

# Increasing the Impact of Public Spending on Agricultural Growth

## MYANMAR AGRICULTURAL PUBLIC EXPENDITURE REVIEW

June 20, 2017



### Livelihoods and Food Security Trust Fund



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## Acronyms and Abbreviations

ADB	Asian Development Bank
ADSIP	Agricultural Development Strategy and Investment Plan of MOALI
AMD	Agricultural Mechanization Department, MOALI
CBM	Central Bank of Myanmar
CCS	Central Cooperative Society
COFOG	United Nations Classification of Functions of Government
DALMS	Department of Agricultural Land Management and Statistics, MOALI
DAR	Department of Agricultural Research, MOALI
DG	Director General
DOA	Department of Agriculture, MOALI
DOC	Department of Cooperatives, MOALI
DOF	Department of Fisheries, MOALI
DOIC	Department of Industrial Crops, MOALI
DRD	Department of Rural Development, MOALI
FAO	United Nations Food and Agriculture Organization
GDP	Gross Domestic Product
Ha	Hectares
ID	Irrigation Department
IFAD	International Fund for Agricultural Development
IWUMD	Irrigation and Water Resource Utilization Department, MOALI
JICA	Japan International Cooperation Agency
LIFT	Livelihoods and Food Security Trust Fund
LUD	Land Use Division of Department of Agriculture, MOALI
MADB	Myanmar Agricultural Development Bank
MTEF	Medium-Term Expenditure Framework
MFI	Microfinance Institution
MOALI	Ministry of Agriculture, Livestock, and Irrigation
MOPF	Ministry of Planning and Finance
NGO	Nongovernmental Organization
NPK	Nitrogen, Phosphorus, and Potassium
OECD	Organisation for Economic Co-operation and Development
O&M	Operations and Management
PFM	Public Finance Management
PPP	Public Private Partnership
R&D	Research and Development
TFP	Total Factor Productivity
USAID	United States Agency for International Development
\$	US Dollar
WB	World Bank

## Glossary of Key Terms

Allocative efficiency of public expenditures	Analysis that permits one to understand priorities and balance of public expenditures. It consists of the analysis of economic and functional compositions
Budget estimate	Budget allocation approved by Myanmar's Parliament (Hluttaw) at the beginning of each fiscal year
Capital expenditures	Investments where the benefit continues over a long period rather than being exhausted in a short period. Such expenditure is of a non-recurring nature and results in acquisition of permanent assets
Economic composition of public expenditures	Assessment of balance between wage, non-wage recurrent, and capital expenditures
Functional composition of public expenditures	Assessment of allocation of public expenditures by main functions and alignment of this composition with strategies, policies, growth diagnostics, and other priorities
Implementation efficiency of public expenditures	Analysis of strengths and weaknesses of existing programs to achieve the stated objectives
Non-wage recurrent expenditure	Recurrent expenditures less expenditure on wages, salaries, and supplements
Provisional actual	Actual budget allocation to the Ministries in Myanmar unconfirmed by the official audit
Recurrent expenditure	Expenditure that does not result in the creation or acquisition of fixed assets. It consists mainly of expenditure on wages, salaries and supplements, purchases of goods and services, operations and maintenance of the fixed assets, interest payments, subsidies, and transfers
Revised estimate	Revised budget allocation approved by Myanmar's Parliament during the midterm review
Wage expenditures	Recurrent expenditure on wages, salaries, and supplements

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## Executive Summary

### Introduction

Agriculture sector growth in Myanmar averaged 2.5 percent during 2009/10–2016/17. This compares to only half of the growth rate in neighboring China and Thailand at the same stage of their economic development and less than one-third of nonagricultural growth in Myanmar. This low agricultural growth is one of the main reasons for slow poverty reduction, high malnutrition, and job insecurity in many parts of Myanmar, given the sector’s continued significance in gross domestic product (GDP) (29 percent), the labor force (50 percent), and exports (30 percent).

*Myanmar’s agriculture has underperformed in recent years*

The lack of adequate and good-quality public agricultural services, proper reorganization and restructuring of relevant institutions, and regulations for private sector investments are among the main reasons for Myanmar’s poor agricultural performance. Despite many opportunities for future growth (mainly through closing the yield gap, producing higher-value crops, and increasing fishery production), Myanmar’s agricultural growth will not be able to realize its potential unless public services are provided in good quantity and quality.

*Low quality public services, policies, and regulations are among the main reasons for slow agricultural growth*

This first-ever Agricultural Public Expenditure Review is an important step to deepen the policy dialogue on improving the impact of public services on agricultural growth and other developmental objectives. It covers the period from 2009/10 to 2016/17, analyzing the budgets of the Union Ministry of Agriculture, Livestock and Irrigation (MOALI),<sup>1</sup> selected Regions and States, the Myanmar Agricultural Development Bank’s (MADB) financing, and donors. The review focuses on allocative and implementation efficiencies of public expenditures.

*This report aims to deepen the dialogue on budget and agricultural development*

The findings and recommendations of this review will serve as a baseline for the investment plan being prepared for the Agricultural Development Strategy and Investment Plan (ADSIP) for 2017–2021. It will also help strengthen the alignment of budget with strategic objectives set in the ADSIP. This review is the start of future systematic analyses of agricultural public expenditures.

*The report’s findings and recommendations could form the basis of follow-up actions*

### Using global experience as a benchmark for Myanmar

Global experience presents important lessons for Myanmar. These lessons can provide insights on why Myanmar’s past public spending

*Global experience shows that public expenditures matter for agricultural growth but*

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<sup>1</sup> Note that the Department of Rural Development is not included in this review. See Chapter 3 for more details.

has had limited impact on agricultural growth and can suggest changes that could increase future impacts:

*their increases must be fiscally prudent*

Public expenditures matter a lot for agricultural growth as they are needed to address inefficiencies caused by market failures and inequalities in the distribution of goods and services. Increasing public spending on agriculture, however, needs to be done in a fiscally responsible manner to avoid macroeconomic distortions that would undermine growth.

The level of public expenditures matters less for growth than their functional and economic composition. Spending on public goods is much more productive than spending on subsidies, and a budget balanced across wages, nonwage recurrent, and capital expenditures achieves higher impacts.

*Not all public expenditures are productive: allocative efficiency matters*

Public investments in agricultural research and complementary programs extending research results to farmers (extension, soil nutrient management, plant protection, etc.) are found to generate the highest rates of return around the world. No country could generate long-term agricultural growth without such investments.

*Spending on agricultural research and complementary programs is the most productive investment*

The quality of implementation affects the outcomes of otherwise well-justified public programs. Implementation results can be affected by limited capacity, poor design, the supply-driven nature of services, inadequate coordination, high unit costs, low budget execution, and public financial management problems.

*High attention is warranted to the quality of programs' implementation*

Investments in public goods bring better results when combined with better policies and institutions. Improvements in the agricultural policy environment augment public spending by enhancing investments for producers and innovators to take advantage of public goods, thereby crowding in private investments.

*Improved policy environment augments the impact of public spending by crowding in private investments*

## **Estimating the level of public spending on Myanmar's agriculture**

This review produces the first-ever estimate of total agricultural public spending in Myanmar during the review period. In addition to the Union MOALI and Presidential budgets, agricultural budget comes from Regions and States, the MADB interest rate subsidy, and donors.

*This report provides a first-ever estimate of the total agricultural public spending in Myanmar*

The Union government consistently increased public spending on agriculture, prioritizing it over other programs during the review period. The Union budget for agriculture, including the Presidential budget, grew from 268 billion Kyats to 619 billion Kyats. Together with the Regional and State budgets, the MADB's interest rate subsidy, and donor funds to the MOALI, total agricultural spending in 2016/17 was 790 billion Kyats, an equivalent of \$667 million, a threefold increase from 268 billion Kyats in 2009/10, an equivalent

*In nominal (real) terms, the total agricultural budget tripled (doubled) between 2009/10 and 2016/17*

of \$267 million.

The share of agriculture's budget in GDP grew from 0.77 percent in 2009/10 to 0.93 percent in 2016/17. It peaked at 1.21 percent of GDP in 2015/16. Yet the share of the agricultural budget in the Union budget fell from 8.4 percent to 5.3 percent over the review period. In regional and global comparison, Myanmar allocated a large share of its fiscal resources to agriculture. Most developing countries in Asia allocate 0.2-0.7 percent of GDP to agriculture.

*Agricultural budget increased as a share of GDP; in international comparison, Myanmar spent a large share of its fiscal resources on agriculture*

The relatively large budget already allocated to agriculture and Myanmar's tight medium-term fiscal outlook call for prioritizing improvements in efficiency and effectiveness of the existing funds over budget increases. It also calls for strategic engagement with donors to secure additional funds mostly for underfunded programs.

*Closer attention to attracting donor funds is warranted due to budget constraints*

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*The review recommends that in the current budget-constrained environment, the first-order priority for achieving a higher impact of public spending on Myanmar's agriculture should be improving the use of existing funds and attracting donor funds to select critically underfunded programs.*

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### **Rebalancing the agricultural budget's composition**

During the review period, more than half of the MOALI's budget was spent on irrigation. Another 15 percent went to agricultural mechanization: its share increased from 6 percent in 2009/10 to 18 percent in 2016/17. Agricultural finance and crop programs averaged 15 percent each, all gaining significance over time.

*Most spending went to irrigation infrastructure development, mechanization, finance, and crop programs*

Other programs such as research, extension, planning, statistics, monitoring and evaluation, soil nutrient management, input quality assurance, plant protection, quarantine and sanitary and phytosanitary measures, livestock, fisheries, and cooperatives received very small budgets. The most underfinanced function was agricultural research. In 2016/17, Myanmar invested only 0.04 percent of agricultural GDP on agricultural research compared to an average of 0.60 percent in Asia and 2.50 percent in developed countries.

*Other programs were severely underfinanced: Myanmar spent 12 times less on ag R&D than other Asian countries*

Most public funds were spent on rice-related programs through irrigation, mechanization, seeds, and extension. Programs for other crops or farming systems received very small budgets. Spending on nutritional security and climate-smart agriculture was also too small to have a visible impact. Gender aspects did not feature in MOALI programs at all.

*Most programs were rice-centric; spending on climate-smart, nutrition, and gender-sensitive programs was limited*

In terms of economic composition, the budget was well balanced between wage, nonwage recurrent, and capital expenditures, and the overall wage bill remained small despite recent wage increases. Yet capital expenditures were skewed toward irrigation and

*While the overall economic composition of the budget was balanced, the large capital budget for a few programs in*

mechanization, allocated to a narrow set of subprograms such as construction of new dams and primary irrigation infrastructure (Irrigation and Water Utilization Management Department) and purchase of tractors and other agricultural machines (Agricultural Mechanization Department). These expenditures crowded out more productive spending such as on irrigation infrastructure management, dam safety, water management and training of trainers for mechanization, provision of repair and other services to the owners of agricultural machines, and testing of new machines and farm implements, especially for non-paddy crops.

*irrigation and mechanization crowded out more productive spending*

Research and extension staff received too small of a travel and operational budget to be able to experiment and produce improved technologies for a wide variety of agricultural products (crops, livestock, and fisheries) suitable for different agro-ecological zones, or to reach out to many farmers with these technologies to ensure their adoption.

*Staff lack travel and operational budget to provide frontline public services*

Improving the impact of public expenditures on agricultural growth would require changes in both the functional and economic composition of public expenditures. This would imply shifting funds: (i) from provision of public mechanization services and irrigation infrastructure development to R&D, irrigation assets management, soil nutrients management and plant protection, seeds, extension (for crops, livestock, and fisheries), input quality assurance, and agricultural planning; and (ii) from capital to nonwage recurrent expenditures, especially to operational costs for extension and other frontline service providers and operation and management (O&M) of irrigation assets. This reallocation would help align the budget with the ADSIP strategic objectives and priorities.

*Allocative efficiency is to be improved to increase the impact of public spending on agricultural growth in Myanmar*

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*The review recommends to: (i) use a strategic framework set up by the ADSIP to rebalance the functional and economic composition of the agricultural budget; (ii) reallocate some parts of the irrigation and mechanization capital budgets to other programs; (iii) shift some funds from capital to nonwage recurrent budget, especially for irrigation O&M and extension programs; and (iv) carry out an institutional review of the MOALI to identify further scope for reallocation of funds.*

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### **Improving the quality of the programs' implementation**

The impact of public spending on agricultural growth in Myanmar can also be increased by improving the implementation efficiency of existing programs. It implies defining the role of the government in service provision and in expenditures to finance, including to crowd in private sector investments. The recently prepared roadmap for seed sector reforms is a good example for other programs to follow.

*Implementation efficiency is important to achieve a high impact of public expenditures, especially in the context of limited fiscal space in Myanmar*

In general, improving implementation efficiency would require: (i)

*Several cross-cutting areas exist*

investing in capacity building of MOALI staff on technical/subject matter issues and in new institutional approaches for demand-driven and market-oriented service provision; (ii) adjusting the design of existing programs to the rich diversity and agro-ecologies of Myanmar, for example by shifting from support of paddy production to diversified farming systems and value chains; (iii) accompanying investments in hardware (i.e., upgrade of irrigation system or rural roads) with complementary investments in software (i.e., water user groups, O&M) and in services (i.e., fertilizer and pesticides quality control, soil nutrient management, extension, seeds, market information); and (iv) strengthening horizontal and vertical coordination among departments.

*for improvements at MOALI*

Gains can also be generated by better public financial management. When capital budgets are being prepared, the central government units should more strongly coordinate with the staff of local implementation units. Enhanced procurement capacity and more flexible rules for daily rates of hired labor for conducting civil works, currently fixed at 3,000 Kyats per day, would help with budget execution. Mandating the Department of Agricultural Planning to scrutinize the budget requests of MOALI departments for alignment with the strategic objectives (e.g., ADSIP) before they are submitted to the Minister office, and investing in monitoring and evaluation to link budget requests with anticipated outcomes of the programs would further improve the quality of public finance management.

*Improving the quality of budget preparation and execution and generating evidence on impact of past programs would increase implementation efficiency*

In regard to the selected programs included in this review, improving the efficiency of irrigation investments would require a shift from infrastructure development to infrastructure management, implying: a reallocation of funds from new construction to improvements in existing irrigation systems and on-farm water infrastructure; increased O&M funding, along with giving Regions and States more say in allocating these funds to specific irrigation systems; increased spending on institutional strengthening of both the Ministry and water users; and promotion of less costly options for larger irrigation coverage than construction of dams.

*Increasing the impact of irrigation spending requires a shift from infrastructure development to infrastructure management*

For agricultural extension, a larger budget for frontline extension staff and their capacity building could provide some initial impetus. Yet sustainable gains can only be generated by: a shift of focus from paddy production to diversified farming systems to take advantage of opportunities inherent in Myanmar's diverse agro-ecology; a change of extension approaches; an increase of farm outreach through ICT technology, donor-funded third-party providers, and the private sector; and much stronger collaboration of the Extension Division with other divisions in the Department of

*Myanmar's extension program requires new approaches, focus, partnerships, and capacity of staff to deliver results*

Agriculture and the Department of Agricultural Research.

For agricultural finance, public spending effectiveness would increase by reforming MADB, focusing on promotion of collective actions in supporting cooperatives, and creating an enabling environment for private banks and microfinance institutions to invest more in agriculture.

*Spending on MADB and cooperatives warrants careful review to crowd in innovative commercial and microfinance funds*

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*The review recommends to: (i) review the existing programs aiming at identifying the areas for government to play a leading role (i.e., doing more directly) or to play a supporting role (i.e., doing less directly, but ensuring an enabling environment) to create space for and crowd in private sector to achieve higher impacts from the use of existing public funds; and (ii) use the example of a Roadmap for Seed Sector Development to initiate reforms in other areas.*

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### **Scaling up the benefits of donor funds**

The ADSIP calls for a doubling of donor spending on agriculture during 2017–2021 and attracting more donor funds is indeed a realistic opportunity to increase overall agricultural spending in Myanmar. Donors' commitment for 2010–2020 is estimated at \$761 million and more may be committed in the outer years.

*Donors provide additional funds to the sector, and these are on the rise*

Donor funds are more balanced across various functions and better aligned with the MOALI's strategic priorities than the government funds. This contributes to their relatively higher efficiency. Yet their potentially higher impact is undermined by several factors such as: (i) lack of complementarity with government funds; (ii) low absorption/disbursement of funds for existing projects; (iii) weak coordination with donor projects implemented outside of government systems (i.e., half of all donor funds); and (iv) lack of incorporation of experiences and lessons learned from donor projects into government programs.

*High impact of donor funds coming from a well-balanced functional composition is undermined by the MOALI's limited utilization of donors' knowledge and finance*

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*The review recommends the MOALI to: (i) coordinate more proactively with donors through the Agriculture and Rural Development Sector Working Group, especially for projects implemented outside of the government system; (ii) increase disbursement of the existing donor funds; and (iii) continuously learn lessons of successes and failures in donor projects, which bring new approaches and good practices to Myanmar, to integrate them into government programs.*

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### **Improving agricultural policy and business regulatory environment**

High returns would arise from implementing the shift prescribed in the ADSIP from the current rice-centric policy to a more multidimensional food policy. This shift would need to be accompanied by establishing appropriate rules and regulations as well as enforcing existing ones to ensure safety and quality of agricultural goods and services and to encourage private sector investment.

*Better policy environment would significantly increase the impact of public spending*

Attracting private sector investment is the key given the context of

*Attracting private*

Myanmar's currently limited budget. Public programs can help by: (i) improving regulations for private sector investment; (ii) providing key public services such as quality control assurance; and (iii) refraining from direct competition with the private sector in provision of mechanization and finance. The net export position for many agricultural products and the currently limited fiscal space warrant more attention to the suitability of farm policy measures: minimum farm prices or large buffer food stocks are not typically suitable in this context.

*investments by refraining from provision of private goods and by maintaining predictable policies warrants high attention*

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*The review recommends to: (i) align policies and expenditure with the strategic framework set up in the ADSIP; (ii) refrain from taking over the role of the private sector in providing mechanization services and credit; (iii) prioritize using public funds for activities that help crowd in private investments; and (iv) tailor the design of agricultural policy support measures to Myanmar's net trade position and limited fiscal space.*

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## အနှစ်ချုပ်တင်ပြချက် နိဒါန်း

မြန်မာနိုင်ငံရှိ စိုက်ပျိုးရေးကဏ္ဍဖွံ့ဖြိုးမှုမှာ ၂၀၀၉/၂၀၁၀ - ၂၀၁၆/ ၂၀၁၇ ကာလများအတွင်း ပျမ်းမျှ ၂.၅% သာ ရှိပါသည်။ ၎င်းပမာဏ သည် အိမ်နီးချင်းနိုင်ငံများဖြစ်သော တရုတ်နိုင်ငံ၊ ထိုင်းနိုင်ငံများအတွင်း ၎င်းတို့၏ တူညီသော စီးပွားရေးဖွံ့ဖြိုးမှုအဆင့်ရှိ ဖွံ့ဖြိုးမှုနှုန်း၏ ထက်ဝက် ခန့်သာရှိပြီး၊ မြန်မာနိုင်ငံအတွင်း စိုက်ပျိုးရေးမဟုတ်သော အခြားကဏ္ဍ ဖွံ့ဖြိုးမှု၏ သုံးပုံတစ်ပုံခန့်သာရှိပါသည်။ စိုက်ပျိုးရေးကဏ္ဍအနေဖြင့် GDPတွင် ရပ်တည်နေသည့် ၎င်း၏ သိသာသော ပါဝင်မှုအချိုးအစား (၂၉%)၊ နိုင်ငံတွင်းစုစုပေါင်း အလုပ်သမား အင်အား၏ (၅၀%) နှင့် ပြည်ပပို့ကုန်များ၏ (၃၀%) ဖြည့်ဆည်းပေးနေသော်လည်း စိုက်ပျိုးရေး ကဏ္ဍ ဖွံ့ဖြိုးမှု နှေးကွေး ခြင်းသည် မြန်မာနိုင်ငံအနှံ့အပြားရှိ နွမ်းပါးမှု လျော့ချရေး လုပ်ငန်းများ နှောင့်နှေးကြန့်ကြာမှု၊ အာဟာရ ချို့တဲ့မှု မြင့်မားခြင်းနှင့် အလုပ် အကိုင်မရေရာမှု စသည့် အခြေအနေများကို ဖြစ်စေသည့်အဓိက အကြောင်းတရားများအနက် တစ်ခုအပါအဝင် ဖြစ်သည်။

မကြာသေးမီနှစ်များအတွင်း မြန်မာ့စိုက်ပျိုးရေးကဏ္ဍသည် စွမ်းရည်ကျဆင်းမှု ရှိနေပါသည်။

ပြည့်စုံလုံလောက်မှုရှိ၍ အရည်အသွေးကောင်းမွန်သော အများ ပြည်သူ့ဆိုင်ရာ စိုက်ပျိုးရေးဝန်ဆောင်မှုများ၊ ပုဂ္ဂလိက ကဏ္ဍ ရင်းနှီး မြှုပ်နှံမှုများအတွက် ဆက်စပ်အဖွဲ့အစည်းများနှင့် စည်းမျဉ်းစည်းကမ်း များ စနစ်တကျ ပြန်လည်ဖွဲ့စည်း သတ်မှတ်ဆောင်ရွက်မှုများ မရှိခြင်း သည် မြန်မာနိုင်ငံ၏ စိုက်ပျိုးရေးကဏ္ဍ စွမ်းဆောင်ရည် အားနည်း ချက်များကို ဖြစ်ပေါ်စေသည့် အကြောင်းရင်း တစ်စိတ်တဒေသ ဖြစ်ပါ သည်။ အနာဂါတ်ကဏ္ဍ ဖွံ့ဖြိုးရေး အတွက် အခွင့်အလမ်းများစွာ ရှိသော်လည်း (အဓိကအားဖြင့် ထွက်နှုန်းကွာဟချက် လျော့နည်းစေခြင်း၊ တန်ဖိုးမြင့် သီးနှံထုတ်လုပ်ခြင်းနှင့် ငါးလုပ်ငန်းကုန်ထုတ်လုပ်မှု တိုးမြှင့် ခြင်းစသည့် နည်းလမ်းများအသုံးပြုခြင်း) အများပြည်သူ့ဆိုင်ရာ ဝန်ဆောင်မှုများ၏ အရည်အသွေးနှင့် အရေအတွက်/ပမာဏများ ပိုမို ကောင်းမွန်စွာ ဖြည့်ဆည်းမှု မဆောင်ရွက်နိုင်ပါက မြန်မာနိုင်ငံရှိ စိုက်ပျိုးရေးကဏ္ဍ ဖွံ့ဖြိုးမှုသည် ၎င်း၏ အလားအလာများကို အပြည့် အဝ ဖြစ်ထွန်းအောင်မြင်စေရန် ဆောင်ရွက်နိုင်မည် မဟုတ်ပါ။

အရည်အသွေးနည်းပါးသည့် ပြည်သူ့ဝန်ဆောင်မှုများ၊ မူဝါဒများနှင့် စည်းမျဉ်းဥပဒေ များသည် စိုက်ပျိုးရေးကဏ္ဍ ဖွံ့ဖြိုးမှု နှေးကွေးခြင်း၏ အဓိက အကြောင်းရင်းများ ဖြစ်ပါသည်။

ပထမဆုံးအကြိမ်အဖြစ် စတင်ဆောင်ရွက်သည့် ဤ “စိုက်ပျိုး ရေးကဏ္ဍ ပြည်သူ့ ဘဏ္ဍာငွေသုံးစွဲမှု (အသုံး စရိတ်) လေ့လာ သုံးသပ်ခြင်း” သည် စိုက်ပျိုးရေးဖွံ့ဖြိုးမှုနှင့် အခြားဖွံ့ဖြိုးရေး ဦးတည်ချက်များအပေါ် အကျိုးသက်ရောက်မှုရှိသည့် အများပြည်သူ ဆိုင်ရာ ဝန်ဆောင်မှုများ တိုးတက် ကောင်းမွန်စေရေး ပိုမိုလေး နက်သည့် မူဝါဒရေးရာ ဆွေးနွေးမှု များအတွက် အလွန်အရေးပါသည့် ခြေလှမ်းတစ်ရပ် ဖြစ်ပါသည်။ ၎င်းတွင် ၂၀၀၉/၂၀၁၀ မှ ၂၀၁၆/ ၂၀၁၇ ကာလအထိ အကြီးဝင်ပြီး စိုက်ပျိုးရေး၊ မွေးမြူရေးနှင့် ဆည် မြောင်းဝန်ကြီးဌာန (MOALI)၊ သတ်မှတ်တိုင်း ဒေသကြီး/ ပြည်နယ် များ၊ မြန်မာ့လယ်ယာဖွံ့ဖြိုးရေးဘဏ် (MADB) ၏ ဘဏ္ဍာ ရေးရာနှင့် အလှူရှင်များ၏ ဘတ်ဂျက်များအပေါ် ဆန်းစစ် လေ့လာ မှုများ ပါဝင်ပါသည်။ လေ့လာသုံးသပ်မှု အနေဖြင့် အများပြည်သူ ဆိုင်ရာ ဘဏ္ဍာငွေသုံးစွဲခြင်းများ၏ ခွဲဝေလျာထားမှုနှင့် အကောင်အထည် ဖော်ရေး စွမ်းရည် ထိရောက်မှုများအပေါ် အဓိကထား ဆောင် ရွက်ခြင်းဖြစ်သည်။

ဤအစီရင်ခံစာအနေဖြင့် ဘတ်ဂျက်၊ စိုက်ပျိုးရေး ဖွံ့ဖြိုးမှု များနှင့် စပ်လျဉ်း၍ ကျယ်ပြန့် လေးနက်သည့် ဆွေးနွေးမှုများ ဆောင်ရွက် နိုင်ရန် ရည်ရွယ်သည်။

ဤလေ့လာသုံးသပ်မှု၏ တွေ့ရှိချက်များနှင့် အကြံပြုချက် များသည် ၂၀၁၇-၂၀၂၁ ကာလ၊ စိုက်ပျိုးရေး ကဏ္ဍ ဖွံ့ဖြိုးရေး မဟာ ဗျူဟာနှင့် ရင်းနှီးမြုပ်နှံမှုအစီအစဉ် (ADSIP) အတွက် ရင်းနှီးမြုပ်နှံမှု အစီအစဉ် အခြေခံ အချက်အလက်များအဖြစ် အသုံးပြုနိုင်ပါသည်။ ထို့အပြင် ၎င်းသည် ADSIP ရှိ ဗျူဟာမြောက် ဦးတည်ချက်များ နှင့် ဘက်ဂျက်ဟန်ချက် ညီမှု ခိုင်မာအားကောင်းစေရန်လည်း အထောက် အကူ ဖြစ်စေပါသည်။ ဤလေ့လာသုံး သပ်မှုသည် စိုက်ပျိုးရေးကဏ္ဍ ပြည်သူ့ဘဏ္ဍာငွေ သုံးစွဲမှုများ၏ စည်းစနစ်ကျသော အနာဂတ် ကာလ ဆန်းစစ် လေ့လာမှုများအတွက် အစပျိုးခြင်းဖြစ်ပါသည်။

အစီရင်ခံစာ၏ လေ့လာတွေ့ ရှိချက်များနှင့် အကြံပြုချက် များသည် နောက်ဆက်တွဲ ဆောင်ရွက်ရမည့် လုပ်ငန်း စဉ်များ၏ အခြေခံ ဖြစ်ပါသည်။

**နိုင်ငံတကာ အတွေ့အကြုံများကို မြန်မာနိုင်ငံအတွက် စံသတ်မှတ် ချက်တစ်ရပ်အဖြစ် အသုံးပြုခြင်း။**

နိုင်ငံတကာအတွေ့အကြုံများသည် မြန်မာနိုင်ငံအတွက် အရေးကြီးသော အတွေ့အကြုံသင်ခန်းစာများ ဖြည့်ဆည်း ပေးနိုင် ပါသည်။ အဆိုပါ အတွေ့အကြုံ သင်ခန်းစာများသည် မြန်မာနိုင်ငံရှိ စိုက်ပျိုးရေးကဏ္ဍ ဖွံ့ဖြိုးမှုအပေါ် အတိတ်ကာလ ပြည်သူ့ဘဏ္ဍာငွေ သုံးစွဲမှုများ၏ အကျိုးသက်ရောက်မှု အကန့် အသတ်ဖြစ်စေသည့် အကြောင်းရင်းများနှင့်ပတ်သတ်၍လည်းကောင်း၊ အနာဂတ် အကျိုးသက်ရောက် မှုများ တိုးတက်ကောင်းမွန်စေရန် ပြုပြင်ပြောင်း လဲရေးဆိုင်ရာ အကြံပြုချက်များနှင့် ပတ်သတ်၍လည်းကောင်း အတွင်းကျကျ လေ့လာသိရှိ နိုင်ရန် ဖြည့်ဆည်းပေးပါသည်။

ဈေးကွက်ဆိုင်ရာ ချို့ယွင်းအားနည်းချက်များနှင့် ကုန်ပစ္စည်း/ဝန်ဆောင် မှုများ၏ မမျှတသည့် ဖြန့်ဖြူး/ ပျံ့နှံ့မှုများကြောင့် ဖြစ်စေသည့် ပြည့်စုံ ထိရောက်မှု မရှိခြင်းကို ဖြေရှင်း ဆောင်ရွက်ရန် ပြည်သူ့ဘဏ္ဍာငွေသုံးစွဲမှု လိုအပ်ခြင်းကြောင့် ၎င်းသည် စိုက်ပျိုးရေးကဏ္ဍ ဖွံ့ဖြိုးရေးအတွက် များစွာ အရေးပါပါသည်။ သို့သော် စိုက်ပျိုးရေးကဏ္ဍအတွက် ပြည်သူ့ ဘဏ္ဍာငွေ တိုးမြှင့်သုံးစွဲရာတွင် ဖွံ့ဖြိုးမှုကို အားနည်းစေသည့် အကြီးစား စီးပွားရေး ဆိုင်ရာ ချို့ယွင်းမှုများကို ရှောင်ရှားနိုင်ရန် ဘဏ္ဍာရေးရာ တာဝန်ခံမှုရှိသော နည်းလမ်းများဖြင့် ဆောင် ရွက်ရန် လိုအပ် ပါသည်။

နိုင်ငံတကာ အတွေ့အကြုံများအရ စိုက်ပျိုးရေးကဏ္ဍ ဖွံ့ဖြိုးမှုအတွက် ပြည်သူ့ဘဏ္ဍာငွေသုံးစွဲမှုမှာ အရေးပါသော်လည်း ၎င်းတို့အား တိုးမြှင့် အသုံးပြုခြင်းအနေဖြင့် ဘဏ္ဍာရေးရာ ချင့်ချိန်တွက်ဆမှု များ လိုအပ်ပါသည်။

ပြည်သူ့ဘဏ္ဍာငွေသုံးစွဲမှုပမာဏသည် ဖွံ့ဖြိုးရေးထက် ၎င်း၏ လုပ်ငန်း ဆိုင်ရာနှင့် စီးပွားရေးရာ ပေါင်းစပ် ဖွဲ့စည်းမှုများ အပေါ်တွင် ပိုမို၍ အရေး ပါပါသည်။ အများပြည်သူ ဆိုင်ရာ ကုန်ပစ္စည်းများအတွက် ငွေကြေးသုံး စွဲမှုသည် ထောက်ပံ့ ကြေးများအတွက် သုံးစွဲမှုထက် များစွာပိုမို၍ အကျိုး ဖြစ်ထွန်း မှု ရှိစေပြီး၊ လုပ်အားခများ၊ လုပ်အားခမဟုတ်သည့် ပုံမှန် ကုန်ကျ ငွေများနှင့် ငွေလုံးငွေရင်း အသုံးစရိတ်များအကြား မျှတမှုရှိသည့် ဘက်ဂျက် ခွဲဝေလျာထားမှုသည် ပိုမိုမြင့်မား သည့် အကျိုးသက်ရောက်မှုများ ရရှိအောင် မြင်စေပါသည်။

ပြည်သူ့ဘဏ္ဍာငွေသုံးစွဲမှုများအား လုံး အနေဖြင့် မလွဲမသွေဖြစ်ထွန်းမှုမျိုး မရှိနိုင်ပါ။ ဘတ်ဂျက်ခွဲဝေသတ်မှတ်မှု ဆိုင်ရာ ထိရောက်အကျိုးရှိမှုမှာ များစွာ အရေးကြီးပါသည်။

စိုက်ပျိုးရေး သုတေသနနှင့် တောင်သူများအတွက် သုတေသန လုပ်ငန်းရ လဒ်များ လက်လှမ်းမီ ရရှိစေသည့် ပေါင်းစပ် ဖြည့် ဆည်းမှု အစီအစဉ်များ (တိုးချဲ့ပညာပေးလုပ်ငန်း၊ မြေဆီ လွှာအာဟာရဓါတ်စီမံခန့်ခွဲမှု၊ သီးနှံကာ ကွယ်ရေး စသည်) တွင် ပြည်သူ့ဘဏ္ဍာငွေရင်းနှီးမြုပ်နှံမှုများသည် အမြင့်မား ဆုံး အကျိုး ရလဒ်များကို ဖြစ်ထွန်းစေနိုင်သောကြောင့် ကမ္ဘာ့နိုင်ငံများတွင် တွေ့မြင်ရပါသည်။ ၎င်းရင်းနှီးမြုပ်နှံမှုများ ဆောင်ရွက် ခြင်းမရှိပဲ မည်သည့် နိုင်ငံမျှ ရေရှည် စိုက်ပျိုးရေးကဏ္ဍ ဖွံ့ဖြိုးရေးကို ဆောင်ရွက်နိုင်မည် မဟုတ်ပါ။

စိုက်ပျိုးရေးသုတေသနနှင့် ဖြည့်စွက် အစီအစဉ်များအပေါ် ရန်ပုံငွေ အသုံးပြုခြင်းသည် အကျိုးဖြစ်ထွန်းမှု အများဆုံး ရင်းနှီးမြုပ်နှံမှု ဖြစ်ပါသည်။

အကောင်အထည်ဖော်ဆောင်ရွက်မှုဆိုင်ရာ အရည်အသွေးသည် တနည်းအား ဖြင့် ကျိုးကြောင်းဆီလျော်စွာ သတ်မှတ် ဆောင်ရွက်သည့် အများပြည်သူ ဆိုင်ရာ အစီအစဉ်များ၏ အကျိုးရလဒ်များအပေါ် သက်ရောက်မှု ရှိပါသည်။ လုပ်ငန်း စွမ်းရည်ကန့်သတ်ချက်များ၊ အားနည်းသည့် ဒီဇိုင်းပုံစံ၊ ဝန်ဆောင်မှု များ၏ ဖြည့်ဆည်းနိုင်မှုအပေါ် အဓိကထားသည့် သဘောသဘာဝ၊ ပြည့်စုံ လုံလောက်မှုမရှိသော ညှိနှိုင်း ဆောင် ရွက်မှု၊ မြင့်မားသည့် ယူနစ်ကုန်ကျ စရိတ်များ၊ နည်းပါးသည့် ဘက်ချက်စီမံဆောင်ရွက်မှုများနှင့် ပြည်သူ့ ဘဏ္ဍာငွေ စီမံခန့် ခွဲမှုဆိုင်ရာ ပြဿနာများ စသည်တို့သည် အကောင် အထည်ဖော်ဆောင်ရွက်မှု အကျိုးရလဒ်များအပေါ် သက်ရောက်မှု ရှိနိုင်ပါသည်။

စီမံကိန်း၏ အကောင်အထည်ဖော် ဆောင်ရွက်မှု အရည်အသွေးအပေါ် အလေးထားဆောင်ရွက်ရန် လိုအပ်ပါသည်။

ကောင်းမွန်သောမူဝါဒများ၊ အဖွဲ့အစည်းများနှင့် ပေါင်းစပ် ဆောင်ရွက်ခြင်း ဖြင့် အများပြည်သူဆိုင်ရာ ကုန်ပစ္စည်းများအပေါ် ရင်းနှီးမြုပ်နှံခြင်းသည် ပိုမိုကောင်း မွန်သော အကျိုး ရလဒ်များကို ဖြစ်ထွန်းစေပါသည်။ စိုက်ပျိုးရေးဆိုင်ရာ မူဝါဒ ဝန်းကျင်များ တိုးတက်ကောင်းမွန်ခြင်းဖြင့် ထုတ်လုပ် သူများနှင့် ဆန်းသစ်ပြောင်း လဲ ဆောင်ရွက်သူများအတွက် အများပြည်သူဆိုင်ရာ ကုန်ပစ္စည်းများအပေါ် အကျိုးရှိစွာ အသုံးချနိုင်ပြီး ပုဂ္ဂလိက ရင်းနှီးမြုပ်နှံမှုများ ဝင်ရောက်လာမှုနှင့်အတူ ရင်းနှီးမြုပ်နှံမှုများ တိုးပွားလာပြီး ပြည်သူ့ဘဏ္ဍာ ငွေသုံးစွဲမှုများ တိုးမြင့် လာစေပါမည်။

မူဝါဒရေးရာ ဝန်းကျင်အခြေ အနေများ တိုးတက်ကောင်းမွန် စေခြင်းဖြင့် ပုဂ္ဂလိက ရင်းနှီး မြုပ်နှံမှုများ တိုးပွားလာစေပြီး ပြည်သူ့ဘဏ္ဍာငွေ သုံးစွဲမှုများ ၏ အကျိုးသက်ရောက်မှုကို တိုးမြင့်စေပါသည်။

**မြန်မာနိုင်ငံ၏ စိုက်ပျိုးရေးကဏ္ဍအတွက် ပြည်သူ့ဘဏ္ဍာငွေ သုံးစွဲမှုပမာဏ အပေါ် ခန့်မှန်းတွက်ချက်ခြင်း။**

ဤလေ့လာသုံးသပ်မှုအနေဖြင့်လေ့လာသုံးသပ်မှုကာလအတွင်း မြန်မာနိုင်ငံရှိ စိုက်ပျိုးရေးကဏ္ဍ ပြည်သူ့ဘဏ္ဍာငွေ သုံးစွဲမှု စုစုပေါင်း ပမာဏအပေါ် ပထမဦးဆုံး အကြိမ် ခန့်မှန်းတွက်ချက်မှုကို ဆောင်ရွက် ခဲ့ပါသည်။ ပြည်ထောင်စု ဝန်ကြီးဌာန (MOALI) နှင့် သမ္မတရန်ပုံငွေ ဘတ်ဂျက် (presidential budgets) အပြင်၊ တိုင်းဒေ သကြီး/ ပြည်နယ် များ၊ MADB အတိုးနှုန်း ထောက်ပံ့ငွေများနှင့် အလှူရှင်များထံ မှလည်း စိုက်ပျိုးရေးဘတ်ဂျက်များ ရရှိပါသည်။

ဤအစီရင်ခံစာသည် ပထမဆုံး အကြိမ်အဖြစ် စိုက်ပျိုးရေးကဏ္ဍ ပြည်သူ့ဘဏ္ဍာငွေ သုံးစွဲမှု စုစုပေါင်း အပေါ် ခန့်မှန်း တွက်ချက်မှုများကို ဖြည့် ဆည်းပေးပါသည်။

ပြည်ထောင်စုအစိုးရအဖွဲ့သည် စိုက်ပျိုးရေးကဏ္ဍအတွက် ပြည်သူ့ဘဏ္ဍာငွေ သုံးစွဲမှုပမာဏကို ပုံမှန်တိုးမြှင့်ဆောင်ရွက်ခဲ့ပြီး လေ့လာသုံးသပ်မှုကာလအတွင်း တွေ့ ရှိချက်အရ အခြားအစီအစဉ်များထက် ၎င်းကဏ္ဍအပေါ် အဓိကထား ဆောင်ရွက် ခဲ့ကြောင်း တွေ့ရပါသည်။ သမ္မတဘတ်ဂျက်ရန်ပုံငွေ အပါအဝင် စိုက်ပျိုးရေးကဏ္ဍ အတွက် ပြည်ထောင်စု ဘတ်ဂျက်မှာ ကျပ်ငွေ (၂၆၈) ဘီလီယံမှ ကျပ်ငွေ (၆၁၉) ဘီလီယံ အထိ တိုးပွားလာခဲ့ပါသည်။ ပြည်နယ်/တိုင်းဒေသကြီး ဘတ်ဂျက်များနှင့်အတူ MADB ၏ အတိုးနှုန်းထောက်ပံ့ငွေ၊ MOALI သို့ အလှူရှင်ရန်ပုံငွေများအပါ အဝင် စိုက်ပျိုးရေး ကဏ္ဍအတွက် စုစုပေါင်း သုံးစွဲခဲ့သည့် ရန်ပုံငွေပမာဏမှာ ၂၀၁၆/၁၇ ခုနှစ်တွင် ကျပ်ငွေ (၇၉၀) ဘီလီယံ (အမေရိကန်ဒေါ်လာ ၆၆၇ သန်း ခန့်) ရှိခဲ့ပြီး ၂၀၀၉/၁၀ ခုနှစ် ဘတ်ဂျက်ရန်ပုံငွေဖြစ်သည့် ကျပ်ငွေ (၂၆၈) ဘီလီယံ (အမေရိကန် ဒေါ်လာ ၂၆၇ သန်းခန့်) နှင့် နှိုင်းယှဉ်ပါက ပမာဏ (၃) ဆခန့် တိုးမြှင့် အသုံးပြုခဲ့ခြင်းဖြစ်ပါသည်။

လက်တွေ့အားဖြင့် စုစုပေါင်း စိုက်ပျိုးရေး ဘတ်ဂျက်ရန်ပုံငွေသည် ၂၀၀၉/၁၀ နှင့် ၂၀၁၆/၁၇ ကာလအတွင်း (၃) ဆခန့် (သို့) (၂)ဆခန့် တိုးမြှင့်ခဲ့ပါသည်။

GDP တွင်စိုက်ပျိုးရေးဘတ်ဂျက်ပါဝင်မှု အမျိုးအစားမှာ ၂၀၀၉/၁၀ ခုနှစ်ရှိ (၀.၇၇%)မှ ၂၀၁၆/၁၇ ခုနှစ်တွင် (၀.၉၃%) အထိ တိုးမြှင့်ခဲ့ပါသည်။ ၎င်းသည် အမြင့်

ဆုံးပမာဏအဖြစ် ၂၀၁၅/ ၁၆ခုနှစ်တွင် GDP၏(၁.၂၁%)အထိ ရောက်ရှိခဲ့ ပြီးဖြစ် ပါသည်။ သို့ရာ တွင် လေ့လာသုံးသပ်မှုကာလအတွင်း စိုက်ပျိုးရေးဘက်ဂျက်၏ ပြည်ထောင်စု ဘက်ဂျက်တွင် ပါဝင်မှု အချိုးအစားမှာ (၈.၄%) မှ (၅.၃%)သို့ လျော့ကျခဲ့ပါသည်။ ဒေသတွင်းနှင့် နိုင်ငံတကာ လေ့လာ နှိုင်းယှဉ်မှုများအရ၊ မြန်မာနိုင်ငံသည် ၎င်း၏ သိသာ ကြီးမားသည့် ဘဏ္ဍာရေးအရင်းအမြစ် အချိုးအစားပမာဏကို စိုက်ပျိုးရေးကဏ္ဍ အတွက် ခွဲဝေသတ်မှတ်အသုံးပြုကြောင်းတွေ့ရပါသည်။ အာရှဒေသရှိ ဖွံ့ဖြိုးဆဲနိုင်ငံ အများစုသည် စိုက်ပျိုးရေးကဏ္ဍအတွက် GDP၏ (၀.၂ - ၀.၇%)ခန့်သာ သတ်မှတ်အသုံးပြုကြပါ သည်။

စိုက်ပျိုးရေးဘက်ဂျက်ရံပုံငွေသည် GDP ၏ အမျိုးအစားတစ်ရပ် အနေဖြင့် တိုးမြှင့်ခဲ့ပါသည်။ နိုင်ငံတကာ အခြေအနေများနှင့် နှိုင်းယှဉ်ပါက မြန်မာနိုင်ငံသည် ၎င်း၏ ဘဏ္ဍာရေး အရင်းအမြစ်၏ ကြီးမားသည့် အချိုးအစား ပမာဏကို စိုက်ပျိုးရေး ကဏ္ဍအတွက် အသုံးပြုခဲ့ပါသည်။

စိုက်ပျိုးရေးကဏ္ဍအတွက် သိသာကြီးမားသည့် ဘက်ဂျက်ပမာဏကို ခွဲဝေသတ်မှတ် အသုံးပြုပြီးဖြစ်၍ မြန်မာနိုင်ငံ၏တင်းကျပ်သည့် ကာလလယ် ဘဏ္ဍာရေး သုံးသပ်ချက်အား အလားအလာများအရ ဘက်ဂျက်ရန်ပုံငွေ တိုးမြှင့်ခြင်းထက် လက်ရှိ ရန်ပုံငွေအသုံးပြုမှု များ၏ ထိရောက်ကောင်းမွန်မှုနှင့်စွမ်းရည်ပြည့်ဝအကျိုးရှိမှုများ ပိုမို တိုးတက် ကောင်းမွန်စေ ရေးအတွက် ဦးစားပေးလုပ်ဆောင်ရန်လိုအပ်နေပါသည်။ ထို့ပြင် အများအားဖြင့် ရန်ပုံငွေမ လုံလောက်သည့် အစီအစဉ်များ အတွက် ထပ်ဆောင်းရန်ပုံငွေများရရှိစေရန် အလှူရှင် အဖွဲ့အစည်းများနှင့် ဗဟုဟာမြောက် ချိတ်ဆက် ဆောင်ရွက်မှုများလုပ်ဆောင်ရန် လိုအပ် ပါသည်။

ဘက်ဂျက်ဆိုင်ရာ ကန့်သတ်ချက် များရှိခြင်းကြောင့် အလှူရှင်အဖွဲ့ အစည်းများ၏ ရံပုံငွေများ ရရှိအ သုံးပြုနိုင်ရေး အလေးအနက်ထား စည်းရုံးဆောင်ရွက်ရန် လိုအပ် ပါသည်။

*ဤလေ့လာသုံးသပ်ချက်အရ၊ ဘက်ဂျက်ကန့်သတ်ချက်ရှိသည့် အခြေအနေတွင်၊ မြန်မာနိုင်ငံ ၏ စိုက်ပျိုးရေးကဏ္ဍအတွက် ပြည်သူ့ဘဏ္ဍာ ငွေသုံးစွဲမှု၏ အကျိုးသက်ရောက်မှုများ ပိုမိုမြင့်မားစေရေးအတွက် ပထမဆုံး ဦးစားပေးလုပ် ဆောင်ရမည့်အချက်မှာ လက်ရှိရန်ပုံငွေ အသုံး ပြုမှုများ ပိုမိုတိုးတက်ကောင်းမွန်စေရန် ဆောင်ရွက်သင့်ပြီး၊ အရေးကြီးသည့် ရန်ပုံငွေ မလုံလောက်သော အစီအစဉ်များ ရွေးချယ်သတ်မှတ်၍ ၎င်းတို့အတွက် အလှူရှင်များ၏ ရန်ပုံငွေ ရရှိစေရေးစည်းရုံး ဆောင်ရွက်သင့်ပါသည်။*

