



HARVARD Kennedy School

ASH CENTER

for Democratic Governance
and Innovation

Revitalizing Agriculture in Myanmar:

Breaking Down Barriers, Building a Framework for Growth

Prepared for

International Development Enterprises | Myanmar

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This paper was written by David O. Dapice (david_dapice@harvard.edu), Thomas J. Valley (thomas_valley@harvard.edu), and Ben Wilkinson (ben_wilkinson@harvard.edu) of the Ash Center for Democratic Governance and Innovation at the Harvard Kennedy School and Michael J. Montesano (michael.montesano@aya.yale.edu) of the Institute of Southeast Asian Studies in Singapore. *The views expressed herein are the authors' alone and do not necessarily reflect those of IDE, the government of the Union of Myanmar, the Harvard Kennedy School, Harvard University, or the Institute of Southeast Asian Studies.* We wish to extend our sincere thanks to our colleagues at IDE/Myanmar and the Ministry of Agriculture and Irrigation for their contributions to the research and for organizing the complex logistics the assessment demanded. Partial funding for the study was provided by the Royal Norwegian Government.

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INTRODUCTION

I. Objectives and Conceptual Framework

This is a study of the rice economy in Myanmar. It seeks to identify barriers and bottlenecks that are hindering growth and depressing value in a sector that must play a central role in alleviating the extreme poverty that currently afflicts an expanding proportion of rural households.

The worst way to read this report is to turn directly to its “Conclusion” and to look for a set of detailed recommendations from the research team. While the concluding section of this report does indeed offer a series of *general* recommendations, they are neither so detailed as to permit of immediate implementation nor readily comprehensible without reference to the report as a whole. What Myanmar needs to do to revitalize its farm sector will require many complex decisions and important choices. It cannot be reduced to a simple five-point list.

The issues that this paper addresses are of importance to the entire Myanmar economy and its prospects for achieving a higher level of growth and delivering prosperity to the Myanmar people. This is because many of the barriers to greater productivity in the rice economy are also obstacles to growth of the economy as a whole. From electricity and transport infrastructure to banking and trade policy, the Myanmar economy is being held back by inappropriate policies and limited state capacity to implement them. In some instances these policies are well-intentioned but poorly designed and implemented; in other cases the policies appear to have been conceived in order to benefit particular interest groups.

The dysfunctionality of economic policy in Myanmar flows directly from the lack of a common understanding among political, business, and policy elites regarding the institutional structure and core logic that drive modern economic systems. The rice economy provides an excellent window on these structural barriers to economic development, in part because the country’s enormous potential in this sector is a historically proven fact. The Ayeyarwady River Delta is one of Southeast Asia’s great rice-growing agro-ecosystems. However, this paper will show that while the rice sectors in Thailand and Vietnam—Mainland Southeast Asia’s other historic centers of rice production—have continued to realize gains in output, in recent years Myanmar’s output has actually declined, on a per capita and yield basis.

This paper builds upon an earlier paper written in March 2009 by three of the four authors of the present study. The 2009 paper sought to assess how the rice economy was recovering from the devastation wrought by Cyclone Nargis. The Team concluded that the Myanmar rice economy was trapped in a downward spiral. Rural households had suffered repeated shocks, in the form of crop-failures, droughts, decapitalization, and arbitrary export bans. With each successive shock households were forced to dig deeper into their meager asset pools, selling off land, livestock, other possessions, and even future labor, sometimes seeking employment elsewhere. The consequence of this string of events, the report argued, was that the countryside was losing the resiliency that had sustained it through decades of neglect and underinvestment. The paper concluded that without urgent interventions to recapitalize the agricultural economy and provide some form of social safety net to the most vulnerable, the risk of a continued deterioration of humanitarian conditions and possible food shortages was likely.

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Writing in the middle of 2010, after two research trips, including extensive field visits that afforded the opportunity to speak with several hundred participants in the rice sector, the research team concludes that, despite signs of recovery in the Ayeyarwady Delta and a few potentially promising policy initiatives, for most rural residents the downward spiral continues. For many households, the risk of a “crash landing” looms ever larger. This prolonged decline is exacting a heavy toll on the Myanmar people. The implications for the next generation are especially frightening: this paper presents data from a nutrition survey conducted in a limited number of townships suggest that the majority of children under five years of age in Myanmar are well below normal weight.

This paper is underpinned by a belief, widely shared among Myanmar experts, that Myanmar’s efforts to resuscitate the rice sector and the economy as a whole, can gain valuable insights from the experiences of its neighbors, in particular Thailand, Vietnam, and Indonesia. In the analysis that follows, the team identifies where it believes that comparative experience may be valuable. The team hastens to add that agricultural and rural development in these countries has been by no means a smooth or flawless process. Indeed, Myanmar’s policymakers can learn as much from their neighbors’ missteps and failures as they can from their successes. The team has distilled three lessons from these experiences that are of particular relevance; it presents them here because they provide a useful framework for approaching the issues discussed in this paper.

First, economies are integrated systems that can only function smoothly when certain core conditions are present. The challenges facing the rice economy must be viewed in the larger context of the Myanmar economy. Reinvigorating the Myanmar agricultural economy will require progress in a range of policy areas well beyond those under the direct purview of agricultural policymakers, including banking and financial sector, electricity generation, infrastructure, and trade policies. However, it is not only in specific sectors that investments must be made or policies reformed. The goal of agricultural development is to improve well-being and to reduce poverty. In order to realize those goals, Myanmar must grow faster and more equitably than it has to date. This paper argues that actual GDP growth per capita in Myanmar has been quite low in the past decade and that poverty reduction has been slow or negligible as a result. A poverty reduction strategy based only on agricultural growth, as vital as agriculture is, will not be very successful. International experience demonstrates that agricultural sectors perform better and poverty falls faster in environments characterized by rapid growth, buoyant internal demand, and improving infrastructure and governance. For this reason a general discussion of the components of successful growth strategies based on international experience is included in Part IV.

Second, the role of the state in economic development, and agricultural development in particular, is critical; in Myanmar the research team believes that this role is misunderstood. In successful economies that do not rely on central planning, the functions of the state, of the market, and of intermediary institutions like business associations are well defined. During Myanmar’s Socialist Period, the role of the state extended into virtually every facet of agricultural production and marketing. This suffocatingly high level of state interference contributed to the economic stagnation that characterized the agricultural sector, and the economy as a whole, in that period. Today, private sector actors are much more active in the rice economy. Many of these actors are performing their functions well.

However, there are also worrying signs, in the agricultural sector and across the economy, that the state may be ceding too much responsibility and authority to the private sector. This paper will identify some of the many areas in which the role of the state is critical. In addition to regulating and disciplining market actors and providing the basic infrastructure on which a dynamic economy depends, a critical state function is to provide its citizens, especially the most vulnerable, with welfare protections including access to basic healthcare and education. Fulfilling all of these duties effectively will require that the state in Myanmar acquire much more technical capacity than it currently possesses. One reason for the shrinking of the state's role is the dearth of resources devoted to economic growth, even though total revenues are growing. If growth and equity are serious targets, they will require a larger share of resources. The private sector—business and business associations—will also an important role to play. How the respective roles of the state and the private sector are defined will have an important impact on the development of Myanmar economy.

Third, information matters. Accurate data and analysis are essential prerequisites for informed decision-making. At present it is extremely difficult to compile an accurate picture of the agricultural economy, or indeed of the economy in its entirety, because most participants in it have an incentive not to tell the truth. State agencies appear to report good news upwards; when good news is not available, the temptation to manufacture it is difficult to resist. Private actors across the value chain from farmers to exporters oftentimes have many incentives to reveal as little as possible about their activities. When inaccurate data are used to guide decision making, there is a danger that resulting policies will be out of synch with actual conditions, perhaps making bad situations worse. Here too, Myanmar's Southeast Asian neighbors have enjoyed successes that are worthy of study.

Fourth, this paper mentions concerns about immediate humanitarian and food security issues in 2010. A long drought and delayed rains have made much lower sesame and rice output all but certain in some townships that were already stressed. It is not yet clear how widespread these problems will be, but there is a potential for them to become more widespread. If expected rains in September and October do not "save" the next rice crop, there will be a need for much more aggressive humanitarian interventions than have been needed until now. To quote a WFP/UNDP assessment from June, "If there is a further delay in rainfall or an inadequate rainfall in the next two months....a significant loss of rice harvest can be expected."¹ It is likely that these issues extend to many townships that the team did not visit. In fact, rainfall and yield data from the Dry Zone evaluated by the research team in July 2010 indicates that large declines in sesame yields are likely and that a severe food security crisis is unfolding in large parts of Sagaing and Mandalay.²

¹ "WFP and UNDP Rapid Assessment of the Potential Impact of Delayed Rains on Food Production in Selected Areas Across Myanmar." There is also a vulnerability assessment (Food Security and Vulnerability Information and Mapping System for Myanmar, FAO) based on 2003 data that places many Shan, Kachin, Chin and Dry Zone townships in highly vulnerable categories with respect to food security. We were not able to visit any townships outside of those from the Ayeyarwady to Shwebo axis.

² Data from Myanmar Agricultural Service and Meteorological Service and other independent sources as of July 18, 2010.

II. About This Paper

This paper draws on the expertise and findings of a team of specialists from Harvard University with many years of experience studying agricultural and economic development in Southeast Asia and engaging in policy dialogue with governments in the region. No member of the team is an expert on Myanmar or on Myanmar's agriculture. Rather, the team has sought to bring its in-depth knowledge of Indonesia, Thailand, and Vietnam to bear on the difficult challenges and valuable opportunities that Myanmar faces today.

In developing an understanding of Myanmar's challenges and opportunities, the team has had no illusions about the difficulty of obtaining reliable data on many aspects of Myanmar's agricultural economy. But its members have benefited from the chance to visit many parts of lowland Myanmar; to speak to farmers, traders, and millers there; to consult with leading specialists on Myanmar's agricultural economy; and to have at its disposal a number of excellent reports on such selected features of the Myanmar economy as rural financial markets and the port of Yangon. These visits, discussions, consultations, and reports have enabled the team to develop indicative but robust answers to some quantitative questions (those concerning rates of interest, for example). They have also allowed the team considerable exposure to the perspectives and analyses of many people who know the country's agricultural economy well, not least among them working farmers. The resulting report relies on the available quantitative data, comparative analysis and qualitative insights from meetings with rice industry stakeholders.

The team's five field visits took it to numerous village tracts in areas of Ayeyarwady Division affected by Cyclone Nargis and in unaffected areas of the same division, in Bago Division, and in Mandalay and Sagaing Divisions. Introductions by the Myanmar Rice Industry Association (MRIA) to millers and traders affiliated with the newly established special agricultural development companies and village meetings with farmers arranged by IDE Myanmar field staff allowed the team to adopt the methodology that it employed. This methodology included long, open-ended exchanges with traders and millers (often accompanied by inspection of newly purchased milling equipment) and with farmers. Village visits with large groups of farmers typically broke up into discussions with smaller groups held during visits to various sites within their villages (homes, shops, mills, schools, clinics, water catchment ponds, etc.). Appendix E includes a more detailed discussion of the team's methodology and its field visits, including a complete list of townships visited.

No report such as this one is complete without explicit mention of the research team's approach to matters of gender. In brief, what distinguished that approach is the team's focus on rural Myanmar *house-holds* as units of production and consumption. Not least, this focus stemmed from the team's hesitation to presume to understand, on the basis of very short visits and group interviews, gender dynamics within rural house-holds in the areas that it visited.

This point having been made, however, the burden of collecting water and fire wood to which the report calls attention in its treatment of the alarming conditions in the Dry Zone fell largely on children, often girls, and women. At the same time, the team found that women borrowers had as

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much—or as little—access to credit as men. Women were able to work on public projects,³ and were able to own land. The circumstances and difficulties of overwhelming concern in this report affect men and women equally. The major problems observed were not specifically gender problems, but rather widespread lack of public services, of credit, and of investment.

This paper proceeds as follows. Part One attempts to provide an accurate picture of the state of the rice economy in Myanmar. The report situates this analysis in comparative perspective; current trends in Myanmar's rice economy are examined alongside those in other Southeast Asian countries. It concludes that rice production in Myanmar on a per capita and per acre basis has declined. To explain this trend we then analyze key links in the rice value chain, finding barriers and bottlenecks at every stage in the production and marketing process.

Part Two focuses on the critically important issue of credit. The sources and costs of credit to which farmers currently have access are analyzed. It explains why offering credit at very low rates often does not achieve the intended result of supporting poor farmers. This section concludes that valuable lessons can be learned from the experiences of other Southeast Asian countries in building robust financial service networks in rural areas.

Part Three examines the humanitarian consequences of agricultural stagnation in the regions we visited, focusing in particular on children's welfare. Data from the aforementioned survey show worryingly high incidence of malnutrition, suggesting that, at least in surveyed areas, living conditions have deteriorated to the point at which families are no longer able to provide children with a healthy diet. Humanitarian conditions in the Dry Zone, where the research team believes that a crisis of potentially immense proportions is unfolding, are also discussed. The discussion also notes concern over the 2010 sesame and rice crops. Each is under threat from drought and delayed rainfall. The failure of either would have a direct and serious impact on food security.

Part Four considers a range of short and long terms solutions to stabilize conditions in rural areas and position the rice economy for rapid and sustainable growth. This section begins with analysis aimed at deriving Myanmar's actual GDP per capita growth; we conclude that official figures have grossly overstated Myanmar's growth. It then presents then present a preliminary framework for approaching the task of forging a new national vision for reversing economic stagnation and building a dynamic, modern economy.

Five appendices present additional detail on certain aspects of the analysis contained in the main body of the report.

³ Pay was often by the cubic yard of soil moved. Women typically moved less soil per hour than men and so were paid less. In farm labor, women's wages were typically less than those of men by one quarter to one third. Such a ratio of female to male wages is very widely spread in developing nations.

PART ONE I The Myanmar Rice Economy in 2010

I. General Impressions

Before turning to a discussion of current trends in the Myanmar rice economy, it is useful to provide some general impressions based on the team's field visits and comparative experience. As the thrust of this report as a whole suggests, rural lowland Myanmar and its farm sector face difficult but not unique or even unfamiliar problems. In fact, the sector bears more than occasional resemblance to what one would find in the more prosperous, successful agricultural areas of Southeast Asia. At this encouraging end of the spectrum, the team saw the dynamic, well informed millers and traders of important towns of the Ayeyarwady Delta (both areas affected by Nargis and other areas), of Shwebo, and of Pyay. While these millers and traders expressed to the team their frustration over the lack of electricity from a reliable power grid, over official policies on agriculture that owe much to the Socialist Period, and over the contrast between Myanmar rice agriculture and what they have seen on trips to Thailand and Vietnam, their attitudes and priorities reminded team members of the attitudes and priorities of millers and traders in Myanmar's mainland Southeast Asian neighbors.

That agriculture in many parts of the Delta has "bounced back" so quickly from Cyclone Nargis owes much to the rapid reconstruction of a market-oriented agricultural economy in Myanmar during the past two decades. One must understand the ability of the special agricultural development companies discussed later in this report to make even a modest positive impact on rural financial markets as a reflection of this same, encouraging part of the picture. Similarly, this encouraging side of what the team saw has increased its confidence that wise public investment in agriculture will not be in vain. The well irrigated areas between Sagaing and Shwebo exemplify that synergy. Willingness on the part of the state to make a serious investment in irrigation there has interacted with the latent dynamism of the Upper Myanmar farm sector to produce a series of unmistakably positive outcomes.

Even in areas in which the research team found such encouraging signs, however, it also found much to discourage it. It is impossible to overlook the fact that, even in the most promising areas of lowland rural Myanmar, issues of poverty and equity represent a serious check on prospects for growth. They also represent an incipient social crisis. The narrow margin of viability characteristic of the operations of what is perhaps a majority of the Delta's farmers undercuts their ability to take part in, or indeed to foster, a more successful agricultural economy. Indeed, in some parts of the Delta, the team heard farmers speak of accelerating land loss.⁴ It also observed that inadequate rural credit programs epitomize the general inadequacy of food policy in

⁴ Patterns of land tenure are of central significance to the agricultural economy and to human and social development in Myanmar. Because of the methodological approach employed by the research team, it was not possible to compile a complete picture of the shifting nature of land use in rural Myanmar. However, farmers in every locality visited by the team spoke of increasingly alienation. In some cases land was being acquired by wealthier households within the village tract, while in other cases, land was falling into the hands of individuals living outside the local community. The latter pattern was more common in the Ayeyarwaddy Delta than in the Dry Zone.

Myanmar. Other reflections of this inadequacy include the inability of the Ministry of Agriculture and Irrigation to maintain functioning research and extension services. The team heard from millers that farm poverty had given rise to a generation or more of functionally illiterate farmers, farmers without the basic educational background required to take advantage of innovation and opportunity in agriculture. The chronically poor nutrition discussed elsewhere in this report will only compound this effect.

The Dry Zone of Upper Myanmar is large and diverse. That the research team's visits to many townships in the Dry Zone left it terribly concerned about access to water will come as no surprise. While the team recognizes the size and diversity of the Dry Zone and that conditions will vary with each locale, it nevertheless wants to highlight just how grim and desperate conditions already were in some areas. In particular, in a number of village tracts of the historically poor Taungtha and Natogyi townships visited by the team, conditions made worse by the lack of services delivered by the state were observed. Critical shortages of water, access to paved roads, and employment opportunities outside of agriculture seem to have brought village tracts in those townships to an effective social, economic, and perhaps nutritional dead end. The team suspects that conditions analogous to those it encountered in these townships are present in significant pockets of other parts of lowland Myanmar and perhaps in significant parts of upland Myanmar as well. The findings and suggestions offered with specific reference to the Dry Zone in this report ought to be read with this belief that they are rather more generally applicable.

II. Myanmar's Rice Economy in Regional Perspective

Before proceeding to a detailed discussion of the Myanmar rice sector, it is instructive to examine briefly the sector's performance in comparative terms. This section offers quantitative data to permit examination of rice yields, total and per capita production, and exports over time in four ASEAN economies. As Indonesia is a marginal exporter of rice, export data for the country are not presented or discussed here. But the inclusion of the Indonesian case in this discussion is of fundamental importance. Exposure to this case can help Myanmar's policymakers and other participants in its rice economy think about the lessons, positive and negative, to be drawn from the example of a country for which the achievement of some measure of food security, rather than of the status of an exporter of rice, figured as the rationale for invigorating the rural sector.

The years chosen for consideration are 1985, 1990, 1995, 2000, and 2005. Most data are from the FAO's on-line database,⁵ but production data for Myanmar in 2000 and 2005 come from the Foreign Agricultural Service of the United States Department of Agriculture. Data are presented in millions of tons of rice and in tons per hectare. No allowance is made for border trade, though a word about its relative importance is offered below.

Figure I. Myanmar Rice Exports, Prices (2005)

⁵ See <http://faostat.fao.org>.

