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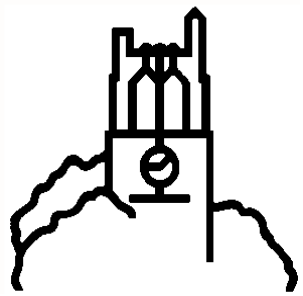
Agribusiness Models for Inclusive Growth in Myanmar: Diagnosis and Ways Forward

by

Derek Byerlee, Dolly Kyaw, U San Thein, and L Seng Kham



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EXECUTIVE SUMMARY

Introduction

This study is being undertaken by Michigan State University, (MSU) and the Myanmar Development Resources Institute- Centre for Economic and Social Development (MDRI-CESD) with support from USAID to identify potential agribusiness models for enhancing inclusive growth particularly through partnerships with small and medium-scale farmers (SMFs). Successful development experiences in Asia and elsewhere have amply demonstrated the greater efficiency and equity achieved with a growth strategy based on SMFs. Therefore, an important premise of this report is that Myanmar needs to build on its most important asset base of its millions of SMFs to jump start economic growth, increase food security, capture export markets, and reduce poverty. The challenge for Myanmar is how to tap the assets of agribusiness in terms of access to technology, capital, and markets to complement the assets of SMFs in terms of their labor, land, entrepreneurship, and local knowledge.

Private investment by agribusiness, both small and medium enterprises (SMEs) and larger agribusiness companies (ABCs) is critical to the realization of these goals (for definitions of SMEs and ABCs see Box S.1). However, how that investment translates into jobs and poverty reduction matters greatly to future prosperity and peace. Myanmar is at a crossroad in terms of developing an inclusive agribusiness strategy. The agricultural sector is characterized by already high land inequality and landlessness, and low productivity of most SMFs. Meanwhile a growing share of land estimated at over nearly 2 M hectares (ha) has been allocated to large land concessions with little evidence of growth impacts and significant evidence of social and environmental risks. Viable alternative business models are available to tap agribusiness for wider economic and social benefits.

Box S.1. Key Definitions

Agriculture is defined to include crop and livestock production. The emphasis in this report is on field crops, perennial crops, and intensive livestock.

Agribusiness denotes organized firms—from small and medium enterprises to multinational corporations—involved in input supply or in downstream transformation. It includes commercial agriculture that involves some transformation activities (even if they are basic). In this report, we do not consider second stage transformation or the retail end of the value chain.

Small and medium enterprises (SMEs) are defined according to the Government of Myanmar as nonfarm enterprises with less than 100 employees.

Agribusiness companies (ABCs) are formally incorporated firms that are generally larger than SMEs and that are involved in input supply, agro-processing, wholesale marketing, and logistics. ABCs are sometimes vertically integrated into agricultural production.

Small and medium farmers (SMFs) are market-oriented farmers that sell the bulk of their produce. Broadly, we consider this group fits into the 2-20 ha range of land holdings. However, for horticulture and intensive livestock many farmers with less than 2 ha will be market-oriented. On the other hand, in the dry zone, more than 2 ha are likely to be required to be viable commercial farmers.

Source: Authors.

Box S.2. Sources for the Report

This report draws on a diversity of sources, including:

1. Review of published papers and reports from Myanmar and the region including the gray literature assembled through email contacts,
2. Review of secondary data, recognizing serious weaknesses in Myanmar statistics[1],
3. Review of development experiences in Thailand (focus on SMFs) and Cambodia (focus on land concessions),
4. Meetings with Myanmar stakeholders, including policy makers, researchers and nongovernmental organizations,
5. Field visit to five regions/states and meetings with companies, farmers and local stakeholders,
6. Preparation of a draft report and PowerPoint, synthesizing the above,
7. Discussion of the preliminary findings with key stakeholders in seminars in Yangon and Nay Pyi Taw,
8. Circulation of full report for comments, and
9. Revision and finalization of the report.

The objective of this study is to provide strategic policy priorities for attracting agribusiness investments and managing land resources for inclusive and sustainable development by addressing two questions:

1. How to attract agribusiness investments to accelerate agricultural growth and competitiveness through business models that put SMFs at the center of the growth strategy and ensure both efficiency and equity?
2. How to identify when large-scale business models may be appropriate and how land may be allocated to them in ways that are economically efficient, and socially and environmentally sustainable?

A variety of methods was employed to achieve this objective (Box S.2). The diagnosis was centered on key value chains that had not been addressed in the previous MSU-MDRI reports. We also reviewed the experiences of Thailand in successfully integrating agribusiness investments with poverty reduction through inclusive development, and Cambodia and the lessons from a strategy based on large land concessions.

The report is divided into three parts: (1) Background on agribusiness in Myanmar, (2) Analysis of business models in selected value chains, and (3) Priorities for developing more efficient and inclusive business models.

Background to Agribusiness Investment in Myanmar

Market Outlook: The market outlook for agribusiness in Myanmar is strong. Economic growth is accelerating and rising incomes and urbanization provide major potential for growth of the food sector, especially associated processing and marketing logistics for high value products. At the same time, regional markets are being opened by new trade agreements, such as the Association of Southeast Asian Nations (ASEAN), and a host of infrastructural corridors that will connect Myanmar's hinterland to fast growing economies over its borders. Finally, global commodity markets have experienced a decade of rising prices and although prices have declined slightly in 2013, the general outlook for agricultural exports remains strong.

[1] See Haggblade et al. (2013) for a review of the quality of agricultural statistics.

Investment Climate: A poor investment climate has constrained agribusiness development in Myanmar, from SMEs to large domestic companies and foreign investors. Despite the abysmally low ranking of Myanmar on the World Bank's Doing Business Indicators, there are positive signs of increased investment and cross-border trade. The government of Myanmar (GoM) has also embarked on an ambitious program of policy reform that has liberalized most markets and opened space for the private sector, both domestic and foreign companies.

Resource Base: On the supply side, Myanmar's agricultural sector is well placed to capture these market opportunities. Relative to its neighbors, it has abundant land and water resources, diverse agro-climatic conditions, and low wages. Both national and international data indicate that Myanmar has land resources that could be brought into cultivation. However, it is likely that much of the potential land is utilized in some way for long fallow cropping systems, livestock grazing, and non-timber forest products, while other land is covered by forests of high conservation value. Thus, actual available land is considerably less than potential.

Land Concessions: From 1991, the granting of large land concessions to investors at cheap prices has been used as an incentive for companies to invest in modern large-scale farming and plantations. By May 2013, based on 'official statistics' we estimate that a total of 377 domestic companies had been allocated 0.94 M ha (2.3 million acres) of vacant, fallow, and virgin (VFV) land (with an average size per concession of 2,497 ha), 822 companies or individuals had been allocated a total of 0.3 M ha (0.8 million acres) of forest land (outside of Mon State where SMFs predominate in land grants), in addition to 0.6 M ha of deep-water land allocated in the 1990s and mostly now abandoned. Although nearly all these grants were for nominally domestic companies, at least three foreign investors had been allocated 0.1 M ha (0.27 million acres). Official Ministry of Agriculture and Irrigation (MOAI) data indicate that the area of VFV land under concessions increased by at least 0.2 M ha from 2010 to 2013. By far the largest areas have been allocated to rubber, oil palm, rice, and jatropha, followed by rice, sugarcane, and cassava.

Many problems associated with the concessions have been substantially documented, especially high social costs in areas of shifting cultivation in the north (taungya system) where farmers do not have secure rights to their land and many concessions encroached on their fallow land, and high environmental costs where concessions overlap forests of high conservation value, especially the oil palm concessions in the south. Despite the many layers of scrutiny, decision-making is not transparent since there is no mechanism in the process for open publication of applications for concessions or for consultation with stakeholders, especially at the local level.

In addition, few concessions are achieving their intended purpose of developing *modern agriculture*. Despite the agreed development schedule, most concessions have made little progress in implementing their development plans. Only 24% of the VFV concessions and 27% of the forestland concessions have been developed or planted, although most were granted over five years ago and should be fully developed according to the rules for concession grants. Finally, the GoM although monitoring progress has not followed its own rules that would require cancellation of nonperforming concessions, or trimming concessions above the allowable maximum per company.

Business Models in Selected Value Chains

Seven value chains were selected to illustrate different business models and diagnose their constraints and opportunities for future development, based on:

- those not considered in the first MSU-MDRI report;
- those that illustrate a range of business models including value chains that are the focus of large land concessions;
- those with products with strong future market opportunities; and
- those visited in the field.

This led to a review of four industrial crops (rubber, oil palm, sugarcane, and cassava), two food staples (maize and sesame) and one livestock sector (poultry). These reviews focused on existing business models and their constraints as well as opportunities for enhancing performance of the value chain. The diagnosis, based on interviews with key stakeholders in the value chain and recent research studies, is preliminary and needs to be confirmed by more in-depth studies.

Table S.1. Typology of Business Models

Model	Agribusiness investments provide:	Small and medium farmers may gain from:
Independent SMFs in spot markets		
Upstream support	Input companies working with SME input suppliers to provide financing and advisory services	Upgrading inputs and technical knowledge by working with input suppliers
Downstream support	Downstream investment in processing and market infrastructure provides new markets.	Improved market prices, diversifying to new products, and/or access warehouse financing
Coordination by value chain actors		
	Participate in value chain roundtables or innovation platforms to coordinate actions to upgrade value chains	Improved productivity and better prices through reduced transactions costs in value chains and higher quality outputs.
Contract farming		
Price contract	Guarantee price for specified quality and specified time	Reduced price risks and possibly higher prices depending on bargaining power
Resource provision	Provision of inputs, cash loans and advisory services often in partnership with bank	Access to working capital and technical advice
Collective action by SMFs		
	Cooperative, farmer organization or private-public commodity board provides advisory services, R&D, and/or processing and marketing services	Organized SMFs pay member fee or output cess in return for services.
Upstream integration by ABC		
	Undertakes production within a vertically integrated system	May include outgrowers or other community equity arrangements

Source: Adapted from Byerlee and Haggblade 2013.

The diagnosis of the seven value chains illustrated a range of business models being employed in Myanmar (Table S.1. above).While each value chain has unique constraints and opportunities, common and well known cross-cutting constraints emerge for all or nearly all value chains—especially access to finance, electricity supply (for processing) and high transport costs. These affect large agribusiness companies as well as SMEs and SMFs.

In addition, for small and medium farmers, lack of strong producer organizations, weak extension, and poor access to technology were common to most chains. In markets with many SMFs and SMEs, lack of value chain coordination and regulation was a major theme resulting in Myanmar's poor reputation for quality in many export markets (e.g., rubber, sesame). Contract farming is in its infancy although good examples are emerging especially in poultry and sugarcane. However, farmers are generally poorly organized to reap potential benefits from these arrangements.

The diagnosis also identified many potential areas of partnership of agribusiness and SMFs (Table S.2.). A comparison of business models in Myanmar with those prevailing in the region reveals many experiences of successful SMF-based value chains that have potential relevance to Myanmar. This is particularly true for the industrial crops, rubber, oil palm, and cassava that have been successfully developed in the region through SMF-based models (Table S.3).

Table S.2. Summary of Business Models in Seven Value Chains (Number of * for Importance)

	Large vertically integrated agribusiness	**Independent SMFs**	**Contract farming in integrated supply chain**	**Independent SMFs linked to privatized inputs (seed, feed)**	**Independent SMFs linked to SMEs in processing**	**Organized SMFs in collective action**
Rubber	**				***	Potential
Oil palm	***		Potential			
Sugarcane	**		**			
Sesame		***	Potential (premium)		**	Potential
Maize			*	***		
Cassava (industrial)	**	*	Potential		Potential	
Poultry			*** (broilers)	** (layers)		

Source: The authors.

Table S.3. Comparison of Business Models in Myanmar with Those in Thailand and Vietnam

	Myanmar	Thailand	Vietnam
Rubber	SMFs and ABCs (dominate in non-traditional areas)	SMFs only	SMFS and large state-owned farms
Oil palm	ABCs	SMFs (80%)	Not grown
Sugarcane	SMFs in contracts with ABCs and vertically integrated ABCs	SMFs in contracts with ABCs	NA
Cassava	Little production but ABCs expanding	SMFs only	SMFs only

Source: The authors.

Toward More Efficient and Inclusive Business Models

Attracting Private Investment: Improving the investment climate is the highest priority in terms of increasing agribusiness investment from SMEs to larger domestic firms to foreign investment. Agro-processing offers excellent prospects to meet rising urban food demands, and because of its high employment multiplier is especially good for inclusive growth. Increasing agricultural productivity in Myanmar and a repositioning of the banking system toward agro-industry are the two highest priorities for this sector.

In successful emerging economies, over 90% of foreign direct investment (FDI) in agriculture and agribusiness is targeted at the food processing and food retail industry. Very little FDI in these countries goes directly into farming. In contrast, the GoM does not allow 100 percent foreign ownership in agricultural inputs and food processing.

The GoM has also launched a series of reforms of investment laws, including a new Foreign Investment Law. Effective implementation will require capacity building at various levels of government to define a strategic vision, and identify investments priorities and responsible investors to match that vision. Implementation will also require transparent processes and matching capacity to evaluate proposals for likely economic, social, and environmental impacts, and to monitor progress on the ground.

Agricultural Inputs–Seed: Agribusiness investment in the seed industry can be a major driver of increased productivity of SMFs. The hybrid seed industry is quickly developing in Myanmar led by maize, with activity also in cotton and vegetables, and future prospects for hybrid rice. However, rice seed production is still dominated by the state resulting in farmers' use of old varieties. Supply of quality planting materials for tree crops such as rubber is severely limited. There is much room for growth of a competitive private seed industry, based around SMEs and FDI in the seed industry. The state can support growth of SME seed companies by providing better access to a steady flow of new varieties and inbreds from strong public breeding programs or from abroad. The state needs to also strengthen the basic regulatory framework by implementing the new seed law.

Contract Farming: High expectations have been put on contract farming. However, contract farming is not a panacea and generally "cannot serve as a strategy for broad-based rural development because it only makes economic sense for certain products in certain markets" (Minot 2007). There are good examples of contract farming in Myanmar such as in poultry and sugarcane and good prospects in other sectors, especially horticulture. There are also good examples of contract farming for branded high quality rice in the region (e.g., Vietnam) that could guide the troubled contract rice farming sector in Myanmar. Contract farming in perennials is more difficult to design, but good examples of outgrower schemes are provided by sugarcane (Thailand) and oil palm (Indonesia). There may also be opportunity for short-term contracts for upgrading existing rubber plantations of SMFs with a focus on quality.

Farmers in Myanmar have little experience with contract farming and much could be done to promote more transparent and equitable contracts. Priorities to improve outcomes with contract farming include strengthening farmer organizations and building their capacity to get the most out of contracts, negotiating tripartite agreements with banks, providing model contracts, and designing dispute resolution mechanisms. There may also be a case for separate legislation on contract farming as in Thailand and Vietnam.

Collective Action by Industry: Given the serious weakness of public sector services in Myanmar, a logical response is for agricultural producers and processors to implement for selected value chains a small industry levy or cess on production or export value to provide new and more stable sources of funding for providing these services. The approach is well established for industrial crops in the region such as rubber, sugarcane, and oil palm and could logically be extended to export crops such as rice and pulses. It has been particularly successful in upgrading rubber value chains for SMFs in Thailand. Various institutional options are available to manage such funds but the initiative should be led and governed by the private sector, but with complementary actions by the public sector, especially to enact collection of the levy.

Managing Large-scale Land Concessions

A Moratorium until Transparent and Participatory Processes Developed: Global experience indicates that the use of large-scale land concessions as an incentive to investors is especially risky–including economic, social, and environmental risks–and Myanmar is no exception. We strongly advocate a freeze on awarding further concessions until a more transparent, equitable process is put in place, and the backlog of conflicts and ambiguities of existing contracts has been cleared.

A first priority should be to encourage investors to focus on enhancing the productivity of existing land users. Such investments can sidestep land transactions, avoid labor recruitment and management issues, and promote wider sharing of benefits while reducing capital and management overheads for investors. One approach already discussed is through contracting and outgrower schemes to supply working capital through value chain financing.

Where projects involve acquisition of land, investment proposals should be screened for responsible practices to maximize opportunities and minimize risks in terms of economic, social, and environmental outcomes. A range of guidelines exist for such screening including the Principles for Responsible Agricultural Investment, the FAO Voluntary Guidelines on Responsible Governance of Tenure of Land, Forests and Fisheries, private standards for commodities such as oil palm and sugarcane, and good practice guides for conducting

Environmental and Social Impact Assessment. All such guidelines outline participatory processes to map existing rights to land in consultation with local communities, conduct upfront assessment of crop suitability and environmental sensitivity, and promote the transfer of land to investors based on existing users' voluntary and informed agreement and fair compensation. All stakeholders need public access to accurate and transparent information on actual transfers, and the technical details of large investments.

Managing Existing Concessions: For existing concessions, the highest priority is to establish a geo-referenced open database that provides details on geographic information system (GIS) coordinates, the investor, targets for total investment and jobs, and the current status in terms of the area sown and infrastructure developed. Laos provides a good example of database constructed through collaboration of the Ministry of Agriculture and development partners. A second priority is to carefully monitor progress of existing concessions and cancel non-performing concessions or concessions that have violated contracts in other ways, using clear rules and processes. An independent and objective commission or panel with adequate resources may be needed to do this outside of partisan politics.

Improving Land Governance: Given ongoing granting of concessions, a major priority is to protect the land rights of traditional land users operating under customary tenure in extensive long fallow farming systems. A promising step is the use of group certification of customary lands that is being piloted by the Land Core Group. Such certification efforts need to be accompanied by capacity building at village level to improve awareness and understanding of land laws and eventually, with secure title, the capacity to negotiate partnerships with investors at fair rents or in joint ventures. Finally given the multiple issues of land governance, Myanmar should consider inviting the Land Governance Assessment Framework (a consortium led by the World Bank) to benchmark the current laws and their implementation against best practice, and also provide a comparator with nearby countries

Allocating VFV Land to the Landless: The coexistence of a large number of landless or near landless with apparently large areas of underutilized land suitable for agriculture provides substantial potential for programs to distribute available VFV land to poor rural families as an alternative to large land concessions to investors. In areas where farmers have already 'encroached' into vacant or forest lands, a systematic program of formal conversion of forest land to titled farmland could be combined with public investment in basic physical and social infrastructure (as in Thailand). Another option is to work with development partners on social land concessions that settle landless and near-landless farmers on available land through participatory planning and approval processes at the community and district levels (e.g., following pilot experience in Cambodia).

Final Word: The report closes with an optimistic outlook for the role of agribusiness investments that support an SMF-based development strategy. Some quick wins may be possible as identified in our value chain analysis (Table S.4.). However, development outcomes will be greatly enhanced by the state adopting the "long-term game" proposed by Haggblade et al. (2013) in the first MSU-MDRI-CESD report. That strategy calls for sharply increased public investment in public goods such as R&D, extension and irrigation, and in supporting marketing and regulatory institutions.

Table S.4. Possible Quick Wins for the Selected Value Chains

Crop	Opportunity	Next steps	Possible study tours
Sesame	Contract farming for high value domestic and foreign markets.	Review market opportunities and quality requirements. Discuss with existing processors and exporters	India or Ethiopia
Maize	Irrigated maize in the cool season in the Ayewaddy Region	Study opportunities for shallow tube well irrigation. Discuss prospects with private seed companies, pump vendors, and banks	Bangladesh
Rubber	Short-term contracts to upgrade existing plantations of SMFs	Review opportunities with potential investors	Thailand
Cassava	Cassava exports to China by SMFs possibly under contract	Request review of opportunities led by CIAT	Vietnam
Sugarcane	Include requirement of SMF outgrowers as part of planned FDI in the industry	Discuss opportunities with foreign investors and Myanmar Investment Commission (MIC)	Thailand

Source: The authors.

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LIST OF ACRONYMS

ABCs	Agribusiness companies
AGPPS	AnGiang Plant Protection Joint Stock Company
ASEAN	Association of Southeast Asian Nations
CANSEA	Network of Conservation Agriculture in Southeast Asia
CCVFV	Central Committee for the Management of Vacant, Fallow, and Virgin Land
CP	Charoen Pokphand Group
CIAT	International Center for Tropical Agriculture
CPO	crude palm oil
CSO	Central Statistical Organization
DICA	Directorate of Investment and Company Administration
DOA	Department of Agriculture
DoICD	Department of Industrial Crops Development
ELCs	Economic Land Concessions
ESIA	environment and social impact assessment
FABs	Farmland Administration Bodies
FAOSTAT	Food and Agricultural Organization Online Statistical Database
FDI	Foreign Direct Investment
FELDA	Federal Land Development Authority
FIRCA	*Fonds Interprofessionnel pour la Recherche et le Conseil Agricoles*
GAEZ	FAO Global Agro-Ecological Zones
GIS	geographic information system
GIZ	*Deutsche Gesellschaft für Internationale Zusammenarbeit* – German Society for International Cooperation
GoM	Government of Myanmar
ha	hectare
HCV	high conservation value
IFC	International Finance Corporation (IFC)
IIASA	International Institute for Applied Systems Analysis (IIASA)
INGOs	International NGOs
kg/capita/yr	kilogram/per capita/per year
MDRI-CESD	Myanmar Development Resources Institute- Centre for Economic and Social Development
MIC	Myanmar Investment Commission
MOAI	Ministry of Agriculture and Irrigation
MoECAF	Ministry of Environmental Conservation and Forestry
MSU	Michigan State University
NGOs	Non-governmental Organizations
ORRAF	Rubber Replanting Aid Fund
RSS	Ribbed Smoked Sheets
SWIA	Sector Wide Impact Assessment
SLRD	Settlement and Land Records Department
SMEs	Small- and medium-sized nonfarm enterprises
SMFs	Market-oriented small- and medium-sized farmers
SLCs	Social Land Concessions
TCD	tons cane per day
t/hr	tons per hour t/hr
TSR	Technically Specified Rubbers
USAID	United States Agency for International Development
VFV/VFVL	Vacant, Fallow and Virgin (land)

1. INTRODUCTION

1.1. Strong Prospects for Agribusiness in Myanmar

Myanmar has strong prospects for growth of agriculture and agribusiness. On the demand side, economic growth is accelerating and rising incomes and urbanization provide major potential for growth of the food sector, including associated processing and marketing logistics. The fastest growth will be in higher value products such as vegetable oils, horticulture, meat, and fish, and processed foods to supply a changing diet due to rising incomes. At the same time, regional markets are being opened by new trade agreements such as ASEAN, and a host of infrastructural corridors connecting Myanmar's hinterland to fast growing economies over its borders (Aung Min 2013). Finally, global agricultural commodity markets have experienced a decade of rising prices and although prices have declined in 2013, the general outlook for exports remains strong (FAO and OECD 2013).

On the supply side, Myanmar's agricultural sector is well placed to capture these market opportunities. Relative to its neighbors, it has abundant land and water resources, diverse agro-climatic conditions, and low wages. The government of Myanmar (GoM) has also embarked on an ambitious program of policy reform that has liberalized most markets and opened space for the private sector, both domestic and foreign.