**စိုက်ပျိုးရေးကဏ္ဍ ဘက်ဂျက်တွင် ဖွဲ့စည်းပါဝင်သည့် ကဏ္ဍများအား ပြန်လည်ချိန်ညှိခြင်း။**

လေ့လာသုံးသပ်မှုကာလအတွင်း MOALIရန်ပုံငွေဘက်ဂျက်စုစုပေါင်း၏ ထက် ဝက်ကျော်ခန့်ကို ဆည်မြောင်းကဏ္ဍအတွက် အသုံးပြုခဲ့ကြောင်းတွေ့ရပါသည်။ နောက်ထပ် ၁၅%ကို စက်မှုလယ်ယာကဏ္ဍအတွက် အသုံးပြုခဲ့ပြီး ၎င်းကဏ္ဍ၏ အချိုးအစားမှာ ၂၀၀၉ /၁၀ ခုနှစ်တွင် (၆%)ရှိခဲ့ရာမှ ၂၀၁၆/၁၇ ခုနှစ်တွင် (၁၈%)ခန့်အထိ တိုးမြှင့် ခဲ့ပါသည်။ စိုက်ပျိုးရေးရန်ပုံငွေနှင့် သီးနှံအစီအစဉ်များမှာ ပျမ်းမျှ (၁၅%)ခန့်စီရှိကြပြီး အချိန်ကာလ အလိုက် သိသိသာသာ တိုးမြှင့်ရရှိလာကြပါသည်။

ဘဏ္ဍာငွေအများစုကို ဆည်မြောင်း အခြေခံ အ ဆောက် အအုံ ဖွံ့ဖြိုးရေး၊ စက်မှုလယ်ယာ၊ ဘဏ္ဍာရေး ရာနှင့် သီးနှံ အစီအစဉ်များ အတွက် အသုံးပြုခဲ့ပါသည်။

အခြားအစီအစဉ်များဖြစ်သည့် သုတေသန၊ တိုးချဲ့ပညာပေး လုပ်ငန်း၊ စီမံကိန်း ရေးဆွဲရေး၊ စာရင်းအင်း၊ လေ့လာ စစ်ဆေးအကဲ ဖြတ်ခြင်း (M&E)၊ မြေဆီလွှာအာဟာရ စီမံခန့်ခွဲမှု၊ သွင်းအားစု အရည် အသွေးအာမခံချက်၊ သီးနှံကာကွယ်ရေး၊ ကူးစက်ရောဂါ ကာ ကွယ်ရေးဆိုင်ရာ သီးသန့်ခွဲခြားခြင်းနှင့် မိလ္လာသန့်ရှင်းရေး၊ အပင်သန့်စင်ရေးဆိုင်ရာ အစီအ

စဉ်များ၊ မွေးမြူရေး၊ ငါးလုပ်ငန်းနှင့်သမဝါယမလုပ်ငန်း၊ စသည့် ကဏ္ဍများအနေဖြင့် အလွန် နည်းပါးသည့် ဘက်ဂျက်ပမာဏ သာရရှိခဲ့ကြပါသည်။ ရန်ပုံငွေ မလုံလောက်မှု အများဆုံး ဖြစ်သည့်လုပ်ငန်းမှာ စိုက်ပျိုးရေး သုတေသနလုပ်ငန်း ဖြစ်ပါသည်။ ၂၀၁၆/၁၇ ခုနှစ်တွင် မြန်မာနိုင်ငံနေပြည်တော် စိုက်ပျိုးရေး သုတေသန လုပ်ငန်းအတွက် စိုက်ပျိုးရေး GDP ၏ (၀.၀၄%) သာ ရင်းနှီးမြုပ်နှံအသုံးပြုခဲ့ပြီး၊ ၎င်းသည် အာရှနိုင်ငံများ၏ ပျမ်းမျှအသုံးပြုမှု (၀.၀၆%)နှင့် ဖွံ့ဖြိုးပြီးနိုင်ငံများ၏ (၂.၅၀%)တို့နှင့် နှိုင်းယှဉ်ပါက လျော့နည်းသည့် အနေ အထားတွင် ရှိပါသည်။

အခြားအစီအစဉ်များတွင် ရံပုံငွေ မလုံလောက်မှု အများအပြား ရှိခဲ့ ပါသည်။ အခြားအာရှနိုင်ငံများ နှင့် နှိုင်းယှဉ်ပါက စိုက်ပျိုးရေး R & D ကဏ္ဍတွင် မြန်မာနိုင်ငံ၏ သုံးစွဲမှုမှာ (၁၂) ဆခန့် လျော့နည်းပါသည်။

ပြည်သူ့ဘဏ္ဍာငွေ အများစုကို ဆန်စပါးနှင့် ဆက်နွယ်သည့် အစီအစဉ်များ - ဆည်မြောင်းလုပ်ငန်း၊ စက်မှု လယ်ယာ၊ မျိုးစေ့၊ တိုးချဲ့ပညာပေး စသည့် နည်းလမ်းများမှ တဆင့် အသုံးပြု ခဲ့ပါသည်။ အခြား သီးနှံများ (သို့) အခြားစိုက်ပျိုးရေး စနစ်များအတွက် အစီအစဉ်များသည် အလွန်နည်းပါးသည့် ဘက်ဂျက်ရန်ပုံငွေ သာရရှိကြပါသည်။ အာဟာရ ဖူလုံမှု နှင့် ရာသီဥတုဒဏ်ခံနိုင်သော စိုက်ပျိုးရေးစနစ်များအတွက် ရံပုံငွေသုံးစွဲမှုမှာ သိသာ မြင်သာသည့် အကျိုး သက်ရောက်မှုများဖြစ်ထွန်းရန် မလုံလောက်သည့် အလွန်နည်းပါး သော ပမာဏသာရှိပါသည်။ MOALIအစီအစဉ်များတွင် ကျား/မ တန်းတူညီမျှဆိုင်ရာ ရှုထောင့်များ ပါဝင်မှုမရှိကြောင်းတွေ့ရှိရပါသည်။

အစီအစဉ်အများစုတွင် ဆန်စပါးအပေါ် အဓိကထား ဆောင်ရွက်မှုများ ရှိပါသည်။ ရာသီဥတုဒဏ် ခုခံနိုင်ရည်ရှိမှု၊ အာဟာရနှင့် ကျား/မ တန်းတူညီမျှ ဆိုင်ရာ အစီအစဉ်များမှာ အကန့် အသတ်ရှိခဲ့ပါသည်။

စီးပွားရေးရာဖွဲ့စည်းပါဝင်မှုအရ ဘက်ဂျက်ရန်ပုံငွေသည် လုပ်အားခများ၊ လုပ်အားခမဟုတ်သည့် ပုံမှန်ကုန်ကျငွေများ၊ ငွေလုံး ငွေရင်းသုံးစွဲမှုများစသည်တို့ နှင့်ပတ် သက်၍ ကောင်းစွာဟန်ချက် ညီမှုရှိခဲ့ပြီး၊ လတ်တလော လုပ်အားတိုး မြှင့်မှုများ ရှိသော် လည်း လုပ်အားခ အသုံးစရိတ်မှာ နည်းပါးသည့် ပမာဏအဖြစ် ဆက်လက်ရှိနေပါ သည်။ သို့သော် ငွေလုံးငွေရင်းသုံးစွဲမှုများသည် ဆည်မြောင်းနှင့် စက်မှုလယ်ယာကဏ္ဍများအတွက် အနည်းငယ်သော အစီအစဉ်ခွဲ များဖြစ်သည့် ဆည်အသစ်များနှင့် ပင်မ ဆည်မြောင်းအ ခြေခံ အဆောက်များတည်ဆောက်ခြင်း (ဆည်မြောင်းနှင့် ရေအသုံးချမှု စီမံခန့်ခွဲရေးဦးစီး ဌာန)နှင့် ထွန်စက်များ၊ အခြားလယ်ယာသုံး စက် ပစ္စည်းများဝယ်ယူခြင်း (စက်မှုလယ်ယာဦး စီးဌာန) စသည်တို့အတွက် အဓိကထားသတ်မှတ် သုံးစွဲမှုများ ဆောင်ရွက်ခဲ့ပါသည်။ အဆို ပါသုံး စွဲမှုများအနေဖြင့် ပိုမို၍ အကျိုးဖြစ်ထွန်းသော သုံးစွဲမှုများဖြစ်သည့် ဆည်မြောင်း အခြေခံအဆောက်အအုံ စီမံခန့်ခွဲမှု၊ ဆည်များ ဘေးကင်း လုံခြုံရေး၊ ရေအရင်းအမြစ် စီမံခန့်ခွဲမှုနှင့် စက်မှုလယ်ယာကဏ္ဍအတွက် သင်တန်းပို့ချမှုဆိုင်ရာ သင်တန်းများ၊ လယ်ယာ သုံးစက်ပစ္စည်း ပိုင်ဆိုင် သူများအတွက် ပြုပြင်ရေးနှင့် အခြားဝန်ဆောင်မှုများ ဖြည့်ဆည်း ခြင်း၊ စက်ပစ္စည်း အသစ်များနှင့် လယ်ယာသုံးစက်ကိရိယာများ စစ်ဆေး စမ်းသပ်ခြင်း (အထူးသဖြင့် စပါးမဟုတ်သော အခြားသီးနှံများ အတွက်) စသည့် အစီအစဉ်များ အတွက်ပါဝင်မှုမရှိခဲ့ပါ။

ဘက်ဂျက်၏ ယေဘုယျ စီးပွားရေး ရာ ဖွဲ့စည်းပါဝင်မှုအနေဖြင့် ဟန်ချက်ညီမှု ရှိခဲ့သော်လည်း အချို့သော ဆည်မြောင်းနှင့်စက်မှု လယ်ယာ အစီအစဉ်များအတွက် ကြီးမားသည့် ငွေလုံးငွေရင်း ဘက်ဂျက်ရံပုံငွေများ အနေဖြင့် ပိုမို အကျိုးဖြစ်ထွန်းစေသည့် သုံးစွဲမှုများ ဆောင်ရွက်ရန် ကျန်ရှိနေပါသည်။

သုတေသနနှင့် တိုးချဲ့ပညာပေးဝန်ထမ်းများအတွက် အမျိုးမျိုး သော စိုက်ပျိုးဂေဟဇုန်များအတွက် သင့်တော်ကောင်းမွန်မှုရှိသည့် အမျိုးမျိုးသော စိုက်ပျိုးရေးထုတ်ကုန်များ(သီးနှံများ၊ မွေးမြူရေးနှင့်ငါး လုပ်ငန်း)အတွက် ပိုမိုကောင်းမွန်သော နည်းပညာများ လက်တွေ့ စမ်းသပ်၊ ထုတ်လုပ်ခြင်း(သို့) အဆိုပါ နည်းပညာများအား

အရေးကြီးသည့် ပြည်သူ့ဝန်ဆောင် မှုများဖြည့်ဆည်းရန် ဝန်ထမ်းများ အတွက် ခရီးသွားလာမှုနှင့် လုပ်ငန်း ဆောင်ရွက်မှုဆိုင်ရာ ဘက်ဂျက် မရှိပါ။

တောင်သူ များ လက်လှမ်းမီ ရရှိ အသုံးပြုနိုင်စေရေး စသည့် လုပ်ငန်းများ ဆောင်ရွက်ရန် ခရီးသွားလာမှုနှင့် လုပ်ငန်းဆောင်ရွက်ဆိုင်ရာ ဘက်ဂျက်ရရှိမှု အလွန်နည်းပါးလှပါသည်။

စိုက်ပျိုးရေးကဏ္ဍဖွံ့ဖြိုးရေးအတွက် ပြည်သူ့ဘဏ္ဍာငွေသုံးစွဲမှု၏ အကျိုးသက်ရောက်မှုတိုးတက်ကောင်းမွန်စေရန် ၎င်းပြည်သူ့ဘဏ္ဍာ ငွေ အသုံးပြုမှုများ၏လုပ်ငန်းဆိုင်ရာနှင့် စီးပွားရေးရာ ဖွဲ့စည်းပုံစံများ တွင် အပြောင်းအလဲများ ဆောင်ရွက်ရန်လိုအပ်ပါသည်။ ၎င်းအနေဖြင့် ရံပုံငွေများ ရွှေ့ပြောင်းပြောင်းလဲမှု ဆောင်ရွက်ရန် လိုအပ်ကြောင်း ညွှန်ပြနေပါသည်။ - (၁) အများပြည်သူဆိုင်ရာ စက်မှုလယ်ယာ ဝန်ဆောင်မှုများဖြည့်ဆည်းခြင်းနှင့် ဆည်းမြောင်းအခြေခံအဆောက် အအုံဖွံ့ဖြိုးရေးကဏ္ဍများမှ သုတေသနနှင့် ဖွံ့ဖြိုးရေး (R&D)၊ ဆည် မြောင်း အင်္ဂါရပ်များစီမံခန့်ခွဲမှု၊ မြေဆီလွှာအာဟာရ စီမံခန့်ခွဲမှုနှင့် သီးနှံ ကာကွယ်ရေးမျိုးစေ့များ၊ တိုးချဲ့ပညာပေး (သီးနှံများ၊ မွေးမြူရေးနှင့်ငါးလုပ်ငန်းများအတွက်)၊ သွင်းအားစုအရည်အသွေး အာမခံ ချက်နှင့်စိုက်ပျိုးရေးစီမံကိန်းရေးဆွဲခြင်းစသည့် ကဏ္ဍများသို့လည်း ကောင်း၊ (၂) ငွေလုံးငွေရင်း သုံးစွဲမှုမှလုပ်အားခ မဟုတ်သော ပုံမှန် သုံးစွဲမှုများသို့လည်းကောင်း၊ အထူးသဖြင့် တိုးချဲ့ပညာပေးလုပ်ငန်း ဆောင်ရွက်မှု ကုန်ကျစရိတ်များနှင့် ဆည်မြောင်းအင်္ဂါရပ်များ၏ လုပ်ငန်းဆောင်ရွက်မှုနှင့် စီမံခန့်ခွဲမှု (O&M)၊ အခြားအရေးကြီးသည့် ဝန်ဆောင်မှုဖြည့်ဆည်းခြင်းများအတွက် အသုံးပြု ဆောင်ရွက်ရန် ဖြစ်သည်။ ယင်းသို့ရန်ပုံငွေပြန်လည်ခွဲဝေသတ်မှတ်ခြင်းသည် ADSIP ဗျူဟာမြောက် ဦးတည်ချက်များ၊ ဦးစားပေးအစီအစဉ်များနှင့် ဘက်ဂျက် ရန်ပုံငွေတို့ ဟန်ချက်ညီကိုက်ညီမှုရှိစေရန် အထောက်အကူ ဖြစ်စေ ပါမည်။

မြန်မာနိုင်ငံအတွင်း စိုက်ပျိုးရေး ဖွံ့ဖြိုးမှုအတွက် ပြည်သူ့ဘဏ္ဍာငွေ သုံးစွဲမှုများ၏ အကျိုးသက်ရောက်မှု တိုးမြှင့်စေရန် ရံပုံငွေ ခွဲဝေသတ်မှတ်မှု ဆိုင်ရာ ထိရောက်အကျိုးရှိမှုများ ပိုမိုကောင်းမွန်စေရန် လိုအပ်ပါသည်။

*(လေ့လာသုံးသပ်ချက်မှ အောက်ပါတို့ဆောင်ရွက်ရန်အကြံပြုသည်။ - (၁)စိုက်ပျိုးရေးဘက်ဂျက် ရန်ပုံငွေ၏ လုပ်ငန်းဆိုင်ရာနှင့် စီးပွားရေး ရာဖွဲ့စည်းပုံစံများ ပြန်လည်ချိန်ညှိရန် ADSIP အရသတ်မှတ်သည့် ဗျူဟာမြောက် မူဘောင်တစ်ရပ်အားအသုံးပြုဆောင်ရွက်ရန်၊ (၂) ဆည်မြောင်းနှင့် စက်မှုလယ်ယာဆိုင်ရာ ငွေလုံးငွေရင်း ဘက်ဂျက် ရံပုံငွေ အချို့အား အခြား အစီအစဉ်များအတွက် ပြန်လည်ခွဲဝေ သတ်မှတ်ရန်၊ (၃) အထူးသဖြင့် ဆည်မြောင်း အင်္ဂါရပ်များ၊ လုပ်ငန်း ဆောင်ရွက်မှုနှင့် စီမံခန့်ခွဲမှု၊ တိုးချဲ့ပညာပေး အစီအစဉ်များအတွက် ငွေလုံးငွေရင်း အသုံး စရိတ်မှ တစ်ချို့ရန်ပုံငွေများကို လုပ်အားခမဟုတ်သော ပုံမှန်ဘက်ဂျက်သုံးစွဲမှုအတွက် ပြောင်းလဲ အသုံးပြုရန်နှင့် (၄)ရန်ပုံငွေ ပြန်လည်ရွှေ့ပြောင်းသတ်မှတ်မှုအတွက် ဖြည့်စွက်အတိုင်းအတာများ သတ်မှတ်နိုင်ရန် MOALI ၏ အဖွဲ့အစည်းဆိုင်ရာ လေ့လာသုံးသပ်မှု တစ်ရပ်ဆောင်ရွက်ရန် စသည့်တို့ဖြစ်သည်။)*

အစီအစဉ်များ၏ အကောင်အထည်ဖော် ဆောင်ရွက်မှု အရည်အသွေး တိုးတက်ကောင်းမွန်စေရန် ဆောင်ရွက်ခြင်း။

လက်ရှိအစီအစဉ်များ၏ အကောင်အထည်ဖော်ဆောင်ရွက်မှု စွမ်းရည်ကို ပိုမိုထိရောက်အကျိုးရှိစေရန် ဆောင်ရွက်ခြင်းဖြင့်လည်း မြန်မာနိုင်ငံအတွင်း စိုက်ပျိုးရေး ကဏ္ဍဖွံ့ဖြိုးရေးအတွက် ပြည်သူ့ဘဏ္ဍာ ငွေသုံးစွဲမှု၏ အကျိုးသက်ရောက်မှုများအား တိုးမြှင့်နိုင်ပါသည်။ ၎င်းအနေဖြင့် ဝန်ဆောင်မှုဖြည့်ဆည်းခြင်းနှင့် ဘဏ္ဍာရေးပံ့ပိုးမှုအတွက် ငွေကြေးသုံးစွဲမှုကဏ္ဍများ (ပုဂ္ဂလိက ကဏ္ဍရင်းနှီးမြုပ်နှံမှုများတိုးပွား စေရေးအပါအဝင်) တွင် အစိုးရ၏အခန်းကဏ္ဍကို သတ်မှတ်နိုင်ရန် လိုအပ်ကြောင်း ညွှန်ပြနေပါသည်။ မကြာသေးမီက ပြင်ဆင်ဆောင် ရွက်ထားသည့် မျိုးစေ့ကဏ္ဍပြုပြင်ပြောင်းလဲရေးလမ်းပြ မြေပုံ သည် အခြားအစီအစဉ်များအတူယူဆောင်ရွက်နိုင်ရန် ကောင်းမွန်သော နမူနာ တစ်ခုဖြစ်ပါသည်။

အထူးသဖြင့် မြန်မာနိုင်ငံ၏ ဘဏ္ဍာရေးရာ အကန့်အသတ် ရှိသည့် အခြေအနေတွင် ပြည်သူ့ ဘဏ္ဍာငွေ သုံးစွဲမှုများအနေဖြင့် မြင့်မားသည့် အကျိုးသက်ရောက်မှု များ ရရှိရန် အကောင်အထည်ဖော် ဆောင်ရွက်မှုဆိုင်ရာ စွမ်းရည် ပြည့်ဝ/ထိရောက်မှုသည် အလွန် အရေးကြီးပါသည်။

ယေဘုယျအားဖြင့် အကောင်အထည်ဖော်ရေး စွမ်းရည်ပြည့်ဝမှု တိုးတက် ကောင်းမွန်စေရန် ဆောင်ရွက်ရာတွင် အောက်ပါတို့ လိုအပ်ပါသည်။ - (၁) နည်းပညာ/ ပညာရပ်ဆိုင်ရာကိစ္စရပ်များ၊ ဈေးကွက် လိုအပ်ချက်အလိုက်နှင့် ဈေးကွက်စီးပွားရေး အခြေခံသည့် ဝန်ဆောင်မှုဖြည့်ဆည်းခြင်းအတွက် အဖွဲ့အစည်းဆိုင်ရာ နည်းလမ်း အသစ်များစသည်တို့နှင့် ပတ်သက်၍ MOALI ဝန်ထမ်းများ ၏လုပ်ငန်းစွမ်းရည် မြှင့်တင်ရေးအတွက် ရင်းနှီးမြုပ်နှံခြင်း၊ (၂) လက်ရှိ အစီအစဉ်များအနေဖြင့် မြန်မာနိုင်ငံ၏ ကြွယ်ဝသည့် မတူကွဲပြားမှု၊ စိုက်ပျိုး-ဂေဟစနစ်များနှင့်ကိုက်ညီမှုရှိစေရန် ဒီဇိုင်းပုံစံချိန်ညှိခြင်း (ဥပမာ- စပါး စိုက်ပျိုးရေးအတွက်ပံ့ပိုးမှုများမှ မတူကွဲပြားမှုရှိသော လယ်ယာလုပ်ငန်းစနစ်များနှင့် တန်ဖိုးမြှင့်ကွင်းဆက်များအတွက် ပြောင်းလဲ ပံ့ပိုးဆောင်ရွက်ခြင်း)၊ (၃) hardwareကဏ္ဍ ရင်းနှီးမြုပ်နှံ မှုများ(ဥပမာ ဆည်မြောင်းစနစ်(သို့) ကျေးလက်လမ်းများ အဆင့်မြှင့်တင်ခြင်း)နှင့်အတူSoftwareကဏ္ဍရင်းနှီးမြုပ်နှံမှုများ၊ (ဥပမာ- ရေအသုံးချ သူအစုအဖွဲ့များ၊ (O&M)နှင့် ဝန်ဆောင်မှုကဏ္ဍ များ(ဥပမာ- ဓါတ်မြေဩဇာနှင့် ပိုးသတ်ဆေးအရည်အသွေး ထိန်းချုပ်မှု၊ မြေဆီလွှာအာဟာရစီမံခန့်ခွဲမှု၊ တိုးချဲ့ ပညာပေးလုပ်ငန်း၊ မျိုးစေ့နှင့် ဈေးကွက်သတင်းအချက်အလက်စနစ်) အတွက်ဖြည့်စွက်ဆောင်ရွက်ခြင်း၊ (၄) ဌာနဆိုင်ရာများအကြားတပြေးညီနှင့် အထက်အောက် ညှိနှိုင်း ဆောင်ရွက်မှုများ ပိုမို အားကောင်းစေရန် ဆောင်ရွက်ခြင်း စသည်တို့ဖြစ် ပါသည်။

MOALI လုပ်ငန်းများ ပိုမို တိုးတက် ကောင်းမွန်စေရန် အပြန်အလှန် ဆက်စပ်မှု ရှိနေသည့် ဧရိယာများ ရှိပါသည်။

ပြည်သူ့ဘဏ္ဍာငွေစီမံခန့်ခွဲမှု ပိုမိုကောင်းမွန်စေခြင်းဖြင့်လည်း အကျိုးကျေးဇူးများ ရရှိနိုင်ပါသည်။ ငွေလုံးငွေရင်း ဘတ်ဂျက်ရန်ပုံငွေ များပြင်ဆင်ဆောင်ရွက်ရာတွင် ဗဟိုအစိုးရဌာနများသည် ဒေသဆိုင်ရာ အကောင်အထည်ဖော်ရေးဌာန ဝန်ထမ်းများနှင့် ပိုမို ခိုင်မာသော ညှိနှိုင်း ဆောင်ရွက်မှုများလုပ်ဆောင်သင့်သည်။ လုပ်ငန်းဆိုင်ရာ ဝယ်ယူဖြည့် ဆည်းမှုစွမ်းရည်တိုးတက်ကောင်းမွန်စေခြင်းနှင့် တည်ဆောက်ရေး လုပ်ငန်းများအတွက် ငှားရမ်းအသုံးပြုသည့် နေ့စဉ်လုပ်အားခနှုန်း ထားများအပေါ် ပိုမိုလိုက်လျောညီထွေရှိသည့် စည်းမျဉ်းများ ဆောင်ရွက်ခြင်းဖြင့် (လက်ရှိအားဖြင့် (၁)ရက်လျှင် ၃၀၀ကျပ်နှုန်းဖြင့် ပုံသေသတ်မှတ်ထားရှိ)ဘတ်ဂျက်ဆိုင်ရာဆောင်ရွက်မှုများအတွက် အ ထောက်အကူဖြစ်စေ ပါသည်။ MOALI ရှိဌာနများ၏ ဘတ်ဂျက် တောင်းခံမှုများနှင့် ပတ်သက်၍ ဝန်ကြီးရုံး သို့မတင်ပြမှီ ဗျူဟာမြောက် ဦးတည်ချက်များ (ဥပမာ-ADSIP) နှင့်ကိုက်ညီမှု ရှိစေရေး စစ်ဆေးစိစစ် နိုင်ရန် စိုက်ပျိုးရေးစီမံကိန်းကဏ္ဍအား တာဝန်ပေးခြင်းနှင့် ဘတ်ဂျက်

ဘတ်ဂျက်ရေးရာ ပြင်ဆင်မှုနှင့် ဆောင်ရွက်မှု လုပ်ငန်းများ၏ အရည် အသွေးတိုးတက်ကောင်းမွန်စေခြင်း နှင့် ယခင်အစီအစဉ်များ အကျိုး သက်ရောက်မှုနှင့် စပ်လျဉ်း သည့် အထောက်အထားများ ထုတ်နုတ် ခြင်း သည် လုပ်ငန်းအကောင် အထည်ဖော်ဆောင်ရွက်မှုဆိုင်ရာ စွမ်းရည်ပြည့်ဝမှု/ထိရောက်မှုများကို တိုးပွားစေပါသည်။

တောင်းခံမှုများအား အစီအစဉ်များမျှော်မှန်း အကျိုးရလဒ်များနှင့် ချိတ်ဆက်နိုင်ရန်လေ့လာ စစ်ဆေးအကဲဖြတ်လုပ်ငန်းများအတွက် ရင်းနှီးမြုပ်နှံခြင်း စသည်တို့ဆောင်ရွက်ခြင်းဖြင့်လည်း ပြည်သူ့ဘဏ္ဍာငွေ စီမံခန့်ခွဲမှု အရည်အသွေးများ ပိုမို တိုးတက်ကောင်းမွန်စေပါသည်။

ဤလေ့လာသုံးသပ်မှုတွင်ပါဝင်သည့် သတ်မှတ်အစီအစဉ် များနှင့်ပတ်သက်၍ ဆည်မြောင်းကဏ္ဍရင်းနှီးမြုပ်နှံမှုများ၏ စွမ်းရည်/ အကျိုးဖြစ်ထွန်းမှုများ တိုးတက်ကောင်းမွန်စေရန်၊ အခြေခံအဆောက်အအုံဖွံ့ဖြိုးရေးကဏ္ဍမှ အခြေခံ အဆောက်အအုံ စီမံခန့်ခွဲမှု ကဏ္ဍများသို့ပြောင်းလဲ၍ အလေးထားဆောင်ရွက်မှုများ လုပ်ဆောင်ရန် လိုအပ်ပါသည်။ ဆိုလိုသည်မှာ - အဆောက်အအုံ/ ပံ့ပိုးအင်္ဂါရပ်များ အသစ်တည်ဆောက်မှုအတွက် ရန်ပုံငွေများကို လက်ရှိဆည်မြောင်း စနစ်များ၊ လယ်ယာမြေ ရေအရင်းအမြစ်အခြေခံ အဆောက်အအုံများ ပိုမိုတိုးတက်ကောင်းမွန်စေရန်နှင့် လုပ်ငန်းဆောင်ရွက်မှုနှင့် ပြုပြင်ထိန်းသိမ်းမှု လုပ်ငန်းများအတွက် (O&M)ရန်ပုံငွေတိုးမြှင့်အသုံးပြုရန် ပြန်လည်ခွဲဝေသတ်မှတ်ခြင်း၊ တိုင်းဒေသကြီး/ပြည်နယ် အဖွဲ့အစည်း များ အနေဖြင့် သက်ဆိုင်ရာ ဆည်မြောင်းစနစ်များအတွက် အဆိုပါရံပုံ ငွေများ ခွဲဝေသတ်မှတ်ရာတွင် ပိုမိုပါဝင်ဆောင်ရွက်စေခြင်း၊ ဝန်ကြီး ဌာနနှင့် ရေအသုံးပြုသူများအတွက် အဖွဲ့အစည်းဆိုင်ရာ ခိုင်မာအားကောင်းမှုရှိစေရေး ရံပုံငွေ တိုးမြှင့် အသုံးပြုခြင်း၊ ဆည်များ တည်ဆောက်မှုအစား ပိုမိုကြီးမားသည့် ဆည်မြောင်းလုပ်ငန်း အကျိုး သက်ရောက်မှု အတိုင်းအတာ၊ အကြီးဝင်မှုအတွက် ကုန်ကျ စရိတ်နည်းပါးသည့် နည်းလမ်းများ မြှင့်တင်ဆောင်ရွက်ခြင်း စသည် တို့ပါဝင်ပါသည်။

ဆည်မြောင်းကဏ္ဍ ရံပုံငွေ သုံးစွဲမှုများ၏ အကျိုးသက်ရောက်မှု တိုးမြှင့်နိုင်ရန်၊ အခြေခံ အဆောက်အအုံ ဖွံ့ဖြိုးရေးကဏ္ဍမှ အခြေခံ အဆောက်အအုံ စီမံခန့်ခွဲရေး ကဏ္ဍသို့ ပြောင်းလဲ၍ အသုံးပြုနိုင်ရန် လိုအပ်ပါသည်။

စိုက်ပျိုးရေးဆိုင်ရာ တိုးချဲ့ပညာပေးလုပ်ငန်းများနှင့် ပတ်သက်၍ အရေးပါသည့် ပညာပေးဝန်ထမ်းများနှင့် ၎င်းတို့အတွက် လုပ်ငန်း စွမ်းရည် မြှင့်တင်မှုများအပေါ် ကြီးမားသည့် ဘတ်ဂျက်ရံပုံငွေ အသုံးပြု ခြင်းသည် အချို့သော ကနဦး တွန်းအားများကို ဖြည့်ဆည်းပေးနိုင်ပါသည်။ သို့ရာတွင် ရေရရှိတည်တံ့ကောင်းမွန်သော အကျိုးကျေးဇူး များအတွက်မူ - မြန်မာနိုင်ငံရှိ မတူကွဲပြားသော စိုက်ပျိုး-ဂေဟစနစ်ရှိ ရှိရင်းစွဲ အခွင့်အလမ်းများကို အပြည့်အဝ အသုံးချနိုင်ရန် ဆန်စပါး ထုတ်လုပ်မှုမှ အမျိုးမျိုးသော မတူကွဲပြားသည့် လယ်ယာ လုပ်ငန်းစနစ် များသို့ ပြောင်းလဲ၍ အလေးထားဆောင်ရွက်ခြင်း၊ စိုက်ပျိုးရေး ပညာပေးနည်းလမ်းများ ဆိုင်ရာ အပြောင်းအလဲ၊ ICT နည်းပညာ အသုံးပြု၍ လယ်ယာ လုပ်ငန်း များ၏ လက်လှမ်းမီ ဆောင်ရွက်နိုင်မှု တိုးမြှင့်ခြင်း၊ အလှူရှင် အဖွဲ့အစည်းများမှ ရံပုံငွေ ပံ့ပိုးသည့် တတိယ အင်အားစု အဖွဲ့အစည်း (Third party) များ၊ ပုဂ္ဂလိက ကဏ္ဍ၊ စိုက်ပျိုး ရေးဦးစီးဌာနနှင့် စိုက်ပျိုးရေး သုတေသန ဦးစီးဌာနများရှိ အခြား ဌာနများနှင့် တိုးချဲ့ပညာပေးဌာနများ အကြား ပိုမိုခိုင်မာသည့် ပူးပေါင်းဆောင်ရွက်မှု - စသည့် နည်းလမ်း များဖြင့်သာ ရရှိအောင် မြင်နိုင်မည် ဖြစ်သည်။

မြန်မာနိုင်ငံ၏ တိုးချဲ့ပညာပေး အစီအစဉ်များ အနေဖြင့် နည်းလမ်းအသစ်များ၊ အလေးထားဆောင်ရွက်မှု၊ မိတ်ဖက်ဆောင်ရွက်မှု နှင့် လိုလားသည့် အကျိုးရလဒ် များ ရရှိနိုင်ရန် ဝန်ထမ်းများ၏ လုပ်ငန်းစွမ်းရည် မြှင့်တင်မှု စသည့် အချက်များ လိုအပ်ပါသည်။

စိုက်ပျိုးရေးကဏ္ဍ ဘဏ္ဍာရေးရာနှင့် ပတ်သက်၍ သမဝါယမ အဖွဲ့အစည်းများအား ပံ့ပိုးခြင်း၊ စိုက်ပျိုးရေးရင်းနှီးမြုပ်နှံမှုများ ပိုမို ဆောင်ရွက်နိုင်ရန် ပုဂ္ဂလိက ဘဏ်များ၊ အသေးစားငွေရေးကြေးရေး လုပ်ငန်းများအတွက် အထောင်အကူပြုသော ဝန်းကျင် အခြေအနေများ ဖန်တီးပေးခြင်း စသည့် ကဏ္ဍများရှိ စုစည်းပေါင်းစပ် ဆောင်ရွက်မှု မြှင့်တင်ခြင်းများအပေါ် အဓိက အလေးထား၍ MADB ပြုပြင်ပြောင်းလဲမှုများဖြင့် ပြည်သူ့ဘဏ္ဍာငွေ သုံးစွဲမှု၏ ထိရောက်အကျိုးရှိမှုကို တိုးမြှင့်နိုင်ပါသည်။

MADB၊ သမဝါယမလုပ်ငန်းများနှင့် စပ်လျဉ်းသည့် ဘတ်ဂျက်အသုံးပြု မှုများအနေဖြင့် ဆန်းသစ်သည့် စီးပွားရေးရာနှင့် အသေးစား ငွေကြေး ရံပုံငွေများ တိုးပွားလာစေရေး အလေးထားသုံးသပ်မှုများ ဆောင်ရွက်ရန် လိုအပ်ပါသည်။

(လေ့လာသုံးသပ်မှုမှ အကြံပြုသည်မှာ - (၁) အစိုးရအနေဖြင့် ဦးဆောင်သည့် အခန်းကဏ္ဍမှ ဆောင်ရွက်နိုင်သည့် ဧရိယာများဖော်ထုတ် သတ်မှတ်ရန် ရည်ရွယ်သည့် လက်ရှိ အစီအစဉ်များအပေါ် လေ့လာ သုံးသပ်ခြင်း (ဥပမာ- ပိုမို၍ တိုက်ရိုက်ကျစွာ ဆောင်ရွက်ခြင်း (သို့) ပံ့ပိုးသည့် အခန်းကဏ္ဍမှ ပါဝင်ခြင်း (ဥပမာ- တိုက်ရိုက်ဆောင်ရွက်မှုမှ နည်းပါးသော်လည်း ပုဂ္ဂလိက ကဏ္ဍအတွင်းရှိ များပြားသည့် ရင်းနှီးမြုပ်နှံမှုများနှင့် အခွင့်အလမ်းများ ဖြည့်ဆည်းနိုင်ရေးအတွက် အထောက်အကူပြု ဝန်းကျင် ကောင်းများ ဖန်တီးခြင်းဖြင့် လက်ရှိပြုပြင်သူ ဘဏ္ဍာငွေ အသုံးပြုမှုမှ ပိုမို မြင့်မားသည့် အကျိုးသက်ရောက်မှုများ ရရှိအောင်မြင် စေရန်) ၊ (၂) မျိုးစေ့ကဏ္ဍဖွံ့ဖြိုးရေးအတွက် လမ်းပြမြေပုံကို နမူနာယူ အသုံးပြုခြင်းဖြင့် အခြားဧရိယာများရှိ ပြုပြင်ပြောင်းလဲမှုများ လုပ်ဆောင် နိုင်ရန် )

**အလှူရှင် အဖွဲ့အစည်းများ၏ ရံပုံငွေများမှ အကျိုးကျေးဇူးများ ကို မြှင့်တင်ခြင်း။**

၂၀၁၇-၂၀၂၁ ကာလအတွင်း စိုက်ပျိုးရေးကဏ္ဍအတွက် အလှူရှင်များ၏ ရံပုံငွေအသုံးပြုမှုကို (၂) ဆတိုးဆောင်ရွက်ရန်နှင့် မြန်မာနိုင်ငံအတွင်း စိုက်ပျိုးရေးကဏ္ဍအတွက် ယေဘုယျရံပုံငွေ အသုံးပြု မှု တိုးမြှင့်နိုင်စေရန် ဆီလျော်သည့် အခွင့်အလမ်း တစ်ရပ်မှာ အလှူရှင် ရံပုံငွေများ ပိုမိုတိုးမြှင့် ရရှိစေရေး စည်းရုံးဆောင်ရွက်ရန် ADSIP အနေဖြင့် လိုအပ်ပါသည်။ ၂၀၁၀-၂၀၂၀ ကာလအတွက် အလှူရှင် အဖွဲ့အစည်းများ၏ ပံ့ပိုးမှု ကတိကဝတ်ပြုမှုမှာ ခန့်မှန်းခြေ အမေ ရိကန်ဒေါ်လာ (၇၆၁) သန်းခန့် ရှိနိုင်ပြီး နောက်ပိုင်း နှစ်များအတွက် လည်း ပိုမို ကတိကဝတ်ပြု ပံ့ပိုးမှုများ ရှိနိုင်ပါသည်။

အလှူရှင် အဖွဲ့အစည်းများ အနေဖြင့် ကဏ္ဍအတွက် ဖြည့်စွက်ရံပုံငွေများ တိုးမြှင့် ဖြည့်ဆည်းပေးလျက် ရှိပါသည်။

အလှူရှင် အဖွဲ့အစည်းများ၏ ရံပုံငွေများကို အမျိုးမျိုးသော လုပ်ငန်းဆောင်ရွက်မှုများအကြား ပိုမို မျှတမှု ရှိစေရန်နှင့် အစိုးရရံပုံငွေများထက် MOALI ၏ ဗျူဟာမြောက် ဦးစားပေး အစီအစဉ်များ နှင့် ပိုမိုကောင်းမွန်သော ဟန်ချက်ညီဆောင် ရွက်မှု ရှိစေရပါမည်။ ၎င်းသည် ပိုမိုမြင့်မားသည့် လုပ်ငန်းစွမ်းရည် ပြည့်ဝမှုအတွက် အထောက်အကူ ဖြစ်စေပါသည်။ သို့သော် ၎င်းတို့၏ အလားအလာ ရှိသည့် မြင့်မားသော အကျိုးသက်ရောက်မှုကို အားနည်း စေသည့် အချက်အလက် တစ်ချို့ရှိပါသည်။ - (၁) အစိုးရရံပုံငွေများနှင့် ဟန်ချက် ညီမှု မရှိခြင်း၊ (၂) လက်ရှိ စီမံကိန်းများအတွက် ရံပုံငွေ ထုတ်ပေးမှု/ပါဝင်မှု နည်းပါးခြင်း၊ (၃) အစိုးရ စနစ်များ၏ ပြင်ပရှိ အကောင် အထည်ဖော် ဆောင်ရွက်နေသည့် အလှူရှင် အဖွဲ့အစည်း များ၏ စီမံ ကိန်းများနှင့် ညှိနှိုင်းဆောင်ရွက်မှု အားနည်းခြင်း (ဥပမာ- အလှူရှင် အဖွဲ့အစည်း ရံပုံငွေများ အားလုံး၏ ထက်ဝက်ခန့်)၊ (၄) အလှူရှင် အဖွဲ့အစည်းများ၏ စီမံကိန်းများမှ ရရှိလာသည့် အတွေ့အကြုံ သင်ခန်းစာများကို အစိုးရ အစီအစဉ်များတွင် ပေါင်းစပ် အသုံးပြုမှု မရှိခြင်း စသည်တို့ဖြစ်ပါသည်။

MOALI အနေဖြင့် အလှူရှင် အဖွဲ့အစည်းများ၏ အသိ ပညာနှင့် ဘဏ္ဍာ ရေးရာ ပံ့ပိုး မှုများအပေါ် အကန့်အ သတ် ဖြင့် အသုံးပြုခြင်းများ ကြောင့် ဟန်ချက်ညီမှု ရှိသော လုပ်ငန်း ဆိုင်ရာ ဖွဲ့စည်းပါဝင် မှုရှိသည့် အလှူရှင် အဖွဲ့အစည်း ရံပုံငွေများ၏ အကျိုးသက် ရောက်မှုကို လျော့နည်းစေ နိုင်ပါသည်။

(လေ့လာသုံးသပ်မှုမှ MOALI သို့ အကြံပြုသည်မှာ - (၁) အထူးသဖြင့် အစိုးရစနစ်၏ ပြင်ပတွင် အကောင်အထည်ဖော်သည့် စီမံကိန်းများ အတွက် စိုက်ပျိုးရေးနှင့် ကျေးလက် ဖွံ့ဖြိုးရေးကဏ္ဍ လုပ်ငန်းအဖွဲ့မှ တဆင့် အလှူရှင် အဖွဲ့အစည်းများနှင့် ပိုမို တက်ကြွစွာ ညှိနှိုင်းဆောင် ရွက်ရန်၊ (၂) လက်ရှိ အလှူရှင် အဖွဲ့အစည်း ရံပုံငွေ ထုတ်ပေးမှုများကို တိုးမြှင့်ရန်၊ (၃) အလှူရှင် အဖွဲ့အစည်းများ၏ စီမံကိန်းများမှ အောင်မြင်မှုနှင့် ချို့ယွင်းမှု သင်ခန်းစာများကို စဉ်ဆက်မပြတ်လေ့လာ၍ မြန်မာနိုင်ငံအတွက် ကောင်းမွန်သော လုပ်နည်းလုပ်ဟန်များ၊ နည်းလမ်း အသစ်များ ဖော်ဆောင်ပြီး ၎င်းတို့အား အစိုးရ အစီအစဉ်များတွင် ပေါင်းစပ် အသုံးပြုရန်)

**စိုက်ပျိုးရေးမူဝါဒနှင့် စီးပွားရေးဆိုင်ရာ စည်းမျဉ်းဥပဒေများ ပိုမိုကောင်းမွန်စေရန် ဆောင်ရွက်ခြင်း။**

ဆန်စပါးအပေါ် အဓိကထားသည့် လက်ရှိမူဝါဒမှ ဘက်စုံ/ ရှုထောင့်စုံ ပိုမို ပါဝင်သည့် စားနပ်ရိက္ခာ မူဝါဒသို့ ပြောင်းလဲဖော် ဆောင်ရန် ADSIP တွင် သတ်မှတ် ပြဋ္ဌာန်းထားသည့် ပြောင်းလဲမှုများ အကောင်အထည်ဖော်ခြင်းအားဖြင့် မြင့်မားသည့် အကျိုး ကျေးဇူးများ ရရှိနိုင်ပါသည်။ ယင်းသို့ပြောင်းလဲဆောင်ရွက်မှု အနေဖြင့် သင့်တော် သော စည်းမျဉ်းဥပဒေများ ရေးဆွဲသတ်မှတ်ခြင်းအပြင် စိုက်ပျိုးရေး ကုန်ပစ္စည်းနှင့် ဝန်ဆောင်မှု များ၏ အရည်အသွေးနှင့် ဘေးကင်းလုံခြုံမှု ရှိစေရန်၊ ပုဂ္ဂလိက ရင်းနှီးမြုပ်နှံမှုများအတွက် တွန်းအားပေးဆောင် ရွက်နိုင်ရန် လက်ရှိ စည်းမျဉ်း ဥပဒေများအား လေးစားလိုက်နာစေရန် ဆောင်ရွက်ခြင်း စသည့် အစီအမံများနှင့် တွဲဖက်လုပ်ဆောင်ရန် လိုအပ်ပါမည်။

ပုဂ္ဂလိက ရင်းနှီးမြုပ်နှံမှုများအား စည်းရုံးဆွဲဆောင်ခြင်းသည် မြန်မာနိုင်ငံ၏ ဘက် ဂျက် အကန့်အသတ်ရှိသည့် အခြေအနေအတွက် အဓိက သေချာချက်တစ်ရပ် ဖြစ်ပါသည်။ ပုဂ္ဂလိက ရင်းနှီးမြုပ်နှံမှုများ အတွက် စည်းမျဉ်းဥပဒေများ တိုးတက်ကောင်းမွန်စေခြင်း၊ အရည်အသွေး ထိန်းချုပ်မှု အာမခံချက်ကဲ့သို့သော အရေးပါသည့် အများ ပြည်သူ့ ကဏ္ဍ ဝန်ဆောင်မှုများ ဖြည့်ဆည်းခြင်း၊ ဘဏ္ဍာရေးနှင့် စက်မှု လယ်ယာ ဖြည့် ဆည်းမှုများတွင် ပုဂ္ဂလိကကဏ္ဍနှင့် တိုက်ရိုက်ယှဉ်ပြိုင် လုပ်ကိုင်မှုများ ရှောင်ရှားခြင်း စသည့် နည်းလမ်း များအားဖြင့် အများ ပြည်သူ့ကဏ္ဍ အစီအစဉ်များ အနေဖြင့် အထောက် အကူ ဖြစ်စေနိုင် ပါသည်။ စိုက်ပျိုးရေးထွက်ကုန် အများစုအတွက် အသားတင် ပြည်ပ တင်ပို့မှု အနေအထား နှင့် လက်ရှိဘဏ္ဍာရေးရာ နေရာလပ် အကန့် အသတ်ရှိမှု အနေဖြင့် လယ်ယာလုပ်ငန်းမူ ဝါဒ အစီအစဉ်များ၏ သင့်တော်ကောင်းမွန်မှု အခြေအနေအပေါ် အလေးထားလုပ်ဆောင် ရန် လိုအပ်ကြောင်း ညွှန်ပြနေပါသည်။ - ဤအခြေအနေတွင် အနိမ့်ဆုံး လယ်ယာဈေးနှုန်း များ (သို့) ကြီးမားသည့် ကြားခံစားနပ်သိုလှောင် ကုန်များမှာ ယေဘုယျအားဖြင့် သင့်တော်မှု မရှိပါ။

ပိုမိုကောင်းမွန်သည့် မူဝါဒရေးရာ ဝန်းကျင် အခြေအနေများသည် ပြည်သူ့ ဘဏ္ဍာငွေ သုံးစွဲမှု၏ အကျိုး သက်ရောက်မှုများကို သိသာ ကြီးမားစွာ တိုးမြှင့်စေပါသည်။

ပုဂ္ဂလိက ကုန်ပစ္စည်း ဖြည့်ဆည်းမှု ကဏ္ဍများတွင် ပါဝင်ဆောင်ရွက်မှု မပြုခြင်း နှင့် သေချာ/ရေရာမှု ရှိသည့် မူဝါဒများ ထိန်းသိမ်း ဆောင်ရွက်ခြင်း ဖြင့် ပုဂ္ဂလိက ရင်းနှီးမြုပ်နှံမှု များအား စည်းရုံးဆွဲ ဆောင်နိုင်ရန် အလေးထား ဆောင်ရွက်သင့်ပါသည်။

*(လေ့လာသုံးသပ်မှုမှ အကြံပြုသည်မှာ - (၁) မူဝါဒများနှင့် အသုံး စရိတ်များကို ADSIP တွင် ရေးဆွဲသတ်မှတ်ထားသည့် နည်းဗျူဟာ မူဘောင်နှင့် ချိန်ညှိဆောင်ရွက်ရန်၊ (၂) စက်မှု လယ်ယာ ဝန်ဆောင်မှုများ နှင့် ချေးငွေကဏ္ဍများတွင် ပုဂ္ဂလိက အခန်းကဏ္ဍအပေါ် ခြိမ်း လှယ်ဆောင်ရွက်မှုများကို ရှောင်ရှားရန်၊ (၃) ပြည်သူ့ဘဏ္ဍာငွေ သုံးစွဲမှုများကို ပုဂ္ဂလိက ရင်းနှီးမြုပ်နှံမှုများ တိုးပွားလာစေရန် အထောက်အကူ ဖြစ်စေသည့် လုပ်ငန်းများအတွက် ဦးစားပေးအသုံးပြုရန်၊ (၄) စိုက်ပျိုး ရေး မူဝါဒ ပံ့ပိုးမှု အစီအစဉ်များ၏ ဒီဇိုင်းပုံစံကို မြန်မာ နိုင်ငံ၏ အသား တင်ကုန်သွယ်မှု အနေအထား၊ အကန့်အသတ်ရှိသော ဘဏ္ဍာရေးရာ နေရာလပ်များနှင့် ချိန်ညှိပုံဖော်ရန်၊ စသည်တို့ ဖြစ်ပါသည်။)*

# 1. Agriculture Sector in Myanmar: Opportunities and Challenges

1. **This chapter sets up the context for the analysis of agricultural public expenditures and policies in Myanmar.** It presents the role of agriculture in Myanmar’s economy and its recent development vis-à-vis its potential, discusses opportunities, and highlights challenges, especially those requiring government actions, either better policies or public spending.