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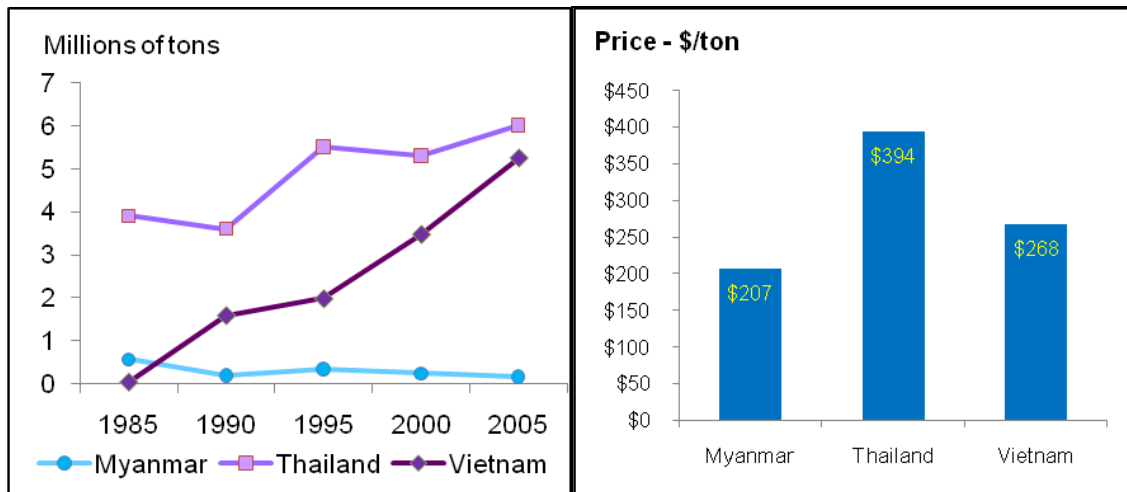
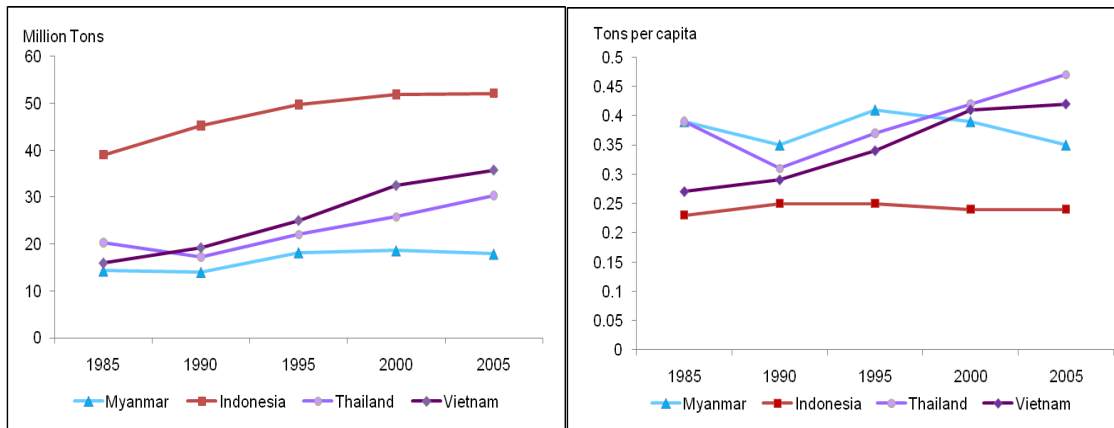


Figure I traces the levels of rice exports from Myanmar, Thailand, and Vietnam during the two decades from 1985. The figures for quantities of rice exported tell several important stories. First, Thailand’s record shows continued increases in its rice exports both from a relatively and absolutely high base during decades when industry and services far outstripped agriculture as contributors to Thailand’s GDP. In this regard, the Thai experience reflects the returns to be gained from investment in the farm sector and attention to food policy as well as the continuing role for a growing agricultural sector even in an economy less and less focused on agriculture. The data for Vietnam reflect that country’s remarkable success in transforming both its policy environment and its agricultural sector in tandem. The mid-1980s were a time during which a substantial number of households in Vietnam found they were unable to afford rice more than once a day. Nevertheless, from that unpromising base, Vietnam proved able within a very short period of time to resume its historical place among mainland Southeast Asia’s major rice exporters. Central to this achievement were, again, both changes in agricultural policy and investment in the sector.

Turning to export price data for 2005, Figure I illustrates Thai success at earning a substantial premium, even in comparison with Vietnam, on each ton of rice exported and the opportunity for Myanmar to close the rice export-price gap with its two mainland Southeast Asian neighbors through attention to issues of varieties grown and post-harvest practices like drying, milling, and shipping. Domestic marketing channels for rice already function very efficiently in much of Myanmar. Their efficiency—and the resultant inability of “middlemen” unfairly to capture profit from their position in the rice trade—means that progress in closing this export-price gap will benefit farmer-producers and accelerate the virtuous cycle in which dynamism in the farm sector acquires a momentum of its own.

Figure II. Paddy Rice Production in Million Tons* **Figure III.** Paddy Production in tons per capita#

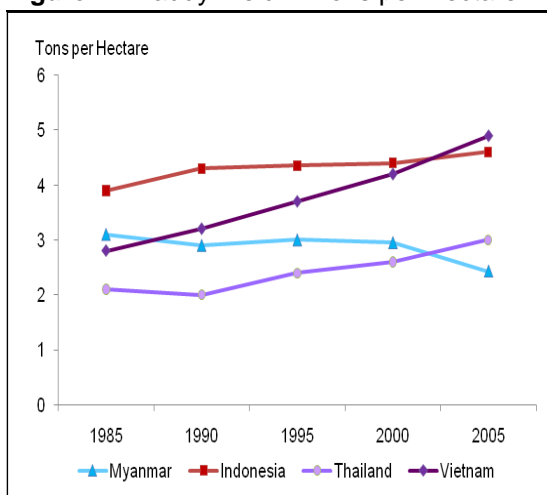
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*Data for 2000 and 2005 from US Department of Agriculture. FAO production figures are 21.3 and 27.7 million tons. #US Census Population data are used. For Myanmar, US Department of Agriculture data is used; FAO production data and US Census population data would result in 0.45 and 0.55 tons of paddy produced per capita.

Export levels and prices represent useful indicators of policy success and return to investment in the agricultural sector. But they do not represent a comprehensive measure of conditions within then rice sector or the agricultural sector as a whole. Figures II and III present comparative data on total and per capita production levels in Myanmar and its three large ASEAN neighbors. They illustrate Myanmar’s success in raising rice production levels in the 1980s and 1990s and its consequent success in raising per capita production figures through 1995. Those figures exceed the figures for Indonesia, despite the latter’s dramatic success in raising production levels. Myanmar’s export levels have however, in the most recent period, lagged behind the figures for its exporter-neighbors Thailand and Vietnam. Notably, in the period after 1985, all three of Myanmar’s neighbors have raised levels of rice production faster than Myanmar both in absolute and percentage terms.

Figure IV. Paddy Yield in Tons per Hectare



*Data for Myanmar include US Department of Agriculture production figures and FAO area figures; if FAO output and area are applied, the yields are 3.38 and 3.75 tons/hectare.

Figure IV presents data directly reflective of the farm-level realities in Myanmar that are the focus of much of the rest of this report. These data illustrate a number of interesting trends. One of these is the apparent deterioration in rice yields in Myanmar in the most recent period. That deterioration appears to have taken yields in Myanmar to below the level in Thailand, where the cultivation of low-yield, high quality varieties and the historically extensive nature of rice cultivation have long resulted in relatively low yields. Second, even in Thailand, yields have steadily risen in the period since 1985 while yields in Myanmar have not. Third, while Indonesia has not figured as a rice exporter and Vietnam has emerged as a major exporter, both enjoyed considerable increases in yields during the two decades after 1985.⁶ Taken together, these trends leave little doubt about the gains that Myanmar stands to enjoy from potential improvements in rice agriculture.

III. Output Trends

Figures I-IV offer a comparative perspective on both trends in the evolution of the Myanmar rice economy and on the state in which those trends have now resulted. They do not, however, afford much insight into the forces behind those trends or the barriers and bottlenecks to which the rice sector is subject. The rest of this section attempts to explain the factors that are most likely to blame for declining output. It emphasizes that, apparent declining per capita output and problems for many rice farmers and traders notwithstanding, Myanmar has great potential to increase rice production and to enjoy the choice of whether or not to export rice.⁷ These outcomes will require the framing and execution of more effective policies, at the sectoral and national level. These must be policies that induce substantial public and private investments in agriculture. It will in turn allow Myanmar to make an essential step in reducing poverty, improving food security for all families, fostering a more dynamic rural sector and making agriculture a dynamic contributor to the national economy.

A. Declining productivity

In the team's 2009 report, it was suggested that actual rice output was closer to the US Department of Agriculture marketing estimates than to the FAO data. While there is some uncertainty over the size of the unrecorded border trade in rice, this continues to be our opinion. Table V reports rice output estimates of the FAO and the US Department of Agriculture, along with official rice export data, for the period since 2000. No adjustment is made for border trade exports, which are unknown. There are also two distinct series of estimates for population, one taken from a Myanmar Ministry of Agriculture and Irrigation source and one from the US Census

⁶ The use of US Department of Agriculture rather than FAO rice production data after 2000 has been debated. In noting that the US Department of Agriculture data correspond more nearly with a range of other observed trends, the discussion in the following section will justify its use in the minds of most readers. This correspondence has led the team to choose not to average the two sets of data in preparing its analysis; the team saw no value in splitting the difference between data supported by independent estimates of consumption, recorded exports, unrecorded exports and changes in stocks, on the one hand, and data whose plausibility these estimates call into question, on the other.

⁷ While increased exports are a current priority, it may be that more income and export revenue could be achieved with a more diversified mix of production. This is an ongoing policy and market choice.

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Bureau, which produces population estimates for most countries. These different series produce two different estimates of trends in paddy rice output and consumption per capita in the last decade. In particular, rice consumption per capita jumps from 250 to over 300 kg per capita per year in the FAO/ official population estimates, while rice consumption drops from 220 to under 200 kg per capita in the US Department of Agriculture/US Census population estimates. None of the millers or traders interviewed by the team suggested that average rice intake was as high as 300 kg per capita; in their view, 180 to 200 kg was a more realistic estimate of per capita consumption. A rural male needs only 2800 calories per capita per day in total food intake; average per capita rice consumption in Myanmar—including that of women, children, and urban dwellers—of 300 kgs per year (an amount equal to 3,000 calories per day) cannot be considered a realistic possibility. If unrecorded exports were 500,000 tons a year, that would subtract 10 kg per capita from the consumption data and would still suggest an implausibly high level of consumption if the FAO/official data series were used. In short, because of the absence of large official exports and the implausible consumption levels implied by the official data, the team believes that the US Department of Agriculture’s rice production estimates are more accurate.

Table I. Population and Rice Output and Official Exports in Million Tons (Rice = 58 percent x Paddy Output; Output and Consumption per capita is in kilograms of rice per person per year)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
FAO-output	12.4	12.7	12.6	13.4	14.4	16.1	17.9	18.3	17.7	18.0*
US Dept of Agr.-output	10.8	10.4	10.8	10.7	9.6	10.4	10.6	10.7	10.15	10.6
Official Exports	0.25	0.94	0.79	0.39	0.18	0.18	0.07	0	0.55	1
Population**	50.1	51.1	52.2	53.2	54.3	55.4	56.5	57.5	58.5 ^{est}	59.5 ^{est}
Population#	47.4	48	48.7	49.3	50	50.6	51.2	51.7	52.3	52.8
FAO output pc	248	249	241	252	265	291	317	318	303	303
US Dept of Agr- output pc	228	217	222	217	192	206	207	207	205	201
FAO consumption pc	243	230	226	244	262	287	315	318	293	286
US Dept of Agr consumption pc	223	195	205	209	188	202	206	207	194	182

Notes to Table V:

*2009 output is an estimate based on the April 2010 FAO Rice Market Monitor figure of 31 million tons of paddy. Rice exports in 2008 and 2009 are from news reports. Prior years are from the FAO data base. US Department of Agriculture data are from the monthly Rice Outlook, at:

<http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1285>.

** Population data in millions taken from “Myanmar Agriculture at a Glance 2008”, p. 10, with 2008-09 extrapolated.

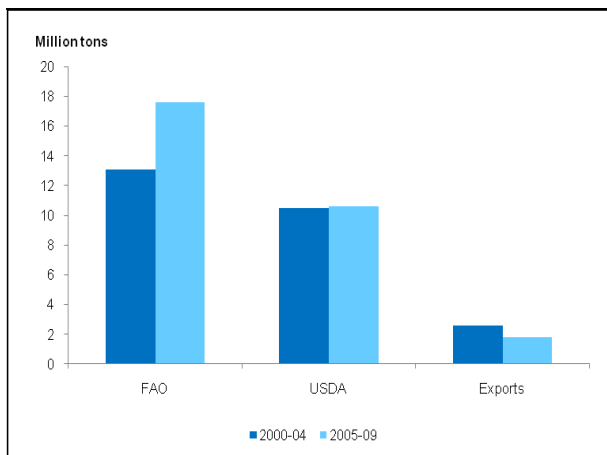
Population in millions from the US Census Bureau; <http://www.census.gov/ipc/www/idb/country.php>; data are provided every five years and are interpolated for the table. The World Bank puts 2007 Myanmar population at 48.8 million and that population with US Department of Agriculture output would mean 219 kg per capita of rice in 2007. The “FAO” production and consumption per capita uses FAO production and official (**) population while the US Department of Agriculture production and consumption per capita uses US Department of Agriculture production and US Census Bureau (#) population data. Consumption is defined as production less recorded exports. An additional correction of up to 10 kg per capita could be deducted from consumption to account for unrecorded rice exports. No adjustment is made for changes in rice stocks, which would influence consumption.

The following graph illustrates these two very different stories about rice output in the last decade. One series, based on US Department of Agriculture/US census data, finds output

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stagnating and per capita output (and consumption) falling, as population grows by 11 per cent. The other production series, provided by FAO which rely on official data, finds rice output growing by nearly half and per capita output rising by nearly one-quarter. If border trade did not change drastically and if output soared, then official exports should have risen dramatically. Figure V shows average annual rice output in 2000-04 and 2005-09 according to both FAO and the US Department of Agriculture. It also shows *total* (not annual) recorded rice exports for each five-year period. Five-year recorded exports *fell* from 2.5 million tons in the first half of the decade to 1.8 million tons in the second. This fall strongly suggests, absent a huge increase in unrecorded rice exports, no large jump in production.⁸ It is not clear why there should be a jump of millions of tons of rice in border trade. Inquiries near the Thai border suggested a lower volume now than in the past. The team was not able to visit areas near Bangladesh or India where border trade is also present. Nevertheless, based on discussions with local experts inside and outside of government, we conclude that while border trade does occur, volumes are likely to be, at most, in the 250,000 to 500,000 tons per year range. This would be an annual average, with larger volumes in some years and smaller volumes in others.

Figure V. Average Annual Rice Output and Total Official Rice Exports, 2000-04 and 2005-09



It is worth noting that the rice yield per hectare of Myanmar in this decade using US Department of Agriculture area and output data, show declining output per unit of area compared to earlier and probably then more reliable FAO data.⁹ Yields had remained stable at about 3 tons per hectare (58 baskets per acre) from 1985 to 2000, but they have since declined to about 2.7 tons/hectare. This is congruent with comments by farmers about increasing pest problems and “tired soils” from too much continuous rice growing and growing problems with diseases and weeds. It may also reflect a lower number of draft animals used and thus less manure application in Nargis-affected regions of the Delta.

⁸ If rice were not exported in the FAO production/consumption series, it would have to be consumed at implausibly high levels of intake per capita, as previously argued.

⁹ One knowledgeable individual with whom the team spoke believed that data for the period 1988-1990 was reasonably accurate.

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There are reasons to be concerned in particular about the 2010 rice and sesame crops. A severe drought with high temperatures and delayed rains had, as of June, caused much lower than typical planting rates. This matter is one of which both the Myanmar government and donors (such as the World Food Programme and UNDP) are well aware.¹⁰ If farmers have no access to shorter season variety rice seed, it is likely that yields will be much lower than normal. This outcome will obtain even if, as predicted, rains fall heavily in September and October (because of a switch from El Niño to La Niña weather patterns). Low stocks of rice, the limited resilience of farmers after recent poor harvests, and a lack of adequate employment alternatives for those without any or much land add to serious concerns about food security. In the Dry Zone, where a failed sesame crop is likely in a number of townships, the food security situation could require prompt attention. Necessary measures would be likely to include an expansion of WFP activity beyond the extensive initiatives already underway.

IV. Explaining Declining Per Capita Rice Output

A. *Underinvestment*

If indeed the lower rice output series is more nearly correct, the question is why were output gains so low or even negative in per capita terms? The answer is neither simple nor due to any single factor. However, the team observed a pattern of underinvestment in the rice sector that spanned everything from research and extension to shortages of good quality seed, poor infrastructure, credit shortages, inadequate milling, post-harvest storage, and transport to the ports. Even large and rich farmers in areas where the rice economy is well-established were unsure of the best seeds to use or where they could reliably get them. Extension service personnel are paid a *per diem* rate of 15 kyat, an amount so low as to be irrelevant. (At an exchange of 1000 kyat to US\$1, the daily compensation rate is less than two pennies.) Roads in many places were impassable in the rainy season and required four wheel drive vehicles or ox carts in the dry season. Many rice mills buy gasifiers to maintain their supply of electricity.¹¹ Fertilizer supplies were of uncertain quality and used in very modest amounts, not least because of the credit problems described. Many mills lacked advanced equipment to dry paddy, sort by color, and produce a consistent product that would fetch better prices. Delays and poor loading conditions at the port raise costs and decrease quality. Government policy that periodically stops exports creates further uncertainty and requires a risk premium, or lower rice price.

¹⁰ See “WFP and UNDP Rapid Assessment of the Potential Impact of Delayed Rains on Food Production in Selected Areas Across Myanmar,” June 2010. On the government side, U Hla Gyi, General Manager of the Myanmar Agricultural Service, was quoted in the Myanmar Times as saying that delayed plantings of 0.3 million hectares could lead to reduced yields. On the other hand, the U.S. Department of Agriculture, June 2010 Rice Outlook, still has a 0.4 million tons projected increase in rice output for Myanmar, an estimate that we find too optimistic.

¹¹ Gasifiers are locally made machines that use rice husks or other farm waste to make biogas which is then fed into converted diesel generators to produce electricity. They generate fairly toxic liquid byproducts and generate a bad odor, but do produce electricity reliably and more cheaply than standard diesel generators. A 125 kilowatt unit sells for \$7000. Rice mills are obvious customers since they have surplus rice husks.

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In terms of prices, Myanmar exports mostly low quality, 25 percent broken rice with a mixture of types. From 2000 to 2003, export prices for Myanmar rice ranged from \$119 to \$142 per ton, while Thai 100 percent broken (A1 Super) grade was selling for \$144 to \$184 a ton in the same period. From 2004 to 2007, Myanmar rice export prices averaged \$216 while Thai A1 Super averaged \$283. Prices for 2008 were \$287 for Myanmar and \$342 for Thai A1 rice. *Overall, it appears that Thailand was able to sell its 100 percent broken rice for 20-30 percent more per ton than the 25 percent broken rice of Myanmar. In 2005 the average export price of Myanmar rice was about half that of Thai rice and three-quarters that of Vietnamese rice.* This makes no adjustment for quality differentials, but does indicate how much more value could be gained.¹²

This lower price feeds through directly to farmers. The team had expected to find large gaps between the farm gate price received by farmers (at least those not compelled to pre-sell their paddy or sell immediately after harvest) and the export price of rice. However, during the team's visit the price of paddy was about \$4 per basket or \$192 per ton. Given a 58 percent extraction ratio, about \$330 worth of paddy is needed to produce one ton of rice. The export price in March 2010 was \$360-\$370 per ton. There was therefore surprisingly little markup from the farm gate to the port. Of course, high port costs depressed the price of rice but that is part of the reason that Myanmar's 25 percent broken rice commands a lower price on international markets than Thailand's 100 percent broken rice.¹³ The farm gate to export ratio of about 90 percent is typical of other rice exporting countries.