Private investment by agribusiness, both small and medium enterprises (SMEs) and larger agribusiness companies (ABCs) are critical to the realization of Myanmar's agricultural potential (Box 1). However, how that investment translates into jobs and poverty reduction matters greatly to future prosperity and peace. In particular, the GoM appears to have prioritized large-scale commercial farming and plantations, to the detriment of its millions of market-oriented small and medium-scale farmers (SMFs).

Successful development experiences in Asia and elsewhere have amply demonstrated the success of a growth strategy based on SMFs. There is strong evidence that there are few economies of scale in farming and that in low wage economies SMFs are more efficient than large-scale farmers in producing most agricultural products (Lipton 2009; World Bank 2007a). At the same time, improved productivity that raises the incomes of SMFs and reduces food prices to poor consumers translates into more equitable growth. Nonetheless, we recognize at the outset that only some SMFs will become viable commercial farmers, while many others will have to find alternative pathways out of poverty through participation in rural nonfarm enterprises linked to a dynamic agriculture and through migration to cities. Still it is estimated that some 2.3 million land holdings or about one third of all Myanmar farmers have between 2 and 20 ha of land, a much larger proportion than elsewhere in Asia (Haggblade et al. 2013).

Even as the share of agriculture in GDP declines, the share of agribusiness in GDP will increase for many years to come (World Bank 2007a). The challenge for Myanmar is how to tap the assets of agribusiness in terms of access to technology, capital, and markets to complement the assets of SMFs in terms of their labor, land, entrepreneurship, and local knowledge. Responding to this challenge requires investment to improve the productivity of SMFs and link them to input industries, processors, and markets. In cases where agribusiness companies invest directly in farming, the challenge is to provide good jobs, while securing land rights of SMFs.

Box 1. Key Definitions

Agriculture is defined to include crop and livestock production. The emphasis in this report is on field crops, perennial crops, and intensive livestock.

Agribusiness denotes organized firms—from small and medium enterprises to multinational corporations—involved in input supply or in downstream transformation. It includes commercial agriculture that involves some transformation activities (even if they are basic). In this report, we do not consider second stage transformation or the retail end of the value chain.

Small and medium enterprises (SMEs) are defined according to the Government of Myanmar as nonfarm enterprises with less than 100 employees.

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Small and medium farmers (SMFs) are market-oriented farmers that sell the bulk of their produce. Broadly, we consider this group fits into the 2-20 ha range of land holdings. However, for horticulture and intensive livestock many farmers with less than 2 ha will be market-oriented. On the other hand, in the dry zone, more than 2 ha may be required to be viable commercial farmers.

Source: The authors.

1.2. Myanmar at a Crossroads

Myanmar is at a crossroad in terms of developing an inclusive approach to the development of its farming and agribusiness sectors. The farm sector is characterized by already high land inequality and landlessness, and a growing share of land estimated at nearly 2.0 million ha (3.8 million acres) has been allocated to large land concessions out of a total agricultural land area of 13 M ha (Annex 3). The Ministry of Agriculture and Irrigation (MOAI) has placed high priority on large-scale farming in the belief the "Establishment of modern mechanized farms throughout the country will create opportunities for farmers to increase their productivity" MOAI (2013). However, Myanmar needs to build on its most important asset base of millions of SMFs by increasing their productivity and facilitating their access to growing markets. Market-oriented SMFs will gradually mechanize as wages rise and as the rural labor force eventually declines through outmigration (after 2025).[2] Myanmar is still at an early stage of its structural transformation relative to its neighbors so that a SMF-based strategy is ideally suited to jump start economic growth, increase food security, capture export markets, generate jobs, and reduce poverty (World Bank 2007a).

1.3. Objectives of This Report

This report focuses on agribusiness models for enhancing inclusive growth particularly those that partner with SMFs. Our overall objective is to provide strategic policy priorities for attracting agribusiness investments and managing land resources for inclusive and sustainable development by addressing two questions:

1. How to attract agribusiness investments to accelerate agricultural growth and competitiveness through business models that put SMFs at the center of the growth strategy and ensure <u>both</u> efficiency and equity?

[2] FAO projects that Myanmar will have a growing agricultural labor force until at least 2025 (FAOSTAT).

2. How to identify when large-scale business models may be appropriate and how land may be allocated to them in ways that are economically efficient, and socially and environmentally sustainable?

A variety of methods were employed to achieve this objective (Box 2) centered around key value chains and regional and global experience. Given the short time available, the diagnosis was focused on value chains that were not included in the previous MSU-MDRI-CESD report, and that illustrate a range of business models from large land concessions to those that are exclusively based on SMFs and SMEs. We also selected dynamic sectors that show strong growth potential. The final selection included sesame, maize, rubber, oil palm, sugarcane, cassava, and poultry.

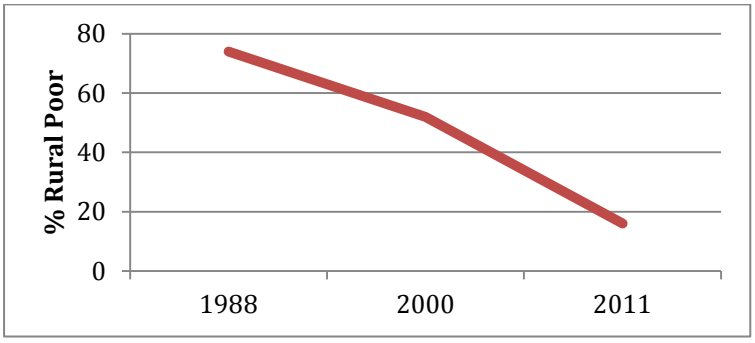
We also reviewed the experiences of Thailand and Cambodia and their relevance to Myanmar. Thailand provides a good example of a growth strategy based on consistent long-term support to both SMFs and private agribusiness that have sustained growth and poverty reduction (Figure 1 and Annex 1). By contrast, Cambodia demonstrates the risks of a strategy based on allocating large land concessions to agribusiness companies, resulting in land conflicts that led to significant erosion of electoral support in 2013 (Annex 2).

Box 2. Sources for the Report

This report draws on a diversity of sources, including:

1. Review of published papers and reports from Myanmar and the region including the 'gray literature' assembled through email contacts.
2. Review of secondary data, recognizing serious weaknesses in Myanmar statistics[3].
3. Review of development experiences in Thailand (focus on SMFs) and Cambodia (focus on land concessions).
4. Meetings with Myanmar stakeholders, including policy makers, researchers and nongovernmental organizations.
5. Field visit to five regions/states and meetings with companies, farmers and local stakeholders
6. Preparation of a draft report and PowerPoint, synthesizing the above.
7. Discussion of the preliminary findings with key stakeholders in seminars in Yangon and Nay Pyi Taw.
8. Circulation of full report for comments.
9. Revision and finalization of the report.

Figure 1. Rural Poverty Reduction in Thailand, 1988-2011



Source: World Bank data.

[3] See Haggblade et al. (2013) for a review of the quality of agricultural statistics.

2. BACKGROUND TO AGRIBUSINESS INVESTMENT IN MYANMAR

2.1. Overall Investment Climate

Since 1988, the military government has promoted the private sector as the major driver of economic growth and employment. In the agriculture sector, it has used a number of instruments to do this. First, the private sector was allowed to export (some crops) and import under the *export first policy*. Second, the government has encouraged private investment in large-scale agribusiness ventures by granting rights to develop new agricultural land for the cultivation of crops such as rice, oilseeds, sugarcane, rubber, and oil palm. Third, after the devastation of Cyclone Nargis and the global financial crisis in 2008, the government encouraged the private sector to establish so-called crop specialization companies to promote contract farming, especially for rice and vegetables.

Despite the stated policy, the private sector remains weak. Most of Myanmar's agribusinesses lack access to capital, know-how, and human resources. A few big companies have developed often as a result of cronyism, monopoly licenses, and the backing of the military government, but many lack competitiveness. The value chain analysis of the next section reveals examples of inefficiencies and underperformance in many supply chains and their lack of effectiveness in stimulating growth and poverty reduction. Furthermore, the opening of the ASEAN Free Trade Area in 2015 will challenge the domestic private sector to compete with their counterparts from ASEAN, requiring drastic upgrading of their technology, human resources, and management.

The weakness of the Myanmar private sector has recently been highlighted by the International Finance Corporation (IFC) Doing Business Indicators where Myanmar ranked 182 out of 189 countries in both 2013 and 2014, the lowest rank in Southeast Asia (Table 1). The rankings were especially low on starting a business, protecting investors and enforcing contracts and somewhat better for paying taxes and trading across borders. These data are from Yangon only and are very preliminary since Myanmar was only included in the rankings from 2013.

In our interviews outside of Yangon (see Annex 4), agribusiness firms consistently highlighted three major constraints—access to bank finance, access to and high prices of electricity, and high transport costs. These require long-term solutions. Interviewers with agricultural exporters in Yangon also highlighted high logistical costs and onerous paper work at the Yangon Port—problems more amenable to short-term solutions.

Table 1. Ranking of Myanmar among 189 Countries on Various Topics in the Doing Business (DB) Indicators

Topic	DB 2014 Rank	DB 2013 Rank	Change in Rank
Starting a business	189	189	No change
Dealing with construction permits	150	140	**-10**
Getting electricity	126	123	**-3**
Registering property	154	149	**-5**
Getting credit	170	167	**-3**
Protecting investors	182	182	No change
Paying taxes	107	113	**+ 6**
Trading across borders	113	114	**+ 1**
Enforcing contracts	188	188	No change
Resolving insolvency	155	153	**-2**

Source: http://www.doingbusiness.org/data/exploreeconomies/myanmar

While these findings are generally gloomy, we also observed fully stocked input supply shops with a wide range of products as well as active cross border trade in many products. In general, Myanmar has relatively open borders with respect to agricultural imports and exports. In many cases, these transactions take place outside of the formal system so that traders and investors are able to sidestep the formal regulations measured by the Doing Business Indicators. The cost of informality is that there is little regulation of the type and quality of agricultural inputs, and of the quality and safety of exported agricultural products. In the long run, these problems are likely to penalize farmers who ultimately pay higher prices for inputs and receive lower prices for outputs than they could in well-regulated markets.

There has also been recent progress in the formal approval process for investments. The government has removed the dual foreign exchange system, reduced the corporate income tax from 30% to 25%, and removed the commercial tax for most exports. The GoM has started to streamline the investment approval process and reduced the documentary requirements for company incorporation to two weeks for foreign investors.

Foreign direct investment (FDI) has played a relatively minor role in agriculture even after liberalization. Based on the data of Directorate of Investment and Company Administration (DICA), foreign investment jumped from very low levels to reach nearly US$2 billion in 2010-2011 before declining in subsequent years. In 2010-2011, the first three foreign companies were allowed to lease land for commercial farming of oil palm in Tanintharyi region (MOAI 2011), amounting to $139 million (DICA 2011). A number of companies have also invested in the seed industry, especially for vegetables. In 2013, FDI in crop agriculture was however, less than 0.5 % of the total approved FDI, and livestock and fish accounted for another 0.8% (DICA 2013). To date then FDI has made a negligible contribution to agriculture with notable exceptions such as the Charoen Pokphand Group (CP Group) from Thailand that has invested heavily in the poultry supply chain and related maize seed industry. However, FDI further downstream in food processing is likely included under manufacturing and therefore overall FDI in food and agricultural and agribusiness may be larger.

2.2. Land Resources

By all measures, Myanmar is land abundant compared to most of Asia. Average farm size is a relatively large 2.7 ha for land holding households. Agricultural land area expanded by 21% from 2003-2010 according to statistics of the Settlements and Land Records Department (SLRD) and by 48% according to the Myanmar Census of Agriculture. Both estimates put the total agricultural land area at between 13 and 14 million ha in 2010.

Land in Myanmar is officially classified into various classes according to its crop suitability. Table 2 based on census data indicates that Paddy and Yar land (dryland) constitute the great majority of area. Rubber land has been expanding fastest. These land types have been preserved in the new Farmland Law, severely constraining crop substitution possibilities such as the growing of sugarcane on paddy land.

At the same time, the SLRD of MOAI estimates some 20.7 M ha of land is available for agricultural expansion, divided between 5.37 M ha of cultivable wastelands and 15.34 M ha of woodlands with the largest concentrations in the far north and extreme south of the country (Kyaw Nyein Aung 2012). To this could be added severely degraded land that was previously forested but still under the jurisdiction of the Ministry of Environmental Conservation and Forestry (MoECAF).

Table 2. Agricultural Land Area by Type, 2010

Land type	'000 ha
Paddy	7,411
Yar (dryland)	3,736
Kaing (alluvial terrace)	551
Garden	504
Dhani (Napier saline)	15
Rubber	248
Other land type	329
Total	12,794

Source: Settlement and Land Records Department 2013.

It is likely that much of this potential land is utilized in some way for long fallow cropping systems, livestock grazing, and non-timber forest products, and by farmers who have moved into this land but are not recognized in SLRD records.

International data supports the finding that Myanmar is relatively well endowed with land. FAOSTAT data suggest a large area of 21 M ha of other land presumably the MOAI definition of VFV land. However, the International Institute for Applied Systems Analysis (IIASA) data set on crop suitability shows only 4 M ha as being of medium or higher suitability for expanded crop cultivation (Table 3). Of this 2.5 M ha is classified as non-forested and only 0.53 M ha of this is in low population density areas with less than 25 persons per km^2 where conflicts with existing land users would be less. While this represents the largest area of uncultivated and non-forested land in the region suited to agriculture, it is only a small percentage of the estimated VFV land available for agriculture. Therefore, Myanmar's land abundance should not be overemphasized.

Table 3. Comparative Statistics on Land Use and Availability in Myanmar and Its Neighbors

		Myanmar	Cambodia	Laos	Malaysia	Thailand	Viet Nam
FAO land data							
Arable land and Permanent crops	000 ha	12,250	4,155	1,500	7,585	20,260	10,200
Permanent crops	000 ha	1,464	155	100	5,785	4,500	3,700
Forest area	000 ha	31,463	9,967	15,673	20,369	18,987	13,941
Other land	000 ha	21,308	2,030	5,029	4,616	11,042	6,224
Rural population	'000	31,744	11,386	4,129	7,803	45,634	61,257
Rural pop density	Pers/km2	48.6	64.5	17.9	23.7	89.3	197.6
Arable ha per worker	ha/pers	0.65	0.83	0.62	4.79	1.06	0.34
% land arable		18.8	23.5	6.5	23.1	39.7	32.9
% other land		32.6	11.5	21.8	14.0	21.6	20.1
% land forest		48.2	56.5	67.9	62.0	37.2	45.0
% arable as permanent		12.0	3.7	6.7	76.3	22.2	36.3
% arable irrigated		18.7	8.5	20.7	4.8	31.7	45.1
Land suited to cultivation-nonprotected IIASA							
Total suitable for crops	M ha	4.03	1.20	0.55	7.07	7.30	1.28
Nonforested	M ha	2.50	0.43	0.29	1.91	6.07	1.08
Low density uncultivated	M ha	0.53	0.18	0.1	0.19	0.13	0.03

Source: FAOSTAT, IIASA, GAEZ at http://www.fao.org/nr/gaez/en/

2.3. Large-scale Land Concessions

The granting of large land concessions to investors derives from the previous military government staring in 1991. Along with monetary incentives to favored business groups and loans from state-owned banks, access to cheap land was provided as an incentive to invest in *modern* large-scale farming and plantations.

By March 2013, a total of 377 national companies and 18,322 SMF growers had been allocated 1.53 million ha of VFV and deep-water land, and 0.36 million ha of forest lands for a total of 1.89 M ha. However, the deep-water lands have largely been abandoned and forestlands allocated in Mon State were nearly all for SMF rubber so excluding these, a more realistic figure is 0.94 M ha of VFV lands and 0.32 M ha of forest lands for a total of 1.26 M ha. Thirty percent of allocated lands were in Kachin State, followed by 21 % in Taninthary Region, and 13 % in Sagaing Region (Annex 3). Management of these land concessions is shared across the MOAI, MoECAF, and the Administration Department (Box 3).

Box 3. Committees Responsible for Land Policies and Land Allocation

A complex system of committees and working groups have been established to manage land issues: Five Working Groups are coordinated and chaired by the Union Minister, Ministry of Environmental Conservation and Forestry (MoECAF) to formulate national land use and management policies:

1. National Land Use and Management Policy Drafting Working Group
2. Legal Affairs Working Group
3. Land Types, Classification, Mapping and Registration Working Group
4. Customary Land Use by National Ethnic Group and Dispute Solution Working Group
5. Working Group for Collaboration with International Agencies.

The Union Minister of MoECAF is also Chairing the Land Allotment and Utilization Scrutiny Committee which consists of 21 members from various government departments, regional governments and parliamentary members. It focuses on issues related to formulation of national land use policy, land use planning and land allocation for investment, including in agriculture. It is tasked to prepare a land use policy by forming the above policy drafting-working groups.

The Union Minister of Ministry of Agriculture and Irrigation chairs the Central Management Committee for VFV lands with two Deputy Union Ministers as Vice Chairmen and Director-General of SLRD as Secretary. It is specifically responsible: for receiving recommendations for VFV land use; rejecting applications or granting, permission orders for VFV land use; rescinding or modifying VFV land use rights; coordinating with the MoECAF and other Ministries to prevent the damage or destruction of forests and natural ecosystem; providing inputs in the formulation of National Land Policy; fixing the rate of security fees to be deposited and the annual land revenue rate and suitable period for tax exemption.

The Land Confiscation and Enquiry Commission, a parliamentary commission chaired by a member parliament was established in July 2012 focusing on issues relating to land confiscation to respond to the growing levels of advocacy on land conflicts. This commission does not have a formal mandate to resolve land conflicts but is tasked to gather information to be passed on to parliament and to make recommendations to parliament.

The Dispute Solution for the Land Concession Committee is chaired by the Vice President No.2 of the Union Government and it is aimed to resolve the land conflicts resulting from land concessions made by previous military governments.

Farmland Administration Bodies (FABs) are line agencies within the MOAI. At central level, the Minister of the MOAI is the Chairperson, the Deputy Minister of the MOAI the Deputy Chairperson and the

Director General of the SLRD the Secretary. This structure is replicated at the state/region, district, and township levels. As per the Farmland Law, FABs are responsible for: approving farmland use rights registration and transactions, and submitting those to the SLRD for registration; revoking farmland use rights if conditions are not fulfilled; resolving disputes over the allocation and use of farmland and its valuation.

Source: The authors.

The Central Committee for the Management of Vacant, Fallow, and Virgin Land (CCVFV) chaired by the Union Minister of Agriculture and Irrigation has responsibility for allocating VFV lands and for deep-water lands that were allocated in the 1990s. Land grants may be up to 5,000 acres (about 2,000 ha) initially, depending on the crop, with subsequent allocations up to a maximum of 50,000 acres (about 20,000 ha) if the initial allocations are fully developed. In practice, some companies have been allocated well above the maximum. Foreign investors can also apply for land concessions once they have been approved by the Myanmar Investment Commission. To date, only three foreign investors with a total of 0.11 million ha have been approved, although other applications are pending.

Investors agree to a development schedule of 15% completed in the first year, 30% in the second year, 30% in the third year, and the final 25% in the fourth year. Investors pay very low rents (about $3/acre for perennial crops) and land rents and taxes are exempted for 2-8 years depending on the crop. Allocated VFV land can only be transferred with the approval of the Minister of Agriculture and Irrigation. It may also be converted to titled farmland if approved by the CCVFV.

The total extent of land concession from VFVL, deep-water areas and forest areas by State and Region wise are shown in Annex 3. For the VFV land, a total of 376 companies had been allocated 0.93 million ha by May 2013 with an average size per concession of about 2,500 ha. Forty percent of allocated VFV land was in Kachin State, followed by 17% in Sagaing Region, and 14% in Tanintharyi Region (Annex 3). The two most important commodities for VFV land allocation are rubber (87,389 ha), oil palm (71,809 ha), and rice (49,482 ha) with significant areas for jatropha, sugarcane, rice, cotton, and cassava. At least one company (or group of closely connected companies) controls over 200,000 ha of this land.

Based on MOAI publications it appears that the area of VFV land under concessions increased by at least 0.2 M ha from 2010 to 2013. Some observers noted a slowdown in land allocations recently but other sources indicate that the GoM may be considering a further allocation of over 300,000 ha although some is for urban expansion and the new infrastructural corridors.

The MoECAF allocates forestlands to agricultural purposes. Procedures are similar, and land allocated by MoECAF cannot be sold or rented. MoECAF data show allocation of some 369,300 ha nationally with by far the largest allocation in Tanintharyi Region (55% of the total). The allocation per concession is much smaller, but this is because of l2,600 grants in Mon State for SMF rubber, averaging 2.8 ha per grant. Excluding Mon state, the average size of a MoECAF land grant is about 400 ha.

The problems associated with the concessions have been substantially documented (e.g., Woods 2013). Many concessions are associated with high social and environmental costs. These costs were highest in the previous military government where rule of law was not respected. However, concessions today still come at a cost. In particular, in areas of shifting cultivation in the north (taungya system), farmers do not have secure rights to their land, and many concessions have encroached on their fallow land and other forms of livelihoods (e.g., grazing). Some concessions also overlap with forests of high conservation value, especially the oil palm concessions in the south.

The Central Committee for the Management of VFV Land does have procedures on the books to assess existing uses of land by the relevant departments on the ground to verify if the lands are actually VFV land (presence or absence of farmers or any squatters on the ground, any overlap of application on the target land, and any possible damage to the

environment). Each application is reviewed at township level offices first, and then district level office before being submitted to the working groups of the Region/State level government. It is finally sent to the Union level CCVFVL with comments and recommendations of the Region /State Government.

Despite the many layers of review, there is no mechanism in the process for open publication of the proposed concession nor for consultation with stakeholders at the local level. The whole process depends on bureaucrats who may not have the skills nor resources to carry out field inspections and who in the absence of transparency, may be open to rent seeking.

Beyond these well-known problems, few concessions (except possibly those for rubber) are achieving their intended purpose of developing modern agriculture. Despite the agreed development schedule, most concessions have made little progress in implementing their development plans. Only 24% of the VFV concessions and 27% of the forestland concessions have been developed or planted, although most were granted over five years ago and should be fully developed according to the concession rules. In some cases, valuable timber has been extracted and this rather than agriculture may have been the main motivation for the application.

Finally, the GoM although monitoring progress has not followed its own rules that would require cancellation of nonperforming concessions, or concessions above the allowable maximum per company. With very low land rents and no penalties, investors have little to lose by hanging onto the land and speculating on its future value.

3. BUSINESS MODELS IN SELECTED VALUE CHAINS MYANMAR

3.1. Typology of Business Models

There is a huge amount of evidence, mostly from Asia that there are few economies of scale in farming and that SMF family farms based on family ownership, management and labor, are the most efficient way of organizing agriculture (Lipton 2009; Hayami 2010). The superiority of SMFs relates to their flexibility in using labor for a variety of tasks on and off the farm, reduced labor supervision costs due to their incentive structure, low management overheads, and better local knowledge by family managers of the resource base. Over 95% of farms in both rich and poor countries alike are family owned and managed. Farm size gradually increases as wages rise to keep pace with nonfarm incomes, but even in rich countries, such as in the USA, relatively large commercial farms are nearly all defined as family farms.