2. **Agriculture<sup>2</sup> remains an important sector in Myanmar’s economy.** Although it declined in the last 10 years, in 2015/16 the sector still accounted for 29 percent of gross domestic product (GDP) and 50 percent of the total labor force, and its contribution to exports tripled, accounting for 30 percent of total exports by value in 2015/16 (Table 1). Beans and pulses were the largest agriculture export item, bringing in USD (\$) 1,152 million, with rice, livestock, and fisheries, the other agricultural export items, each generating \$400–500 million.

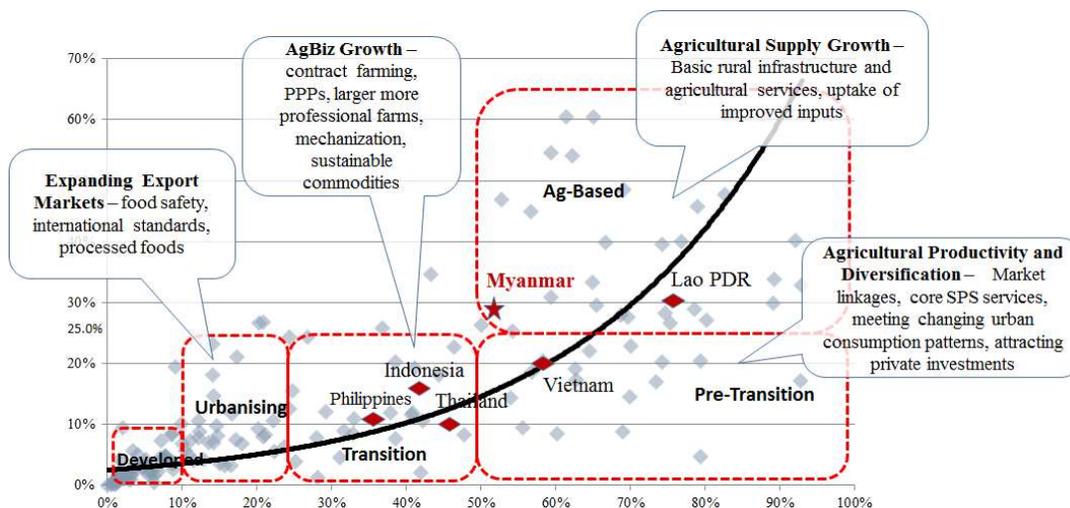
**Table 1: Myanmar’s agriculture is still large in national accounts**

	2005/06	2010/11	2015/16
Agriculture in % of GDP	47	37	29
Agricultural labor force in % of total	65	52	50
Agri-food exports in % of total merchandise exports	9	25	30

*Source: Ministry of Planning and Finance (MOPF), World Bank (WB) staff estimates.*

3. **From a global perspective, due to the larger share of agriculture in GDP and labor force, Myanmar is still an “agri-based” economy.** While most Asian countries have moved to more developed “pre-transition” and “transition” phases and aspire to join a group of “urbanizing” countries, Myanmar’s agriculture still faces basic supply growth constraints (Figure 1).

**Figure 1: Myanmar is still an agri-based country in global comparison**



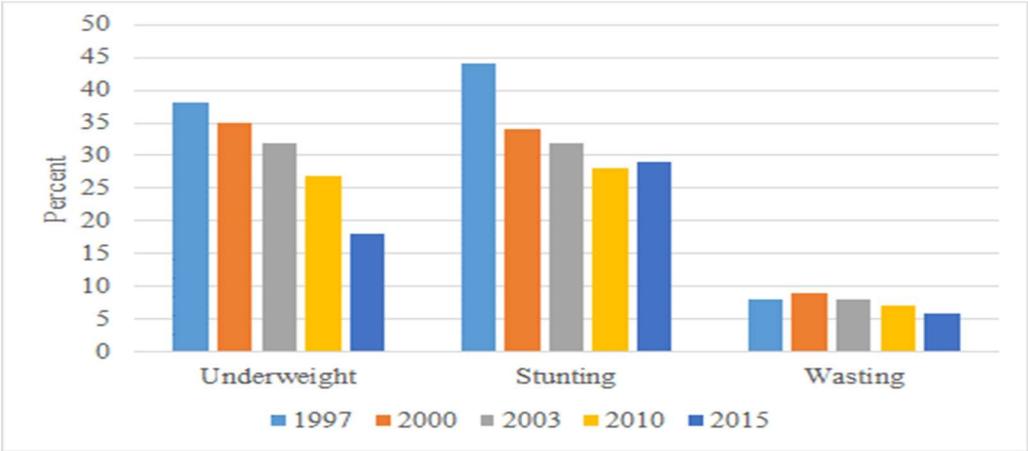
*Source: WB staff depiction based on WDR 2007.*

<sup>2</sup> Agriculture sector in this report includes crops, livestock, fisheries, and forestry, following the United Nations Classification of Functions of Government (COFOG).

4. **Global experience indicates that at its current stage of development Myanmar needs to focus on farm productivity and diversification before it can leap into value chain development and penetration of more sophisticated export markets.** This is supported by Myanmar’s analytical work, which identified an increase in crop yields, a shift to higher-value crops, and an increase in fishery and livestock production to be major drivers of the agricultural growth in the medium run (LIFT and World Bank 2016; NESAC 2016).

5. **Such agricultural growth would not only increase farmers’ income and purchasing power, it would also increase the supply of dietary food and help enhance poor people’s access to nutritious food at affordable prices, thereby reducing malnutrition.** Nutritional security improved in Myanmar in recent years: underweight, stunting, and wasting rates all decreased notably (Figure 2). The average stunting rate of children under five years old, for example, dropped from 42 percent in 1997 to 29 percent in 2015.<sup>3</sup> Yet significant regional disparities in prevalence of stunting still exist: Shan, Chin, Kayan, and Rakhine States all have stunting rates above 35 percent. Even the average stunting rate of 29 percent is above the 20 percent level considered moderate regionally, pointing to the importance of continuing to address malnutrition to ensure long-term growth, which would otherwise be impeded by future malnourished generations.

**Figure 2: While nutritional security recently improved, the under-five (child) stunting rate remains high in Myanmar**



Source: MDHS 2015.

6. **Despite good potential, recent agricultural growth in Myanmar was low and volatile.** The cumulative growth between 2011/12 and 2016/17 was 15 percent, much less than the 55 percent seen in industry and 59 percent in services (Table 2). As a result, the contribution of agriculture to overall growth in Myanmar has been rather modest (Figure 3).

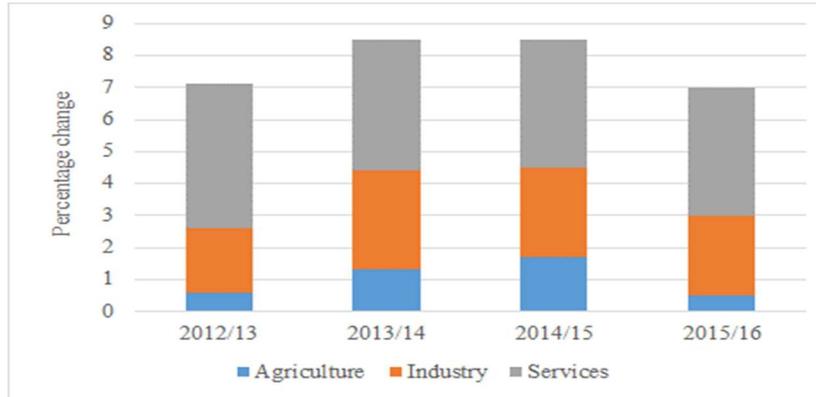
<sup>3</sup> The survey of the Livelihoods and Food Security Trust Fund (LIFT) households confirmed the country’s trends as captured in the Myanmar Demographic and Health Survey. The prevalence of stunting in LIFT villages decreased from 33 percent in 2011 to 25 percent in 2015. Furthermore, in 2013 the percentage of children under the age of five who showed signs of moderate and severe wasting was 6.8 percent, decreasing to 5.8 percent in 2015. These improvements suggest a marked increase in the well-being and nutritional status of children in LIFT villages and are perhaps a reflection of the dramatic improvement in household food security from 2011 to 2013 and 2015.

**Table 2: Recent agricultural growth (%) was slower and more volatile than in other sectors**

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Agriculture	-0.7	1.7	3.6	2.8	3.4	4.3
Industry	10.2	8.0	11.4	12.1	8.7	4.5
Services	8.5	12.0	10.3	9.1	9.1	9.5
Total	5.6	7.3	8.4	8.0	7.3	6.5

Source: MOPF, WB staff estimates.

**Figure 3: Agriculture’s contribution to GDP growth in Myanmar was low**



Source: MOPF, WB staff estimates.

7. **Agricultural growth in Myanmar lags behind that of neighboring countries at similar stages of their development.** In Thailand in the early 1980s, when its per capita GDP was about the same as in Myanmar in 2010–2014 (\$1,533), agricultural growth averaged 4.1 percent. In China during 1993–2000, when its per capita income was similar to that of contemporary Myanmar, agricultural growth averaged 3.6 percent. Myanmar’s agriculture grew at only half of those rates in 2010–2014 (Table 3).

**Table 3: Agricultural growth in Myanmar is slower than in comparator countries**

	Ag GDP growth, %/year
Myanmar (2010–2014)	2.5
China (1993–2000)	3.6
Thailand (1980–1985)	4.1

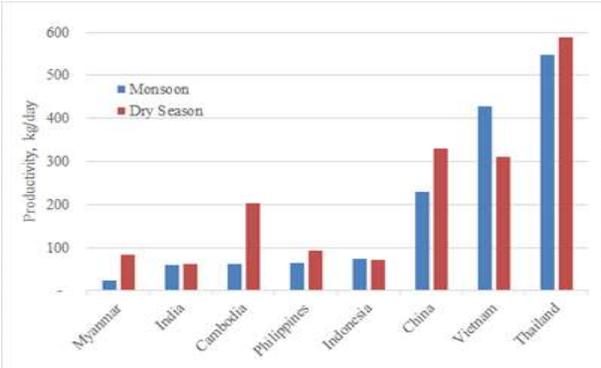
Source: WDI 2017.

8. **Low agricultural growth in Myanmar is simultaneously the cause and result of low productivity.** Productivity is low regardless of the indicator used. Paddy yields are among the lowest in Asia, both on average and among the best farms (Table 4). Labor productivity in paddy production in the commercial parts of Ayeyarwaddy Delta is only a fraction of labor productivity observed in other Asian rice production bowls (Figure 4). Low land and labor productivity lead to low farm profits, which are 3 times below the average achieved in other countries (Figure 5).

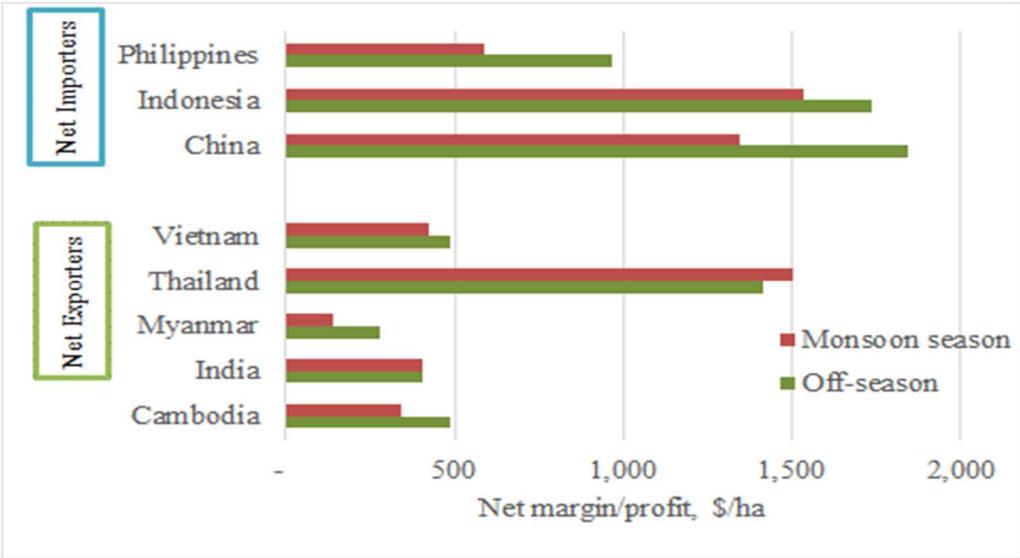
**Table 4: Land productivity (paddy yields), tons/ha, 2013/14**

	Average (USDA)	Better farms (Surveys)
Myanmar	2.7	2.7
Philippines	3.9	6.3
Thailand	2.8	5.7
China	6.7	6.6
Vietnam	5.8	6.8

**Figure 4: Labor productivity, kg of paddy per day of work, 2013/14**



**Figure 5: Net income from paddy production, \$/ha, 2013/14**



*Note: Data for Myanmar are from Ayeyarwaddy Region. Data for Cambodia are from Southeast, and for other countries from irrigated and intensively cultivated areas in the following locations: Nueva Ecija, Philippines; Zhejiang, China; West Java, Indonesia; Tamil Nadu, India; Suphan Buri, Thailand; and Can Tho, Vietnam.*

*Source: World Bank and AusAid 2015; Bordey et al. 2016; LIFT and World Bank 2016.*

9. **This report concludes that limited availability and poor quality of public agricultural services and ineffective policies and regulations, which constrain private sector investment, are among the main reasons for this poor sector performance.** Unless these constraints and failures are addressed, agricultural growth will not be fully realized. Myanmar is at the bottom of many cross-country comparisons for enabling the businesses of agriculture (Figure 6). For example, the World Bank measures the legal barriers and efficiency of regulations for businesses operating in agriculture in 62 economies and across 8 topic areas. Myanmar ranks last in regulatory environment for machinery, finance, and water and in the middle for seeds, fertilizers, and ICT. The rest of this chapter presents examples of such ineffective policies and services and their outcomes for farmers.

10. **The first example is seeds, of which there are very little of high-quality available on the market.** In 2013/14, the supply of paddy seeds was estimated to satisfy only 0.35 percent of demand for seeds (LIFT and World Bank 2016). Of 1,730 farms surveyed in four regions of Myanmar in 2013/14, only 7 percent were using good-quality paddy seeds. The situation with other crops was even worse. This is strong evidence of the failure of the government program to produce sufficient quality breeder and foundation seeds and to encourage their multiplication by the private sector or to involve the private sector in varietal development. As a result, most farmers use recycled seeds, leading to low yields.

**Figure 6: Myanmar underperforms in creating an enabling environment for business in agriculture**



*Note: Distance to Frontier (DTF) score shows the distance to the best practice frontier (set at 100). Rank shows the place of the country among 62 comparators.*

*Source: World Bank 2017a.*

11. **Second, most farmers do not know the conditions of their soils, how to manage them, or what fertilizers to use, and no agricultural research and extension programs are in place to help farmers address these issues.** Many farmers buy fertilizers, spending about \$650 million on them annually, even though the output response to fertilizers has been generally low. In the same survey of 1,730 farmers mentioned above, no significant difference in the net profit of paddy production was found among farmers applying different amounts and mixes of fertilizers (Table 5). Several reasons could explain this result. Fertilizers can be of poor-quality, sometimes even fake, and together with poor-quality seeds they result in low yields. Compounding this problem is that farmers do not have adequate knowledge of the conditions of their soils and the fertilizer quantity and quality required for those soils. At a total application rate of 392 kilograms per hectare (ha) of urea, nitrogen-phosphorus-potassium (NPK), and T-super (high users), yields should be much higher than the average 3.3 tons per ha achieved. Another reason could be an inefficient mix of nutrients applied: the fertilizer mix is biased toward nitrogen, while other nutrients are underused. All of these point to the underperformance of agricultural research and extension programs, which are ineffective in improving farming practices and soil nutrient management in Myanmar.

**Table 5: Supply response to fertilizer use in Myanmar has been very low**

	Low Use	Medium Use	High Use
Application of fertilizers, kg/ha	30	137	392
Cost of fertilizers, \$/ha	23	74	178
Yield, wet paddy, tons/ha	2.74	3.13	3.28
Total costs, \$/ha	330	426	617
Gross profit, \$/ha	233	221	204
Net profit, \$/ha	168	136	109
Labor productivity, \$/day	4.52	3.95	4.24

Source: LIFT and World Bank 2016.

12. **Another example of poor-quality public services is irrigation.** The productivity, intensity of use, and value of land usually increase with access to water. With irrigation and drainage, farmers are willing to invest more in the use of modern inputs, labor, and services, taking into account reduced climatic risks such as drought and flooding. Yet irrigation coverage in Myanmar is relatively low. In 2011, 2.11 million ha of agricultural land were irrigated according to the Ministry of Agriculture, Livestock, and Irrigation (MOALI). This constituted 15.5 percent of crop area and was much smaller than in other Asian countries, except Cambodia (Table 6). In 2015, irrigation coverage increased only to 2.17 million ha and 16.2 percent of crop area. In the dry seasons, when water is most needed, the actual irrigation coverage of most public systems rarely exceeds 60–80 percent of total irrigable area. Moreover, the legal and regulatory environment for management of irrigation systems is outdated and restrictive, reducing the efficient and productive use of irrigation water in agriculture. Public irrigation systems are designed to produce paddy, a water-intensive crop with limited income growth opportunities in many parts of the country, and not easily convertible to use by other crops.

**Table 6: Irrigation coverage in Myanmar is low and has hardly changed over time**

Country	Full control actual irrigated area (ha) 2011–2012	Arable land (ha) 2011	Share of irrigated areas in arable land (%)
China	54,218,976	111,598,500	48.6
Indonesia	6,722,299	23,500,000	28.6
Malaysia	340,717	1,800,000	18.9
Philippines	1,879,084	5,400,000	34.8
South Korea	880,400	1,492,000	59.0
Thailand	5,059,914	15,760,000	32.1
Vietnam	4,585,500	6,500,000	70.5
Myanmar (2011)	2,110,000	13,580,000	15.5
Myanmar (2015)	2,170,000	13,360,000	16.2

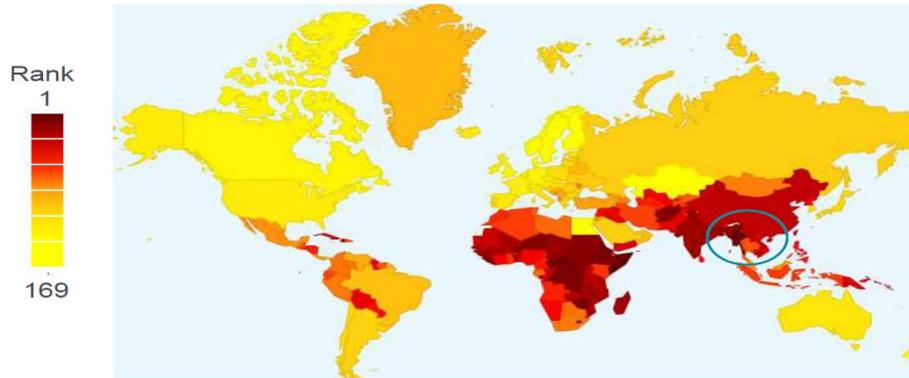
Source: MOALI for Myanmar, FAO 2012 for irrigation statistics, and WDI for arable land.

13. **Low irrigation coverage is further complicated by inadequate water service provision.** Operation of irrigation systems is supply-driven and not responsive to farmers' crop choice. Though crop choice was recently liberalized, the irrigation practice in government systems still allows water to be supplied only for paddy. Support to water user groups and to the development of on-farm water management systems is limited to land consolidation projects. The MOALI is faced with a maintenance backlog for irrigation assets, resulting in their gradual deterioration. Besides limiting farmers' incentives to invest in climate-smart and productivity-

enhancing measures, irrigation-related limitations also reduce farmers' ability to respond to extreme weather events, to which Myanmar is greatly exposed (Figure 7).

**Figure 7: Myanmar ranks high on the Global Climate Risk Index**

**Overall vulnerability:** Physical impacts adjusted for coping ability



**Myanmar ranks 2<sup>nd</sup> out of 187 countries in the Global Climate Risk Index**

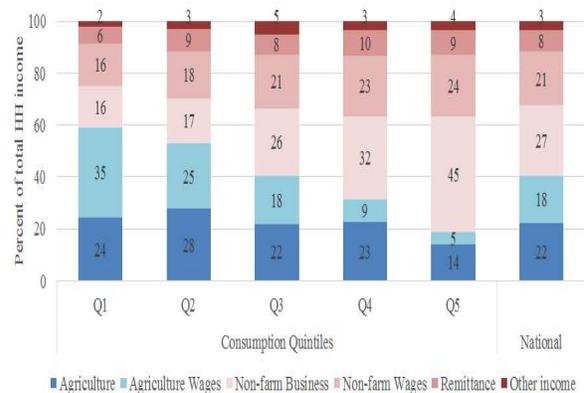
Source: OCHA 2016.

14. **Another example is a lack of attention to diversification.** Most public services provided by the MOALI focus on paddy production. Attention to other objectives such as trade, diversification, and farm incomes is low compared to the attention paid to rice. This is a disconnect with the reality of Myanmar's diversified farming systems and livelihood practices. Diversification begins with livelihoods and income sources: in 2015/16, 69 percent of rural households were involved in crop cultivation and livestock production and 11 percent in fisheries; 40 percent worked for agricultural wages; and many were also involved in nonfarm activities (Figure 8). Regarding sources of income, only 40 percent of household income came from agriculture (production and sales of own products and wages), while most income came from nonfarm sources (Figure 9).

**Figure 8: Rural households in Myanmar not only earn money from producing paddy...**



**Figure 9: They also have diverse income sources**



Source: WB staff estimates based on the 2015 poverty survey.

15. **Diversification is also high on the production side, as many farmers produce several crops, often paddy in wet season and beans and pulses in cool and dry seasons, as well as practicing crop rotations and intercropping.** Yet despite the relatively higher profitability of non-paddy crops such as beans and pulses (Table 7), their recent production growth was rather modest. During 2012–2016, production of beans and pulses increased by 3–4 percent annually, although markets for absorbing much higher surpluses readily exist in India and China. The lack and low quality of public services, resulting in the lack of good-quality seeds and poor farming practices, and supply chain weaknesses are among the main reasons for this low supply response.

**Table 7: Profits and labor productivity of beans are higher than for paddy in Myanmar**

	Net profit, \$/ha	Labor productivity, \$/day
Monsoon paddy	114	4.75
Dry season paddy	246	9.20
Black gram	267	9.29
Green gram	581	15.92
Chickpeas	141	6.85
Groundnuts	324	8.32
Sesame	202	8.54
Sunflower seeds	377	15.68

*Source: LIFT and World Bank 2016.*

16. **The vast majority of farmers lack access to affordable and suitable finance.** The current structure of Myanmar’s formal financial system in terms of credit provision is led by banks, pawnshops, microfinance institutions (MFIs), and cooperatives, in descending order of importance (UNCDF 2014). The total amount of credit provided in 2016 was only 10 trillion Kyats (equivalent to \$8 billion or 12 percent of GDP), of which 53 percent was by informal moneylenders and agricultural input companies. The state-owned Myanmar Agricultural Development Bank (MADB) provided the lion’s share of the bank financing, as commercial banks hesitate to provide loans to farmers due to limited collateral, high transaction costs of appraising farmers’ proposals, more profitable alternatives outside of agriculture, and the lack of agricultural knowledge and appraisal techniques suitable for farmers. MFIs and cooperatives each provided 1 percent. The average loans from MFIs amount to 100,000 Kyats (equivalent to \$90), and from MADB and cooperative societies to 500,000 Kyats (equivalent to \$450). Yet most people cannot access even these loans: the main population facing finance gaps includes small farmers, agri-entrepreneurs, microbusinesses, and small and medium enterprises along the agricultural supply chain.

17. **The final example is Myanmar’s rice-centric agricultural policy, which focuses on paddy production.** Although the Union government promotes rice exports, which doubled from 0.7 million tons (or 6 percent of production) in 2009/10 to 1.5 million tons (or 12 percent of production) in 2016/17 (FAS-USDA 2017), the stability of paddy production and rice prices tends to override other objectives. The Second Short-Term Five Year Agricultural Policies and Plans approved in 2016 offers a more diverse set of agricultural policy objectives, yet paddy production and rice price volatility remain important policy issues. When rice prices fluctuate, as they often do in Myanmar, the government tends to consider policy instruments that could undermine exports. Every sharp drop in rice prices in recent years was accompanied by discussions on introduction of minimum farm prices and large buffer stocks, i.e., farm support measures not compatible with Myanmar’s net trading position for rice (see Annex 7), while

every sharp increase in prices was accompanied by discussions on export restrictions. This policy unpredictability has reduced private sector investments in the rice value chain and slowed down overall agricultural growth.

18. **The examples presented above clearly illustrate how the underprovision and poor quality of public services and policies undermine realization of Myanmar's agricultural growth potential.** This report evaluates the reasons for this situation by reviewing agricultural public expenditures and policies to enhance the impact of public expenditures. Lessons learned from global experience on using public funds to accelerate agricultural growth presented in the next chapter set the benchmark against which to compare Myanmar's use of public funds and policies to support agricultural growth in the past and changes required to improve the efficacy of policy and public funds in the future.

## 2. Public Expenditures and Agricultural Growth: Global Experience

19. **This chapter presents global experiences on the link between public spending and agricultural growth.** It builds on the empirical work of the World Bank around this topic and that of other organizations and institutions and sets up a framework for understanding the links between public spending and growth in Myanmar.

20. **Lesson #1: Public expenditures matter for agricultural growth.** A study of 10 Latin American countries found that a 10 percent increase in agricultural public expenditures lifted agricultural growth by 0.6 percent during the period 1985–2000 (Lopez 2005). The rationale for public investments derives from two fundamental sources: economic inefficiencies resulting from market failures and inequalities in the distribution of goods and services. The benefits from public goods for agriculture, which stimulate growth, can be grouped into four pathways (World Bank 2016b):

- a. **Generating technology:** Investments in research and development (R&D) are among the most important public goods and a critical component of agricultural public spending. The returns to R&D include benefits not only to the farm sector but also to the food industry and consumers in the form of more abundant food at lower prices. The private sector tends to underinvest in agricultural R&D, requiring governments to correct this market failure.
- b. **Disseminating knowledge and building more human capital:** Human capital-enhancing effects can be associated with public spending on extension, training, and information services that transfer knowledge and skills to those engaged in farming.
- c. **Reducing transaction costs:** Rural roads are a critical element of public infrastructure for agricultural growth. Similarly, institutional investments to overcome barriers to collective action and reduce transaction costs to improve collection, storage, input and output quality control, and price information can optimize supply chain management.
- d. **Attracting private capital:** The crowding-in effects of agricultural public spending on private capital come about to the extent that public and private investments are complements in production. Examples are public investment: in (i) large irrigation infrastructure such as dams and canals, which then make it profitable for farmers to make small on-farm investments in water management and a wider range of production technologies; and (ii) input quality assurance systems, which help build farmers trust in quality of inputs, leading to higher demand and stronger response from their use.

21. **Lesson #2: To generate long-term agricultural growth, spending on agriculture needs to be done in a fiscally responsible manner.** Excessive agricultural public spending can lead to high budget deficits that can create various types of macroeconomic imbalances such as higher inflation and misaligned exchange rates, causing lower economic growth and weaker demand for farm products. By investigating the underlying factors in agricultural growth worldwide, Gardner (2005) found macroeconomic stability and real income growth in the nonagriculture economy to be the most important factors explaining agricultural growth in 85 developing countries during 1960–2001. Thus expansion of agricultural public expenditures needs to be balanced with prudence/fiscal discipline.

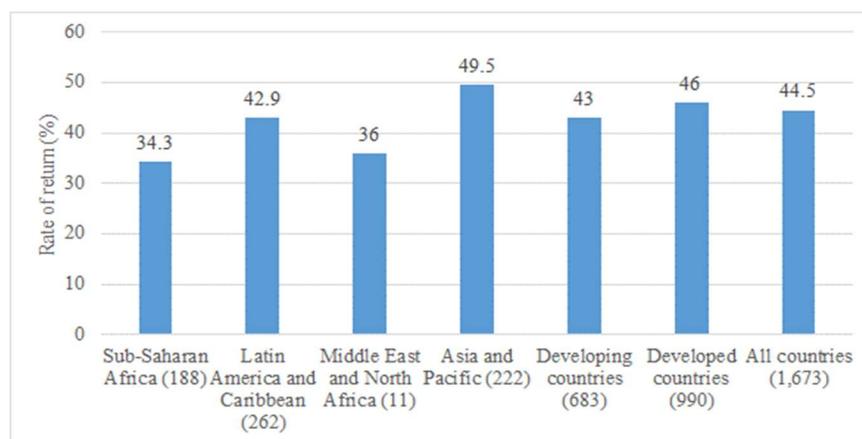
22. **Lesson #3: Not all public expenditures are productive.** Many empirical studies find a low impact of aggregate spending on agricultural growth (IFPRI 2012b), implying that all

investments are not equal. Governments sometimes spend on things that are not public goods, for example output and input subsidies and subsidized credit. In addition, even when clear failures exist in particular markets, government spending will not necessarily improve the situation. Interventions can sometimes lead to government failures, which exacerbate original problems caused by market failures and produce unintended adverse effects.

23. **Strong empirical evidence comes from Latin America, where a study of 10 Latin American and Caribbean countries during 1985–2000 found that agricultural public spending on public goods was much more productive than public spending on private goods (López 2005).** The study found that reallocation of 10 percentage points of total public expenditures from subsidies to public goods<sup>4</sup> increased per capita agricultural income by 2.3 percent. This was obtained without increasing total expenditures. Those impacts were significant mainly because they captured both the positive effect of increasing the budget for public goods and reducing the distortions created by subsidies, which negatively affected the quantity and quality of private investments.

24. **Lesson #4: Public spending on agricultural R&D is found to generate high rates of return around the world.** One recent study found the rates of return of such investments to average 45 percent, showing high impacts in both developing and developed countries (Figure 10). No country in the world could generate long-term growth in agricultural total factor productivity (TFP) without such investments; they are key to increase yields, and to develop and support adoption of location-specific technologies in farm and off-farm segments of food value chains. This is why developed countries spend on average 2.5 percent of agricultural GDP on such investments, and many developing countries increasingly prioritize them over other spending. The impact of investments in agricultural R&D is often found to outpace the impact of other critical public goods, e.g., roads, irrigation, electricity or education) on agricultural growth, as shown by examples in China, India, Thailand, and Uganda (Figure 11).

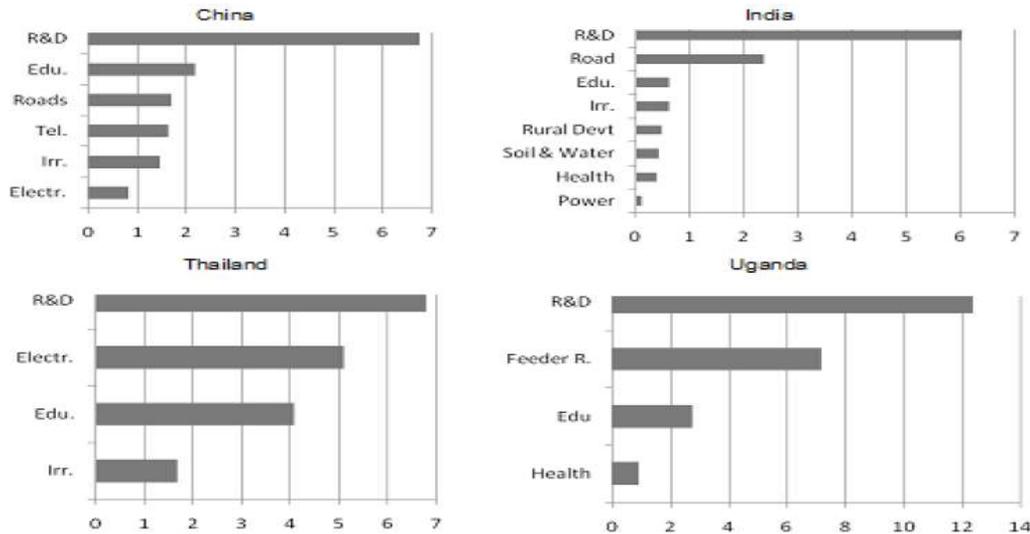
**Figure 10: Rates of return of agricultural R&D investments are high around the world**



Source: IFPRI 2012a.

<sup>4</sup> In that study the public goods expenditures include those on technology generation and transfers, soil conservation, sanitary and phytosanitary protection, communications and information services, rural infrastructure, and social services (for example, education and health). For private goods, expenditures include commodity-specific subsidies, marketing assistance and promotion, and subsidized credit.

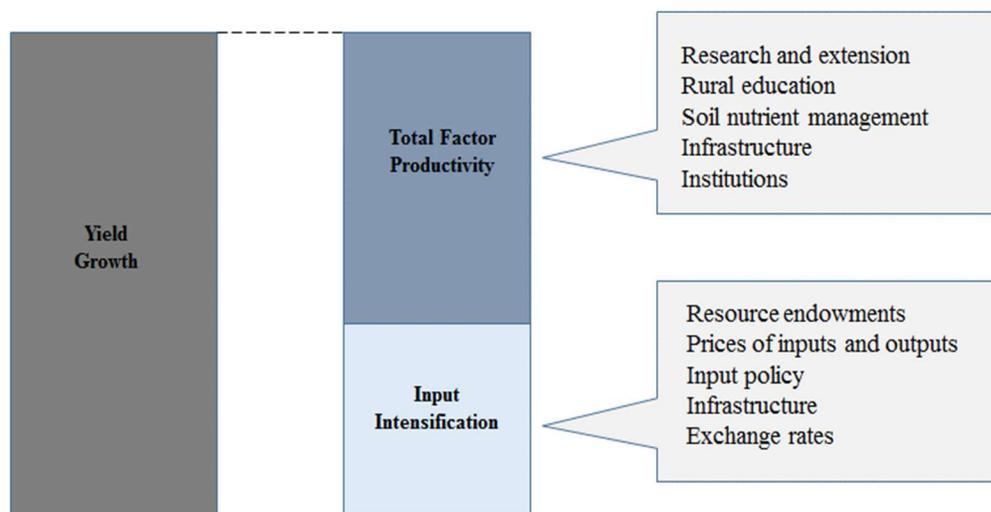
**Figure 11: Investments in agricultural R&D contribute more to agricultural growth than any other investments**



Source: IFPRI 2012b.

25. The following example illustrates the importance of public investments in R&D (and other complementary public goods) to achieve sustainable growth. The crop yield growth so much needed in Myanmar can be driven by an increase in the use of inputs (intensification) and/or TFP (Figure 12). The latter is a much more sustainable source of growth in the long run because the former is costly to farmers (buying inputs increases production costs) and detrimental to the environment. The growth in TFP comes from the knowledge gained to innovate in (better) use of inputs and other factors of production without necessarily buying more inputs, which in turn requires investments in R&D as well as other public goods such as extension, education, infrastructure, and institutions (Figure 12).

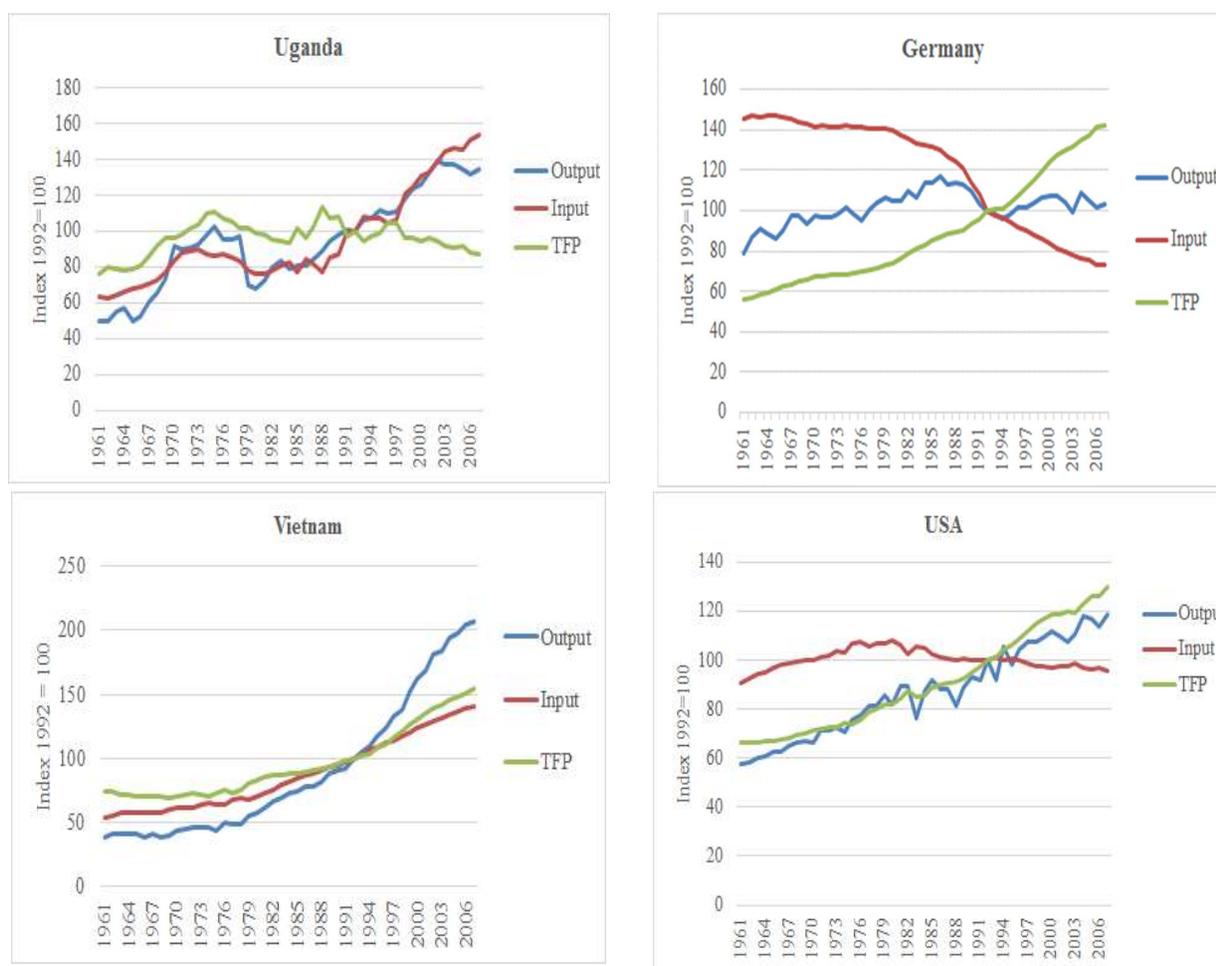
**Figure 12: Growth driven by TFP is more sustainable than that driven by input intensification**



Source: Adopted from Fuglie and Rada 2013.

26. **Without such investments and, thus, without TFP growth, agricultural growth in Myanmar would look like that of Uganda, where it was driven by input intensification rather than TFP during 1960–2007** (Figure 13, upper left side). For growth to look like that of Vietnam (Figure 13, lower left side), Myanmar would need to increase its public spending on agricultural research 10 times, from 0.02 percent to 0.20 percent of agricultural GDP (refer to Table 18 in Chapter 4), and then spend additional funds on eliminating the environmental damage caused by input intensification, as evident in contemporary Vietnam (World Bank and IPSARD 2016). Further, to follow the growth path of developed countries such as Germany and the United States (Figure 13, right side), mainly driven by the lower but better use of inputs, investments in agricultural research in Myanmar would need to surge more than a hundred times, to 2.5 percent of agricultural GDP (refer to Table 18 in Chapter 4).

**Figure 13: TFP growth makes agricultural growth more sustainable**



*Source: WB staff estimates based on the USDA database on agricultural productivity.*

27. **Lesson #5: The economic composition of spending is critical for achieving high impacts.** For example, when an entire budget for extension services is spent on salaries and there is no fuel for motorbikes and vehicles for farm visits, large spending on extension is not effective. Likewise, inadequate spending on operations and management (O&M) for rural roads and irrigation investments reduces the economic value of these assets, leading to higher budget outlays in the longer run. The lesson from around the world is that the agricultural budget needs

to be well balanced across subcategories (wages, nonwage recurrent, and capital expenditures) to make agricultural programs effective (World Bank 2011).

28. **Lesson #6: Quality of implementation affects the outcomes of even justifiable public programs.** When delivering public programs, attention needs to be given to: unit costs and value for money; implementers' capacity; a targeting strategy to identify and reach intended beneficiaries; collaboration of various departments within and between ministries; division of labor between central and local governments; and establishment and use of effective monitoring and evaluation. It is also important to pay attention to budget execution, which shows the absorption capacity of the government to utilize allocated funds. In the case of Myanmar, this is especially important in regard to donor funds executed by the Union government.

29. **Lesson #7: Investments in public goods combined with better policies and institutions bring about the highest results.** Improvements in the policy environment through trade and regulatory reforms augment public spending by enhancing incentives for producers and innovators to take advantage of public goods, thereby crowding in private investments. On the other hand, distortions such as input and output subsidies or credit subsidies usually crowd out private investments. A review of the drivers of agricultural growth in East Asia during its economic boom years found that policy and institutional reforms were the strongest contributors to agricultural growth and poverty reduction, outpacing investments in key public goods (Table 8). Giving the low ranking of Myanmar in creating an enabling environment for business in agriculture (Figure 6), regulatory improvements, from seeds and fertilizers to use of machinery and banking services, would need to move to the top of the policy reform agenda to maximize the rate of return of agricultural public spending.

**Table 8: Policy and institutional reforms drive inclusive agricultural growth in East Asia**

	Ag growth effects		Poverty reduction effects	
	Median share of ag growth attributable to	Median rank by total effect	Median share of ag growth attributable to	Median rank by total effect
<i>Policy/institutional reform</i>	40%	1	30%	1
<i>Infrastructure</i>				
Rural roads	10%	3	15%	3
Irrigation	9%	4 (tied)	8%	5
Electricity/health/education	9%	4 (tied)	18%	2
<i>Agricultural input delivery</i>				
Fertilizers/seeds/chemicals	10%	5	7%	6 (tied)
Credit/insurance	2%	6 (tied)	5%	6 (tied)
<i>Agricultural innovations</i>				
Ag research	15%	2	10%	4
Ag extension	2%	6 (tied)	5%	6 (tied)

Source: World Bank 2016b.

30. **The significant role of economic policy reforms for agricultural productivity is also empirically proven in other parts of the world, for example in Sub-Saharan Africa.** A recent study of factors influencing growth in agricultural productivity there found that full removal of economic policies biased against agriculture would have the largest impact, followed by investments in international and national agricultural research systems and irrigation (Table 9).

**Table 9: Policy reforms and investments in research are key to raising agricultural productivity in Sub-Saharan Africa**

<b>Factors affecting agricultural productivity</b>	<b>Simulated increase in TFP</b>
Doubling spending on international research	4.1%
Doubling spending on national research	3.4%
Economic policy reforms	4.7%
Doubling irrigation investments	2.9%
Improving labor force schooling	1.3%
Stopping the spread of HIV/AIDS	2.1%
Stopping armed conflicts	0.5%

*Source: Fuglie and Rada 2013.*

31. **In summary, global experience provides many useful lessons for Myanmar.** An adequate, fiscally prudent level of public expenditures, allocated to growth-inducing programs and implemented effectively, would help generate sustainable agricultural growth. Removal of policy constraints and strengthening of institutions would usefully augment public spending. Yet increasing spending on agriculture without improvements in allocative and technical efficiency of public expenditures and in the agricultural policy environment would bring very little economic and social benefits.

### 3. Level of Agricultural Public Expenditures in Myanmar

32. **This chapter starts the review of agricultural public expenditures in Myanmar, beginning with an analysis of the level of expenditures.** When too little is spent on agricultural programs, even good implementation of such programs may not necessarily result in a large impact on the ground. As discussed in Chapter 1, agricultural growth in Myanmar was low in recent years, which raises the question: was this lackluster performance the result of low levels of agricultural public expenditures?

33. **To answer this question, the review first analyzes the level of expenditures in Myanmar and then benchmarks this with other countries.** It covers the programs implemented by the MOALI, which consisted of three ministries until 2016: Ministry of Agriculture and Irrigation; Ministry of Livestock, Fisheries, and Rural Development; and Ministry of Cooperatives. Functionally the review follows the United Nations Classification of Functions of Government (COFOG) to make Myanmar’s “agriculture sector” comparable with those of other countries. The COFOG definition of agriculture includes crops, irrigation, livestock, and fisheries subsectors and cooperatives and excludes rural development. Rural development is a broad concept and means different things in different countries as it may cover energy and road infrastructure, health care, education, sanitation, water delivery, etc., making both in-country analyses and cross-country comparisons challenging. The Department of Rural Development (DRD) is not included in the review, therefore.

34. **The review period is seven years, from 2009/10 to 2016/17.** Most of the data come from the BOOST database<sup>5</sup> compiled by the Ministry of Planning and Finance (MOPF). For the period 2009/10–2014/15, the Provisional Actual Budget figures are used. The Revised Estimate Budget is used for the years 2015/16 and 2016/17. In addition, the 2017/18 Budget Estimate is used to discuss the alignment of the first budget prepared by the new administration with the MOALI’s strategic priorities and to study trends.

