standards for fruits and vegetables and the produce are graded and priced as per agreed norms. Farmers are paid every two weeks through their associations.

Source: Joshi, Gulati and Cummings Jr., 2007

Contract farming

Contract farming has been promoted in many Asian countries as a potential means to incorporate small farmers into growing markets for high-value commodities. Since contracts often include the provision of seed, fertilizer and technical assistance for accessing credit and a guaranteed price at harvest, this form of 'vertical coordination' has the potential to address many constraints to small-farm productivity. In this sense, it has been viewed as an institutional solution to the problems of market failure for credit, insurance and information.

Several studies have assessed to what degree smallholder farmers have participated in contract faring in Asia, and the evidence has been mixed. A recent study of contract and non-contract growers of apples and green onions in Shandong province of China found no bias toward large farmers in contract farming schemes (Miyata et al., 2009). In contrast, another study found that small farmers were less likely to participate in contract farming than larger farmers (Guo et al., 2005). Singh (2002) identifies several problems associated with contract vegetable production in Punjab state of India – imbalanced power between farmers and companies, violation of the terms of the agreements, social differentiation, and environmental unsustainability.

Most studies indicate positive impacts of contract farming on incomes. For example, Birthal et al (2005) found that the gross margins for contract dairy farmers in India were almost double those of independent dairy farmers, largely because contract farmers had lower production and marketing costs. Miyata et al (2009) also found that contract farmers earned more than non-contract farmers even after controlling for household labour availability, education, farm size, share of land irrigated, and proximity to the village leader. Major factors for this difference included higher yields obtained by contract growers due to the technical assistance and specialized inputs provided by the packers, and higher prices received.

Supply chains and supermarkets

Several researchers have argued that smallholders enjoy several advantages over large commercial farmers in supplying to supermarkets. The first advantage is linked to production technologies and the associated labour requirements. Thai Fresh United, for example, has a portfolio of 140 herbs, spices, vegetables and fruits, each of which has stringent quality requirements (Gaiha and Thapa, 2007). Smallholders, especially women, are able to give the careful attention that such crops require. Small producers supplying Hortico, for example, had

lower rejection rates for certain non-traditional vegetables relative to large farmers. Second, the traditional agro-economic and production practices of smallholders are more amenable to the requirements of supermarkets. For example, in Thailand, Tops has found that smallholders adapt more easily to organic production through crop rotation and selection among resistant varieties.

However, smallholders need support for intermediation and internalization to be able to integrate into the supply chains (Gaiha and Thapa, 2007; Lipton, 2006; Swinnen 2006). Intermediation can take different forms involving the cooperation of public and private agencies. For example, food safety standards might be laid down by national governments, and private agencies might help smallholders implement them; rural infrastructure might be strengthened by the public sector through private financing; suppliers might help finance the provision of inputs and provide extension. Internalization involves organizations of producers, especially small producers, who negotiate production and marketing arrangements with supermarkets or their suppliers.

A study sponsored by IFAD found the prospects for the expansion of supermarkets to be promising in most Asian countries (Gaiha and Thapa, 2007). It also saw good potential for the integration of smallholders in a rapidly transforming food and agricultural sector provided they receive adequate support from the public and private sectors.

Information and communication technology

Information and communication technologies can reduce information asymmetries by providing information to smallholders on weather, input and output prices and production technologies. Many successful examples of smallholders benefiting from ICT are emerging.

Marketing support to smallholders through information and communication technology: the case of e-Choupal in India

The e-Choupal initiative of the Indian Tobacco Company (ITC) is changing the lives of thousands of farmers in India. Between 2000 and 2007, the agribusiness division of ITC set up 6,400 Internet kiosks called e-Choupals in nine Indian states, reaching about 38,000 villages and 4 million farmers. ITC establishes an Internet facility in a village and appoints and trains an operator (*sanchalak*) from among the farmers in the village. The *sanchalak* operates the computer to enable farmers to get free information on local and global market prices, weather, and farming practices. The e-Choupal also allows farmers to buy a range of consumer goods and agricultural inputs and services (sourced from other companies).

