

Old Issues & New Challenges to Food Security in Asia

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Hunger continues to stalk the lives of 925 million people in the world today, and their numbers continue to rise. Over three-fifths, or 578 million hungry, live in Asia (FAO, 2010).

Poverty lies at the root of hunger. About 70% of the world's poor live in the rural areas – far and isolated from centers of decision and power, deprived of assets, having limited economic opportunities, poor education and skills, and hampered by socio-political inequities (by gender, age or indigenous roots).

Asia has two-thirds of the world's poor and 63% of the world's undernourished people. About 1.7 billion people (or more than half of the population of developing countries in Asia) live on less than \$2 a day, majority of them in rural areas.

Throughout history, small farmers and producers have served as the backbone of Asian agriculture and food security. Asia is home to 75 percent of the world's farming households, 80% of whom are small-scale farmers and producers. However, majority of them are resource poor and lack access to productive assets, especially land and water. As with other regions of the world, small rural producers in Asia also lack access to financial services, education opportunities, advisory services, infrastructure, and well-functioning markets.

Will Asia continue to be able to feed itself? With 4 billion people or 60% of the world's population, Asia has 34% of the world's agricultural area, 15% of the world's forests, and a wealth of ecological, ethnic and biological diversity. Already four times more densely populated than Europe, Asia's population growth and accelerated

This is based on a regional workshop held on 22–23 August 2011 in Jakarta, Indonesia, on the theme of “Translating Commitments to Actions Towards Results: An Asian Multi-stakeholder Regional Workshop on Food Sovereignty”, organized by the Asian NGO Coalition (ANGOC) and the Food and Agriculture Organization (FAO).

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urbanization in the coming decades will bring even greater pressures and conflict on existing land, agricultural and ecological resources, along with changes in people's lifestyles and consumption patterns. In the "transforming economies" of Asia (including China), poverty remains overwhelmingly rural, yet agriculture is no longer seen as the main engine of economic growth that it once was, and small producers are no longer given the support that they need.¹ This may have tragic consequences, as rural poverty persists, and rural-urban disparities grow wider than ever.

I Asia's continuing "silent crisis"

In the developing countries of Asia, poverty and hunger remain largely rural and agricultural. And the great irony is that small food producers are the most vulnerable to hunger. Small farmers and producers, rural artisans and indigenous peoples are often deprived of access and control over productive resources (i.e., land, water, forests and coastlines) on which they depend for livelihoods. In the Philippines, statistics show that fishermen and farmers are the two poorest sectors. Filipino farmer households have a poverty incidence of 40 percent and fisherfolk households, 50 percent –compared to national poverty incidence of 21% in 2009. In Vietnam, poverty rates are higher among the 53 ethnic minorities compared to the ethnic majority. Poverty incidence is also highest in mountainous regions and in areas vulnerable to floods, droughts and storms, as these conditions limit agricultural development and restrict access to infrastructure and markets.

Indeed, many are forced to eke out a living from their fragile environments – sacrificing long-term sustainability for immediate survival. The rural youth meanwhile migrate to towns and cities in search of work, adding to the growing numbers in urban slums.

Bangladesh has a population of about 140 million people living in a territory of approximately 14 million hectares, making it one of the most densely populated countries of the world. The lands are fertile but scarce; available land per capita is just 0.28 hectare. Based on official data, 56% of the population or 72 million people are in poverty. About 80% of the poor are in rural areas, and half of them are dependent on agriculture. Another 25 million people are at constant risk of falling into poverty. Already, 45% of the 140 million people are experiencing food deficits – consuming less than their daily calorie requirements.

¹ The *World Development Report of 2008* describes three types of countries, based on their development agendas for agriculture: (i) agriculture-based, (ii) transforming countries, and (iii) urbanized countries. (World Bank 2008).

In Sri Lanka, the victims of war and internally-displaced persons also count among those in poverty and hunger. The country is still recovering from the war of 2007, especially in the North, where there were massive losses to lives, agriculture and infrastructure. While the conflict has ended, social tensions remain, with many people still missing, most of them men. In the Northern Province, there are at least 300,000 internally displaced people and a large number of female-headed households who have since been resettled.