Several comments are in order. First, if the milling ratio were 63-65 percent, as in other countries, the value of paddy required to produce a ton of rice would only be \$295, and the farm gate/export price ratio would fall to 80 percent. Either the farm gate price would thus rise or there would be a bigger margin. Second, in March 2010 stocks of rice were low and exports had been curtailed. It may be that this decline in stocks created a "seller's market" for paddy. The average harvest-time paddy price (*ngakywe* variety) for 2006-2008 was \$130 per ton, or \$224 for enough paddy to make one ton of rice at 58 percent extraction ratio. The rice export price averaged \$261 in those years. The longer-term farm gate to export price ratio was therefore 0.86—still in the normal range for the region.¹⁴ However, as suggested, the low milling ratio translates into a lower effective paddy price for farmers. This low price and the high cost of credit are among those factors that contribute to the declining profitability of rice farming and to what villager-informants reported as declining numbers of farms and farmers and increases in the share of landless and land-poor workers.¹⁵

¹² Figure I provides export price data for Thai, Vietnamese and Myanmar rice.

¹³ If competing rice is available for \$300 a ton delivered to an importing customer and high Myanmar port costs mean that it costs \$50 a ton to ship rice, then the local price of rice for export cannot exceed \$250.

¹⁴ In Vietnam from 2004 to 2006, the paddy price averaged \$141 per ton while the rice export price was \$251. At a 63 percent extraction ratio, that is \$224 worth of paddy to produce one ton for export, or an 89 percent ratio.

¹⁵ In the mid- 1990's when one of the authors was visiting villages, a "big enough" farm was five acres. It now seems that farms much below ten acres are likely to fail over time. The 1993 Census reported 2.95 million farmers and the 2003 Census reported 3.45 million, so any decline would have started after 2003. During its field visits, the research team often heard about villages and village tracts with significant proportions of households without economically viable holdings of land. The nature of its visits and the

B. Domestic rice prices and exports: the cost of policy uncertainty

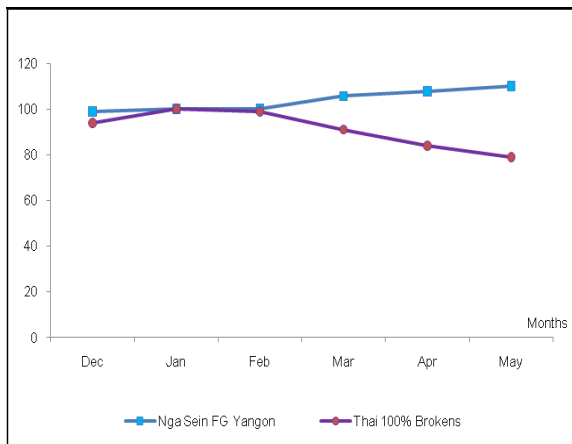
One area that merits attention is paddy prices. A higher price for paddy is an obvious means to increase the profitability of growing rice. If world rice prices rise, then domestic rice and paddy prices would also rise (unless export controls or taxes were introduced). Export controls, or simply a decision not to issue or to restrict export quotas, would lower domestic rice prices to the extent that they prevent exports. (Or border trade *might* simply increase.) Is it desirable to depress rice prices? Obviously, rice farmers who are net sellers would suffer. But urban consumers, rural people without access to economically viable landholdings, farmers who do not grow rice and most small rice farmers who are net buyers will benefit. There are only 0.5 to 1 million farmers who are net sellers of rice. Including family members, that figure would represent only 2.5 million to 5 million people, or 5 to 10 percent of the total population. If world rice prices again skyrocket to over \$1000 a ton, should an export ban be imposed? Should an export tax be used instead? Should some type of food ration be introduced? This decision is largely political, though it has important implications for rice production. A fuller discussion of the various dimensions of this issue and of possible policy responses is included in Appendix D.

Another important policy concern is whether the government should target a specific domestic price or export quantity. Recent events have cast this policy issue in a particularly urgent light. In 2009, there was apparently an effort to export one million tons of rice, and this indeed was accomplished. However, it also appears that rice stocks fell to unusually low levels, as stocks from 2008, 2009 and “borrowed” stocks from 2010 were used to meet the export target. This cannot be proven, as reliable data on rice stocks do not exist. However, real rice prices normally fall after December and in 2010 they increased even while world rice prices fell rather sharply. Thai and Vietnamese rice export prices fell by 20 to 25 percent from January to May, but local wholesale prices rose by up to 10 percent in the same period, even though the kyat was stable against the dollar. This phenomenon is starkly illustrated in Figure VI, comparing the wholesale price of rice in Yangon with the export price of Thai “A1 Super” (100 broken) rice. The most logical explanation of this situation is that the 2009 rice export target was “too high,” resulting in low domestic supply which in turn drove up domestic price. In May 2010, some traders reported that local rice prices were so high that it was not profitable to export. A policy aimed at achieving a particular rice price or price within a range would avoid the dangers of quantitative targets.

Figure VI. Wholesale Rice Price Index for Yangon (Nga Sein FG), Thai 100 percent broken export price (January 2010 = 100)

difficulty of access to reliable statistics have meant, however, that the team was able to develop no clear sense of rates of true landlessness in the areas visited. It was clear that in some cases the category of households described as “landless” included families who owned some productive land but whose holdings were insufficient to guarantee a minimal standard of living. Others might enjoy more or less stable tenancy relationships with landlords.

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V. Dry Season Irrigation and Self-Sufficiency by Division

Farmers frequently spoke of their dilemma of whether or not to plant a dry season rice crop. In areas served by gravity fed irrigation systems, if water sufficient for paddy rice is released, it is nearly impossible to plant anything but rice, without additional ability to divert or manage water.¹⁶ When farmers wish to plant rice, there is of course no problem. In some cases, however, farmers indicated that they would prefer to grow another type of crop, either because it was deemed more reliable or profitable, or because it would enrich the soil and reduce the risk of pests stemming from multiple rice crops.

Moving from analysis to suggestions, it would be preferable for farmers to be able to select the crops they want to grow. Policies that encourage self-sufficiency in rice at the state or division level through local quotas or restrictions on paddy trade and transport both contradict and indeed undermine the economic liberalization that is now emphasized as national policy. Some regions of Myanmar are better suited to rice cultivation than others, where the risks associated with paddy farming are higher. It makes sense to let farmers in the high rice cost and risk areas to grow other crops if they prefer to do so. These areas can buy rice from the low cost areas. Allowing this kind of choice would reduce farmer indebtedness, improve farm incomes, and maximize overall agricultural growth and environmental resilience. The relaxation of “rice first” policies, such as those that force farmers to grow a dry season rice crop if irrigation is available, would likely make it much easier for groups of farmers to reach agreement within the group about the amount of water to apply to a local water management area. This is an organizational and policy change that would require few resources. Eventually, more investment in tertiary water control might also be helpful, but only after adopting more flexible and less rice-centric policies.

VI. Soil issues, Research, Extension and Seeds

In areas of the Delta where salt has intruded, typically from Cyclone Nargis, the soil exhibits special problems. Salty soils produce much lower rice yields. The rice plants are under much stress, grow poorly, and disease problems appear much more readily. Sometimes invasive weeds

¹⁶ Of course, if one farmer wishes to grow rice and his or her neighbor does not, water management disputes may arise; the water authority is not always to blame.

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appear that were not a problem before. The team was told of yields only one-third to one-half of normal levels in these areas. One solution is to apply chemicals such as gypsum, but this is costly and beyond the immediate financial ability of most farmers. Another approach is to change cropping patterns, use salt tolerant and pest resistant varieties (if available), or even to switch to fish or shrimp farming. However, farmers often do not know what chemicals should be added, what rotations would work best, or lack other relevant knowledge. Again, even when they do know, the cost of correcting problems is beyond their means.

There was a policy decision made about ten years ago to make government seed, research and extension services largely self supporting. There is some valuable government research but it seldom gets disseminated to farmers. The amount of quality seed distributed by the Ministry of Agriculture and Irrigation, for example, has dropped sharply. In 2000/01, 573,000 baskets of paddy seed were distributed; in the years since only 60-80,000 baskets have been distributed annually. Similarly, the distribution of maize seed fell from 60,600 baskets in 2000/01 to 1,700 in subsequent years. Additional research—whether conceived as an expansion of or a complement to the ongoing work on Myanmar undertaken by the International Rice Research Institute—into improved varieties, pests, and cropping patterns would be very helpful. It would be unrealistic to expect the private sector to pursue this kind of research; this type of knowledge is in the nature of a public good and should be supported by robust public sector funding.

Without a vibrant research program, extension workers will have little relevant knowledge to share. Relying on pesticide shops for information about the right chemicals to apply in response to an unfamiliar pest, as farmers in Myanmar often do today, is costly and often ineffective, and sometimes harmful to the crop and to human health. There may eventually be a demand for quality seeds produced privately, but when it is difficult even to get fertilizer that provides the promised nutrients, or to be sure that needed irrigation water will arrive, it is unlikely that farmers will buy expensive seed.

If good quality seed became easily and cheaply available, it may be possible to persuade farmers to restrict the varieties of rice they plant in any one field. The team was told that often several varieties were mixed together and this detracted from the consistency and quality of rice meant for export, and thus the export price. (Milling is also more difficult as there are a higher percentage of broken grains.) The team is uncertain whether this mixing of varieties is unintentional or reflects a calculated risk mitigation strategy by farmers to guard against total crop loss. If traders and millers were willing to pay a premium for paddy of a consistent variety, farmers would be expected to take account of this. As long as all paddy varieties (mixed or not) are priced alike, farmers will have scant incentive to invest in uniform seed.

The research team believes that Vietnam's experience providing extension services to its rice farmers is particularly relevant to Myanmar. Given that non-cooperative extension only started in 1993, Vietnam managed a rapid growth in extension which targeted typical farmers. While in practice this approach sometimes meant that the poorest farmers and those living in remote, mountainous regions were neglected, the overall impact was to raise rice productivity and increase diversification, especially livestock. Extension knowledge was disseminated by a cadre of about 3,000 extension workers (in a country with many more farmers than Myanmar), research

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staff, and mass organizations. Radio and, later, television, has been used to reach farmers who could not be reached on an individual basis. While private sector actors such as fertilizer dealers and seed companies are a source of knowledge, in general their role has been limited and they have failed to achieve a high-level of credibility with farmers. Differences with Myanmar include a high level of education in Vietnam, a lack of landlessness, and a steady rise in domestic demand for food due to rapidly rising incomes. However, in Myanmar a force of 3000 extension workers focused on serving the three million farmers with land holdings of three acres or more could achieve a ratio of 1 worker for 1000 farmers. (In practice, there might be a focus on farmers with at least five acres as this cohort is more likely to be able to borrow, sell a surplus, and take risks. This number is only about 1.5 million, or 1 worker for 500 farmers.) If an extension worker were paid \$1000 per year and incurred \$1000 for field expenses, the total cost of staff and travel would be under \$10 million. This would be less than \$1 per ton of rice produced – and the rice export tax on one million tons is over \$25 million at a 10 percent rate. It appears that if rice output were increased by even 10 percent and exported, such a program would pay for itself.

VII. Post-Harvest Losses

The team was surprised by reports that harvesting by machine yielded much more paddy than harvesting by hand. If this is correct, it would suggest investing more in machine harvesting. Complicating any policy analysis is the fact that a lack of employment for the many workers in rural areas who do not have access to economically viable holdings of land is a major issue in many places. Subsidizing machinery when there is poverty and underemployment may prove perverse. Improving access to credit would allow highly profitable mechanization to proceed without subsidizing the displacement of already marginally employed farm laborers.

Other post-harvest issues include the unavailability of drying equipment and the age or sophistication of many of the rice mills the team observed.¹⁷ Paddy is often dried on roads or in substandard warehouse storage where moisture levels are too high and/or variable and grains are likely to be broken in milling. Investing in simple drying machines that burn rice husks for heat is one solution – except they require powerful electric fans and electricity is often unreliable.

A detailed discussion of electricity policy is beyond the scope of the present paper, but the research teams emphasizes that Myanmar will encounter great difficulty in improving the competitiveness of its economy relative to its major ASEAN neighbors without reliable and competitively priced electricity. With respect to rice mills, if the efficiency of ports and export policies improve, so should the price of rice exports. This would give more incentive to rice mills to upgrade their equipment. Again, if credit were more freely available at reasonable (1-2 percent a month in real terms, after deducting inflation), then there would be a greater ability to borrow and invest in improved machinery.

VIII. Port Efficiency

¹⁷ Our impression is that there is not a shortage of overall milling capacity – indeed many of the mills we saw were not operating nearly at full capacity. It is the quality of paddy, moisture levels, and mill sophistication that has implications for the export price of paddy.

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In a globalized economy, the ease and cost of exporting and importing is crucial to national competitiveness. A detailed assessment of the state of Yangon's port facilities was recently completed as a companion to the present study.¹⁸ According to this report, the speed with which sacks of rice are loaded on ships is extremely slow. On average, during the dry season workers using small cranes and slings required four to five days to load a 10,000 ton ship, a small vessel by international shipping standards. Since ships pay for every day in port, this raises the cost of shipping. The lack of covered loading made it even harder to load ships in the rainy season, where loading times could take many weeks. Indeed, a recent rice shipment had gone bad because it had been soaked while being loaded. There are delays for other reasons as well—shallow channels, tides, limited capacity, etc. There is a need to invest in conveyor belts, side loading trucks, dredging, lighting for night ship travel and administrative simplification. (Containers work well for rice exports but do not connect well with African nations who are the main consumers of Myanmar rice, so that most rice is loaded in bags as general cargo.)

The obvious solution to port inefficiency is to raise investment in the ports to modernize them. Some new ports have been opened up close to the main port and there was at least talk of further privatization and deregulation. This reform lies well outside of agriculture but has a potentially large impact on it. A better operating port would improve Myanmar's overall competitiveness and reduce the time and cost of exporting and importing. (If the volume of rice exports exceeds 1.5 million tons a year, port improvements would be required rather than simply desirable.) Improving port efficiency is desirable and should be possible since improvements should pay for themselves.

An important point is that lower port costs should translate into higher paddy prices for farmers, but also higher rice prices for consumers. High port costs act like an export tax. If the goal is to keep domestic rice prices low, the government would have to raise the already considerable 10 percent export tax. This is not a suggestion or recommendation, but a logical consequence of lower port costs. As it is, rice prices have already risen from last year. Paddy prices were below 3000 kyat per basket last year and are now normally 4000 kyat or more. If wages do not rise in conjunction with rice prices, the real wages of laborers and people without access to economically viable holdings of land will fall and food security problems can arise.

IX. Important Recent Initiatives in Rice Policy

The year 2009 brought a pair of important policy initiatives affecting Myanmar's rice sector. These were the establishment of a new Myanmar Rice Industry Association (MRIA) and the creation of 31 "special agricultural development companies" (SACs), operating at the township level. These initiatives are in themselves very encouraging, for they indicate increasing attention to agriculture in Myanmar. The institutions created by these initiatives also hold much promise as valuable contributors to the country's farm sector. Each deserves discussion.

¹⁸ Stuart Larkin, "The Rice Supply Chain: Study of Yangon Port," March 2010. This report provides valuable analysis of current barriers to increased efficiency based on original research and analysis and comparative data.

A. The Myanmar Rice Industry Association

Due to supersede a number of older associations of participants in the Myanmar rice economy, the MRIA gives the country a *national* industry group to represent the concerns of the rice growing, processing, and exporting industry to the government. The Association is a natural candidate to lobby for more public research, extension, and agricultural and infrastructural investment. Today, though some people are making much money in the rice business, the sector confronts a number of shared problems about which the MRIA is well positioned to communicate to the government. For even larger farmers face many difficulties and sometimes have losses. Millers and traders face problems of over-capacity, uncertain credit and export quota conditions, and poor infrastructure. These problems impose costs on all participants in the sector. The MRIA will allow better public-private cooperation in coordinating rice policy and investments in the rice sector. It will play an important role in calling state attention to the sector's needs. Of particularly great importance, the MRIA is uniquely positioned to develop the capacity to provide the government with basic, reliable information and statistics on the state of the country's rice sector, something that the country sorely lacks today. In short, many more steps are needed to modernize the rice industry in Myanmar and help it re-establish itself as a world leader. The MRIA can serve as a partner to the Myanmar government in helping the country take those steps.

This great promise notwithstanding, it is important to inject a note of caution into discussion of the MRIA. The Association's industry-wide reach can prove a curse as well as a blessing for the sector. Should the MRIA evolve into a group focused on the creation of opportunities to capture special privileges for its members, it would block rather than promote the improvement of farmer welfare and the rice sector's emergence as a contributor to national prosperity. The emergence of commodity cartels masked as industry associations in the Republic of the Philippines during the presidency of Ferdinand Marcos illustrates that risk. In the Myanmar case, the relationship among those members of the MRIA who were previously involved in rice milling, trading, or exporting and those members without such previous involvement will be an especially important factor. The latter members of the association are in many cases business interests who have prospered greatly in the period leading up to the adoption of the new state constitution. Their ability to prosper in the changed circumstances of the years ahead and their willingness to commit the MRIA to the improvement of the rice sector rather than merely to their own gains will in large part determine whether the Association achieves its full potential.

B. The special agricultural development companies

The research team had the opportunity to visit and meet with 6 of the 31 special agricultural development companies (SACs) established in 2009. Each company operates in a single township, and only one company can operate in any given township. Each company has as its largest investor a big business interest operating in Yangon. These interests may or may not have been involved in the rice sector before. While these interests provide most of the SACs' capital, other investors in the SACs include millers, traders, and sometimes farmers in the township in which an SAC operates. These investors provide smaller shares of SAC capital, but their roles in the companies' activities give the SACs much of their promise. For the structure of the SACs

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combines metropolitan capital on the one hand with local knowledge of the rice sector and familiarity with rice-growing areas on the other. The local shareholders in SACs play the most important part in extending the farm loans at interest rates of up to two percent a month; they also guarantee the loans. As of March 2010, SACs were still new. Some of the companies with which the research team met had only recently begun to operate. Others had made loans to rice farmers in the township – though typically mainly to large and well established farmers with a very low risk of default. These loans were the major activity of the SACs up to that time.

What makes the SACs so promising? First, and quite simply, their creation—perhaps along with that of the MRIA—has clearly boosted the morale and focused the minds of leading local actors in Myanmar’s rice sector. This effect is evident above all in the substantial investment in new milling equipment that the research team witnessed among SAC share-holders in the townships. The effect has helped Myanmar mobilize and energize its most valuable human capital in the rice sector, veteran traders and millers. Second, the tie between metropolitan and local interests has married capital with knowledge and familiarity. Third, the SACs open the way for township level private-public cooperation of the sort that the MRIA may foster at the national level. Fourth, the sophisticated local knowledge of the companies’ township-level shareholders will make the SACs ideal collaborators with banks and other financial institutions. Fifth and finally, as a small, short-term measure, SAC farm lending has clearly been valuable to rice producers. It has helped recapitalize at least larger farmers, especially in Nargis-affected areas of the Delta.