35. **The figures of the total budget by department in this review may differ slightly from the budgets presented by the Union government for the following reasons.** First, the budget in this review includes *net interest*, defined as gross interest *less* interest paid by private beneficiaries, such as for loans provided by MADB<sup>6</sup> or the Department of Cooperatives (DOC), while Union expenditures include gross interest. And second, to avoid double counting loans as an expenditure, *repayment of loans* is excluded from the total expenditure as they are cancelled out by loans extended earlier and included in the earlier expenditure data.

36. **The agriculture sector receives funds from several sources.** These include the Union budget, the Presidential budget, the Regional and State budgets (the review covers Ayeyarwaddy and Mandalay Regions only), and donors. The review starts with estimating funds from the

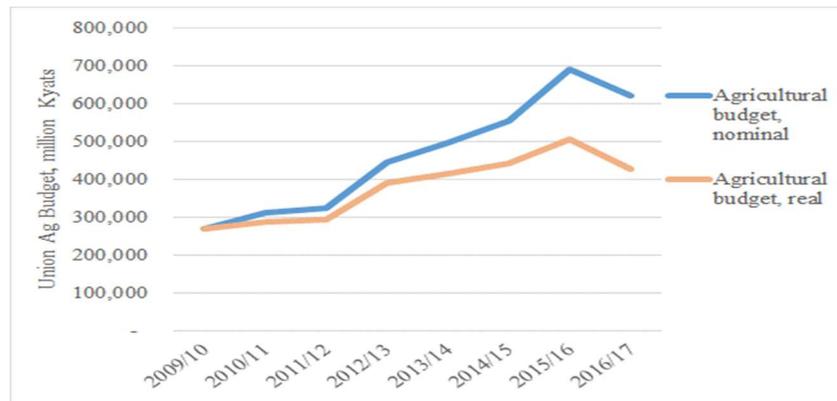
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<sup>5</sup> The BOOST initiative is a World Bank-wide collaborative effort launched in 2010 to facilitate access to budget data and promote effective use for improved decision-making processes, transparency, and accountability. Currently deployed in about 40 countries globally, the appeal of the BOOST approach is that it provides user-friendly platforms where all expenditure data are easily accessed to examine trends in allocations of public resources, analyze potential sources of inefficiencies, and become better informed about how governments finance the delivery of public services.

<sup>6</sup> For example, in 2012/13 the MADB’s interest payment in the amount of 18 billion Kyats was fully covered by the users of the loans, farmers, who paid 29 billion Kyats to MADB in 2012/13, for loans served in the current and previous years. Thus, the net expenditure for interest rate payment for MADB was zero.

Union budget allocated to the MOALI. The Union government prioritized spending on agriculture during the review period, increasing it in both nominal and real terms every year until 2016/17, when it was reduced compared to 2015/16 (Figure 14). In 2016/17, the total Union budget for agriculture amounted 619 billion Kyats (\$522 million).<sup>7</sup> In nominal terms, the total Union budget increased 130 percent during the review period. In real terms, the increase was 60 percent. In USD terms, the total Union budget for agriculture doubled, from \$267 million to \$522 million.

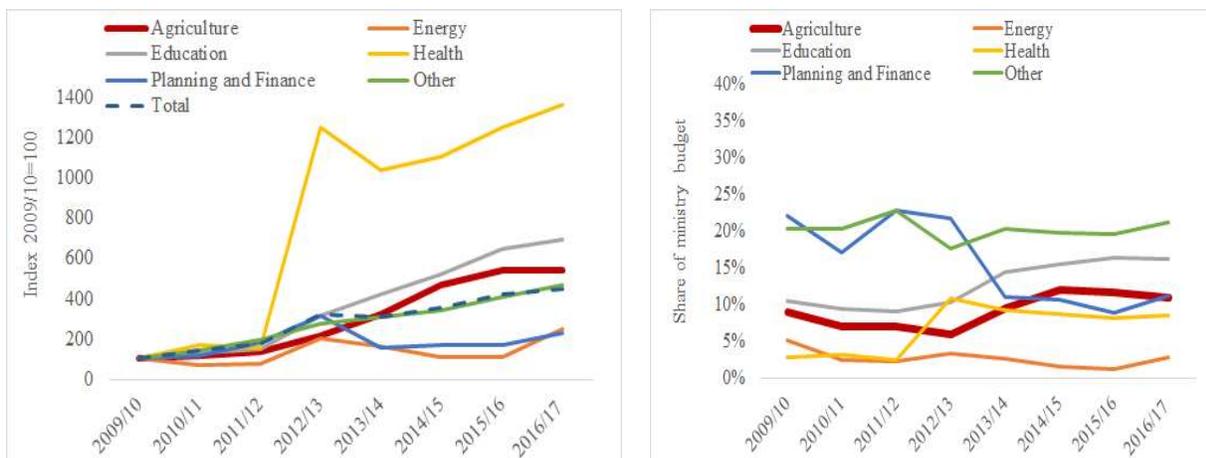
**Figure 14: The Union budget’s agricultural expenditures have increased since 2009/10**



Source: MOPF, WB staff estimates.

37. **Agriculture is among the major priority sectors to receive more budget in Myanmar.** The MOALI is among the ministries with the biggest budget increases since 2009/10, behind only the Ministry of Health and comparable to those of the Ministry of Education (Figure 15).<sup>8</sup>

**Figure 15: Agriculture sector spending growth is among the highest in Myanmar**



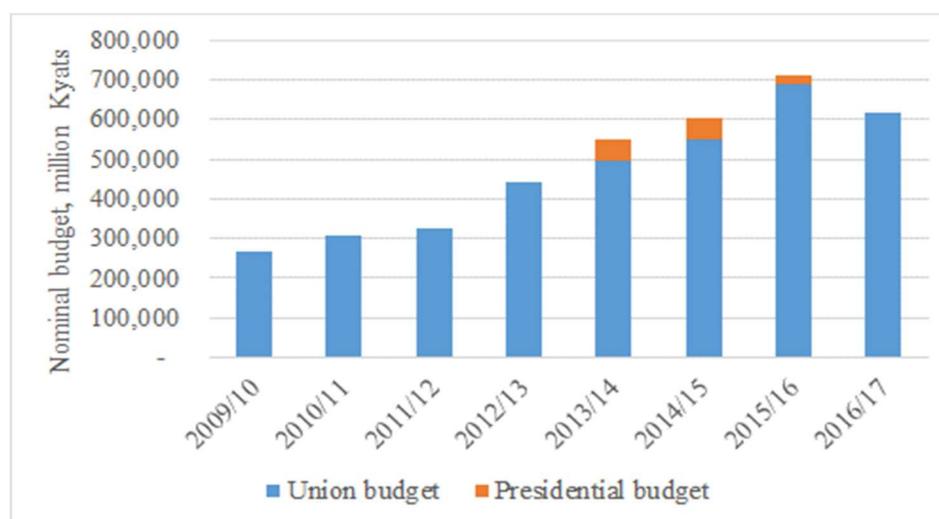
Source: MOPF, WB staff estimates.

<sup>7</sup> For information, DRD’s budget estimate in 2016/17 was 541 billion Kyats, which was revised downwards mid-year to 343 billion Kyats (revised estimate).

<sup>8</sup> Note that the agriculture budget in this figure includes DRD, which saw a significant increase in its budget.

38. **In addition to the Union budget, the agriculture sector benefited from the Presidential budget.** Funds from this budget were used to respond to natural emergencies such as floods and were allocated entirely to the Irrigation Department (ID). Such funds amounted to 53 billion Kyats in both 2013/14 and 2014/15 and 23 billion Kyats in 2015/16 (Figure 16).

**Figure 16: The Presidential budget added more funds to the sector**



Source: MOALI, WB staff estimates.

39. **Most funds from the Union and Presidential budgets were allocated to irrigation and crop programs.** These two categories accounted for 93 percent of the total budget during the review period (Table 10). Livestock, fisheries, and cooperatives received only 7 percent of the total budget.

**Table 10: Most agricultural spending in Myanmar went to irrigation and crops**

Million Kyats	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Crops	80,594	92,883	74,652	103,124	111,987	135,707	255,220	251,272
Irrigation	153,083	170,774	225,660	322,413	407,823	423,221	420,378	333,898
Livestock & fisheries	29,081	39,995	22,669	15,540	23,708	36,293	28,481	27,751
Cooperatives	5,158	6,180	1,406	2,386	4,439	9,881	8,507	5,936
<b>Total</b>	<b>267,915</b>	<b>309,833</b>	<b>324,418</b>	<b>443,463</b>	<b>547,957</b>	<b>605,103</b>	<b>712,586</b>	<b>618,858</b>

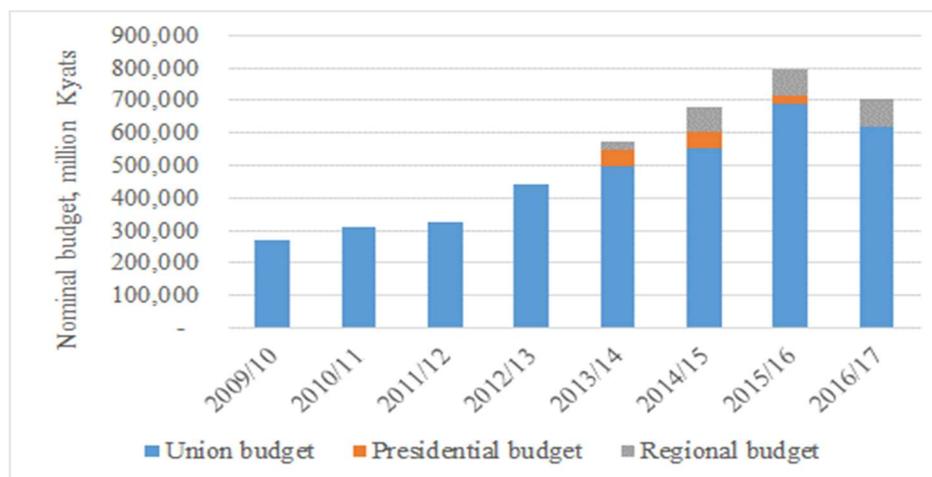
Source: MOPF, MOALI, WB staff estimates.

40. **The agriculture sector also received public funds from the Regional and State governments.** The devolution of some functions from the central to local governments started in 2013, along with rising budget transfers from the Union government. In 2013/14, total Union transfers to States and Regions amounted to 498 billion Kyats or 6 percent of total Union expenditures. In 2016/17, these transfers increased to 1,720 billion Kyats or 12 percent of total Union expenditures. Union transfers accounted for 90 percent of total Regional and State budgets (World Bank 2017b).

41. **A review of public expenditures in two large agricultural regions, Ayeyarwaddy and Mandalay, found that in 2016/17 regional budgets allocated 10-15 percent to agricultural programs.** Most expenditures were used for irrigation O&M for systems smaller than 5,000

acres<sup>9</sup> and for extension services, largely for wages. Given the smaller size of farm land and irrigation areas in most other regions compared to Ayeyarwaddy and Mandalay Regions, it is assumed that they spend a smaller share of their local expenditures on agriculture. This review assumes a 5 percent average allocation of all States' and Regions' budgets for agriculture, which in 2016/17 translates into 86 billion Kyats (Figure 17). This increased the agricultural budget by 14 percent. With the gradually increasing devolution of government functions in Myanmar, regional public expenditures warrant closer attention going forward.

**Figure 17: Region and State budgets added 14 percent more for agricultural spending in 2016/17**

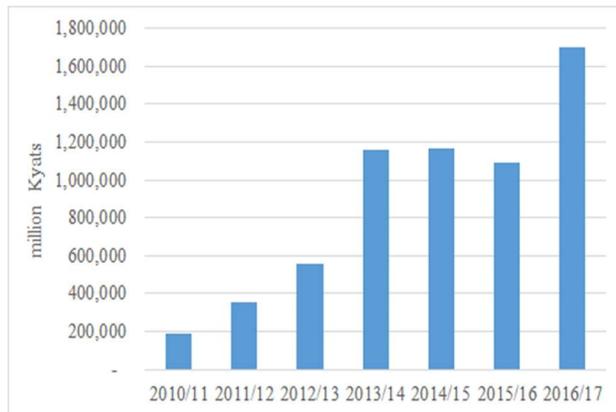


*Source: MOPF, Ayeyarwaddy and Mandalay Regions, WB staff estimates.*

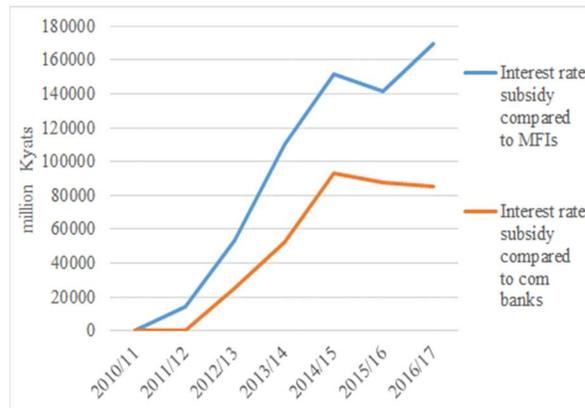
42. **The last type of public funds for agriculture in Myanmar during the review period was the interest rate subsidy for loans provided by MADB.** MADB sharply increased lending in recent years, from 191 billion Kyats in 2013/14 to 1,700 billion Kyats in 2016/17 (Figure 18). Starting in 2012/13, MADB's interest rate was set below the market interest rate. In 2014/15, for example, it was 5 percent, rising to 8 percent in 2016/17 (Table 38). For comparison, the prevailing interest rate for commercial banks during the same period was 13 percent and for MFIs 18 percent. Farmers benefited from the lower interest rate offered by MADB at the expense of the Union budget. The total interest subsidy grew over time; in 2016/17 it was estimated at 85 billion Kyats, when using the commercial banks' interest rate for comparison (Figure 19). If MADB's interest rate is compared with loans offered by MFIs, the subsidy was 170 billion Kyats.

<sup>9</sup> Funding for management of irrigation systems above 5,000 acres (~2,000 ha) remains the responsibility of the Union government, which receives regular allocations for O&M from the Union budget.

**Figure 18: MADB lending surged in 2016 compared to 2013–2015**



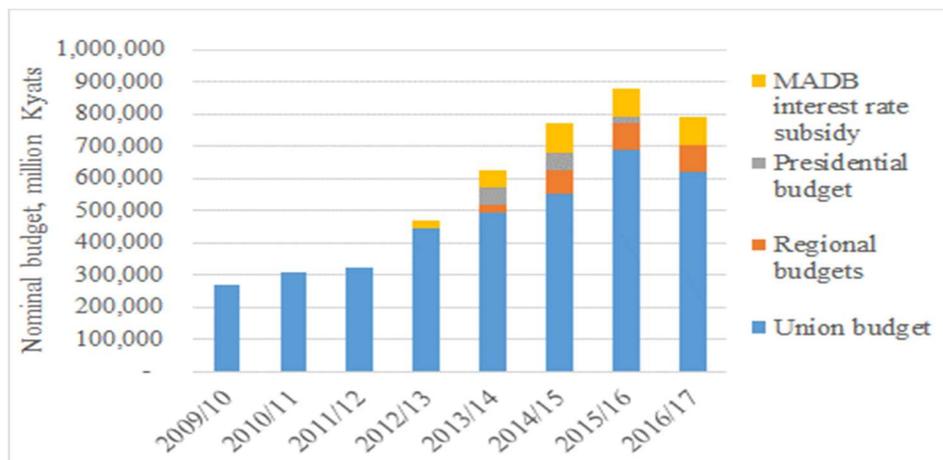
**Figure 19: The higher MADB lending resulted in a larger interest rate subsidy**



Source: MADB, MOALI, WB staff estimates.

43. In 2016/17, **total agricultural spending in Myanmar** was 790 billion Kyats (\$667 million). Total spending in nominal terms tripled during the review period (Table 11 and Figure 20). The Union budget<sup>10</sup> was the main source of funds for agriculture, while the Regional and State budgets along with the Presidential budget added 9 percent to the total budget envelope.

**Figure 20: Total agricultural spending in Myanmar tripled during the review period**



Source: MOPF, MOALI, WB staff estimates.

44. As a share of GDP, Myanmar allocated 0.93 percent to agriculture in 2016/17, including 0.73 percent of GDP coming from the Union budget. This was slightly less than in 2015/16, when 1.21 percent of GDP was allocated to the sector (Table 11). Until 2016/17, the share of GDP allocated to agriculture grew constantly, in contrast to the share of the Union budget allocated to the sector. As a share of the total Union budget, agricultural expenditures financed by the Union government declined from 8.4 percent in 2009/10 to 5.3 percent in 2016/17.

<sup>10</sup> Note that MADB’s interest rate subsidy is also paid by the Union budget, through Myanmar Economic Bank.

**Table 11: Agricultural public expenditures in Myanmar averaged 1 percent of GDP and 6.5 percent of the Union budget**

	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Ag budget, billion Kyats	268	310	324	468	625	774	881	790
% of GDP	0.77	0.79	0.75	1.05	1.08	1.19	1.21	0.93
% of the Union budget	8.4	7.2	7.2	7.3	6.5	5.8	6.3	5.3

*Source: MOPF, MOALI, WB staff estimates.*

45. **How does Myanmar’s agricultural budget compare with other countries?** The picture is mixed. In 2007, Asian countries spent on average 5.9 percent of their budgets and 1.1 percent of GDP on agriculture (Table 12). This was more than in other regions around the world. Yet given the larger share of agriculture in GDP in Asia, the ratio of agricultural spending to agricultural GDP was close to the world average (fourth column in Table 12). In 2009/10, Myanmar allocated the same share of GDP and more than twice the share of its total budget to agriculture compared to the world average, which is the good news. However, the sector’s large share in GDP (above 30 percent) made Myanmar’s agricultural public expenditures three times smaller as a share of agricultural GDP (2.4) than the world average (8.2).

**Table 12: Myanmar fared well in agricultural spending as a share of total budget but the sector’s large size made effective spending smaller than in other countries**

Regions	% of ag budget in total budget	% of ag budget in GDP	% of ag budget in ag GDP
Asia	5.9	1.1	8.7
Europe and Central Asia	2.8	0.7	15.0
Latin America	1.7	0.3	4.7
Middle East and Northern Africa	2.5	0.6	7.0
Sub-Saharan Africa	4.4	0.8	8.4
TOTAL	4.2	0.8	8.2
<i>Myanmar in 2009/10</i>	<i>8.4</i>	<i>0.8</i>	<i>2.4</i>

*Source: IFPRI 2012b using IMF data.*

46. **The situation remained the same in more recent years.** As a share of GDP, Myanmar’s agricultural spending fares well against many countries around the world, both members of the Organisation for Economic Co-operation and Development (OECD), representing developed countries, and non-OECD members, which are included in the OECD database. Agricultural spending as a share of GDP in Myanmar was higher than in all countries in 2014, the latest year with available data (Table 13). OECD countries spent 0.10–0.60 percent of their GDP<sup>11</sup> on agriculture compared to 1.19 percent in Myanmar. Non-OECD countries spent 0.35 percent on average, from 0.22 percent in Indonesia to 0.66 percent in China. Yet the share of agriculture in GDP in Myanmar is two times as large as in Indonesia, three times as large as in China, and fifteen times as large as in most OECD countries, leading to relatively low spending

<sup>11</sup> Note that these figures include only public expenditures, the same as in Myanmar. The OECD also estimates agricultural support provided through higher prices caused by import tariffs or domestic price support measures, but they are not considered here as this support is paid by consumers, not taxpayers, who are the focus of the public expenditure review for Myanmar.

on the sector compared to its relative size. It should be noted, however, that even using the latter ratio, in 2014 Myanmar was a larger spender on agriculture than Indonesia and Vietnam, and the same as the Philippines.

**Table 13: International comparisons show a mixed picture of agricultural spending in Myanmar**

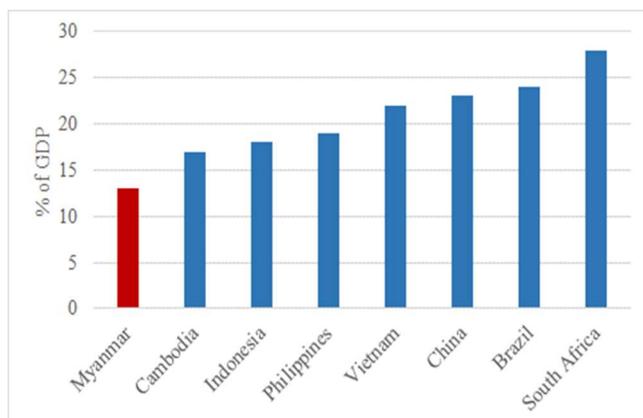
	Ag budget as % of GDP	Agriculture as % of GDP	Ag budget as % of ag GDP
<b>OECD countries</b>			
Australia	0.10	2.4	4.17
New Zealand	0.23	7.2	3.19
Chile	0.30	3.4	8.82
Canada	0.27	1.6	16.88
Japan	0.37	1.2	30.83
Korea	0.41	2.3	17.83
USA	0.46	1.3	35.38
EU	0.60	1.7	35.29
<b>Non-OECD countries</b>			
Indonesia	0.22	14.5	1.52
South Africa	0.23	2.4	9.58
Vietnam	0.24	18.4	1.30
Brazil	0.48	5.7	8.42
Philippines	0.48	12.0	4.00
China	0.66	10.0	6.60
<i>Myanmar (2014)</i>	<i>1.19</i>	<i>29.0</i>	<i>4.09</i>
<i>Myanmar (2016)</i>	<i>0.93</i>	<i>29.0</i>	<i>3.21</i>

*Source: WB staff estimates based on OECD 2016.*

47. **Was the past level of agricultural public spending in Myanmar adequate?** The international comparison does not provide a conclusive answer. What it does show, however, is that the Myanmar government has been allocating a large share of its relatively limited budget revenues to the agriculture sector. Yet agricultural growth has not lived up to the expectations and aspirations discussed in Chapter 1, indicating potential problems with where public funds were spent and how they were utilized.

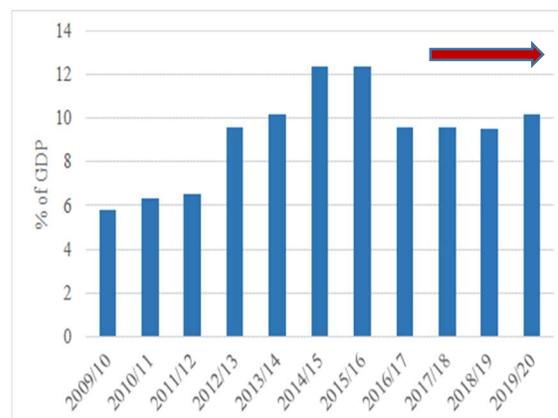
48. **Most experts working in Myanmar would argue that the agriculture sector faces many challenges that require substantial financial resources.** Are there more public funds available for Myanmar's agriculture? The Medium-Term Expenditure Framework (MTEF) indicates that the fiscal space will remain quite limited. Total Union revenues in Myanmar are small compared to other countries (Figure 21), and are projected to stay relatively small in the near future (Figure 22). The MOPF anticipates Union revenues to drop to 9.6 percent of GDP in 2016/17, from a peak of 12.4 percent in 2015/16, and to then increase, but only to 10.2 percent by 2019/20 (World Bank 2017b). As a result, total Union expenditures in 2019/20 are projected to stay the same as in 2016/17, at 11.8 percent of GDP, recovering from the slight reduction in the in-between years (Table 14).

**Figure 21: Myanmar has a relatively low fiscal revenue-generation capacity**



Source: WDI 2017.

**Figure 22: Union budget revenues in Myanmar are projected to stay low**



Source: World Bank 2017b.

49. **The implication of this modest future increase in fiscal space is that Myanmar’s agriculture sector is unlikely to receive a very large increase in allocation from the Union budget.** The MTEF anticipates the MOALI budget, which includes DRD, to increase from 1.3 percent of GDP in 2016/17 to 1.4 percent in 2020/21 (Table 14), hardly the increase anticipated by many in Myanmar. Note that agriculture is still expected to be among the few ministries with a growing budget, along with the energy, education, and health ministries. Most other ministries are projected to receive less funds in the future, which may not necessarily materialize as quickly as planned, putting at risk even the slight increase in public finance for agriculture.

**Table 14: MTEF foresees a modest increase in agricultural spending in Myanmar**

% of GDP	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Agriculture <sup>12</sup>	1.5	1.3	1.2	1.1	1.2	1.4
Energy	0.2	0.3	0.6	0.6	0.8	1.2
Education	2.1	1.9	1.9	2.1	2.5	2.9
Health	1.1	1.0	1.0	1.2	1.4	1.6
Other Ministries	8.0	7.2	6.8	6.4	5.9	5.5
<b>Total</b>	<b>12.9</b>	<b>11.7</b>	<b>11.5</b>	<b>11.4</b>	<b>11.8</b>	<b>12.6</b>

Source: WB staff estimates.

50. **The budget estimate for 2017/18 confirms the above points.** The 2017/18 MOALI budget, without MADB<sup>13</sup> and DRD, is projected at 596 billion Kyats, which is 3 percent lower than in 2016/17. The increase in the Union budget’s financing of agriculture will be minimal in the near future, necessitating the MOALI to engage with donors to secure their finance.

51. **The good news is that the level of donor funds into Myanmar’s agriculture sector has risen over time, even faster than the Union budget.** In 2012/13, donor funds amounted to only \$7 million. In 2016/17, they grew to \$108 million (Table 15) and are projected to increase further in the medium run. Based on the existing pipeline of donor projects, annual donor

<sup>12</sup> Note that this figure shows only the Union budget and excludes the Presidential budget, the Regional and State budgets, and the interest rate subsidy.

<sup>13</sup> On April 1, 2017, MADB became part of the MOPF.

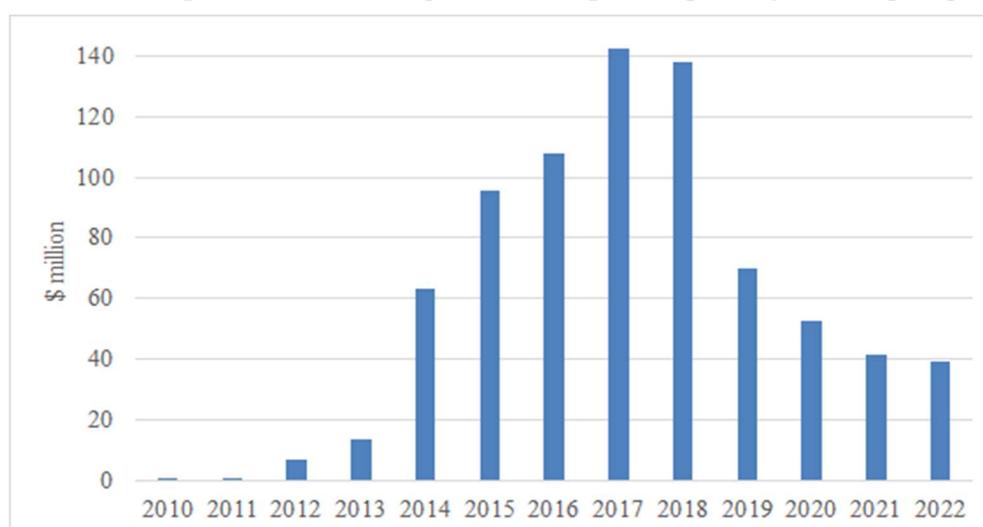
spending for agriculture in Myanmar is expected to reach about \$140 million in both 2017 and 2018 (Figure 23).<sup>14</sup> New projects can add even more resources in the outer years, offering a good source of future funds for agricultural development.

**Table 15: Donors funds for agriculture increased in significance in Myanmar**

\$ million	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Public ag budget	267	360	394	542	652	746	685	667
Donor budget	small	small	small	7	14	64	95	108
Aggregate budget	267	360	394	549	666	809	780	775
Donor funds in aggregate budget <sup>15</sup>	0	0	0	1%	2%	8%	12%	14%

Source: WB staff estimates based on data from donor agencies in Myanmar.

**Figure 23: Donors plan to increase agricultural spending in Myanmar going forward**



Source: WB staff estimates based on data from donor agencies in Myanmar.

52. **Yet growing donor funding would not automatically increase expenditures for the MOALI.** This would require the MOALI to have the absorption capacity to use these funds, a capacity proven to be low in recent years. All donors providing funds directly to the MOALI report the disbursement rate of their funds to be between 1 percent and 4 percent compared to 15–20 percent of annual disbursement plans. In addition, more than half of donor funds are implemented outside of the government system (see Chapter 6). Benefiting from them requires the MOALI to more proactively engage with donors to ensure complementarity and to learn lessons from these projects to enhance relevant public programs, which has also proven to be difficult in the past. These pose additional challenges.

<sup>14</sup> The list of donors for these figures is not exhaustive. This estimate is as of January 2017, made through the survey of major donors working in Myanmar.

<sup>15</sup> Actual “additional” donor funds are smaller, given that the projects financed by Asian Development Bank (ADB), Japan International Cooperation Agency (JICA), International Fund for Agricultural Development (IFAD), and WB are included in the Union budget. The share of these organizations in total donor funds during 2010–2016 averaged 32 percent. The actual donor budget included in the Union budget is likely to be smaller than the estimated annual allocations in Table 15, largely due to the MOALI’s weak absorption capacity.

53. **In conclusion, the level of overall government spending for Myanmar’s agriculture is unlikely to significantly increase over the next five years.** Irrespective of the future level of spending, the global experience discussed in Chapter 2 clearly demonstrates that increasing the volume of public spending will be important but insufficient to kindle agricultural growth. Actions are needed to improve the efficiency and effectiveness of spending, given that Myanmar already allocates a relatively large share of its fiscal resources to agriculture. The expectation that high-quality public spending should bolster growth has strong empirical validation. Many studies find quite low returns to aggregate spending but almost all find high returns to specific types of spending, such as investments in core public goods related to technology generation and diffusion, market linkages, and infrastructure, especially when they are augmented by policy and institutional reforms. The inevitable conclusion is that choices about how and where to allocate public spending matter significantly.

54. **In the context of Myanmar, additional gains for a larger impact of public expenditures on agricultural growth and farm incomes could come from the following sources** (analyzed in turn in the next three chapters):

- a. Shifting public funds across functions and economic categories (allocative efficiency).
- b. Enhancing the implementation efficiency of existing programs (technical efficiency), along with improved policies and institutions that would crowd in private investments and raise the rates of return of public expenditures.
- c. Increasing the absorption of donor funds, their effective utilization, and coordination with donor projects implemented outside of government systems.

#### 4. Improving Allocative Efficiency of Agricultural Public Expenditures in Myanmar

55. **The analysis of allocative efficiency of public expenditures consists of three parts.** It starts with the analysis of *functional composition*, which assesses whether resources are allocated to the programs with the highest payoffs for agricultural growth, nutritional security, and resilience to climate change. It then moves to compare the *alignment of spending with government strategies*. Last, it goes into the analysis of *economic composition*, which assesses the balance between wage, nonwage recurrent, and capital expenditures to find out whether sufficient resources are provided to frontline service providers so they can reach out to a large number of farmers and whether adequate resources are allocated to O&M to effectively utilize and protect public assets.

##### *Functional composition*

56. **The functional composition of agricultural public expenditures during the review period was skewed toward a narrow set of programs, with the largest amount of funds spent on irrigation infrastructure development.** Irrigation expenditures peaked at 417 billion Kyats in 2015/16 before declining to a still large amount of 334 billion Kyats in 2016/17. The share of funds allocated to irrigation (executed by the Irrigation and Water Resource Utilization Department, IWUMD) in total agricultural spending increased from 56 percent during 2009/10–2011/12 to 66 percent during 2012/13–2015/16, before dropping to 54 percent in 2016/17<sup>16</sup> (Table 16). The vast majority of irrigation expenditures were used to expand irrigation coverage and build new dams and embankments; the management of irrigation assets while maximizing their use to increase farm incomes received little attention. Irrigation expenditures largely benefited paddy producers, by political choice and by technical design, promoted by Myanmar’s rice-centric policy.

57. **The second and third largest spending categories were agricultural finance and mechanization.** Each accounted for more than 15 percent of total spending in 2016/17, respectively, starting from much smaller shares in 2009/10. The value of the interest rate subsidy of MADB loans increased along with the growing volume of loans provided by MADB (Figure 18 and Figure 19). The Agricultural Mechanization Department (AMD) budget began to sharply increase in 2014/15 when the previous administration started to purchase a large quantity of agricultural machines, mainly tractors and combine harvesters, to provide direct services to farmers. This was a distortive policy, achieving little in terms of increasing mechanization in most parts of the country or of reducing farm production costs, while crowding out private investments (LIFT and World Bank 2016). The 2016/17 budget allocation to AMD stayed high, implying the continuation of the past distortive policy by the new administration, despite the rapidly increasing private investments in agricultural mechanization.

58. **The fourth largest spending category was crop development.** It covered programs for seeds, land use, plant protection, and extension, executed by the Department of Agriculture (DOA). Most of these funds were spent on rice-centric extension services and production of hybrid paddy seeds. In 2016/17, industrial crops were added to DOA. The share of these two programs reached 13.5 percent of total agricultural spending, twice as high as in 2012–2015.

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<sup>16</sup> Note that the 2016/17 figures do not include the Presidential budget, which might have been allocated to IWUMD as was the case in the previous several years.

**Table 16: Most public expenditures in Myanmar went to irrigation, mechanization, and crop programs**

	Million Kyats*			% of Total		
	2009–2011	2012–2015	2016/17	2009–2011	2012–2015	2016/17
Mechanization	18,144	53,424	113,182	6.0	9.3	18.3
Planning	1,063	1,534	764	0.4	0.3	0.1
Agricultural research	1,549	5,811	10,073	0.5	1.0	1.6
Agricultural education:	1,646	13,755	7,793	0.5	2.4	1.2
<i>Yezin Agricultural University</i>	<i>1,520</i>	<i>11,514</i>	<i>5,688</i>	<i>0.5</i>	<i>2.0</i>	<i>0.9</i>
<i>University of Veterinary Services</i>	<i>126</i>	<i>2,241</i>	<i>2,105</i>	<i>0.0</i>	<i>0.4</i>	<i>0.3</i>
Crops development	18,234	32,288	83,761	6.1	5.6	13.5
Industrial crops	30,008	11,623	n/a**	10.0	2.0	n/a
Irrigation	167,324	382,186	333,898	55.6	66.2	54.0
Water resource utilization	15,848	11,273	n/a**	5.3	2.0	n/a
Land management and statistics	7,578	25,456	32,138	2.5	4.4	5.2
Agricultural finance	4,487	74,023	90,176	1.5	12.8	14.6
Livestock	27,913	17,166	18,712	9.3	3.0	3.0
Fisheries	2,317	5,890	5,565	0.8	1.0	0.9
Cooperatives	4,248	6,303	5,936	1.4	1.1	1.0
<b>TOTAL</b>	<b>300,722</b>	<b>577,277</b>	<b>618,858</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Note: \*The budget in this table excludes the Regional and State budgets, the functional composition of which is not known. \*\*The Industrial Crops Department budget was merged with that of the Department of Agriculture and the Department of Water Resource Utilization budget with that of the Department of Irrigation in 2016/17.

Source: MOPF, MOALI, WB staff estimates.

59. **The fifth largest agricultural program was land management and statistics.** Its share grew from 2.2 percent of the total budget during 2009–2012 to 5.2 percent in 2016/17, due to the need to finance the issuance of land user right certificates and land consolidation programs executed by the Department of Agricultural Land Management and Statistics (DALMS) together with AMD and IWUMD. Despite the larger budgets for DALMS, the continued land tenure insecurity and the poor credibility of certificates remain among the most critical unfinished agendas in Myanmar. Moreover, agricultural statistics have not improved, due to both political reasons<sup>17</sup> and DALMS’s weak capacity.

60. **All other remaining programs received very small budgets.** The budgets for sector planning, water resource utilization, livestock, industrial crops, and cooperatives declined significantly, never being large enough in the past anyway. Funding for fisheries increased over time, but the volumes and shares remained very small over the review period.

<sup>17</sup> Myanmar has a very low quality of statistics, including agricultural statistics. Most production figures are highly inflated and food commodity balances do not represent reality. A high likelihood of the need for downward revision of most agricultural production figures, especially rice, has led to delays in adjusting the data collection methodologies.

61. **The functional composition of the MOALI’s 2017/18 budget, less the budget for DRD and MADB, is largely similar to the one in 2016/17.** Most funds will continue to be allocated to irrigation and mechanization, with the share of the latter growing from 18.4 percent to 25.6 percent (Table 17). The increased budgets for education, fishery, and livestock, a positive shift, are negated by the reduced budgets for research and crops.

**Table 17: The 2017/18 MOALI budget is a continuation of the 2016/17 budget**

	2016/17	2017/18
Minister's Office	0.4%	0.3%
Department of Agricultural Mechanization	18.4%	25.6%
Department of Agricultural Planning	0.1%	0.1%
Department of Agricultural Research	1.6%	1.4%
Department of Agriculture	13.6%	8.8%
Irrigation and Water Utilization Department	54.4%	49.8%
Agricultural Land Management and Statistics	5.2%	5.4%
Yezin Agricultural University	0.9%	1.5%
Department of Fisheries	0.9%	2.1%
Livestock Breeding and Veterinary Department	3.0%	3.6%
University of Veterinary Science	0.3%	0.2%
Cooperative Department	0.6%	0.8%
Small Scale Industries Department	0.2%	0.2%
<b>Total budget, million Kyats</b>	<b>613,682</b>	<b>596,354</b>

*Source: WB staff estimate, MOPF.*

62. **The above analysis suggests that public funds are not allocated to the programs that could stimulate economic growth.** Especially underfinanced is agricultural research. The Department of Agricultural Research’s (DAR) financing doubled in 2016/17 compared to the averages in 2012–2015 but its share in total agricultural spending stayed at a very low level, 1.6 percent (Table 16), and will decline to 1.4 percent in 2017/18 (Table 17). The global experience presented in Chapter 2 shows the key role such spending plays in driving long-term agricultural growth. Without a significant increase in such spending (along with improved quality of research programs), it is difficult to expect agricultural growth to accelerate in Myanmar in the near term.

63. **Catching up with the rest of the world will be a long journey for Myanmar.** In 2016/17, the ratio of public spending on agricultural research to agricultural GDP was only 0.04 percent, more than 10 times less than in East Asian developing countries, which experienced sustained periods of agricultural growth, 20 times less than in South Asian countries, and more than 60 times less than in developed countries (Table 18).

64. **Spending more on agricultural research in Myanmar requires a careful prioritization and improvement of quality of the existing spending.** The MOALI engaged several donors in late 2016 to prepare a roadmap for revitalizing agricultural research and education. This roadmap would inform priority for public investments, their sequence, and institutional changes needed to achieve satisfactory outcomes.

**Table 18: Spending on agricultural research in Myanmar is very low**

	Spending in % of ag GDP
<i>Myanmar (2013/14)</i>	0.02
<i>Myanmar (2016/17)</i>	0.04
East Asia and Pacific Region (2000–2011)	0.60
China (2010)	0.62
Lao PDR (2013)	0.42
Indonesia (2008)	0.31
Thailand (2008)	0.32
Vietnam (2015)	0.19
South Asia (2000–2011)	0.90
India	0.30
Bangladesh	0.38
Latin America and Caribbean (2000–2011)	1.32
Developed countries	2.51

*Source: IFPRI 2012a, WB staff estimates for Myanmar.*

65. **The prevailing functional composition of agricultural public spending in Myanmar is not well positioned to generate agricultural growth; it is also not well positioned to help achieve other important objectives such as improvement in nutritional security or climate-smart agriculture**, which are critical for Myanmar (Figure 2 and Figure 7). In regard to nutritional security, agriculture affects nutrition to varying degrees through several pathways. The global evidence to date shows that among the five main pathways listed in Table 19, higher farm income, household consumption of dietary food, and women’s empowerment yield the greatest results in decreasing malnutrition (World Bank 2013a). Public expenditures, which can stimulate these pathways, include those promoting farm diversification (improved seed development for all crops; livestock and fisheries programs; extension services promoting soil nutrient and pest management of farming systems rather than rice monoculture; and management of irrigation infrastructure in addition to infrastructure development) and a targeted provision of agricultural services tailored to the needs of women farmers (Table 19). All of these programs were either chronically underfinanced or ignored in Myanmar during the review period.

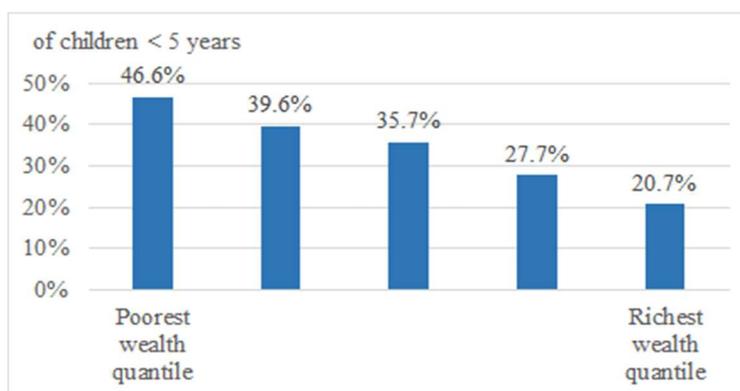
66. **The first deficiency of agricultural public expenditures in Myanmar in regard to nutritional sensitivity is manifested in their inability to generate agricultural growth.** The empirical evidence shows that income and economic growth matter for reducing malnutrition: child stunting in Myanmar was found to be much less common in households with higher incomes (Figure 24), and the average stunting rate in urban areas (20 percent), where GDP growth was bigger, was smaller than in rural areas (32 percent) in 2015/16. Thus in the medium run, higher agricultural growth would have helped reduce stunting in Myanmar.

**Table 19: Pathways linking agriculture with nutrition, and public programs**

Pathway	Strength of pathway	Desired public programs
Increase in <b>agricultural growth</b>	<b>Modest effect.</b> Doubling per capita agricultural income is associated with 15-21 percent decline in stunting on average, which would result in slow and uneven progress in reducing undernutrition. The income effect is larger in the lower income countries.	<ul style="list-style-type: none"> <li>• Research, extension, education</li> <li>• Irrigation infrastructure management and rural roads</li> <li>• Land tenure security</li> </ul>
Increase in <b>access to food</b> by higher production and decreasing food prices	<b>Modest effect.</b> Of the countries meeting the Millennium Development Goal 1 (MDG1) target to halve hunger, fewer than one-third are on track to meet MDG1 target to halve undernutrition, demonstrating the limited translation of national-wide grain availability to nutritional improvements.	<ul style="list-style-type: none"> <li>• Research and extension biased toward cereals (rice)</li> <li>• Irrigation development for paddy production</li> <li>• Private-sector-driven mechanization</li> </ul>
Increase <b>household income</b> through selling agricultural products	<b>Strong evidence.</b> On average, income poverty and undernutrition are correlated, but increases in household income do not necessarily lead to improved nutritional status of its most vulnerable members. The impact of higher income on child stunting tends to be large until the stunting reaches 20 percent.	<ul style="list-style-type: none"> <li>• Rural roads and irrigation</li> <li>• Access to finance</li> <li>• Productive alliances/partnerships</li> <li>• Standards and trade facilitation</li> </ul>
Increase <b>nutrient dense food production</b> for household consumption	<b>Strong evidence.</b> The best evidence to date is found from increasing small-scale production of nutrient dense foods, crops, livestock and fisheries.	<ul style="list-style-type: none"> <li>• Seed programs for all crops</li> <li>• Fishery and livestock development</li> <li>• Extension along with soil nutrient and pest management in farming systems</li> <li>• Investments in drainage infrastructure and multipurpose irrigation</li> </ul>
<b>Empowerment of women</b> through targeted agricultural interventions	<b>Strong evidence.</b> Over 50 percent of the reduction in child underweight from 1970 to 1995 is attributable to improvements in women's status. In agricultural activities increasing women's discretionary income and reducing women's time and labor constraints appear to be especially important to improve nutrition.	<ul style="list-style-type: none"> <li>• Women-sensitive extension</li> <li>• Special programs targeting women</li> </ul>

Source: World Bank 2013a, WB staff assessment.

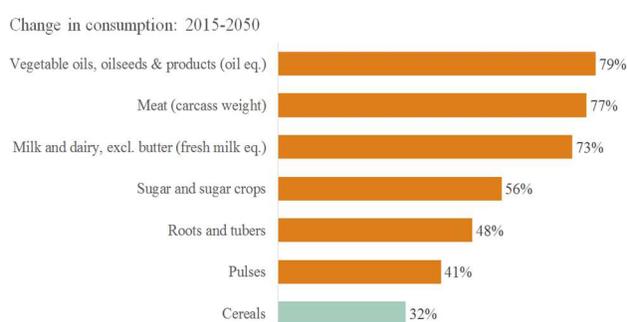
**Figure 24: Stunting falls with increased incomes in Myanmar**



Source: MICS 2009.

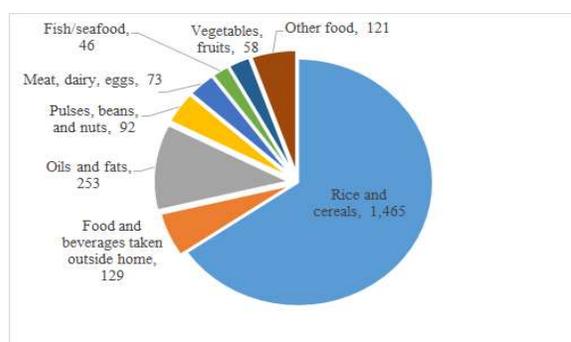
67. **The second deficiency of public expenditures in Myanmar in regard to nutritional security is a mismatch between what is supported for agricultural production and what is demanded by consumers.** Urbanization and the growth of income worldwide, including in Asia, has significantly changed people’s diets, shifting demand from cereals to vegetable oils, meat and dairy, and horticulture products (Figure 25). These products are often more nutritious than rice. Although rice continues to dominate the food diet in Myanmar, providing 66 percent of food calories in 2015 (Figure 26), the shift to eating less rice in Myanmar has also been long underway. During 1989–2016, rice expenditures in total household expenditures dropped from 33 percent to 15 percent in rural areas and from 22 percent to 11 percent in urban areas (Myint 2016). Yet most government programs in Myanmar continue to support rice production, with little attention paid to higher-value and more nutritious food.

**Figure 25: Global demand for non-cereals will increase the most by 2050**



Source: FAO.

**Figure 26: In 2015, about 70 percent of calories in Myanmar diets came from rice**



Source: WB staff assessment based on the 2015 household livelihood survey.

68. **The third deficiency of public expenditures in Myanmar in regard to nutritional security is their limited focus on women’s needs in agricultural production.** In 2014/15, women-headed households accounted for 13 percent of all households producing paddy and beans and pulses and 20 percent of households producing pigeon peas and maize. Furthermore, women are involved in many production tasks in men-headed households, yet they are largely ignored in delivery of agricultural services in Myanmar. In spite of the disparity in access to public services and the lack of programs tailored to women’s needs, productivity and profitability of women-headed households are similar to that of men-headed households (LIFT and World Bank 2016). This constitutes a foregone opportunity to increase women’s productivity further and empower them through a voice in collective action and improved human capacity, thereby improving the nutritional security of their households.