For the purpose of this paper, we focus on commercial SMFs with potential to supply the rapidly rising urban and export markets. In Myanmar, some 40% or about 2.5 million households largely produce for the market (Haggblade et al. 2013). Most of these farmers are likely to be among the 2.3 million households with holdings over 2 ha. Many horticulture and intensive livestock farmers with less than 2 ha may also be commercially oriented.

A dynamic commercial smallholder sector oriented to rapidly expanding markets offers the best opportunity to absorb new entrants to the labor force, as well as to stimulate employment in the nonfarm economy. In addition, a SMF-based approach is more equitable since rural households receive returns to land, labor, capital and management which are significantly above returns to labor that could be achieved by wage work on large farms and plantations. For example, in intensive rubber systems in Asia, factor shares to labor are only about half of total returns to all factors (Barlow 1997). Thus, a laborer working as a rubber tapper may not be able to escape poverty but working his or her owned 1 ha rubber holding may well do so. Of course, with rising real wages, smallholder farms generally adopt laborsaving technologies and gradually increase average farm size in order to allow farm incomes to match growing nonfarm incomes.

The main exceptions to a SMF-based strategy that may sometimes give an efficiency advantage to large agribusiness farms are:

- Economies of scale in processing for bulky products that have to be processed quickly in large mills soon after harvest such as sugarcane and oil palm, raising the transactions cost of organizing mill delivery from many small suppliers.
- Demanding process standards for some high value crops in export markets, especially some types of horticulture and floriculture, where fixed cost of certification disadvantage small suppliers.
- High pioneering or start up risks and costs for opening up remote areas for new crops that favor large producers with access to external capital.

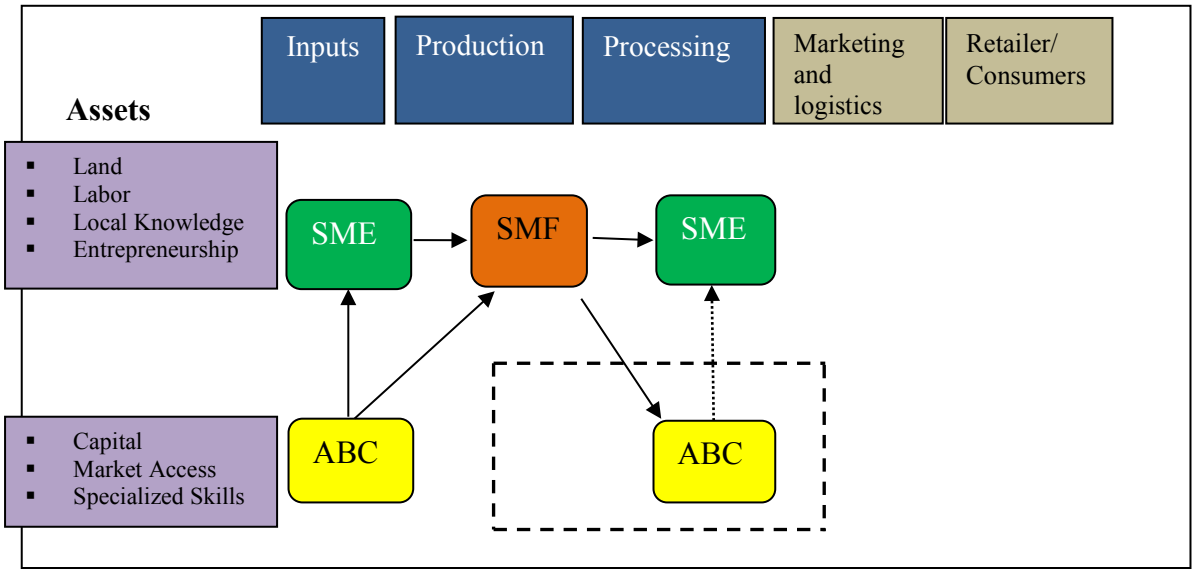
Typically SMFs procure inputs and sell their produce to input dealers, processors, and traders who are mainly small and medium enterprises that also lack critical assets for upgrading value chains. Despite the inherent efficiency of SMFs, poorly functioning markets, especially financial and land markets, often constrain the ability of SMFs to make high upfront investments and adopt modern technologies. In the past, and especially in Asia, the state provided a range of services to allow SMFs to overcome these disadvantages. This worked well as demonstrated by the green revolution stimulated by heavy public investment in agriculture and strong government leadership. However, long-term underinvestment by the

public sector in Myanmar agriculture and weak capacity to deliver government services reduces the prospect of using this pathway to SMF development.

In the absence of a strong state, supporting investments and services (apart from infrastructure) can sometimes be provided by larger agribusiness companies working in partnership with SMFs. This leads to several business models outlined in Table 4 and Figure 2. (Byerlee and Haggblade 2013). First, with an appropriate investment climate ABCs can profit from embodying services such as improved technology and technical advice through input sales (e.g., hybrid seed) or improved market logistics in ways that enhance SMF productivity as well. Second, ABCs can contract with smallholders who provide at least the land, labor, and day-to-day management in a variety of potential contractual arrangements. Even informal mechanisms that share information and attempt to resolve coordination problems along the value chain can sometimes be effective. Innovation platforms that bring SMFs, input suppliers, banks, extension, and processors together have been shown to be successful (e.g., Byerlee 2013). Another model is for well-organized SMFs to vertically integrate downstream into processing and marketing or upstream into R&D through collective action (e.g., cooperatives or research funds) to overcome scale diseconomies and asset gaps.

Another model is for larger processing and marketing firms (i.e., ABCs) to integrate upstream to secure supplies by engaging in direct production in large-scale operations (indicated by the dashed box in Figure 2). In most cases this is not the most efficient option as where ABCs move into agricultural production it is usually because of a policy environment that favors them over SMFs. Granting of large land concessions at very low rents is one such example, creating a situation where speculative gains rather than efficiency gains becomes the main motive for ABCs to enter farm production (Byerlee and Deininger 2013). Even so, responsible ABCs can generate substantial benefits for local communities if they create good jobs, pay competitive wages and provide training programs for employees and educational and health benefits for families. Responsible companies can also play a role in local economic development by building infrastructure and generating tax revenues.

Figure 2. Conceptual Overview of Interactions of Agribusiness Companies and SMFs



Source: The authors.
Note: The dashed line indicates potential for ABCs to vertically integrate into production.

Table 4. Summary of Business Models

Model	Agribusiness investments provide:	Small and medium farmers may gain from:
Independent SMFs in spot markets		
Upstream support	Input companies working with SME input suppliers to provide financing and advisory services	Upgrading inputs and technical knowledge by working with input suppliers
Downstream support	Downstream investment in processing and market infrastructure provides new markets.	Improved market prices, diversifying to new products and/or access warehouse financing
Coordination by value chain actors		
	Participate in value chain roundtables or innovation platforms to coordinate actions to upgrade value chains	Improved productivity and better prices through reduced transactions costs in value chains and higher quality outputs.
Contract farming		
Price contract	Guarantee price for specified quality and specified time	Reduced price risks and possibly higher prices depending on bargaining power
Resource provision	Provision of inputs, cash loans and advisory services often in partnership with bank	Access to working capital and technical advice
Collective action by SMFs		
	Cooperative, farmer organization or private-public commodity board provides advisory services, R&D, and/or processing and marketing services	Organized SMFs pay member fee or output cess in return for services.
Upstream integration by ABC		
	Undertakes production within a vertically integrated system	May include outgrowers or other community equity arrangements

Source: Adapted from Byerlee and Haggblade 2013.

Finally, companies that have their own nucleus farm or plantation may also enter into partnerships with SMF outgrowers. They may also develop other arrangements with local communities that provide equity shares in the company in return for access to land and water resources.

3.2. Selection of Value Chains

We chose seven value chains to illustrate different business models and diagnose their constraints and opportunities for future development. While not completely systematic, several criteria were used in this selection:

- those not considered in the first MSU-MDRI-CESD report by Haggblade et al. (2013);

- those that illustrate a range of business models including value chains that are the focus of large land concessions;
- those with products that have strong market opportunities; and
- those visited in the field.

This led to a review of four industrial crops (rubber, oil palm, sugarcane, and cassava), two food staples (maize and sesame) and one livestock sector (poultry). Time constraints as well as an initial focus on land concessions left significant gaps in this line up such as a whole range of horticultural products that have strong domestic and international market prospects.

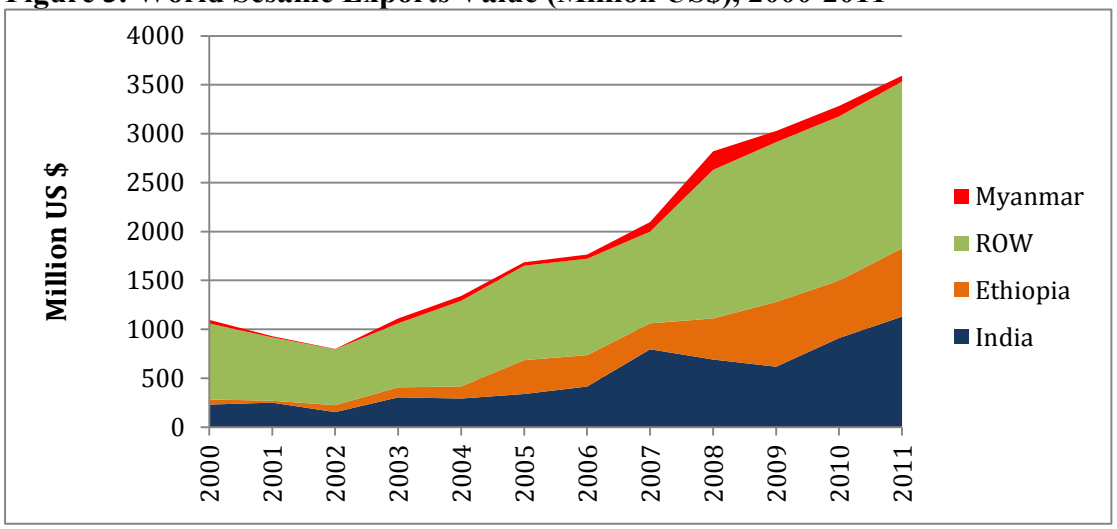
The following is a brief description and diagnosis of the business models actual and potential in these seven value chains. Much more in-depth analysis is needed to confirm these initial findings.

3.2.1. Sesame

Myanmar (according to GoM statistics) is the world's largest sesame producer and sesame is the most important oilseed crop in Myanmar, occupying 46% of total oilseed area of 3.5 M ha followed by groundnut (26%) and sunflower (16%). However, palm oil, mostly imported, is the major source of vegetable oils especially for low-income consumers. Oilseed area reached a peak in 2009-2010 and declined thereafter when the GoM allowed the private sector to import palm oil free of duty. The majority of the population prefers groundnut oil and only people in the dry zone prefer sesame oil. In other parts of the country, sesame oil is regarded as expensive and having a bitter taste. Edible oils such as sesame oil are frequently mixed adulterated with palm oil.

Despite the downward trend in oilseeds more generally, sesame has continued to expand rapidly by 8% annually since 2000 to reach 862,000 tons in 2012. This expansion has been driven by increases in both area and yields. This appears to reflect strong markets for the multiple products from sesame seed, beyond sesame oil, especially the popular sesame snacks or brittle.

Figure 3. World Sesame Exports Value (Million US$), 2000-2011



Source: FAOSTAT 2013.
Note: ROW = Rest of World.

Although the sesame sector shows considerable dynamism, Myanmar has been losing share in world sesame markets. World imports of sesame increased fourfold from 2001 to reach US$2 billion in 2011, led by China and other Asian markets. India and most recently Ethiopia have captured the lion's share of market growth leaving Myanmar with only 2% market share in 2011 and seventh rank among exporting nations (Figure 3).

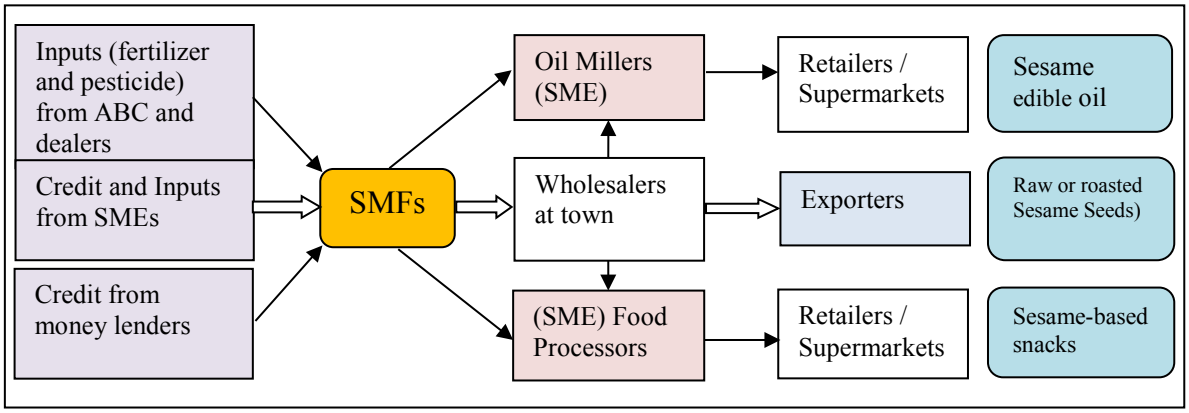
Due to low quality, Myanmar received lower unit export prices than other sesame exporting countries. Export markets are very sensitive to the colors of the sesame and among the main cultivated strains *black Theikpan, ordinary black sesame, white sesame,* and *red sesame*, the cultivar, black Theikpan fetched the highest price in Japanese markets. Moreover, roasted sesame seeds also receive higher price than raw seeds.

Sesame can be grown in both Le land (wet land) and Yar land (dry land) and in pre-monsoon, monsoon, and winter seasons. Yar land (monsoon season) sesame accounts for 74% of the total sesame area and 65% of total production, mostly in the central plains of Magway, Mandalay and Sagaing Regions, and much of it in the driest areas of the country. However, profitability of Yar land sesame is low relative to sesame grown in the cool season under irrigated conditions (Favre and Kyaw Myint 2009).

The sesame supply chain in Magway Region, a major producing region, presented in Figure 4 illustrates the channels to the three main products—sesame oil and processed sesame snacks (brittles) for domestic markets and sesame seed for export (Thuza Lin 2013). Regardless of the final product, the main business model is independent SMFs purchasing inputs from local SMEs and selling to SME traders, millers and processors. Oil millers, exporters and food processors generally buy sesame seeds from wholesalers but some oil millers buy directly from farmers. After processing, sesame oil and sesame brittle are distributed to consumers by retailers or through supermarkets in large cities.

Linkages and relationships among actors in the value chains are weak. In some cases, input dealers provide inputs to farmers in advance and farmers make repayments at 2% interest rate per month after crop harvesting. Some farmers also take credit (at 5-20% interest rate) for production cost and family consumption from traders and oil millers. There is also reported to be some contract farming for export of sesame into the high value Japanese market (Favre and Myint 2009).

Figure 4. Sesame Value Chain in Myanmar



Source: Thuza Lin 2013.

The majority of farmers engage in sesame production with traditional technology and low levels of input use in Myanmar. Although GoM provides credit, extension service and certified seeds, these benefit only a small number of growers. In addition, there is a lack of drought and pest/disease resistant sesame varieties for improving yields and yield stability, as well as varieties with quality traits suited to demanding export markets. As a result, sesame yields are low and volatile, especially in the Yar land of central dry zone area.

The major constraint for millers, processors, and exporters is the electricity shortage for cleaning and processing the sesame. Many medium and even large oil mills still use very old and inefficient machinery. Thus oil millers face high processing cost, high maintenance cost, and high transportation cost.

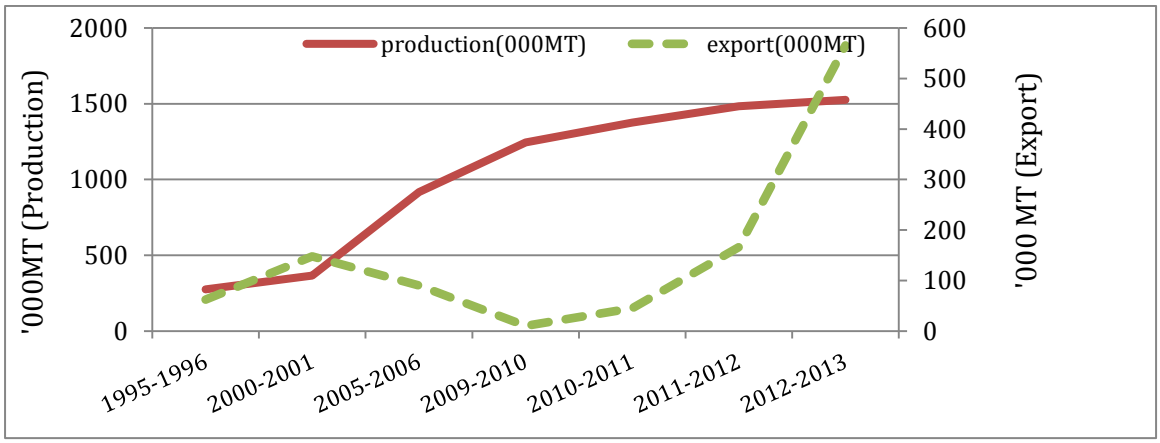
Farmers have little access to certified seeds of varieties with preferred traits in global markets because of an underdeveloped private seed industry. Lack of laboratory facility to test Imidacloprid (chemical residue) in the country limits exports to demanding markets such as Japan. Sesame exporters who send sesame by ship also face high costs of transportation due to inefficient port facility and poor logistic procedures.

Despite these constraints and Myanmar's poor performance in global markets, there is good potential for Myanmar sesame products in both domestic and export market because of high prices and the possibilities of value addition. Part of this potential could be realized by capturing high value markets by upgrading quality and producing more value added products such as cold pressed sesame oil, roasted sesame for the Japanese and Korean markets, and branded and unadulterated oil for domestic markets. This will require well-specified standards as well as the development of varieties suited to the various products. For these higher value markets, contract farming offers good prospects as long as sufficient financing is available for upgrading key elements of the value chain, including milling.

3.2.2. Maize

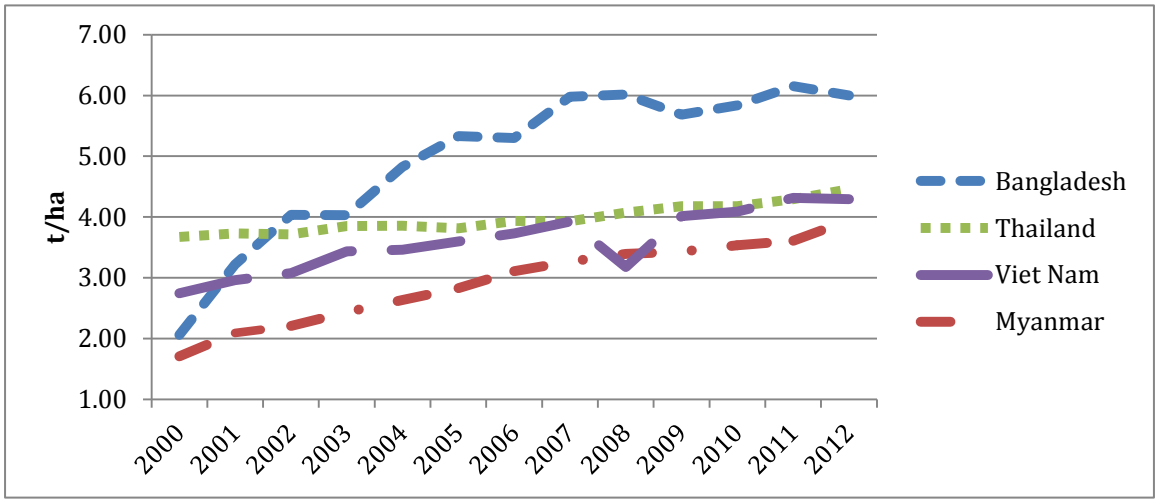
Maize is the second most important cereal after rice in Myanmar in terms of both production and exports. Production has increased rapidly since 2000 to reach 1.5 M tons by 2012-13, reflecting both area expansion and impressive yield gains (Figure 5). Growth of the industry has been driven by rising demand for livestock feed especially for poultry (see below), as well as by Chinese imports for feed.

Figure 5. Total Maize Production, and Exports, Myanmar, 1995-2013



Source: Extracted from Department of Agricultural Planning 2013.

Figure 6. Maize Yields in Myanmar and Its Neighbors, 2000-2012



Source: FAOSTAT.

Over the past two years, exports have jumped sharply to 566,000 tons, with China accounting for 75% of the market, mostly overland from Shan State (Figure 6). Industry sources suggest higher exports due to informal border trade. In any event, with current trends, Myanmar will be the leading maize exporter from the Southeast Asian region.

Shan State, especially Northern Shan State, Chin State, Ayarwaddy Region, and central parts of Myanmar are the leading producers. Maize from these regions supplies commercial processing mills primarily for feed use in poultry farms (see below).

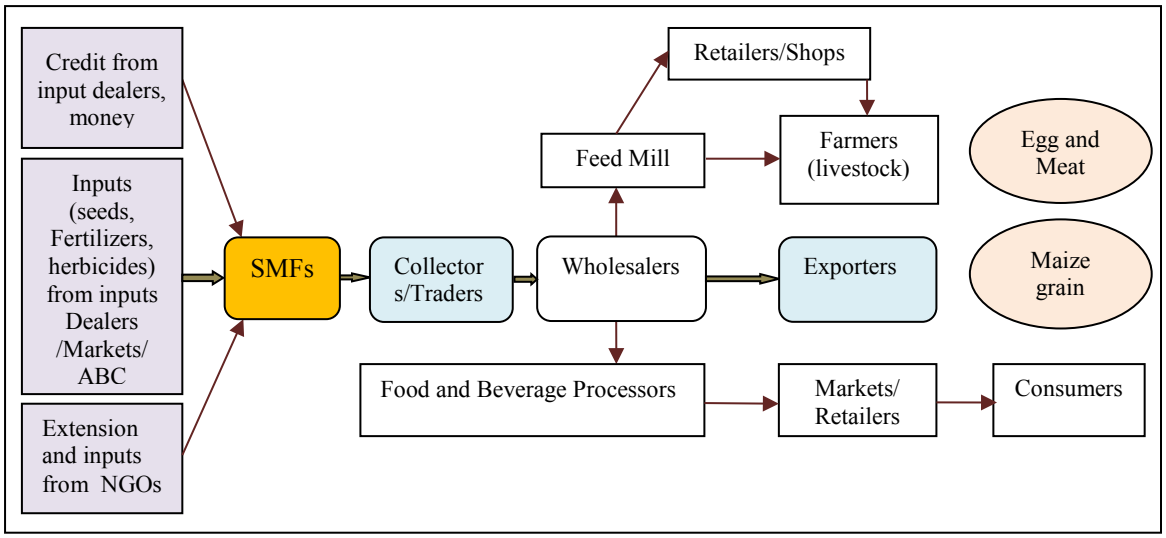
Most maize is produced with hybrid seed introduced into Myanmar by private companies. Charoen Pokphand Group (CP) has been the leader in hybrid maize and claims over 80% of the market and an annual growth rate of seed sales of 1,500 tons (enough for 120,000 ha). The wide adoption of hybrid seed has allowed maize yields to double, although they are still well below those in neighboring countries such as Vietnam and Thailand (Figure 6).