Even if they work in close collaboration with the MRIA, however, SACs will not solve all of the Myanmar rice sector’s problems. As another section of this report indicates, their loans represent only a tiny fraction of the farm sector’s needs. These companies are not banks—indeed, the legal basis for their lending activities appears unclear—nor should they become banks. They are unlikely ever to address the credit needs of smaller farmers. Even at a higher interest rate of 3 to 4 percent per month, they will never mobilize needed volumes of farm credit. And each SAC’s exclusive right to operate in the township that it serves presents the risk of collusion among SAC investors in the future. “Township monopolies” could depress paddy prices through coordinated price setting. Finally, many big and small investors have chosen to participate in SACs at least in part in order to have access to rice export permits. This incentive for them to participate in the SACs is a relic of an approach to its rice sector that Myanmar can choose to abandon. These concerns are, however, minor next to the benefits that the SACs can readily bring to the farm sector.

Each of the two recent policy initiatives affecting the Myanmar rice sector that the research team found so promising owes its origins to a decision taken by the Myanmar state. For either the MRIA or the SACs to realize their potential that the team sees in them and to avoid the pitfalls that the team also recognizes requires, however, that they play roles previously unfamiliar in Myanmar’s political economy. They must cooperate with the state in its efforts to foster the reconstruction of the rice sector and complement those efforts. But they must also evolve into bodies under the control of their members or investors, rather than become mere adjuncts to the state’s bureaucracy. Nor ought they be viewed as substitutes for the state. The Myanmar state needs, as this report makes clear, to make a major investment in its farm sector, in the

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infrastructure required for the prosperity of that sector, and in its own capacity to serve that sector. International experience demonstrates decisively that neither private sector firms nor business associations are likely to have the incentive, the capacity, or the resources to provide the hard and soft infrastructure that dynamic agricultural economies require. At the same time, the state's ability to foster the prosperity of that sector will be enhanced rather than challenged by the existence of complementary institutions like the MRIA and the SACs. The complementary role of such institutions can broaden rather than narrow the choices that Myanmar's political leaders have in the economic realm. The dynamism of such institutions will in turn give the members of the MRIA and the investors in the SACs a greater degree of choice as they work to improve the health of the country's rice sector. In short, the future of the Myanmar rice sector requires a more capable state, but it also requires both a state that works with domestic partners more effectively and capable domestic partners to work with that state.

PART TWO | Credit: Current Situation and Policy Options

The credit situation that the team observed in virtually all locations visited in the Ayeyarwady Delta was slightly better than last year for a minority of well-established farmers but unchanged for the vast majority, even for those with plots over ten acres. Credit remains a major issue constraining rice output as it severely limits farmers' ability to purchase seeds, fertilizer and technologies that improve yields. There are a variety of credit alternatives available to rice farmers with different terms and conditions.¹⁹ These alternatives are briefly sketched out in this section.

I. Sources, Access, Cost

A. Formal sources

The only formal sector credit institution from which the overwhelming majority of farmers borrow directly is the Myanmar Agriculture and Development Bank (MADB). As the research team found in its January 2009 study, the amounts lent by the MADB—about US\$8 per acre—can finance only a small percentage of farmers' production costs.²⁰ The interest cost of these loans is very low (about 1.3 percent per month), but the cost in terms of paperwork, visits to bank offices, forming lending groups, speed money (payments to process loan forms quickly), etc. can be very high. Nevertheless, despite these hassles most farmers reported borrowing regularly from the MADB. The MADB is currently really more of a lending program than a bank and does little forward-looking risk assessment.

B. Informal sources

Many farmers are compelled to borrow at rates of about 10 percent per month from money lenders, typically wealthier villagers or townspeople. Finding willing lenders is not always easy. Farmers not infrequently spoke of travelling to the nearest town multiple times in order to ingratiate themselves with wealthy lenders—in order to secure a small loan at an interest rate of 10 percent per month. The real cost of the loan was not just the 10 percent (due at harvest time) but also the cost and time of going to the city many times. To put these rates in perspective, in areas where drought was severe or where soil and pest problems meant that the chance for crop failure was high, the team learned that farmers deemed even a monthly interest rate of 3 percent too high or too risky. Traders and input suppliers will sometimes provide credit at 4 to 8 percent a month to farmers whom they think will repay their loans. There are problems with these loans. Sometimes the brand of fertilizer offered is not the best value and may not even contain the promised nutrients. A fertilizer trader might insist on repayment at harvest, when prices are lowest. However, farmers who are desperate for credit would often make use of these sources if

¹⁹ A very good paper on credit issues is, "Credit Market Analysis of the Delta, April 2009" prepared for the Post-Nargis Social Impacts Monitoring. (Draft, November 2009) by Winston Set Aung

²⁰ In May 2010 the team was informed by MADB officials that lending limits would be increased to 20,000 kyat per acre, with credit terms remaining unchanged. Though welcome, even with the increase MADB is at present unable to provide as much credit as farmers would prefer to borrow, even at higher interest rates.

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they could access them. Farmers or traders who possess gold collateral can borrow from gold and pawn shops or money lenders at 3 to 5 percent per month, with smaller borrowers (\$50 to \$100 or less) paying 5 percent. Because the value of gold fluctuates, the amount that can be borrowed is less than the value of gold pledged as collateral. Very few people with whom the team spoke had gold collateral; this is not currently a large part of the total credit picture. Pawn shops will take collateral other than gold, but interest rates are higher.

When interest rates rise much above 10 percent per month, loans are often for consumption. The team encountered a number of instances of laborers without access to land (or to economically viable holdings) who borrowed from shopkeepers or neighbors at rates of 15 to 20 percent per month. The loans were in small amounts just sufficient to cover food purchases. In one area near Pyay, moneylenders from outside the village visited by motorcycle to offer subsistence consumption credit at high rates, but more commonly the loans are secured within the village and subject to limits in both total value and length. (Of course, there are loans at zero interest among relatives or close friends, but when these sources are exhausted, higher rates apply.)

Myanmar's agricultural sector needs *commercial* credit, supplied through channels with long-term viability. The amount required on a farm of ten acres is measured in several hundreds of dollars or even more than \$1,000. Group borrowing may or may not prove appropriate for this kind of credit; it is likely to prove less appropriate as the scale of individual loans increases and the variety of uses to which credit is applied broadens. It is also best that farmer-borrowers repay their entire loans after harvest, rather than in small monthly installments. Some loans do not come with an explicit interest rate but specify a (low) price for the farmer's crop when it is harvested or for the worker's labor in the future in exchange for cash now. The discount of the future contract price against the "normal" price is often about half. Calculation of implicit interest rates depends on the duration of loans, but in general the implicit interest rates appeared to be similar to consumer credit rates (15 to 20 percent a month). If a laborer without access to land is unable to find paid work for some months of the year—and this is quite normal—then there may be excessive borrowing against the future value of wages. In the extreme, the worker gets so far behind that he falls into a state of virtual debt bondage to whoever will support him. Farmers who get into these loans often lose their land because they cannot earn enough to repay their debts.

Micro-credit has not been discussed thus far in large part because the size of many rice loans will be large relative to the size of most micro-loans and in part because the timely build-out of a national infrastructure is beyond the scope of existing micro-finance programs in Myanmar. This is in no way a criticism of micro-finance. It allows many families access to small loans for livelihood activities. It would be desirable if there were a wider spread of such programs, as many who now lack this access would take productive advantage of such opportunities. However, it would require a considerable scaling up from the existing programs to billions of dollars of agricultural lending. In most nations, it is the banks that extend credit of several hundreds to thousands of dollars per borrower in aggregate amounts equal to billions of dollars. While the well-known Grameen Bank in Bangladesh has managed to grow with subsidies over a quarter-century, its loans outstanding were only \$816 million in 2009. Thus, the discussion of agricultural credit in this paper is essentially parallel to the needed development of micro-credit. The other major success in rural lending, the BRI Kupedes program, is explicitly not restricted to small loan

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amounts and was linked to a very large and successful bank. It quickly grew to a large size but could build on a branch system in place that covered essentially all of Indonesia.

C. Recent entrants to credit market

Since 2009, special agricultural development companies have begun to provide credit in some townships, primarily in the Ayeyarwady Delta.²¹ (These companies are also discussed in Part Two.) The companies' local shareholders, who typically are well-established participants in the local rice economy, have managed their lending activities. These individuals are expected to guarantee the loans. The maximum interest rate was set at 2 percent per month by the government. The amount available to lend per farmer varied with the rules of each company but was often up to 50,000 kyat per acre, usually up to a maximum number of acres per farmer. In general, those securing loans were well established and larger farmers whose risk of default local share-holders deemed low, reflecting the risk-averse approach adopted by participating millers and traders. These loans were in substantial amounts relative to the input needs, if less than needed. In total, less than \$15 million in loans were extended in 2009, but with roughly \$100 per acre in input costs and about 20 million acres of paddy planted nationwide, total input costs are \$2 billion a year. In other words, these companies provided less than 1 percent of cultivation costs in the rice sector. In addition, some of these credits were "tied" to particular inputs, particular brands of inputs, or even sales of otherwise unmarketable products. Sometimes these inputs were not what the farmer would have purchased with a "no strings attached" loan.

D. Impact on livelihoods

In general, both laborers without access to economically viable holdings of land and indeed most farmers face poor prospects with respect to credit. Lack of affordable credit exerts a debilitating effect on production and erodes livelihoods. When only expensive credit is available, farmers may opt to practice broadcast sowing rather than transplant seedlings; use of the former technique reduces both yields and the demand for labor. Fertilizer usage is often reduced, with such consequences as smaller harvests and less work or sharing of the harvest for the local people without access to economically viable holdings of land.

As the time without sufficient work grows to as many as four months per year, families naturally look for alternatives. Because of unsustainable harvesting, returns to fishing and firewood gathering have fallen. While most of the groups of villagers with which the team met reported that at least one villager had left to pursue work overseas—typically in Thailand or Malaysia—the several hundred dollars needed to secure such work was prohibitively expensive for many families. Working in the jade and other mines in the north is dangerous due to disease and security. Construction jobs were available in Naypidaw, but because most workers must rent accommodations and buy prepared food many villagers felt that the net earnings were insufficient

²¹ See Winston Set Aung, "An Independent Lesson-Learning Review of Pilot Projects on Rice Production and Rural Credit," April 2010.

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to justify leaving the village. In short, rural people without access to economically viable holdings of land face a set of increasingly risky and unpromising alternatives.²²

For rice farmers with small holdings, the picture is scarcely brighter. Many have had to borrow at high interest rates and are one crop failure away from ruinous debt. Only a minority of farmers, most of them with large areas or specialty crops, held significant paddy or rice reserves for their own consumption.²³ Others had to sell their paddy at low harvest-time prices and buy rice back after prices had gone up. Most farmers with whom the team spoke had very high debt levels. There are indications of decreasing numbers of farmers in many villages and of land consolidation or the rise of absentee landlords.

E. Why low-cost credit often doesn't benefit the poorest farmers

Reasonable credit at 3 percent interest per month would help to contain these problems and others. It would cover lending costs much more effectively than the rather arbitrary rate of 2 percent at which the special agricultural development companies have extended credit. It would allow for the mobilization of greater volumes of loanable funds and make it possible for lenders either to make loans to a significantly greater number of farmers. Those farmers would include higher-risk borrowers who are perhaps in greater need of access to low-cost credit than the low-risk borrowers to whom the special development companies loaned funds during their first year of operation.²⁴

II. Building a Robust and Diversified Credit System

A central theme of this report is the urgent need for a much more extensive and professional credit system, extending deep into rural areas and catering to participants in the rice economy. Thailand, Vietnam, and Indonesia have all managed to make formal credit available in adequate amounts much more cheaply than is currently the norm in Myanmar. They have done so by building diversified credit systems, at the center of which is a robust banking system composed of private, semi-private, and public institutions. This section highlights some of the challenges associated with building a modern financial system in Myanmar. This section should be read in conjunction with Appendices B and C. Through an attempt to estimate the revenue that Myanmar

²² Land policy in Myanmar remains a very challenging issue. The country's potentially cultivable lowland area, perhaps even including sections of the Ayeryarwady Delta, is clearly greater than that currently under cultivation. Reasons for this situation may include lack of access to production credit, a legacy of perverse policy incentives in the agricultural sector, and poorly functioning input and output markets. Measures such as those called for in this report will address all of these issues. Progress in implementing such measures will also make attention to land policy increasingly urgent.

²³ A survey of the Dry Zone in 2009 by the World Food Programme found that 80 percent of families did not have food stocks and that 75 percent of farmers owned five acres or less of cultivatable cultivate. In addition, nearly half of all families had no land at all, implying that only 10-15 percent of rural families had a viable holding.

²⁴ Such an outcome is of course not guaranteed. The possibility that the mobilization of greater quantities of farm credit would lead above all to increased lending to low-risk borrowers is a real one. Even that outcome would benefit Myanmar's farm sector and increase rural employment. The point is that either outcome is superior to the arbitrary restriction of interest rates in the belief that such a policy protects small farmer-borrowers; it does not.

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is likely to earn from natural gas and other natural resources, Appendix B argues that the government should have no shortage of funds that might be profitably invested in rural finance. Appendix C addresses additional considerations specific to the extension of the financial system to rural areas.

A. Removing regulatory and legal barriers to effective farm lending

A primary barrier to the emergence of a more effective credit system is regulatory and legal. There are caps on deposit and lending rates that are too low to attract depositors or to allow lenders to make a profit when dealing with small and sometimes risky borrowers. A major consideration is whether the interest rates take inflation into consideration. When inflation is 1.5 percent to 2 percent a month and the deposit rate is only 1 percent per month, it is much more attractive for someone with money to buy gold, land or foreign exchange than to put money in the bank and watch it shrink in real terms. If a person deposits 1 million kyat in a bank for a period of one year and earns 120,000 kyat in interest, it appears that he or she has generated income. But if inflation is 20 percent a year, the depositor would need 200,000 kyat just to keep the same buying power that he started with. A deposit rate lower than the rate of inflation will ensure that there are not many deposits, and without deposits there are few borrowers. But even if a bank has money, it may cost a lot to set up rural branches, hire employees, develop information about local borrowers and absorb loan losses from borrowers who really cannot repay. In general, a “real” interest rate (the interest rate in excess of inflation) for risky borrowers has to be about 2 percent a month. If the interest rate is held lower than this, the bank or lender will not lend to risky borrowers. They will then have to turn to very expensive informal finance at 10 percent per month.

Any discussion of an interest rate for borrowers has to start with an interest rate high enough to attract deposits. Without deposits, there is no money to lend. How much would be needed to attract deposits to banks in Myanmar? Prices doubled from 2005 to 2008, a 25 percent per year rate of increase. While inflation has slowed over the past two years, it is uncertain how high it may go. A minimum deposit rate of 1 percent month is almost certainly needed to attract significant levels of savings. Given inflation and other risks, wealth holders would want to hold gold, dollars or real estate instead of bank accounts with low deposit rates. Deposit rates are but one component of lending costs. The other two significant components are operating costs and provision for loan losses. In a mature and well-run urban commercial banking system, the “spread” between deposit and lending costs may be only 3-4 percent per year, with loan losses amounting to 1-2 percent of annual loans. Riskier loans, such as credit card or consumer debt, often charge interest rates of 1.5-2 percent per month when there are very low deposit rates. Building up a rural banking infrastructure in Myanmar will require establishing hundreds of small branch offices, training staff, installing the oversight and audit capability needed to manage hundreds of thousands of small loans, and managing the risks and vagaries inherent to agriculture. All of these factors will increase costs.

It is difficult to estimate loss rates for agricultural loans in Myanmar, given the nascent state of formal sector financing. The small amounts lent per acre at very low interest rates by the MADB enjoy very high repayment rates, a pattern that is likely due in part to a desire by borrowers to

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avoid official pressure and to maintain access to inexpensive, albeit limited, credit. On the other hand, we do know that when the SACs lent at 2 percent per month in 2009, only the wealthiest farmers received credit. Given that the costs of lending on top of the cost of capital (deposits) are 1.5-2 percent per month, and the cost of capital will be 1-1.5 percent per month, a lending rate of 3 percent per month is needed both to attract adequate deposits and also to give an incentive for bankers to serve farmers with small and medium-sized land holdings. If rates are held to lower levels, deposits will be inadequate or banks will restrict lending to a few “safe” and large borrowers, in which case other farmers are certain to face much higher borrowing costs—perhaps 6 percent per month from fertilizer suppliers and 10 percent or more for loans from informal-sector lenders, when such loans are even available.

However, it is not just interest rates that hold back rural lending. Private commercial banks are not allowed to lend to farmers. These banks have severe limitations on their ability to take deposits. If they make a loan to a farmer, they are not allowed to take land as collateral. These kinds of restrictions would block rural lending even if interest rate caps were removed. There has to be a rethinking of the role of regulation and a move to allow more banks to make loans that they can expect will be repaid.

It is important to realize that some of the most successful banks in Southeast Asia have been built upon rural lending. Bank Rakyat Indonesia (BRI) boasts thousands of branches which have loaned billions of dollars in small to medium amounts to rural borrowers. Indonesia’s second-largest bank, BRI has been consistently profitable. Its success demonstrates not only that rural borrowers repay their loans reliably if those loans are made professionally but also that they begin to have savings. One reason for private banks to get involved in rural areas is that they can develop a low cost source of deposits and funding.

B. The creation of formal-sector rural financial markets

There is always some debate about whether or not government or private-sector commercial banks should be lending to farmers. The answer is that both should enter the sector and that both sectors should be competitive. There are both government failures and market failures. A government bank, unless it is truly reformed, will tend to make loans without much scrutiny and act more like a lending program than a bank. A private bank may fail to extend its operations into many rural areas and try to “skim off” only the most promising borrowers. If rural banking is going to improve, government banks should be transformed into real banks and private-sector commercial banks should be allowed, but not required, to get deeply involved in rural banking—but without any loan guarantees. Only through the participation of banks of both kinds in rural financial markets is it likely that banking services of acceptable quality will be extended quickly.

The state and state monies have a crucial role to play in jump-starting the institutional development of formal-sector rural financial markets. Financial institutions, both state and private-sector, may initially face a shortage of loanable funds in the form of deposits. At this early stage, the government ought to deposit funds with banks engaged in farm-sector lending. These funds should be drawn from its foreign exchange reserves (in local currency). It should receive interest on those deposits at prevailing deposit rates, so long as those rates at least equal inflation

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rates. The amounts to be deposited to allow rural lending should be contingent upon the volume of credit extended to the rural sector. However, after some experience, the amounts should be keyed to the amount of successful loans made. The incentives should be to make good loans that are repaid, not just to have a high level of lending. Since government reserves currently earn essentially no return (they are either held in cash or at very low interest rates), a 12 percent annual return in kyat would boost government income, even after deducting current inflation, which the Asian Development Bank currently estimates is less than 10 percent per year. If, for example, the government deposited \$100 million with banks for onward lending to farmers next year, (that would be 100,000 loans of \$1000 each—a small amount for 3.5 million farmers), the interest income would amount to \$12 million. It is important to emphasize the temporary nature of this measure. The experience of numerous other economies makes clear that, before long, rural-sector savings deposited with banks would furnish those institutions with adequate loanable funds.²⁵

It is not clear how rapidly banks could safely and prudently expand rural lending, but it is better to err on the side of conservatism. If farmers come to think that the banks are lending money that does not have to be repaid, the entire rural credit system would suffer. It is likely that as incentives and technical and customer-oriented training within banks improve, and as new branches are established, there could be at least one to two million loans worth a total of more than \$1 billion.