69. **Agricultural public expenditures in Myanmar are also poorly aligned with the needs of climate-smart agriculture.** Myanmar’s agriculture is very vulnerable to climate change (Figure 7), while at the same time it is a large source of greenhouse emissions. According to FAO, in 2010 it accounted for 33 percent of total emissions in Myanmar. The main contributors are rice cultivation and livestock, partially due to a lack of manure management: these sources accounted for 90 percent of all agricultural CO<sub>2</sub> emissions in 2014 (Table 20). Promoting climate-smart agriculture (which includes: (i) an increase in productivity, (ii) strengthening of farmers’ resilience to climate change, and (iii) reduction of agriculture’s contribution to climate change by reducing greenhouse gas emissions and increasing carbon storage on farmland) could

deliver a triple win. But this requires smart public investments. Box 1 shows the programs that from global experience can help achieve a triple win. They include improved land and water management; better weather forecasting; early warning systems and risk insurance; development of new technologies such as drought- or flood-tolerant crops, alternate wetting and drying of rice fields, livestock nutrition and feed management, and better manure management. Such investments have been largely missing in Myanmar, based on the above review. Instead, the Myanmar government allocated most public expenditures for rice cultivation, while the sustainable management of livestock and manure treatment received very little in the government budget. Furthermore, the large investments in irrigation and flood control were not climate-smart, as they did little to strengthen on-farm irrigation infrastructure and were not complemented by programs such as alternate wetting and drying and soil nutrient management.

**Table 20: Rice cultivation and livestock are the largest agricultural emitters in Myanmar**

	CO <sub>2</sub> equivalent, million tons	% of total
Rice cultivation	24.6	33.6
Enteric fermentation	23.8	32.4
Manure left on pasture and applied to soils	9.4	12.8
Manure management	8.3	11.4
Crop residues	2.6	3.6
Cultivation of organic soils	2.2	2.9
Synthetic fertilizers	1.1	1.5
Burning – savanna	0.9	1.3
Burning – crop residue	0.4	0.5
<b>Total</b>	<b>73.3</b>	<b>100.0</b>

Source: FAOSTAT 2017.

**Box 1: Programs delivering the triple win of climate-smart agriculture**

- *Raising agricultural productivity* can reduce pressure for land-use change, such as reducing deforestation driven by agricultural expansion of food, fiber, and fuel.
- *Strengthening farmers’ resilience* will help adaptation to the increasing frequency and intensity of droughts and floods, together with temperature changes. Improved land and water management, better weather forecasting, early warning systems and risk insurance, and development of new technologies such as drought- or flood-tolerant crops can improve climate resilience.
- *Reducing GHG emissions* from agriculture to mitigate climate change beyond reductions in CO<sub>2</sub> emissions (which are predominantly from land-use changes), require reduction in methane and nitrous oxide emissions. Activities to reduce methane emissions include improved livestock nutrition and feed management, reduced frequency and intensity of biomass burning, alternate wetting and drying of rice fields, keeping wetland rice fields dry in the off-season, and better waste management in intensive livestock systems. Activities to reduce nitrous oxide emissions include timely use (and slow release) of nitrogen fertilizers, when applied, and more use of legume trees to reduce dependence on fertilizers.
- *Increasing carbon storage in farmland* will also help mitigate climate change. Actions to enhance carbon storage can lead to the triple win of higher productivity, more resilience, and greater carbon capture in soils. This includes techniques such as mulching, intercropping, integrated crop-livestock management, conservation agriculture, and agro-forestry. The potential for carbon storage is highest on degraded lands.

Source: World Bank 2013b.

### *Alignment of public spending with strategies and action plans*

70. **Public expenditures tend to bring about higher economic returns if they are aligned with government strategies and actions plans.** Exceptions would be cases when strategies neither address key challenges nor capitalize on opportunities for sector development. The key strategic document for agriculture in the previous administration was the Strategy of the Ministry of Agriculture and Irrigation for 2011–2015. This document outlined a good list of priorities; had they been implemented, agricultural production and food security would have improved. These priorities included the following:

- a. Extend production and use of good-quality and high-yielding seeds.
- b. Disseminate modern agricultural technologies to farmers.
- c. Upgrade vocational education and training.
- d. Enhance R&D for sustainable agriculture.
- e. Encourage transformation to mechanized farming, climate-smart agriculture, and extension of water availability.
- f. Improve agricultural laws.
- g. Encourage private public partnerships and improve the environment for private investments in agriculture.

71. **The above strategy encompassed many good aspects of sustainable agricultural development.** Yet public expenditures during 2011–2015 were aligned with a small number of priorities, such as: (i) extend the production of high-yielding (hybrid) paddy seeds; (ii) encourage transformation to mechanized farming; and (iii) extend water availability. The budget's alignment with other priorities was very weak, partially reflecting the low and even declining budget for agricultural planning (Table 16). The supported programs did little to enhance sustainable and inclusive agricultural growth due to their poor implementation, crowding out of private investments (in the case of hybrid seeds and mechanization), and prioritization of irrigation infrastructure development over effective infrastructure management. Other programs that could have helped spur growth, including adaptive research, dissemination of improved technologies to farmers (extension services), and improvement of regulatory environment for private investments in agriculture, were too chronically underfinanced to have any impact.

72. **In addition to poor alignment with the main agricultural strategy, public expenditures were misaligned with the sources of agricultural growth identified by many experts.** As discussed in Chapter 1, increased crop yields, shifts of land from paddy to higher-value crops, and increased fishery production are expected to be the main sources of future agricultural growth in Myanmar. A group of policy advisors and agricultural experts prepared the *2016 White Paper for New Vision of Agricultural Development*, which emphasized diversification of agricultural production and improvement of the policy environment for private investments as necessary for Myanmar to shift from a rice bowl to a food basket (NESAC 2016). The World Bank, in analytical work conducted together with other development partners such as the LIFT, emphasized investments in agricultural R&D and extension, upgrade of existing irrigation systems to permit crop diversification, improved access to finance and logistical services, and outward-looking agricultural and trade policy to support agricultural value chains and promote stability of food prices (LIFT and World Bank 2014b; World Bank 2014; LIFT and World Bank 2016). Yet most agricultural public expenditures were spent on construction of new

dams and primary irrigation infrastructure, land consolidation, mechanization, and production of hybrid seeds, all programs that did little to stimulate inclusive and diversified agricultural growth (Table 16).

73. **The Second Short-Term Five Year Agriculture Policies and Plans presents the new administration’s vision on agriculture and rural development (MOALI 2016).** While it still lacks clarity over priorities and how to improve the performance of existing programs, this document includes goals that could help spur agricultural growth if budgeted properly and implemented well. These goals include the following:

- a. Improve food security, nutritional status of food and food safety of the people.
- b. Enhance agricultural diversification programs in compliance with the changing market and prevailing agroclimatic conditions.
- c. Satisfy specified quality and standard of agriculture, livestock and fishery products.
- d. Improve dissemination of markets and price information.
- e. Conduct sanitary and phytosanitary measures.
- f. Develop and adopt good agricultural practices for crop, livestock and fishery production.
- g. Encourage producer groups and cooperative societies aiming at sustaining the development of agriculture sector.
- h. Develop seed industry and highly-performing pure animal breeds and fish species, and conserve native breeds and species.
- i. Develop and enhance agriculture-based industries, small-scale industries, traditional weaving, handicraft, including 10 traditional artworks and crafts, vocational education, and rural infrastructure.
- j. Improve and enhance research and extension services, and human resource programs.

74. **The above policy document is the basis for the Agricultural Development Strategy and Investment Plan (ADSIP) for 2017–2022 currently being prepared by the MOALI.** Analyzing both of these documents, it seems that the MOALI budget for 2017/18 is not well aligned with these new priorities either, although some positive developments took place. More funds are allocated to fishery and livestock compared to previous years, but most other programs remained underfinanced. Moreover, most irrigation funds are still used to build new irrigation systems, despite the urgent need to upgrade and rehabilitate existing ones and enhance their management. The large capital expenditures for AMD go against the objective of financing public goods to attract private investments in agriculture. Therefore, more shifts are necessary within the MOALI budget to align it with the ADSIP budget.

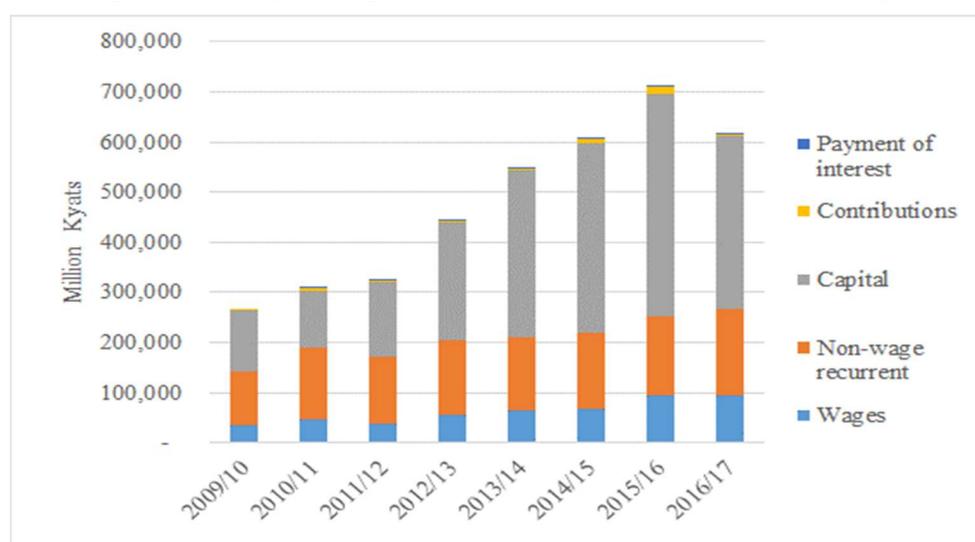
75. **What explains the misalignment of the agricultural budget with policies?** There are several reasons. Partially, this could be a result of underspending on agricultural planning (which received only 0.1 percent of total MOALI expenditures in 2016/17) and of a lack of mandate for this department to screen the alignment of budget proposals prepared by the MOALI’s departments with the Ministry’s strategic objectives and priorities. The lack of monitoring and evaluation of existing programs also contributes to misalignment between the budget and strategies at the MOALI, as there is no empirical basis to reward high achievers and penalize poor performers. Public finance management (PFM) considerations such as procurement also matter: they affect the extent of budget execution by different departments (see Chapter 5 for

more details) and indirectly shape the functional composition of public expenditures. The Irrigation Department, for example, has the strongest PFM capacity in the MOALI, which, combined with its in-house construction circles, makes it easier to fully utilize the allocated funds. Departments required to outsource construction to the private sector often lack capacity to procure and manage contracts effectively. In many instances, however, the misalignment between the budget and policy objectives is a result of discretionary decisions of the Ministry's senior management, who allocate funds to various functions and programs based on their own priorities rather than on official strategies and policies.

### *Economic composition*

76. **The economic composition of the MOALI budget<sup>18</sup> was biased toward capital expenditures.** These accounted for 55 percent of the total budget, compared with 13 percent of wages and 32 percent of nonwage recurrent expenditures during the review period (Figure 27). The share of capital expenditures in the total budget peaked at 62 percent in 2015/16, rising from 46 percent in 2009/10 before declining to 56 percent in 2016/17.

**Figure 27: Capital expenditures dominate the MOALI budget**



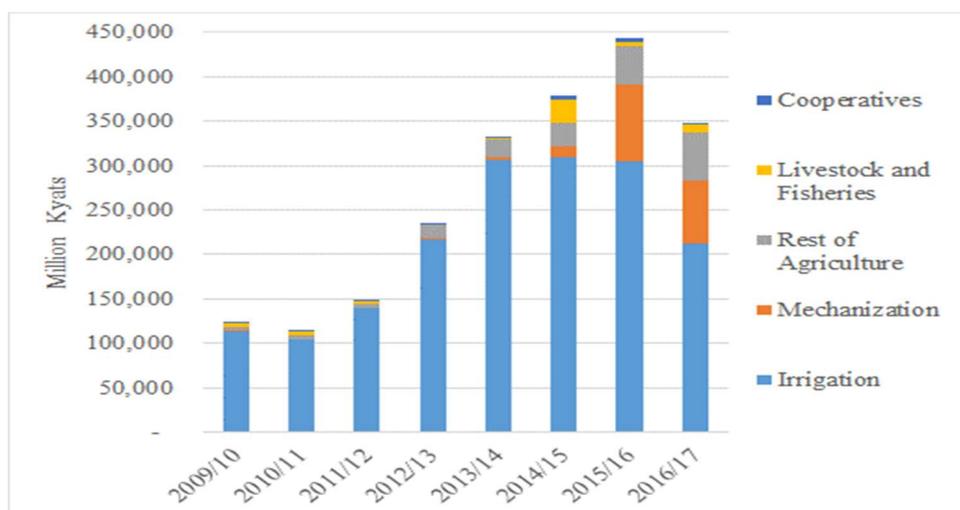
*Source: MOPF, MOALI, WB staff estimates.*

77. **Irrigation accounted for 81 percent of total capital spending during the review period.** Capital expenditures were mainly used for construction of new dams and primary irrigation infrastructure, large repairs of existing systems, and rehabilitation of existing systems using the loans and grants, mainly from IFAD and JICA.<sup>19</sup> Mechanization and other crop programs accounted for 8 percent each, leaving only 3 percent for the remaining programs (Figure 28). The capital allocation to AMD and DOA grew, particularly in 2015/16 and 2016/17, reducing the share of irrigation to 65 percent.

<sup>18</sup> The economic composition of public expenditures is known only for the Union budget of the MOALI. Other sources of public funds are excluded from this analysis.

<sup>19</sup> The irrigation rehabilitation project financed by the World Bank is at the early stage of implementation, and is not yet reflected in the MOALI budget. ADB's irrigation rehabilitation projects are still under preparation.

**Figure 28: Most capital expenditures were allocated for irrigation and mechanization**



Source: MOPF, MOALI, WB staff estimates.

78. **Excluding irrigation expenditures, the economic composition of the budget was better balanced.** Wages accounted for 25 percent while nonwage recurrent and capital expenditures accounted for 40 percent and 32 percent of the total budget, respectively (Table 21).

**Table 21: Without irrigation, the economic composition of the budget was more balanced**

Expenditure category	Average budget (2009–2016), million Kyats		% of MOALI budget	
	With irrigation	Without irrigation	With irrigation	Without irrigation
Wages	61,927	45,772	13%	25%
Non-wage recurrent	145,071	73,080	30%	40%
Capital	264,924	57,998	55%	32%
Contributions to other organizations	6,119	6,119	2%	3%
Interest payments	1,205	647	0%	0%
<b>TOTAL</b>	<b>479,193</b>	<b>183,619</b>	<b>100%</b>	<b>100%</b>

Source: MOPF, MOALI, WB staff estimates.

79. **Most nonwage recurrent expenditures were allocated to two subcategories.** Expenses for O&M accounted for 48 percent of total nonwage recurrent expenditures, followed by 45 percent spent on goods and services (Table 22). O&M expenditures were mainly executed by ID, while AMD, ID, and DOA were responsible for 80 percent of total expenses on goods and services (Table 23). The budget for travel expenses was very small, preventing most MOALI staff from traveling and working with farmers.

**Table 22: Most nonwage recurrent expenses were allocated to O&M and goods & services**

Billion Kyats	2009/ 10	2010/ 11	2011/ 12	2012/ 13	2013/ 14	2014/ 15	2015/ 16	2016/ 17
<b>Crops and Irrigation</b>								
Travelling allowances	0.50	0.69	1.82	3.82	3.27	3.14	3.38	3.87
Goods and services	26.95	28.74	29.50	58.09	50.23	54.91	64.42	70.02
O&M charges	20.65	44.58	63.36	74.16	72.62	81.43	78.19	73.08
Transfer payments	0.19	0.21	0.20	0.65	0.76	0.71	1.17	0.97
Entertainment and meal expenses	0.01	0.01	0.01	0.16	0.18	0.18	0.20	0.19
<b>Subtotal</b>	<b>48.3</b>	<b>74.4</b>	<b>95.6</b>	<b>136.9</b>	<b>127.1</b>	<b>140.4</b>	<b>147.4</b>	<b>148.1</b>
<b>Livestock, Fisheries, and Cooperatives</b>								
Travelling allowances	0.07	0.08	0.02	0.12	0.11	0.17	0.16	0.19
Goods and services	1.47	1.70	1.20	1.63	1.64	5.15	8.10	6.49
O&M charges	0.29	0.40	0.25	0.35	0.25	0.60	0.78	0.56
Transfer payments	0.01	0.01	0.01	0.01	0.01	0.28	0.66	0.22
Entertainment and meal expenses	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.01
<b>Subtotal</b>	<b>1.8</b>	<b>2.2</b>	<b>1.5</b>	<b>2.1</b>	<b>2.0</b>	<b>6.2</b>	<b>9.7</b>	<b>7.5</b>

*Source: MOPF, MOALI, WB staff estimates.*

**Table 23: Most nonwage recurrent expenses were spent by ID, AMD, and DOA**

	2009/10–2013/14		2014/15–2016/17	
	Goods & services	O&M	Goods & services	O&M
Agricultural Mechanization Department	12,283	1,684	22,167	1,744
Department of Agricultural Planning	242	95	352	58
Department of Agricultural Research	1,159	145	2,576	372
Department of Agriculture (and Industrial Crops)	14,517	2,857	19,187	3,614
Irrigation Department	10,635	50,493	15,555	70,709
Water Resource Utilization Department	4,831	1,102	832	658
Department of Ag Land Management and Statistics	3,429	215	3,030	300
Yezin Agricultural University	315	223	839	508
Department of Fisheries	762	147	822	144
Livestock Breeding and Veterinary Department	602	107	5,293	372
University of Veterinary Sciences	60	21	227	80
All Cooperative Departments	360	138	584	158
Minister Office	277	76	540	84
<b>TOTAL</b>	<b>49,474</b>	<b>57,305</b>	<b>72,005</b>	<b>78,799</b>

*Source: MOPF, MOALI, WB staff estimates.*

80. The following conclusions are derived from the analysis of allocative efficiency of agricultural public expenditures in Myanmar:

- a. The good news is that there are no agricultural input and output subsidies; most public programs in Myanmar finance public goods. This actually limits the scope for

- internal reallocation of expenditures within the MOALI. The only private good is the large part<sup>20</sup> of expenditures for mechanization, allocated to purchase agricultural machines and provide mechanization services to farmers. This crowds out private investments in mechanization.
- b. Expenditures on irrigation and mechanization are high relative to other programs and crowd out other growth-inducing public programs. These two programs are candidates for reallocation of expenditures within the MOALI.
  - c. Most public funds are spent on rice-related programs, particularly through irrigation, mechanization, research, seeds, and extension. The programs for other crops or for farming systems receive very small budgets.
  - d. Spending on agricultural R&D, along with complementary spending on seeds, soil nutrient management, plant protection, and extension, was very small, explaining the low agricultural growth, as well as the poor achievements of nutrition-sensitive and climate-smart agriculture. Gender was not a feature of the MOALI programs at all.
  - e. Alignment between MOALI policies and expenditures was weak in general and strong with the small number of (not so good) priorities. The functional composition of public spending did not support the sources of growth identified by the MOALI itself and by agricultural experts. Improving functional composition would require shifting funds from provision of mechanization services and irrigation infrastructure development to R&D, irrigation assets management, soil nutrients management and plant protection, seeds, extension (for crops, livestock and fisheries), and agricultural planning.
  - f. The MOALI budget was generally balanced between wage, nonwage recurrent, and capital expenditures. The wage bill remained small despite recent wage increases. Yet most capital expenditures were allocated to a narrow set of activities such as construction of new dams and irrigation systems and large repairs of existing irrigation systems by IWUMD or to buying tractors and other agricultural machines by AMD. These capital expenditures crowded out spending on rehabilitation and upgrade of existing irrigation systems, their O&M, and strengthening capacity of the irrigation staff to establish and support water user groups (for IWUMD); and on training of trainers for mechanization, provision of repair and other services to the owners of agricultural machines, and testing of new machines, especially for non-paddy crops, in different parts of the country (for AMD).<sup>21</sup>
  - g. Research and extension, along with other frontline service providers, received very small travel and other operational budgets, in addition to wages, to experiment and produce improved technologies for a wide variety of agricultural products (crops, livestock, and fisheries) suitable for different agro-ecological zones and to reach out to many farmers with these technologies to ensure their adoption. This needs to be addressed, along with PFM improvement in the concerned departments.

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<sup>20</sup> Some AMD expenditures such as for vocational training and demonstration activities are of a public good nature.

<sup>21</sup> Services that are usually underprovided by the private sector but which are necessary to ensure high returns of farmers' investments in mechanization and crowding in the private sector investments.

## 5. Enhancing Implementation Efficiency of Agricultural Public Expenditures in Myanmar

81. **This chapter analyzes the implementation efficiency of Myanmar’s public programs.** Implementation efficiency is important to achieve a high impact of public programs. The result of even “desirable” programs may be negated by factors such as low capacity of staff, poor design of programs, supply-driven delivery of services, low coordination with other departments and divisions, poor budget execution, and other PFM issues. In other words, correction of a market failure through public programs may result in a government failure. The quality of implementation is particularly important in the context of Myanmar, given its limited fiscal space for a significant increase in the volume of agricultural spending and the high potential for implementation and regulatory improvements that would help increase the impact of public expenditures.

82. **It is widely recognized that the implementation efficiency and quality of most agricultural public programs in Myanmar has been very low.** This belief is based on the ample evidence of the supply-driven nature of most services; the strong bias for rice in service provision at the expense of farming systems and farm production economics; the low capacity of most MOALI staff; the prevailing silo approach to service delivery, with insufficient collaboration between the MOALI’s departments, across both old and new department composition;<sup>22</sup> and the weak integration of activities planned and carried out by the Union government with those of Regional and State governments. It was anticipated that many of these weaknesses, especially fragmentation and insufficient interdepartmental collaboration, would be addressed after the merger of the three ministries into the MOALI, but this remains unmaterialized.

83. **Another common constraint to effective implementation of existing programs is PFM issues.** The generic budget cycle includes budget preparation aligned with sector objectives and strategies, budget allocation, budget execution, and monitoring and evaluation of the programs’ outcomes to feed into the budget cycle (Figure 29). In Myanmar, issues arise at all stages of the budget cycle, as presented below:

- a. **Budget preparation:** Generally, budget preparation begins with the bottom-up needs of each division and department (the detailed steps in the budget process are presented in Annex 1 for the Irrigation Department as an example). The budget requests for wages and routine operational activities are honored automatically, although for some departments such as ID the basis for O&M budget allocations is rather outdated (e.g., 1928 Department Code). The preparation of the capital budget is less clear. In some departments, it adds up to the bottom-up requests. In many instances, however, allocation decisions are made by Director Generals without consultation with lower implementation units. The list of fixed assets to build and equipment/machinery to purchase for various MOALI state farms and stations is often decided by the central unit, without consultation with managers of the local units/farms.

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<sup>22</sup> Share of transfer payments in the total agricultural budget, showing the interdepartmental budget compensations, increased from 0.07 percent in 2009/10 to only 0.20 percent in 2016/17.

- b. Preparation of Union and local government budgets: There is no coordination in preparation of the Union budget and the budgets of States and Regions. As discussed in Chapter 3, the rising share of local budgets is being spent on wages of local extension officers and O&M of irrigation systems with less than 5,000 acres (see more details below in this chapter), but local budgets are typically prepared separately from budgets at the Union level. Moreover, the Regions and States rarely ever know the Union budget allocated to DAR or DOA farms or laboratories in their respective localities.
- c. Alignment of the proposed budget with strategic objectives: Budget proposals for each department are prepared by the concerned departments and submitted to the Minister office without scrutiny of their alignment with strategic objectives. In most countries, such scrutiny is conducted by the planning department, but in Myanmar this department lacks such authority and also budget. In addition, the MOALI departments are not required to provide evidence of impact of their past programs to justify budget proposals. Budget allocations are based on budget execution and political priority rather than on program outcomes. A lack of monitoring and evaluation of programs, largely because of the limited pressure from senior management to link budget proposals with program outcomes, further reduces the quality of the budgeting process.
- d. Budget execution: It was not possible to collect data on budget execution at the MOALI, as the data are not readily available. Interviews with MOALI staff revealed that some departments utilize their budgets more fully than others. For example, ID has a high rate of budget execution, mainly due to the use of its own construction circles through force account and strong fiduciary capacity. The budget execution of other departments averages 80–90 percent, often being lower for capital budget and expenditures financed by foreign loans and grants. In some places with high labor cost, the low maximum daily allowance fixed at 3,000 Kyats prevents hiring of temporary labor to execute civil works, in addition to limiting the mobility of government staff. Many departments also struggle with procurement, largely because of lack of experienced, trained staff. Staff members have no experience in contracting services or purchasing goods from the private sector, or with complying with requirements of donors, who increasingly provide funds to the MOALI (see Chapter 6). The recent introduction of procurement guidelines for all ministries in Myanmar will help overcome some previous problems, especially where complemented by procurement training and performance monitoring.

84. **More insights on implementation are generated from a detailed analysis of several programs that are key for growth in the near term.** Most of them account for a large share of public funds, so their improvement would increase the overall quality of public spending. These programs include: (i) irrigation and water management; (ii) agricultural innovations, with a focus on extension, seeds, and fertilizer quality and soil nutrient management; (iii) mechanization; (iv) agricultural finance; and (v) fisheries. The review focuses on the main aspects of these programs. It highlights the areas for “doing less” and “doing more” going forward and allocating budgets accordingly. The analysis also studies the regulatory and policy environment related to these programs, given the importance of their improvements on overall efficiency of public programs and expenditures.

85. **Although highly important, farmland tenure security is not included in the review.** Enhancing tenure security is critical not only for inclusive growth but also for social cohesion and stability, and for sustainable management of natural resources in Myanmar. Currently, claims over land acquisition injustices dominate public discourse and the new government's agenda. In parallel, infrastructure and institutions for land administration and property markets are grossly outdated. Adoption of the Land Use Policy in 2016 created momentum for taking action, but progress remains slow. Many experts work on this agenda in Myanmar and this review would not be able to provide more novel, specific recommendations. Notwithstanding, it needs to be recognized that strengthening farmland tenure security requires more budget outlays in the future to not only improve land registration but to start building institutions for land administration and markets.

**Figure 29: Key elements of the generic budget cycle**

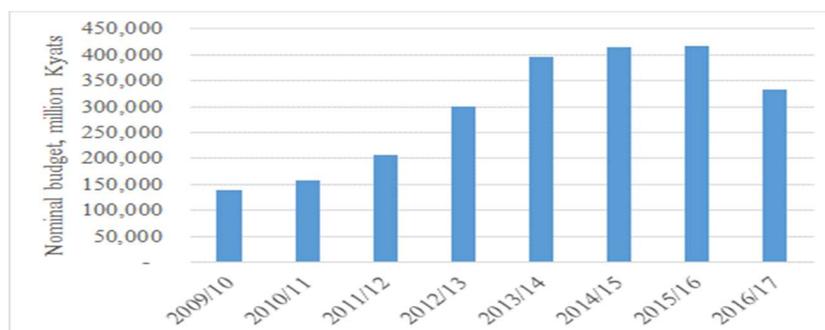


*Source: World Bank 2011.*

### ***Irrigation and water management***

86. **The review of selected program starts with irrigation and water management.** Irrigation was a public spending priority of various Myanmar governments, with no exception in the previous and current administrations. As shown in Chapter 4, these expenditures dominated overall agricultural spending during the whole review period. Public expenditures for irrigation and water resource utilization rose from 139 billion Kyats in 2009/10 to 417 billion Kyats in 2015/16 (Figure 30). In 2016/17, these expenditures dropped to 315 billion Kyats, due to the reduced spending on the construction of dams; in 2017/18 they are projected to further decline to 297 billion Kyats.

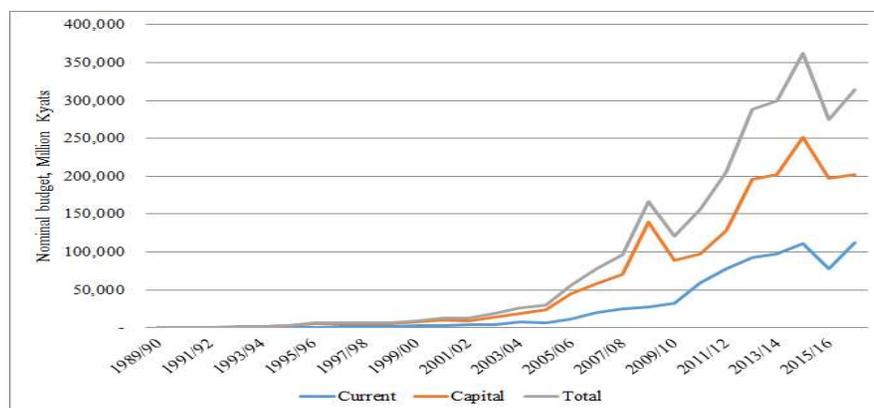
**Figure 30: Irrigation spending increased significantly during the review period**



*Source: MOALI, MOPF, WB staff estimates.*

87. **The largest part of the irrigation budget was historically allocated to capital expenditures.** They financed construction of new dams and primary irrigation infrastructure; construction and repairs of embankments and flood protection systems; large repairs of existing infrastructure; preparation of feasibility documents for investments; and all donor projects. Since 1989, ID has invested mainly in new dams and irrigation projects with some investments in embankments and polder systems (Figure 31). The budget grew over the years due to the expansion of irrigated area and the construction of associated dams (Annex 1 includes more details on the department and its budget processes).

**Figure 31: Capital expenditures historically dominated ID’s budgets**



Source: MOALI, WB staff estimates.

88. **Capital expenditures also dominated the more recent period.** They accounted for 70 percent of the total ID budget during the period of 2009/10–2016/17 (Table 24). Expenses on O&M accounted for 20 percent of the total ID budget, significantly growing between 2009/10 and 2014/15, after which they began to decline, partially reflecting the shift in mandate for O&M from the Union to local governments (see more discussion on this below).

**Table 24: Capital expenditures remained dominant for ID in more recent years**

Billion Kyats	2009/ 10	2010/ 11	2011/ 12	2012/ 13	2013/ 14	2014/ 15	2015/ 16	2016/ 17
Wages	6.3	8.5	8.6	13.4	17.1	20.3	27.3	27.9
Travel expenses	0.2	0.2	0.2	0.4	0.3	0.3	0.3	0.4
Expenses on goods & services	7.8	9.0	9.2	12.5	14.6	15.9	14.5	16.3
O&M	18.3	42.0	59.4	66.8	65.9	74.0	71.0	67.1
Transfer payments	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Capital expenditures	106.3	97.2	128.7	205.3	298.6	304.3	302.6	201.7
Payment of interest	0	small	small	1.1	0	0.7	1.4	1.4
<b>TOTAL</b>	<b>138.9</b>	<b>156.9</b>	<b>206.2</b>	<b>299.5</b>	<b>396.6</b>	<b>415.6</b>	<b>417.1</b>	<b>314.8</b>

Note: In 2016 the Irrigation and Water Resource Utilization Departments merged but their 2016/17 budgets are still separated as the previous government prepared them. The IWUMD budget thus consists of two parallel budgets for the previous ID and WRUD. The budget figures in this and following tables refer to the figures for ID.

Source: MOALI, MOPF, WB staff estimates.

89. **As of December 2015, ID managed 1.34 million ha of irrigated systems.** In addition, it managed most major water infrastructure in Myanmar, including 230 dams on the tributaries of the main rivers, 1,135 km of flood protection embankments along the main rivers, and polders protecting 1.5 million ha. Regional governments, private enterprises, and farmer communities managed the remaining 0.76 million ha of irrigated systems. WRUD (now amalgamated with ID into IWUMD) manages 201,000 ha of irrigation from 327 river pumping schemes and 70,000 ha of groundwater irrigation.

90. **Public expenditures on irrigation focused on reservoir and canal systems and river pumping systems, but the real gains in the last 10 years were in small-scale farmer-managed pumping from both surface and groundwater.** Groundwater irrigation is growing rapidly: the area grew from 40,000 ha in 1995/96 to 151,000 ha in 2013/14, almost matching the growth of canal systems in the same period (MOAI 2015a). In addition, there is a large but undocumented growth in area irrigated under small-scale farmer-managed pumping from tube wells. Small pumps are commonly used for high-value horticulture crops, even within formal irrigation schemes, because they provide control over the timing and volume of water delivery. Small-scale pumping transformed irrigation in South Asia and China, and Myanmar may follow a similar trajectory. A more strategic approach is needed to balancing investment between large- and small-scale irrigation options.

91. **Regarding public investment in large irrigation systems, from an engineering perspective they seem to be of good quality, but from an economic perspective the effectiveness of irrigation spending has been low.** Global experience shows that high economic effectiveness is achieved when infrastructure development goes hand-in-hand with infrastructure management, demand-driven service orientation, on-farm irrigation and drainage management, and integrated water resource management. The latter aspects have been largely overlooked in Myanmar, leading to suboptimal economic outcomes. Below are several examples:

- a. Despite a doubling of irrigation spending in nominal terms between 2011 and 2015, irrigation coverage increased by only 3 percent, from 2.11 million ha in 2011 to 2.17 million ha in 2015, according to the MOALI.<sup>23</sup> At 16 percent, irrigation coverage in Myanmar is among the lowest in Asia (Table 6).
- b. The productivity and cropping intensities in existing irrigation systems are low for various reasons, of which one is the performance of irrigation systems themselves. Only part of the irrigable area presented in Table 25 is actually irrigated. This may be due to malfunctioning infrastructure, water shortages, or inefficiencies in water allocation and delivery.
- c. Productivity in public irrigation systems does not seem to differ much from that in rainfed systems, except in a small number of properly maintained irrigation systems such as Shwebo in Sagaing Region. In addition to the insecure irrigation water supply, low agricultural productivity is a result of weak coordination between ID and other MOALI departments, which results in an undersupply of public services to farmers in irrigation systems, such as seeds, adaptive research, extension, and basic education, and limited access to affordable credit suitable for farm production cycles.

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<sup>23</sup> This figure does not include irrigation coverage from private investments in pumps and wells.

- d. Underperformance of productivity in irrigation systems can also be attributed to the system of irrigated farm land classification (rice or non-rice land status restricting the crop choice/production system), the rigid supply-oriented concepts of operation of irrigation systems and reservoirs, and the absence of detailed distribution and drainage infrastructure on and below the watercourse level. The vast majority of public irrigation systems only receive water to produce paddy. Using the existing systems for so-much-needed crop diversification would require significant investments in drainage, a readjustment of some primary and secondary canals, and overall management of the systems. In their current form, Myanmar’s irrigation systems do not maximize the efficient use of water, thereby producing suboptimal outcomes.

**Table 25: Actually irrigated areas are often smaller than potentially irrigable areas**

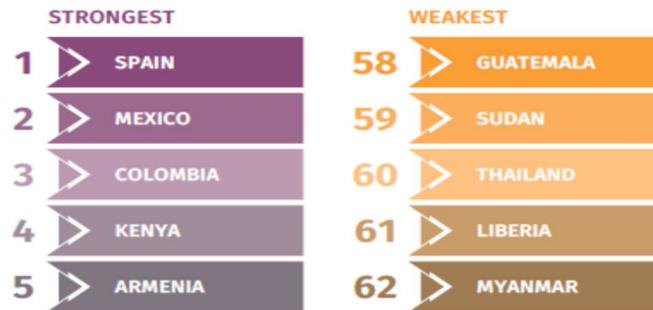
	<b>Naypyitaw</b>	<b>Sagaing</b>	<b>Bago-East</b>	<b>Mandalay</b>
Irrigation system	Sinthe	North Yamar	Swa	Male Nattaung
Irrigable area (gross): acres	25,416	12,000	35,000	10,000
Irrigable area (net): acres	15,218	11,320	23,467	6,500
Irrigated area: acres	12,712	5,900	20,670	5,755
Irrigated to irrigable area, %	83	52	88	88

*Note: Gross irrigable area is the total area within system boundaries, including villages, roads, and non-irrigable areas such as marshes and uplands. Net irrigable area is the total service area that can be provided with irrigation water. Irrigated area is the net irrigable area that receives irrigation water.*

*Source: World Bank 2015b.*

- e. The lack of formal organization among farmers related to water management and of the legal foundation for it further limit effective use and management of current irrigation systems. Where the regional irrigation departments manage the main systems, water user groups are supposed to develop and manage water and infrastructure below the outlet of the watercourses. Irrigation, drainage, flood management, and transport infrastructure at the terminal units in irrigation and drainage/polder systems are generally lacking; consequently, systems are underutilized and productivity is low. This also results in uneven and unreliable water delivery and drainage problems, constraining crop diversification potential.
- f. Water scarcity and soil degradation present significant practical constraints to both irrigation and agricultural development. In addition, while irrigation poses a variety of benefits for agricultural growth such as increased crop production, it can also heavily impact the availability of water resources for other uses and users. To this end, integrated water resources management promotes a view toward managing water in conjunction with land and other interconnected resources to achieve equitable and sustainable use. It requires establishment of institutions at the basin level, water planning, development of information systems, and water resource protection, all of which are largely missing in Myanmar, placing it last in the World Bank’s ranking of water regulations in 62 countries in 2016 (Figure 32).

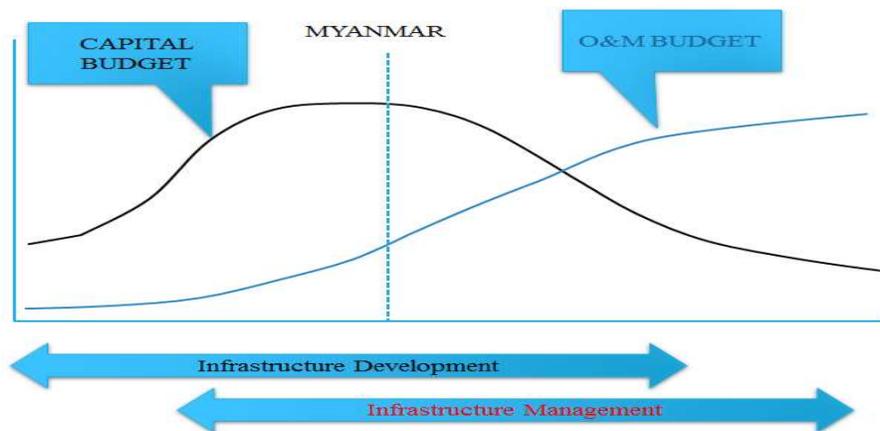
**Figure 32: Myanmar is the weakest globally in integrated water resources management**



*Source: World Bank 2017a.*

92. Myanmar appears to have reached the point where it is necessary to shift from **infrastructure development to infrastructure management and economic development in irrigation sites**. Infrastructure development normally starts with a sharp increase in capital expenditures. After a period of initial investment, the cost for O&M will increase and capital expenditures will gradually decrease (Figure 33). When most of the infrastructure is developed, the size of the O&M budget will surpass the size of the capital budget although the capital budget will remain substantial for further investments in modernization, rehabilitation, and replacement of assets. Myanmar has developed an important part of its main irrigation infrastructure and is now at the point where O&M becomes more demanding. A rise in O&M expenditures is well justified, therefore. Myanmar also needs to expand irrigation coverage, which is still relatively small, by more feasible means than construction of new gravity systems and to bring agricultural public services to farmers in irrigation systems so they can achieve higher incomes. Investment and policies to support small-scale, farmer-managed pumping could provide an important alternative to large-scale infrastructure development in some contexts, but must be accompanied by regulation and management to ensure sustainable and equitable development and to avoid overexploitation.

**Figure 33: Myanmar needs to shift from irrigation infrastructure development to infrastructure management**



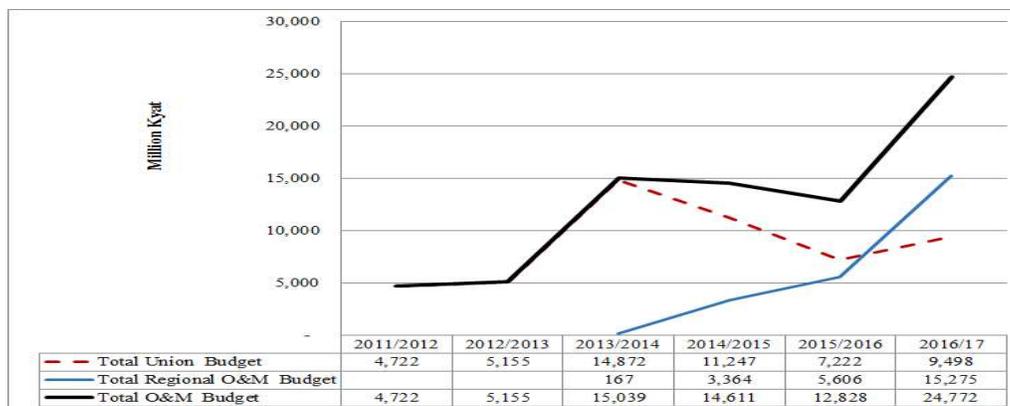
*Source: WB staff presentation.*

93. **Protecting existing assets through sufficient O&M expenditures is the first step to enhance infrastructure management.** How adequate are the O&M expenditures in Myanmar? On average, the Union budget spent \$50 per ha of irrigated area in 2015/16. This estimate is based on information that: (i) ID’s budget responsibility is for irrigation systems with a net service area of more than 5,000 acres, which adds up to 1.34 million ha of rice-based, mainly gravity irrigation; and (ii) the total O&M allocation in the Union budget in 2015/16 was 86 billion Kyats. The average of \$50 per ha is large in international comparison. For example, the figure is \$60 per ha for fully government-managed systems in the Philippines. In Indonesia, the allocation for central government-managed irrigation systems (size over 3,000 ha) is \$20–25 per ha.

94. **Actual O&M expenditures for irrigation systems in Myanmar are, however, much smaller than \$50 per ha and are thus inadequate to protect most irrigation assets.** This is because the O&M allocation in Myanmar also covers expenses for dams, weirs, pumping stations, and especially drains and polder and flood embankments in the Ayeyarwaddy Delta that are located outside the 1.34 million ha. In addition, the average budget masks uneven spatial allocation of O&M funds, with some irrigation systems getting more funds than others, leading to deterioration of infrastructure in many systems across the country. Furthermore, very little is allocated to maintaining irrigation canals and drainage systems (for sediment removal); most special budget is allocated for embankments and sluices.

95. **In addition to the need to spend more on O&M, changes are required to delegate more decision making from the Union to the Regions and States, along with the ongoing shift of mandates for O&M.** In 2013, management of smaller irrigation systems (less than 2,000 ha) was transferred to Regions and States. In Mandalay Region, for example, this transition in budget responsibility led to an increase in the total O&M budget. In 2015/16, the total O&M budget (Union and Regional) was 23.5 billion Kyats, or \$18.8 million for an irrigable area of 300,000 ha (Figure 34). This averaged \$62 per ha for the Region’s total irrigation area compared with the overall Union budget of \$50 per ha. The situation is similar in Ayeyarwaddy Region, which in 2016/17 allocated more to irrigation O&M from the Regional budget than received from the Union budget (Figure 35), although the total budget declined.

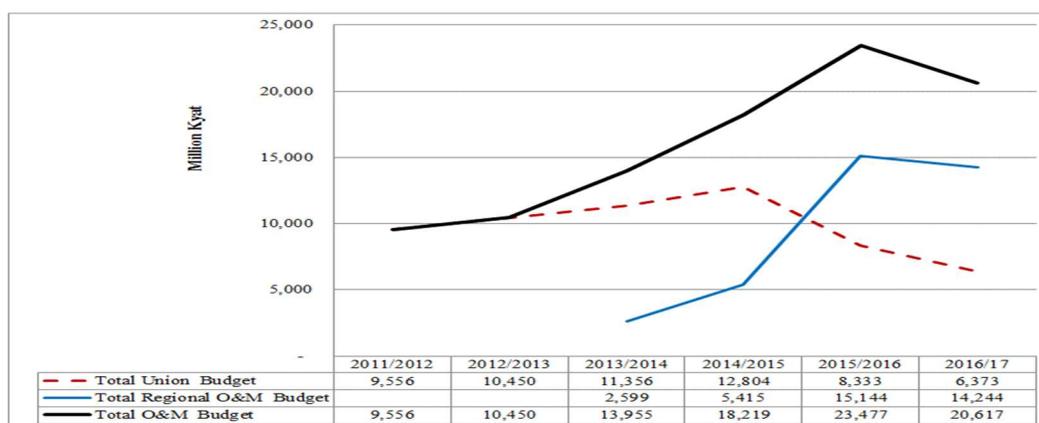
**Figure 34: Mandalay Region allocates more funds for irrigation O&M than it receives from the Union budget**



Source: Mandalay Regional Government, WB staff estimates.

96. **In Mandalay Region, 88 percent of the irrigable area is in systems larger than 2,000 ha, and thus falls under the funding responsibility of the Union budget.** The remaining 12 percent of the area falls under the Regional budget, but development of budgets in Mandalay Region does not match this trend. Although the area responsibility is only 12 percent, the Regional O&M budget in 2015/16 was 65 percent of the total O&M budget. As reported, much of the Regional budget is spent on systems that fall under the national budget responsibility. In other words, the use of Regional budgets seems not to be restricted to systems smaller than 2,500 ha. Budget allocation mechanisms and monitoring of expenditures need to be more transparent to justify this important difference. Going forward, Regions need to have more say on budgets coming from the Union to all existing systems.

**Figure 35: Ayeyarwaddy Region also allocates more funds for irrigation O&M than it receives from the Union budget**



*Source: Ayeyarwaddy Regional Government, WB staff estimates.*

97. **In addition to ensuring the adequate funding of O&M expenses and devolving fund allocation decisions to Regions and States, increasing effectiveness of irrigation spending in Myanmar requires a number of changes in the policy environment, management of irrigation assets, and investment priorities for IWUMD:**

- a. **Irrigation policy development:** A policy and strategy for the irrigation sector needs to be developed to match the ambitions of the ADSIP. According to the ADSIP, the key roles of agriculture are to ensure food security, increase foreign exchange earnings, and contribute to rural development through diversification toward high-value products, including livestock and fisheries, and development of rural nonfarm sector. The general policy direction toward higher productivity and more crop diversification combined with the conditions associated with the geographic and monsoon climate conditions in the delta, central dry zone, the hills, and plateaus require a regionally adaptable, more demand-oriented, flexible, and precise management of irrigation and drainage services. This represents a big shift away from the standard “for rice only” supply-oriented water management system still being practiced. Such a strategy needs to look beyond reservoir and canal systems to consider a balance between different irrigation modes and potential contribution of small-scale, farmer-managed options from both surface and groundwater.
- b. The Water Livelihoods Project financed by the LIFT in Shan State illustrates this point. The project realizes that a “one size fits all” approach to irrigation does not

exist, and offers a range of irrigation technologies (furrow, sprinkler, and drip) to suit farmers' financial situation and preferences. Table 26 describes the advantages and disadvantages of each technology, cost estimates, and crops' suitability. IWUMD could benefit from learning from such projects to inform its activities and programs and underpin a shift from large investments only to a mix of irrigation options suitable for various contexts.

