

Strategic Choices for the Future of Agriculture in Myanmar: A Summary Paper

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by Michigan State University (MSU) and the
Myanmar Development Resource Institute's Center for Economic and Social Development
(MDRI/CESD)

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1. Introduction

The Government of Myanmar (GOM) and the Ministry of Agriculture and Irrigation (MOAI) face important decisions about the future direction of agriculture. Myanmar's agricultural potential is enormous given the country's resource endowments and favorable geographic location. As growing water scarcity constrains production around the globe, and particularly in neighboring China and India, Myanmar's water resources will offer a significant agricultural competitive advantage. In addition, the country's diverse topography and eco-systems enable farmers to produce a wide range of cereals, pulses, horticulture, fruits, livestock and fish. Combined with its strategic location between two enormous regional markets, in India and China, and easy access to buoyant markets in the Gulf, Myanmar's farmers and agribusinesses find themselves well-positioned to succeed in regional and global agricultural markets. Thus, with rich natural resources (especially its major river systems), growing domestic and international markets, a stable exchange rate and strong interest from overseas investors, the future is potentially very bright.

Major challenges, internal and external, must be addressed to secure this future. As an aid to decision-making, by government and donors, this paper tackles three core tasks. First, it provides an assessment of the current performance of agriculture in Myanmar. Second, it conducts a diagnostic assessment of the opportunities and constraints faced by farmers and agribusiness that have hampered agricultural growth relative to its regional peers. Third, the paper identifies actions that will be necessary to realize the considerable potential of agriculture in Myanmar to bring prosperity to the largest possible number of its citizens, now and for future generations.

This paper summarizes a more detailed diagnostic report² prepared by a team of 6 MDRI staff and 7 international experts in the areas of rice production systems, agribusiness, rural finance, food and nutrition security, agricultural education and research, and agricultural economics. To prepare the report the team interviewed government officials, farmers, traders, agribusiness operators, transporters, representatives of UMFCCI and traders' associations, international donors and NGO staff, and visited more than 36 villages and over 24 markets in the Delta, Dry Zone and Shan State. The team also reviewed a large number of previous reports on agriculture in Myanmar, analyzed agricultural statistics and market information, and compared the historical performance of agriculture in Myanmar to other countries in ASEAN and South Asia.

² "A Strategic Agricultural Sector and Food Security Diagnostic for Myanmar". Draft Report, February 2013. Michigan State University (MSU) and the Myanmar Development Resource Institute, Center for Economic and Social Development (MDRI/CESD). This study was made possible with support from the American people delivered through the U.S. Agency for International Development (USAID). The contents are the responsibility of MSU and MDRI/CESD and do not necessarily reflect the opinion of USAID or the U.S. Government.

The discussion below begins with a synopsis of the current structure and performance of the agricultural sector.³ It then addresses the following two questions. Why has Myanmar's agricultural sector not performed as well as in neighboring countries? What actions -- by government, private stakeholders and donors -- will be most effective in stimulating rapid, broad-based increases in agricultural productivity and profitability?

2. Current structure and performance of Myanmar's agricultural sector

2.1. Structure

As in neighboring countries, smallholder paddy production dominates Myanmar's agricultural economy. Paddy production accounts for roughly half of all cropped area, while pulses and oilseeds account for a further 20% each, with horticulture crops, roots and other cereals accounting for the remainder. Farmers generally grow lower value crops such as paddy, pulses and oilseeds on relatively large surfaces, while high-value horticulture and fruit crops take place on much smaller plots. Paddy, pulse and oilseed farmers cultivate an average of 4-5 acres per holding. In contrast, onions, garlic and potato fields average about 1.5 acres each, while vegetables and cut flowers are grown on plots ranging between 0.6 and 0.7 acres in size. High value crops enable even small landholders to earn high returns from small holdings.

Horticulture products -- including fresh fruits, vegetables and flowers -- provide earnings for about 15% of rural households in Myanmar. Grown widely throughout Myanmar, horticultural products assume particular prominence in the hilly zones of Shan State and other border regions. Livestock and fisheries account for about 20% of total agricultural incomes in Myanmar, though these estimates may understate the economic and nutritional importance of these non-crop sectors. As with high value horticulture products, small stock and poultry attract considerable interest among landless⁴ and near landless households because of their high value and low land requirements.