Chronic rural poverty is caused by landlessness and the lack of secure tenure, which continues to rise in many countries. Poor governance contributes to landlessness. In Bangladesh, agriculture remains the largest sector of the economy, employing three-fifths of the total labor force. Yet, there is growing landlessness in agriculture; the percentage of landless households (or those owning 0-0.19 hectare) rose from 19% in 1960 to 56% in 1996. Studies show a strong association between landlessness and poverty, i.e., that poverty is reduced with increased landownership.² Yet land reforms remain as unfinished business. Only a portion of the total collected *khas* lands (1.34 million hectares, or some 10% of the total area of Bangladesh as of 2001) has been distributed, often involving the payment of bribes and corruption. The remaining *khas* lands supposedly under government custody have been illegally occupied by rich peasants.³

Pakistan is the world's sixth most populous country, with 173 million people in 2008. About 68% live in the rural areas, where two-thirds of the people rely on agriculture for their livelihoods. Data from Pakistan's Planning Commission shows that at least 64 million people were living below poverty line in 2008, mostly rural and dependent on agriculture. Landownership is highly skewed, and landlessness is the main cause of rural poverty; some 60% of the rural poor are landless. Since independence in 1945, three land reforms were instituted, but they had little or no effect due to poor governance and corruption under successive military rulers. In Pakistan, the military holds significant landholdings throughout the country. Military personnel control an estimated 4.9 million hectares, constituting about 12% of state land, including 2.8M hectares of prime agricultural lands in Punjab and Sindh.

² ALRD (2008). *Landwatch Asia Campaign: Bangladesh Status Report*. Association of Land Reform and Development. Unpublished. The paper provides a table on "Poverty and Landownership Trends" using data from the Ministry of Finance, 2003.

³ Barkat, Abdul, S. Zaman and S. Raihan (2001). *Political Economy of Khas Land in Bangladesh*. Dhaka: Association for Land Reform and Development.

In Cambodia, farmers continue to suffer from insecurity of land tenure. Political upheavals in the last 40 years have overturned the country's land and property rights systems, causing massive confusion and dislocation in the ownership and use of land. Implementation of the 2001 Land Law and related decrees is plagued by corruption, as the government grants economic land concessions (ELCs) to corporations. From 2008-2011 alone, over 2 million hectares were given as concessions to 222 private companies.

Hunger is due not to insufficient food supplies, but to the lack of “access” to food. With 16% of the world's population and only 2% of the world's land, India has managed to avoid major famines due to crop failures that plagued the country in the past. However, chronic poverty and hunger persist because of people's lack of economic access (purchasing power).⁴ About 77% of the population lives on half a US dollar (INR 20) per person per day (Arjun Sengupta Commission, 2009). The 2010 Global Hunger Index ranks India at 67th out of 122 developing countries.

In many countries, the poor suffer not only from hunger but also from malnutrition, known as the “silent killer”. Disproportionately affected are the children and women. In India, overall poverty incidence was placed at 28%, or more than 300 million in 2004-05, based on official estimates.⁵ Yet a larger segment of the population is chronically malnourished. A recent survey by Naandi Foundation showed that 42% of children in India below 5 years are underweight. Malnutrition leads to diseases that should be preventable. Meanwhile, anemia among children and women is on the rise; about 79% of children aged 6-35 months and 56% of women of 15-49 years are anemic. According to UNICEF data, one-third of malnourished children in the world live in India. (FAO, 2012)

Malnutrition stunts growth among young children, and could leave a permanent scar they could carry throughout their lives. Malnutrition also robs adults of their capacity to work, limiting their ability to improve their own lives. In Pakistan, 26% of the population is undernourished, and at least 38% of the undernourished are children. At present, 77 million or almost half the population is food insecure, with a daily calorie intake below the recommended level.

⁴ The Indian economist Amartya Sen, in his 1981 study “Poverty and Famines”, showed how “famines thrive even without a general decline in food availability”. He brought forward the concept of “entitlements”.

⁵ Some sectors claim that official estimates of poverty are too low. Another government report shows an overall poverty incidence of 37.2% or more than 400 million people in 2004-05. (Dev, 2010)

In Cambodia, about 35% of the population lives below the poverty line, and 23% of the population, or over 3 million people, are food-deprived or food insecure – consuming less than their minimum dietary energy requirement. Children are the ones hardest hit by the effects of poverty and lack of nutrition. Two out of every five children (40%) below 5 years old are chronically malnourished, with nearly one in ten (9%) of children below 5 years old acutely malnourished. Some 29% of all children are underweight. Malnutrition is the cause of 54% of premature deaths among children (1 in 8 children dies before the age of 5).