It is also important to realize that a substantial proportion of rural credit does not go to farmers. Traders, millers, local input providers, and petty manufacturers are all candidates for loans. Private banks may initially be more comfortable making loans to these groups, and some of them will then in turn extend loans to farmers indirectly, as (for example) fertilizer dealers do now. If there is more rural lending, then there will be more options for farmers to borrow, even if they are not eligible for bank credit.

This is not the place to describe a detailed roadmap for transforming government banks, such as the Myanmar Agricultural Development Bank (MADB). However, the transformation of Indonesia's BRI in the 1980's may give some hints. Initially, BRI "rural lending units" acted like government offices providing a fixed basket of inputs for each acre of rice grown. The interest rate was fixed, and farmers only had to prove that they were growing rice to secure a loan. When this rice program was phased out (it was ineffective), there was wholesale retraining of 15,000 bank officers. Each "lending unit" became a rural bank with its own profit and loss accounting. Salaries were raised to private sector levels and bonuses were paid to units that made a profit. Dishonest officers were weeded out. Deposits grew so much that there was soon sufficient funding from savings at the units, though government loans to the units helped get things started. At all times, any loan thought to be sound was funded—there was never a shortage of funds. Repayment rates were 97 percent, and lending units became profitable within one or two years of becoming fully operational. It is not clear if such a transformation is feasible so quickly in the case of Myanmar's MADB, but it would be foolish not to attempt a similar improvement.

²⁵Again, Appendices B and C offer further details to support these proposed measures.

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The MADB has recently received permission to increase its lending level to 20,000 kyat per acre. This is a welcome decision, although over the long term the amount lent per acre to qualified borrowers will need to be increased still further. The MADB's lending rates will need to be increased to enable the bank to offer attractive deposit rates to savers and to finance the other costs associated with making loans, including the prospect of write-offs in the event of crop failures. The team estimates that in the current environment a monthly interest rate of 3 percent would likely be adequate to cover these costs. In a discussion with the team, an MADB representative stated that transforming the organization into a commercially oriented financial institution will require significant reforms to its internal accounting and management procedures, as well as investments in staff training and technology. Structurally, comparative experience suggests that the MADB will need to be spun-off from the Ministry of Agriculture and Irrigation and incorporated as a state-owned company. It would also have to increase its branch offices, which are at present located in only 205 of Myanmar's 325 townships. This process would take some time.

It is important to realize that a renovated rural credit system will not solve all problems. Some farmers are such poor credit risks that they should not get loans, at least not from banks. If drought or pest problems are severe and chronic, the farmers may not want to borrow, properly fearing that they would not be able to repay. Lack of water, proper seeds, knowledge about pests or fertilizers, and low crop prices will create problems that credit cannot solve. Some rural families may need to become non-farm rural workers and perhaps borrow for trade or other services. However, if a credit program can provide savings and lending services to most rural families at realistic interest rates, there is little doubt that it would be an important prod toward better incomes, production and employment. While credit will not solve all problems, for Myanmar agriculture to make progress without a sound, active formal-sector rural financial system is very nearly impossible.

The process of creating a more vibrant credit system will need to begin with sweeping reform to the existing regulatory framework relating to financial institutions and credit markets. Interest rate policies must be reformed, as must policies towards deposits, collateral, and lending restrictions. The technical capacity of the Central Bank and the Ministry of Finance will need to be upgraded in order to ensure that these agencies are capable of exercising effective oversight of the financial system. Both the Central Bank and the Ministry of Finance must have the authority and power to implement policies, as well as the skills to design them. Successful countries have known the importance of strengthening these institutions, so critical for macroeconomic stability and the regulation of the financial sector.

PART THREE | The Humanitarian Consequences of Economic Stagnation

I. Rural Poverty

While increasing rice output is a crucial and achievable goal, poverty reduction also ranks as an important, and distinct, goal. There is no shortage of rice for sale in shops and markets in Myanmar. Anyone with the money can buy rice. Unfortunately, not everyone has been able to earn enough money to buy sufficient rice to meet even minimum standards. This section discusses the problems in estimating, defining and dealing with the problems of food security and poverty. The discussion of food security here refers to the level of the household or individual, not the nation.

Rice in Myanmar is sometimes an inferior good. That is, when incomes fall, people will often eat fewer high-protein or other expensive foods that are preferred and instead eat more rice. This is rational, for it provides cheap calories. If things become especially difficult, it is even possible to eat 100 percent broken rice, which is cheaper than the ordinary sort and is normally used for animal feed. Rice prices in the villages that the team visited had generally risen, although wages had not. A *pyi* (2.13 kg) of medium quality rice had been 500-600 kyat last year and had risen to 700-800 kyat. Even so, that is only 35 cents per kg or 20 cents for 2000 calories—a basic daily intake. Rural wages varied depending on gender, time of year and type of work but ranged from 1000 to 2000 kyat (about \$1-2) a day for men and two-thirds as much for women, sometimes a meal was added to that. Since wages had not generally risen in the last year while rice prices had increased, laborers' real incomes had dropped. With lower incomes, some families had shifted from preferred foods to consuming more rice.

It is important to understand the difference between poverty and hunger. Poverty is having insufficient income to meet basic needs. Hunger is not having enough to eat. Obviously, a hungry person is in poverty but not every poor person will be hungry. (Housing, clothing, or healthcare may be below a minimum standard even if food is not.) If “having enough to eat” is defined as having enough calories to work, then most people whom the team interviewed were not hungry. If “having enough to eat” means having a diet that provides all necessary nutrients, or includes foods considered a normal part of the diet, then a fair share of people were not eating the necessary foods. *Many young children were not eating enough rice, let alone other foods.* Most people had stopped eating curries, had very little oil, and were getting by on rice, some greens, fish sauce and chilies. To put it another way, the team observed widespread poverty but less “food poverty” where income is insufficient to buy the needed calories.

The 2004 *Integrated Household Living Conditions Survey* suggested a household food poverty level of 118,400 kyat per year and a poverty level income of 162,100 kyat.²⁶ Since 2004, paddy prices have risen by a factor of 2.2 times and energy prices even more. This would suggest a

²⁶ The survey was prepared by the Ministry of National Planning and Economic Development and the UNDP and is available at http://www.mm.undp.org/UNDP_Publication_PDF/IHLCA-Poverty%20survey.pdf.

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current poverty level income of about 365,000 kyat per year. In 2004, the share of those in poverty was 32 percent in all of Myanmar, though the rate naturally varied by location. Yangon, for example, had only 15 percent counted as being poor while some Shan states were over 50 percent and Chin state was estimated at 73 percent poor. Not surprisingly, rural poverty (36 percent) was higher than urban poverty (22 percent).

One reason why poverty rates are likely to have risen is that credit is such a problem. When farmers are heavily in debt and have trouble borrowing at even 10 percent a month, it pays to cut back on dry season area planted; to save the 30,000 kyat per acre involved in transplanting rather than broadcasting seed (in spite of the 10-20 baskets per acre lower yields); to use less fertilizer; and to weed less. The result is less work for the half of all families that are either landless or whose land holdings are not economically viable under the best of circumstances. Since these families often face two or even three months without much work in the best of times, they become truly desperate if their neighbors do not employ them as much during the times when they are normally busy.

II. Children's Welfare

During the research team's field visits it became increasingly clear that economic stagnation in rural areas is exacting a heavy toll on children. If children have to walk hours to get water, there is less time or energy for school work. If they have a poor diet, it will be harder for them to learn. If any kind of extra income is badly needed, more children will drop out after a few years of schooling. These costs are not easily measured but in the long-run may be far costlier than crop losses.

A recent survey of middle upper arm circumference (MUAC, a widely used indicator of malnutrition) provides stark evidence of the human cost of economic stagnation, at least in localities included in the survey. The survey was conducted by IDE/M on a very limited sample of village tracts in selected Nargis-affected townships in Ayeyarwady Division and in Magway, Sagaing, and Mandalay Divisions in the Dry Zone as part of a baseline analysis conducted prior to implementing local infrastructure projects.²⁷ The survey included 1820 children of less than five years of age in sixteen villages; every effort was made to measure all children in the age cohort in every village. The team emphasizes that the survey is not representative of anything other than the villages that were included. Nevertheless, the findings, displayed in Figure 7, are extremely sobering. The bell curve to the right displays the distribution that one would expect to find in a healthy population.²⁸ The bell curve to the left illustrates the findings of the IDE/M survey. Severe and extreme malnutrition (the two most serious categories) are at the far left-hand tail of the curve and account for 3-5 percent of surveyed children.²⁹ This cohort corresponds to 3

²⁷ Selected townships included: Bogale, Dedaye, Labutta, Mawkyun, Pyapon (Ayeyarwady); and Myaing, Myin Chan, Nwa Tho Gyi, Pakokku, Taung Tha, and Yesagyio (Magway).

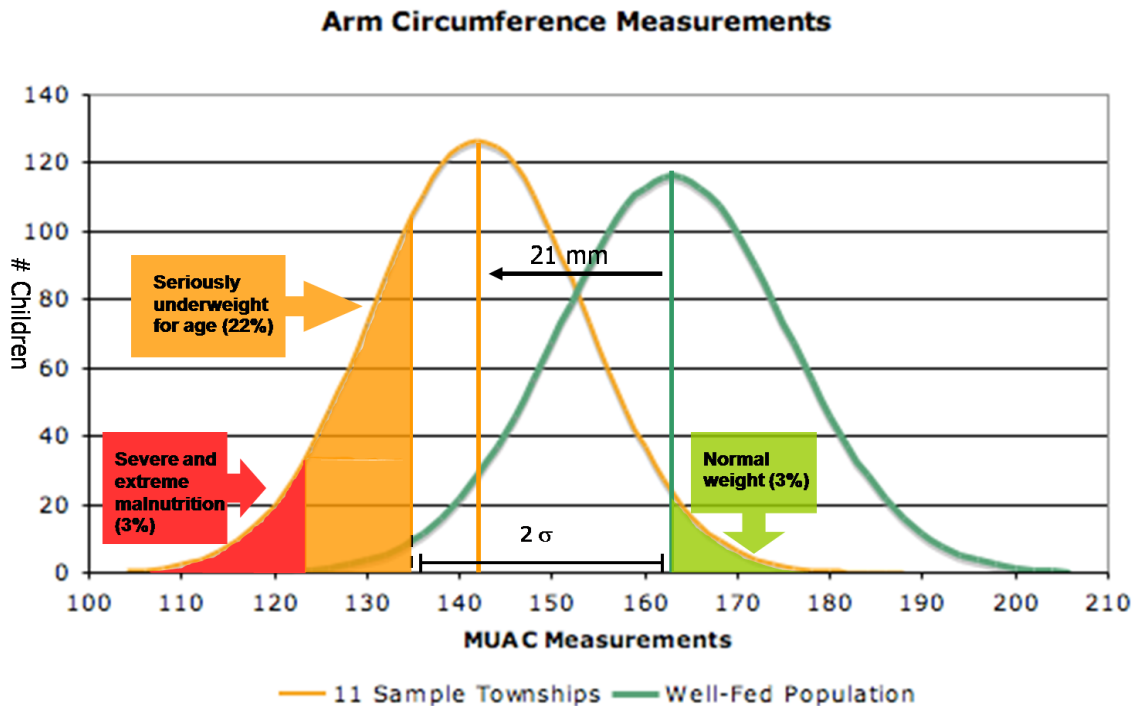
²⁸ This bell curve is based on data collected by the National Center for Health Statistics (NCHS), a division of the Center for Disease Control and Prevention, a US federal government agency. The NCHS regularly collects health data around the world. See <http://www.cdc.gov/nchs>.

²⁹ The cutoffs used were below 115 mm for extreme malnutrition and 115-125 mm for serious malnutrition. Very low middle upper arm circumference measurements (MUAC) are predictive of deaths in young children. Under-five mortality in Myanmar is 103/1000 for 2007. (*World Development Report 2009*, p.

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or more standard deviations below the median arm circumference for children 6-59 months of age. Children suffering from severe and extreme malnutrition are at a high risk of death and in most cases require medical intervention. Moderate malnutrition, at -2 standard deviations is also viewed as a public health problem needing attention, attention and one out of four children were at minus two standard deviations or less.

Figure VII. Arm Circumference Measurements: Sample townships (left), Healthy Population



However, one worrying finding of the survey is that only 3 percent of children were above the median weight/arm circumference for healthy children where 50 percent should be. In addition, 77 percent were one standard deviation or more below the median where only 16 percent should be found. *This means that 60 percent of children in the selected villages are underweight.* Since there is some natural variation among children in terms of growth and stature, not every child below median weight, height or arm circumference is malnourished. (Appendix A analyzes additional Dry Zone data in more depth.) However, various studies have found that very thin or short children tend to enter school later, have more absences, repeat grades more and generally complete fewer years of schooling.³⁰ While a low arm circumference is associated with protein-energy malnutrition (not enough to eat of a normal diet) and is a problem in its own right, it is also often correlated with other problems such as Vitamin A or iron deficiency, both of which have been associated with learning problems. Other studies find that it is difficult fully to reverse

123) Indonesia's comparable rate is 31/1000 and Vietnam's is 15/1000. More analysis is presented in Appendix B.

³⁰ "Long-term Consequences of Early Childhood Malnutrition" by Alderman, Hoddinott and Kinsey. IFPRI Food Consumption and Nutrition Division, Paper 168, December 2003. The paper can be accessed at: http://are.berkeley.edu/courses/ARE251/2004/papers/Alderman_Hoddinott.pdf

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damage from severe malnutrition after two or three years of age. The differences show up in long term health problems, stature, earnings and education. If agricultural development also promotes jobs year-round for the landless and land-poor and for small farmers, then it should also reduce childhood malnutrition. However, it is important to recognize that other factors, such as clean water, maternal education and nutrition programs also influence malnutrition. Comprehensive improvements would be most likely to show consistent results. This outcome would help Myanmar move towards its Millennium Development Goals and improve both human well being and development targets.³¹

III. The Dry Zone

A. Overview

A humanitarian crisis is unfolding in the Dry Zone. The problems that the team observed in parts of the Dry Zone without access to irrigation (above all the historically dry and difficult areas of Taungtha, Myingyan, and Natogyi) were qualitatively different from those in other parts of the country that the team visited. Many non-irrigated areas were desperately short of water for household use. It was common to dedicate one person, often a girl or woman, to walk for hours to get a small amount of water. Large ponds and reservoirs had run completely dry, and deep wells had been dug in them or near them to get ground water dozens of feet below the surface. These wells recharged very slowly with the result that it could take a long time to get 5-10 gallons of water—enough for drinking, washing and animals. The containers were filled a few cups at a time. People were sleeping by these wells so that they could stay in line, sometimes for hours. The need to devote the labor of one family member exclusively to fetching water often took that person away from other productive work and reduced family income. The lower family income had an impact on food consumption. (It also often meant that children had difficulty staying in school.) That such great efforts are necessary to procure a modest amount of water for home consumption testifies to the hardships these households are confronting.³²

Indebtedness is another pressing problem. A World Food Programme survey conducted in December 2009 in the Dry Zone found that 84 percent of households reported being in debt.³³ The median debt was 300,000 kyat or six to twelve months worth of wages for a male worker—if there is work constantly available. Levels of debt have increased markedly in the last year or two for most households, and that is one reason why it is so hard to borrow. Normal lenders have less

³¹ The 11-township graph of arm circumference is very similar to that of Bangladesh, which reports higher malnutrition (40 percent compared to 30 percent for Myanmar) but much lower under-five mortality.

³² In the Dry Zone, the team asked the oldest members of each village focus group to compare present conditions with their lived experience. Without exception these individuals (typically seventy to eighty years of age), responded that the current hardships were unprecedented. In March 2010, many observed that while the drought was not considered especially severe by recent historical standards, its effects were amplified by the string of crop failures and other shocks preceding it. This is hardly a scientific or statistically significant finding, but it is further cause to suspect that poverty levels may now be considerably higher than the 2004 UN survey showed.

³³ The WFP survey found two-thirds of all households were borrowing money to purchase food or healthcare while only 20 percent borrowed to purchase farming inputs. A majority (55 percent) of households reported debt levels over 100,000 kyat, an additional 25 percent of households reported debt levels of between 50,000 and 100,000 kyat.

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money and borrowers already carry heavy debt loads. An injection of cash would help get households back on their feet. Without this kind of effort, creating a viable credit system would be difficult. As it is now (and not only in the Dry Zone), a highly indebted farmer will borrow from a lower cost source of credit to pay off a higher cost source, but not use all of the “new” credit for directly productive purposes. Without much higher income, they then fall behind on their new loan. This cycle of increasing indebtedness has to be broken. Otherwise, it will be difficult to realize higher levels of inputs, better seeds and other soil or irrigation improvements.

B. Recommended short-term responses to reduce vulnerability

In many of the village tracts visited by the team, a well is the most pressing priority. If the water is not too deep, a human-powered pump will lift the water. If the water is much below 40 feet, then a mechanical pump is needed. The cost can run from several hundred to a few thousand dollars, depending on the soil, depth, and pump cost. A survey of villages would reveal how many needed this kind of investment. Normally, some cost sharing might be desirable, if only to ensure that the village keeps the pump operating. However, many of these villages have gone through several lean years and have sold their animals and durable goods (even roofing); have become deeply indebted; and have trouble even affording food or medicine, much less candles to burn at night. Under these circumstances, a grant to the village is probably in order.

A second activity worthy of immediate action is the provision of small grants (~\$5,000) to villages for the execution of local infrastructure projects. It appeared to the research team that many townships that had no external aid or special government programs would have benefitted from them in both an immediate humanitarian sense and also in terms of benefitting from the improved infrastructure. In some areas this will be digging out an existing pond or reservoir used by the village, increasing its capacity and repairing its surrounding dikes. Some cement could be used for gates and a spillway to prevent the dikes from washing out if there is heavy rain. This kind of activity is labor intensive and easily monitored. It involves no specialized technology or equipment. Improving water storage capacity for the next dry season or drought would be productive; it would free much labor from walking for hours to fetch water. It is not a trivial task to organize these efforts with a minimum of waste. It requires some *local* organization to select productive projects that are not simply make-work, and the possibility of “ghost workers” has to be guarded against. These projects can be overseen by village councils selected for the purpose, a model that IDE/M has adopted successfully on a pilot basis. Paid work would especially benefit households without economically viable land holdings, but it is likely that many farmers would also be interested in participating in such schemes.

In some cases there is not a need for a deeper pond, but there is a need for firewood. If the village can find an area for growing firewood, villagers can be paid to plant firewood trees and develop a plan for managing them for the entire village. Because the rapid denuding of the Dry Zone landscape in recent years has forced villagers to range ever greater distances in search of firewood, this kind of investment would have a similar impact in terms of time savings as well drilling. The cost of saplings is modest; most of the cost is in labor for digging holes and maintaining the trees. Within a few years, the trees can be cut down and still grow back, providing a sustainable source of fuel wood.

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A third possibility for small and local investment with paid wages is building bridges or improving roads. These projects can also be labor intensive, but often need more raw material than ponds or tree planting. Bridges may require cement and re-bar or at least large sections of trees or wood. A road may need crushed rock and even a roller to compact it. Bridges can be quite helpful in making it safe for children to go to school or making it easier to bring goods to or from the market. Motorcycles, bicycles and normal trucks can use improved roads, not just four wheel drive vehicles and ox carts. This can make a major difference for more isolated villages, and not only in the Dry Zone.

While it is most desirable to offer jobs close to the villages that are worst hit, it may not always be possible. In the Dry Zone there are many irrigated areas. Some of these irrigation schemes have not been maintained. The actual area irrigated is not equal to the command area in the plans. It is not hard to design labor-intensive projects to clean out (or even line) drainage and irrigation canals so that the actual irrigated area increases back to the planned amount. It would be possible to hire local workers to do this work, some of whom may come from villages without irrigation.