Over the past decade, the Government of Myanmar has allocated nearly 2 million acres of land in large concessions to local agribusiness companies and, since 2010, to foreign investors. Some of the large concessions have proven commercially successful as farming businesses. Other concessionaires appear to have limited interest in farming and instead gain land rights in order to enable mineral extraction, lumbering or land rental to smallholder sharecroppers. For

³ Problems of data reliability pose persistent difficulties for policy makers and private decision makers in Myanmar. Most of the stakeholders we spoke with -- in the private and public sector -- agree that the quality of Myanmar's agricultural data is generally weak. Production estimates for paddy, the nation's most important crop, differ by nearly a factor of two among major reporting sources. For minor crops, livestock and fisheries, data are similarly uncertain. Yet imprecision on this scale makes it difficult for both government policy makers and private investors to make informed decisions. Hence the importance of improving statistical systems as part of the Long Game structural reforms outlined below.

⁴ Rural households without tillage rights are, by definition, landless. Some are landless by choice. Nonfarm business owners and salaried workers -- accounting for about 20% of rural landless households -- fall into this category. The majority, however, are involuntarily landless. Some work as tenant farmers, though most earn their living as wage laborers, primarily by working in the fields of neighboring farmers who hold tillage rights. Although estimates vary regionally and across sources, we estimate that roughly 50% of rural households in Myanmar are currently landless (MSU/MRDI 2013, Tables C4 and C5).

some categories of commercial agriculture and agribusiness, large concessions offer a viable model for meeting the stringent quantity, timing and quality demands of high-value products and niche export markets. However, these large holdings do not offer a feasible exit for the vast majority of Myanmar's landless poor, given common tendencies to mechanize large-scale operations. In practice, overly rapid mechanization on large farms risks displacing labor and thereby depressing rural wage rates, thus further constraining the short-term survival strategies of the rural landless. Under most crops and agro-ecological conditions in Myanmar, smallholder farmers offer significant potential for productivity growth, increased competitiveness and expanded employment for landless households (Box 1).

Box 1. Small Farms and Large Farms: Efficiency and Equity Implications of Agricultural Growth

Alternate models. The Government of Myanmar faces important policy choices in the agricultural sector, in particular whether to focus public resources on the smallholder sector or large-scale commercial farming. This is a policy question on which much can be learned from the development experience of other countries in the region and around the world. Many land-constrained Asian countries – including India, China, South Korea, Japan, Vietnam, Bangladesh and the Philippines – have focused their agricultural development strategies on small-farmer-led growth. Others, including Laos and Cambodia, have followed a mixed strategy that promotes large-scale private agribusiness investment alongside local small farms. At the other end of the spectrum, land-abundant Brazil has centered its agricultural growth strategy on highly mechanized, large-scale farms. Over the past three decades, these large farms have successfully turned Brazil into a highly competitive exporter of soybeans, sugar and meat. Which of these strategies will best suit Myanmar? Available evidence on the efficiency and equity implications of alternate agricultural growth strategies can help to answer to this question.

Small farms. Empirical evidence generally suggests that small farms achieve higher land productivity and employment than large farms. Smallholders can achieve this high productivity for two reasons. First, smallholders' productivity advantage stems from their widespread use of highly motivated family labor and the ability of family farmers to carefully supervise hired labor. Large farms, in contrast, typically face lower borrowing costs and hence are better able to finance equipment and inputs. As a result, smallholder farms generally dominate in early stages of development in locations where equipment is expensive and land scarce. Large farms, in contrast, perform better in later developing countries with high labor costs and surplus land.

Second, many farm technologies are scale-neutral. The Green Revolution packages of improved seeds and fertilizer can be applied with equal effect on farms of 1 acre or 1,000 acres. Bulk purchasing by large farms, which leads to lower input costs, can be offset by farmer organizations and collective action. The combination of improved technology and good labor management leads to high productivity achievement by smallholders. "The record on the superiority of smallholder farming as a form of organization is striking. Many countries have tried to promote large-scale farming believing that smallholder farming is inefficient, backward and resistant to change. The results were unimpressive and sometimes disastrous." (World Bank 2007, p.91).

The poverty impact of smallholder farming is also typically greater than from mechanized large farms, which instead tend to displace labor. Rapid reductions in poverty following Green Revolutions in India and China are generally attributed to small farmer led agricultural growth. More generally, Lipton concludes that, "There are virtually no examples of mass poverty reduction since 1700 that did not start with a sharp rise in employment and self-employment due to higher productivity on small family farms." (Lipton 2005, p.9).

Large farms. Large farms are more competitive than small farms in situations where land is plentiful and labor is scarce (like Brazil), where economies of scale in processing lead to high minimum investment costs (as with plantation crops such as palm oil, rubber and sugar cane), where bulky or perishable products require quick processing (like tea and sugar cane) or where consumers impose high quality and food safety standards (as in export horticulture and floriculture). Moreover, large farms offer benefits in mobilizing private investment in agriculture, facilitating international technology transfer and developing new markets. Mixed models frequently emerge with

plantation crops (such as rubber, palm oil, sugar cane and tea), where large agroprocessors with core plantation farms make initial investments, which smallholder can later supply through outgrower schemes. On the negative side of the ledger, large farms typically generate an unequal distribution of income. Hence their generally poor record of poverty reduction. Likewise subsidies for large farms, through concessional finance, for example, risk premature mechanization and displacement of labor.