Lao PDR is the poorest country in Southeast Asia, where majority of the population are dependent on subsistence-farming. Despite having doubled its cereal production and tripled its meat production in the last 25 years, Lao PDR still remains in a state of food insecurity. One fifth of the population is undernourished, 40% children are underweight and 42% suffer from stunted growth due to lack of proper nutrition.

Despite the importance of agriculture to employment generation and poverty reduction, however, there has been a declining government emphasis and investment in agriculture, especially in support of smallholders.

In Pakistan, the agriculture sector contributes 22% of GDP, 60% of exports, and provides employment to 45% of the labor force. In Cambodia, 85% of all households live in the rural areas – engaged in rice-based agriculture, collection of forest products and livestock production. The agricultural sector generates one-third of GDP and provides employment to 80% of the country's labor force. Some of the key challenges include: landlessness, poor infrastructure, high costs of agricultural inputs, credit and production related concerns, land reform and land titling.

In Vietnam, only 7% of the national budget is spent for agriculture, showing a decline in public spending for agriculture. Agriculture contributes 20% of GDP and employs at least 70% of the labor force. Other issues faced by producers are land degradation, loss of land to industry, degradation of environment, heavy use of chemicals, population growth, increasing food prices, natural calamities and climate change.

Asian governments all have food security as a national priority. However, there is a lack of focus on programs to improve *smallholder farming and production systems*. Many issues remain – including policy coherence, land tenure, support for smallholders, agriculture subsidies, women empowerment and addressing risks and vulnerabilities of malnutrition and food insecurity of the rural poor and the most vulnerable sectors.

The direct response of governments to hunger has been through “safety net” programs for the poor. But while these distribution programs alleviate hunger, they are not intended to address its underlying causes. In Indonesia and the Philippines, the government provides food (rice) subsidies by retailing food to poor consumers at government-subsidized prices. However, low prices could also act as a disincentive for small producers. In Asia, staples like rice and wheat are considered not only as economic goods, but also as “political crops”. Sufficiency of supplies and price stability in rice and staples are often used as benchmarks for food security, economic performance and political stability. Ensuring an adequate supply of low-priced staples is seen as part of a larger “development strategy” – i.e., to keep urban wages low, and to stave off political uncertainty and social discontent. While Indonesia is self-sufficient as a rice producer, the Philippines ranks among the world’s top importers of rice.

In India, the government’s direct response to hunger is the Public Distribution System (PDS) where food grains procured and stored by the government is delivered through nearly half a million Fair Price shops. Yet the program has been plagued by leakage and the high costs of delivery. The Philippine government meanwhile has carried out a Conditional Cash Transfer (CCT) program since 2008 which provides cash to the poorest households (2.2 million people as of 2011). CCTs were also implemented in Indonesia, Pakistan and Sri Lanka, where the cash-transfer approach was first piloted in 1991 under the *Janasaviya Program*.

Safety net programs in Asia are still growing. In India, the Parliament is discussing a Food Security Bill that would extend subsidized food grains to 75% of the rural population and about half of urban households in this country of 1.2 billion people. In the Philippines, the government plans to expand the CCT program with an additional USD 100M loan from the World Bank.

The key question about safety net programs is whether these are sustainable in the long-term, and whether they empower poor people to escape from chronic poverty, hunger and malnutrition.

Ensuring “food security for all” remains as a prime responsibility and mandate of the state. The right to food is a basic principle enshrined in the Universal Declaration of Human Rights that stipulates the rights of everyone “to a standard of living adequate for the health and well being of himself and of his family, including food, clothing, housing and medical care and necessary social services.” The right to food is also enshrined in the Constitutions of each country. The Pakistan Constitution (Article

38d) ensures the provision of basic necessities of life including food for all its citizens. It states: “The State shall provide basic necessities of life, such as food, clothing, housing, education and medical relief, for all citizens, irrespective of sex, caste, creed or race, as are permanently or temporarily unable to earn their livelihood on account of infirmity, sickness or unemployment”.

Nepal’s interim constitution of 2007 establishes the fundamental right of each citizen to food sovereignty, and it is the responsibility of the state to protect this right. As the country is still recovering from a decade of civil war, food insecurity remains a serious developmental challenge.