This discussion draws on the research team's field visits to and on surveys conducted in the Dry Zone. The size and geographic and climactic diversity of the Dry Zone make it impossible to claim that the team's observations during those visits were representative of the situation in the zone as a whole. Nevertheless, consultation in Mandalay with more than two dozen members of IDE/M's Dry Zone field staff, who work in a wide range of townships other than those that the research team visited, generally confirmed the broad contours of the account offered here. As noted at the outset, the team did not visit the largely upland regions of Upper Myanmar outside the Dry Zone. It did not visit the country's eastern or western border region. While this report cannot therefore comment on the humanitarian situation there, the team believes that it is likely that similarly grim conditions obtain in at least significant parts of those other areas, as indeed some other studies have found.³⁴

³⁴ For example, World Food Programme surveys in 2009 found about 85 percent of families in the Chin and Northern Rakhine to be indebted and having trouble covering basic requirements. In some cases, (43 percent of households in Rakhine), there was not enough food intake.

PART FOUR | Short and Long-Term Solutions

I. Agricultural Development in Context

A. International experience

As Myanmar continues to liberalize its economy, it should be mindful of the experiences, positive and negative, of other countries in the region. The preceding sections of the report have identified areas that merit consideration of comparative perspectives. One way to understand the outcome of development policies followed by countries such as Thailand, Vietnam, and Indonesia, is that they have created *choices* for their government and for their citizens. These choices have come in areas directly related to agriculture and food policy, such as the level and mix of exports of rice and other agricultural goods; the means of promoting the welfare of city dwellers, of farmers, and of rural people who are not farmers; and the achievement of a dynamic rural sector and the contribution of that sector to the development of the commercial, industrial, and service sectors. But these countries have created choices of a more fundamental nature as well. Their governments have enjoyed the ability to choose among growth strategies to pursue. Their people have had options for how and where to live their lives and how best to support themselves and their loved ones. In Vietnam, Thailand, and Indonesia, one of the most important options regards the ability of rural inhabitants to pursue employment outside of the agricultural economy.

It may seem odd to conclude a study that is primarily focused on agricultural policy by highlighting the importance of other sectors. The research team does so for two reasons. First, the development experience of Asian countries demonstrates that, while a dynamic agricultural economy can be an important catalyst for growth, over the long run industrialization, not agriculture, generates national prosperity. During Japan's period of rapid industrialization in the first half of the twentieth century, and during the economic take-offs of South Korea and Taiwan, and now China, young people have left the countryside to reside in cities and take jobs in higher productivity sectors such as manufacturing. Many doubtless left because they wished to escape the hard realities of even the most dynamic agricultural economies. Myanmar is not exempt from the logic of economic development. While agriculture can and should remain an important driver of economic growth for many decades into the future, agriculture alone will not lift Myanmar out of poverty, or create the life choices that Myanmar's people deserve.

Second, the conditions that the research team observed in rural Myanmar lend the task of creating off-farm employment special urgency. *There is reason to suspect that a larger than recognized and growing percentage of rural residents in the regions that the research team visited no longer possess economically viable landholdings, and there is reason to believe that the number is increasing.* This means that many people living in rural areas are no longer "farmers" in the conventional sense of the term. This paper has recommended elsewhere that the government consider funding small scale village infrastructure projects partly as a means to generate wage labor opportunities for the poor; while the economic and humanitarian impact of such initiatives can be significant, ultimately they are short term measures. A recapitalized and revitalized rural economy will certainly create much greater employment opportunities than such measures. Of course, some people will always leave rural areas in search of opportunity of various kinds,

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including economic opportunity. But at present the range of available options—migration to neighboring countries, employment in the upland mining sector, or migration to cities—are limited and fraught with risk.

B. Poverty and growth

Economic growth is considered a necessary but insufficient condition by most economists to rapidly reduce poverty. As Martin Ravallion wrote in 2004³⁵, there are two views of growth and poverty. One is that growth reduces poverty, since the poor seem to maintain their share of output on average as growth proceeds, even if their share is small. If a country manages to double income per capita in a decade, the poor will roughly do the same. On the other hand, according to a more critical view of globalization held by organizations such as Oxfam, “current patterns of growth are widening income disparities and hence acting as a brake on poverty reduction.”³⁶ To partially resolve these two views, Ravallion constructs a matrix based on 117 periods from household surveys in 47 countries and finds an element of truth in each view. The change in numbers in poverty in the matrix refers to the median case.

Figure VIII.

		<i>Change in Household Income Between Surveys</i>	
		Falling	Rising
<i>Inequality Change (Between Surveys)</i>	Rising	Poverty rising at 14.3% a year [16% of spells]	Poverty falling at 1.3% a year [30% of spells]
	Falling	Poverty rising at 1.7% a year [26% of spells]	Poverty falling at 9.6% a year [27% of spells]

The results of this study are not surprising. Poverty reduction is fastest when inequality is dropping and incomes are rising. Poverty increases fastest when incomes are falling and inequality is rising – an uncommon but not rare situation. In intermediate cases, there is a smaller decline in poverty when incomes and inequality rise and a slower increase in poverty when incomes and inequality fall. What can we take from this? First, it is better to have everything go well. If it cannot, there is a question of how rapidly growth might proceed—a very rapidly rising tide might lift the small boats a fair amount—a point Ravallion does not fully address. Or, perhaps a bit of growth should be sacrificed to gain more equity, if the goal is the most rapid reduction in poverty. Over a longer term, there are limits to how much income can be shifted

³⁵ His “Growth, Inequality and Poverty: Looking Beyond the Averages” is published in the book, *Growth, Inequality and Poverty: Prospects for Pro-poor Development* in Oxford Scholarship Online, 2004. This book was edited by Anthony Shorrocks of the United Nations University and Ralph van der Hoeven of the ILO. It can be accessed at:

<http://www.oxfordscholarship.com/oso/public/content/economicsfinance/9780199268658/toc.html>

³⁶ The quote is from the Ravallion paper but is taken from Justin Forsyth, Oxfam Policy Director.

from the rich to the poor, and it is necessary to have economic growth. The question is if there are tradeoffs between growth and equity and what they look like.

The economist Hyun Son explores these possible tradeoffs in more empirical detail.³⁷ He calculates from historical data the amount of growth that would be needed to offset a 1 percent change in the Gini index (a measure of income inequality) in either direction. Most nations need 1-2 percent income growth to offset a 1 percent Gini deterioration, though richer ones need more growth than poorer ones to further reduce poverty.³⁸ Of more interest, is that the “poverty equivalent growth rate” (PEGR)—the rate needed to produce the same change in poverty if inequality had remained level. If the PEGR is higher than the actual growth rate then that means that observed growth is pro-poor. That is, if a lower actual growth rate kept poverty constant but a higher PEGR (counter-factual) rate would be needed to do the same, then the actual growth was pro-poor. In calculations for rural areas in India and China up to 1996, growth was pro-poor. (His calculations stop in 2001.) For entire nations, growth was also pro-poor up to 1996 for Indonesia, Bangladesh, Thailand and Vietnam. What we can deduce from these findings is that growth in much of South and Southeast Asia has generally been pro-poor in its early phases. If a combination of agricultural and light manufacturing growth raise rural incomes and provide jobs for those who do not wish to work in farming, poverty can be reduced quickly. Of course, agricultural growth in Asia has largely relied on small farmers, not on huge plantations – though parts of Indonesia and Malaysia are different.³⁹

The reason that 1996 is a break point for some nations could be the 1997-98 Asian financial crisis. However, the changes are not what one might expect. China’s rural growth turned against the poor after 1996, even though China was not much affected by that crisis. It did, however, rely more on state-led and foreign growth after a period of having more decentralized growth in the town and village enterprises. In India, growth remained pro-poor in the rural areas after 1996. In Indonesia, growth stopped being pro-poor not in 1999 but in 2001, following a period of uncertainty about political stability and capital outflows. In Bangladesh and Thailand, growth remained pro-poor after 1996, while in Vietnam it switched from pro-poor to neutral. What does all of this mean for Myanmar?

First, reducing poverty will work best when growth is fast and broadly based. Growth has the least impact on poverty in unusual cases – Nigeria’s or Zaire’s corrupt oil/mineral growth; Brazilian super-concentrated land and capital ownership in the 1970’s; or South Africa’s apartheid era. If growth, as is typical in Asia, starts with agriculture and spreads to light manufacturing with its rapid growth in employment, then there tends to be pronounced reductions in poverty. As Indonesia showed, mineral wealth need not be “cursed” if the revenues are put into health, education and efficient infrastructure and public services like agricultural research and extension. If high quality growth can also be rapid, then the reduction in poverty will be gratifying. This was the case in China, Indonesia and Vietnam. There is no reason why Myanmar could not follow a similar path. The two problems Myanmar faces are how to accelerate growth and how to improve the quality of this growth so that it is pro-poor and sustainable.

³⁷ “Interrelationship between Growth, Inequality and Poverty: The Asian Experience,” 2007, *Asian Development Review*, vol. 24, no.2, pp. 37-63

³⁸ This is not surprising. As the share of the population in poverty shrinks towards single digits, the ability of general growth to help those with the least skills or worst geographic location is increasingly limited.

³⁹ Malaysia is 70 percent urban and is importing migrants to work on plantations. Indonesian population is centered in Java and Bali where plantations are not significant.

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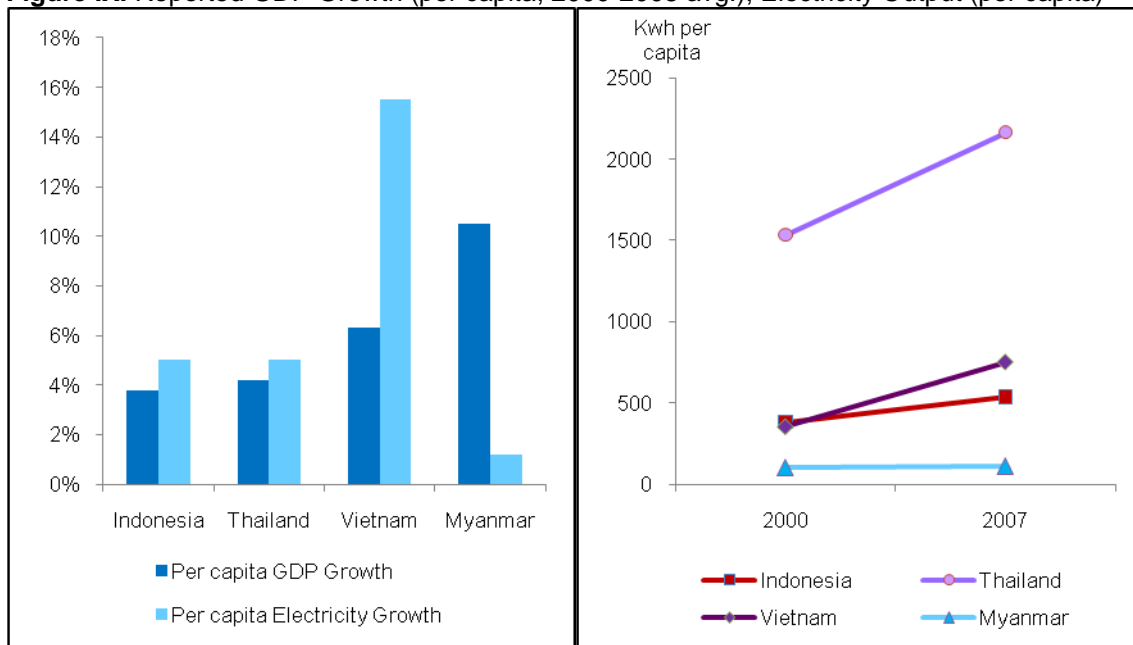
II. How Countries Grow

If dynamic economic growth is the key to Myanmar's future strength, prosperity, and stability, it is prudent to consider what is known about the factors that lead some countries to grow rapidly and others to stagnate. This section will briefly consider key determinants of economic growth. Before proceeding to a discussion, a basic question should be answered: how well is the Myanmar economy performing?

A. How fast is Myanmar growing?

Because electricity is normally centrally produced (private generators will be discussed below), electricity output is among the most reliable of data available in most economies. Electricity is absolutely essential to modern economic growth and normally grows faster than overall real GDP growth. All other ASEAN members have had growth in electricity output above that of real GDP. In per capita terms, the following table shows the data for Indonesia, Thailand, Vietnam and Myanmar, all for 2000 to 2007.

Figure IX. Reported GDP Growth (per capita, 2000-2008 avg.); Electricity Output (per capita)



Source: Asian Development Bank database; Myanmar data from *Statistical Yearbook 2008* (Naypidaw: Central Statistical Organization, 2009).

Normally, in countries with low electricity consumption per capita, the electricity output grows much faster than GDP; the case of Vietnam exemplifies this trend. Indonesia is famous for its slow infrastructure growth since the 1997 crisis and is now engaged in a much more rapid increase in electricity production. In Thailand, where electricity use per capita is already high, electricity growth is more in line with GDP growth. Myanmar reports GDP per capita growth 9 times its electricity per capita growth, even though its electricity use per capita is very low.

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(Countries with low levels of electricity use per capita normally observe electricity growth much higher than GDP per capita growth.) The fact that such a pattern is unprecedented anywhere in the world strongly suggests that something is amiss. *Because the electricity numbers are in its judgment reliable, the team concludes that Myanmar's reported GDP growth data are inaccurate.* In reality, per capita GDP growth is probably under 1 percent per year, if the *official* population data are used. However, if the (more conservative) estimates of population growth of the US Census Bureau are used, then real GDP growth would be approximately 2 percent a year.⁴⁰ Whichever data are used, Myanmar's official GDP growth rates are almost certainly off the mark by a wide margin.

A reasonable rejoinder is that private generators and gasifiers are not included in the Myanmar total (or any other either). However, in 2005 diesel generation was estimated to be only 12 percent of total electricity supply in Myanmar; any correction would therefore be small. Even so, it is useful to investigate the growth of petroleum product use in this decade. Official production and import data were taken for 2000-01 and 2001-02 as a base and 2006-07 and 2007-08 as an end point. It turns out that total (not per capita) use of liquid fuels dropped by 1 percent between these two points. If compressed natural gas (CNG) is included, per capita fuel consumption drops 6 percent, using the US Census Bureau population figure, or 10 percent, using Myanmar government data. Any increase in diesel generated electricity (though not rice-husk gasifiers) would appear in the fuel consumption data. To have a tiny growth in electricity per capita and a sharp decline in liquid fuel use per capita again supports the conclusion that any real growth in per capita output has been very modest. It is possible that it is consistent with no real GDP growth at all, but a small gain of as much as 1.0-1.5 percent a year in real GDP per capita is more likely.

A final objection to this conclusion would be that there is fuel smuggling. It is true that there is and has been fuel smuggling. But it would have to have increased massively to change the conclusion of declining per capita fuel use. Indeed, the official diesel price increases in 2005 and 2007 in Myanmar that ended the black market with even higher unsubsidized diesel prices would suggest a decline in smuggling rather than an increase.

It goes without saying that modern economic growth or competitiveness is virtually impossible without a fast-growing and fairly reliable electricity supply. There are not enough rice husks for all of the gasifiers needed to replace central generation capacity. Doubling capacity every four to five years is a reasonable goal until supply begins to catch up with demand. While prices of electricity will have to rise (again) in steps, a low "lifeline" rate for the first few kilowatt hours a month could provide protection to the truly poor. A policy of keeping electricity very cheap is likely to lead to underinvestment in power generation, to the long-term detriment of the economy. Achieving rapid real GDP growth will require a concerted effort to increase the supply and reliability of electricity.

B. Determinants of growth

It is not just a matter of having enough electricity to be competitive that makes this growth discussion critical to agriculture. This section considers lessons learned from successful growth episodes drawn from international experience. Analysis shows that agricultural growth in Asia is

⁴⁰ According to Myanmar government estimates, the annual population growth rate is 2 percent. The US Census Bureau estimate is 1 percent per year. Subtracting 1 percent a year in population growth adds it to the per capita GDP growth rate.

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faster when overall GDP growth is faster.⁴¹ Other studies, cited in the previous section, show that poverty reduction is fastest when growth is positive and inequality is falling. In order to boost agricultural growth and to make rapid progress in improving welfare, achieving broadly based growth is a necessity. This is why a section is devoted to a discussion of growth experiences in general.

How countries develop and why they follow one development trajectory and not another is a subject that has received a great deal of attention from scholars and policymakers. These efforts have not produced a “template” for growth; a country’s development prospects are shaped by a multitude of factors including geography, natural resource endowments, and historical, cultural, and political conditions and circumstances. Nevertheless, it is possible to identify some common characteristics shared by the world’s most successful developing countries. This was the mandate of the Commission on Growth and Development, a blue-ribbon panel of experts from developed and developing countries, including policymakers, businesspeople, and two Nobel Prize-winning academics.⁴² The Commission examined the experiences since 1950 of the 13 countries that sustained growth rates of 7 percent or more for 25 years.⁴³ Critical factors identified by the Commission are listed in the following table. The research team believes that the Commission’s final report, *The Growth Report: Strategies for Sustained Growth and Inclusive Development*, offers many insights of relevance to Myanmar’s current policy dilemmas.

Table II.

Characteristics of High-Growth Economies
Exploited the world economy
Maintained macroeconomic stability
Enjoyed high rates of saving and investment
Relied on markets to allocate resources
Had committed, credible, capable governments
Invested in education and health

Derived from *The Growth Report: Strategies for Sustained Growth and Inclusive Development*

Many of these matters have already been addressed, directly or indirectly, in this report. The role of the state is a central theme of the team’s analysis. Myanmar has suffered from repeated bouts of macroeconomic instability in the past three decades. Consistent monetary policies and a more independent, technically capable central bank will be critical to bring long-lasting stability to the macroeconomy. In the preceding analysis and in the recommendations that follow, this report

⁴¹ From 2000 to 2008, six Asian countries enjoyed annual agricultural growth rates of 4 percent per year or more (the cumulative average was 5.6 percent). In these countries, real overall GDP growth averaged more than 10 percent per year; all except Mongolia (7.8 percent) grew at a rate of at least 8 percent per year. Twelve Asian countries displayed agricultural growth rates under 4 percent per year (the cumulative average was 3.1 percent) while their overall real GDP grew at 5.7 percent per year; none grew as fast as 8 percent per year.

⁴² The Commission was chaired by Professor Michael Spence of Stanford University and funded in part by the Department for International Development (DFID). Its final report, *The Growth Report: Strategic for Sustained and Inclusive Development* (2008) is available online at <http://www.growthcommission.org>.

⁴³ These countries are: Botswana, Brazil, China, Hong Kong, Japan, South Korea, Malaysia, Malta, Oman, Singapore, Taiwan, and Thailand.

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highlights the urgent need for investment in transport infrastructure, electricity, and other prerequisites for economic growth that only governments or a firm government policy framework, can systematically provide. Indeed, this paper, and the team's 2009 study, have sought to demonstrate the many ways in which Myanmar's development is being constrained by the legacy of chronic underinvestment over many years. Two additional characteristics merit special attention here.