Growth linkages. In irrigated Asian agriculture, every dollar in direct farm income generates roughly an additional 60 cents in indirect income because of farmer spending on local goods, services and inputs (Haggblade, Hazell and Dorosh 2007). These growth linkages differ substantially between large and small farms. While large farms purchase more equipment, repair services and inputs, small farms spend more on local consumption goods and services. Because consumption linkages (spending on consumer goods and services) dominate growth linkages, small farms generate large local income multipliers. These indirect gains from agricultural growth tend to be large and hence small farm led growth leads to greater direct and indirect poverty reduction impacts.

Implications for Myanmar. Myanmar requires an agricultural strategy that will generate rapid income growth as well as broad-based poverty reduction. Small and large farms each have a role to play in promoting efficient, rapid rural income growth. However, given Myanmar’s current high levels of landlessness and rural poverty, concerted efforts to promote broad-based small farmer growth offer the likeliest pathway to rural poverty reduction.

References: Deininger and Byerlee (2012), Haggblade, Hazell and Dorosh (2007), Lipton (2005), World Bank (2007).

2.2. Performance

Looking back over the past 20 years, paddy output appears to have grown more slowly than most other crops in spite of the Government of Myanmar’s heavy priority for rice. Even optimistic official production figures suggest that rice output has grown at about 3% annually over the past two and a half decades, with the bulk of these gains coming from area expansion. More conservative estimates from the USDA suggest paddy output has grown at closer to 1% per year.

Maize production has grown far more rapidly than rice, on the heels of rapidly growing demand for poultry feed and emerging regional export markets. Pulse production has grown more rapidly than any other agricultural commodity group since liberalization in 1988, at a compound annual rate of 9% per year. Horticulture and poultry output have grown at 6% to 7% annually over the past two and a half decades, driven by growing urban demand and growing incomes (Table 1).

Table 1. Annual Rates of Agricultural Growth in Myanmar, 1985/86 to 2009/10

| | Area | Production |
|--------------|------|------------|
| Cereals | | |
| paddy, GOM | 2% | 3% |
| paddy, USDA | n.a. | 1% |
| maize | 3% | 6% |
| Oilseeds | 3% | 6% |
| Pulses | 7% | 9% |
| Horticulture | 5% | 7% |
| Poultry | n.a. | 6% |

Source: Growth rates computed from data in Myanmar Statistical Yearbooks and USDA .

Despite major investments in rice production by government it is one of the less profitable crops for small farmers. Prices are often low immediately after harvest, while labor and fertilizer costs are high. The interest rates for informal sector credit, at 6-8% a month, eat into the farmers' potential profit margin. Private sector pesticide companies have been aggressively promoting pesticide use on rice, but farmers have little information about how to use them correctly. Increasingly irregular rainfall, coupled with poor water control, leads to increasing frequency of both flooding and drought.

The production of beans and pulses is generally seen as more profitable than rice in the winter season, in part because of much lower labor requirements and input costs. Prices, however, are especially volatile because 70% or more of pulses such as black gram, green gram, pigeonpea and chickpea are exported to countries, especially India, whose demand from one year to the next is very unpredictable. Horticulture, poultry, small livestock and fishing offer rapidly growing, high-value markets. For very small landholders, these high-value commodities offer the attraction of growing markets and limited land requirements.

In the aggregate, agricultural productivity in Myanmar remains low in comparison with its international competitors and neighbors. With per capita farm earnings that average roughly \$200 per year, Myanmar's farming households earn one-half to one-third of the levels attained by their regional peers (Table 2). National rice self-sufficiency has not translated into food security for the poor. Roughly one-fourth of the national population – and 29% of rural households – falls below the national poverty line (IHLCA 2011). Poor households spend over 70% of their income on food, and fully one-third of rural households borrow at some point during the year to purchase food (IHLCS 2010, LIFT 2012). In spite of these considerable efforts, up to half of rural households report inadequate food intake for over two months each year (MICS 2011, LIFT 2012). Consequently, stunting affects about one-third of children under five, while malnutrition as measured by underweight affects similar numbers (MICS 2011).