The main business model for commercial maize production is based on independent small and medium farmers (SMFs) who are linked closely with agribusiness companies, through the purchase of hybrid seed and through the sale of their maize to feed mills and exporters. Farmers can also receive extension services and technical assistance from the companies who run a large number of demonstrations. CP also conducts a relatively large contract seed production enterprise in Southern Shan State, and exports seed.

Many farmers, especially smaller farmers, receive inputs on credit from export companies, input dealers, and local traders in an informal contract farming system. Some feed mill companies also assure high quality maize for their mills through contract farming. Traders associations, wholesalers, and agents are performing aggregation, drying, and storage services for export markets. The value chain map of hybrid-maize production in Myanmar is presented in Figure 7.

Another model used in Northern Shan State, named '101' was originally funded by the U.S. Government at the initiative of old soldiers of Detachment 101 who served the U.S. army in World War II in Myanmar. 101 assists more than 250 villages; each village has a village committee and cooperative farms for research and training to provide inputs and extension services.

Figure 7. Hybrid-Maize Value Chain



Source: Base of Field Visits and Research Findings.

101 also has an extensive system of acquiring, testing, and selecting suitable varieties from CIMMYT, China, Thailand, the Department of Agricultural Research in Yezin, and CP and multiplying seeds of selected varieties.

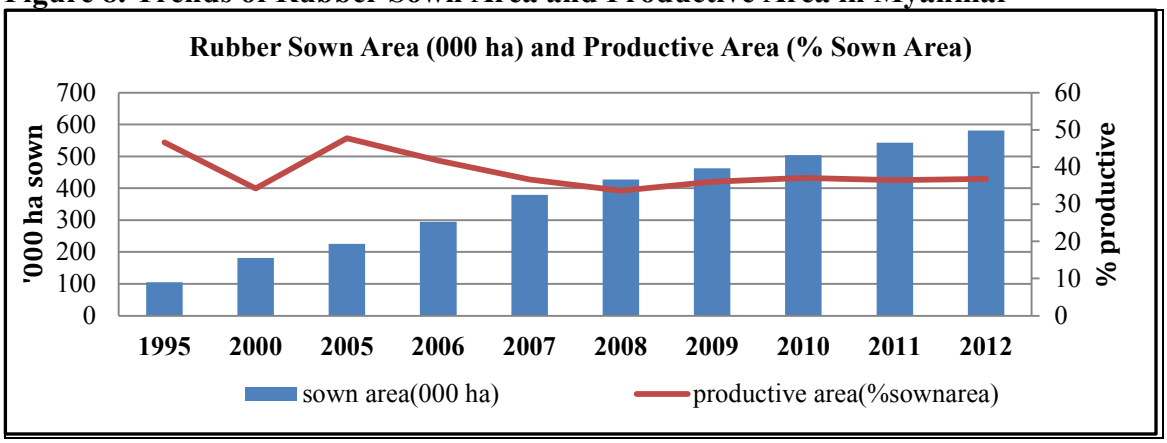
Major constraints identified for hybrid maize were high input price, scarcity of labor, price and weather risks, and the perennial issues of access to finance and extension services. Cultivation methods are heavily dependent on rain fed cultivation and employ low levels of mechanization. In some areas at least, the crop is quite risky given the yield levels obtained in relation to the cost of inputs. Continuous planting of maize in sloping areas has also resulted in serious soil erosion (Seng Kham 2009).

Given its land and water resources and strong domestic and nearby export markets, Myanmar has great potential in maize. Thailand and Vietnam each produce three times more maize partly through higher yields (Figure 6.). In rain fed areas the wide adoption of conservation tillage to reduce costs and drought risks and put maize on a more sustainable footing offers much potential. A public-private partnership with input companies, CANSEA (Network of Conservation Agriculture in Southeast Asia - Myanmar is not currently a member) and MOAI would be one model to investigate to adapt and scale up the technology. There is also considerable potential for maize as a dry season crop after rice, where there is irrigation potential as Bangladesh with average national yields of over 6 tons/ha has very successfully shown. Exports could grow more rapidly if regional integration eliminates currently high import tariffs (officially over 50%) that reduce exports to China.

3.2.3. Rubber

In the past decade, rubber has been one of the most dynamic commodity export sectors, driven by rapid growth of the Asian automobile sector, led by China. World rubber prices (RSS3 in the Singapore Exchange) increased from $0.67/kg in 2001 to over $6/kg in February 2012, before falling back to $2.49 /kg in Nov 2013 due to the slowdown in the Chinese economy.

Figure 8. Trends of Rubber Sown Area and Productive Area in Myanmar



Source: DAP 2013; MOAI 2013.

Southeast Asia produces over 75% of the world's natural rubber, led by Thailand and Indonesia. Myanmar is a small producer and exporter with currently only about a one percent share of the world market. However, as in other countries of the region, rubber area has expanded rapidly in recent years in response to surging world prices as well as GoM's liberalization of the sector in 2004. In 2012, Myanmar had 581,000 sown hectares of rubber with an average yield of 785 kg/ha from 215,000 harvested ha. The low ratio of harvested to sown area (37%) reflects the rapid expansion of the industry and the young age of most plantations (Figure 8). Expansion has been fastest in the non-traditional areas of the center and north that now make up 21% of sown area.

The structure of the rubber industry is highly unequal as seen in Table 5, with a large number of smallholders (under 20 acres) as well as a few very large operations. Therefore, we illustrate two extremes of the business models being employed for rubber in Myanmar (aside from the small percentage of area still under state management).

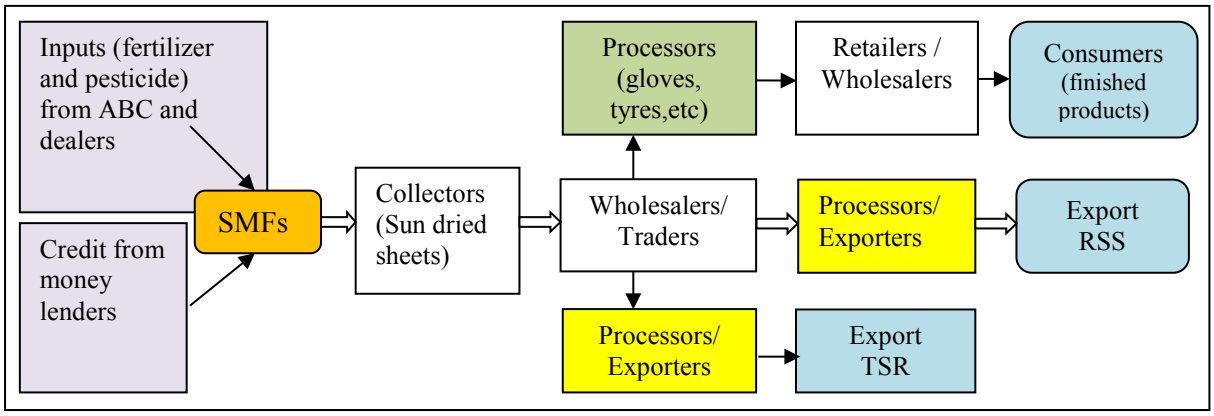
1. Independent SMFs (< 50 acre) with their own simple first stage processing linked to traders and second stage processors of ribbed smoked sheets (RSS) rubber much of which is used further downstream in the Myanmar manufacturing sector (Figure 9).
2. Large-scale plantations (> 1,000 acre), mostly through land concession, with processing to RSS rubber and direct export, mostly to China. These large plantations (31 in 2006-07) probably account for over 20% of rubber production and the estimated 10% of rubber that is technically specified rubber (TSR) quality.

Table 5. Structure of Rubber Holdings, Myanmar 2006-07

Holding size (acres)	No. holdings	% planted area
< 5	22,423	8.6
5 - 20	28,052	33.3
20 - 50	3,791	15.1
50 - 100	950	8.2
100 - 150	419	13.7
500 – 1,000	65	7.2
> 1,000	31	13.9
Total	**55,731**	**100**

Source: Myint 2013.

Figure 9. Value Chain for Rubber SMFs

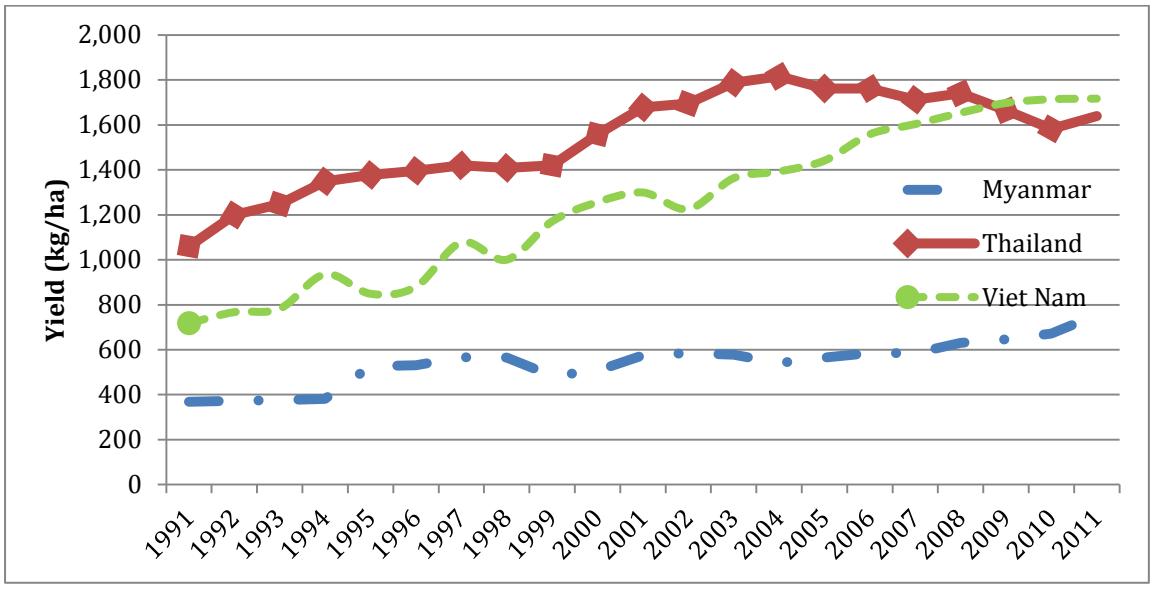


Source: Field Visit 2013.

Overall, Myanmar should be strongly competitive in rubber given its low land and labor costs. This is reflected in its growing exports. However, there are serious and well-known constraints: access to finance to upgrade to high yielding clones that make up only about 25% of sown area; low quality as a result of weak extension; low investment in research; and lack of regulation of standards. Current yields are less than half of neighboring Thailand and Vietnam where high yielding clones have been almost universally adopted (Figure 10).

On the large concessions, where yields appear to much higher, the major constraint is likely to be labor for tapping as a large number of young trees come on stream in the coming years, often in quite remote locations, as well as working capital to maintain a large labor force. In addition, sustainability is a major issue where plantations are expanding at the expense of forests of high conservation value.

Figure 10. Trends in Rubber Yields in Myanmar Compared to Neighbors Using High Yielding Clones, 1991-2012



Source: FAOSTAT.

On the marketing side, Myanmar is losing substantially from low quality due to lack of regulation and enforcement of grading standards. The Myanmar Rubber Producers and Processors Association reported that prices for Myanmar rubber in international markets are discounted by $450/ton relative to a Singapore Exchange price of about $2,500/ton. Even where TSR quality rubber is produced, there are only a handful of laboratories to check quality.

At the same time, the sector has huge potential given the strong outlook in international markets (despite current weaknesses) and the opportunity to build a quality supply chain for soon-to-be privatized domestic tire factories and other manufactured products. Relatively simple changes in production management would provide these quality dividends providing superior quality is suitably rewarded. Additional investments to upgrade from RSS to TSR and concentrated latex would also add value.

Models to Upgrade Smallholders: In all the major rubber producing countries, rubber has switched from being entirely a crop grown on large externally financed plantations during the last century to an industry that is over 90% smallholders (outside of remaining state-owned plantations in some countries), (Box 4). Average holding size in Thailand, the world's leading producer, for example, is around 2.6 ha (Delarue 2011).

Box 4. Rubber – A Bit of History

Initially rubber was harvested wild from a range of species in the tropics, but in the early 20th century, when the nascent automobile industry stimulated a major new market for rubber, concerted efforts were made to cultivate rubber. With active support by the colonial government, entrepreneurial planters in Malaya were successful in cultivating *Hevea brasiliensis,* based on seeds from Brazil. The initial high price of rubber stimulated large inflows of foreign investment and rapid expansion of planted rubber through foreign-owned plantations in Southeast Asia (largely British, Dutch, and French but also American-owned). However, with highly volatile prices, many small companies and individual planters did not survive, and large vertically integrated tire manufacturing companies (Goodyear, Dunlop, and Michelin) took over large areas.

Colonial governments in the region actively supported the development of rubber plantations through loans, such as Malaya's Loan to Planters Scheme of 1904 and by facilitating importation of labor from India, China, and Java. Above all, colonial states provided access to cheap land grants that encouraged investors as well as considerable land speculation.

One of the unexpected developments at the time was the rapid emergence of smallholder rubber producers that broke the enclave nature of plantation agriculture. Rubber could be processed on farm through relatively simple methods and as a labor-intensive crop that required daily harvesting it was quickly taken up by smallholders, once the basic technology (varieties, tapping techniques) and infrastructure were in place. This was despite a hostile policy environment from colonial governments especially in the discriminatory allocation of market quotas after the price collapse following WWI and in the lack of research and extension services for smallholder systems. By 1930, about half of rubber in Asia was already produced by smallholders and by the first decade of this century, this share was over 80% in the world's major rubber producers, including in Malaysia the original pioneer of plantation rubber (following Table). The plantations remaining in 2005 were largely state-owned as in China and Vietnam and a legacy of nationalization after independence or under communism.

In land extensive systems, smallholders quickly adapted rubber to their long fallow agroforestry systems that produce diversified outputs, reduce risks, spread labor demand, and conserve biodiversity. A common approach was to incorporate rubber as a complementary crop into existing upland food systems as they reverted to their long fallow cycle. Smallholders have also successfully intensified rubber production in Thailand, China, and India, under pressure of growing land scarcity and conservation efforts to preserve remaining forests. Thailand, where rubber is virtually all produced by smallholders has become the world's number one rubber exporter through a four-fold increase in yields since 1980 (Annex 1).

Table. Percent of World Rubber Production and Share Area under Smallholdings in Top Rubber Producers and Myanmar, Circa 2005

	% of world production, 2005	% rubber area in smallholdings
Thailand	32	91
Indonesia	25	85
Malaysia	12	93
India	9	88
China	6	50
Vietnam	5	32
Myanmar	0.5	57
Total	**89**	**83**

Note: Smallholding defined according to country but usually < 20-25 ha.
Source: Fox and Castella 2013; www.faostat.fao.org
Source: Byerlee forthcoming.

Given low rubber yields and quality in Myanmar, there is enormous potential to upgrade SMF rubber through improved varieties and management, and improved processing. Three basic approaches could be employed;

1. **State-led** through targeted state support to SMFs focused on improved research, extension, credit and capacity building for farmer organizations and processing cooperatives. This is the model successfully employed in neighboring Thailand, India, and China where yields have increased sharply over the past two decades based on a SMF model (see Annex 1 for the Thai experience). The main drawback of this model in Myanmar is the lack of a strong state with resources and capacity to implement this model.
2. **Private sector led** through agribusiness companies contracting of existing growers or establishing outgrowers. This has not generally worked well for rubber as discussed below in Section 4.3, but some elements may be applicable.
3. **Public-private partnerships** that would involve collective action through a levy/cess to support research, extension, and market quality regulation, combined with capacity building and certification for private nurseries, and possibly loans, credit or grants up to say 5 acres for replanting with high yielding clones. The core of this approach would be a public-private board to manage the cess (see Section 4.4). This approach seems most feasible to Myanmar's situation.

Regardless of the business model, an important issue for SMFs is the need to manage price risks through diversification. One approach is to move toward improved rubber agro forestry systems by inter-planting of fruit and timber species as has been extensively employed in Thailand and Indonesia (Wibawa, Hendratno, and Van Noordwijk 2005; Delarue 2011). Another approach is to develop integrated livelihood systems around a range of farm and nonfarm enterprises as in Assam (Viswanathan and Shivakoti 2008).

3.2.4. Sugarcane

The sugar industry was largely state owned and managed until 2009. Since privatization, sugarcane area has expanded to around 162,000 ha with sugar production of 348,130 tons in 2012-13. Most sugarcane is produced under rainfed conditions with average yields of 55-60 t/ha in line with global average yields for rainfed sugarcane.

There are currently 21 sugar factories with crushing capacities of 1,500 to 2,000 t/day capacity (tons cane per day or TCD). Three more large factories (over 5,000 TCD) are being built by private companies (two of which are joint ventures with foreign companies). Due to increasing sugar prices and demand, sugar production has become an attractive business. After the mills were leased by the government to private entrepreneurs, farmers have been switching from other crops to sugarcane. The majority of these farmers are quite small with 69% under 2 ha.

As sugarcane is a bulky product that has to be processed soon after harvest, there is a natural symbiosis between sugarcane growers and sugar millers that makes it ideally suited to adoption of contract farming. As in other countries, a formula pricing method is often used that distributes the product share between farmers and factories. For example, in Thailand, farmers received the equivalent of 70% of the ex-mill sugar price. However, the legacy of state-owned mills has left Myanmar with a low farmer share of value. After the factories were privatized, the cane growers' value share increased to 48% but is still well below international norms (Table 6).

Most sugar mills enter into contract farming agreements with cane growers facilitated by a natural monopsony on purchasing sugarcane from a small area around the mill. In some cases, mills and contract farmers have developed well-structured agreements and strong relationships. For example, the Nawaday Sugar Factory (a Joint Venture with a Thai company) was established around 2000 and started working with contract farmers with better assets and relatively larger farm holdings. It supplies certified varieties and fertilizers, payable after cane delivery, and extension advice. After the sugarcane procurement price increased from K 13,500 in 2007-08 to K 30,000 per ton in 2012-13, small farmers (under 2 ha) also entered contracts. To enhance mechanization, tractor dealers forged a commercial link with a private bank for financing tractor purchases based on a guarantee by the sugar factory of credit worthiness, with loan repayments deducted by the mill. In a similar way, larger farmers could afford to buy the five to seven ton truck for cane transport. These arrangements have allowed a sense of trust to develop over years between farmers and the mill.

Table 6. Computation of Cane Growers Share of Ex-Mill Price in the State-Run System, 2006-07, and after Privatization, 2012-13

Year	Cane purchase price K/t	Ton cane crushed to get one ton of sugar	Sugar selling price,	Tax per ton sugar	Sugar price after tax	Cane grower's share
	K/t	tons	'000K/Mt	'000K/Mt	'000K/Mt	%
State run system						
2006-07	13,500	11.76	521	57	463	34
2007-08	13,500	11.76	428	47	382	42
Privatized system						
2012-13	30,000	8.33	583	64	519	48

Source: Adapted from San Thein (2008).

Other contract farming arrangements have been less successful either because of the structure of the agreement (relatively informal) or because of weak relationships between the mill and growers. About seven sugar mills also operate their own nucleus farms.

Sugarcane production has strong market prospects through value adding, especially the conversion of molasses to ethanol and the co-generation of electricity. Production of sugarcane-based ethanol also has potential, given that there is significant rainfed land that could be used to expand production. Myanmar could also become a significant exporter of sugar and possibly ethanol as well (Thailand is the world's second largest sugar exporter). However, certification of social and environmental standards would likely be needed to gain duty free access to the EU under the Everything but Arms agreement.

To serve these potential markets, the Myanmar sugarcane industry needs to enhance its competitiveness. Production costs are about 30% above Thai costs and the opening of a free trade zone in 2015 adds urgency to further restructuring of the sugar industry that is still in transition from state to private hands. Considerable consolidation is needed to reap economies of scale by transiting to larger scale more efficient mills characteristic of Thailand with 15,000 TCD. This will require foreign investors with the needed capital and technology. One investor is currently exploring the opening of a large state-of-the-art operation in the hinterland where land is available for a nucleus estate that could be combined with outgrowers.

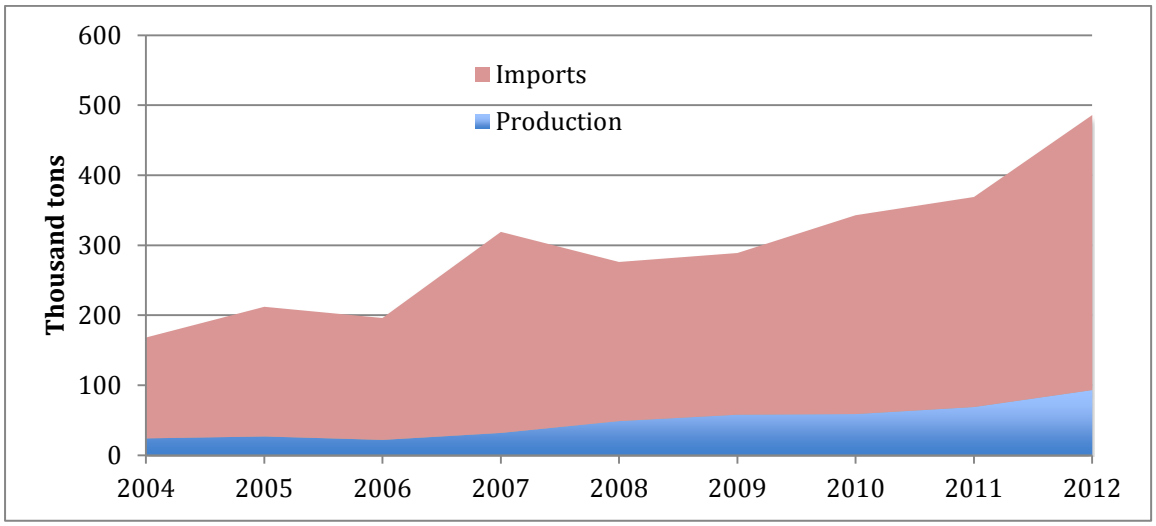
Provided a more equitable price sharing formula can be negotiated, a zoning policy for existing mills would enable them to expand and better utilize capacity, by guaranteeing that a mill would have sole rights to supply from a given area. Another priority is to relax land policies that currently restrict land conversion from paddy to other uses such as irrigated sugarcane.

3.2.5. Palm Oil

Palm oil accounts for over half of annual edible oil consumption of 850,000 tons in Myanmar, with over three quarters of palm oil imported and only about 80,000 tons produced locally. As imports have grown rapidly (Figure 11) from about 150,000 tons in 2004 to over 300,000 tons in recent years (400,000 Mt in 2012), the government has targeted edible oils and palm oil in particular as a strategic industry.