**Table 26: Irrigation approaches and products offered by the LIFT project in Shan State**

Option	Technology	Equipment needed	Advantages	Disadvantages	Cost	Suitable crops
1	Alternate furrow irrigation	Re-level land to suit free-flow water, and use Stroh irrigation pipes.	Flexi poly pipes, which are easy to use, farmers are familiar with furrow	Lower water efficiency, inadequate application uniformity, labor intensive, run-off and leaching	\$250/acre	Rice, potatoes, garlic, onions
2	Sprinkler irrigation	Pump, lateral pipe and movable sprinklers pm PVC stand	Low cost, good for weed control, easy to use	Affected by wind, lower efficiency than drip, requires daily shifting	\$500/acre	Potatoes, garlic, onions
3	Drip irrigation	Pump, main, sub-main head-controls, drip lines	Good for weed control, less labor, unaffected by wind, efficient use of water	High cost	\$1,000/acre	Potatoes, garlic, onions, tomatoes

*Source: WB staff based on information provided by the LIFT.*

- c. Research on irrigated and rainfed agriculture: There is an urgent need to improve service delivery performance in existing irrigation systems, through rehabilitation and some modification, to enable more responsive and flexible provision of irrigation water. There is no concept yet at the MOALI on how to do this in Myanmar. Research needs to be carried out on management concepts as well as irrigation and drainage technology. Great productivity gains could be realized by improving water security in rainfed agriculture systems. Here too investments in research need to be increased to develop on-farm water and soil management technologies, water harvesting systems and development of conjunctive use of groundwater and surface water on a local scale.
- d. Investments in institutional and human resource development: Responsive and demand-oriented service provision requires institutions and staffing that can deliver those services. Investments are needed in development of irrigation management institutions, including development and modernization of the existing legal and regulatory framework and all associated human resources. This includes service providers, water user organizations, and platforms for consultation, coordination, and joint decision making, such as Agriculture Coordination Committees, cost recovery, land rights, etc.

- e. Cost recovery and irrigation service fees: The government is considering reestablishing irrigation charges. Although it makes sense in financial and economic terms, the introduction of irrigation service fees in other countries in the region has not been very successful. Indonesia and Vietnam already abolished irrigation service fees and the Philippines will abolish them in 2017. Reasons for abolishment include high political costs (putting more burden on the poorest in society – Indonesia) and high transaction costs for fee collection (Vietnam and the Philippines). One alternative is to give water users more responsibility in maintenance of infrastructure, as in Indonesia. This can only work if there are well-functioning water user groups with a clear interest in reliable irrigation and drainage services. With the present state of water user groups' development, Myanmar seems not yet ready for such an approach. Another approach is indirect taxation of land or inputs. Other ways of cost recovery need investigation and testing before a decision on the cost recovery issue is made.
- f. Investments in new system development: The export of surplus rice, beans, and pulses may indicate that national food and nutritional security has already been achieved. However, the spatial distribution of production centers is quite uneven and many pockets of local production shortages still exist, resulting in malnutrition. Investments in local irrigation and drainage infrastructure may be needed to improve local food security and local livelihoods despite surpluses generated elsewhere, with DRD.
- g. Investments in rehabilitation and modification of main irrigation and drainage systems to meet service requirement: The present infrastructure is not fully capable of delivering the more responsive and flexible irrigation and drainage services that are needed for more diversified and productive agriculture. Modifications in flow control systems, canals, and regulating structures may be required to meet the new demands. What should and could be done requires research and dialogue between management institutions and water users.
- h. Investments in on-farm water management infrastructure: On-farm irrigation and drainage infrastructure is basically missing. If more flexible and responsive irrigation services are desired, important investments need to be made in watercourses and their on-farm distribution systems. A participatory approach to planning, design, and implementation is needed, for which people must be trained and guided throughout their implementation. Investments in human resource development and infrastructure will have to be considered.
- i. Investments in sediment management and sediment removal: An important part of O&M costs can be attributed to high levels of sedimentation in irrigation/drainage systems. Deforestation observed in Myanmar combined with high erodibility of soils cause high sediment concentration in river flows and consequently high rates of sedimentation of reservoirs, lakes, and irrigation and drainage canals. It is not surprising that after several years of important inundations and floods, an important part of the special maintenance resources is related to removal of sediment inside and outside the irrigation perimeters. As this has not been done for several decades, a backlog needs to be removed before maintenance can be carried out on a more routine basis. In the near future quite some capital budget will be needed for this activity. For Ayeyarwaddy Region this concerns almost all of the available budget. It is obvious

that more effort should be put on watershed management but this is the mandate of the Ministry of Natural Resources and Environmental Conservation.

- j. Investments in enhancing water security and flood safety, and integrated water resource management: One of IWUMD’s mandates is development and maintenance of flood embankments. The increase in frequency and extent of flooding as a consequence of degrading watersheds, increasing sedimentation of riverbeds, climate change, and increasing population, the value of infrastructure and economic activity warrant a review of flood protection systems and the associated level of river embankments. Before any action on investments is taken, a masterplan is needed to understand the implications of raising flood protection levels through raising or strengthening embankments (Box 2 illustrates an example for Rakhine State). This requires cooperation with other ministries like the Ministry of Transport, which is responsible for riverbed management.

**Box 2: Assessment of embankment reconstruction in Rakhine State**

Cyclone Giri destroyed large parts of embankment infrastructure in Rakhine State, affecting the livelihoods of many people. A post-Giri assessment originally identified the need to repair 105 miles of embankments, but many thought this was an underestimate. In addition, although individual organizations knew their specific responsibilities, the masterplan for joint work and coordination was missing.

The LIFT responded to the call for a detailed assessment, including a cost-benefit analysis of reconstruction. The total length of embankments in need of repair was found to be 409 miles, including 304 sluice gates. These embankments vary in size, providing protection for multiple or sole villages, and 45 percent of them were prioritized, informing the sequence of works. This helped guide the works and coordination between the government and NGOs.

*Source: WB staff based on information provided by the LIFT.*

- k. Investments in groundwater resource assessment and governance: Groundwater irrigation represents both opportunity and threat. Extraction is currently unregulated, and the resource is poorly understood. Drawdown has been observed in some existing irrigation systems (such as 99 ponds in Monywa). In other areas, such as the alluvial corridor of the Ayeyarwaddy River, aquifers are closely linked to and annually replenished by the river, and may provide a large, sustainable resource. Given Myanmar’s dependence on groundwater for domestic supplies (more than 75 percent of households in the Dry Zone), investment in groundwater resource assessment, management, and regulation are urgent priorities.
98. **Going forward IWUMD needs to spend much “less” on new irrigation infrastructure (dams) and much “more” on infrastructure management, policies, and practices.** Options for improving effectiveness of irrigation spending are summarized in Table 27.

**Table 27: Improving the effectiveness of irrigation expenditures**

Do More	Do Less
<ul style="list-style-type: none"> <li>• Update existing irrigation policies.</li> <li>• Carry out adaptive research on both irrigated and rainfed agriculture.</li> <li>• Increase the provision of funds for O&amp;M and delegate more decision making about funds allocation to Regions and States.</li> <li>• Invest in institutional and human resource development.</li> <li>• Modernize management information systems, hydro-meteorological networks and decision support systems (i.e., asset management tools).</li> <li>• Increase irrigation coverage and efficiency through feasible means, including through investments in: (a) rehabilitation and modification of main irrigation and drainage systems to meet service requirements; (b) on-farm water management and transport infrastructure; and (c) sediment management/removal.</li> <li>• Invest in water security and flood safety, and groundwater regulations.</li> </ul>	<ul style="list-style-type: none"> <li>• Construction of new dams and development of big irrigation systems.</li> <li>• Allocation of water only for paddy production.</li> </ul>
<p><b>Expected outcomes:</b></p> <ol style="list-style-type: none"> <li>1. Generated budget savings.</li> <li>2. Increased irrigation coverage at lower costs.</li> <li>3. Enhanced quality of irrigation infrastructure.</li> <li>4. Increased farm productivity and incomes through higher yields and crop diversification.</li> <li>5. Increased resilience to climate change.</li> <li>6. Increased farmers' participation and sustainability of the infrastructure.</li> </ol>	

### ***Agricultural innovations***

99. **Services promoting agricultural innovations are critical for adoption of improved technologies by farmers, improvement of farmers' skills, and sustainable management of natural resources.** DOA is the principle public sector agency in Myanmar to promote agricultural innovations. Its mandate includes seed development and production, fertilizer quality and soil nutrient management, integrated pest management, extension, and since 2015, when Department of Industrial Crops (DOIC) was merged with DOA, the development of industrial crops. Between 2009/10 and 2011/12, the DOIC budget was larger than that of DOA and the budgets of both departments accounted for 15 percent of total agricultural expenditures (Table 28). The expenditures began shifting in 2012/13; by 2014/15 DOA received twice as much as DOIC. In 2015/16, these departments merged, and in 2016/17 their budget increased significantly to 84 billion Kyats, or 14 percent of total agricultural expenditures.

**Table 28: Spending on crop programs started to increase significantly in 2015/16**

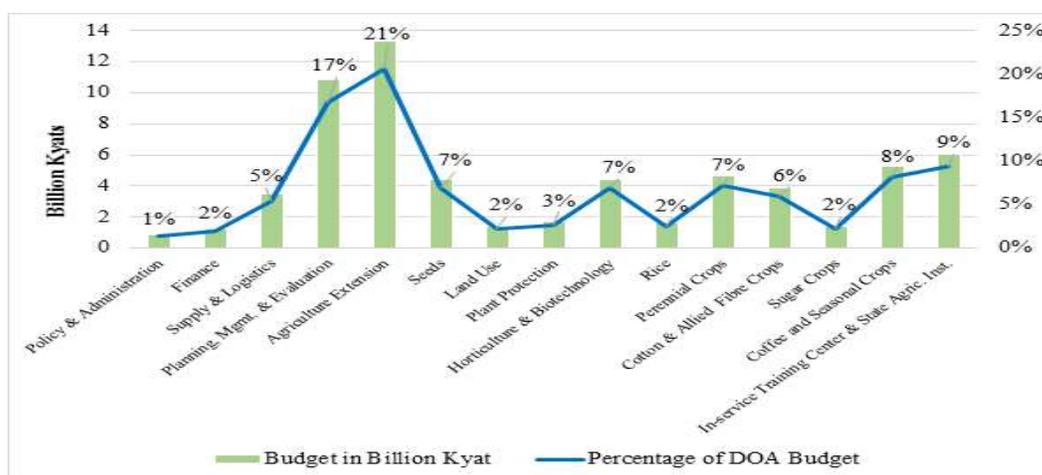
<i>Billion Kyats</i>	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Agriculture	18.8	23.0	12.9	18.3	18.3	27.4	65.2	83.8
Industrial crops	32.3	34.6	23.1	16.2	16.8	13.5	0	0
Total	51.1	57.6	36.0	34.5	35.1	40.9	65.2	83.8
% of ag budget	19	19	11	8	6	7	9	14

*Source: MOALI, WB staff estimates.*

100. **The mandate of the merged DOA is large.** It currently consists of 15 divisions, with portfolios sometimes quite diverse, fragmented, and not always logical. For example, coffee as a perennial crop is not under "Perennial Crops Division" but combined with seasonal crops under

the so-called “Coffee and Seasonal Crops Division.”<sup>24</sup> Rice is not under seasonal crops but under a separate “Rice Division.” Some of the specialized crops divisions do research, others do not. The full mandate of “Planning, Management and Monitoring and Evaluation Division” is unclear vis-à-vis its large budget in 2016/17, which accounted for 17 percent of the DOA budget (Figure 36). This lack of clarity often has historic dimensions, such as the resettlement programs of ex-army officials, poppy substitution programs, or special policies to promote selected crops such as hybrid rice, amongst others. Yet the result is a budget spread thinly across many divisions, programs, and activities, calling for a clear reconfiguration of this department.

**Figure 36: DOA budget is spread across many divisions, 2016/17**



Source: MOALI, WB staff estimates.

101. **This review studies selected DOA programs**, including agricultural extension and associated with it seed, soil nutrient, and plant protection programs. The share of these programs in the DOA budget doubled from 17 percent in 2012/13 to 34 percent in 2016/17 (Figure 40).

102. **The allocation of 21 percent of the DOA budget to agricultural extension in 2016/17 is encouraging, but expressed as a percentage of agricultural GDP amounts to only to 0.1-0.2 percent.**<sup>25</sup> Comparable data on investment in extension are hard to get and it is often not clear what activities are counted as extension services. One of the few studies done on this topic reported expenditures on extension as a share of agricultural GDP at 0.50 percent (global weighted average) and 0.56 percent for the Asia and Pacific region (Roseboom 2004). Usually, lower-income countries spend more, around 1.10 percent, while high-income countries spend less (0.42 percent). Considering these international comparisons Myanmar’s extension budget falls short. This is important in light of evidence that extension, if executed well, is a cost-effective means of increasing economic returns for farmers and has had significant and positive effects on knowledge, adoption, and productivity in many countries. A CGIAR meta-analysis of 292 studies found median rates of return of 58 percent for investments in advisory services (World Bank 2012). This situation in Myanmar is exacerbated by the overall low funding of agricultural research, which stands at 0.02–0.06 percent of agricultural GDP (Table 18).

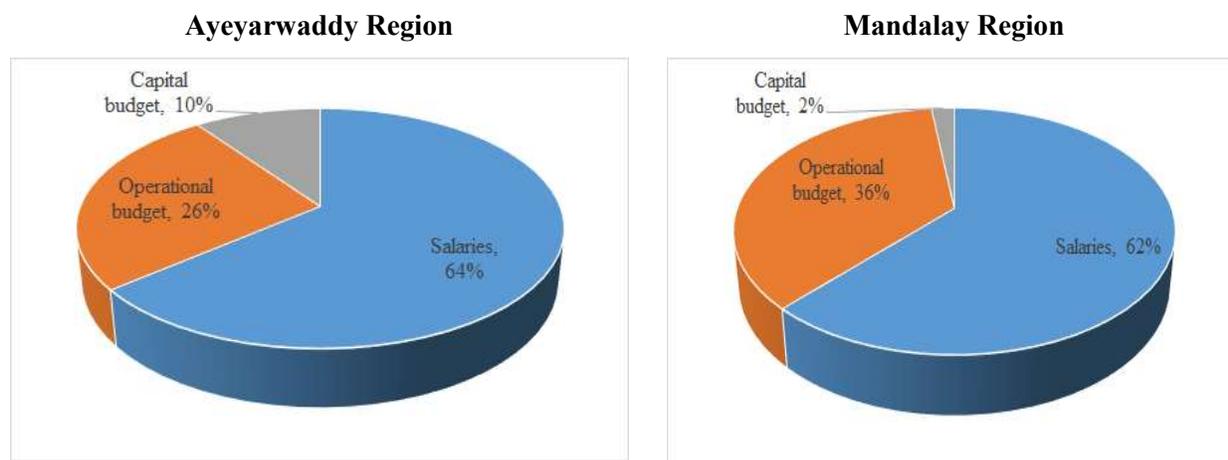
<sup>24</sup> The list of all divisions in DOA and their mandates are presented in Annex 2.

<sup>25</sup> This is based on an estimate derived from budget allocations at the Union and Regional levels, using the example of Ayeyarwaddy and Mandalay Regions.

## Extension

103. **In addition to low budget levels, implementation of the extension program suffers from a number of significant weaknesses.** For an extension organization to be fully functional, global experience reveals that 30 percent of the budget should be allocated for operational expenses, another 5 percent for capital costs, and no more than 65 percent for salaries and personnel costs (World Bank 2010). Considering this rule of thumb, Myanmar's extension service system seems to be generally on track. At the Union level, in 2016/17 about 50 percent of the DOA budget for extension, seeds, land use, and plant protection was used for nonwage recurrent expenses, 35 percent for capital, and only 15 percent for wages. Yet at the Regional and State level, as the example of Mandalay and Ayeyarwaddy Regions shows, the situation is closer to the recommended levels. Salaries consume 62–64 percent of the budget, operational costs 26–36 percent, and capital budget only 2–10 percent (Figure 37).<sup>26</sup>

**Figure 37: DOA budget at the regional level**



*Source: Ayeyarwaddy and Mandalay Regional Governments, WB staff estimates.*

104. **Despite the good balance of the overall budget, the mismatch between the Union and Regional budgets results in two kinds of inefficiencies.** The first is the small operational budget at the regional level. Union staff absorb the majority of the nonwage recurrent budget, while frontline service providers do not have enough funds to do their basic job, let alone to go to the field to provide services. They lack essential inputs such as transport/motorbikes, fuel, and lubricants. They also lack travel budget to go beyond their assigned areas. It does not matter that Union extension staff, who have operational budget, can visit districts and townships for technical backup. The township extension officers have no means to effectively reach out to many farmers. The second inefficiency is the low influence of Regions and States on decisions about capital investments. Decisions to upgrade seed farms or laboratories are made in Naypyitaw, often without consulting the respective farm managers or regional administrators, who are much closer to the regional DOA farm stations than the Union government.

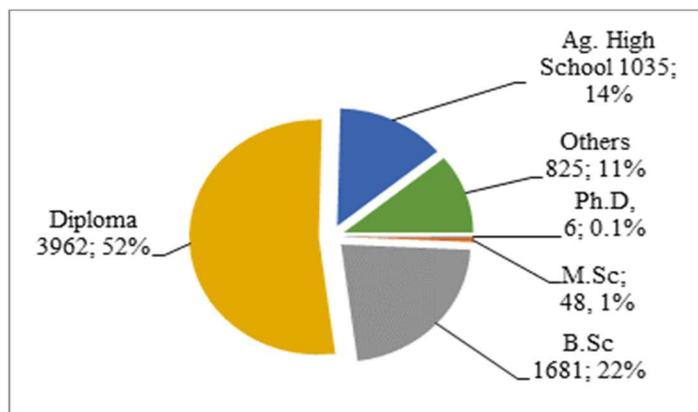
105. **Other constraints to effective delivery of extension services in Myanmar include:** (i) the relatively low educational levels of extension staff; (ii) the low farm outreach (measured in number of rural population or hectare of farmland per extension agent); (iii) the lack of up-to-date extension material; (iv) the low use of innovative approaches and technology; (v) the low

<sup>26</sup> The regional DOA seed farms and laboratories are financed by the Union budget.

involvement of private extension service providers; and (vi) underdeveloped farmer organizations.

106. **Let’s look at the education level of agricultural extension staff.** Myanmar has an extension workforce that is 7,557 strong. Out of this, only 0.1 percent are PhD holders, 1 percent hold a Masters’ degree, and 22 percent hold a Bachelor’s degree,<sup>27</sup> whereas half of the staff hold just a Diploma (Figure 38). High degrees of education are not necessarily linked to higher positions within the division. The education levels of extension staff in Ayeyarwaddy and Mandalay Regions are about the same as the country average (Figure 50 in Annex 2).

**Figure 38: Agricultural extension staff in Myanmar have a low level of education**



*Source: MOALI, WB staff estimates.*

107. **Farmer coverage by extension services is low.** In comparison to other countries in the region, the ratio of farmland per extension agent and the ratio of rural population per extension agent are very high in Myanmar (Figure 39). The actual numbers in Myanmar could be even higher and thus less favorable since the calculations used in Figure 39 are based on total number of extension staff per country. Not all of these staff are in contact with farmers, and they may have other administrative duties at the central, regional, or district level. The low farm outreach is exacerbated by inadequate mobility, low education, lack of innovative information technologies, and lack of supplementary private sector advisory services.

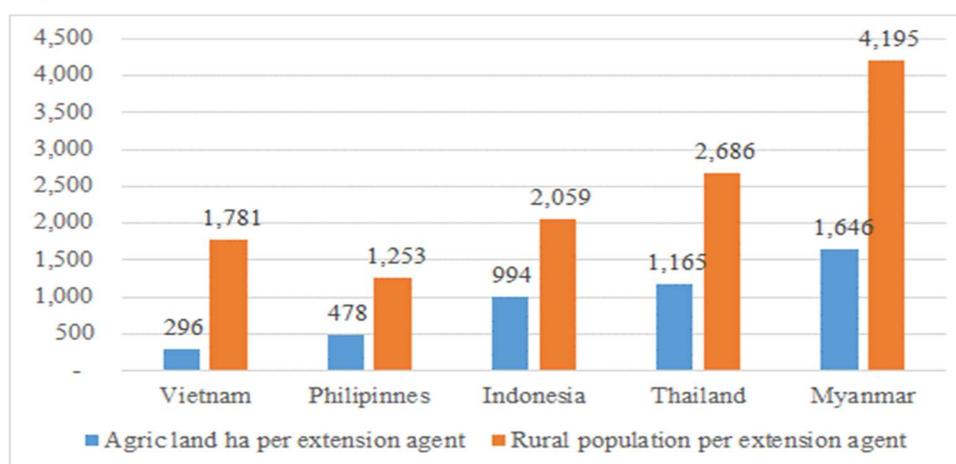
108. **Mandalay and Ayeyarwaddy Regions illustrate these constraints.** In Mandalay Region, DOA’s current staffing level stands at 1,067 (calculated as the total for extension, land use, seeds, and plant protection), whereby 7 percent of total staff are assigned to the regional level, 23 percent to the district level (7 districts), and 70 percent to the township level (28 townships). Staff comprise 25 percent men and 75 percent women, with a slightly higher percentage of female staff at the township level (78 percent) and a slightly lower percentage at the district level (67 percent). This has been attributed to the observation that in many families, men seek employment in the private sector with better income opportunities, whereas women take up public sector jobs, which offer more job security but lower income, and perhaps lower performance expectations.

109. **On average, Myanmar’s frontline extension worker, who is supposed to maintain direct contact with farmers, is required to cover several village tracts with 1,215–2,430 ha**

<sup>27</sup> For comparison, 80 percent of extension officers in Dong Thap Province of Vietnam hold at least a Bachelor’s degree.

**of cropland** (Cho 2013). In Mandalay Region, this number was confirmed: one frontline extension worker has to cover two village tracts containing 6–8 villages and a total of 1,962 ha of cropland. In Ayeyarwaddy Region, the ratio is less favorable: one frontline extension worker has to cover around three village tracts with 18–20 villages amounting to 4,015 ha of cropland. These calculations do not take into consideration that not all DOA staff in a township are involved in practical extension work and they have different level of qualification. The DOA township manager is an ex-officio member of several committees, with the obligation to participate in all relevant meetings. In addition, a small number of personnel in DOA township offices are supplementary staff, including assistants and staff with limited formal qualifications. Another challenge is the gap between sanctioned and actually filled positions in the respective divisions. This means the actual ratio (extension agent per ha of farmland) is much higher than presented above. These findings correlate with other studies done on extension services in the country (AFC Consultants 2015).

**Figure 39: Myanmar has a low farm outreach of extension services**



Source: WB staff estimates based on data retrieved from Swanson 2014, <http://www.g-fras.org/en/world-wide-extension-study/asia.html>, and <http://databank.worldbank.org/data/home.aspx>.

110. **The last weakness of Myanmar’s extension services is extension approaches.** The currently used approaches are largely supply-driven and are little oriented toward problems as perceived by farmers. They are therefore suboptimal in fostering knowledge sharing between farmers, between farmers and extension agents, and between extension agents and researchers. Current extension focuses on transfer of technologies aimed at increasing yields rather than maximizing return on farmers’ investments (Cho 2013; IFAD 2013; AERES GROEP 2015).

111. **The mindset in terms of extension methodology is still influenced by previous approaches from the 1970s such as the High Yielding Program, also called the Selective Concentration Strategy, and the Training and Visit System.** The government-driven High Yielding Program especially focused heavily on establishment of demonstration plots, organized and managed in collaboration with extension agents and contact-farmers. This system still partially exists with much emphasis on introduction of new seed varieties, especially for hybrid rice. Demonstration plots are usually close to good roads for easy accessibility by visitors. Additionally, the government built so-called “production camps” for training groups of farmers. Farmers would be invited to attend demonstrations two to three times per cropping cycle. Many

of these “production camps” are not functional anymore, although recent development projects are reviving some (e.g., the IFAD-funded FARM project).

112. **Since extension agents usually have to cater to a large number of farming households and have to use their own means of transport (e.g., private motorbikes, for which they receive some compensatory allowance depending on the distances travelled), field visits and direct contacts with farmers are rare.** In addition, extension agents are ill-equipped with more modern extension tools in the form of modern information technology and applications or with simpler practical problem-solving-oriented tools such as “Leaf Color Charts” (Box 3).

### **Box 3: The case of the “Leaf Color Chart”**

The Leaf Color Chart is a standardized color chart with four to six different color scales of green and is used for assessing the leaf Nitrogen status of rice plants to optimize N-applications. Its use usually reduces the amount of N used while at the same time optimizing the time of application, increasing the yield and returns for farmers. In October 2016, the AgPER team held a meeting with farmers and extension agents in Mandalay. The team showed them a plastic Leaf Color Chart developed by the Philippine Rice Research Institute in collaboration with the International Rice Research Institute. When asked if they had seen this simple tool before, none of the farmers knew it, and only one extension agent confirmed having seen it. He reported that there is only one at the Township Office. Obviously this is not the best approach to enable farmers to use such low-cost technologies.

*Source: WB staff assessment.*

113. **More modern agricultural extension systems such as Farmer Field Schools are successfully introduced by some projects, especially in projects facilitated through the LIFT.** Although these approaches have been strong on farmer participation and learning, earned the trust of farming communities, and shown good results, their outreach in terms of villages or districts covered is still small, the costs relatively high, and their scalability challenging. Of particular concern is the lack of interaction between DAR and DOA, which contributes to a large share of yield gap between research and farmers’ achievements (Annex 3). Most extension messages are centrally designed and mechanically implemented by field staff over a diverse range of agri-ecological and socioeconomic conditions, without proper consideration of farmers’ needs and limitations or market requirements (IFAD 2013). In other words, they use a one-size-fits-all approach.

114. **Other countries in the region have tried to optimize the outreach and coverage of extension agents by introducing modern information technologies and web-based applications by using smartphones, tablets, micro-projectors, and SMS services.** These applications not only empower extension agents but also farmers themselves; they can deliver a wide range of services such as weather information, market information, and crop management. The inclusion of such technologies in participatory extension approaches such as Farmer Field Schools may help make them more cost-efficient. Some examples of successful applications are presented in Annex 2.

115. **High-quality extension services can change agriculture in Myanmar.** But the system needs to go through many changes to achieve good results. Higher budget for mobility, skills, and other expenses of frontline extension staff will help initiate some changes. But achieving big

success will depend on adoption of modern extension approaches and farm outreach methods by DOA. It will also depend on the willingness of DOA management and staff to learn from and be involved in donor-financed projects, which bring global knowledge adapted to Myanmar’s conditions. Proactive collaboration and joint programs with DAR and other DOA divisions, which generate technologies and knowledge to be disseminated by the Extension Division, are also necessary to increase the impact of extension on farming practices and farm profitability. Options for enhancing the quality of extension services are presented in Table 29.

**Table 29: Enhancing the quality of extension services**

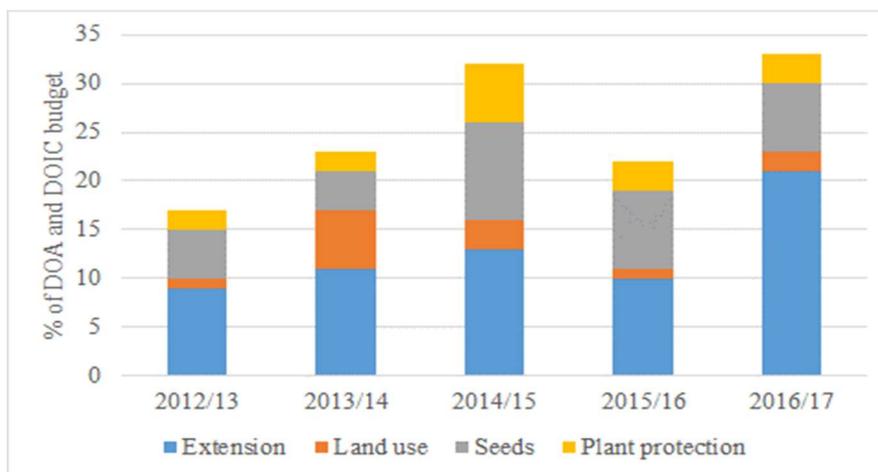
Do More	Do Less
<ul style="list-style-type: none"> <li>• Equip extension staff with mobility and operational budget.</li> <li>• Strengthen capacity of extension staff through internal training and also through learning from donor-financed projects.</li> <li>• Provide extension services for all crops, not only paddy. Think of farming systems rather than isolated crops.</li> <li>• Increase the number of visits to farmers and adopt modern extension approaches.</li> <li>• Increase outreach by using modern information technologies and web-based applications by using smartphones, tablets, micro-projectors, SMS services.</li> <li>• Engage with other DOA divisions and DAR to bring the best and more recent improved technologies to farmers.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration plots close to roads for easy accessibility by visitors.</li> <li>• Production camps.</li> <li>• Paddy production extension.</li> </ul>
<p><b>Expected outcomes:</b></p> <ol style="list-style-type: none"> <li>1. Enhanced skills of extension service staff and gradual adoption of demand-driven and cost-effective extension approaches.</li> <li>2. Increased adoption of improved technologies by farmers.</li> <li>3. Joint programs with DAR and other DOA divisions.</li> </ol>	

### Seeds

116. **The recent increase in the Extension Division’s budget was not accompanied by a similar increase in budgets for the Seeds, Land Use, and Plant Protection Divisions.** These three divisions accounted for only 12 percent of the DOA budget in 2016/17 (Figure 40), reducing the effectiveness of extension services, the job of which is to disseminate improved technologies and practices developed by the three divisions.

117. **The Seed Division’s budget in 2016/17 was 4.4 billion Kyats.** It included the budgetary provisions for 35 seed farms and laboratories managed by DOA. The inadequacy of the budget is seen in the dire situation of these farms and laboratories (World Bank 2015b; Myanmar Agriculture Network 2016). The vast majority are in need of more or better equipment such as tractors, seed dryers and cleaners, and infrastructure such irrigation and storage facilities. Seed laboratories’ equipment is mostly out of order or outdated, and it only serves basic seed testing. Seed inspectors lack transport and budget to more often supervise “seed villages” and contact-farmers involved in seed production. Seed production on the fields of contact-farmers suffers from their failure or reluctance to follow procedures for rouging, testing, and labelling as “certified seeds,” which in turn diminishes farmers’ trust in the superior quality of those seeds. All of the above can be attributed to a lack of budget combined with a lack of education and motivation on the part of seed farms’ employees, as well as on part of the extension service in general and seed inspectors specifically.

**Figure 40: Budgets for critical DOA functions rose but remained inadequate**



*Source: MOALI and WB staff estimates.*

118. **The effectiveness of public spending on seeds is hindered by other weaknesses.** They include the insufficient protection of intellectual property/breeder rights, an unclear regulatory framework for establishment of seed production companies, lack of skilled labor, and weak institutions to support compliance with phytosanitary requirements (e.g., adequate testing laboratories, adoption of sector wide standards, and certification) (Myanmar Agriculture Network 2016). In addition, 50 percent of the seed produced in the public system are rejected by existing seed testing laboratories; as a result, a substantial percentage is not sold as seed but consumed as grain. For the varieties developed in the public sector, the estimate is that farmers buy less than 10 percent of certified rice seed and less than 1 percent of certified seed of other crops – e.g., pulses, beans and oilseeds (LIFT and World Bank 2016). The World Bank puts Myanmar in 34th place out of 62 countries with regard to the enabling environment for plant breeding, variety registration, and seed quality control in 2016, indicating large scope for improvements (World Bank 2017a).

119. **The MOALI recently agreed on a Roadmap for Myanmar’s Seed Sector 2017–2020, a good example for other programs to follow.** This document outlines the current and envisaged structures of the seed sector and the way forward to address existing challenges (Myanmar Agriculture Network 2016). A first step is approval of new or revised policies and guidelines such as the Seed Policy, the Seed Regulations, and the Plant Variety Protection Law, which together regulate most aspects of variety registration, seed production, and seed business. This is expected to open up opportunities for small and medium-size seed companies to enter the market with confidence, knowledge, and an understanding of the regulatory environment in which they will operate, removing much of the uncertainty from their business plans. And in turn this will free up DAR and DOA farms for increased production of more and better-quality breeder and foundation seeds, and for increased attention to pulses, which are less interesting to the private sector.

120. **The Roadmap has other priorities,** including to: (i) enforce appropriate quality certification and product safety standards; (ii) encourage participation of domestic and foreign private sector firms; and (iii) continue seed policy reform to permit private sector companies, including multinationals, to develop and import and export seeds, subject to appropriate certification. It also includes (iv) the upgrading of facilities such as seed testing laboratories,

ensuring that at least one laboratory (a national laboratory), public or privately run, is International Seed Testing Association accredited (promoting seed exports), outsourcing of certification functions to accredited private seed certification laboratories, and a greater role for private sector, including seed production by groups of farmers and seed companies. In fact, improvement of the system of seed villages and contact-farmers to produce certified seeds was given highest priority in the National Seed Sector Workshop conducted in September 2016. It again has implications for increased budget allocations and training or retraining of staff in the area of seed production, testing, and certification, and other activities to improve farmers' access to good seeds (Table 30).

**Table 30: Improving farmers' access to good seeds**

Do More	Do Less
<ul style="list-style-type: none"> <li>• Introduce new or revise policies and guidelines to attract private investments in seed.</li> <li>• Produce breeder and foundation seeds not profitable for the private sector such as open-pollinated varieties for a wide variety of crops.</li> <li>• Reequip public seed farms and improve their business models.</li> <li>• Upgrade public seed testing facilities, their operation, and management.</li> <li>• Support seed farm multiplication groups through extension and seed quality control.</li> <li>• Strengthen human capacity of DOA and farmers in producing high-quality seeds.</li> <li>• Stimulate demand for quality/certified seeds.</li> </ul>	<ul style="list-style-type: none"> <li>• Monopolization of seed production.</li> <li>• Seed multiplication.</li> </ul>
<p><b>Expected outcomes:</b></p> <ol style="list-style-type: none"> <li>1. More and better seeds available to farmers.</li> <li>2. Limited public funds are allocated to the areas of little interest to private sector and to addressing market failures.</li> <li>3. High private sector investments in seed production.</li> <li>4. Joint programs with DAR and Extension Division.</li> </ol>	

### Fertilizer quality and soil nutrient management

121. **Soil nutrient management is an integral part of good agricultural practices.** Promoting it largely falls within the responsibility of the Land Use Division (LUD) of DOA, which is supposed to work with the Extension Division and DAR to disseminate knowledge about soils, nutrients, and fertilizer responses to kindle a wide adoption of technologies by farmers. Making sure that fertilizers sold to farmers are of high quality and are suitable for different soils and agro-ecological zones is another LUD responsibility.

122. **In practice, Myanmar farmers do not have access to advisory services on crop nutrient requirements for various agro-ecological zones.** The official fertilizer recommendations are outdated and concern only 10 crops. The Extension Division is limited in effectiveness in providing farmers updated crop nutrient extension services based upon the rapidly changing mix of fertilizer products. Importantly, private sector fertilizer dealers have no formal training in crop nutrient management and fertilizer products and their use. At present, very few dealers have sufficient knowledge to advise farmers, a weakness magnified by the entry of numerous NPK compounds in the market; though some positive examples have started to appear (Box 4).

**Box 4: Project for agrodealer training in Dry Zone**

The International Fertilizer Development Center is partnering with the LIFT to strengthen a network of providers of agricultural inputs and services in the Dry Zone. The project aims to train 55 private sector input and service providers on business management, inputs, and services. These providers will serve 30,000 farmers during the life of the project (2015–2018). Training is also provided to DOA extension staff to build their capacity and link with private advisory service providers to deliver the best services to farmers.

*Source: WB staff based on information provided by the LIFT.*

123. **As a result, crop yields are low (Table 4), partially because of the poor quality of seeds, but also because the responses to fertilizer application remain small.** Only for paddy production during wet and dry seasons, Myanmar farmers are estimated to spend \$658 million annually (Table 31), about the same as total agricultural public expenditures in one year! But the users of fertilizers often obtain similar profits as non-users (Table 5). This, in turn, affects the fertilizer market, which recently experienced rapid growth, albeit from a low baseline, and businesses that invest in anticipation of rising demand for fertilizers and higher future profits from sales (Annex 4). Weakening demand from farmers, who do not see profits increase from using fertilizers, would disappoint these businesses by buying less fertilizers in the long run.

**Table 31: Spending on fertilizers for paddy production in Myanmar is about the same as total agricultural public spending**

	Average cost of fertilizers, Kyats/acre	Average cost of fertilizers, \$/ha	Planting area, ha	Total costs of fertilizers, \$
Wet season paddy	33,230	70	7,000,000	490,000,000
Dry season paddy	57,660	120	1,400,000	168,000,000
<b>Total</b>				<b>658,000,000</b>

*Source: WB staff estimate based on LIFT and World Bank 2016 and FAS-USDA 2017.*

124. **LUD pays most of its attention and budget to import control and fertilizer registration.** Yet LUD does not seem to provide trustworthy quality assurance for fertilizers (Annex 4 describes LUD’s functions and activities in this respect). Confidence is lacking among farmers (and at all stakeholder levels) in the quality of fertilizers in Myanmar. Quality deficiencies arise in four areas: purposeful adulteration; mixing of low-analysis products with high-analysis products; rebagging inferior brands of fertilizer in bags of more favored brands; and short-weight bags. In addition, there is scope that imported product quality differs from the quality of the samples provided to and analyzed by LUD, and bags labelled in languages other than the accepted Myanmar/English language contribute to farmer and dealer uncertainty (IFDC 2014; World Bank 2016a). LUD does not carry out any quality control of fertilizers at Muse, the key import entry point.

125. **LUD does not have its own written inspection protocols and methodologies for fertilizer inspection, including sampling and analyses.** Rather, it generally follows the guidelines of the Fertilizer Control Order of India of 1985, which is generally compliant with internationally accepted standards. However, it includes language specific to the India fertilizer policy framework, which does not apply to Myanmar. LUD relies on product testing at

registration as the quality control “check point” and only sporadically draws samples at various points in the supply chain. LUD does not apply risk management and risk-based inspections to maximize its limited human resources and capacity in inspecting fertilizer throughout its value chain. Instead, LUD conducts analyses of fertilizers if farmers file a complaint regarding fertilizer quality. Two key deficiencies in the LUD inspection protocols are: (i) samples are not routinely drawn by LUD staff based upon accepted sampling method/inspection protocols at the entry point for imports and at domestic processing factories; and (ii) regular/ongoing inspections are not conducted at wholesale and retail points of sale. The effect of the LUD inspection protocols is an overreliance on testing products at registration as the “quality assurance check,” with little attention to fertilizer quality checks in the market.

126. **The increase in multi-nutrient fertilizers in the Myanmar market, and particularly bulk-blend products, adds to quality control challenges.** For example, fertilizer bulk blending technology (which is growing rapidly in Myanmar) is an excellent, relatively simple technology. It yields benefits in tailoring multi-nutrient formulations to soil/crop-specific needs, often at a lower cost than granulated NPK compound fertilizers. The challenges of blended fertilizers are achieving a “blend” that is consistently accurate and uniform in nutrient content and remains dry and free-flowing as it moves through the marketing channel system from processor to retailer. Achieving consistently high-quality “blends” matching specific soil types requires close attention to detail in equipment design and process operations as well as more intensive soil testing. Human capacity building for bulk blend processors is essential (Box 7 in Annex 4).

Changes are needed going forward to ensure that any increase in budget improves the current situation. **Both the public and private sectors have key roles to play in assuring that only high-quality fertilizers are sold to farmers and that farmers have access to sound advisory services on crop nutrient management and the most appropriate fertilizer products for their needs. Reform of the Myanmar Fertilizer Law to an accepted international standard will provide a solid foundation to fertilizer sector development and provide clarity on fertilizer quality issues. Fortification of LUD capacity and reorientation of inspection protocols and methodologies will improve fertilizer quality assurance. LUD’s attention to upgrading crop/zone-specific fertilizer recommendations for all significant crops in Myanmar will support improved fertilizer use efficiency and increased returns to farmers. Private sector capacity building at the fertilizer importer/processor levels is needed to assure that fertilizers entering the Myanmar market are consistent with the “Truth in Labelling” concept. And capacity building at the dealer/retailer level will contribute to knowledge transfer to farmers on fertilizer “best management practices” and provide a further measure in fertilizer quality control. The implications for LUD on what to do “more” and “less” of to increase effectiveness of its programs are presented in Table 32. The summary of specific changes needed, deficiencies negatively impacting the fertilizer market, recommended actions, and expected results are presented in**

127. Table 51 in Annex 4.

**Table 32: Improving effectiveness of public expenditures on fertilizer quality and soil nutrient management**

Do More	Do Less
<ul style="list-style-type: none"> <li>• Update the Fertilizer Law to reflect complete set of definitions, clarity in language, and specifics regarding nutrient and bag weight tolerance limits and penalties for violations.</li> <li>• Update inspection protocols, focusing inspections to points of entry for imports, processor/blender sites, and market sales points.</li> <li>• Establish fully equipped LUD fertilizer laboratory at key border import entry point (Muse). Exploring Public Private Partnerships (PPP) to outsource testing to private sector-operated labs would contribute to this outcome and help to establish efficient process and lab management.</li> <li>• Strengthen capacity of LUD inspectors and lab staff on sample procedures and internationally accepted methodologies for fertilizer analyses.</li> <li>• Train dealers in basics of crop nutrient management, fertilizer products, and best use practices, and train operators in fertilizer processing/blending to achieve high-quality fertilizer blends.</li> <li>• Update and expand fertilizer recommendations-- all crops by agro-ecological zone – and disseminate them to private sector and Extension Division.</li> </ul>	<ul style="list-style-type: none"> <li>• Application of uncertain methodologies for fertilizer testing and inspections.</li> <li>• Work alone without collaboration with DOA Extension.</li> <li>• Provision of blank fertilizer use recommendations to a small number of farmers.</li> </ul>
<p><b>Expected outcomes:</b></p> <ol style="list-style-type: none"> <li>1. Improved and/or restored stakeholder confidence in fertilizer quality.</li> <li>2. Clarity in analytical methodologies and laboratory procedures for current and new products, and improved efficiency in fertilizer inspections and quality checks at import entry.</li> <li>3. Increased fertilizer response and farm profitability, through updates in information available to farmers through dealers/retailers and government extension staff and private sector and improved product mix of importers/processors based upon updated crop- and zone-specific requirements.</li> </ol>	

***Agricultural mechanization***

128. **Agricultural mechanization lags in Myanmar compared to its neighbors.** Farming practices are labor intensive for all crops, especially paddy. The monsoon season paddy production in Myanmar required more than 100 person-days per ha in 2013, compared to 11 days in Suphan Buri of Thailand, 22 days in Can Tho of Vietnam, and 20 days in Zhejiang of China (Table 33). The difference is due to the high extent of mechanization of land preparation and harvesting in these countries, while many farmers in Myanmar still use draught oxen. Farming practices in Myanmar are close to those prevailing in Indonesia and Philippines, where farm mechanization is also limited.

129. **The low extent of mechanization brings a number of challenges.** In some parts of Myanmar, the migration of rural labor has risen, creating a farm labor deficit, especially during critical times such as transplanting and harvesting. Increasing wages reduce profits for farmers, who struggle to raise their productivity in the absence of high-quality extension and other agricultural services. Manual harvesting of agricultural products leads to high post-harvest losses and poor harvest quality.

**Table 33: Myanmar lags behind in agricultural mechanization compared to its neighbors**

	Myanmar (Delta)	Philippines (Nueva Ecija)	China (Zhejiang)	Indonesia (West Java)	Thailand (Suphan Buri)	Vietnam (Can Tho)
Labor use in paddy production, days/ha	>100	71	20	94	11	22
<b>% of farmers adopting machines</b>						
Two-wheel tractor	15	96	10	57	89	12
Four-wheel tractor	3	2	87	0	58	88
Combine harvester	1	5	100	0	100	100
Draught oxen	35	0	0	0	0	0

Source: Bordey et al. 2016; LIFT and World Bank 2016.

130. **Thus, accelerating mechanization has rightly been seen by Myanmar’s government as an opportunity to help farmers cope with rising labor costs and high post-harvest losses; however, the way it was promoted was ineffective.** The former Ministry of Agriculture and Irrigation decided to invest heavily in the purchase of agricultural machines to provide direct rental services to farmers through AMD, especially for land consolidation projects. The capital expenditures for this purpose grew from 1 billion Kyat during 2009/10–2013/14 to 87 billion Kyats in 2015/16, along with associated expenses in fuel, lubricants, and other goods (Table 34). As a result, the share of AMD budget in the Ministry budget grew from 5 percent to 17 percent during the same period. The capital budget remained high even in 2016/17. In addition, AMD increased training of farmers, both at Meikhtila vocational training center and at AMD service stations, assuming farmers themselves would operate most agricultural machinery in the future.

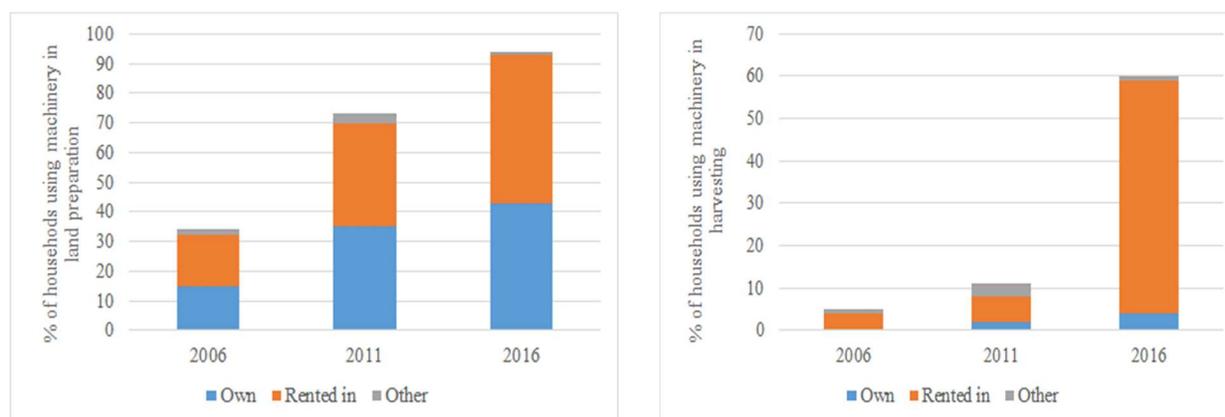
**Table 34: AMD’s budget was heavily skewed toward purchase of machinery**

<i>Million Kyats</i>	2009–2013	2014/15	2015/16	2016/17
Wages	4,882	8,550	12,537	12,552
Nonwage recurrent expenses	14,262	19,724	25,372	28,773
Capital expenditures	997	12,897	87,105	71,046
Total AMD budget	20,142	41,171	125,014	112,371
AMD budget in MOALI budget	5%	7%	17%	18%

Source: MOALI and WB staff estimates.

131. **Both programs have achieved little.** Very few farmers have access to AMD’s rental services. Those who have access are mostly concentrated around Naypyitaw. On the other hand, in other parts of the country, especially around urban areas of Delta and Dry Zone, private rental services show a higher rate of growth and penetration, triggered by the Purchase Hire Financing Program managed by several commercial banks, most prominently Yoma Bank, supported by the LIFT. A survey carried out in May 2016 in four townships close to Yangon City where paddy and pulses are widely cultivated shows a significant increase in adoption of mechanization (Win and Thinzar 2016). The use of machinery in land preparation increased from 33 percent to 95 percent between 2006 and 2016 (Figure 41, left panel). The adoption of combine harvesters was even more dramatic – from 7 percent to 60 percent (Figure 41, right panel). Some farmers buy tractors for land preparation, but very few buy combines – these are usually rented from the private sector.