First, integration into the world economy is an essential element of successful development. The most dynamic economies in ASEAN, which are also among the 13 high-growth economies studied by the Commission on Growth, are distinguished by their deep integration with the international economy. The Commission explains:

Growth of 7 percent a year, sustained over 25 years, was unheard of before the latter half of the 20th century. It is possible only because the world economy is now more open and integrated. This allows fast-growing economies to import ideas, technologies, and know-how from the rest of the world. One conduit for this knowledge is foreign direct investment, which several high-growth economies actively courted; another is foreign education, which often creates lasting international networks. Since learning something is easier than inventing it, fast learners can rapidly gain ground on the leading economies. Sustainable, high growth is catch-up growth. *And the global economy is the essential resource.*⁴⁴

At present Myanmar is by far the most economically isolated member of ASEAN. This isolation is preventing the country from taking advantage of the benefits of economic integration described by the Commission. The research team recognizes, of course, that Myanmar's isolation is in large measure a result of sanctions imposed by the United States and other advanced economies. Dismantling the sanctions regime would require political accommodations that this paper will not address. However, we believe that Myanmar must make economic integration a top priority.

In addition to providing much-needed investment and creating employment opportunities, the forces of international trade and investment represent the most effective check against the growing power of a privileged economic elite. While it may seem counterintuitive, international experience demonstrates convincingly that integration makes economies and local firms more competitive, not less. Foreign investment creates opportunities for local firms to upgrade technologically and managerially through joint ventures and by integrating into supplier networks. Recognition of the critical importance of this process has informed China's economic policy for much of the past two decades. Greater integration will benefit Myanmar's people; the argument that it will not is, in the team's opinion, a fallacy. While integration creates many new regulatory challenges for the state, international experience demonstrates decisively that countries that decide not to join the international economy have little hope of achieving prosperity.

The research team believes that Myanmar would be well-served by considering the case of Vietnam. In the mid-1980s, Vietnam found itself in a position of isolation not unlike that faced by Myanmar today. The Vietnamese leadership recognized that the US-led embargo directed against

⁴⁴ *The Growth Report*, 2. Emphasis added.

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Vietnam constituted an insurmountable obstacle to realizing its economic and geopolitical goals. Vietnam's aggressive efforts to re-establish diplomatic relations with Washington were motivated not simply or even primarily by a desire to improve political and economic ties with its former adversary. They were also determined to re-enter the world economic system, join multilateral development agencies such as the World Bank and the Asian Development Bank, and attract foreign investment, in the first instance from wealthy Asian countries including Japan, South Korea, Taiwan, and Singapore.⁴⁵

Second, the Commission's prioritization of the market allocation of resources should be seen in the context of the Myanmar government's ongoing privatization effort. Building a modern, competent state system will require that the state limit its scope to those activities that it is best-positioned to perform or that other actors are unwilling or unable to carry out. However, if executed improperly, the privatization of state assets can create lasting structural imbalances in an economy. Many Myanmar scholars and businesspeople have expressed alarm at the manner in which privatization is proceeding. A thorough discussion of international experience with privatization is not possible here. However, this report emphasizes the importance of developing a strategic vision to guide the process. Such a vision must be informed by an understanding of what functions should be performed by the state and which should not. It may well make sense to privatize certain types of state assets, such as airlines or companies engaged in manufacturing or processing. However, privatizing essential services such as power delivery, agricultural extension, or the provision of health and education, is a much more complicated matter. Put another way, the state should not expect private firms to implement social policies or that monopolies are desirable without firm regulation.

The disposal of state-owned assets must also be approached with great caution because it is a process that can easily be abused by rent-seeking interests inside and outside the state. The authorities responsible for privatizing assets have an obligation not only to ensure a maximum return to the state, but also to ensure that those who acquire the assets possess the expertise to manage them efficiently. Too often, privatization is an opaque process dominated by privileged insiders. When this happens, assets are rarely disposed of transparently, and much of their value accrues not to the government but to special interests. In short, privatization can hasten the emergence of one of the principal scourges of Southeast Asian economies: the dominance of the economy by powerful interests whose "comparative advantage" lies in their close relationships to the centers of power within the state and their ability to leverage these relationships for material gain. The power of these groups and their ability to bend state power to serve their interests at the expense of the public interest is a primary cause of the relative stagnation of Southeast Asian economies in recent years in comparison with China. It would be a disastrous way to proceed with economic "reform."

⁴⁵ The role that integration has played in lifting Vietnam out of the ranks of the world's poorest nations no doubt partly explains why Vietnamese people have an extremely positive view of globalization. According to a survey of world publics conducted by the Pew Global Attitudes Project, 98 percent of Vietnamese respondents felt that "global trade and business ties were good for their country." See <http://pewglobal.org/2003/09/05/world-publics-approve-increased-international-trade/>.

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The development pathways followed by the 13 countries profiled in the Commission's report were punctuated with setbacks and policy failures. This is to be expected; as the Commission observes, "Governing a growing economy is not a static challenge. It is more akin to a long voyage undertaken with incomplete and sometimes inaccurate charts."⁴⁶ Indeed, the Commission concludes that a willingness to experiment and to discard policies that do not or no longer deliver desired outcomes is important to sustaining high growth. This pragmatic approach to policymaking is rooted in a shared understanding of the institutional structure and logic of modern economic systems. In the team's opinion, such a shared vision for the national development project Myanmar seeks to undertake is not yet in evidence. As justification for this frank assessment, the research team notes with concern that of the five key characteristics of successful developing economies listed in Table VI, *none of them are present in Myanmar today*. Although this national development project can be fruitfully informed by the experiences of other countries, it cannot be "imported" from abroad. The team can offer no guidance regarding the nature of the process through which the contours of Myanmar's national project development will emerge. However, the Commission's final report offers a clue:

A country's fortunes depend on stopping bad policies as well as implementing good ones. Fallacies and follies must be identified, criticized, and rejected. Judging by the experiences of the members of the Commission and other leaders, the importance of this function should not be underestimated. Successful countries owe a lot to an environment in which all ideas, good and bad, are exposed to review and vigorous debate.⁴⁷

There is a direct if difficult to quantify link between the health of a country's policy analysis and debate and the quality of the policies it adopts. This has been true in the more successful ASEAN countries including Thailand, Indonesia, and Malaysia. Even authoritarian Vietnam, which views criticism of the Vietnamese Communist Party with great suspicion and hostility, nonetheless welcomes, and indeed encourages, constructive debate and criticism of its development policies. By any measure, the state of policy analysis and debate in Myanmar compares unfavorably with these countries. This situation poses a serious, in the team's view insurmountable, obstacle to Myanmar's development prospects. Greater and more inclusive policy discussion is particularly important; while Myanmar's ministries and departments enjoy the services of many talented individuals (a number of whom the team has had the privilege to confer with and to learn from), in any country much talent also lies outside the ranks of government officials. (This is particularly true of the United States, for example.) To varying degrees, the other Southeast Asian states mentioned here recognize that their credibility, in the eyes of the international community, of investors, and crucially, of their own people, depended on their ability to communicate a strategic vision for their development that is sound and credible. Currently there are far too many unanswered questions regarding the direction of Myanmar policymaking; the hoped-for objectives of the current privatization drive are but one example.

III. Conclusion

⁴⁶ *The Growth Report*, 29.

⁴⁷ *Ibid.* 67.

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The analysis in the preceding sections leads the research team to make the following recommendations. They should be regarded as policy priorities; translating them into actionable policies will require additional analysis, based on reliable data, and careful consideration of comparative experiences. In that regard, these recommendations are to be understood not as a list of concrete solutions, ready for instant implementation. Rather, they reiterate the most important findings of this report and point the way toward addressing these findings. If some points prove unsurprising or even obvious, the intention of this report is not merely to affirm their importance through repetition but to highlight their interrelation with the full range of measures necessary to the revitalization of Myanmar agriculture. Because development is above all else a political—and not a merely technical—process, the research team offers these recommendations while fully understanding that the pace of economic reform will be determined through political processes at the local and national levels.

1. Upgrade the capacity of key organs of the state. A technically competent state apparatus capable of formulating effective policies and regulating a complex, integrated economy is an essential prerequisite for sustained economic and social development. The state must avoid falling under the control of powerful interests that seek to manipulate state power to advance their interests. The experience of other Southeast Asian countries offers a host of cautionary lessons for Myanmar. The need to upgrade the capacity of key ministries is especially urgent; in particular the Central Bank, the Ministry of Finance, and the Ministry of Agriculture and Irrigation will all be called upon to formulate and implement crucially important policies. To do so effectively they will need to invest heavily in upgrading skills and staff competence and professionalism.

2. Build a robust credit system. Part III addresses the urgent need for Myanmar to establish a modern banking system. This report has argued that the state should view this both as a policy priority and an investment opportunity. The government should make an investment and then be able to realize a return on investments in the expansion of the banking system provided that an appropriate incentive system is designed. In particular, the experience of Indonesia suggests that rural banking institutions can generate handsome returns to investors while meeting the needs of customers who in many developing countries are underserved by formal urban-based banks. It also suggests the importance of rural-bank autonomy from the ministry of agriculture and other parts of the government administration.

3. Invest in the rice value chain. Successful agricultural economies invest heavily in agricultural research and disseminate the innovations that this effort generates through professional extension services. While the private sector can contribute to knowledge generation, international experience demonstrates that public institutions will need to assume a leading role in this effort. In Myanmar, the state's once-proud research institutes and extension service have withered away over the past decade or longer, to the point that the farmers, traders, and millers with whom the research team spoke identified a lack of knowledge and information (about seed varieties, techniques, pest management, yield responses to different nutrient and water conditions, etc.) as a problem as urgent as the lack of credit. In this area Myanmar can learn much from its Southeast Asian neighbors, including Vietnam and Thailand. Priority research areas should include sustainable cropping systems, because erratic weather in the Dry Zone has made it especially difficult for farmers to earn a living and this may be a longer term problem, not simply

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a bad run of a few years. In addition, dams upstream could cause problems with river flow in the Delta, especially in the dry season. Unless there is more scientific knowledge about the scope of these sorts of problems and possible responses, it will be increasingly difficult for farming to remain profitable.

4. Develop Myanmar's national economic infrastructure. It may seem obvious and unoriginal to state that Myanmar's infrastructure has suffered from decades of neglect and underinvestment. It may seem equally obvious to point out the crippling negative effects of this neglect of Myanmar's electricity-generating capacity, transport infrastructure, port facilities, and telecommunications on the country's economic competitiveness, including the competitiveness of its rice economy. Others have pointed these problems out before, and even the first-time visitor to Myanmar is quickly made aware of them. The obviousness of this point notwithstanding, it has particular importance in relation to this report and to the perspective that this report asks readers to consider. For nothing that this report recommends, from its urgent suggestions concerning rural poverty to its genuinely hopeful remarks about the very substantial impact on Myanmar agriculture that a relatively simple reform of rural credit markets will have, has any relevance unless it is taken in the context of the need for the Myanmar state to expend resources in the thorough-going development of the country's national economic infrastructure. Better capitalized farmers will never enjoy the fruits of enhanced access to credit with also having access over good roads to markets. The country's poor will not escape poverty for good without access to electricity, to information, and to employment opportunities outside their villages. The national economy cannot be competitive without more efficient ports. This recommendation is thus offered not to repeat the obvious and not to recommend attention to an obviously urgent matter. Rather, this recommendation is offered because, without attention to infrastructure, Myanmar will not be able to benefit from any of the other recommendations made in the report. This stark, direct point must be appreciated by all who read this report. While a fuller treatment of this policy area is well beyond the scope of the current paper, here too the experience of Myanmar's neighbors can offer positive and negative lessons. One such lesson is that the institutional mechanisms by which investment decisions are made is very important. In Myanmar, the central planning approach of the past decade has underinvested in critical areas like electricity, extension services, and transport while tending to emphasize physical accomplishments at the expense of economic efficiency. Even when investments did have promise (and many irrigation systems did), there were often no well-functioning institutional structures to keep the systems maintained properly. As a result, roads with little traffic and irrigation that covers many fewer acres than planned can result, with modest economic benefits.

5. Provide social safety nets for the poor. There is an urgent need for the state to provide assistance to the most vulnerable segments of rural (and urban) society. One priority is to undertake periodic surveys to identify the most vulnerable. This is of high priority and should be instituted immediately. In the short term, interventions might take the form of small (~US\$5,000) village infrastructure projects. Infrastructure projects piloted by IDE/M and others seem to be effective. These projects improve local infrastructure and provide badly needed wage income for landless and land-poor workers and small farmers. For people without access to economically viable landholdings, it will reduce their reliance on high-interest loans for daily food needs. This

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report reiterates the importance of ensuring that, over the longer term, Myanmar's economic policies provide opportunities for the rural poor, many of whom are no longer engaged in owner-cultivator agriculture, to pursue off-farm employment opportunities.

6. Alleviate suffering in the Dry Zone and other distressed areas. Humanitarian conditions in certain parts of the Dry Zone have deteriorated to alarmingly low levels. In particularly hard-hit townships there is a pervasive sense that if the 2010 monsoon crop fails (an increasingly likely possibility given the drought that, as of mid-May, continued to affect the region), many households will be unable to cope. There is an urgent need to install tube wells to ensure access to water for household consumption. In certain instances it may be prudent to initiate feeding programs for children, or at the very least to prepare contingency plans that can be executed in the event that humanitarian conditions deteriorate further. Possible policy responses are discussed in more detail in Part Three, above. This report once more offers the caveat that the team did not visit other regions of Upper Myanmar or the country's western and eastern border areas. However, based on conversations that the team held with local experts and published reports, the research team believes that some of its analysis and recommended interventions regarding the Dry Zone apply elsewhere.

APPENDIX A | Nutrition Survey: Additional Analysis and Background

This appendix offers additional analysis of the child nutrition survey undertaken by IDE/M in select townships in Ayeyarwady Division and the Dry Zone and described in Part Three above. Selected townships included: Bogale, Dedaye, Labutta, Mawkyun, Pyapon (Ayeyarwady); and Myaing, Myin Chan, Nwa Tho Gyi, Pakokku, Taung Tha, and Yesagyo (Magway). These were townships where IDE/M was undertaking cash-for-work, community infrastructure projects.

The weights of children, as determined by middle-upper arm circumference (MUAC), are normally distributed in a healthy population. That means the distribution follows a bell shaped curve. The median (which is also the mean or average) is the most observed or most likely value and 68.2 percent of all observations lie within +/- one standard deviation (SD) from the median in a well-fed cohort. Another 27.2 percent of observations lie within one and two standard deviations (positive and negative) from the median. If a child has an arm circumference more than 2 standard deviations below the median, then it is nearly 98 percent likely that the child is too thin. In any population, due to genetics, some people will be thinner or heavier than others, even if properly fed.⁴⁸ This pattern is found throughout the world.

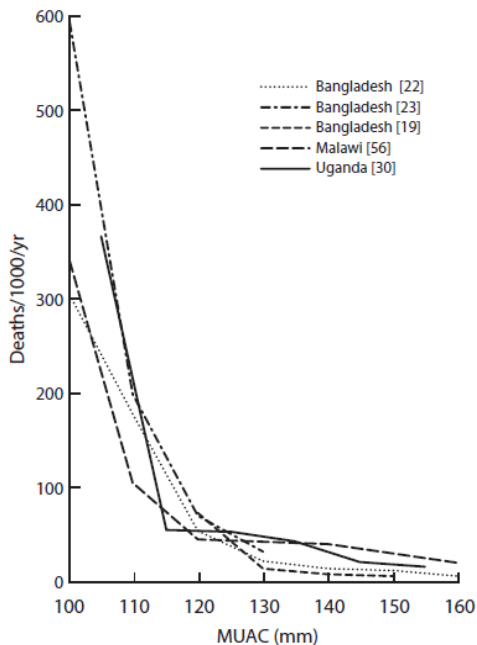
The measurements made in these townships found only 3 percent of 1820 children, or 57, had an arm circumference above the normal median, when there would be half of all children, or 910, that heavy in a well-fed population. On the other hand, 77 percent had a measurement of -1 SD or less when only 16 percent would be expected if well-fed out of a sample. In other words, over 60 percent of the sample was well below average and their expected weights. This does not mean they were in danger of dying, though mortality risk rises gradually up to about -2 to -3 standard deviations and then rises rapidly, a pattern illustrated in Figure I, below.⁴⁹

⁴⁸ The arm circumference and weight respond mainly to adequate caloric intake – basically enough rice in the current context. A “properly fed” child also should eat a varied diet with sufficient protein, vitamins and minerals. These help boost the immune system and ensure better health and normal growth.

⁴⁹Mark Myatt, Tanya Khara and Steve Collins, “A review of methods to detect cases of severely malnourished children in the community for their admission into community-based therapeutic care programs” in *Food and Nutrition Bulletin*, volume 27, no. 3, 2006 available at: http://www.fantaproject.org/downloads/pdfs/FNB_27_3_2006_b.pdf

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Figure I. Observed relationship between (MUAC) and child mortality in five studies⁵⁰



Notice from the table below that 450 children (instead of an expected norm of 40) have an arm circumference two standard deviations or more below the median. This means that approximately one in four children surveyed is approaching the range in which mortality risk begins to increase. Since these children are exposed to this risk for five years, a seemingly low risk (such as 30/1000 per year) rises to a 15 percent chance of mortality over five years. This high degree of significantly underweight children is one factor that contributes to the relatively high under-five mortality rate observed in Myanmar.

But even those staying alive have problems from being well below their healthy weight. Normally, children who are not well fed have several problems. Their immune systems do not function as well as those in well-fed children. As a result, they get sick more often or have longer periods of illness. They start school later, repeat grades more and do not finish so many grades. They end up being smaller, sicker, less productive and poorer as adults than if they had been well fed as children. Their own children will also suffer from the disadvantages of growing up in a family with less income, more disease and modest education. This might apply to a substantial fraction of children in Myanmar, if the small and atypical sample used in this note is at all suggestive of the larger picture.

To clarify the survey findings with the expected distribution in any well-fed population, the table below shows the “expected well-fed” and “actual” arm circumferences of 1820 children from 6 months to 5 years of age.

⁵⁰ Reproduced from Myat, et. al. Op cit.

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Table I. Expected versus actual MUAC

	Expected if Well-Fed	Observed in 11 Township Sample	Difference
+2 or more standard deviations	40	3	-37
+1-1.99 standard deviations (SD)	248	9	-239
Median to +0.999 SD	621	45	-576
-0.999 SD to median	621	359	-262
-1.99 to -1 SD	24	954	+706
-2SD or more (worse)	40	450	+410

It is at least interesting to compare this fragmentary sample with the results of the Bangladesh's 2005 *Child and Mother Nutrition Survey*.⁵¹ The distribution of MUAC measurements for one to five year olds is virtually identical to that of the eleven township sample. The table below follows the Bangladesh grouping of having all children appearing from plus to minus one standard deviation together. Even so, the percentage distribution is very similar, as shown in Table 2.

Table 2. MUAC Distribution in Myanmar and Bangladesh

	+1 SD or more	+1 to -1 SD	-1 to -2 SD	-2 SD or worse
Myanmar (11 townships)	0.70%	22.20%	52.40%	24.70%
Bangladesh – 2005	0.40%	21.10%	51.10%	27.40%

According to official data, in Bangladesh 40 percent of all under-five children are underweight and 46 percent are stunted. By contrast, official data for Myanmar report that only 30 percent of under-five children are underweight and 40 percent are stunted. If the eleven township sample were indicative of a broader reality, these differences would be hard to reconcile, since the MUAC measurements should be broadly in line with other nutrition measurements. Indeed, Bangladesh has total food intake of less than 2300 calories per capita per day.⁵² (This is yet one more reason to believe that rice consumption alone in Myanmar cannot be 2900-3000 calories per day per person as official data indicate.) If indeed, Myanmar and Bangladesh are similar, this would imply much higher levels of poverty and malnutrition than commonly reported in official data, such as the 2004 survey used as a basis for poverty incidence in this paper.