Large-scale oil palm cultivation is exclusively carried out in Tanintharyi Region as part of the government's program to provide land concessions to investors. Since 2000, at least 412,000 ha (1 million acres) have been allocated to 42 private firms of which about 129,000 ha (320,000 acres) have been planted (Win, Zaw, Bo Saing, and Yuzana Bo Saing 2013). Some 75% of oil palm is grown in Kawthaung District visited by the team. One company accounts for 70% of the oil palm area in the District and another for about 10% of the area sown. Very little progress has been made with the remaining 18 concessions in the district on which only about 10% of allotted area has been planted.

Figure 11. Palm Oil Production and Imports, Myanmar



Source: Win, Zaw, Bo Saing, and Yuzana Bo Saing 2013.

Four variants of business model are evident in the industry, all based on large-scale plantations.

- Very large vertically integrated company with plantation production on over 81,000 ha (200,000 acres), first stage crude palm oil (CPO) processing in two large-scale imported mills (each with a modern mill of 60 t/hr capacity), linked to a refinery in Yangon.
- Vertically integrated plantations (< 2,000 hectares) with relatively small locally manufactured mills of capacity of 2-5 t/hr that sell to the Yangon refinery. There were reported to be eight such private mills in Myanmar in 2009 (Favre and Kyaw Myint 2009).
- Stand-alone large plantations that sell fresh palm fruits to a nearby vertically integrated mill although most aspire to having their own mill. There are also a handful of SMFs who sell to a mill.
- State-owned plantations and mills, mostly very old and underperforming, and destined for privatization in the near future.

All private plantations are owned by domestic companies with the exceptions of one foreign direct investment company (Auto Industrial Group of Korea) and two joint ventures with a Malaysian company. None of the foreign investors appear to have any prior experience in palm oil.

Palm oil targets the bulk edible oils market. After liberalization of imports, the wholesale price of palm oil has fallen sharply to world price levels and palm oil prices are currently less than half of the other major edible oils such as groundnut oil and sesame oil (Han and Myint 2013). This provides strong incentives for further substitution of palm oil, mostly imported, for other edible oils.

A major question is whether domestic palm oil can compete with imports. Myanmar is just north of the generally recommended limit for palm oil production of 10 degrees N latitude and this may be exacerbated by a relatively long dry season and in the future, climate change. FAO-IIASA data estimates that about one million ha is of medium suitability for oil palm production in Myanmar, and none with good or excellent suitability. Yields at 2.5 CPO/ha (5 t/acre Fresh Fruit Bunches) are low relative to Malaysia (4.7 t/ha of CPO) but similar to Thailand. Low yields may reflect the fact that most plantations have not reached full maturity.

The three private plantations visited claim to be profitable and are expanding, helped by low land and labor costs.

Major constraints identified were poor roads and high transport costs (15% of the delivery price for one plantation), lack of financing for investing in mill capacity (now totaling about 260,000 tons of fresh fruit bunch), no systematic program to access suitable genetic stock, lack of adaptive research and location-specific technical information on production practices, and high turnover for migrant labor recruited and housed by the plantations.

A further major constraint is sustainability of the industry. Planting to date has generally taken place in more accessible areas where there may have been more competition (and conflict) with existing land users. Current and future expansion is likely to be at the expense of forests some of which are likely to be of high conservation value (HCV). There seems to have been little effort to demarcate HCV areas and even less effort to demarcate and conserve sensitive areas in laying out plantations (such as along streams and ridges and animal migration corridors).

Many of these constraints could be overcome by attracting responsible foreign companies with a track record in the industry and who have access to the latest technology and are committed to sustainable production through certification programs such as the Roundtable on Sustainable Palm Oil. To date, foreign investors (both approved and under consideration) do not appear to have any prior experience in oil palm, and present significant economic, social and environmental risks. A joint Malaysian Palm Oil Council - Myanmar Trade Fair was recently organized to attract FDI into the industry.

Furthermore, SMFs are virtually absent from the industry in contrast to the situation just across the border in Thailand where SMFs account for 80% of production (Annex 1). Responsible FDI could also attract SMFs into the industry as in the Nucleus Estate System in Indonesia the world's largest producer where 40% of oil palm area is now under SMFs (see Section 4.3).

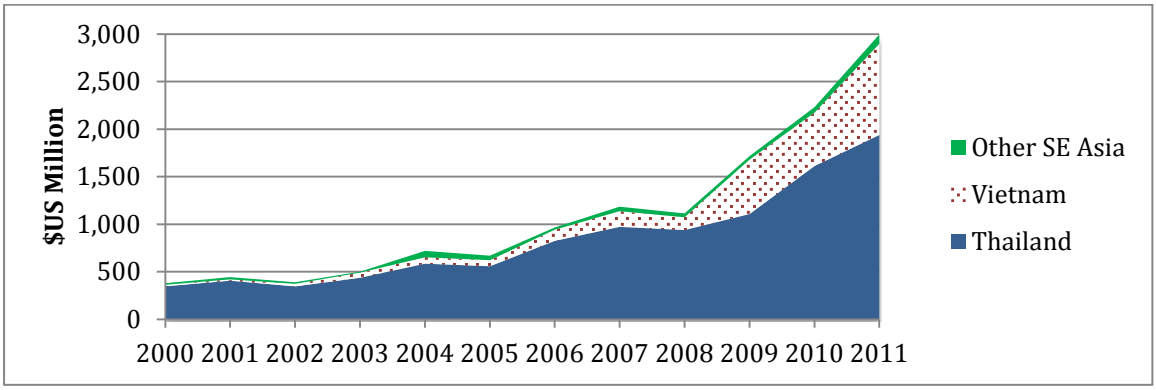
While there is little doubt that consumption of edible oils in Myanmar (currently well below the developing country average of 16.7 kg/capita/yr), will grow rapidly it is far from clear that Myanmar can achieve competitive import substitution based on its current business model of providing large concessions to inexperienced domestic and foreign investors to produce oil palm. Competitiveness could be enhanced by engaging investors with a track record in the industry and supporting SMFs with lower overhead costs to enter the industry.

3.2.6. Industrial Cassava

Our final value chain, cassava, is included as a major potential opportunity for Myanmar in what Howeler (2009) describes as Asia's next green revolution. In the 1970s, Thailand built a profitable cassava export business to the EU that made it the world's leading cassava exporter (Ekasingh et al. 2007). This market declined with changing EU policies in the 1990s. However, since then increased demand for domestic uses and for exports, primarily to China, has led to a boom in the industry in the past 15 years to reach over $3 billion dollars of sales. The industry also added value through downstream processing into starch and biofuel.

Likewise starting in the 1990s, Vietnam has become a significant cassava producer and the world's second largest exporter. Exports from Thailand and Vietnam of dry cassava chips and starch now amount to over $3 billion annually mostly to China (Figure 12).

Figure 12. Cassava Exports become a $US3 Billion Export Industry for Thailand and Vietnam



Source: FAOSTAT 2013.

One recent study identifies Vietnam as highly competitive in cassava relative to rice outside of the main Mekong delta region (Keyser, Jaffee, and Nguyen 2013).

Demand for cassava is being driven by markets for animal feed, starch, and bioethanol, all with strong growth. China has established a very large bioethanol factory in Guanxi that depends in part on imported cassava chips, and both Vietnam and Thailand have established biofuel mandates and bioethanol facilities based on cassava. By 2009, actual and installed capacity for ethanol from cassava would require 750,000 ha of cassava feedstock when fully online (Howeler 2009).

On the supply side, production increases have been provided from both increased area and yields. Thailand and Vietnam have made impressive gains in yields based on improved varieties and better management practices. Vietnam had lower yields than Myanmar in 1990s but since then yields in Vietnam have grown by nearly 6% annually to exceed Myanmar's by 40%.

Cassava is a minor crop in Myanmar that does not even merit a listing in the MOAI statistics. However, some independent SMFs in Kyone Pyaw Township produce cassava for a local SME starch factory. There is also one vertically integrated starch processor with a large land concession of 81,000 ha that is being developed in Kachin State for the export market. This concession has installed a factory with a rated capacity of 600 tons starch per day in Phakant Township, Kachin State. However, only about 4,000 ha of cassava has been planted in part due to a shortage of labor and local conflicts.

There is strong demand for cassava for starch, feed, and biofuels in both domestic and export markets. A business model built on SMFs and SMEs for processing offers the best prospects for building the industry as seen in the Thai and Vietnam cases. Partnerships with the International Center for Tropical Agriculture (CIAT) could facilitate access to germplasm, sustainable management practices, and institutional arrangements with processors.

The experience of Thailand and Vietnam shows that SMFs acting independently or under contract with SME processing units can be very competitive in capturing growing markets. Most of these farmers are relatively poor ethnic minorities in upland areas. Since cassava has to be processed quickly after harvest, contracts with groups of farmers have been successfully employed by Vietnam (Tuan 2014). An international NGO has provided facilitation and technical assistance to put such contracts in place for over 20,000 farmers in upland areas of

Vietnam. Contract farmers achieved incomes 18-55% higher than non-contracted farmers due to higher yields from private extension services and higher prices due to direct sales to factories (Janssen 2012). These experiences with SMFs provide Myanmar an alternative model to large land concessions for tapping booming cassava markets.

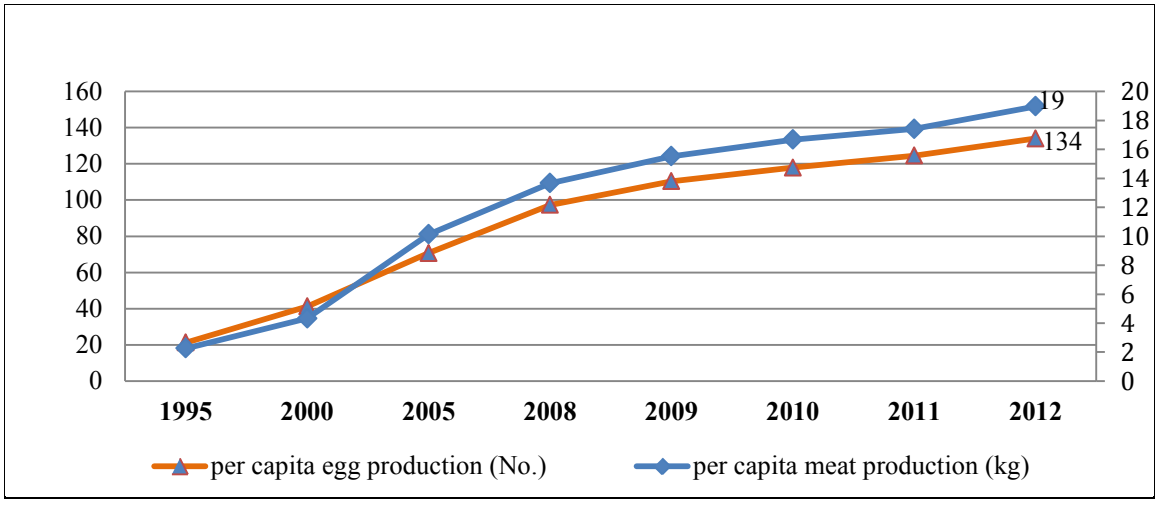
3.2.7. Poultry

For cultural and religious reasons, poultry is by far the most important meat consumed in Myanmar. Consumption has increased rapidly by almost tenfold from 1990 to reach about 20 kg per capita and provide nearly 60% of all meat consumed.

Poultry farming is concentrated in Shan State and in Mandalay, Sagaing, Yangon, Bago, and Ayeyarwaddy Regions. Traditional backyard poultry raising is being replaced by modern commercial systems for broiler and chicken egg that have propelled poultry into its leading role in the livestock sector (Figure 13). The sector has achieved an annual growth rate of over 10% annually since 1990 and although slowing somewhat is still growing at an impressive 6-7% annually. Prices of poultry meat are now below those of beef and pork in the Yangon market.[4]

The main business model for broiler production is contract farming, pioneered by CP Livestock from 1996. Although CP remains dominant, other companies have now also entered in contract farming. CP provides chicks, feeds, and vaccines on short-term credit to contract farmers as well as intensive advisory services for feed, health and building design. CP also provides long-term co-financing for building construction to about half of its farmers. The company buys the broilers at market-determined prices that it processes into fresh meat and processed meats such as sausage and chicken balls. Contract broiler farmers are on average relatively small with an average of about 3,000 birds. Figure 14 depicts the broiler value chain.

Figure 13. Per-capita Chicken Meat and Egg Production, Myanmar, 1995-2012



Source: Dept of Livestock personal communication.

[4]In 2011, low prices were partly due to avian flu on many broiler farms.

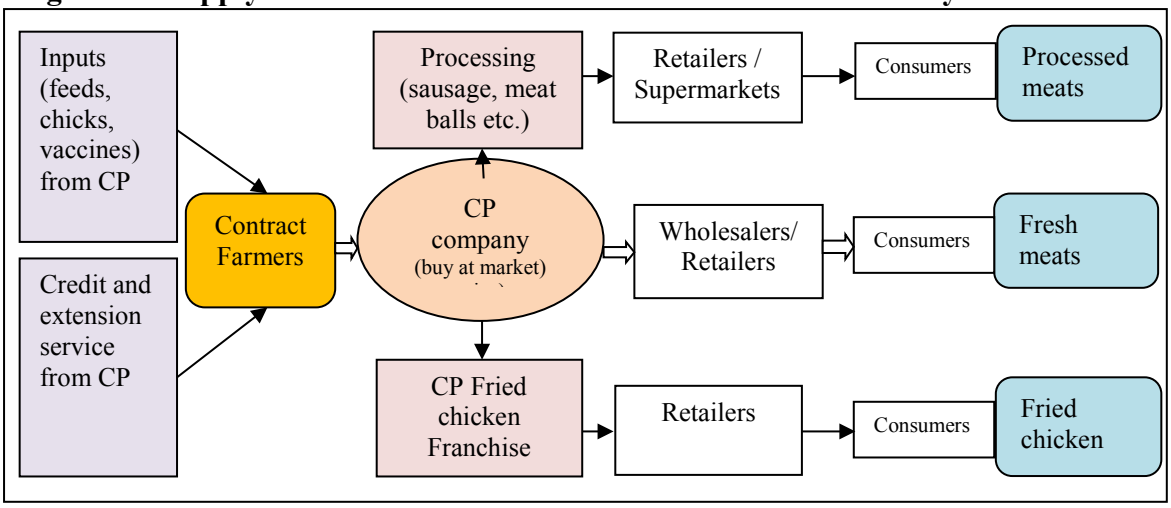
The business model for egg production is different in that individual farmers produce eggs without contracts but receive advice on design of the building, and feeding and health care from CP Company as part of its input sales unit. The farmers sell eggs in the open market.

Based on meeting with broiler producers in Taungyi Township of Shan State, the returns to land from both broiler production are significantly higher than vegetable production practiced near towns (such as garlic, mustard, cabbage, etc.). Farmers receive about $1,500-2,000 per year per acre from crop production while the same amount will be received within one and half months from broiler or egg production. After deducting all costs, it also appears that broiler producers are earning about double the rural daily wage per unit of labor and management invested.

The contract and individual farmer models being employed in the commercial poultry industry appears to be working well, as demonstrated by its rapid growth. However, the industry has been protected by a GOM ban on importing chicken meat and eggs for many years, although there is some informal cross-border trade from neighboring countries. It is thus not clear whether Myanmar producers can compete with large-scale mass production in neighboring countries, especially Thailand, after a regional free trade agreement take effect after 2015. Other major challenges are the volatility of prices of feedstuffs some of which are exported, (i.e., maize), while others (i.e., soybean meal), are largely imported, the high cost and lack of access to electricity, and the threat of Avian Flu epidemics.

If the industry can improve competitiveness, it has a bright future. Demand growth should continue with rising incomes, and Myanmar has the potential to source feeds locally, especially soy meal (although this has to be further analyzed). To increase scale in order to improve competitiveness, the industry faces a critical decision point on whether agribusiness companies themselves will vertically integrate into large-scale production or attempt to expand the scale of contract farming as has occurred in Thailand (about 10,000 birds per grower). Given the differences in institutional environment, it is not clear that the larger scale contract operations are feasible in Myanmar.

Figure 14. Supply Chain of Contract Broiler Production in the Study Area



Source: Field Visit 2013.

3.3. Synthesis of Business Models

The quick diagnosis of the seven value chains illustrated a range of business models being employed in Myanmar as well as their strengths and weaknesses (Table 7).

While each value chain has unique constraints and opportunities, common and well known cross-cutting constraints emerge for all or nearly all value chains—especially access to finance, electricity supply (for processing) and high transport costs—that affect agribusiness companies as well as SMEs and SMFs. In addition for small and medium farmers, lack of strong producer organizations, weak extension, and poor access to technology (especially seed technology) were common to most chains. In markets with many SMFs and SMEs, lack of value chain coordination and regulation was a major theme resulting in Myanmar's poor reputation for quality in many export markets (e.g., rubber, sesame). Contract farming is in its infancy and although good examples were seen, farmers are poorly organized to reap potential benefits from these arrangements.

The diagnosis also identified many potential areas of partnership of agribusiness and SMFs that are explored in the following section. In particular, the comparison of business models in Myanmar with those prevailing in the region suggests fruitful areas for exploring SMF-led value chains in Myanmar. This is particularly so for the industrial crops targeted by the concessions, rubber, oil palm, sugarcane, and cassava, crops in which Thailand and Vietnam have developed successful industries based on SMFs that have demonstrated competitiveness and sharply reduced poverty (Table 8).

Table 7. Summary of Business Models in Seven Value Chains (Number of * for Importance)

	Large vertically integrated agribusiness	Independent SMFs	Contract farming in integrated supply chain	Independent SMFs linked to privatized inputs (seed, feed)	Independent SMFs linked to SMEs in processing	Organized SMFs in collective action
Rubber	**				***	Potential
Oil palm	***		Potential			
Sugarcane	**		**			
Sesame		***	Potential (premium)		**	Potential
Maize			*	***		
Cassava (indust)	**	*	Potential		Potential	
Poultry			*** (broilers)	** (layers)		

Source: The authors.

Table 8. Comparison of Business Models in Myanmar with Those in Thailand and Vietnam

	Myanmar	Thailand	Vietnam
Rubber	SMFs and ABCs (dominate in non-traditional areas)	SMFs only	SMFS and large state farms
Oil palm	ABCs	SMFs (80%)	Not grown
Sugarcane	SMFs in contracts with ABCs and vertically integrated ABCs	SMFs in contracts with ABCs	NA
Cassava	Little production but ABCs expanding	SMFs only	SMFs only

Source: The Authors.

4. ATTRACTING MORE EFFICIENT AND INCLUSIVE BUSINESS MODELS IN MYANMAR

This section outlines a number of opportunities for building agribusiness for inclusive growth in Myanmar based on partnerships of agribusiness companies and SMFs. These opportunities have been selected from the value chain diagnosis of the previous section and are not a comprehensive set of priorities.

4.1. Attracting Private Investment (Including FDI)

Improving the investment climate is the highest priority in terms of increasing agribusiness investment from SMEs to larger domestic firms to foreign investment. This is especially true for agro-industry where the food-processing sector is set to grow rapidly to meet urban food demands. The food-processing sector is especially good for inclusive growth. Higher value can be captured through relatively simple changes, such as canning, fruit drying, packaging, and even simple labeling. These additions can be an important step for a farmer or SME to expand commercial activity and access higher-value markets. The growth of supermarkets will further propel demand for such products. A recent report from India, estimated that the employment multiplier of agro-processing is 2.5 times higher than for other manufacturing sectors (World Bank 2014).

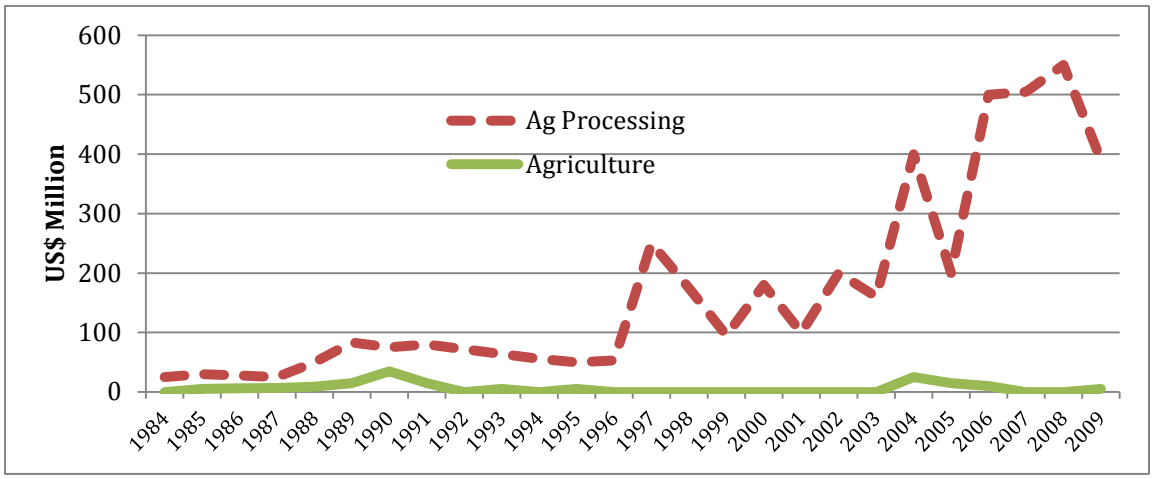
Beyond the investment climate (including infrastructure) the other major determinants of growth in Indian agro-industry were agricultural productivity and access to credit. These findings underscore the central role of increasing productivity of SMFs in Myanmar and repositioning of Myanmar's banking sector toward agro-industry. AgriFin supported by the Bill and Melinda Gates Foundation has had some successes in building capacity of banks to recognize and evaluate investments in agro-industry (http://www.agrifinfacility.org/).

Foresight and oversight of large agribusiness investment is also required to achieve positive development outcomes. A Myanmar Investment Commission (MIC) with 9 members and a Proposal Scrutinizing Committee with high-ranking officials from 10 departments was established in 2012. MIC is intended as a one-stop service center to facilitate investment. Further a new Foreign Direct Investment Law was designed and approved in November 2012, replacing the Foreign Investment Law of 1988. The FDI Law and subsequently issued rules give the MIC discretionary powers to seek government approval to allow investments in otherwise off-limits areas.

Foreign investments as well as large domestic investments require MIC approval and major incentives such as tax holidays and land leasing are at the discretion of the MIC.[5] Thus foreign investors are permitted to lease land from the state or private owners for an initial term of 50 years and subject to approval from the MIC, two further extensions of 10 years each. However, use of such incentives, especially on land concessions, carries significant risks as we discuss later. In addition, the land provisions in the Foreign Investment Law differ from the new VFV Land Law that stipulates land concessions for 30 years with up to two ten-year extensions.

[5] The threshold investment amount requiring MIC approval has yet to be established.

Figure 15. FDI into Food Processing, and Farming, Thailand



Source: Suphanachart and Thirawat 2011.