In India, a public interest litigation petition was recently filed by the People’s Union for Civil Liberties over the rotting food in warehouses, despite the existence of widespread hunger. In an unprecedented decision, the Indian Supreme Court upheld the fundamental “right to food” and ordered that the surplus food-grains be distributed among the poor for free or be sold at low cost. Also, the Standing Committee of Parliament advised that surplus food-grains be distributed among the poor free of cost or exported. (AVARD, 2011)

China has made major strides in reducing poverty and hunger. With only 9% of the world’s cultivated land, China has managed to meet the food demands of most of its 1.3 billion people, or 20% of the world’s population. Carefully-managed market reforms since the 1980s have brought rapid economic growth and increases in household incomes. A major factor was introduction of the household responsibility system (HRS) in the late 1970s, where collective farms were dismantled and land distributed among individual farming households. The impact on production was dramatic: between 1978 and 1983, per capita incomes of rural people doubled, and food calorie intake increased. Over the years, poverty has significantly been reduced to about 11% of the population (150 million) today.⁶ However, there is concern over growing income disparities: average urban incomes are three times higher than rural incomes.

Similarly, since introducing economic reforms under *Doi Moi* (renovation) in 1986, food security in Vietnam has also significantly improved. Hunger and poverty have been reduced from 58% of the population in 1993 to 18% today. Within the agriculture sector, peasant households were given usufruct rights to land. Vietnam has

⁶ China uses a local measure of poverty at USD 0.5 per day, compared to USD 1.25 per day of the World Bank.

transformed from a rice importer to becoming the 2nd largest exporter of rice in the world today.

II Emerging issues in Asia's food security

In recent years, Asia and the world experienced a new round of “food crises” that brought food security back into public attention and into national development agendas.⁷ These food crises periods were different from those of the past; they were marked by sudden spikes in global and domestic food prices – especially of rice and wheat – two key staples produced and consumed in Asia. And even after the market stabilized, food prices have remained high – thus suggesting that the problems are deeper and systemic, rather than just a matter of temporary price fluctuations.

In several countries, the crises forced people to stand in long queues to purchase government-subsidized grains and to receive food rations. Poor families spend about half their income on food; thus, any sudden price hikes of rice and staples force poor families to cut back on food, resulting in food insecurity and malnutrition. The lack of food, in turn, hinders the ability of poor people to work, and this sinks them deeper into debt and poverty. It is said that a 10% spike in domestic food prices in developing Asia could push an additional 64.4 million into poverty. (ADB, 2011) Indeed, when a crisis strikes, the rich get away unscathed, while the poor starve even more.

Several factors have been cited for the rise in food prices. On the *demand* side: *Asia's growing populations* and *changing tastes and diets* – away from traditional staples produced by small farmers, and towards increased consumption of commercially-grown meats and processed foods that require more resources and energy to produce.⁸ On the *supply* side, factors include: *rising costs of inputs*; *competing use of crops for biofuels*; *unsustainable production systems* that cause soil erosion and reduce soil fertility; *increasing scarcity of fresh water*; and *reduction of farmlands* due to urban expansion, commercialization and climate change.

Rising competition from the biofuel industry for land and food crops

One reason cited for rising food prices is the growth of the biofuel industry worldwide, which has increased the demand and competition for Asia's land and food

⁷ Asia's “food crisis” occurred in three periods: 1997-98, 2007-08 and 2010-11.

⁸ With increased incomes and growing urbanization, people move up the food chain towards consumption of meat, dairy and “high-value” products, which require more resources to produce. To cite: 1 kilo of meat requires a minimum of 5-7 kilos of feed grain.

products. Market demand for biofuels rose with the sudden spike in global oil prices and with Western governments' support for renewable fuels.⁹ Biofuels production worldwide grew from 1 million hectares in 2001 to 25 million hectares in 2008, and is expected to more than double between 2007 and 2017. (FAO, 2008b)

Biofuel production affects agricultural production by shifting land use from forests and food, to biofuel crops. Biofuel production is capital-intensive and thus favors large-scale plantations. Palm oil is one of the major crops used for biofuel. Although Indonesia already has 6 million hectares of oil palm plantations, it has plans for expanding by another 4 million hectares by 2015, dedicated to biofuel production alone.¹⁰

Biofuel is produced also from foodcrops that include sugarcane, maize and soybean, and the end-use of these crops are often undetermined until they have been harvested and sold. Thus, it is *market prices* that determine whether these crops end up as food for people or as fuel for cars. According to FAO, global biofuel production based on agricultural commodities increased more than three-fold from 2000 to 2008. And because crops such as maize and sugar can be diverted to biofuel, food prices are now exposed to other factors, such as the volatility of oil prices, hoarding, and the growing energy market.