**Figure 41: Agricultural mechanization is booming in Myanmar’s Delta Region**

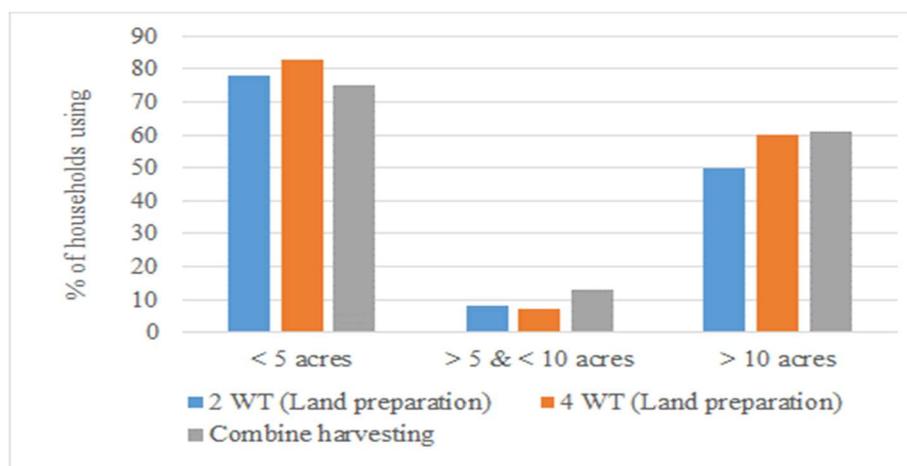


Source: Win and Thinzar 2016.

132. **Small farm sizes do not seem to have hindered the adoption of mechanization in Myanmar.** Farms with less than five acres are reported to mechanize their farming practices even more than larger farms (Figure 42). Large farms tend to buy machinery for own use and service provision while smaller farms tend to rely on rental services. This is aligned with the general trend in Asia, when adoption of mechanization does not require investment in own machinery; it requires renting services from private companies (Table 35). Some farmers may invest in their own tractors for multipurpose use, including for transportation, but very few invest in expensive large tractors or combines.

**Figure 42: Even small farms adopt mechanization in Myanmar’s Delta Region**

(Share of households using machinery for land preparation and harvesting in paddy cultivation, by farm size, 2015/16)



Source: Win and Thinzar 2016.

133. **Several governments in the region, especially that of China, tried to promote mechanization through direct service provision, but these efforts failed.** Instead, attention is turning to facilitation of mechanization services provided by the private sector. The Chinese government has even started to provide matching grants to private sector service providers to promote mechanization aligned with the principles of climate-smart agriculture. It has also invested in vocational training of future mechanics and machinery operators, in adaptive research

for suitability of machines to various agro-ecological zones, and in its regulatory environment for service providers.

**Table 35: Most farmers in Asia rent, not own, machinery**

	Philippines (Nueva Ecija)	China (Zhejiang)	Indonesia (West Java)	Thailand (Suphan Buri)	Vietnam (Can Tho)
<b>% of adopters of machinery</b>					
Two-wheel tractor	96	10	57	89	12
Four-wheel tractor	2	87	0	58	88
Combine harvester	5	100	0	100	100
<b>% of farmers owning machines</b>					
Two-wheel tractor	42	14	17	90	1
Four-wheel tractor	0	5	1	7	3
Combine harvester	0	7	0	0	0

*Source: Bordey et al. 2016.*

134. **This is the direction AMD can follow to correct a number of market failures prevailing in Myanmar.** Investing in the wrong priorities in Myanmar left a big gap, reducing the impact and speed of mechanization. The country is positioned last (out of 62) in the global ranking on requirements for provision of after-sale service and parts, machinery safety, and testing and standard application (World Bank 2017a). Going forward, AMD should stop buying machinery and training farmers and do “more” activities aimed at crowding in the private sector and increasing the number and quality of private sector jobs in rural areas, including the following (Table 36):

- a. Develop the strategy for effective use of the AMD machinery park, with the intention of phasing out public delivery of mechanization services in the future. Some machines and equipment can be transferred to the research farms of DAR and seed farms managed by DOA. These farms are in dire need of upgrades and modernization. Identify (remote) areas with little interest from the private sector and redirect the provision of public mechanization services to these areas until the AMD machinery is fully depreciated.
- b. Equip AMD stations with repair facilities to provide repair and other services to farmers owning machines and to the private sector. Improve rules for machinery safety regulations in Myanmar.
- c. Mechanization of production processes for non-paddy crops remains nonexistent; thus conduct more adoptive trials and research in different parts of the country to inform private sector and farmers about potential options.
- d. Shift from training farmers to training trainers for a large multiplier effect; private firms have access to capital to invest more in agricultural machinery, but face a shortage of qualified workers and robust demand from farmers for services due to their low profitability. AMD can be more strategic in using the Meikhtila vocational training center, in collaboration with the private sector, to train trainers who will train more mechanics and machine operators using private sector facilities.

- e. Engage with cooperatives, together with the Department of Cooperatives, to build their capacity to become effective providers of mechanization services.

**Table 36: Improving effectiveness of public expenditures on mechanization**

Do More	Do Less
<ul style="list-style-type: none"> <li>• Transfer some of the AMD machinery to DAR and DOA farms for their use.</li> <li>• Carefully target the services with AMD machines to areas of little interest to the private sector.</li> <li>• Get AMD stations to provide repair and other services to cooperatives and the private sector.</li> <li>• Conduct more adaptive/applied research to test and demonstrate various technologies to inform private sector investments and introduce new technologies for non-paddy crops.</li> <li>• Focus vocational training on future mechanics and tractor drivers (training of trainers at Meikhtila).</li> <li>• Develop capacity and business skills of cooperatives.</li> </ul>	<ul style="list-style-type: none"> <li>• Purchasing of machinery and provision of services to all farmers.</li> <li>• Forced land consolidation.</li> <li>• Provision of subsidized loans to individual farmers to buy machines as enough liquidity exists in Myanmar.</li> <li>• Training of farmers for machine use.</li> </ul>
<p><b>Expected outcomes:</b></p> <ol style="list-style-type: none"> <li>1. Budget savings from buying fewer machines.</li> <li>2. Reallocation of public funds from buying machines to applied research, vocational training, and targeted strategy for AMD stations.</li> <li>3. Better access of farmers to more affordable mechanization services from the private sector.</li> <li>4. More non-farm jobs available in rural areas and an emerging private sector at the grassroots level.</li> </ol>	

### *Agricultural Finance*

135. **Farmers’ weak access to affordable finance in Myanmar and the negative impact on farm performance are well documented in numerous reports** (Turnell 2009; Ash Center 2011; LIFT and World Bank 2014a; UNCDF 2014; LIFT and World Bank 2016). In response, the Union government provides subsidized loans for crop cultivation through MADB. It also encourages private and development banks to increase their lending to agriculture, established the credit lines for cooperatives in 2014/15, and has been enhancing an enabling environment for MFIs to promote higher lending to rural areas (see Annex 5 for details). Yet the impact of these efforts appears to be modest. Most farmers still complain about poor access to formal agricultural finance, their debt continues to rise, and agricultural growth remains slow. Understanding the reasons for these poor results is very important to improve the efficiency of public spending. That analysis begins with MADB.

136. **The lending volumes of MADB, a state-owned bank, grew significantly in the last several years.** In 2010/11, total lending amounted to 191 billion Kyats; in 2016/17 it rose to 1,700 billion Kyats (Figure 18). Starting from 2012/13, the interest rate for MADB loans is subsidized, kept much lower than prevailing market rates. In 2013/14, for example, MADB offered loans with a monthly median of 0.8 percent compared with 1.0 percent offered by rice companies, 2.5 percent offered by MFIs, and 5.0 percent offered by informal moneylenders (Table 37).

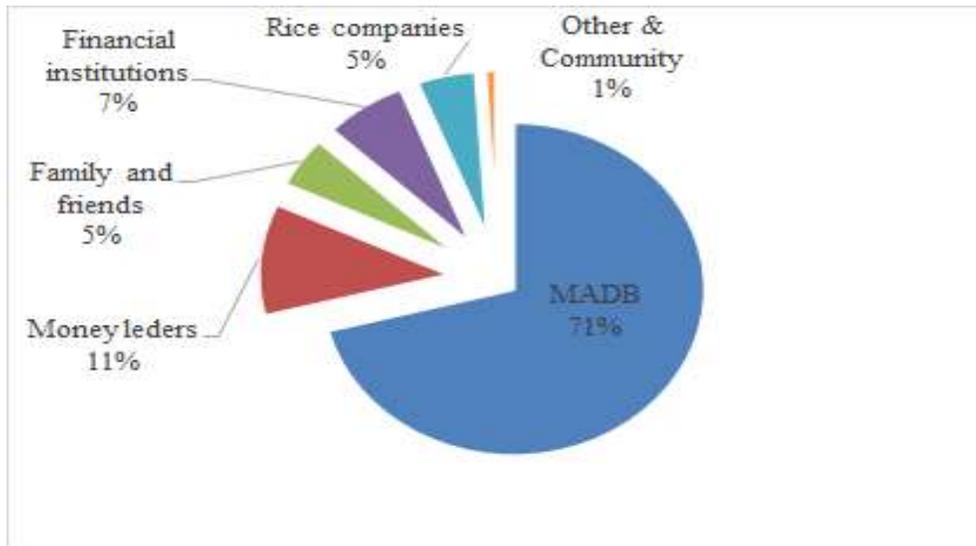
**Table 37: MADB provides subsidized credit to farmers**

Source of Loan	Number of interviewed farmers	Average monthly interest, %	Median monthly interest, %
MADB	1,124	0.80	0.80
Moneylenders	170	5.40	5.00
Family and friends	73	4.13	5.00
MFIs	111	2.42	2.50
Rice companies	87	1.11	1.00
Others	24	2.59	2.50
<b>Total</b>	<b>1,589</b>	<b>1.60</b>	<b>0.80</b>

Source: LIFT and World Bank 2016.

137. **The subsidization of MADB’s interest rate helped increase and keep the demand for MADB loans among farmers high.** According to MADB, 2.2 million farmers accessed its loans in 2015/16. A 2013/14 survey of about 1,600 farm households in four regions of Myanmar found that 71 percent used MADB loans for monsoon season production (Figure 43). Another survey of 1,100 farm households in Ayeyarwaddy Region conducted in 2016 found that 85 percent of farmers accessed MADB loans (Lwin and Tun 2016).

**Figure 43: MADB dominates agricultural lending**



Source: LIFT and World Bank 2016.

138. **Yet the increase in farm outreach came at a cost.** The interest rate subsidy peaked in 2014/15, costing the Treasury 93 billion Kyats or 0.14 percent of GDP (Table 38). In 2016/17, the cost declined to 85 billion Kyats (0.10 percent of GDP) due to the upward revision of MADB’s annual interest rate from 5 percent to 8 percent.

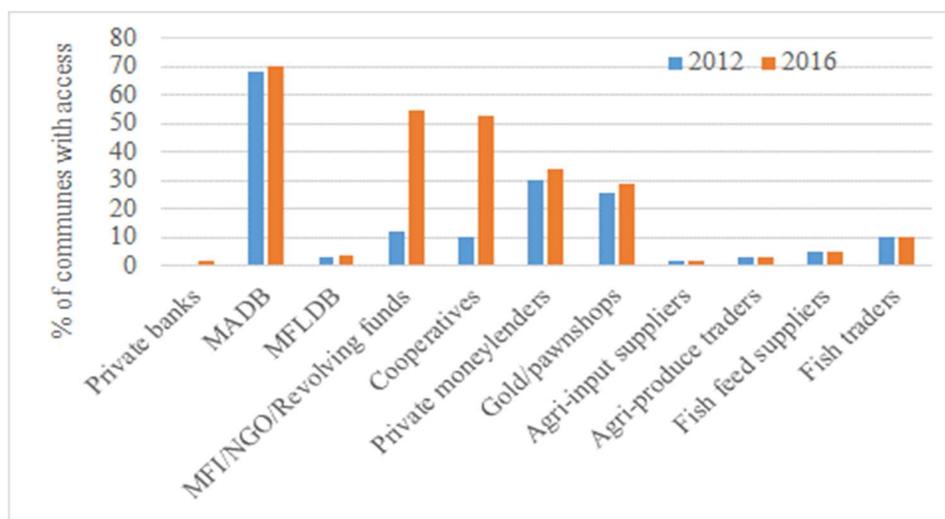
**Table 38: The interest rate subsidy grew along with the increase in MADB loan volumes**

	MADB loans (billion Kyats)	MADB interest rate, %	Commercial banks interest rate, %	Interest rate subsidy (billion Kyats)
2010/11	191	17.0	17.0	0
2011/12	353	13.0	13.0	0
2012/13	558	8.5	13.0	25.1
2013/14	1,159	8.5	13.0	52.2
2014/15	1,167	5.0	13.0	93.4
2015/16	1,091	5.0	13.0	87.3
2016/17	1,700	8.0	13.0	85.0

Source: WB staff estimate based on the MADB data.

139. **The move of MADB from the MOALI to the MOPF in April 2017 could kickstart the reform in agricultural lending.** This move needs to result not only in a better-performing and restructured MADB<sup>28</sup> – without transformation, MADB will continue to be a heavy fiscal burden for the government unable to support the much needed modernization of the agriculture sector. MADB’s transformation would also need to ensure that it complements other sources of finance rather than crowding it out. While MADB still dominates in rural areas, communities around larger cities such as Yangon are increasingly experiencing a rise in access to diverse lending products. In Delta Region, for example, between 2012 and 2016 the increase was particularly noticeable for financial products from MFIs, cooperatives, and NGOs’ revolving funds (Figure 44). The role of the government would be to encourage that more of these private funds be provided in rural areas to reduce the fiscal bill of MADB and other public financial programs such as cooperatives.

**Figure 44: The diversity of lending products in Delta Region is rising rapidly**



Source: Lwin and Tun 2016.

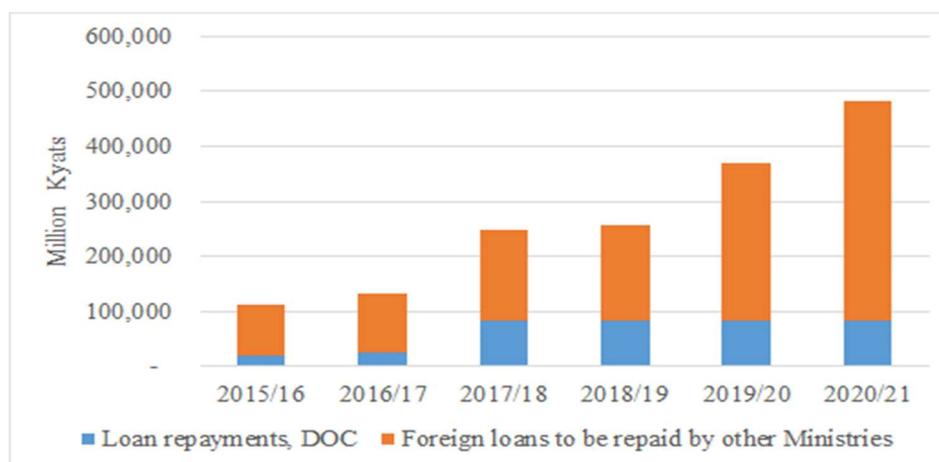
<sup>28</sup> The World Bank conducted the initial assessment and reform options for MADB in 2014 in partnership with the LIFT. The Bank is currently working with the MOPF, in partnership with the U.K. Department for International Development, to formulate the ownership framework and to improve the corporate governance aspects of all state-owned banks in Myanmar, including MADB.

140. **A starting point is to rethink the financial support to cooperatives.** During 2013/14–2015/16, the Department of Cooperatives (DOC) received \$400 million in loans from Chinese EXIM Bank to support cooperatives. It also attracted a \$100 million loan from Daedong Industry Co Ltd. from South Korea to finance the purchase of agricultural machinery (see Annex 5 for details). These loans financed a significant expansion of credit provided to cooperatives, estimated to reach 2.6 million customers.

141. **The effectiveness of these programs is likely to be challenged by a number of weaknesses.** Several examples are presented below:

- a. Financing of collective action: Loan programs managed by DOC do not seem to focus on supporting the collective actions of cooperatives' members. Loans are simply provided to individuals based on their individual needs. It is not much different from credit offered by private banks or MFIs. Usually, loans provided by the government are expected to finance public goods or correct market failures, i.e., finance programs not interesting to the private sector. Examples include community irrigation infrastructure, and collective storage and drying. Collective actions receive limited attention in DOC's loan programs, which simply compete with MFIs on an unequal footing, offering loans at 18 percent, much less than that offered by MFIs (up to 30 percent).
- b. Business plans: Obtaining a loan from DOC does not require any business plan. This reduces the quality of lending, puts borrowers and lenders at a risk of default, and, most importantly, wastes the opportunity to strengthen cooperatives. Good global practice is to request the members of cooperatives to come up with business plan for their future development to obtain funds for their joint, or at least coordinated, subprojects.
- c. Preferential machinery suppliers: The loan program with Daedong Industry Co Ltd. finances purchase only of South Korean machines. While farmers are free not to purchase these machines, they often do not have full information to make rational decisions. Most of these machines are not tested in the various agro-ecological zones of Myanmar or for different crops, and repair services and spare parts are not readily available countrywide. AMD has had little participation in this program to help with testing and servicing, but since both AMD and DOC have been part of the same ministry since 2016, this needs to be changed.
- d. Macroeconomic impact: The repayment of DOC loans kicked in as of 2015/16 and the amount of repaid loans will increase in the coming years. In 2017/18 and 2018/19, repayment of DOC loans will account for more than 30 percent of total foreign loan repayment, equal to 0.1 percent of GDP (Figure 45). The share of DOC in total loan repayment will decrease over time, but will continue to add fiscal pressure. During the next several years, the MOPF will have to convert a significant amount of funds from Kyats into USD or Euros to repay debts, which may create a shortage of foreign currencies and cause inflation. This weakens the case for continued borrowing of foreign commercial funds for such cooperative loan programs.

**Figure 45: Repayment of DOC loans may pose a risk to exchange rates and debt service**



Source: WB staff estimate, MOPF.

142. **Public funds need to be allocated for activities unlikely to be financed by the private sector, and away from areas where the private sector is best positioned to fill the financing gap.** An increasing number of private banks in Myanmar are engaged in innovative agricultural lending. For example, MAB and A Bank work in rice value chain in collaboration with the Myanmar Rice Federation, providing loans at 13 percent per year, while investing in systematic product development and risk management. Yoma Bank ventured into a hire-purchase financing enabling farmers and nonfarmers to borrow and buy agricultural machines. It partners with the LIFT, Rabobank, and USAID to ensure a portfolio guarantee and technical assistance for product development (see Annex 5 for details). In addition, the number of MFIs providing rural finance is growing, replacing informal moneylenders, encouraging entrepreneurial behavior of rural households, and ultimately closing the financing gap in agriculture. The amount of agricultural lending provided by private banks and MFIs is still low, but it is growing. Further growth would require the reform of MADB, especially its interest rate setting, and improvements in farm productivity and profitability so farmers can become more creditworthy (Table 39).

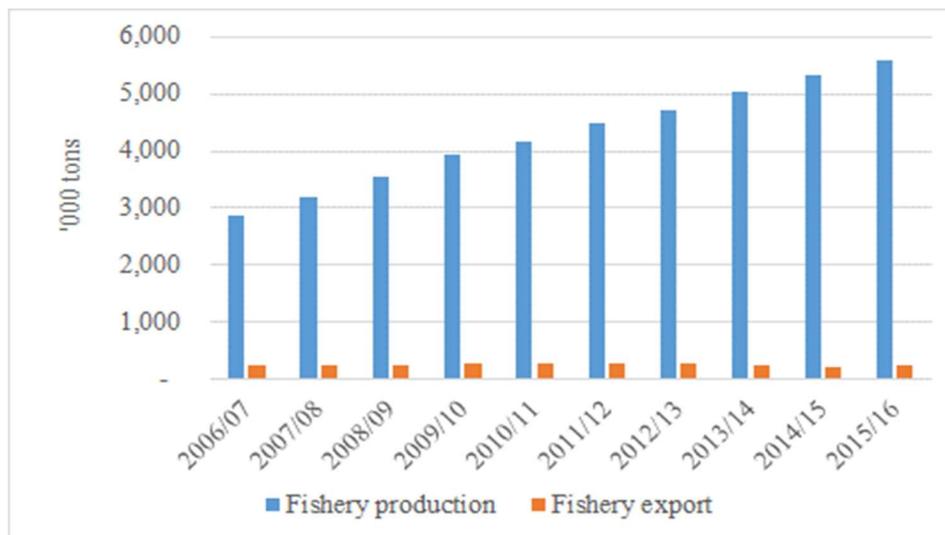
**Table 39: Improving the effectiveness of public spending on agricultural finance**

Do More	Do Less
<ul style="list-style-type: none"> <li>Reform MADB with a long-term objective of ensuring that it is an efficient, transparent, and effective financier for agriculture. Promote diversified farm development, not only paddy.</li> <li>Remove distortions caused by current interest rate policy and subsidized agricultural loans. Use public funds to finance collective action activities for cooperatives. Link the loan programs for cooperatives with the work of other departments of the MOALI such as AMD.</li> </ul>	<ul style="list-style-type: none"> <li>Subsidization of loans for rice production.</li> <li>Attraction of foreign funds for loans of cooperatives' members.</li> </ul>
<p><b>Expected outcomes:</b></p> <ol style="list-style-type: none"> <li>Reduced financing gap to farmers through private financing.</li> <li>Diverse financial instruments available along food value chains.</li> <li>Budget savings.</li> </ol>	

## Fisheries

143. **Increased fishery production is considered an important contributor to accelerate agricultural growth.** The growth in fishery output has not been disappointing: at an average 6 percent during 2009/10–2015/16 it was well above the growth rates in the crop and livestock sectors (Figure 46 and Table 52 in Annex 6). Yet while fishery production doubled in the last 10 years, exports remained flat, pointing to a problem with competitiveness (Figure 46 and Table 53 in Annex 6).

**Figure 46: As fishery production doubled in Myanmar, exports remained flat**



Source: DOF.

144. **The above-mentioned production growth occurred in spite of the low levels of public spending.** The Union budget for the Department of Fisheries (DOF) averaged 1 percent of the total agricultural budget during the review period, peaking at 1.7 percent of total spending in 2014/15 before falling to 0.9 percent in 2016/17 (Table 10). The sector’s growth was driven by private sector investments, especially in aquaculture. A distinguishing feature of Myanmar’s aquaculture subsector is its dichotomous structure with big/mega fish farms ranging from a few hundred to 3,000 acres versus small fishers who operate fish farms of less than 10 acres. Most of the large or mega fish farms have their own hatcheries, nurseries, and grow-out ponds (ranging from 10 to 30 acres each), with some having their own ice plants, trucks, and outlets in fish wholesale markets in Yangon. Some smallholdings are also involved in hatcheries, including backyard hatcheries, and nurseries rearing fish from fingerlings for a year and selling foot-long fishes to grow-out ponds of larger operations (Annex 6).

145. **DOF has not adjusted to these developments.** Its small budget was spent mainly on public hatcheries producing a small variety of fingerlings (Rohu and prawns), disease monitoring and control, and conservation programs. Many weak links along the value chain remain unaddressed (Figure 55 in Annex 6), i.e., DOF has not supported smallholders’ efforts to expand, grow strong, and penetrate new markets. As a result, smallholders involved in fish production face many challenges. Underprovision of public services is exacerbated by the fact that land for aquaculture is not considered “agricultural,” so conversion from paddy to aquaculture land is very expensive and difficult, depending on the region. In addition, fish farmers do not have

access to MADB and other formal credit. The privatized Myanmar Livestock and Fisheries Development Bank, transformed into a public company by shares subscription and renamed Golden Treasure Bank, continues to provide credit to the fisheries sector, albeit at a limited scale (Annex 6).

146. **Without good public services, the risk is high that sustainability of fish production growth will decline and fish export will stagnate further.** The quality of public spending for DOF can be enhanced by better focus on the weak links along the value chain. Areas requiring attention start with the need to reduce production costs for smallholders. This can be achieved through relaxation of regulation on land use (La Na 39), granting fish farmers greater access to credit (by including them in MADB financing, for example), and facilitation of private investments in the fish feed industry. It requires DOF to focus less on hatcheries operation and more on higher-value species and synergism/integration with private sector hatcheries, nurseries, and grow-out farms. DOF also needs to conduct adoptive research on productive and profitable farming systems, including poultry over fish ponds (as it is gaining popularity), rice and fish, and aquaponics. More public expenditures are needed for research and extension, and for organization of small fishers and fisherman and their subsequent integration in fish value chains.

147. **Another weak link in the fish value chain is the processing industry.** Processing is largely limited to dried fish and fishmeal besides that of frozen fisheries products. Processing cost is high due to Myanmar's inconsistent electricity supply. A lack of financing also exists. Many existing processing plants do not meet the EU requirement of using flake ice, potable water, and steel boxes. Aquaculture exports mainly go to China, but the lack of food safety management guidelines and accredited fisheries product testing laboratories hampers export diversification. Potential responses for DOF range from promotion of foreign direct investments in strategic and integrated processing<sup>29</sup> and investments in safety and quality assurance by upgrading or establishing labs that are accredited to key targeted export markets (EU, Japan). Transaction costs for exports can be reduced by enhancing port and border trade facilities, and via greater efficiency of regulations.

148. **Finally, the serious lack of human resource development relating to fisheries is recognized.** Parliament's approval to establish a University of Fisheries Science is a positive development, but the process of establishment seems to have stalled. This setback needs to be addressed urgently. Quality and consistency of data are often compounded by reluctance to pool and share data. It is suggested to reform data collection and information sharing to enable evidence-based policies as well as attract strategic investments. Resolving financing issues would help galvanize and leverage innovative combination of MFIs, cooperatives, development banks, and private banks' participation, while facilitating stakeholders' cooperation with donors and international and local NGOs would help bring more resources for the sector. The areas of more and less attention for DOF going forward to improve the quality of public spending are summarized in Table 40.

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<sup>29</sup> Examples from other countries include strategic investments in organic tilapia following the United States' HQ model in Hainan, China and the Norwegian joint venture in Malaysia for cage culture of specially bred, sushi-grade tilapia.

**Table 40: Options for increasing the quality of public services for fisheries in Myanmar**

Do More	Do Less
<ul style="list-style-type: none"> <li>• Support restructuring and expansion of seedling infrastructure for aquaculture, working closely with private sector hatcheries, nurseries, and grow-out ponds.</li> <li>• Enhanced production and distribution of disease-free fish and shrimp seeds as many are currently sourced from the wild and from Thailand and Bangladesh.</li> <li>• Attract foreign direct investments in fish processing and exports.</li> <li>• Develop soft infrastructure (human capital, extension and veterinary services to support more responsive public and private service provision for farmers in areas such as disease control, feed formulation, linking small fishers and SMEs along evolving, though still weak fish and shrimp value chains).</li> </ul>	<ul style="list-style-type: none"> <li>• Support for public hatcheries producing a small variety of fingerlings (Rohu and prawns)</li> <li>• Avoidance of attention to market developments and issues along the fish value chain.</li> </ul>
<p><b>Expected outcomes:</b></p> <ol style="list-style-type: none"> <li>1. Lower production costs for fish producers, largely smallholders.</li> <li>2. Better access of fish farmers to improved technologies generated by public and private research.</li> <li>3. Increased variety of processed fish products and increased export competitiveness.</li> <li>4. More private sector jobs in rural areas.</li> </ol>	

## 6. Scaling Up the Benefits of Donor Funds in Myanmar

149. **Another opportunity to accelerate agricultural growth in Myanmar is to attract more foreign funds and, even more importantly, use them effectively.** The latter requires significant improvements compared to the current situation in: (i) absorption of funds already provided to the Union government; and (ii) coordination of all projects irrespective of whether they are managed by the government or implemented by subcontractors on behalf of donors.

150. **Attracting more donor funds for agriculture is quite realistic in the current context of Myanmar.** Overall donor financing for agriculture is on the rise (Figure 23): it increased from \$200,000 in 2010 to \$108 million in 2016. About \$140 million is already included in the pipeline for 2017 and 2018, and more funds can come in the outer years. The total amount of donor funds during 2010–2022, covered by the survey for this report, is estimated at \$761 million (Table 41).

151. **Funds are provided by a large number of donors, ranging from bilateral donors and multidonor trust funds (e.g., LIFT) to multilateral development banks.** About half of the funds are channeled through the government in the form of grants and loans, via nine projects from ADB, IFAD, JICA, and WB (Table 41). These projects are integrated in the Union budget. The remaining half is provided through 92 projects by numerous donors, with the largest amount allocated by the LIFT,<sup>30</sup> followed by France, the United States, and Korea.

**Table 41: Estimated external aid allocated to agriculture in Myanmar, 2010–2022**

	Total budget, \$	% of total	No. of Projects
<b>Agencies providing funds directly to the Union government</b>			
ADB	86.0	11%	4
IFAD	19.4	3%	1
Japan/JICA	154.6	20%	2
World Bank	102.1	14%	2
<b>Agencies using nongovernmental arrangements for implementation of projects</b>			
European Union (EU)	16.2	2%	5
FAO	15.5	2%	12
France	80.4	10%	6
Denmark	9.5	1%	1
Germany	34.6	5%	5
International Finance Corporation	2.0	1%	1
International Trade Center	1.0	0.1%	1
Korea	36.2	5%	4
LIFT	143.8	19%	45
Switzerland	12.8	2%	3
USAID	56.7	7%	8
<b>TOTAL</b>	<b>770.7</b>	<b>100.0%</b>	<b>100</b>

*Source: WB staff estimates based on information provided by donors in Myanmar.*

<sup>30</sup> The LIFT is financed by the EU, the governments of Australia, Denmark, France, Ireland, Italy, Luxembourg, the Netherlands, New Zealand, Sweden, Switzerland, the United Kingdom, and the United States, and Mitsubishi Corporation.

152. **The share of donor funds in total sector financing grew over time.** While the Union budget for agriculture is much larger than the donor funds, the latter are becoming increasingly important for the large departments in the MOALI. Donor funds are included in the capital budget of the departments. For example, they accounted for 55 percent of the ID budget in 2014/15 and 42 percent in 2016/17 (Table 42). DOA’s reliance on donor funds has been even bigger (Table 43). Note, however, that the funds reported here are “allocations,” not “actual spending.” These funds may not necessarily be utilized in given or other years.

**Table 42: ID increasingly relies on donor funds**

	2014/15	2015/16	2016/17
ID capital budget, million Kyats	304.3	341.3	201.7
Union government	85.4	279.5	117.2
Presidential budget	53.0	23.1	0
Loans/grants	165.9	38.8	84.5
<i>Share of loans/grants in ID budget</i>	<i>55%</i>	<i>11%</i>	<i>42%</i>

*Source: MOALI, WB staff estimates.*

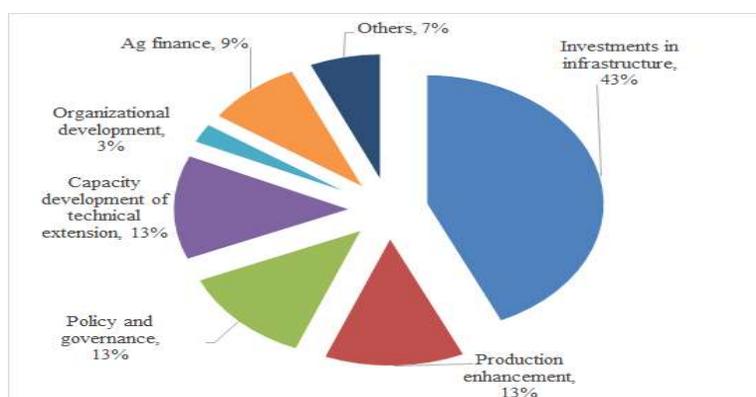
**Table 43: DOA is even more dependent on donor funds**

	2014/15	2015/16	2016/17
DOA capital budget, million Kyats	8,735	24,806	25,295
Union government	4,925	1,061	9,087
Loans	3,810	8,686	10,505
Grants	0	15,059	5,703
<i>Share of loans/grants in DOA budget</i>	<i>44%</i>	<i>96%</i>	<i>64%</i>

*Source: MOALI, WB staff estimates.*

153. **Regarding functional composition, the donor funds are better aligned with government priorities than the Union budget.** Most donor funds are allocated to irrigation, amounting to \$333 million and accounting for 43 percent of total funds during 2010–2022 (Figure 47). But other functions also receive adequate donor funding, presenting a balanced composition of the overall spending.

**Figure 47: Functional composition of donor funds is more balanced than that of government funds**



*Source: WB staff estimates based on information provided by donors in Myanmar.*

154. **Most infrastructure finance by donors was for irrigation infrastructure management.** In contrast to the irrigation spending from the Union budget, largely allocated to new dams and maintenance of primary irrigation infrastructure, most donor funds were used for rehabilitation and upgrade of existing irrigation systems to increase irrigation coverage, develop or improve on-farm irrigation infrastructure, reduce water losses, or add drainage infrastructure, along with strengthening of water management institutions to increase water use efficiency and O&M of irrigation systems (Table 44). Irrigation spending is expected to increase in 2016–2022, as the MOALI and donors make progress in ongoing projects and preparation of new ones.

**Table 44: Most donor funds for irrigation finance rehabilitation of existing systems**

	<b>Total, \$ million</b>	<b>Annual average, 2010–2015, \$ million</b>	<b>Annual average, 2016–2022, \$ million</b>
New irrigation	16.0	0.2	2.2
Rehab/upgrade of existing irrigation	309.1	10.0	35.6
Agroprocessing	2.2	0.2	0.2
Other investments	5.3	0.2	0.6
<b>TOTAL</b>	<b>332.7</b>	<b>10.6</b>	<b>38.5</b>

*Source: WB staff estimates based on information provided by donors in Myanmar.*

155. **The remaining donor funds were distributed almost equally among several functions.** They mainly finance support to farming production practices, capacity and institutional development, strengthening of cooperatives and water user organizations, and agricultural microfinance (Figure 47). These kinds of programs are underfinanced by the government in Myanmar. In addition, about 11 percent of funds were used for work on policy and governance, another area receiving little attention in the government budget. Donor spending on policy and governance is projected to increase over time.

156. **Farm production enhancement spending accounted for 14 percent of donor spending, going to many programs, from seeds to soil and water management.** This is projected to increase from \$3.2 million annually in 2010–2015 to \$11.2 million annually in 2016–2022 (Table 45). These programs seek to promote good farming practices and climate-smart agriculture, responding to the actual needs of Myanmar farmers.

**Table 45: Donors spend funds on good farming practices and climate-smart agriculture**

	<b>Total, \$ million</b>	<b>Annual average, 2010–2015, \$ million</b>	<b>Annual average, 2016–2022, \$ million</b>
Seeds	10.7	0.4	1.2
Soil nutrient management	10.9	0.5	1.1
Plant protection	1.0	0.0	0.1
Mechanization	13.5	0.7	1.4
Improved farm practices	17.0	1.0	1.6
Water management practices	7.6	0.4	0.7
Other climate-smart agriculture	20.4	0.0	2.9
Other programs	17.9	0.2	2.2
<b>TOTAL</b>	<b>98.9</b>	<b>3.2</b>	<b>11.2</b>

*Source: WB staff estimates based on information provided by donors in Myanmar.*

157. **Capacity building and organizational development together accounted for 16 percent of donor spending.** This is projected to increase from \$5.1 million annually in 2010–2015 to \$13.1 million annually in 2016–2022 (Table 46). These programs support the delivery of a wide range of extension services and partners, from DOA to private sector providers.

**Table 46: Capacity-building programs of donors cover many subjects**

	<b>Total, \$ million</b>	<b>Annual average, 2010–2015, \$ million</b>	<b>Annual average, 2016–2022, \$ million</b>
Ag extension	34.3	1.4	3.7
Veterinary services	13.4	0.1	1.8
Fisheries extension	20.9	0.6	2.5
University curriculum	4.1	0.1	0.5
Producer cooperatives	4.2	0.3	0.4
Water user groups	10.3	0.1	1.4
Associations/traders	3.0	0.3	0.2
Other programs	32.0	2.3	2.6
<b>TOTAL</b>	<b>122.3</b>	<b>5.1</b>	<b>13.1</b>

*Source: WB staff estimates based on information provided by donors in Myanmar.*

158. **Donor spending on policy and governance account for 11 percent of total spending over 2010–2022.** This is projected to increase from \$3.5 million annually in 2010–2015 to \$9.4 million annually in 2016–2022 (Table 47). These funds finance knowledge generation through studies and workshops and policy dialogue using this knowledge to improve the enabling policy environment and governance in Myanmar. The key areas of support are fisheries management, land governance, value chains, and agricultural policies.

**Table 47: Policy and governance programs are among donors' priorities**

	<b>Total, \$ million</b>	<b>Annual average, 2010–2015, \$ million</b>	<b>Annual average, 2016–2022, \$ million</b>
Land access and management	13.2	1.6	0.6
Water management	1.4	0.1	0.1
Fisheries management*	62.3	0.2	8.8
Sanitary and phytosanitary issues	1.7	0.1	0.1
Food safety and traceability	1.7	0.1	0.1
Gender-related	1.4	0.1	0.1
Ag policy and value chains	14.8	1.0	1.1
<b>TOTAL</b>	<b>96.4</b>	<b>3.5</b>	<b>10.8</b>

*Note: \*This high budget for fisheries management is due to two projects in the pipeline: the French Development Agency's project with a budget of \$60 million for implementation during 2018–2023 and Denmark's project in the amount of \$9.5 million during 2017–2020.*

*Source: WB staff estimates based on information provided by donors in Myanmar.*

159. **The above illustration of donor funds' functional composition shows their much stronger alignment with government priorities and potential growth areas than that of the government's own programs.** This contributes to high efficiency and effectiveness of donor funds. Four major issues undermine their overall impact, however:

- a. The first issue is the obvious one: the weak alignment of government funds with its own priorities and growth opportunities reduces the overall effectiveness of donor funds. Government funds are still much larger than donor funds will ever be. If the government funds make little impact, donor funds will be underutilized.
- b. Absorption of existing donor funds by the government has been very low. Moreover, there is little indication that the government is taking specific steps to improve the situation. The donor funds discussed above are allocations, not actual spending. There is a high risk that the use of allocated funds is either delayed, rolling over large budgets to last years of implementation, which can reduce quality of implementation, or returned to donors. Most donors working with the MOALI report their actual annual disbursement rates to range between 1–4 percent vis-à-vis the planned 15–20 percent. The main reasons for delay include weak implementation capacity of government staff, a lack of clear internal procedures within the MOALI to work with donor projects, and the Ministry’s reluctance to use loan funds to hire consultants for temporary help and technical support in implementation of such donor projects. This is a government-wide issue. There has been little coordination with donor projects implemented outside of the government system. About half of the current and future donor projects are implemented outside of the government (Table 41), mainly by bilateral agencies and the LIFT. Beyond some general meetings with donors under the Agriculture and Rural Development Sector Working Group, the MOALI made little effort to proactively and strategically engage with donors during early stages of their projects’ preparation to align them better with existing sector strategies and priorities. The MOALI also made little effort to link technical assistance and capacity building projects with loan projects (to augment hardware financed by loans with software financed by grants) or to promote spatial integration of various projects. Ultimately, for successful implementation of the ADSIP, the MOALI needs to think in terms of programs financed by government expenditures and donor projects rather than individual projects. This would significantly increase the impact of donor funds and increase the likelihood of successful ADSIP implementation.
- c. Incorporation of experiences and lessons learned from donor projects into government programs has been poor to none. Many donors have experimented with delivering services to farmers, building organizational capacity of farm groups, and creating institutions at the local level. Myanmar is known as a country with a history of conflict, weak social cohesion and organization, and an ineffective extension system. Many agricultural extension methods discussed in Annex 2 are currently being tested and studied in Myanmar to identify suitable approaches for achieving best results. Some of them are location-specific given the large agro-ecological and ethnic diversity in the country. Yet this rich information largely passes by the MOALI’s departments. Little of the knowledge gained from donors’ projects is integrated into government programs, further reducing the overall effectiveness of donor financing in Myanmar.

160. **Thus, while the increase in donor funds is a realistic source for the larger volumes of public spending on agriculture in Myanmar in the near future as envisaged in the ADSIP, more attention is needed to ensure their effective use.** Steps in this direction could include: (i) stronger alignment of government programs with the ADSIP and with donor projects; (ii) enhancement of internal arrangements and coordination to effectively utilize donor funds in a

more timely manner (i.e., disburse the allocated funds); (iii) the MOALI’s coordination with donors, especially those channeling funds outside of the government, of preparation and implementation of their projects and integration of these projects in ADSIP programs; and (iv) efforts to learn lessons of both successes and failures from donor projects, which bring new approaches and practices to Myanmar, and integration of these lessons into government programs.

161. **The impact of these steps might not be visible in the short run but they certainly will be in the long run, significantly improving the impact of both donor and government expenditures on agricultural development.** The MOALI plans to attract a significant amount of additional donor funds to finance the ADSIP 2017–2022 (Table 48), twice as much as currently planned by donors in their approved pipeline (Figure 23). If the above-discussed limitations remain unaddressed, however, the future donor lending pipeline could dry up. Donors unable to disburse existing funds will hesitate to invest additional resources, further slowing down Myanmar’s long-term agricultural growth.

**Table 48: The MOALI plans to attract large amount of additional donor funds to finance the ADSIP**

	<b>Billion Kyats</b>	<b>%</b>
Government	772	34
Donors	1,406	61
Private	65	3
Farmers	43	2
<b>Total</b>	<b>2,290</b>	<b>100</b>

*Source: MOALI 2017.*

## 7. Implications for Agricultural Public Expenditure in Myanmar

162. **This chapter summarizes the implications of the above analyses for agricultural public expenditure in Myanmar.** It focuses on actions that would increase the impact of public expenditure on agricultural growth, nutritional security, poverty reduction, and climate resilience through more efficient and effective use of existing resources.

163. **Myanmar's government already spends a relatively large share of its overall budget and GDP on agriculture.** Very few countries in the region allocate a larger share of GDP on agriculture than Myanmar. The constrained fiscal space in Myanmar and the large demand for public funds from other sectors such as education, health, and infrastructure call for a careful allocation of additional funds only to underfinanced functions such as research, extension and training, soil nutrient management, and fisheries development, rather than topping up relatively well-financed programs such as irrigation.

164. **The MOALI budget is projected to stay at 1.4 percent of GDP between 2016/17 and 2020/21, essentially showing no real increase in the next five years.** Thus, most of the increase in agricultural budget is expected to come from donors. However, attracting more donor funds and using them effectively require major improvements in the MOALI's absorption capacity and its coordination with donor projects, including those implemented outside of government systems. Notwithstanding, public resources will remain limited vis-à-vis the needs and they will be lower than anticipated by the ADSIP. The first-order priority would be to find the internal reserves/opportunities for reallocation of funds and to improve the effectiveness of existing budget and programs.

165. **Some scope exists for improving the effectiveness of the existing budget through internal reallocation of funds.** The functional composition of agricultural public expenditure needs to be more strongly aligned with the ADSIP, which rightly identifies programs and activities that would help accelerate growth and enhance resilience to climate change, reduce poverty, improve nutritional security, and create jobs. Yet the scope for internal reallocation is largely limited to the capital budgets of AMD and IWUMD. Some portion of the AMD capital budget needs to be redirected to other AMD programs necessary to facilitate market-driven agricultural mechanization, but most of the capital budget can be shifted to other departments in dire need, especially DAR, DOA, Livestock and Fisheries, and DOP. The situation with IWUMD is similar. Some capital budget could be shifted to other departments, but a large share of the IWUMD capital budget is needed to finance the shift from irrigation infrastructure development to irrigation infrastructure management.

166. **In addition, some scope exists for changing the economic composition of public expenditure within departments,** especially for DOA, where the capital and some administrative budget can be shifted to the recurrent budget of frontline service providers, especially extension staff at the district and township levels. But more budget savings can only be generated through institutional restructuring of the MOALI, which has not yet converted the merger of three ministries into one ministry with well-defined functions within and across departments.

167. **The effectiveness of existing public funds can be further enhanced through improving the quality of programs' implementation.** Opportunities are ample. Shifting the operational budget from the Union level to districts and townships, particularly for extension

activities, would result in immediate improvements. Most MOALI staff need additional training and capacity building on technical issues but also on new institutional approaches for demand and market-oriented service provision. Design of support programs should better utilize the rich diversity and agro-ecologies of Myanmar, requiring a shift from production support (e.g., paddy) to support of diversified farming systems and value chains. Investments in hardware (i.e., upgrade of irrigation system or rural roads) need to go hand-in-hand with investments in software (i.e., water user groups, O&M) and in agricultural services (i.e., fertilizer quality control, soil nutrient management, integrated pest management, extension, seeds). Horizontal and vertical coordination is a big problem at each level. Not only is it insufficient between different ministries and different levels of government, it is also insufficient among departments and among divisions within the same department. PFM issues such as procurement deficiencies and lacking monitoring and evaluation also hinder the implementation effectiveness of MOALI programs. This urgently needs to be addressed.

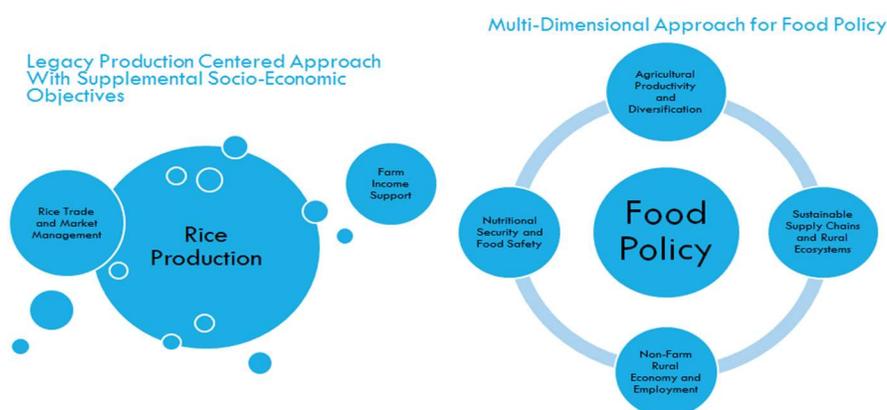
168. **Chapter 5 provides specific areas for improvements.** For irrigation, for example, improving technical efficiency requires a shift from infrastructure development to infrastructure management, involving the reallocation of funds from new construction to improvements in existing irrigation systems and on-farm water infrastructure; an increase in O&M funding along with giving Regions and States more say in allocating these funds to specific irrigation systems; and large spending on institutional strengthening of both the ministry and water users. The shift also requires investment in human capital to meet the requirements of demand-driven service delivery. For agricultural extension, the improvement in quality could come from several sides. More operational budget for frontline extension staff and their capacity building could provide some initial impetus. Yet sustainable gains can only be generated by shifting from support for paddy production to support for diversified farming systems, based on opportunities given by Myanmar's diverse agro-ecology, by a change of extension approaches, by an increase of farm outreach through ICT, donors, and the private sector, and by much stronger collaboration and joint programs between the Extension Division and other divisions in DOA and DAR, especially at the district level. For finance, public spending effectiveness would increase by channeling funds through the reformed MADB and creating an enabling environment for private banks and MFIs to invest more in agriculture. For fisheries, the impact of public expenditures would grow from enhanced seedling infrastructure for aquaculture, enhanced production and distribution of disease-free fish and shrimp seeds (as many are currently sourced from the wild and from Thailand and Bangladesh), and investments in soft infrastructure such as extension and veterinary services to support more responsive public and private service provision for farmers in areas such as disease control, feed formulation, linking small fishers and SMEs along evolving, though still weak, fish and shrimp value chains.