Some restrictions are exclusively targeted on foreign investment in agribusiness. With the motive to stimulate technology transfer, only joint ventures with majority national ownership are allowed in seed, fertilizer and pesticide, and rice and pulse milling. To protect and promote small and medium enterprises, 100% foreign ownership in food processing or value-added production for export is allowed but not for domestic markets. A relatively liberal attitude to FDI in land-related investments while severely restricting FDI in input and processing sectors is inconsistent with global norms. Over 90% of all FDI in the agricultural and food systems is in the agricultural input industry and food processing and retail so that FDI in farming, outside of a few countries is not common. For example, Thailand has developed a vibrant agricultural input and processing sectors through FDI (Figure 15) while banning investment in farming itself. Thus Myanmar needs to re-orient FDI toward food processing and agricultural inputs by lifting restrictions, especially in labor-intensive and internationally competitive sectors (e.g., rice mills, oil mills, food processing, seed industry, etc.). At the same time, FDI's role directly in farming should be carefully rationalized and scrutinized.

Above all, the government should have a clear strategic vision of development, and of the types of investment that are best suited to advance that vision. The MIC has to provide prospective investors with information and guidance on priorities. It also needs capacity (including transparent and accountable units in various ministries) to provide technical scrutiny of proposals and the capacity to manage investment processes. A vibrant civil society and parliamentary oversight can hold government and business to account. It must also have the capacity to ensure that agribusiness projects contribute to social and environmental sustainability.

A long-term foreign investment promotion plan (for 20 years) is being prepared by DICA with technical assistance from the Japan International Cooperation Agency. Institutional strengthening of DICA is urgently needed to screen projects and investors and assess progress. DICA already has a capacity building program (with help of the *Deutsche Gesellschaft für Internationale Zusammenarbeit*, GIZ) to share information, implement a one-stop service for company registration, and provide export and import licenses. Moreover, the integration of the Myanmar Citizen Investment Law (governing investments by domestic companies) and the Foreign Investment Law is being considered in order to harmonize with other ASEAN countries that have only one investment law.

The newly established Department of Environmental Conservation under the Ministry of Environmental Conservation and Forestry takes responsibility to assess investment proposals and decide whether an environment and social impact assessment (ESIA) is required. After the investors have carried out the ESIA, the Department has to review and provide recommendation to MIC on whether the proposal is acceptable. The Department also requires human resource development and capacity building to effectively play these roles.

Finally, the Myanmar Center for Responsible Business is undertaking Sector Wide Impact Assessment (SWIA) to assess the complete picture of the potential impact of a business sector on Myanmar society and on its enjoyment of human rights. A SWIA of agribusiness is planned for 2014 that is likely to highlight significant social and environmental risks of the current agribusiness portfolio built on large land concessions.

All these efforts should aim with the minimum of bureaucracy to attract 'good' investors and screen for due diligence in order to maximize economic and social outcomes and reduce environmental risks. Government incentives to investors through tax holidays and infrastructural zones and corridors may well be part of the package, but other incentives such as cheap land and credit distort prices and raise risks.

4.2. Building a Private Seed Industry

Agribusiness investment in the seed industry can be a major driver of increased productivity of SMFs. This is especially the case for hybrid seed where the need to purchase seed annually provides a reliable market for private companies to invest. Even for major crops such as rice where seed can be saved a viable private seed industry can quickly develop based on a mature public plant breeding industry that provides a regular supply of new varieties and associated foundation seed. In tree crops too, private nurseries can be an important vehicle for disseminating improved and high quality genetic material.

The hybrid seed industry is quickly developing in Myanmar led by maize, with activity also in cotton and vegetables, and future prospects for hybrid rice (MOAI has leased ShweTaung Farm for five years to a company for hybrid rice seed). However, the hybrid maize seed industry is dominated by one company that has yet to develop a local breeding program. Rice seed production is still dominated by the state although some private companies have now entered the market. Most farmers are using low quality seed of old varieties that seriously undermine profitability (Dolly Kyaw, Tin Htut, and Hnin Yu Lwin forthcoming). Supply of quality planting materials for tree crops such as rubber is severely limited. Farmers often rely on imported seeds from neighboring countries for production of rubber, palm oil, and vegetables. Sometimes this means unregulated distribution of low quality and unsuitable materials.

Clearly there is much room for growth of a competitive private seed industry. The state can support this growth by providing a basic regulatory framework and open and easy access to germplasm from public breeding programs. In Myanmar, a seed law was enacted on 7thJanuary, 2011 by the State Peace and Development Council. However, draft rules to implement the seed law are still pending approval despite the lapse of the two-year grace period for implementation of the seed law (Tin Htut Oo and Tin Maung Shwe 2013).

A strong public breeding program that provides quality foundation seed and inbreds to private companies is also essential to stimulate a dynamic private seed industry. The provision of maize inbred by public breeding programs in India provided the impetus to the establishment of dozens of SME hybrid seed companies (Suresh, Singh, and Morris 1998).

Likewise, in India, rice seed in the major rice growing areas of India has long been provided by large numbers of private companies that multiply and sell varieties developed by the public sector (Tripp and Pal 2001).

The state could also support the private seed industry by selling off old and outdated seed farms and seed processing units to private investors with a track record in the seed industry. It can also support the industry through training in seed science and seed quality control and establishing seed testing laboratory to ensure the quality of commercial seed.

4.3. Promoting Contract Farming

The government of Myanmar has aggressively promoted contract farming for a range of products. There is a long tradition and often sorry history of informal *contract farming* usually between traders or input dealer and Myanmar farmers to finance inputs (e.g., Adas 2011). Here, we use the term contract farming to denote a formal written agreement where the company provides advisory services, an assured market for the product, and sometimes also working capital or inputs, in return for an assured supply of a product of specified standard at a given time. Contract farming is not a panacea and generally "cannot serve as a strategy for broad-based rural development because it only makes economic sense for certain products in certain markets" (Minot 2007).

4.3.1. Which Products Are Suited for Contract Farming?

Contract farming works for products that have to be processed or shipped quickly or products that provide a price premium for demanding standards, so that contracts can be enforced readily by processors or shippers with quasi-monopsony powers. It can also be employed to introduce new crops in new areas provided additional risks to farmers are addressed in the contract. Contracts are used widely in sugarcane, oil palm, poultry, and export horticulture, and most evaluations indicate positive benefits for SMF participants and sometimes-positive spillovers to other farm enterprises and neighbors. However, contract farmers tend to be larger and better resourced and special support measures are generally needed to include woman and landless households (a good example is the BRAC contract farming program for poultry in Bangladesh (Jabbah 2007)).

In Myanmar, contract farming for broiler poultry based on a well-tried model seems to be working well. Likewise, there are good prospects for contract farming of horticultural products such as the recently initiated venture by PEPSICO with potato growers in Shan State. However, attempts to extend contract farming to rice have run into major problems of loan default and side selling. In addition, a recent evaluation indicates that benefits to participating farmers are marginal, especially in terms of improved productivity. This outcome is not surprising given global experience with contract farming of staple foods—CP for example, had two failed attempts to develop contract farming for rice in Thailand (Annex 1). However, for high quality export rice that commands a premium in world markets, contract farming may be appropriate as seen in examples from Cambodia (Cai, Setboonsarng, and Leung 2008) and Vietnam's An Giang Plant Protection Joint Stock Company (Box 5). The payment of a premium price ensures that farmers sell to the company and repay loans.

Box 5. Contract Farming of Rice in Vietnam

AnGiang Plant Protection Joint Stock Company (AGPPS) has been implementing an ambitious program of contract farming of rice in the Mekong Delta region since 2006 now reaching 15,000 farmers with a total rice area of 28,500 ha. AGPPS has invested in a large modern mill targeted at 200,000 t/year capacity to market a premium brand rice of high quality and purity to both domestic and export markets. AGPPS provides quality inputs, machinery hire services, advisory services, and transport and storage at the mill in return for a guaranteed price set above market prices to reward premium quality. In 2013, contract growers achieved average yields of 6.5 t/ha and a net return to working capital of 97% (not including land and management costs).

Source: An Giang Plant Protection Joint Stock Company 2013.

Could contract farming work for perennial crops where it is much more difficult to fix prices and other contract provisions given the long gestation period from planting to a positive cash flow? One option for involving SMFs in industrial crop production (rubber, sugarcane, and oil palm) is through nucleus estate with outgrower schemes that have been used with mixed success for perennial crops in many settings. Typically, the company invests in a processing mill and an associated nucleus estate and in return for the land concession for the nucleus estate the company provides technical advice and inputs to associated outgrowers who are obliged to sell to the mill according to an agreed pricing formula. Occasionally the company might finance long-term investment in the outgrower plantation but most commonly, this financing is arranged through a tripartite agreement with a bank (often state owned).

Box 6. Rubber – Options for Contract Farming

Considerable interest was expressed by a number of stakeholders in Myanmar in the possibility of contract farming for rubber, especially to overcome the serious financial constraints faced by many SMFs in planting high yielding clonal rubber (which requires at least double the investment of traditional rubber seedlings) and upgrading processing equipment to improve quality. Contract farming of rubber based on a nucleus estate and outgrower model was extensively tried in Indonesia with very mixed results (Dove 2011). This was largely because rubber can be processed and sold independently of the nucleus company and contracts and loan repayment are difficult to monitor and enforce, given the long lead time from planting to maturity for rubber. Nonetheless, responding to controversy over large land concessions, rubber companies in both Cambodia and Laos have set up so-called 2+3 contracts in which smallholders provide land and labor (the 2) and the companies provide the technology, capital, and access to markets (the 3). It is too early to evaluate these schemes but they are likely to face similar issues of contract enforcement and contract disputes since many details of the contracts such as the setting of rubber prices are vague (Hicks et al. 2009).

One model that does seem to be working is the Ghana Rubber Estates that supports 5,450 farmers in a tripartite arrangement with state-owned banks. Four factors contribute to this success: (i) farmers are already rubber growers so that the technical assistance and financing is for upgrading existing plantations, (ii) farmers are organized into a strong Rubber Outgrowers and Agents Association that negotiates with the company, (iii) farmers have secure title to their land to underwrite long-term financing, and (iv) loan repayment is based on a price formula fixed against the Singapore Exchange average price that is calculated to reduce risks in times of low prices (Paglietti and Sabrie 2012).

A modification of this option, as suggested by one private investor in Myanmar, would be to contract for management and quality upgrading with existing growers and their existing trees. This would reduce risks since financing would be short term and the emphasis on higher quality products such as latex concentrate would reduce side selling. Once strong farmer organizations and mutual trust are established between a company and the farmer organization, support to outgrowers could move to long-term financing to upgrade to high yielding rubber clones.

Outgrower and other contract arrangements in tree crops work best for oil palm and sugarcane that have to be processed nearby in large mills. This model could be more widely applied for these crops in Myanmar, as demonstrated by the apparent success of the Naywady Sugar Company (after prolonged struggling under the previous government- controlled inputs and output pricing mechanism). The major barrier is likely to be access to long-term finance for the outgrowers to make it attractive for companies to enter such schemes. A private bank provides this service in the case of Naywady Sugar Company for longer-term loans for tractors and small trucks. It is much less clear that contract or outgrower scheme would work for rubber a crop that is easily processed at small-scale on the farm. Indeed the experiences to date are not promising although some form of short-term contracting to upgrade existing plantations might work (Box 6 above).

4.3.2. Making Contracts Work Better for SMFs in Myanmar

Contract farming is still in its infancy in Myanmar and much could be done to promote more transparent and equitable contracts. Given that companies may have monopsony buying power, there is a risk that farmers will be exploited. Likewise, companies risk losses if farmers side sell when market prices rise above the agreed price. FAO has recently drawn up guiding principles for responsible contract farming (FAO 2012) and a number of detailed manuals on setting up contract farming schemes are available that lay out good practice for contractual processes such as quality specifications, transport arrangements, pricing, loan repayment, and dispute resolution (e.g., USAID 2013; Will 2013).

Risks of contracts to both growers and companies can be mitigated through actions that strengthen farmer organizations and their ability to negotiate fair deals with companies in return for farmer organizations helping to enforce contracts with their members. Provision of information (market prices, for example), model contracts for different products, and an independent facility to test compliance with agreed and tightly specified standards can also support farmers' bargaining position. A third party mechanism can also be nominated in contracts to provide an informal dispute mechanism since seeking redress through the court system would involve high transaction costs and time, beyond the reach of most SMFs.[6]

For commodity crops such as sugarcane, a negotiated price formula based on a given percent of the price in a major commodity exchange (e.g., Bangkok) can be used to increase transparency.

Box 7. Roles of Civil Society in Contract Farming

Civil society has important roles in facilitating contract farming in ways that maximize benefits to farmers. Non-governmental Organizations (NGOs) can often be important in helping to build the capacity of farmer organizations to be effective agents of change. NGOs, especially international NGOs that are experienced in contract farming can also facilitate negotiation of contracts with ABCs by providing basic information on expected value addition by processors or traders and key clauses in contracts to protect farmer benefits. They may also help broker tripartite agreements with banks for financing as well as provide access to information on new market opportunities.

[6]The team observed that contracts being signed by farmers have no legal basis anyway since they are not registered.

Tripartite agreements with banks can also reduce startup risks to investors, by co-financing initial investment costs for SMFs, such as tree crop establishment or irrigation. Alternatively, approval of land concessions could be made contingent on including a specified percent of area under SMFs under contractual arrangements (Section 5).

Finally, although contracts may be legally covered by standard contract legislation, many countries including India, Thailand and Vietnam, have specific legislation to govern the special needs of contract farming. These countries also have government units to implement the legislation, facilitate contracting, and monitor progress. The relevance of these examples for Myanmar should be further studied in relation to the extremely poor ranking of Myanmar on contract enforcement in the World Bank's Doing Business Indicators.

4.4. Using Collective Action by Industry to Finance Services

Given the serious weakness of public sector research, extension, and marketing services in Myanmar, a logical response is for agricultural producers and processors to provide new and more stable sources of funding for providing these services for selected value chains. Countries as diverse as Australia, Colombia, Sri Lanka, Thailand, and Malaysia have established global competitiveness based on a small levy or cess of the order of about 1% of production or export value. Such levies work best for commercial crops such as rubber, oil palm, sugarcane, and even rice and pulses that are exported or pass through a few large mills. They are usually administered through some type of public-private partnership, sometimes matched by government funding. Reviews have generally shown that when industry associations including producers, processors, and traders are in the driver's seat, R&D is more efficient and relevant (Byerlee 2011).

Levies are usually legislated, often at the request of the industry, in order to avoid free riders. The institutional arrangements under which the industry funds are allocated to R&D also vary considerably (Table 9).

- Most common is a legally required levy that is managed by an industry council or board with official status, which oversees its own in house services such as a research institute. A good example is the Malaysian Palm Oil Board with its own research institute and the Thai Office of Rubber Replanting Aid Fund (ORRAF) that provides grants to farmers to plant high yield clones. The influence of producer and processing associations on these boards may be quite variable but the general trend has been to increase the power of industry associations in their governance at the expense of the state.
- Another model is for a private industry association to govern the funds and manage the provision of services, although supporting legislation is usually needed to ensure that the levy is universally collected. The eight commodity associations in Colombia are organized on this basis with each having its own research institute and some such as the coffee association providing a wide range of services.
- Alternatively a legally required levy is managed by either a parastatal or an industry governed fund that sets priorities and contracts public or private organizations to conduct the research and other services. The Australian Research and Development Centers set up for each major commodity with matching government funds is a good example of this type of structure. Another good example for Myanmar is *Fonds Interprofessionnel pour la Recherche et le Conseil Agricoles* (FIRCA) that supports R&D, extension and building of producer organizations for coffee, cocoa, oil palm, rubber and rice in Cote d'Ivoire.

Table 9. Examples of Research and Other Services Funded by an Industry Levy or Cess

Administrative status	Own research institute	Outsources services usually to public research organizations
Parastatal board or council	Malaysian Oil Palm Board (R, Q) Malaysian Oil Palm Council (M) ORRAF (rubber), Thailand (R, E, G) TSHDA (tea), Sri Lanka (E, G, M)	RDCs Australia (R) (one for each major crop)
Private industry association or council	CENIPALMA, Colombia (oil palm) (R, E) FEDECAFE, Colombia (coffee) (R, E, G, Q, M)	FIRCA, Cot d'Ivoire (R, E, POs) (all commercial crops)

Note: R = R&D, E = Extension, G = grants to producers, Q = Quality control, M = Market promotion, POs = Support to producer organizations.

The range of activities financed by these schemes varies. They nearly always include R&D but also often include extension and sometimes services downstream in the value chain such as quality control and market promotion (Table 9). Some levies also fund replanting grants to upgrade tree crop plantations.

Obviously the potential of levies depends on the ease of implementation. Crops that are formally exported commonly have a levy, since they pass through one or a very few ports. In addition, most commercial production that passes through a small number of mills can be levied. Sugarcane, oil palm and some oilseeds are in this category, since they mostly pass through a few fairly large-scale mills. The levy may apply also to imports such as palm oil.

In addition, a minimum threshold industry size is needed to introduce a levy, since the levy generated has to be large enough to cover the costs of collecting and managing it.

Byerlee (2011) arbitrarily set the threshold industry size at $US100 million per country; a 1% levy on such an industry would generate at least $US1 million for R&D, sufficient to fund a small research institute.

Finally, even without a levy, collective action by industry can strengthen market institutions for all. One such example would be the development of commodity exchanges as a way to improve market information, encourage storage, standardize grades, facilitate access to finance, and reduce risk through the use of futures and options. For products such as pulses, where Myanmar is the leading exporter, Yangon could become the focal exchange of the region. Logically this would begin with upgrading the current trading floor to electronic trading for spot markets and forward contracting, integrating with existing information and trading systems. The private sector through the Pulses and Beans Association of Myanmar should take the lead, while the public sector provides regulatory oversight. Only after the credibility of the exchange and market volume are established should consideration be given to introducing futures and options. There are advisory services on creating commodity exchanges in frontier markets such as http://eleniexchanges.com/.

5. MANAGING LARGE-SCALE LAND CONCESSIONS

Although the allocation of large land concessions in Myanmar appears to have slowed, the process is still highly flawed. Appropriate land banks of available land have not been mapped out, contracts are awarded without open consultation with key stakeholders (especially with local communities), and the MOAI has weak capacity to monitor implementation. Moreover, no attention has been given to models that would share benefits more widely. We therefore strongly advocate a freeze on awarding further concessions until a more transparent and equitable process is put in place and the backlog of conflicts and ambiguities of existing contracts has been cleared. This follows the experience in both Cambodia and Laos where after recurring problems of land conflicts and illegal deforestation, both countries have imposed a moratorium on further concessions.

To ensure better outcomes of investments involving the acquisition of farmland, investment proposals should be screened for responsible practices to maximize opportunities and minimize risks in terms of economic, social, and environmental outcomes. Several international organizations have identified seven principles for responsible agro-investment, which are being refined through consultations with a range of stakeholders. These draft principles relate largely to issues surrounding land acquisition and the rights of local communities and land users (Box 8). FAO's recently approved Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries, and Forests provide even more specific guidance on respect to land rights. Effective implementation of these principle and guidelines requires a broad effort to develop capacity and raise awareness among potential investors and government agencies. One way to do this is through a rigorous process of Environmental and Social Impact Assessment prior to approval, as being planned by the MoECAF. For commodities where there are recognized private voluntary standards, such as the Roundtable on Sustainable Palm Oil and the Better Sugar Initiative, a condition for awarding the concession could be to require certification for these standards, even when a commodity is not exported.

Box 8. Principles for Responsible Agro-investment

Principle 1. Respecting land and resource rights. Existing rights to land and associated natural resources are recognized and respected.

Principle 2. Ensuring food security. Investments do not jeopardize food security but strengthen it.

Principle 3. Ensuring transparency, good governance, and a proper enabling environment. Processes for acquiring land and other resources and then making associated investments are transparent and monitored, ensuring the accountability of all stakeholders, within a proper legal, regulatory, and business environment.

Principle 4. Consultation and participation. All those materially affected are consulted, and the agreements from consultations are recorded and enforced.

Principle 5. Responsible agro-investing. Investors ensure that projects respect the rule of law, reflect industry best practice, are viable economically, and result in durable shared value.

Principle 6. Social sustainability. Investments generate desirable social and distributional impacts and do not increase vulnerability

Principle 7. Environmental sustainability. Environmental impacts of a project are quantified and measures taken to encourage sustainable resource use while minimizing and mitigating the risk and magnitude of negative impacts.

Source: World Bank 2014.

A first priority should be to encourage investors to focus on enhancing the productivity of existing land users. Many investors fail to recognize that the most efficient (and equitable) way of investing is through arrangements with SMFs. Such investments can sidestep land transactions, avoid labor recruitment and management issues, and promote wider sharing of benefits while reducing capital and management overheads for investors. One approach already discussed is through contracting and outgrower schemes (see Section 4.3).

5.1. Improving the Process for New Concessions

As part of the Responsible Agribusiness Investment Initiative, the World Bank has laid out a number of steps to improve outcomes from land concessions (Deininger and Byerlee 2011; World Bank 2013).

Before providing new concessions, available land and existing use rights should be carefully identified and mapped. A critical step to better investment outcomes is to map degraded forestland and VFV land by crop suitability, irrigation potential, environmental sensitivity, and available infrastructure in order to indicate where investments can provide the highest benefits based on agro-ecological endowments and existing land uses. This exercise should be combined with mapping and documenting existing rights on a systematic basis, as well as building capacity of local populations on how to manage their land assets most effectively. With full community participation and agreement, land banks of available land and associated holders of rights to that land can be identified to facilitate access by investors.

Transfers of land to investors should be based on existing users' voluntary and informed agreement and fair compensation. To create these preconditions, local people need to be aware of their rights, the value of their land, and ways to contract. Civil society can help build capacity in analyzing investment proposals, negotiating with investors, monitoring performance, and ensuring compliance. To provide a basis for negotiating fair compensation in the absence of land markets, communities need to be able to assess the potential return to the land.

If they are to perform their respective functions effectively, all stakeholders need access to accurate and transparent information on opportunities, actual transfers, and the technical details of large investments. Information on contracts, rights, and land use plans should be publicly available to help local people and other stakeholders monitor the performance of investments and of public institutions. State and Regional authorities should be in the driver's seat in land allocation provided they are transparent, representative, and accountable. The Union government with the support of development partners should provide technical assistance to help local authorities—for example, by further developing the land cadastre to be electronically accessible and model lease contracts. Investors should be willing to commit to long-term investments, pay fair rents on land and water, and provide other economic and social benefits in exchange for secured land rights.

State authorities can encourage equity shares by local communities in emerging companies. Even where production is on a large scale**,** there are a growing number of examples of local communities owning equity in agribusiness companies. These arrangements, often promoted by the companies themselves or underwritten by donors, may be part of land deals with local communities or designed to build and reward employee and local community support.

Investor agreements can transfer technology, skills, and social services to local communities, even without contract farming or outgrower arrangements. Some investors such as CP have also supported local schools and health clinics. In the short run, these actions may be

regarded as a form of corporate social responsibility, but in the long run, companies should view them as good business practice for reducing conflict and widening market opportunities. These arrangements could be formalized as part of foreign investment deals.