The impact of non-sustainable production systems

Agricultural production in Asia increased by some 62% from 1990 to 2002, but this was achieved largely through more *intensive use* of land and water resources.¹¹ This involved heavy use of agrochemicals and freshwater. During the same period, Asia's application of mineral fertilizers per hectare of agricultural land increased by some 15%, in contrast to a *decline* in the rest of the world. In 2002 twice as much mineral fertilizer was used per hectare in the region as in the rest of the world (FAO, 2004). Overuse of agrochemicals affects the long-term productive capacities of the soil, and affects water quality, wildlife and human health.

⁹ Global demand for biofuels is driven by a European Union policy of sourcing 10% of all transport fuels from renewable fuels by year 2020. About 80-90% of this target is likely to be met by biofuels. (Cotula, 2011) Also, in 2007 the US passed the Energy Independence and Security Act which seeks to reduce the country's dependence on oil imports through mandatory use of renewable energy sources.

¹⁰ The Indonesian government has reportedly given concessions to 600 companies for 9.4 million hectares of land for oil palm companies, mostly from Malaysia, Singapore and the Middle East. From the report of Iwan Nurdin, KPA, 22 June 2011.

¹¹ During this time, global agricultural production increased by only 27%.

Many of the Asia's developing countries suffer from soil erosion and degradation. According to a 1997 UNEP study, 35% of the productive land in Asia has been affected by desertification. The main causes of land degradation are deforestation, poor irrigation and drainage practices, inadequate soil conservation, steep slopes and over-grazing. Some 25% of soil degradation in the Asia-Pacific region is directly attributed to agricultural activities.

While Asia has 61% of the global population, it has only 36% of global fresh water resources (UNESCAP, 2011). Water withdrawals in Asia increased by almost 25% in the past 20 years (1990-2010), due mainly to the agricultural sector, which dominates water use. In all sub-regions of Asia, between 60% and 90% of freshwater withdrawal is used for agriculture. (FAOSTAT) An increasing amount of water for irrigation is extracted from the ground through tubewells and mechanized pumps that deplete the aquifer, and contribute to desertification and salinization in many countries.

The new competition for Asia's farmlands and fresh water

Population growth, coupled with urbanization and industrial development, also contributes to the growing competition for land and water. Yet, in recent years, a new kind of commercial competition has come from wealthy food-importing countries and private investors who have begun acquiring farmlands overseas for the large-scale production of food, biofuel, livestock & other products.

Because of rising world food prices, many wealthy countries have decided to directly produce their own food abroad, and thereby avoid the risks of depending too much on world markets for their food supply. Yet this rush for securing farmlands overseas is driven not only by the need for food, but increasingly by *commercial profit*, as the rise in agricultural commodity prices has made production more profitable.

About one million hectares of land in Cambodia were acquired for agriculture and forestry by foreign governments and companies between 1988 and 2006, and more than 415,000 hectares acquired in two provinces of Lao PDR. (Cotula, 2011) Land acquisitions in Asia have been led by capital-rich Arab Gulf States and the prosperous countries of East Asia. Based on one estimate, China, South Korea, United Arab Emirates, Japan and Saudi Arabia controlled an estimated 7.6 million hectares overseas as of the end of 2008. (Kugelman) Control of the land also brings with it the control of water resources that are locked up beneath the surface. Meanwhile, China's overseas acquisitions include fishing rights to the exclusive economic zones (EEZs) of

32 countries that include Malaysia, Indonesia, Burma and Sri Lanka, as well as West Africa, Fiji and Argentina.

The new investments differ from those of the past. Foreign investors seek *resources* (land, water) rather than just commodities and markets. The investments are also much larger in *scale*, and are now spearheaded more by *government-led investment* than in the past.

The new land deals affect domestic food production in host countries, as large tracts of productive land are ceded to foreigners, even though the host countries have growing populations that are chronically short on food supplies and dependent on imports. Also, there are documented cases of small farmers and settlers are being displaced or evicted from their lands, even when so called “public”, “surplus” or “unused” lands such as forests are leased to foreign ventures. The new land deals increase the concentration of land ownership in a few corporations, and often leave the rural poor outside of both land and markets.