Table 2. Indicators of Agricultural Productivity and Food Security

| Country | Agricultural Income per Ag. Worker (\$ per year) | Poverty (% under \$1.25 per day) | Malnutrition (% children underweight) |
|----------------|--|--|---|
| Malaysia | \$6,680 | <1 | 13 |
| Philippines | \$1,119 | 18 | 21 |
| Indonesia | \$730 | 18 | 20 |
| Thailand | \$706 | <1 | 7 |
| Bangladesh | \$507 | 43 | 41 |
| Cambodia | \$434 | 23 | 29 |
| Vietnam | \$367 | 17 | 20 |
| Myanmar | \$194 | 26 | 32 |

Sources: IHLCA (2011), World Bank Development Indicators (2012), MDG Indicators (2012).

3. Why has Myanmar's agricultural sector under-performed?

A series of institutional, policy and structural constraints has hampered agricultural growth and contributed to Myanmar's current high rates of hunger and malnutrition. The most critical of these problems include: • a highly skewed land distribution, which leaves roughly half of rural households landless, • poor water control systems in the presence of global climate change and increasingly unpredictable rainfall, • a high-cost transportation system, • weak rural financial institutions, • unpredictable and uneven implementation of new government policies, • low public investments in agricultural research, and • weak links between extension services and farmers.

Highly skewed land distribution. A signature feature of rural Myanmar is its highly skewed distribution of cultivable farmland. Data on land distribution remain difficult to assemble given acute political sensitivities, locational differences in traditional tenure systems and large numbers of unrecorded, informal transactions. Even so, available evidence unambiguously suggests that the highest rates of landlessness occur in the Delta region, where field estimates of rural landlessness range from 50% to 80% of rural households. In the Dry Zone and hilly regions, where land pressure is visibly less, the share of landless in total rural households ranges between 25% and 45% (LIFT 2012). Although estimates of landlessness differ widely, the preponderance of available evidence – from various household surveys and from the last three agricultural censuses – suggests that between one quarter and one half of all rural households are landless in the sense that they have no land use rights to cultivable land.

Without land of their own to cultivate, most rural landless households depend on intermittent wage labor, frequently on neighboring farms. Given low prevailing daily wage rates in rural areas, poverty and landlessness are strongly correlated. Poor households hold significantly smaller landholdings than nonpoor (IHLCA 2011, Table 18). Likewise, rates of landless are much higher among the poor than the nonpoor. Among the poorest decile of households, 38% are landless. This contrasts with landless rates of only 7% among the richest decile of households (IHLCA 2011, Table 21). As a result of lower incomes and higher poverty rates, landless households are more likely than large landholders to go hungry and to borrow for food purchases (LIFT 2012, Tables 43 and 107). Given a highly skewed distribution of productive assets and income, rates of poverty and hunger remain stubbornly high.⁵

Underinvestment in agricultural research. Improved varieties, crop and post-harvest management practices have driven agricultural productivity growth across most of Asia. Yet over the past five decades, underinvestment in public research has limited these gains in Myanmar, where agricultural research expenditures have lagged far behind those of its regional and international peers. On average, Myanmar spends only \$0.06 of every \$100 in agricultural output on agricultural research compared to \$0.41 by its Asian neighbors (Table 3). As a consequence of these acute funding constraints, MOAI currently conducts no breeding research

⁵ The relationship between gender and vulnerability is an important issue but one that is especially difficult to untangle in Myanmar, given conflicting reported findings and generally weak data on the intra-household division of labor tasks, incomes and consumption. As a result, the main diagnostic report has flagged gender issues as an area requiring further research.

on improved varieties of green or black gram, the country’s two most valuable pulse exports. With agricultural research expenditures averaging only 20% of its peers and competitors, Myanmar’s farm productivity and incomes have lagged. If this situation persists, it is difficult to see how Myanmar’s farmers will be able to compete in international and domestic markets given this level of underinvestment in core public research functions.

| Table 3. Agricultural Research Intensity (public research spending per \$100 dollars in agricultural GDP) | | |
|--|---|------|
| Location | Agricultural research spending intensity | |
| | 2000 | 2008 |
| Developed world | 2.40 | 3.07 |
| Developing world | 0.53 | 0.54 |
| Asia | 0.41 | 0.42 |
| Myanmar, 2003 | 0.06 | n.a. |

Source: Stads and Kam (2007), Beintema et al. (2012).

Investment in publicly funded plant breeding and agronomic research is particularly critical, given that Myanmar’s farmers allocate the majority of planted area to self-pollinated crops such as rice and pulses for which the private sector seed companies have little incentive to invest. Vegetatively propagated crops such as betel leaf, dragon fruit and grafted fruit trees similarly require public support because of limited incentives for private research investment in commodities and technologies for which companies cannot recoup their research and development costs. Raising productivity in livestock and fisheries, likewise, requires collective action and public investment in the development and introduction new species, control of contagious diseases and regulation of fish spawning and license allocations.