5.2. Monitoring Existing Concessions

For existing concessions, the highest priority is to establish a geo-referenced open database that provides details on GIS coordinates, the investor, the investment plan targets for total investment and jobs, and the current status in terms of the area sown, infrastructure developed etc. Examples are provided by Laos, where the database was a collaborative effort between international partners and the Ministry of Natural Resources and the Environment (Box 9), and Cambodia where the database has been developed by civil society through a crowd sourcing approach to supplement official records which were deemed incomplete (http://www.opendevelopmentcambodia.net/).

Monitoring of concessions against investment plans is critical to ensure that concessions are achieving their objectives. This will require greater field presence of and mobility of MOAI staff in areas where concessions are concentrated, combined with use of modern tools such as remote sensing. Even the use of a simple tool like Google Earth allows easy identification of area planted to some crops, such as oil palm. In addition, clear rules and processes are needed for cancellation of non-performing concessions or concessions that have violated contracts in other ways.

5.3. Allocating VFV Land to the Landless

The combination of a large number of landless or near landless with apparently large areas of underutilized land suitable for agriculture provides substantial potential for programs to distribute available land to poor rural families as an alternative to large land concessions to investors.[7]

Box 9. The State Land Lease and Concessions Inventory, Laos

In response to mounting backlash from civil society, local communities, and international partners on continuing large land concessions, the Ministry of Natural Resources and the Environment of Laos with support from development partners has developed a detailed GIS-referenced database on land leases and concessions. The objective of this exercise was to take stock of existing land concessions that have increased rapidly since 2000 and enhance transparency to all stakeholders. The database includes 2,642 land deals totally over 1.1 M ha. Some 213 of these are over 500 ha. Field visits were made to half of the project to geo-reference coordinates and assess progress on the ground. This GIS data base is then being overlaid with other spatial data bases on poverty, villages, land use, and roads, to better inform decision makers on potential impacts.

Source: Schönweger et al. 2012.

[7] This strategy is going to be increasingly important as mechanization of paddy harvesting removes a key earning opportunity from landless households' daily wage portfolio.

This may entail at least three options of increasing complexity and investment costs:

- **Option 1.** In areas where farmers have already 'encroached' into degraded forest lands, undertake a systematic program of formal conversion of forest land to titled farmland combined with public investment in basic physical and social infrastructure. Thailand for example, registered some 1.5 million smallholders in what were previously classified as forest lands.

- **Option 2.** Organize settlement schemes in available land through participatory planning and approval processes at the community and district levels. For example, Cambodia with support from development partners is now allocating land to Social Land Concessions (SLCs). The SLCs use a bottom up process to identify suitable land areas and potential settlers along with transparent criteria for selecting settlers and allocating land. The Land Allocation for Social and Economic Development Project supported by the World Bank and GIZ is settling some 3,000 smallholders on about 10,000 ha of land over a five-year period. In addition to demarcating and registering land plots, the project provides subsistence grants in the first year for settlers as well as grants for community infrastructure such as roads, small-scale irrigation, schools, extension, and marketing support. Progress to date has been good but it will be challenging to scale up given weak local capacity and a cost of about $4,000 per settler.

- **Option 3.** An even more ambitious approach is to support settlement associated with perennial crops. The well-known Federal Land Development Authority (FELDA) in Malaysia initiated in 1956 allocated an average of 4 ha of mostly tree crops (rubber and oil palm) to over 100,000 poor families. Although settlers were provided long term loans (up to 15 years), costs were high, and strong capacity was required by FELDA to implement the schemes.

These approaches should be reviewed as a complement to large land concessions in Myanmar. Clearly strong support from development partners will be needed to underwrite costs, especially for options two and three.

5.4. Strengthening Farmland Governance

There are many issues on land governance that are being addressed by a variety of stakeholders, and most are outside of the focus of this report. However, given ongoing granting of concessions, a major priority is to protect the land rights of traditional land users operating under customary tenure, including rights associated with land in long fallows, and land used for grazing and forest products. A promising step is the use of group certification of customary lands that is being piloted by the Land Core Group. Since much of this land has not been surveyed, this may entail significant investment by the GoM and partners.

Such certification efforts need to be accompanied by capacity building at village level to improve awareness and understanding of land laws. Eventually, local communities with secure customary land titles may be willing to negotiate their own deals with agribusiness companies that would provide benefits through fair land rents or through equity shares in plantations. Such awareness campaigns should be extended to investors not only in terms of principles and guidelines for responsible investment discussed above, but also the role and benefits of shifting cultivation that is widely disparaged for not being modern agriculture. At the same time, civil society and others need to recognize that shifting cultivation is unlikely to move people out of poverty and in the long run with population growth becomes unsustainable. However, there are promising options for these farmers to improve

agroforestry fallows as well as establish diversified permanent tree crop systems, such as agroforestry rubber and community forest plantations. Experiences from Thailand and Indonesia provide good examples to draw from (Wibawa et al. 2005; Viswanathan 2008).

Other land governance issues observed by the team are the granting of forestland to SMFs that cannot be transferred without ministerial approval, the lack of rights of those who have migrated and settled into previously forest land, and the restrictions on what crops can be produced on what type of land now enshrined in the land certificate. Myanmar should consider inviting the Land Governance Assessment Framework led by the World Bank and a number of partners to carry out a land governance analysis according to an agreed framework, in order to establish a baseline against best practice, and provide a comparator with nearby countries.[8]

8 http://web.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTPROGRAMS/EXTARDR/EXTLGA/0,,contentMDK:22793966~pagePK:64168427~piPK:64168435~theSitePK:7630425,00.html

6. FINAL WORD: THE "LONG GAME" AND "QUICK WINS"

In this report, we have identified a number of priorities for moving forward. There are some opportunities for interventions that might provide quick wins in the short term (Table 10). Returning to the value chains reviewed, these might include interventions to facilitate short-term contracting with SMF rubber farmers to upgrade quality from existing plantations, contracting of sesame producers for higher value markets (either domestic or export), coordinating SMFs an SMEs to initiate cassava production and processing for export, and a program to demonstrate the potential of hybrid maize in the delta regions using shallow tube wells.

However, impacts of support to these value chains will be more broadly distributed and more sustainable if the GoM adopts the long game advocated by Haggblade et al. (2013). This strategy would emphasize increased public investment in research, extension, agricultural education, and irrigation, together with support to building marketing, financial and land institutions. Coupled with an optimistic outlook for agriculture and food markets, such an approach offers the potential for both SMFs and agribusiness firms to mutually contribute to and benefit from the long-term inclusive growth of the sector.

Table 10. Possible Quick Wins for the Selected Value Chains

Crop	Opportunity	Next steps	Possible study tours
Sesame	Contract farming for high value domestic and foreign markets.	Review market opportunities and quality requirements. Discuss with existing processors and exporters	India or Ethiopia
Maize	Irrigated maize in the cool season in the Ayewaddy Region	Study opportunities for shallow tube well irrigation. Discuss prospects with private seed companies, pump vendors, and banks	Bangladesh
Rubber	Short-term contracts to upgrade existing plantations of SMFs	Review opportunities with potential investors	Thailand
Cassava	Cassava exports to China by SMFs possibly under contract	Request review of opportunities led by CIAT	Vietnam
Sugarcane	Include requirement of SMF outgrowers as part of planned FDI in the industry	Discuss opportunities with foreign investors and MIC	Thailand

Source: The authors.

ANNEXES

ANNEX 1. THAILAND—A MODEL FOR PRIVATE-SECTOR DRIVEN SMALLHOLDER-BASED GROWTH

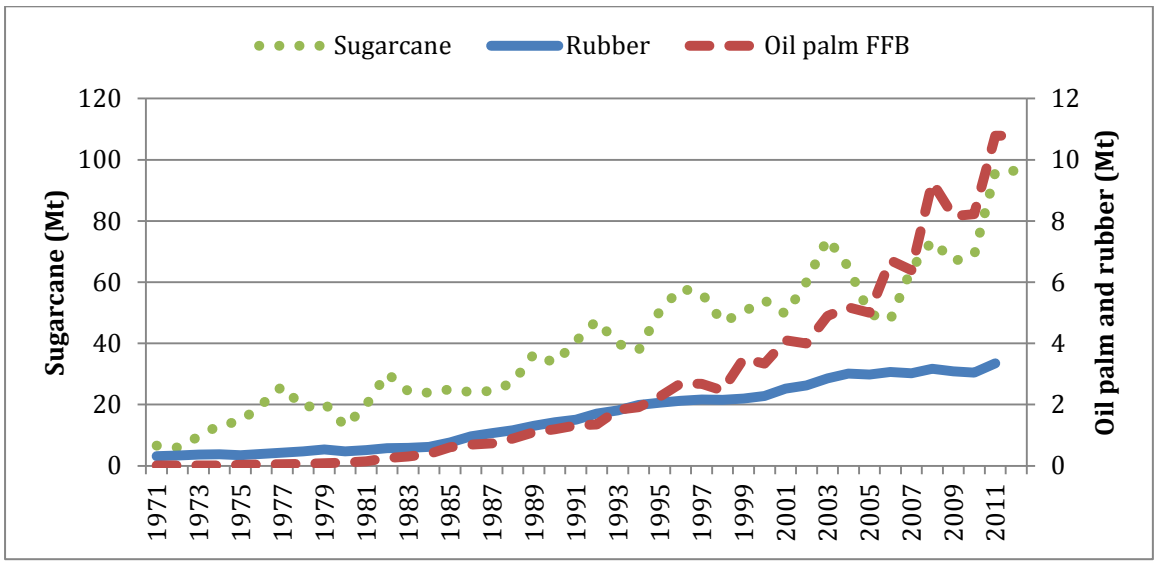
Thailand has effectively integrated many elements of private investment and support to smallholders, including land tenure to achieve long-term growth, competitiveness, and poverty reduction. This case study first provides an overview of the policy environment, followed by an examination of the business models used in three subsectors that have been the subject of land concessions in Myanmar—rubber, oil palm, and sugarcane. Each industry started from a very small base in 1971 and has grown rapidly placing Thailand in each case among the top producers or exporters. Then we review the experience with land reform and land tenure where Thailand has been a pioneer. Finally, we draw out lessons from the Thai experience.

A1.1. Overview

Starting from the 1960s, Thailand has experienced rapid growth of its agricultural sector. From 1961-80, agriculture grew at 4.7% annually, in part through expansion of land area. Since the 1980s, growth has slowed to 2.3% annually and the main source of growth has shifted to intensification through better yields and diversification to higher value horticulture and livestock products (Leturque and Wiggins 2011). At the same time, the main source of growth in the food system has switched to food processing with a growth rate of 4.3% during 2000-09 (Suphannachart and Thirawat 2011).

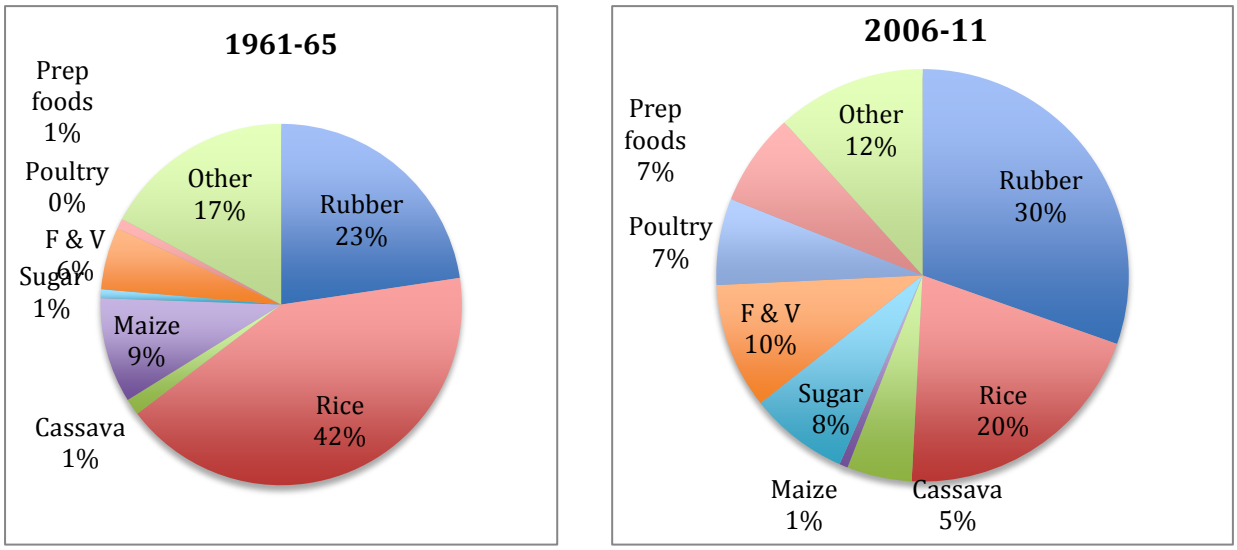
Thailand has also emerged as one of the world's most successful agricultural exporters. It is the leading exporter of rice, rubber, cassava, and in the top five exporters of sugar, palm oil, horticulture, poultry, and processed food. Since 1970, it has more than doubled its share of world agricultural markets and has noticeably diversified its exports to higher value and processed products (Figures A.1. and A.2.).

Figure A.1. Production of Sugarcane, Oil Palm, and Rubber, Thailand, 1971-2011



Source: FAOSTAT 2013.

Figure A.2. Share of Thai Agricultural Exports, 1961-65, and 2006-11



Source: FAOSTAT 2013.

A hallmark of the Thai success has been a consistent long-term focus on smallholders including for crops that are often grown in plantations. These policies have included strong public support systems such as one of the few successful state-owned agricultural banks anywhere, the Bank for Agriculture and Agricultural Cooperatives (BAAC). BAAC lent to six million farm families in 2008 and in addition, private banks were mandated to allocate to agriculture and agribusiness (Leturque and Wiggins 2011). Secure land tenure has been an important factor in stimulating agricultural investment and facilitating access to credit (Feder et al. 1988).

With a strong smallholder focus, Thailand has one of the best records globally in reducing poverty. Rural poverty incidence fell sharply from 74% in 1988 to 16% in 2011. One estimate is that every 1% growth in agriculture reduced rural poverty by 0.4% (Fan, Jitsuchon, and Methakunnavut 2004). With surplus food production, low prices of rice, and rising incomes, there has also been a steep reduction in malnutrition. Small-scale commercial farmers have been important in stimulating growth and poverty reduction in backward regions especially the Northeast.

Thailand's government policy has maintained a relatively stable macro-economic policy and a generally low protection or taxation of the sector (Warr and Kohpaiboon 2007). Policy has also fostered the growth of a strong private agribusiness sector with some companies such as Charoen Pokphand Group (CP) emerging as multi-national corporations with operations throughout the region. Thailand ranks 18th on the IFC's Doing Business Index in 2013, higher than Japan, Canada, and Germany. Foreign investment is also encouraged in agricultural value chains but not in farming itself—in fact, foreign ownership of land prohibited in Thailand. Foreign investment has helped build up the food processing sector and agricultural input industries but has had negligible impact on agricultural production.

Finally, public investment has been important in promoting growth and poverty reduction. In 2004, the public sector spent 12% of agricultural value added on the agricultural sector, significantly higher than the average for developing countries. Fan, Jitsuchon, and Methakunnavut (2004) found that this spending paid, with the highest returns to agricultural

R&D, irrigation, rural education, and infrastructure (including roads and electricity). Expenditures on rural roads increased particularly rapidly and helped reduce rural poverty.

A1.2. State Support to Smallholders Captures World Rubber Markets

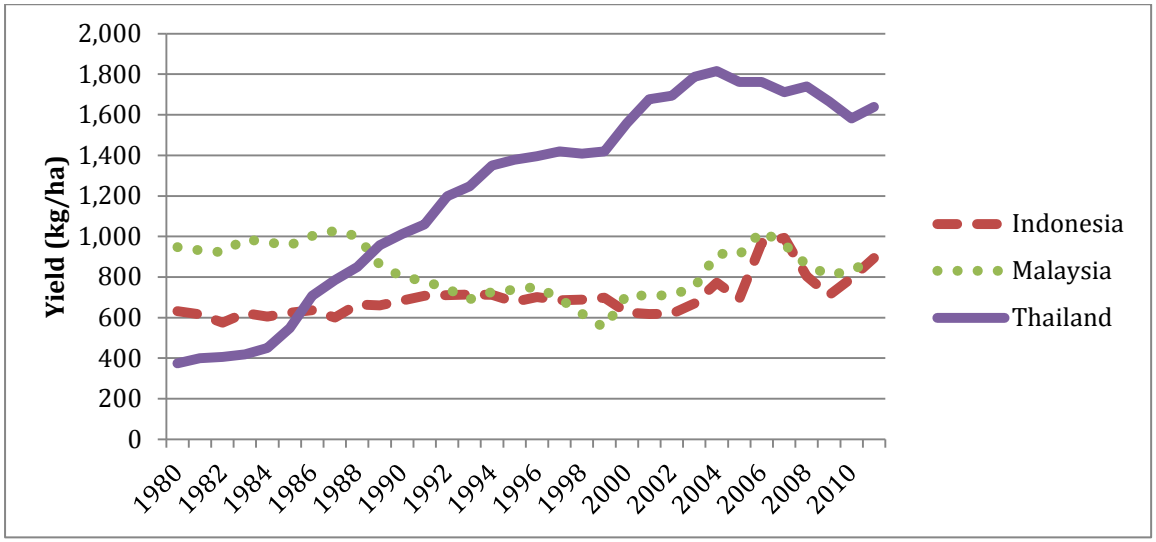
Thailand has increased rubber exports 150% since 1990, jumping from third place in rubber exports to occupy first place ahead of Indonesia and Malaysia. The rubber economy of Thailand is overwhelmingly smallholder based. One million small farmers with an average of 2-2.5 ha make up 95% of area, and rubber provides the livelihood of 10% of the Thai population (Delarue 2011).

Thailand's success in improving competitiveness in world rubber markets is due to a fourfold increase in its yields, while yields of its main competitors stagnated (Figure A.3.). The distribution of clones that now make up about 80% of the area has been the major factor in this success.

Support to smallholders for the adoption of clonal planting materials has been orchestrated by the ORRAF established in 1960. ORRAF provides grants from $750-1,450/ha for replanting up to 2.5 ha. (Viswanathan 2008). Replanting grants are largely funded by a cess on rubber sales with additional support from a customs tax on exports, and at times, direct expenditures from public revenue. ORRAF is generally regarded as one of the most efficient parastatal institutions in Thailand (Delarue 2011).

Other programs have been more sharply targeted to the poor, such as the program to extend rubber to the impoverished and ethnically diverse Northeast Thailand. These programs have included self-help settlement schemes and land reform programs where new land was offered to local farmers and immigrants. In these cases, tree crop establishment was financed by BAAC and through the land reform program (Vishnawathan 2008).

Figure A.3. Increasing Yields Has Enabled Thailand to Increase World Market Share



Source: FAOSTAT.

Other support services have also been important, including research, initial training programs from ORRAF, extension from MOA and a central rubber auction. The land titling program has provided tenure security to invest in tree crops and facilitated access to credit through BAAC. An ORRAF program to establish village cooperatives to process rubber to ribbed smoke sheets has provided local value adding.

A1.3. The Only Asian Country to Develop a Smallholder Oil Palm Industry

Quietly Thailand has emerged as the world's third largest palm oil producer. In 2012, Thailand produced about 1.6 Mt of palm oil from a bit over 600,000 ha. Compared to the two leading producers, Malaysia and Indonesia where very large plantations dominate, 70-80% of oil palm is produced by small and medium size farmers, defined as having less than 8 ha. Most smallholders work independently and most mills are not running their own plantations (Dallinger 2011).

More than 120,000 small and medium sized farmers are involved in oil palm with an average land holding of 3.9 ha (Dallinger 2011). Most farmers operate independently but some have contractual arrangements with mills and a few operate cooperative mills. Average net incomes from oil palm in 2008 were $4,000 per year per farm (Beall 2012). Most farmers extensively hired labor, much of it from Myanmar, especially for harvesting.

The dominance of smallholders in the Thai oil palm industry derives from a number of factors:

- Government policy has stimulated the industry through a Thai Oil Palm and Palm Oil Industries Development Plan that guides investment in the sector, the Thai Renewable Energy Policy with a blending target in 2011 of 5% biodiesel and credit lines for oil palm planting from BAAC.
- With no program to provide land concessions and rising prices for land in Thailand, land for large-scale plantations is difficult and expensive to acquire. Smallholders have shifted from rice, rubber, and previously unused (degraded) land into oil palm. Even the plantations associated with mills generally operate less than 1,000 ha.
- The oil palm development policy has provided significant incentives for investing in processing capacity so that capacity is about double production. While this creates inefficiencies, it also provides significant competition in purchasing of fresh fruit and allows independent producers to *shop around* to mill their fruit.

A major challenge for smallholders is to sustainably improve productivity and quality, to meet export standards of sustainability. To improve the quality and the oil extraction ratio and to meet certification standards, recent efforts have focused on contract farming by organizing existing growers, providing technical advice, and introducing quality standards for fresh fruit (Thongrak and Kiatpahtomchai 2012). However, certification under the Roundtable for Sustainable Palm Oil is costly and it is not clear how the program can be scaled up (Beall 2012).

A1.4. Challenges of Making Contract Farming in Sugarcane Competitive

Thailand is the world's second most important sugar exporter after Brazil. The industry is based on small farmers up to 3 ha, and medium size farmers up to 8 ha, Rainfed upland production in the poor northeast is the most important production system (Ekasingh et al. 2007).

Some farmers are both independent growers and contract farmers who sell on a quota schedule to mills, but the majority are independent growers who sell to contracted farmers to fill their quota. A strong Sugarcane Farmers Association negotiates the cane price paid by mills within a 70:30 framework for sharing revenues that has operated since 1984 with an adjustment for sugar content. Contract farmers and many independent farmers depend on BAAC for working capital.

While the industry has expanded rapidly it is supported by a domestic price set above the world price in most years, and there are questions about Thailand's competitiveness. The fact that all cane is produced by dispersed smallholders means that transport costs account for about one third of total costs versus about 15% in Brazil's large plantations, its major competitor (Ekasingh et al. 2007; Byerlee 2013). The overall protection to the industry estimated by Warr and Kohpaiboon (2007) for the period 1970-2005 was close to 20%.

A1.5. A Long Term Vision to Provide Land Tenure Security

Thailand has a long tradition that every family should have rights to land. About 70% of land is classified as private land carrying a range of tenure options from full ownership to usufruct (temporary) rights. Opening of new lands was encouraged by tenure rules that allowed clearing and guaranteed property rights (but also encouraged deforestation) (Dallinger 2013). The state has allocated 3.7 M ha to 1.5 million families from land previously classified as state land usually forests (USAID 2013).

At various times there have been ceilings on land ownership to discourage large-scale land acquisition and establishment of large plantations. In addition, foreigners cannot own or rent land under the Foreign Business Act of 1999 (Dallinger 2013).

Thailand was a pioneer in formally titling of land. Prior to 1980, only 12% of land was titled but today after launching a 20-year program of titling, about 63% of plots have some sort of formal title to their land although rights especially for mortgaging and sales are restricted to some types of titles (USAID 2013). However, in 2003, BAAC changed its policy to allow usufruct certificates to be used as collateral on loans.