The e-Choupal serves as a purchase centre for ITC for 13 agricultural commodities, with the *sanchalak* acting as the commission agent in purchasing the produce and organizing its delivery to ITC. In 2006/07 ITC purchased about 2 million tons of wheat, soybeans, coffee, shrimp, and pulses valued at $400 million through the e-Choupal network. This direct purchasing cuts marketing costs for both farmers and ITC. It improves price transparency and allows better grading of produce. It also allows farmers to realize a bigger share of the final price.

Source: World Bank. 2007. World Development Report 2008: Agriculture for Development.

Fiscal stimulus

Although the contagion of the financial crisis did not dampen growth in the Asia and the Pacific region as much as initially feared, the projected reductions in growth rates are 2 per cent or more in 2009. This is largely due to the resilience of China and to a lesser extent India (ADB, 2009a). In anticipation of such losses, and to minimize them, fiscal stimulus was

undertaken by many countries in the region, ranging from 0.5 per cent of gross domestic product to more than 5 per cent (ADB, 2009b). A study undertaken by IFAD's Asia and the Pacific Division (Gaiha et al., 2009) demonstrates the potential of fiscal stimulus in accelerating overall growth through agricultural growth. If mechanisms are put in place to direct the fiscal stimulus to rural areas where both physical and social infrastructure are inadequate to sustain the growth impulse, substantial increases in yields and revenues from agriculture are likely. Various studies have confirmed the vital role of rural roads, transportation and market access in enabling small farmers and others to reap greater benefits from higher prices (Fan and Rao, 2008; Gaiha et al., 2009). Of particular significance are the findings of a study by Shilpi and Deininger (2008), focusing not only on distance to a market in the Indian state of Tamil Nadu, but also on the facilities available in that market. Their analysis shows that additional investments in market facilities are indeed pro-poor, since the sales by poorer farmers increase more than those by wealthy farmers. In other words, while the wealthier farmers capture the benefits of existing facilities better than the poorer farmers, the marginal benefit from an improvement of market facilities is substantially greater for small (poorer) farmers.

V. How governments and external partners can support small farms

Governments can support small farmers through policy interventions that create a conducive economic environment for market-led development, and by providing stable economic incentives and necessary public goods and services. However, if market failures put small farms at a disadvantage in terms of accessing inputs and markets, then unchecked markets may favour large-farm outcomes that are less efficient and less equitable than those that could result from small-farm-led growth (Hazell et al., 2007). In such cases, targeted policy interventions that correct the underlying market failures could contribute to efficient and equitable solutions.

Rural areas are usually characterized by poor infrastructure development (roads, irrigation, communication, etc.), inadequate health facilities and lack of appropriate technologies. In such cases, the first phase of government policies and programmes should "establish the basics", with investments in public goods to develop technologies that will raise the potential productivity of small farms (Dorward et al., 2004). The second phase should "kick-start markets" with coordinated complementary investments to improve the access by small farms to financial services and input and output markets necessary for technology adoption. External partners can provide complementary funding for projects and programmes of governments in both phases.

Institutional innovations can play an important role in the provision of inputs and services to small farmers when there are market failures. In some cases, the private sector has adequate incentives to innovate (as discussed above in the sections on contract farming and supermarkets). However, in many cases the government should play an active role in coordinating the delivery of input, financial, technical and output marketing services to small farms. For example, governments and external partners can support the development and strengthening of producer/farmer organizations, which can play an important part in service delivery and advocacy at both the national and local levels.

Although governments in many Asian countries have shown strong political commitment to small-farm-led agricultural development in the past, further support to small farmers will be needed in the areas of policy interventions, support for institutional innovations, public-private partnership and South-South cooperation in order to enable small farmers to face new challenges and benefit from new opportunities.

Questions to guide the discussion

- What is the outlook for smallholders in the future? What is the role of smallholders in feeding the world in 2050?
- What policy support can governments provide to small farmers for sustainable agricultural production and to empower them to cope with emerging challenges (e.g. adaptation to climate change)? How important are land issues?
- What is the role of external development partners in empowering smallholders?
- What can governments and external partners do to promote South-South cooperation in sharing lessons learned and in replicating and upscaling successful experiences?

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