Weak links between extension staff, researchers and farmers. A farmer-centered, service-oriented extension system provides the conduit through which common farmer problems get identified and flagged for the attention of researchers so they can help farmers to solve practical problems that limit farm productivity. Nonetheless, links between extension and research remain generally weak in Myanmar. “Of particular concern is the absence of operational interaction between staff of the Central Agricultural Research Institute (CARI’s) outlying research farms and staff of the extension services. Extension agents rarely come to the research stations and researchers do not routinely visit extension offices or demonstration sites.” (FAO 2005, p.112). Our interviews with stakeholders suggest that these links between extension and research still remain weak in 2012.

Links between extension officers and farmers are similarly limited. In part, extension staff find themselves constrained by an acute shortage of transport and field allowances. In addition, institutional tendencies to instruct rather than listen to farmers have become embedded over two generations of command and control management of Myanmar’s agricultural sector. Consequently, “The strong extension force of the Myanmar Agricultural Service (MAS) is mostly occupied with achievement of central production targets for pillar crops and especially for rice. To have a more significant impact on improving farm incomes, crop production and the

alleviation of rural poverty the service requires re-orientation within a new enabling environment for farm production.” (FAO 2005, p.55) A more recent investigation in 2012 similarly finds that, “extension of agricultural advice is virtually non-existent with farmers depending heavily on each other, private suppliers of inputs and wholesale purchasers.” (Anderson Irrigation 2012, p.14). As a result of cutbacks in extension staff imposed on MOAI in 2006 and limited travel budgets, many of the farmers we met during our field visits had never encountered an extension agent.

Poor water control in the presence of global climate change. Farmers observe that weather patterns are increasingly difficult to predict, with drought one year and flooding the next. Most formal assessments suggest that climate change will affect Myanmar significantly. Major expected changes include rising temperatures, higher rainfall and a possibly a shorter rainy season, which in combination will contribute to considerable increase in flooding. Rising sea levels along the coast are likely to compound these problems by aggravating salt water intrusion and soil salinity in the coastal areas and river deltas. Risk reduction will require household as well as system-level investments in diversification and water control to manage increasingly unpredictable swings in seasonal rains and drought.

Weak agricultural finance institutions and rural household indebtedness. Myanmar’s financial sector and banking system are small and underdeveloped. Access to finance for agricultural sector participants is minimal. While the agricultural sector in Myanmar generates 36% of GDP and employs two thirds of the population it accounts for only about 2.5% of all formal sector loans. This situation affects both rural households and agribusinesses in ways that reduce productivity and profitability at the farm level, increase indebtedness for rural households (especially the poor), and constrains growth in agricultural GDP.

At the farm level, the Myanmar Agricultural Development Bank (MADB) is undercapitalized and, even after recent increases in the amount of credit allocated per acre of paddy, is only able to lend a quarter of the input and hired labor costs. Many farmers do not have access to MADB credit at all due to group lending policies. Farmers have to source additional credit from traders or other informal sources at rates of 6-8% per month, amounting to approximately 50% for the monsoon season. Such high rates of interest result in low or inappropriate fertilizer use and sub-optimal crop management and post-harvest practices, and hence low yields and poor paddy quality. Loan repayment schedules oblige farmers to sell their paddy as soon as possible after harvest when prices are at their lowest. Low yields, low paddy quality and low prices result in very low profitability at best, and often translate into financial losses that contribute to chronic indebtedness. The situation can be equally difficult for landless households that depend on agricultural wages. They are frequently obliged to contract loans or accept advance discounted wages to pay for food when prices are at their highest. Among landless households, 58% report food purchases as their most important reason for borrowing, while only 5% of large landholders do (LIFT 2012, Table 107). For both small farmers and landless households the high cost of informal credit becomes a “poverty trap”. The impact of high cost loans on indebtedness and poverty among rural households has been consistently documented by surveys and studies (IHLCA 2011, Dapice et al. 2011, LIFT 2012, Kloeppinger-Todd and Sandar 2013).

Access to commercial finance for traders and processors in major commodities such as rice and pulses is also constrained due to the high collateral requirements of commercial banks. As a result, traders are limited in the amount of stocks they can hold at any one time. This in turn constrains their ability to buy all the produce farmers want to sell at harvest time and to supply the quantities with standard specifications that international buyers want to procure. While rice millers have benefitted from access to low cost mills imported from China, pulse and bean processors have been limited in their ability to invest in advanced processing equipment to meet the standards of high value, growth markets like Europe and Japan. Finally, lack of access to capital can also result in a highly concentrated market structure. For example, while there are approximately 3000 beans and pulses traders nationally, the export trade is dominated by just 25 – 30 traders. If just a few of these large traders run into financial difficulties, prices in the domestic market for pulses temporarily collapse.