The titling process was carried out on a village-by-village basis using open and transparent methods. Staff of the Department of Lands carried out field surveys to collect evidence of rights that were certified by adjoining landholders, village officials, and adjudication staff. Results were publicly displayed for 30 days and the whole process was completed within 90 days for a village. In the third phase, nearly 5 million titles were produced at a unit cost of $27. The system includes a dispute resolution mechanism based on local approaches as well as the judiciary (Burns 2004).

The Thai program was one of the first to be rigorously evaluated in terms of impacts on income and productivity. Feder et al. (1988) found a strong effect of titling on access to credit in formal credit markets. Land titling also increased investment in attached capital (up to 300%) and the value of output on titled land was 12-14% more than on untitled land. However, the act of titling land, also involves significant costs in terms of surveys, and legal and administrative fees. Feder et al. went on to compute these costs and estimated a favorable benefit-cost ratio to investment in the program. Later longitudinal studies confirmed these results with institutional credit increasing by 27% (Burns 2004).

The land titling program has sharply increased the number of land transactions requiring an efficient transactions system. The land administration system in Thailand, implemented by an

effective and decentralized staff of the Department of Lands, is considered a model for other countries (Childress 2004).

Burns (2004) concludes that: "The success of the land-titling program in Thailand has been due to a number of factors. A major factor has been the clear vision for the project, the long-term plan to achieve this vision and the commitment of Thai government and the key stakeholders to project implementation. There was a strong policy, legal and institutional framework for land administration in Thailand."

Although progress in the land sector has been impressive, tenure security remains an unfinished agenda in Thailand. The major challenges now is how to improve tenure security on the forest margin on land classified as state forest—occupied by as many as 12 million people, mostly poor and indigenous groups. A Community Forestry Act has been enacted to give some rights to forest dwellers and efforts are being made to regularize tenure, especially for those who have resided there since 1997 (USAID 2013).

A1.6. General Lessons from Thailand

The policy environment in Thailand has fostered a dynamic private sector that linked with farmers, the public sector, and the BAAC in a variety of business models. In some cases, formal contractual agreements with growers were employed, but in general, contract farming has been most successful in high value products where the government's Four Sector Cooperation Plan has encouraged partnerships of agribusiness, farmers, financial institutions, and government (Box A.1).

In most cases, smallholder development has depended on more informal communication between public and private actors that has enabled effective coordination along the value chain. In some industries, such as sugarcane, farmer organizations have played an important role in representing farmer interests in negotiating with sugar mills. Cooperative societies have also taken on some of the downstream processing and marketing activities, such as in rubber and cassava.

Box A.1. Contract Farming for High Value Products

Thailand has been a leader in contract farming for high value product such as high quality rice, poultry, and horticulture— again largely for export markets. The state played a role early on in stimulating contract farming through the Four Sector Cooperation Plan. Once contract farming has been established, the state generally withdraws especially where farmer organizations have become well established. Some types of contract farming have evolved quite rapidly with increasing scale and vertical integration, especially in poultry. Contract farming has also frequently failed. Notably CP tried contract farming of rice on two occasions in the 1980s before abandoning the effort.

Source: Singh 2005; Sriboonchitta and Wiboonpoongse 2008.

Five key factors were instrumental in driving the transformation of Thailand's agricultural successes.

1. A strong commitment to smallholder development as a strategy to foster broad based growth and poverty reduction.
2. An open trade and market environment that transmitted world prices to farmers and a vibrant agribusiness sector who were able to capitalize on favorable market opportunities. Improved road transport systems linked poorer and more remote regions to global markets.
3. Investment in adaptive national research program backed by an extension system with a strong field presence that provided the technologies needed by farmers to adapt to heterogeneous growing conditions and respond to changes in market demand.
4. Land titling implemented through an open and transparent process even on *encroached land*, backed by an efficient land administration system that provided farmers security to invest in land improvement and productivity enhancing innovations.
5. A number of state institutions, notably BAAC, ORRAF, and the Ministry of Lands that was consistently effective over decades in providing services and financing to farmers.

Although Thailand has been extraordinarily successful in developing a smallholder export-oriented agricultural sector, there are important qualifications to this conclusion.

- First, the definition of smallholders is defined broadly in Thailand as farmers under about 8 ha, and many of the participants in successful commercialization are relatively large farmers by Asian standards. Since 2004, there has been an explicit focus on professional farmers that make up about 20% of the farming population. While some programs, especially in rubber, have targeted poor farmers, increased demand for wage labor and transfer programs and safety nets have been more important in reaching the poorest.
- High dependence on exports in volatile commodity markets has led to periods of significant hardship to smallholders that are sometimes highly specialized, although most now have more diversified sources of incomes through the nonfarm sector.
- At times the state has overextended its reach and led to costly programs especially futile efforts to stabilize or support prices in industries in which Thailand dominates exports. The current populist effort to raise prices of rice is an extreme example of this tendency and is not sustainable. In other cases, such as sugar, competitive exports have been possible only because the industry is subsidized by domestic consumers who pay higher than world prices.
- The extensification strategy in the early years that depended on land expansion was at the expense of high rates of deforestation. Although this strategy has been reversed, Thailand still has a low share of it land in forests relative to other countries in the region.

ANNEX 2. CAMBODIA—RISKS FROM LARGE LAND CONCESSIONS

Cambodia has engaged in large land concessions, under its Economic Land Concessions (ELCs) Policy, for over a decade in an effort attract investment into the agricultural sector. Given the lack of transparency of the allocation process, estimates of the size of these concessions vary widely. Deininger and Byerlee (2011) estimated that around 1 M ha was transferred from 2004-2009. By 2012, government statistics placed the size of the ELCs at 1.1 M ha. However, nongovernmental organizations estimate the size at 2.6 M ha with a further 1.3 M ha of large-scale operations where land was obtained through other means (Khiev 2013). Another recent study estimates that 2.0-2.6 M ha of land has been granted in ELCs (Michel 2013). Accepting this estimate, over half the agricultural land in Cambodia is in concessions.

Most concessions are for rubber, oil palm, sugarcane, cassava, and plantation forestry. Both domestic companies and foreign investors mostly from neighboring countries, especially Vietnam and China, are active in the ELCs. Although by law, ELCs should be limited to 10,000 ha per company, many ELCs are much larger. For example, Pheapimex, a Chinese company, is reported to hold over 300,000 ha for cassava, rubber, and tree plantations the LYP Group has 60,000 ha for sugar, the MRT Group has 220,000 ha for oil palm, and the Vietnam Rubber Group has 200,000 ha of rubber (Khiev 2013).

The surge of concessions has led to an outcry about their negative social and environmental impacts. With poorly defined land rights, there are many claims of overlapping land rights and displacement of existing users in long fallow systems (Saing, Hem, and Ouch 2012; Neef, Touch, and Chiengthong 2013; Global Witness 2013). While the Land Law of 2001 provides to registration of land rights of existing farmers, only about 12% of households have formal titles although perhaps half have some type of paper certification (Markussen 2008). In more remote areas of shifting cultivation, where customary rights prevail, very little land is formally registered. Overlapping land rights of ELCs and communities often lead to conflict. Indeed, land issues became important in the highly imperfect 2013 election that sharply reduced the support to the long ruling governing party.

Likewise, the concessions have been associated with serious deforestation in what has been called the ‘rubber juggernaut’ (Ziegler 2009). Several concessions overlap with national parks or forests of high conservation diversity (Khiev 2013). Cambodia is ranked among countries with the highest rates of deforestation globally.

Many of the problems with the ELCs relate to their implementation rather than to the laws and regulations themselves. In a field review of three concessions, Michel (2013) found that the whole process was marred by lack of transparency and likely corruption, and in no case were the rules for granting ELCs followed. Collusion between government officials and companies to access to timber seemed to be an important reason for keeping the process behind closed doors. As a result, some communities were displaced and other lost rights to access to forests. In all cases, communities lacked information about the concession.

With growing controversy, the government of Cambodia placed a moratorium on further land concessions in 2012. However, since the moratorium excluded concessions in the pipeline, it is not clear if it is having the desired impact.

ANNEX 3. STATISTICS ON LAND CONCESSIONS IN MYANMAR

Table A.1. VFV Land Concession by the Government and Completion Status of Agribusiness Companies that Developed Lands and Planted Crops with Respect to States and Regions, as of 31 March, 2013 (not Included Deep-Water Areas of Delta)

State/ Region	No. of companies granted	VFV Land granted (ha)	Land developed (ha)	% land developed	Planted area (ha)	% concession planted
Naypyitaw	6	4,126	1,519	36.8	1,070	25.9
Kachin	113	371,715	37,078	10.0	28,534	7.7
Kayin	1	409	155	38.0	85	20.8
Chin						
Sagaing	29	166,631	3,282	2.0	1,477	0.9
Taninthari	41	126,464	73,673	58.3	73,324	58.0
Bago	15	6,227	2,626	42.2	2,210	35.5
Magway	19	35,835	20,397	56.9	10,612	29.6
Mandalay	10	7,190	1,500	20.9	1,192	16.6
Yangon	9	5,460	5,398	98.9	2,691	49.3
Rakhine	10	45,487	572	1.3	168	0.4
Shan	65	85,427	17,187	20.1	11,977	14.0
Ayarwaddy	59	89,019	61,423	69.0	37,514	42.1
Union Total	377	939,944	224,814	23.9	170,855	18.2

Source: Personal interview with officials of the Department of Agricultural Planning (DAP) 2013.

Table A.2. Land Concession of VFV Land, Deep-Water Fields of Delta Areas and Forest Lands in States and Regions to Agribusiness Companies and Growers, as of 31 March, 2013

State/ Region	Land granted (Hectare) VFVL and Deep water lands	No. of Companies and growers granted	Forest lands	No. of companies and growers granted	Total land granted (ha)	% of land concessions by state/region
Naypyitaw	7,104	108	1,519	2	8,623	0.45
Kachin	558,950	846	13,729	6	572,679	30.17
Kayah	14,142	358			14,142	0.74
Kayin			8,172	200	8,172	0.43
Chin	706	13			706	0.04
Sagaing	215,866	187	36,178	26	252,044	13.28
Tanintharyi	197,355	248	201,539	296	398,894	21.01
Bago	81,000	770	16,211	82	97,211	5.12
Magway	88,862	121	7,304	9	96,166	5.07
Mandalay	22,682	199	2,425	20	25,107	1.32
Mon			34,323	12,619	34,323	1.81
Yangon	32,460	577	16,166	126	48,625	2.56
Rakhine	53,285	185	238	1	53,523	2.82
Shan	131,053	723	10,135	20	141,189	7.44
Ayarwaddy	135,707	516	11,230	34	146,937	7.74
Union Total	1,539,172	4,881	359,170	13,441	1,898,342	100.0

Source: Interview with Department of Agriculture (DAP) officials 2013.
Deep water land areas in Ayarwaddy Region = 78249 ha (193,353 acres).
VFVL= Vacant, fallow and virgin land; ABCs= Agribusiness companies.

Table A.3. Areas of Land Granted in Different Regions and States from the Vacant, Fallow, and Virgin Land and Deep-Water Areas and Status of Land Development and Planting by Companies and Crops, as of 31 March, 2012-2013

State/ Division	No. of companies and business people granted	VFV and deep-water land granted (ha)	Land developed (ha)	% land developed	Planted area under different crops (ha)				Total planted ha*
					Rubber	Oil Palm	Paddy	Other	3,795
Naypyitaw	108	7,104	2,111	29.72			11	1,525	1,536
Kachin	846	558,950	69,748	12.48	11,092	22	767	40,775	52,656
Kayin	358	14,142	10,468	74.02	9,529		154	574	10,257
Kayah									
Chin	13	706	48	6.82	10.12			24	34
Sagaing	187	215,866	7,909	3.66	1136		233	3,558	4,927
Tanintharyi	248	197,355	84,177	42.65	10,854	71,786	402	725	83,767
Bago	770	81,000	36,857	45.50	16,645		4,319	12,469	33,433
Magway	121	88,862	38,830	43.70	14.16		477	20,176	20,667
Mandalay	199	22,682	5867	25.87	0.00		25	4,401	4,426
Mon									
Yangon	577	32,460	30,855	95.06	10,186		4,014	8,201	22,401
Rakhine	185	53,285	5,332	10.01	1,726		1,419	807	3,952
Shan	723	131,053	48,726	37.18	20,545		1,458	19,933	41,936
Ayarwaddy	516	135,707	86,187	63.51	5,652		36,202	17,302	59,157
Union Total	4,881	1,539,172	427,118	27.75	87,389	71,809	49,481	130,470	339,149

Source: Interview with officials from Department of Agricultural Planning 2013; MOAI 2013.

*Percent planted area over granted land = 22.03%.

Table A.4. Area of Forest Land (ha) Allotted to Companies and Growers and Area Planted to Natural Rubber, Palm Oil, Sugarcane, and Industrial Crops in the Forest Areas in States and Regions of Myanmar, as of 2013

State/ Regions	Rubber			Sugarcane and industrial crops			Total area (including oil palm*)		
	No. of companies and growers	Allotted ha	Hectare completed for planting	No. of companies	Allotted ha	Hectare completed for planting	No. of companies	Allotted ha	Hectare completed for planting
Naypyitaw				2	1,519	1,519	2	1,519	1,519
Kachin	4	9,885	5,008	2	3,845	3,278	6	13,729	8,286
Kayah									
Kayin	200	8,172	4,962				200	8,172	4,962
Chin									
Sagaing	18	239	221	8	35,939	19,888	26	36,178	20,109
Taninthary	261	14,441	5,658				296	201,539	48,189
Bago	76	9,473	1,535	6	6,738	6,617	82	16,211	8,152
Magway				9	7,304	1,568	9	7,344	1,568
Mandalay	13	219	53	7	2,206	2,128	20	2,425	2,182
Mon	12,619	34,323	33,499				12,619	34,323	33,499
Rakhine	1	238	238				1	238	238
Yangon	40	5,387	2,950	86	10,779	9,349	126	16,166	12,299
Shan whole	14	558	558	6	9,577	4,395	20	10,135	4,953
Shan south				4	998	210	4	998	210
Shan Lashio	7	204	204	2	8,580	4,185	9	8,783	4,389
Shan Kaingtong	7	354	354				7	354	354
Ayeyarwaddy	31	4,463	999	3	6,767	6,689	34	11,230	
Total	13,277	87,957	56,240	129	94,250	59,828	13,441	369,346	150,911

Source: Interview with officials of the Department of Forestry 2013.

Remark: *There are 35 companies being allotted 187099 ha (462321 acres: initially forest lands) in Taninthary Region. About 42531 ha (105094 acres) have been planted under palm oil.

ANNEX 4. LIST OF FIELD VISITS AND INTERVIEWS

No.	Name	Position	Organization
Meeting with experts, Donor Organization, INGOs ,NGOs and HR lawyers			
1	Dr. Sein Hla Bo	President Economic Advisor	President Advisory Office
2	Dr. Zaw Oo	President Economic Advisor/Executive Director	MDRI-CESD
3	Dr. Tin Maung Than	Director	MDRI-CESD
4	Marisa Charles	Senior Program Coordinator	MDRI-CESD
5	U Than Tun	Senior Research Fellow	MDRI-CESD
6	Dr. Kyaing Kyaing Sein	Director (Admin)	MDRI-CESD
7	Chris Milligan	Mission Director	USAID
8	James L. Goggin	Agriculture Advisor, Economic Growth office	USAID
9	Leslie Murbary	Director	USAID
10	Andrew Kirkwood	Fund Director	LIFT
11	Su Mon	Social Impact Manager	Proximity Designs
12	James Taylor	Chief Executive	Proximity Designs
13	Debbie Aung Din Taylor	Director	Proximity Designs
14	U Shwe Thein	Chairman	Land Core Group
15	Kevin Woods	Doctoral Candidate (Berkeley)	TNI
16	U Min Thu	Member of Parliament	NLD Party
17	U Khin Maung Zaw	Member (Lawyer)	NLD Party
18	U Han Shin Win	Lawyer (Advocate)	Freelance
19	U Tin Htut Oo	Chairman	Nesaac
20	U Tin Maung Shwe	Senior Executive Officer	ARDC
21	Karin Eberhardt	Development Advisor	Swiss Agency for Development and Coperation (SDC)
22	U Si Maw	Manager/former Extension Officer of MOAI	Pyay
23	U Maung Maung San	General Manager	Pyay
24	U Kyaw Than	Retd.Regional Manager of MAS	Pyay
No.	Name	Position	Organization
Meeting with Private Associations, Companies, and Farmers			
1	Ye Min Aung	Secretary General	Myanmar Rice Federation (MRF)
2	U Khin Soe	Senior Advisor	Myanmar Rice Federation (MRF)
3	U Shu Kyein	Senior Advisor	Myanmar Rice Federation (MRF)
4	Dr. Myo Lwin	Managing Director (Arkar Oo Co., LTD.)	Beans and Pulses Association

Annex 4. con't.

No.	Name	Position	Organization
Meeting with Private Associations, Companies, and Farmers			
5	U Myint Zaw	Executive Committee Member	Beans and Pulses Association
6	Dr. Nyi Nyi	Advisor	Yuzana Company Ltd
7	Ko Zaw Lwin	Manager	Yuzana Company Ltd (Kawthaung)
8	Ko Amban	Manager	Yuzana Company Ltd (Kawthaung)
9	Myo Lwin	General Manager	Po Kaung Company Ltd (Kawthaung)
10	Aye Min Zaw	Manager	Po Kaung Company Ltd (Kawthaung)
11	U Chan Htwe	Chairman	Potatoe Producer Association (Heho)
12	Dr. Moe Si Thu	General Manager (MCPL)	CP Company Ltd
13	Dr. Aung Soe Moe	General Manager (MCPL)	CP Company Ltd
14	U Kyaw Kyaw Moe	Deputy General Manager (Feed Business Operation)	CP Company Ltd
15	Dr. Myat Soe	Central Executive Committee Member	Chammber of Commerce and Industry, Yangon
16	Dr. Myo Lwin	Vice President (4)	Chammber of Commerce and Industry, Yangon
17	U San Thain	Central Executive Committee Member	Chammber of Commerce and Industry, Yangon
18	U Kyaw Aung	Executive Committee Member	Chammber of Commerce and Industry, Yangon
19	U Myat Soe	Head of Staff	Chammber of Commerce and Industry, Yangon
20	Kevin M. Murphy	Managing Director	Andaman Capital Partners, Myanmar
21	Daniel Nickel	Consultant	
22	U Win Myint Hlaing	Managing Director	Ayar Pathein Rice Specialization Company, Pathein
23	U Maung Maung Yu	Rice Miller	Pathein
24	U Soe Win	Rice Miller and Rubber planter	Pathein
25	U Hla Tun	Farmer	Zayat Seit Village, Kyaung Pan Kone VT, Pathein
26	U San Tun	Rice Farmer	Taik Kyi Kone Village, Pathein
27	U Myint Naing	Miller	Pathein
28	U Aung Thein	President	Ruby Land Company
29	U Soe Naing	Secretary,	June Flower Rubber Land Company
30	U Si Thu	Simma	Simma Company
31	U Chit Ko Ko	Shwe Kyae Sin Guest House	Pathein
32	U Hlu Hla Kyaw	Joint Secretary, ex-army officer	Pathein
33	U Saw Htun	Rubber trader	Pathein
34	U Zae Aung	Trader/Planter	Pathein

Annex 4 con't.

No.	Name	Position	Organization
Meeting with Private Associations, Companies, and Farmers			
35	U Myo Nyunt	Dy.Director of MOAI (Retd.), Manager	Diamond Star Company, Taik Kyi
36	U Zaw Min Kyi	Ricer Farmer	Kan Thone Sint Village, Taik Kyi
37	Three farmers	Farmers	Kanthone Sint Village, Taik Kyi
38	U Min Zaw	Camp incharge,	Diamond Star Company, Taik Kyi
39	U Win Tin	Tar Gwa Village	Taik Kyi
40	U Than Oo	Farmer	Zi Oak Village, Pyay
41	U Win Myint	Farmer	That Yet le Village, Padaung Township
42	U Hla Phone Myint	Farmer	Twin Phyi Village Tract, Pyay
43	U Soe Myint	Farmer	Kya Khat Village Tract, Pyay
44	U Than Soe	Farmer	Kha Khat Village Tract, Pyay
45	U Kyi Myint	Farmer	Nama Yan village, Shwe Daung Township, Pyay
46	U Myint Soe	Farmer	Pa Rabaik village, Pyay
47	U Ko Myint	Farmer	Thayet Lain village, Padaung township, Pyay
48	U San Shein	Cane Procurement Officer	Nawade Factory, Pyay
49	U Chit Lwin	Factory Manager	Nawade Factory, Pyay
50	Amon Latt	Sugarcane Seeds Farm Manager	Nawade Factory
51	U Kyi Win	Capatain retd./ Cane Procurement	Nawade Factory
52	U Min Kyaw Oo	Sugarcane Farmer	Pyay
53	U Kyaw Win	Cane Farmer	Char Si Bo village
54	U Htain Htain	Cane Farmer	Pyay
55	U Soe Myint	Cane Farmer	Kya Khat Village
56	U Hla Myint	Advisor	Myanmar Rubber Planters and Producers Association (MRPPA)
57	U Aung Myint Htoo	President	MRPPA
58	U Khaing Myint	Secretary General	MRPPA
59	Dr. Maung Maung Myint	Executive Member	MRPPA
No.	Name	Position	Organization
Meeting with Government Officials			
1	Dr. Myo Kwe	Pro-rector	Yezin Agricultural University
2	Dr. Hnin Yu Lwin	Lecturer	Yezin Agricultural University
3	Dr. Shwe Mar Than	Lecturer	Yezin Agricultural University
4	U Nay Aye	Director General	Ministry of Environmental Conservation and Forestry
5	U Hla Maung Thein	Deputy Director General	Ministry of Environmental Conservation and Forestry
6	Dr. San Oo	Director (Environmental Conservation)	Ministry of Environmental Conservation and Forestry

Annex 4 con't.

No.	Name	Position	Organization
Meeting with Government Officials			
7	U Htin Aung Shein	Director (Department of Agriculture)	Ministry of Agriculture and Irrigation
8	Dr. Win Htut	Director (SLRD)	Ministry of Agriculture and Irrigation
9	U Kyaw Nyein Aung	Director (SLRD)	Ministry of Agriculture and Irrigation
10	U Zaw Win	Director (Planning: DoICD)	Ministry of Agriculture and Irrigation
11	U Thein Soe	Assistant Director	Department of Industrial Crops Development, Kawthaung
12	U Myint Thein	Director(Regional Office)	Department of Agriculture (DOA), Pathein
13	U Htun Aung Kyaw	Deputy Director (Regional Office)	Department of Agriculture (DOA), Pathein
14	U Sein Maung Myint	Township Officer	Department of Agriculture (DOA), Pathein
15	U Sai Kyar Ohn	District Officer	Department of Agriculture (DOA), Pathein
16	U Ye Win	Regional Director	Department of Industrial Crops Development (DoICD), Pathein
17	U Myint Soe	Assistant Director	DoICD, Pathein
18	Daw Soe Soe Aye	Officer	DoICD, Pathein
19	U Aung Naing Oo	Director General	Myanmar Investment Commission
20	Ms. Tin Aye Han	Director	Myanmar Investment Commission

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