This fragmentary sample suggests that a full survey is needed. If this sample is indicative of a wider reality, it would suggest that growth is substantially retarded in about half of under-five children. If such a situation were found, it would suggest a need to implement further food security steps. These include a wide array of interventions including clean water, maternal education and nutrition programs. But, of course, higher and more stable rural incomes would be a good place to start.

⁵¹ It can be found at: http://www.unicef.org/bangladesh/Child_and_Mother_Nutrition_Survey.pdf

⁵² To be clear, the 2300 calorie per capita per day figure is total calories divided by total population and does not apply only to under-five year old children.

APPENDIX B | Estimating Revenue from Natural Gas Production

Myanmar is now exporting gas to Thailand and earns about \$2.5 billion a year from it in gross export revenues. In 2013 it will also export gas to China and the physical quantity of gas is reported to be 12 billion cubic meters a year equivalent to 425 million thousand cubic feet.

The export price of the gas going to China can be assumed to be similar to the Thai gas price, which is \$6-8 per million BTU or thousand cubic feet (tcf).⁵³ In 2007, exports of gas to Thailand were worth \$2.5 billion, and there were 346 million tcf. The price was thus \$7.20 per tcf.⁵⁴ That should produce about \$3 billion a year worth of gas exports to China in addition to the \$2.5 billion to Thailand. (This assumes domestic production can also increase enough to take care of rising domestic demand.)

However, there are costs to producing this gas and those are paid to the producing companies. In India, an offshore field reported gas production costs of \$3 per million BTU in 2009.⁵⁵ The terms of the production sharing contracts in 2000 specified that after costs and royalties were covered, the gas producer would take 20 percent of production from 301 to 600 million cubic feet a day, with 30 percent for volumes below that and 10-15 percent for volumes above 600 million cubic feet a day. If Indian and Myanmar offshore gas costs are similar, then Myanmar should receive about 75 percent of any price difference above \$3 per tcf.⁵⁶ Myanmar's share of the surplus would be \$3 per tcf or over \$1 billion a year just for the Thai gas exports at recent prices. China, under similar terms, should add \$1.28 billion more in two years. Of course, the team does not know the exact terms for the Chinese gas exports, but global energy prices have risen since 2000 and the position of resource owners has improved. The terms for newer production sharing should, if anything, be better than in 2000. If energy prices fell sharply, of course less revenue would be forthcoming.

This estimate explicitly omits any transit fees for oil or gas. The pipeline runs about 800 km through Myanmar and it is normal to collect transit fees. (Transit fees could be partly given to the state or township through which the pipeline runs – a good way to ensure local support.)⁵⁷ Transit fees in the Ukraine which has an 1100 km of Russian-built pipeline are five cents per tcf per 100 km for gas and \$1.20 per barrel for oil for the entire country. If there are 800 km in Myanmar's pipelines to China and 425 million tcf a year being transported, that would produce income of \$170 million a year in gas transit fees and \$100 million a year in transit fees for 12 million metric tons (87.6 million bbl.) a year of crude oil – assuming that Myanmar negotiated similar terms as Ukraine did with Russia. (Transit fees to Thailand would be much lower due to the short distances involved.)

⁵³ Roughly speaking 1,000 cubic feet of gas provides an amount of heat equal to 1 million BTU, or British Thermal Units. There are 35.2 cubic feet in a cubic meter.

⁵⁴ It is possible to compare the heat value of 1000 cubic feet of gas (= 1 million BTU) with a barrel of oil which has 5.8 million BTU. At \$7.22 per tcf, the "per barrel" price of gas is \$42 per barrel equivalent.

⁵⁵ <http://business.rediff.com/report/2009/jun/23/reliance-gas-production-cost.htm>

⁵⁶ See: <http://www.mondaq.com/article.asp?articleid=8531>.

⁵⁷ Since fuel to Yunnan has to travel some distance from China's coast, the cost of these transit fees should be added to the wellhead cost of gas or import cost of crude oil. These pipelines are the cheapest way for gas or oil to reach the interior of China and it is normal and business-like to charge for transit.

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There is a growing amount of natural gas being consumed within Myanmar and that gas could be sold on similar terms as the exported gas or only a bit less. This would add to the amount of taxes and royalties being earned and increase resources beyond those calculated here. In 2006, domestic natural gas consumption was 126 million tcf and this is projected triple to nearly 400 million tcf in the coming years. At \$1.50 net taxes per tcf – half of the export revenue – that would add \$600 million. Overall, it is not far off to expect more than \$3 billion a year in net revenues to the government once full production is reached after 2012. The *current* earnings should be over \$1 billion a year from the Thai gas and additional amounts from domestic gas.⁵⁸

While the terms of various hydroelectric projects are not fully known, it is also likely that the government will be getting either electricity (which can be sold) or money in return for providing sites for foreign invested hydroelectric projects. This will add tens of millions of dollars a year per project and will further augment public funds that could be used for rural development.

The purpose of these calculations is to check if there is any “fiscal space” for investing in rural infrastructure and services. Given that foreign exchange reserves have jumped at a rate of over \$1 billion a year recently⁵⁹ and this is the same amount of net gas revenues now coming in each year and is likely to more than double soon, there does appear to be sufficient funds in both a stock and a flow sense to invest more in agriculture and associated infrastructure. The foreign exchange reserve data are relevant because if reserves were lent out on commercial terms, they would improve rice and pulse production and exports and give the authorities a higher return than rich country debt or bank accounts.

⁵⁸ Natural gas resources are transferred to the budget at an exchange rate of about 6 kyat per US dollar. Utilizing a market exchange rate would allow these revenues to fully flow through the budget in a more transparent way. At present, over 99 percent of gas revenues do not pass through the budget.

⁵⁹ See discussion paper #225 of the Japan External Trade Organization’s Institute of Developing Economies by Koji Kubo, “Natural Gas Export Revenue, Fiscal Balance and Inflation in Myanmar,” p. 17 (from IMF sources). Available at <http://www.ide.go.jp/English/Publish/Download/Dp/pdf/225.pdf>. These data are also available in Stuart Larkin’s and U San Thein’s paper, “Trade and Exchange Rate Policies to Develop Agriculture” prepared for IDE in April/May 2010.

APPENDIX C | Financial Development for Rural Areas

Currently, the availability of credit in rural areas is extremely limited. Private commercial banks are hampered by interest rate caps and regulatory restrictions from lending. The Myanmar Agriculture and Development Bank lends very small fixed amounts per acre at low to negative real interest rates to a list of farmers and is more of a lending program than a bank in the normal sense. As a result, most farmers receive very little or no formal credit and rely on informal sources that are very expensive for any additional borrowing. Pawn shops start at about 5 percent a month with collateral and money lenders often charge 10 percent a month. Some fertilizer dealers will lend for less (often 4-6 percent a month) but on the whole, credit is expensive and difficult to get in adequate amounts.

Thirty-one new agricultural development companies introduced lending at 2 percent a month, but in small total amounts (though more per farmer or per acre than the MADB) and only to very reliable farmers. These companies cannot take deposits and would have trouble scaling up to cover a majority of those deserving credit, even if they were allowed to lend at 3 percent per month.

The question of scale is an important one. If farm credit needs averaged \$100 per acre for rice (and it is much higher in other ASEAN economies), then \$1-2 billion in credit would be needed. The entire private commercial banking sector has only about \$500 million dollars in loans, and is currently set up for urban rather than rural lending. So, while some private banks might gradually develop rural lending if regulatory and interest barriers were lowered, they could not quickly step in to fill the void.

The question facing policy makers is how to proceed if the goal is to introduce adequate and sustainable credit and other financial services to rural areas at a reasonably rapid pace. The answer must include existing government banks. There is no doubt that these banks could lend a great deal more very quickly, but that is not the problem. The problem is to turn them into real banks that make risk assessments so that the repayment rate on loans is high. In this regard, it is not at all clear how useful the private commercial banks would be. To the extent that they lend at all, they often lend for real estate or to businesses related to a conglomerate which owns the bank. Sometimes, they will lend for trade to well known associates. Many basically transfer money and foreign exchange rather than make many loans due to severe restrictions on deposits. None of these skills is useful in lending to farmers. Privatizing MADB by handing it over to an existing private commercial bank is not likely to be successful.

The aforementioned case of Bank Rakyat Indonesia (BRI) is perhaps more relevant. It chose a strong management team and created profit centers at each rural lending unit. Fifteen thousand rural employees were retrained, given salaries equivalent to the private sector and paid bonuses if they made a profit in their village unit. The BRI was completely severed from the government and Ministry of Agriculture, even though it remained state-owned. Indeed, persuading BRI to invest and co-manage MADB would be one possible strategy.⁶⁰ If it were successful, a stock offering to the general public would privatize the bank, rather than handing it to one or a few well-connected individuals who have little relevant experience.

⁶⁰ Even if such an alliance were of interest to BRI, it would almost certainly require a listing of sanctions against Myanmar to implement.

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This is not to suggest that private commercial banks should not be encouraged to lend and expand into rural areas. They should be allowed to lend at higher rates, take deposits and pay deposit rates higher than the inflation rate, and generally be less controlled. Rules relating to land and collateral will need to be examined. Their initial lending is likely to be to traders, millers and input providers and perhaps a few large farmers. But gradually, if they expand their branches and provide more training for employees, they could become a factor in direct lending to most farmers. However, these steps will take time and not all banks will decide to compete.

The best way for MADB to increase lending is to take a cautious approach. The base lending and interest rate scheme now in place could be continued, if that were thought necessary. However, farmers that seem especially sound could be allowed to borrow more per acre at higher (3 percent a month or so) interest rates. For example, local bank officers could be encouraged to consult with local traders, millers and other village leaders to gain insight into potential risks. Initially higher lending might be capped at (say) \$40 an acre above the \$20 per acre level (as of May 2010) universally lent at a low interest rate, with higher lending to follow as loans are repaid. The “extra” amount would have to pay a higher interest rate.⁶¹ This approach would balance the need for fairly rapid expansion with a need for prudence. (A pilot scheme in one state or division would be another way to control risk, at the expense of a longer lag before adequate credit flowed to deserving farmers.) The government might have to deposit, at market interest rates, amounts equal to the increase in lending. (This could also be done for private banks that expanded their rural lending.) However, as the rural economy expanded, it is likely that deposits in rural branches would grow rapidly and the need for government deposits to fund loans should diminish. Again, the point of this reform would not be to extend credit to every farmer. It would be to create a viable rural financial system that extended commercial and sustainable credit in adequate amounts to those able to repay.

One problem that all rural banks have is that sometimes there is a failure of the harvest that is in no way attributable to the skills, character, or effort of the farmer. There are several ways to deal with this. The most obvious is to charge enough interest to cover these types of losses. A second is to curtail lending in areas that are especially difficult with respect to these risks. A third is to lend for a variety of activities that may include but not be confined to agriculture. Deciding how to lend again to a borrower who suffered a failed crop and defaulted on his or her loan is part of management. Extending the time period for repayment, forgiving some interest, and reducing the new amount loaned are all possible steps without completely cutting the borrower off. Of course, if there is a capacity to repay and the issue is unwillingness to repay, that calls for court action or at least a complete cessation of lending.

More generally, there is a need to revamp the MADB into a “real” bank that is able to attract deposits and make commercial loans at interest rates that will cover all costs and make a modest profit. This will entail separating it from the Ministry of Agriculture, paying its employees a realistic wage well above that of civil servants, deregulating interest rates and other rules that prevent deposit taking, and allowing the use of land as collateral. Different management, accounting and training would be needed for bank staff. It remains an open question if the MADB should partner with a foreign bank, NGO, or domestic bank or try to go it alone.

⁶¹ We are not prepared to make a political judgment about the need to continue the current universal 20,000 kyat per acre lending program, which lends at an interest rate of about 1 per month. It would be administratively cleaner to only lend at a higher interest rate and only to good credit risks. It is hard to mix “social” and commercial loans in the same bank. Over time, the “social” program could be discontinued or transferred to another entity.

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Expanding the credit available is necessary and time is pressing. However, a multi-pronged approach that encourages various actors and that does not abandon prudence, even while committing government deposits as needed to those willing to lend with some of their own capital at risk, is the most likely way to provide financial services responsibly and sustainably.

APPENDIX D | Export Policy Options

Regarding the rice export/domestic pricing issue, there is a significant problem with sporadic export controls or erratic issuance (and revocation) of export quotas. The uncertainty of policy influences the reputation of Myanmar's reliability as a rice supplier. This factor leads to lower prices for the country's rice, even for rice of the same quality, than for that from other exporters. It transfers resources from Myanmar to its customers or intermediate traders who can absorb the risk due to the country's erratic exports. A better policy would increase the reliability of Myanmar as a rice exporter and thus allow it to realize rice export prices closer to Thailand and Vietnam. One such policy could be a variable export tax. An export tax drives a wedge between domestic and export prices. For example, if the world price of Myanmar's rice exports rose to \$500 per ton (it was \$370 in March), but there were a \$100 per ton export tax, the domestic price would not rise above \$400 per ton. A quarterly announcement of the export tax would allow exporters to make firm contracts and calculate profitability with much less uncertainty. Adjusting the tax quarterly would keep domestic rice prices within a reasonable range if world rice prices begin to fluctuate dramatically. If the world rice price fell to a very low level, the export tax could be set at zero. This approach would to be sure result in some fluctuation in tax rates, but that outcome remains preferable to the current situation. Among alternatives, a rice rationing system would be unwieldy, administratively complex, expensive and inappropriate as a means to mitigate the effects of erratic rice prices. In addition, the proceeds of an export tax could be loaned to rice producers at a rate high enough to cover the cost of lending. (See the discussion of interest rates in the previous section of the paper.) As the burden of such a tax would fall above all on rice producers, this policy choice would be justified on equity grounds alone. Equally important, it could help underwrite the expansion of farm credit fundamental to the growth and prosperity of Myanmar agriculture.

APPENDIX E |Background, Methodology, and Field Visits

In January 2009, a small team from Harvard University assessed the agricultural situation in Myanmar, with a focus on paddy production and humanitarian issues. This report, which included interviews with many groups of farmers in villages from the Ayeyarwady Delta to north of Mandalay made several points about the economy:

1. Actual rice production was much lower than official data suggested.
2. Interest rates were very high and credit difficult to get even at rates as high as 10 percent a month. Almost all households were heavily indebted.
3. There was a danger that rice output would suffer due to lingering Nargis damage and due to the credit problems.
4. The price of paddy paid to farmers was too low and lower than in comparable nations.
5. Landless or land-poor households—half of all families—and smaller farmers lacked paid employment during several months of the year. Rural infrastructure projects could provide such work and also provide needed infrastructure in the form of roads, irrigation, small bridges, etc.
6. Food security was not just a matter of rice being available for sale in markets, but also a matter of people being able to earn money to purchase rice.

The report was submitted to IDE/Myanmar a non-governmental organization engaged in improving the productivity and incomes of poor, rural families in Myanmar. The report was also disseminated more widely.

During 1-18 March 2010, a team composed of the researchers responsible for the 2009 Harvard report on Myanmar agriculture plus one additional specialist, visited Myanmar at the request of IDE/Myanmar. IDE/M sought an assessment of changes in the country's agricultural economy during 2009 and early 2010. The team's program of field visits took it to a wide range of the country's rice-growing areas. Its members used these field visits as a chance to gain intense exposure to some of the realities of Myanmar's rice economy and to a range of the key participants in that economy—farmers, traders, millers, and business people. It also met with and learned from the perspectives of IDE/M field staff. Meetings and discussions with participants in Myanmar's rice economy complemented the team's meeting and discussions in Yangon with local experts on Myanmar agricultural and development issues.

Throughout its visit and during the preparation of this report, the team has sought to understand what it learned during its March 2010 visit through the prism of its members' decades of study of issues relating to agriculture, development, and economic policy in Indonesia, Vietnam, and Thailand. Armed with that perspective, the team formed very strong impressions of the state of Myanmar's agricultural economy during its field visits. And it is worth reviewing the itineraries of those visits, the research approach taken during those visits, and the broad understanding of rice-growing areas of lowland Myanmar which team members gained.

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As described in the introduction, the team's five field trips took it to a number of townships in Ayeyarwady Division in the Ayeyarwady River Delta, to Bago Division north of Yangon, and to Sagaing and Mandalay Divisions in the Dry Zone of Upper Myanmar. In each locality visited the team met with and interviewed a broad spectrum of participants in the rice economy. In its discussions with millers, traders, and others associated with the MRIA and with specialized companies; with IDE field staff; and with farmers, the research team focused above all on the rice marketing chain, on rice yields and prices, on the availability and cost of rural credit, on food security and indebtedness, on water scarcity and rural welfare. In essence, it asked the same questions of hundreds of people, and what it heard in response informs all of the findings reported and suggestions offered in the report. What the team saw and heard during its five field visits—when filtered through the team member's experience of and familiarity with other parts of rural Southeast Asia and with the farm sector in many of Myanmar's ASEAN neighbors—has also informed this report in less specific ways.

The team made visits to Nargis- and non-Nargis-affected areas of the Ayeyarwady Delta, to a range of locations in the Dry Zone, and to Pyay and Kawa; its itinerary is detailed in Table I, below. During these field visits, the team gathered groups of villagers for group interviews and discussions, followed by break-out discussions with different sub-groups and visits to local shops, rice mills, schools, homes and clinics. In drafting this report, the team gathered comparative data from Myanmar's Southeast Asian neighbors to frame its analysis.

The newly formed Myanmar Rice Industry Association was extremely helpful in arranging meetings with rice millers and traders, and their insights were crucial in complementing the information from farmers. Meetings with other participants in Myanmar's rice economy also proved very valuable. The IDE field staff covered a much larger set of townships than it was possible for the team to visit and allowed the team to understand whether the areas that it visited were representative of the overall situation of Myanmar's agricultural economy in early 2010.

Table I.

List of Field Visits
<p><i>Field Visit I, Ayeyarwady Division, 4-5 March 2010</i> --visited Nyaungdone, Danu Phyu, Myaungmya, Kangyidaung townships --held meetings with farmers, representatives of/investors in two specialized companies, local rice sector representatives, and IDE field staff</p>
<p><i>Field Visit II, East Bago Division, 7 March 2010</i> --visited Kawa township --held meetings with representatives of/investors in one specialized company, local rice sector representatives, and with farmers and IDE field staff</p>
<p><i>Field Visit III, Ayeyarwady Division, 8-9 March 2010</i> --visited Nargis-affected areas of the Delta --visited Khungyangone, Dedaye, Pyapone, and Kyaiklat townships --held meetings with representatives of/investors in two specialized companies, local rice sector representatives, with Pyoe Pin staff, and with farmers and IDE field staff</p>
<p><i>Field Visit IV, Mandalay and Sagaing Divisions, 10-12 March 2010</i> --visited Sint Kaing, Kyaukse, Myit Tha, Wundwin, Ma Laing, Taungtha, Natogyi, Wet Let, Shew Bo townships --held meetings with farmers in a very large number of villages, millers operating at a range of scales and local rice sector representatives, and with IDE field staff from throughout the Dry Zone (who travelled to Mandalay to meet with the team)</p>
<p><i>Field Visit V, West Bago Division, 14-15 March 2010</i> --visited Letpadan, Thegone, and Pyay townships --held meetings with local rice sector representatives, with IDE field staff, and with farmers</p>