Government has not been able to substitute for absent commercial banks. In an effort to improve farm input credit, the government instituted a system of Rice Specialization Companies (RSC) in 2008 under which registered firms were encouraged to provide paddy inputs on credit under contract farming schemes in return for rice export permits. Although 57 RSC's have been registered, many face difficulties in running viable contract farming schemes for paddy. Heavy cost of input financing coupled with poor repayment due to crop losses, flooding and low paddy prices, only a handful of RSCs continued contract farming in Monsoon crop of 2012 (Wong and Wai 2013).

High transport and communication costs. Transportation and logistics costs are high in Myanmar as a result of many decades of underinvestment, heavy regulation and limited structures linking the water, road and rail transportation (Wong and Wai 2013). Currently, Myanmar ranks lowest in the ASEAN region in quality of logistics and transport-related infrastructure (ADB 2012).⁶ The country's main rivers offer potentially cheap internal transport. Yet the management of intermodal connections, linking water transport, rail, road and air are not well developed. As a result, road and sea container freight rates quickly rise during the peak marketing season in response to cargo congestion.

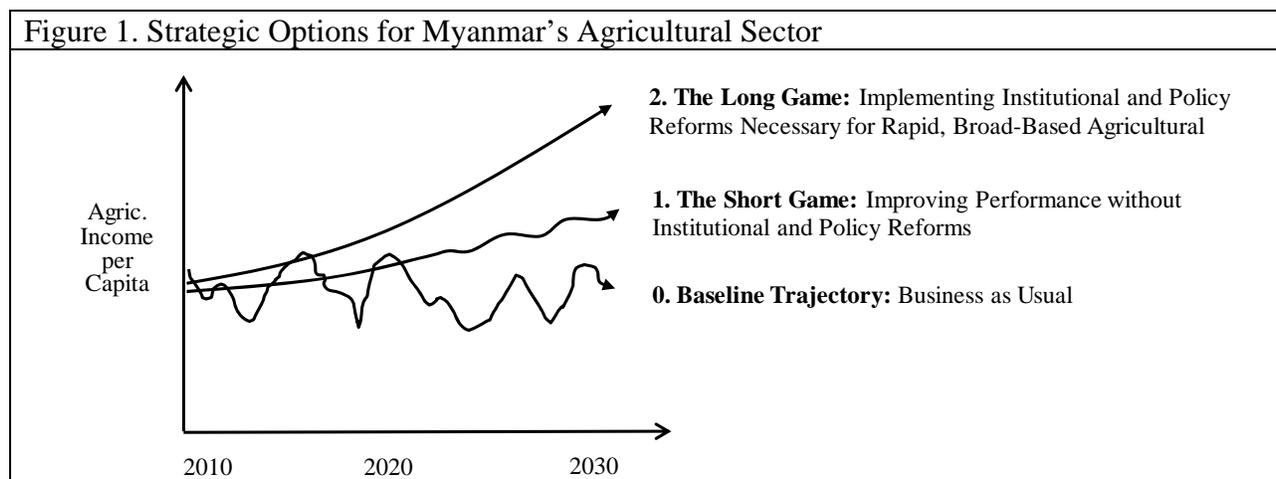
Unpredictable policies. Many of the stakeholders we interviewed offered examples of how arbitrary and unpredictable implementation of evolving government policies had adversely affected agricultural trade, production and investment. Despite recent relaxation of production and land allocation controls at the farm level, many farmers spoke of continued government "encouragement" to plant certain crops, while a few complained explicitly about non-paddy crops being ripped out and plowed under by disapproving local authorities. Clarity about land use choices is particularly critical for farmers wishing to diversify into high-value horticulture, fruit, poultry and fish farming. Many of the agribusiness people we interviewed likewise complained about unpredictable export restrictions, and in some cases continued land controls, that prevented them from exporting specific crops over the past decade, even when business conditions looked attractive. The removal of trade restrictions, or at least clarity on the

⁶ Among 155 countries worldwide, Myanmar ranks 129th in the World Bank's logistics performance index and 133rd in terms of quality of infrastructure (World Bank 2012).

circumstances under which they will be imposed, would help to moderate domestic price fluctuations that, in turn, risk leading to panicked calls for costly government intervention.

4. Three Alternative Pathways for Myanmar's Agriculture

Looking forward, we see three alternative pathways for Myanmar's agricultural sector (Figure 1). Under a Business as Usual scenario, Myanmar's agriculture will continue along its current low-productivity, highly volatile trajectory. But Myanmar can do better -- even within the country's current considerable policy, institutional and structural constraints. And under a vigorous program of policy and structural reforms, Myanmar's agricultural sector can accelerate rapidly. Key decisions by the GOM, its supporters and stakeholders will determine which of these three pathways the country's farmers will travel. We next examine each pathway in more detail.