The “supermarketization” of Asia’s food sector

With growing urbanization, Asia’s food industry has also been undergoing a qualitative transformation since the 1980s. There is a shift towards vertical integration of the food value chain – linking production to wholesaling, processing and retailing. Corporations now dominate the food sector. Profound changes are occurring in the *retail* sector through the “supermarket revolution”. The spread of supermarkets and fast-food chains started in East Asia, then in Southeast Asia and China, where the share of supermarkets in food retailing will double to 23% by 2015.¹² Supermarkets have expanded to include the sale of fresh produce (grains, vegetables and meat), and they now compete directly with traditional fresh markets supplied by small producers. With the growing integration of the food production and distribution chains, the big traders and retail stores are now able to dictate the terms over their suppliers, and this leaves the small producers in a weak bargaining position.

For the small farmers in Asia, the opening of agriculture to trade liberalization since the 1990s has meant the abolition of agricultural credit and subsidies from government, the privatization of agricultural support services, and increased competition from cheaper imports. There has also been a decline in *public* investment

¹² In South Asia, however, the rapid growth of supermarkets is not expected in the immediate term, because of low incomes and highly rural economies (FAO, 2008).

and spending in agriculture in many Asian countries, in sharp contrast to US and European countries where agriculture continues to be heavily subsidized by the State.

With the vertical integration of the food industry, Asia's small farmers today face a new layer of barriers – difficulty in accessing services and credit, weak extension services, and pricing policies that work against farmers (e.g., price controls on the farmgate prices of staples grains and traditional food crops). Small producers are also faced with new market demands: high-value products, continuous supply of uniform products, use of new production technologies, formal contracting arrangements, and new institutional requirements (permits and certification). The new rules of the market inadvertently serve as barriers against smallholders, and this includes various industry requirements and standards.¹³ Given the high costs of certification and compliance monitoring, trading companies are likely to switch from smallholders to large agribusiness farms. Companies generally prefer to source from larger producers because of the lower transaction costs involved and because these producers also have easier access to facilities such as storage, greenhouses, irrigation and transport.

III Meeting the challenges

With half a billion people in Asia undernourished, the demand for food is expected to further grow with the increase in population. It is projected that Asia will exceed 5.25 billion people by 2050, requiring a 70% increase in food production to achieve food for all.

Throughout its long history, Asia's food security and agriculture have been built on the productivity and resiliency of smallholder farming. Smallholders continue to face many constraints. They cultivate small plots often with little or no public support; they continue to count among the poorest and most food insecure sectors in Asia and the world today. Many lack access to land and facilities, and increasingly depend on prices dictated by buyers. Recent trends in agriculture and the food industry are putting small farmers at even greater risk.

Yet even with the barriers they face, smallholders contribute a significant amount to the total value of agricultural output. In India, smallholders contribute over 50% of the country's total farm output although they cultivate only 44% of the land. Throughout Asia, smallholders continue as the main producers of staples such as rice, corn, root

¹³ This includes those stipulated under the Joint FAO/WHO Food Standards Programme (Codex Alimentarius). However, different countries and corporations impose additional food standards – including on safety and hygiene, nutrition, labeling, traceability, processing, packaging, organic standards, etc.

crops and pulses that feed growing populations.¹⁴ Small farms also serve as conservators as they also tend to grow a wider variety of crops and cultivars; these, in turn, serve to increase the resiliency of small farms against pests, diseases, droughts and other stresses. Small farms have higher use of labor; they have generally higher cropping intensity and are more diversified than large farms. There is a growing body of evidence that shows small farms to be more productive per unit area than large farms. This provides a compelling argument in favor of *land reform*, as land redistribution would increase productivity, efficiency and equity.

Meeting the new challenges and market demands for food security will require technological and institutional innovations, supported by government policy and public investments. In the field of agriculture, actions for food security must be based on a genuine appreciation, recognition and support for the central role of small farmers and producers. □ (ABQ)

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¹⁴ Smallholders also dominate in certain tree crops. Small farmers and rural communities produce three-fourths of Indonesia’s rubber, 95% of its coffee and most of its coconut/copra production. (smallholder agroforestry) are managed so that they reproduce the functions of natural forests. Cinnamon, rattan, resins, coffee, durian are cultivated among timber species and agricultural crops. (Contreras-Hermosilla and Fay, 2005)

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