4.1. Business as Usual

Under a "Business as Usual" scenario, Myanmar's agricultural future will look much like its past, characterized by low farm productivity, high volatility and consequently high levels of poverty and vulnerability.

Myanmar's low agricultural productivity, in relation to its neighbors and competitors, is the product of many decades of under-investment in the public goods that drive agricultural growth. While its neighbors have invested in agricultural research, extension, modern statistical systems, rural roads and telecommunication systems, investment in these growth drivers in Myanmar lags far behind.

High volatility -- of both production and prices -- stems in part from increasingly irregular rainfall accompanying climate change coupled with poor water control and increasingly frequent drought and flooding. As a result of ongoing changes in rainfall and climate, weather-induced shocks seem likely to aggravate patterns of production and price volatility. Unpredictable policies, particularly trade bans on major export commodities, likewise contribute to price volatility and drive wide year-to-year swings in farmer planting decisions. Reliance on single markets for export crops compound volatility problems. High transport and transaction costs together with the lowest cell phone penetration rates in the region combine to exacerbate price volatility and drive a large wedge between farmgate and consumer prices.

4.2. *The Long Game*

In order to match the impressive agricultural performance of its regional peers, Myanmar will need to undertake a series of key institutional and policy reforms. Currently, Myanmar invests only 20% as much in agricultural research (per \$100 in agricultural output) as its regional counterparts. Not only will Myanmar need to substantially boost the resources it allocates to agriculture, it will also need to restructure its line ministries and departments in order to better support the core public goods and services that drive productivity growth in agriculture. Many decades of socialist command and control systems have left a legacy of over-staffed departments designed to supervise and control farmer decisions. Yet service-oriented systems for listening to farmers, diagnosing problems and finding practical, scientific solutions have atrophied.

MOAI has taken several important steps in this direction in the past year, most notably by authorizing the hiring of 700 additional extension officers, adding a horticulture department in DOA to promote crop diversification, elevating plant protection efforts to departmental status, selling off ministry-owned industrial crop processing enterprises and restructuring public support to focus on research, development and extension in a newly structured Department of Industrial Crops Development (DICD). Continuing institutional reforms can build on these initial efforts.

Movement towards a highly productive, competitive, broad-based agricultural growth trajectory will require a further restructuring of agricultural support institutions in the three key areas. First are the public goods that drive broad-based agricultural productivity growth: • agricultural research, through the creation of a market-oriented, farmer-centered research system, • extension system modernization and reform, • agricultural education, • irrigation and improved water management systems, • land administration and access, • deepening of rural financial systems, • improved rural communications and transport, • support for farmer-based organizations and • a transparent, predictable policy environment, particularly in areas governing land use decisions, input quality and cross-border trade. Second is an accurate, objective statistical data collection and dissemination system. Currently, few stakeholders express confidence in Myanmar's official production statistics -- even for rice, where alternate estimates differ by as much as 50% . Yet transparent, effective policies require a firm empirical grounding, as do private sector investment decisions. As part of an overall effort to improve agricultural data, MOAI's detailed cadastral map library could quickly be digitized, geo-referenced and combined with best practice survey methods to lower data collection costs, increase speed and improve precision, early warning and forecasting capacity. Third, is a long-range reengineering of the organization and funding for education, health and nutrition institutions that promote long-term human capital formation among rural children, particularly the children of landless households and other disadvantaged groups.

To successfully implement a restructuring of agricultural support institutions there is an urgent need for investment in graduate training in a wide range of technical and social sciences. For example, not only is the number of scientists in the agricultural research system very small, but many experienced researchers are approaching retirement. In some technical areas, such as soil and water management, post-harvest technology, and policy analysis, there is almost a complete gap. Formal graduate training should be complemented by exchange visits to see how other countries in the region are tackling the challenges facing Myanmar.

Table 4 summarizes key early actions and long-term initiatives that will enable Myanmar to make the structural and policy reforms necessary for driving a long-term acceleration of its agricultural growth trajectory. Full details about these early actions are available in the main report.

| Food system components | Long Game Early Actions | Long Game Reforms |
|----------------------------|---|--|
| Farming | 1. agricultural sector budget and institutional review → 2. agricultural graduate deployment (UDOC) → 3. land policy monitoring and support → 4. access to micro-irrigation for farmer organizations → 5. climate change and water control assessment → | + budget resources for agriculture + institutional reform (agricultural research, extension, education) + land access + farmer organizations + water system management |
| Post-farm value chain | 6. upgrade agricultural statistical systems → 7. rural cell phone expansion 8. MADB assessment → | + improve data quality + predictable policies (land use, input quality, trade) + rural finance + intermodal transport system logistics |
| Landless and near landless | 9. pilot efforts to improve enrollment, curriculum and nutrition → | + education reform + rural nutrition, health and sanitation |

4.3. The Short Game

Options for improving agricultural performance without further institutional or policy reforms center around four strategic axes (Table 5). The first involves improving the productivity of monsoon rice through improved seed quality, better agronomic practices, improved water control, optimized fertilizer and input use, and integrated pest management. As a rough order of magnitude, our discussions with local stakeholders suggest that improved practices among rice farmers could increase productivity and earnings from paddy farming on the order of 25% to 50% over the next 5 to 7 years, even under current conditions. Updating and enforcing pesticide regulations, such as the 1991 requirement to print instructions in Myanmar language, offers an additional quick opportunity to reduce pesticide misuse. Second, promoting diversification into high-value horticulture, poultry, fisheries and small livestock offers prospects for raising returns per acre by a factor of two to ten for both small farmers and landless. A third set of interventions

revolves around post-harvest opportunities for reducing losses and increasing market access for Myanmar farmers. The fourth major axis under a Short Game would focus on landless and other vulnerable rural households. One segment of this effort will focus on preparing children of landless and near landless for productive career trajectories in high-productivity agriculture, agribusiness and nonfarm professions by building up their human capital through nutrition programs and enhanced access to improved rural education. Related efforts involve improving safety nets for vulnerable members of the population.

| Targets | Short Game Early Actions | Short Game |
|--|---|--|
| Farming a) improve productivity of monsoon rice b) promote dry season and Dry Zone diversification | 1. summarize best practices and economics of alternate cropping systems → 2. assess lessons from elsewhere on promotion of high value activities for vulnerable groups → | + agronomic practices + seed quality + farm-level water management + diversification: high-value, scalable (horticulture, poultry, fish ponds) |
| Post-farm value chain | 3. post-harvest loss assessment → | + post-harvest handling + target niche markets |
| Landless and near landless | 4. pilot programs promoting school attendance, improved nutrition and health (link with high-value diversification) → 5. test pilot safety nets to reduce indebtedness following livelihood shocks → | + high value agriculture + nonfarm income + education access + nutrition packages (horticulture, poultry, education, public health) + scale up safety nets and insurance options for landless households |

4.4. Key Decisions Going Forward

Our team strongly advocates a strategy focused on the Long Game, particularly a set of early actions necessary for enabling necessary structural reforms, but complemented by Short Game interventions that help to increase incomes, assets, farmer skills and water management systems that expand productive potential in the Long Game. By piloting models for effective bottom-up research and extension, actions in a Short Game can help to set up a successful Long Game. A balanced attack, centered on the Long Game but complemented by Short Game interventions, will likewise help to demonstrate to rural communities that the GOM and its development partners are seriously committed to improving the agriculture sector. This multi-pronged approach addresses the needs of rural communities for early visible change while at the same time remaining committed to necessary structural re-engineering of institutions and policies.

Myanmar's neighbors and competitors in Thailand, Vietnam, Bangladesh, Malaysia, India and China have all committed to a Long Game involving strong public investments in agricultural research, extension and in the public goods required to support agricultural productivity growth, especially among small farmers. Without similar commitment in Myanmar, we find it difficult to see how the country's farmers will be able to compete in increasingly competitive regional and global markets – including those at home.

Policy reforms begun in Myanmar at the end of the 1980s have moved in this direction, though slowly and at sometimes variable speeds. Continued reforms, coupled with increased resource allocations for agriculture and improved policy implementation capacity will be required to translate these still-unfolding policy changes into sustained, improved conditions on the farm. Promulgating new laws -- as difficult as that appears -- is often the easiest part of a reform process. Mobilizing the political will to increase budget resources, in the presence of many competing constituencies, frequently proves more difficult, as does institutional restructuring, which by definition alters the power base of many vested interests. Myanmar has reached the stage in its agricultural reform process where substantial resource increases and significant institutional restructuring are required to advance an effective reform agenda.

Because two-thirds of Myanmar's population and three-fourths of its poor live and work in rural areas, broad-based agricultural growth offers a uniquely powerful instrument for accelerating economic growth and improving the welfare and food security of vulnerable households. Myanmar's current highly skewed distribution of land, its growing levels of landlessness and increasingly contentious disputes over land access not only pose dangers to vulnerable household welfare but also risk inflaming social tensions and conflict. As a result, we consider the Long Game reforms outlined here imperative for agricultural productivity growth and poverty reduction, as well as long-term political stability.

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