169. **Improvements in donor coordination and in utilization of the provided donor funds can bring additional gains.** Gains are possible from both increasing the volume of spending on agriculture and from improving the effectiveness of government agricultural programs. The MOALI anticipates a significant increase in additional donor funds to finance ADSIP implementation, twice as much as is included in the existing donor pipeline. Yet achieving that objective requires serious improvements, including to: (i) more strongly align government programs with the ADSIP and with donor projects; (ii) enhance internal arrangements and coordination within the MOALI to more effectively utilize donor funds in a more timely manner; (iii) proactively coordinate with donors, especially those channeling funds outside of government systems, during preparation and implementation of their projects to integrate them in ADSIP

programs; and (iv) learn lessons on successes and failures from donor projects, which bring new approaches and practices to Myanmar, and integrate these lessons into government programs. If the existing weaknesses of the use of donor funds remain unaddressed, the future donor lending pipeline could dry up. Donors unable to disburse the existing funds will hesitate to bring additional resources.

170. **The last, but not least, opportunity to improve the efficiency and effectiveness of agricultural public expenditures of all kinds, government and donors, is to improve agricultural policy and the business regulatory environment.** That would help attract private investment at low budget costs in critical parts of the food value chains, which is needed to leverage limited public funds to accelerate growth and boost shared prosperity. The critical step is to shift the policy attention from rice production and export of low-cost commodities to a multidimensional food policy that would include focus areas such as agricultural productivity and diversification, nutritional security and food safety, sustainable value/supply chains, and the nonfarm rural economy and employment (Figure 48). Essentially, Myanmar’s agricultural policy needs to be aligned with the policy framework outlined in the ADSIP (MOALI 2017).

**Figure 48: Realigning the stars beyond a rice-centric agricultural strategy**



*Source: World Bank 2015a.*

171. **In addition to alignment with strategic priorities, agricultural policies, programs, and regulations need to (re) focus on crowding in private investments.** In relation to public expenditures, this implies two main things. The first is to refrain from direct competition with the private sector, for example in provision of inputs (e.g., seeds), mechanization services, and agricultural finance. The second is to use public funds purposely to crowd in private investments. Example of such public programs, mentioned in this report, include: (i) strengthened intellectual property rights for varietal development and seed quality assurance; (ii) PPPs for management of laboratories for input quality control; and (iii) testing of farm machinery for non-paddy crops and vocational training of future mechanics and machinery operators.

172. **Finally, agricultural policy needs to be predictable and aligned with the net export position of Myanmar for many crops and with the small fiscal space.** Introducing minimum farm prices, considered in Myanmar from time to time, would undermine its export competitiveness (Annex 7). Export restrictions would hamper investments along the food value chains. These policies need to be avoided to keep the rates of return of public expenditures high.

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## **Annex 1: Irrigation and Water Utilization Management Department**

1. The Department of Irrigation and Water Utilization Management was originally established as the Irrigation Department under the British Colonial Government in 1929 as part of the Public Works and is still regulated by the Canal Act of 1905, the Embankment Act of 1909, the Public Works Accounts Code of 1933 and the Public Works Departmental Code of 1933. In 1965, the Irrigation Department merged into the Ministry of Agriculture. In 2016, the Irrigation Department merged with the Water Resources Utilization Department (IWUMD).
2. **Mandate.** IWUMD's mandate is to provide irrigation water and flood protection to sustain agricultural development toward industrialization and all round development. The primary objectives of IWUMD are to:
  - a. Carry out hydrological and geological investigations, and topographic surveys and preparation of designs of works planned and under implementation.
  - b. Undertake planning and construction of new projects.
  - c. Perform operation and maintenance of the existing irrigation, drainage and flood protection works.
  - d. Provide technical assistance for rural irrigation works, rural development and rural uplift of Border Areas and Ethnic Groups.
3. All capital and recurrent costs for fulfilling the mandate are to be carried out by the Union Budget for IWUMD with the exception for the current budgets for gravity irrigation systems of less than 5,000 acres (2,000 ha), which need to be financed from the Regional Budget.
4. **Assets.** IWUMD managed in 2015 a total irrigable area of 1.34 million ha in 459 systems, out of which 0.77 million ha were served by reservoirs and the remaining 0.57 million ha served by run-of the river systems. In addition, 1.50 million ha were provided with flood protection, out of which 1.13 million ha through the provision of embankments and 0.37 million ha through provision of drainage canals (MOAI 2015b). IWUMD also developed and manages 240 dams with a total storage capacity of some 17,000 million cubic meters. Some 12 completed irrigation dams also produce hydropower with a 580 megawatt installed capacity. Further 9 dams with hydropower are under construction, out of which 4 are developed with the Department of Hydropower. Their total installed capacity will be 1,942 mega-watt. In 2016/17, construction was ongoing for 22 irrigation projects, including 11 dams (total 2,000 million cubic meters) with a total of 61,000 ha irrigable area.
5. **Organization and Staffing.** IWUMD is headed by a Director General (DG) who since the merger with the Water Resources Utilization Department is assisted by three Deputy DGs (Upper Myanmar, Lower Myanmar, and Water Utilization Management). The Head Office consists of five administrative branches (administration, planning of works, procurement, accounts, and inspection) and seven technical branches (design, irrigation technology, investigation, geology, hydrology, drilling and blasting, and hydropower).
6. Throughout the country there are 9 Construction Circles responsible for all force account construction works, 17 Maintenance Branches responsible for O&M of all assets after handing over from the construction branch, and 4 Mechanical branches, responsible for the management of all ID equipment.

7. The total permanent staff before the merger with the Water Resources Utilization Department was 21,274 persons, of which almost 5 percent are officers/managers and 95 percent are staff. Daily labor and external service providers are not included.

8. **Revenue Generation.** The ID has the following sources of revenue:

- a. Water tax for domestic use: 10 Kyat/1,000 gallons.
- b. Water tax for industrial use: 90 Kyat/1,000 gallons.
- c. Water tax for irrigation water: 1,950 Kyat/acre of paddy and 900 Kyat/acre of other crops.
- d. Embankment tax: 5 Kyat/acre.
- e. Revenues from pumped irrigation systems.

9. The water tax for irrigation is not collected as the legal foundation for the revised charges is still lacking. The previous value of charges for embankment taxes of 5 Kyat/acre is far less than the cost of collection. An amendment to the Canal Act of 1905 is being processed that would legalize the collection of irrigation water charges. The total revenue in 2014-15 amounted 3,460 million Kyats, of which 3,447 million Kyat water tax and 13 million Kyat Embankment tax. Revenues from pumped irrigation and hydropower production have not been reported and are not yet included above. An amendment to the 1905 Canal Act now under preparation will provide adequate legal basis to adjust and collect these irrigation and embankment charges.

10. **Budget system:** For expenditures on irrigation and drainage three budgets need to be considered: (i) the Union Ministerial budget; (ii) the Regional or State budget; and (iii) the Presidential or special budget. The Union budget funds all Branches, with the exception of the Maintenance Branch, which is partially funded by the Regions following the delegation of funding responsibility in 2013 for O&M irrigation, drainage and polder systems with service areas less than 5,000 acres (2,000 ha) to Regions and States. The Union and Regional budgets consist of two main components:

11. Current Budget, which can be subdivided into:

- a. Routine budget for expenses for salaries, travel allowance, operational cost of offices, fuel for administrative purposes, repairs for facilities, machines etc. This also includes training for permanent ID staff. (Budget lines 01.00-03.00)
- b. O&M Budget (Budget Line 04.00)
  - i. Ordinary budget for operation, maintenance and ordinary repairs (incl. labor) of the infrastructure, equipment and fixed assets, incl. salary cost of daily labor.
  - ii. Special Repair budget to be used upon request and for approval by DG. Part of the special budget is withheld for emergency situations and the unspent portion of this budget will be allocated again to States and Regions.

12. All divisions/branches such as Maintenance Branch and Construction Circle have the same budget lines.

13. Capital Budget: for investments in new equipment, office equipment, planning and construction of works (including surveys, designs and consultants), training, research, and development for special projects, and all activities funded through loans and grants.

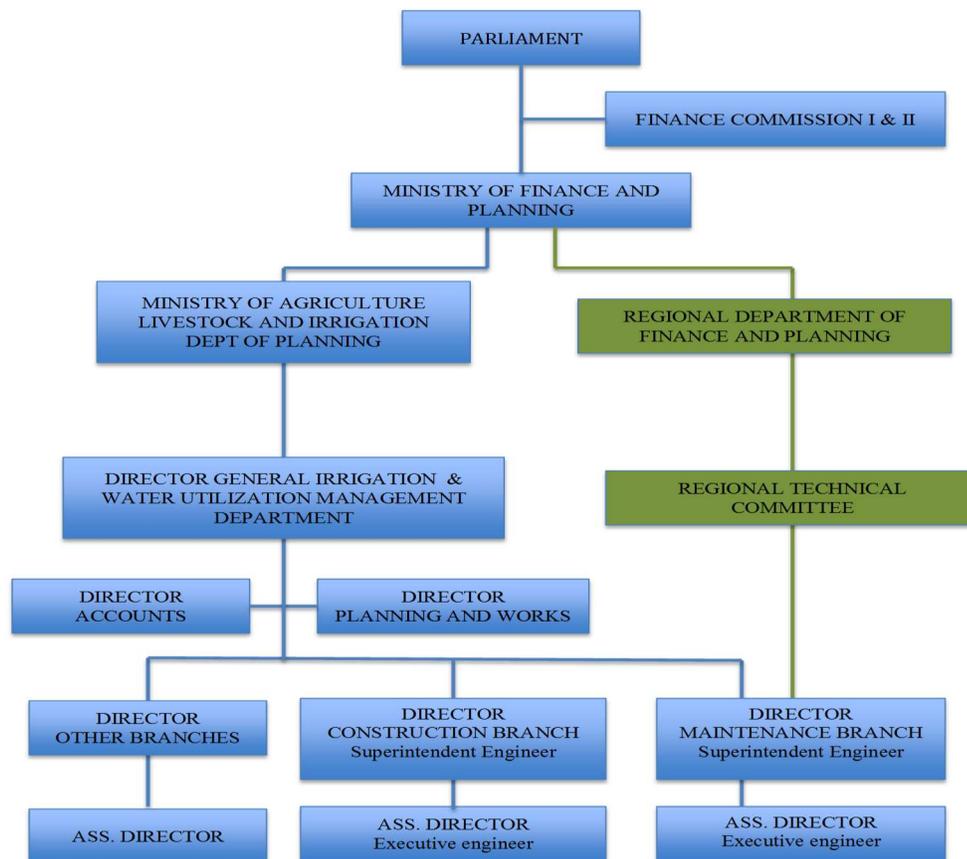
14. Presidential Budget: for disaster mitigation and prevention allocated at the discretion of the President. Since 2013-14, the allocations are used for flood and drought mitigation and prevention.

15. **Budget Preparation.** The Union and Regional budgets are prepared in the following steps (also see Figure 49):

- a. The Assistant Director (or Executive Engineer) prepares a work plan with input from the local Agriculture Coordination Committee. It includes a cost estimate for the coming fiscal year. For the routine and O&M budgets formulas used are based on Department Code 1928, which prescribes the method for calculation of staff needs (so-called Barker forms) assuming all O&M works to be done on force account. Basically the method calculates the amount of man-days needed for the regular O&M of canals (of different size), structures, and dams (using those historical standards). The resulting number of man-days is then multiplied with a standard daily wage, which results in the amount requested for regular O&M. This amount is always honored in the Current Union budget. The Special budget as well as the Capital budget (incl. loans) requires detailed design drawings, specifications and bills of quantity to support the justification of volume and the readiness for implementation. Rehabilitation (which includes desiltation of canals) falls under the capital budget. The Executive Engineer forwards the work plan to the Director of the regional office in July.
- b. The Director collects, evaluates, prioritizes and processes all work plans and decides which parts of the work plan to be forwarded for the Union budget and which for the Regional Budget. Besides the agreement on the 5,000-acre rule, there seems to be no rules or regulations that indicate which activities are to be funded under the Union versus the Regional budget. It also may happen that the regional budget is used for activities in areas over 5,000 acres if the Union budget is not adequate as became clear in Ayeyarwady Region. Requests for the Special or Presidential budget are also prepared:
  - i. The accumulated requests for works selected for the Union budget are then forwarded to the DG with copy to the Director of Planning and Works and the Director of Accounts.
  - ii. The works under the regional budget comprise O&M of the irrigation and polder systems with an area of less than 5,000 acres. Other works can also be selected for the regional budget to complement the works in the Union budget. These works are evaluated by the regional technical committee; after its approval and that of the Regional MOPF, they are sent to the Union MOPF.
- c. The Director of Planning and Works checks the request for reasonability and the DG prioritizes the requests for special budget and capital budget based on a ceiling provided by the MOPF. From the total allocation for special budget the DG reserves some budget for emergency repairs. The DG then forwards the total requests to the Account Director in the Minister's office, where the Minister will do a next round of prioritization in August. The size of the current budget does not change very much. The regular budgets are honored and the special budget is whatever remaining. The total budget variation is mainly in the capital budget, which reflects the government policy and priorities for investments.

- d. The Ministry's work plan will be forwarded to the MOPF for approval, prioritization and sometimes changes together with the Regional budget requests. The MOPF sends the proposed budgets to the Parliament.
- e. Parliament discusses the budgets in two finance committees; one for the Union budget for the Ministries and one committee for the Regional budgets. These committees are each chaired by one of the vice presidents.

**Figure 49: Budget preparation for the Union and Regional IDs**



*Source: WB staff assessment based on discussion with the Union and Regional IDs.*

16. The preparation of the budgets for management of irrigation systems is in principle need-based. The current budget requests for salaries and routine maintenance are usually honored. However, the basis for budget allocations as prescribed in the 1928 Department Code seems to still be based on old technology and review of this code is highly advisable.

17. The variation is in the allocation of the special budget in the maintenance charges (budget line 04.09). These reflect the priorities as set by the DG of ID so in theory the limited funds go to the most urgent issues. This budget for periodic maintenance and repairs is inadequate to meet the needs for sustainable system operations and service delivery, causing a gradual degradation of infrastructure and associated provision of services. This is partly compensated by making use of the capital budget and the Presidential special budget to cope with deferred maintenance.

18. The system of planning for and prioritizing works for maintenance, rehabilitation, replacement and modernization could benefit from an asset management approach that is based on the life cycle of assets like dams, weirs, canals, and structures. Such process will increase cost efficiency and transparency in budget allocation processes. Moreover, it will provide a transparent basis for determination of costs of service delivery and with that will be an important factor in the establishment of the cost of service provision, the level of irrigation service fees, and the overall budget requests from the Union government.

19. **Disbursement System.** The use of the budget is in the hands of so-called “drawing officers” i.e., the Deputy Director or assigned Assistant Director. A distinction needs to be made between payments made to suppliers or contractors based on invoices, and works done on “force account”.

20. Drawing Limit. When the budget is allocated, money is transferred to a bank account managed by the drawing officers. One account has separate budget heads in accordance with the approved budget. Each quarter the drawing officer makes cash flow projections based on the approved work plan and requests a “drawing limit” to the DG through the Director. A drawing limit is the approval to use budget per budget line over the following quarter. When checked by the Director of Planning and Works, and the Director of Accounts and approved by the DG, the DG informs the central Myanmar Economic Bank and the Assistant Director. The Central Myanmar Economic Bank then informs the local Myanmar Economic Bank of the approval, send money to the local account, and money can be released.

21. Withdrawals. The Assistant or Deputy Director receive invoices or requests for payments from suppliers or contractors. After verification and when the Drawing Limit is approved, the Drawing Officer can instruct the accounts officer to make payments either through a check or in cash.

22. The efficiency and effectiveness of this disbursement system is founded on the force account approach of the last decade. With the modernization of the banking system and the foreseen increasing involvement of the private sector in development and O&M a review of this disbursement system is advisable. This also needs to be seen from the perspective of the level of responsibility in financing O&M by the regions, where more authority for financial transactions may be shifted.

## Annex 2: Department of Agriculture

1. The Department of Agriculture (DOA) is the principle agency providing extension and education services to farmers, although the Industrial Crops Development Department, which was merged with DOA in 2015, also provided extension services for industrial crops but covered only certain areas where industrial crops are grown.

2. **Vision:** DOA's vision is to contribute to increased self-sufficiency of domestic consumption as well as to increase export of excess production. DOA's role is seen in training and education, research and development and seed production. DOA's main function is to transfer technologies to farmers to get better economic returns by increasing yields and improving crop quality in line with the six priorities for development of production of main crops such as rice, corn, ground-nut, sesame, sunflower, mustard, niger, pulses, chilli, onion, garlic and potato as culinary crops.<sup>31</sup>

3. **Priorities:** DOA's "six key priorities" are set to ensure the development of the crop subsector: (i) strengthening of profitable and sustainable markets for farmers; (ii) utilization of good-quality seeds to produce quality products; (iii) utilization of Good Agricultural Practices; (iv) efficient application of inputs such as irrigation water, agrochemical, and fertilizers; (v) encouragement to establish an agro-based industry that can produce value-added products from agricultural raw material; and (vi) reduction of production and transactional costs along the supply chain.

4. The vision, role and function of DOA formulated above may not yet completely reflect the recent restructuring of the MOALI that took place in 2015/16 and, amongst others, led to the merger of DOA with the DOIC. Functions of DOIC were incorporated into DOA as additional specialized crop divisions, namely the Perennial Crops Division, Cotton and Allied Fiber Crops Division, Sugar Crops Division, and the Coffee and Seasonal Crops Division, bringing the number of DOA's divisions to a total of fifteen when added to Divisions: Policy and Administration; Finance; Supply and Logistics; Project Planning, Management and Evaluation; Seed; Land Use; Plant Protection; Horticulture & Plant Biotechnology; In-Service Training Centre and State Agricultural Institute; Agriculture Extension; and Rice.

5. **Divisions of the former DOIC:** The Perennial Crops Division works on macadamia, cashew, oil palms, and rubber-related activities such as rubber clone trials and selection of high yielding clones. The Cotton and Allied Fiber Crops Division works on cotton and jute: for example, cotton seed production, BT cotton, etc. The jute-related activities came to a standstill since no proper processing facilities exist. The Sugar Crops Division amongst others maintains the Central Seed Farm. The Coffee and Seasonal Crops Division is engaged in larger commercial farms, seed production and some research activities.

6. **Collaboration:** DOA's in-house collaboration needs to be strengthened. Following the merger of departments, it would be beneficial to have stronger collaboration between DOA

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<sup>31</sup> Based on MOALI's <http://www.moai.gov.mm/index.php/doa> (accessed on December 5, 2016).

divisions, especially between those actively involved in research and farm advisory services such as the specialized crop divisions and the Divisions for Extension, Land Use, Seeds, and Plant Protection. Extension staff usually lack training and knowledge in most of the crops handled by the specialized crop divisions. Since the specialized crop divisions do not generally provide extension services with a broader coverage, and the Extension Division lacks the Subject Matter Specialists for these crops there is a vacuum for providing the good agricultural practices to farmers involved in these crops. Furthermore, frontline extension staff would benefit from more regular and systematic training provided by other divisions. The first step should be a review of the existing divisional mandates and the collaboration and in-house training mechanisms, followed by a training need assessment of front-line extension staff.

7. Collaboration between DOA and DAR also needs to be reviewed and strengthened. Since some of the specialized crop divisions under DOA are currently also involved in research and extension activities the divisions' core tasks, and their collaboration with each other and with DAR's divisions (such as with the Rice and Other Cereal Crops Division, the Oil Seed Crops and Food Legumes, and the Industrial Crops and Horticulture Division) should be reviewed. Collaboration exists to some extent for sugarcane, cotton and jute research, not for coffee, rubber and palm oil. Of particular importance is the collaboration between DAR and those DOA divisions involved in agricultural extension activities in the area of seed production, plant protection, soil fertility management, water management, and agronomy.

8. **State Agricultural Institutes:** DOA manages seven State Agricultural Institutes: Pyinmana, Thahtone, Myaungmya, Shwebo, Patheingyi, Pwintphyu, and Tharyarwady. The yearly intake of each institute is around 200 students (Cho 2013). In addition, the Central Agricultural Research and Training Centre in Hlegu Township, near Yangon, offers pre-service and in-service training and plays a complementary role in preparing Yezin Agricultural University and State Agricultural Institutes graduates for their entry into service and additional specialized training during service.

9. **Human resources in the Extension Division:** The Extension Division employs the largest number of staff. The current status of the extension staff indicates a total workforce of 7,557 countrywide. Out of this only 0.1 percent are PhD holders, 1 percent hold a Masters' degree and 22 percent hold a Bachelors' degree, whereas the majority are Diploma holders. High degrees of education are not necessarily linked to higher positions within the Division. Table 49 shows the staffing of the Extension Division as of March 31, 2016.

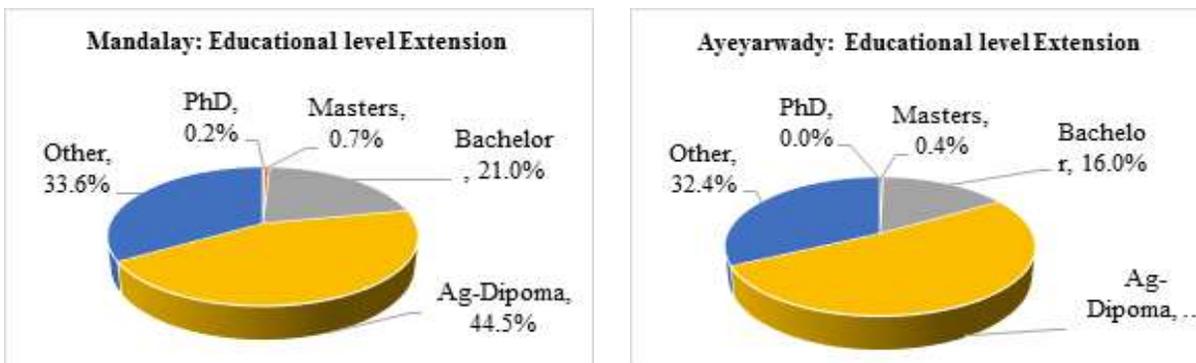
**Table 49: Staffing of the Extension Division**

Designation	PhD	MSc	BSc	Diploma	Ag High School	Others	Total
Director	0	0	8	0	0	2	10
Deputy Director	1	0	34	0	0	14	49
Assistant Director	1	6	84	6	0	15	112
Staff Officer	3	15	406	106	1	37	568
Head of Branch	0	0	3	1	2	47	53
Deputy Staff Officer	1	17	455	759	136	106	1,474
Assistant Staff Officer	0	8	238	1,169	722	311	2,448
Deputy Assistant Staff Officer	0	0	317	1,277	147	282	2,023
Daily Wage Laborers	0	2	136	644	27	11	820
<b>TOTAL</b>	<b>6</b>	<b>48</b>	<b>1,681</b>	<b>3,962</b>	<b>1,035</b>	<b>825</b>	<b>7,557</b>

Source: DOA, WB staff estimates.

10. The extension services in Mandalay and Ayeyarwaddy Regions may serve as an example and reflect the overall situation. They are also dominated by Agricultural Diploma holders (45-51 percent), followed by other qualifications (32-34 percent), Bachelor degree holders (16-21 percent) and last but not least marginal numbers of Master’s (0.4-0.7 percent) and PhD degrees (only two staff members) (Figure 50). Most of the Master’s and PhD degree holders are women. It is common that frontline extension workers are younger and less experienced staff members at the beginning of their career.

**Figure 50: Education of extension staff in Ayeyarwaddy and Mandalay Regions**



Source: DOA, WB staff estimates.

11. The distribution of extension staff across the Regions and States is presented in Table 50. The data shows that the distribution of staff correlates with the area sown except in a few Regions and States such as Sagaing, Bago, and particularly Ayeyarwaddy. Although Ayeyarwaddy Region contributes 22 percent of area sown with some major crops, it has only 7 percent of extension staff.

12. **Coverage:** Coverage of extension advisory services in terms of acres of agricultural land per extension agent poses an additional challenge. The townships of Yinmarbin and Pale, both in Yinmarbin District in Sagaing Region and Tatkone in Ottarathiri District in Naypyitaw Region may serve as an example. These Township Offices have between 30 and 40 staff, including those under training (“apprentices”). One extension agent may be responsible for anywhere between 2,000 and 10,000 acres, but in reality they manage to serve only 6,000 acres and not more than

1,000 farmers. This situation is exacerbated by the lack of adequate mobility and innovative IT solutions; accordingly, the frequency of contact between farmers and extension agents is sporadic and suboptimal.

**Table 50: Regional distribution of extension staff**

Region/State	Number of Extension Staff	% Area Sown*	% Staff posted in Region/State
Extension Head Quarter	195	n/a	n/a
Naypyitaw Council	378	n/a	n/a
Kachin State	132	2%	2%
Kayah State	134	1%	2%
Kayin State	172	3%	2%
Chin State	259	1%	3%
Sagaing Region	972	15%	13%
Taninthari Region	142	1%	2%
Bago Region	1,071	17%	14%
Magwe Region	850	12%	11%
Mandalay Region	826	10%	11%
Mon State	327	3%	4%
Rakhine State	440	4%	6%
Yangon Region	350	6%	5%
Shan State	798	7%	11%
Ayeyarwaddy Region	511	21%	7%
<b>TOTAL</b>	<b>7,557</b>		

Note: \*Sown area is calculated as total area sown with the major cereals, pulses, and oil crops (paddy, wheat, maize, groundnut, sesame, black gram and green gram).

Source: DOA, WB staff estimates.

13. **Extension approaches:** The current extension approach is little oriented toward the problems as perceived by farmers, does not facilitate more frequent field visits due to budgetary constraints, and is suboptimal in fostering knowledge sharing between farmers, between farmers and extension agents, and between extension agents and researchers. Current extension focuses on transfer of technologies aimed at increasing yields rather than maximizing returns on farmers' investments.

14. The mindset in terms of extension methodology is still influenced by previous limited-scope approaches from the 1970s such as the High Yielding Program, also called the Selective Concentration Strategy, and the Training and Visit System. The government-driven High Yielding Program/Selective Concentration Strategy approach especially focused on the establishment of demonstration plots organized and managed in collaboration between extension agents and contact-farmers. This system still partially exists with much emphasis on the introduction of new seed varieties, especially hybrid rice. Demonstration plots are usually close to good roads for easy accessibility by visitors. Additionally, the government built so-called "production camps" to train groups of farmers. Farmers would be invited to attend demonstrations two-three times per cropping cycle. Many of these "production camps" are not functional anymore although recent projects are reviving some (e.g., the IFAD-funded FARM).

15. Since extension agents have to cater to a large number of farming households and have to use their own means of transport (e.g., private motorbikes), for which they receive some

compensatory allowance depending on the distances travelled, field visits and direct contacts with farmers are rare. In addition, extension agents are ill-equipped with extension tools in the form of modern information technology and applications, or with more simple practical tools such as Leaf Color Charts.

16. More modern agricultural extension systems such as Farmer Field Schools have been successfully introduced by various projects, especially in projects facilitated through the LIFT. Although these approaches are strong on farmer participation and learning, have earned the trust of farming communities, and have shown good results their outreach in terms of villages or districts covered is still small, the costs relatively high, and their scalability a challenge.

17. Of particular concern is the lack of interaction between DAR and extension, which contributes to the large yield gap between research and farmers' achievements. Most extension messages are centrally designed and mechanically implemented by field staff over a diverse range of agro-ecological and socioeconomic conditions, without proper consideration of farmers' needs and limitations or of market requirements.

18. Other countries in the region have tried to optimize the outreach and coverage of extension agents by aggressively introducing modern information technologies and web-based applications by using smartphones, tablets, micro-projectors, and SMS services. These applications not only empower the extension agent but also the farmer him/herself and have the capacity to deliver a wide range of services such as weather information, market information, crop management, etc. The inclusion of such technologies in participatory extension approaches such as Farmer Field Schools may also help to make them more cost-efficient. Some examples of successful applications are discussed below.

19. **India, the case of mKisan Portal**, <http://mkisan.gov.in/>: As part of the agricultural extension modernization under the National e-Governance Plan - Agriculture, various modes of delivery of services have been envisaged. These include Internet, touch-screen kiosks, agri-clinics, private kiosks, mass media, Common Service Centers, Kisan Call Centers, and integrated platforms in the departmental offices coupled with physical outreach of extension personnel equipped with pico-projectors and hand held devices. However, mobile telephony (with or without Internet) is the most potent and omnipresent tool of agricultural extension.

20. The project, conceptualized, designed, and developed by the Department of Agriculture and Cooperation widened the outreach of scientists, experts and government officers posted down to the Block level to disseminate information and provide advisories to farmers through their mobile telephones. SMS Portal was inaugurated by the Hon. President of India on July 16, 2013 and since its inception, nearly 327 crore messages or more than 1,044 crore SMSs have been sent to farmers throughout the country. These figures have risen ever since.

21. These messages are specific to farmers' specific needs and relevant at a particular point of time and generate a heavy inflow of calls in the Kisan Call Centers where people call up to get supplementary information. SMS Portal for Farmers empowered all central and state government organizations in agriculture and allied sectors (including State Agriculture Universities, Krishi Vigyan Kendras, Agromet Forecasts Units of India Meteorological Department, ICAR Institutes, organizations in animal husbandry, dairy and fisheries) to give advisory services to farmers by SMS in their language, preference of agricultural practices, and locations.

22. **Digital Green**, <https://www.digitalgreen.org/>: Digital Green is a not-for-profit international development organization that uses an innovative digital platform for community engagement to improve lives of rural communities across South Asia and Sub-Saharan Africa. Digital Green partners with public, private and civil society organizations and institutions such as Ministries of Agriculture, NGOs, etc. to share knowledge on improved agricultural practices, livelihoods, health, and nutrition, using locally produced videos and human-mediated dissemination. In a controlled evaluation, the approach was found to be 10 times more cost-effective and uptake of new practices 7 times higher compared to traditional extension services. Digital Green currently implements projects in collaboration with over 20 partner organizations across 9 states in India and parts of Ethiopia, Afghanistan, Ghana, Niger, and Tanzania.
23. Village-level mediators, trained by Digital Green and its partners, produce and share videos on locally relevant agronomic, health and livelihood practices to motivate and educate community members. The equipment used for video production and dissemination is of low cost, durable and easy to use, and adaptive to diverse environments.
24. A community video production team of four to six individuals in each district creates videos, averaging 8-10 minutes in length that are screened for small community groups twice a week using battery-operated pico-projectors. A facilitator from the community mediates a discussion around the video screenings by pausing, rewinding, asking questions, and responding to feedback. Regular adoption verification visits are scheduled for gauging the impact of the dissemination on actual practices.
25. **IRRI Crop Manager**, <http://cropmanager.irri.org/?gclid=CK2q6MPAsNECFcIK0wodI4MGEG>: The International Rice Research Institute (IRRI) Crop Manager is a decision-making tool accessible through the web browser on computers and smartphones. It provides small-scale rice, wheat, and maize farmers with crop and nutrient management advice customized to farming conditions and needs. It can be used by extension workers, crop advisors, and service providers to interview a farmer and provide advice.
26. **IRRI Rice Doctor**, <http://www.knowledgebank.irri.org/decision-tools/rice-doctor>: IRRI Rice Doctor is an interactive tool for extension workers, students, researchers and other users who want to learn and diagnose pest, disease, and other problems that can occur in rice and how to manage them. It was developed by an international team involving IRRI, Lucid Team at the University of Queensland, Australia, Philippine Rice Research Institute (PhilRice), and the Research Institute for Rice, Indonesia.
27. **ICRISAT Mobile App for Pest and Disease Management of Crops**, <http://www.icrisat.org/mobile-app-for-pest-and-disease-management-of-crops/>: An app that allows farmers to identify pests and diseases using their mobile phones and provides remedial measures is the latest addition to using modern digital tools to benefit smallholder farmers. A key feature of the mobile app “Plantix” is automated disease diagnosis. Farmers can upload a photo of their infected crop and the app will provide a diagnosis. Besides giving a diagnosis and steps to mitigate the disease, the app provides information on preventing the disease in the next cropping season. Farmers are also presented biological treatment options for pest and disease control. Given the rampant overuse of chemical pesticides in India, the app also helps disseminate best practice methods to reduce pesticides. The app also features a library of diseases that farmers can refer to when there is no Internet connectivity.

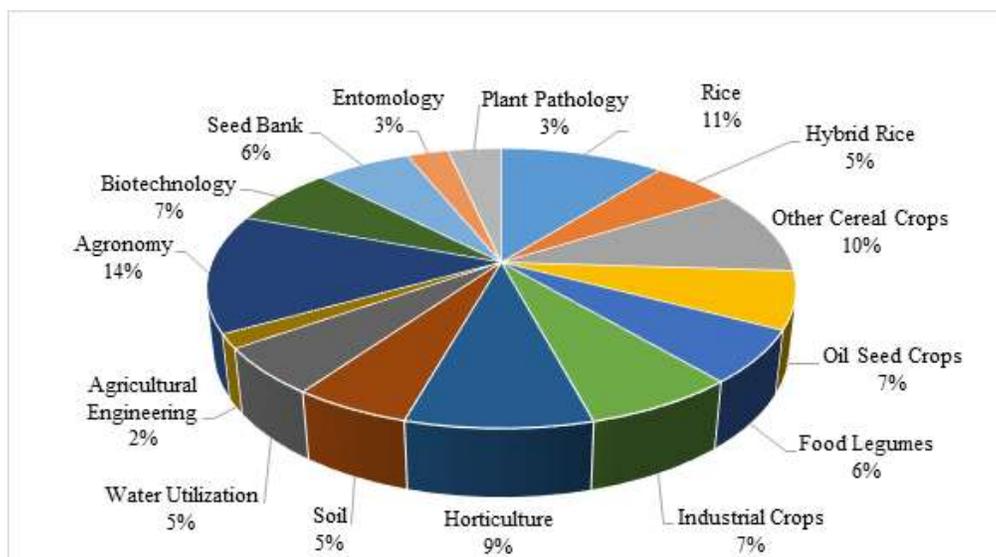
### Annex 3: Agricultural Research

1. This review does not conduct a detailed and thorough analysis of the Department of Agricultural Research (DAR) due to the complex agenda for reforming agricultural research and education institutions in Myanmar, which requires a thorough institutional analysis. This Annex provides some information on DAR's budget and the general issues reducing the effectiveness of DAR's operation.

2. Budget allocations to DAR grew over the years, from 2.9 billion Kyats in 2013/14 to 9.8 billion Kyats in 2016/17. Significant gains were made especially in the capital budget. However, budget data obtained from DAR by divisions and sections only display the current budget, not the capital budget (Figure 51). Therefore, it is impossible at this point to assess where the priorities for investments in research and development were.

3. It is worth noting that despite the recent increase in total budget, the ratio to agricultural GDP is still low and only increased from 0.02 percent in 2013/14 to 0.04 percent in 2016/17, which is extremely low when compared to other countries in the region (Table 18).

**Figure 51: DAR's recurrent budget is thinly spread for many activities**



Source: MOALI, WB staff estimates.

4. The low budget makes it very difficult for DAR to perform its duties and show results. Regional agricultural stations receive little funds for location-specific adoptive research, leaving farmers and extension officers in the dark regarding agricultural practices to promote.

5. Limited collaboration with the DOA also contributes to the low efficiency. Collaboration takes place at the senior management level of both departments, but little joint work occurs between technical divisions or at the regional level. Ample scope exists for closer collaboration to improve the results of both DAR and DOA, ranging from seeds and pest management to good agricultural practices. In practice, these departments work in silos, with little complementarity and overlap, particularly in the areas of foundation seed, soil nutrient management, and pest management.

## Annex 4: Fertilizer Market and Regulations

1. **Fertilizer market:** Myanmar's fertilizer market is experiencing rapid growth. Compared to 2012, total fertilizer use has increased by 50 percent to an estimated 1.2-1.4 million tons of product in 2015. Yet the intensity of fertilizers remains low at less than 30 percent of the world average. The NPK fertilizer use ratio, based upon prevailing farmer practices, is unbalanced in favor of nitrogen.
2. Dependent upon imports for 85 percent of fertilizer supply, the number of licensed fertilizer importers/wholesalers increased from 242 in 2010 to 628 in 2015. About 80 percent of the fertilizer imports are via overland routes, sourced mainly from China and Thailand (IFDC 2014). The balance is imported via the Port of Yangon. Some limited "informal" cross-border trade exists, but is relatively insignificant in terms of total imports. Imports in 2015 was 1,291,060 tons.<sup>32</sup>
3. Domestic fertilizer production is limited to five public ammonia/urea factories; only three are in operation. Due to various constraints, operating efficiency is below 35 percent and annual output is only 150,000–200,000 tons of urea per year. In addition to basic fertilizer manufacture, some companies are involved in processing, mainly bulk blending, of imported commodity-type fertilizers (e.g., urea, ammonium phosphate, and muriate of potash). The domestic processing capacity and annual output are not known.
4. **Fertilizer pricing:** As fertilizer supply is based upon imports, fertilizer prices in Myanmar are heavily influenced by international market prices. Myanmar has no fertilizer price subsidy; prices at all levels in the marketing system are market-based. The market is highly competitive. Downstream fertilizer marketing is handled by 835 licensed fertilizer distributors and more than 3,200 retailers/dealers. The dealer network extends throughout the country; on average, each dealer serves about 1,300 farmers. Fertilizer price mark-ups realized by importers/wholesaler and retailers/dealers are estimated at 8 percent and 2-3 percent, respectively.<sup>33</sup> Competitive strategies are largely based upon price and new product offerings (e.g., multi-nutrient compounds with micronutrients). Little attention is devoted to fertilizer promotion and technology transfer to farmers.
5. **Fertilizer use in agriculture:** In 2015, fertilizer use in Myanmar totaled 1.2-1.4 million tons of product: a 50 percent increase over the estimated use level in 2012. Despite the increase, the intensity of fertilizer use in Myanmar is extremely low by world and regional standards. Farmers currently use only 23 kg of fertilizer nutrients per ha *versus* a world average of more than 100 kg per ha. Reflecting the dominance of rice in the cropping system, urea accounts for about 60 percent of the product mix. In recent years, there has been increased emphasis on the introduction of multi-nutrient NPK products, which currently account for an estimated 26 percent of the market. Granular Triple superphosphate accounts for 8 percent of the market.

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<sup>32</sup> Information provided by the Land Use Division (LUD) in personal communications.

<sup>33</sup> Fertilizer price mark-ups realized by private sector importers and dealers vary by country depending upon government fertilizer price policy and market-related factors such as wholesaler/dealer services provided, competition in the market, volume of throughput, and risk. Based upon the stage of growth in the Myanmar fertilizer market, fertilizer price mark-ups would be expected to be in the range of 8-10 percent at the importer/wholesale level and 4-6 percent at the retailer/dealer level. To illustrate: in Bangladesh, the government fixes the maximum retail price. Importers/distributors and retailers realize gross margins in the range of 4-11 percent and 1.24-6.25 percent, respectively.

6. The increased emphasis on NPK formulations (in many cases fortified with secondary and micro-nutrients) appears to reflect a supply-driven phenomenon rather than being demand-driven, as importers seek to increase market share through product mix diversification. In some cases, importers/wholesalers/local processors are conducting research/trials to validate the need for specific formulations. For example, AWBA is conducting more than 400 fertilizer trials per year involving various crops in different agro-ecological zones. Based upon their findings, their product mix is adjusted to include various NPK formulations.

7. The official fertilizer recommendations (which originate from LUD) are only for 10 most important crops and they are outdated. With the exception of those firms conducting their own research trials, the basis for some NPK formulations is not clear (Box 5).

**Box 5: NPK fertilizers and conditions for their effective use**

Advancing multi-nutrient fertilizers (i.e., NPK formulations) that are tailored to specific crops/soils in specific agro-ecological zones in Myanmar is important to improved agricultural productivity and farmer returns. Three fundamentals for success are: (i) establishing the requirement for specific formulations based upon proper agronomic research/fertilizer trials; (ii) delivering quality NPK formulations compliant with the “truth in labelling” concept; and (iii) educating farmers on best fertilizer management practices. At present, existing systems in Myanmar do not adequately support fertilizer quality assurance and improved fertilizer use management.

*Source: WB staff.*

8. **Market outlook:** The outlook for the Myanmar fertilizer market is positive, based upon the following factors:

- a. The intensity of fertilizer use in Myanmar is very low (vis-à-vis the world average) and farmers are not practicing balanced fertilizer use, critical to yield improvement (quantity and quality).
- b. About 70 percent of the population is rural, mostly engaged in rice farming – the potential for rice yield improvement and crop diversification (e.g., vegetables, horticulture) is favorable, necessitating improved crop nutrient management.
- c. The recent growth trend in terms of fertilizer use is positive.
- d. Private sector participation in the fertilizer market is rapidly expanding at all levels – import, wholesale/distributor and retailer.
- e. An investment of more than \$40 million by Myanmar and multinational firms in improved fertilizer technology is in progress, indicative of investor confidence in future growth.
- f. The Myanmar Seed and Fertilizer Association was created in 2013 by major private sector stakeholders to promote (among others) orderly fertilizer market development.
- g. The MOALI places a high priority on improved agriculture productivity and technology adoption by farmers, including fertilizers. In addition, international development organizations/agencies are engaged in agriculture sector support in areas that will have a positive impact on fertilizer market development (e.g., agribusiness development/value-added processing, dealer training, crop diversification, infrastructure rehabilitation).

9. **Major issues related to fertilizers:** The major fertilizer-related issues are as follows:
- a. Fertilizer quality: Confidence among farmers (and at all stakeholder levels) in the quality of fertilizers is seriously lacking in Myanmar. Quality deficiencies reputedly arise in four areas: (i) purposeful adulteration; (ii) mixing of low-analysis products with high-analysis products; (iii) rebagging inferior brands of fertilizer in bags of more favored brands; and (iv) short-weight bags. In addition, there is scope that imported product quality differs from the quality of the samples provided to and analyzed by LUD (IFDC 2014). In addition, bags labelled in languages other than the accepted Burmese/English language contributes to farmer and dealer uncertainty.
  - b. Farmer access to advisory services on fertilizers and crop nutrient management: Farmers do not have access to quality advisory services on crop nutrient requirements for various agro-ecological zones. This is due in part to the fact that the official fertilizer recommendations are dated and concern only 10 crops. The DOA Extension has limited effectiveness in providing farmers updated crop nutrient advisory services given the rapidly changing mix of fertilizer products. Importantly, private sector fertilizer dealers/retailers (the “sales point of contact” for farmers , who are well positioned to provide advisory services to farmers on soil nutrient management/the most appropriate fertilizer products to meet their needs) have no formal training in crop nutrient management and fertilizer products and their use. At present, very few dealers have sufficient knowledge to advice farmers, a weakness magnified by the entry of numerous NPK compounds in the market.
10. **Fertilizer legislation and regulations for fertilizer quality control:** The role of the public sector is in: (i) establishing the policy framework and regulatory system; (ii) providing administrative/technical guidance and oversight regarding the various provisions of the law (e.g., establishing fertilizer-related terms and definitions, licensing of private sector importers/wholesalers/retailers, general guidelines to regulate the market, product registration approval, and fertilizer quality control); (iii) managing the government ammonia/urea fertilizer factories; and (iv) carrying out fertilizer-related research and support.
11. The Fertilizer Law (2002/amended 2015) provides the policy framework for regulating fertilizer manufacture, trade, in-country marketing, and use in Myanmar. It provides for a market-oriented policy environment. Under the purview of the MOALI, the Law is administered through the Fertilizer Committee which includes representatives of relevant ministries concerned with business licensing and trade as well as the MOALI (e.g., LUD) and the law enforcement authority.
12. Functioning under the authority of the Fertilizer Committee, the Fertilizer Technical Committee provide technical expertise on fertilizer-related matters. The Technical Committee comprise eight members, with five (including DG as Chair) from DOA, and two from DAR (DG serving as Deputy Chair), and one from Yezin Agriculture University.
13. The Fertilizer Law addresses the key elements typical of fertilizer legislation and regulations in market-oriented fertilizer markets. It provides guidelines applicable to fertilizer commerce in Myanmar. However, important elements of the Law are inadequately covered. For example: (i) fertilizer-related terms and definitions are not complete and (in some cases) lack clarity and /or conformity with internationally accepted definitions; (ii) tolerances for allowable

variances in nutrient content and bag weight are not stipulated; and (iii) penalties for violations are not well defined (see also World Bank 2016a).

14. **Role and functions of Ministries and Agencies related to fertilizer quality control:** LUD is the government agency responsible for fertilizer product registration and fertilizer inspections. The Director of LUD serves as Assistant Secretary of the Fertilizer Committee.

15. LUD has two fertilizer analytical laboratories. The main laboratory, located in Yangon, is fully equipped to conduct complete analyses of fertilizers and is responsible for testing all fertilizers for registration purposes. The laboratory in Mandalay was established in 2013/14 and is equipped to conduct analyses of major and secondary nutrients only. In total, LUD conducted 1,257 and 2,606 chemical analyses of fertilizer samples in 2014 and 2015, respectively.

16. LUD does not have its own written inspection protocols and methodologies for fertilizer inspection, including sampling and analyses. It does not apply risk management and risk-based inspections principles. Rather, it generally follows the guidelines of the Fertilizer Control Order of India of 1985, which is generally compliant with internationally accepted standards. However, it includes language specific to the India fertilizer policy framework, which does not apply to Myanmar.

17. LUD adapted the India Control Order inspection protocols to its requirements and capacity limitations. It basically relies on product testing at registration as the quality control “check point” and only sporadically draws samples at various points in the supply chain. LUD also conducts analyses of fertilizers if farmers file a complaint regarding fertilizer quality. Two key deficiencies in the LUD inspection protocols are: (i) samples are not routinely drawn by the LUD staff based upon accepted sampling method/inspection protocols at the entry point for imports and at domestic processing factories; and (ii) regular/ongoing inspections are not conducted at wholesale and retail points of sale. The effect of the LUD inspection protocols is *an overreliance on the testing of products at registration as the “quality assurance check”, with little attention to fertilizer quality checks in the market or risk management.*

18. **Fertilizer sampling protocols and methodologies:** These are not consistent with international standards which seek to routinely and systematically inspect fertilizers throughout the value chain. Key weaknesses are that:

- a. Sampling protocols are ineffective in quality assurance; samples are provided by the importer rather than being drawn by LUD inspectors based on risk management principles.
- b. Sampling protocols do not involve extensive sampling in wholesale and retail markets.
- c. Fertilizer sample taking is not consistent with proper guidelines that allow for drawing a representative sample.

19. Within the private sector, fertilizer quality assurance is largely based upon supplier: importer relationships whereby importers trust that their supplier will provide quality fertilizers in accordance with contracted technical specifications. Importers rely on LUD’s verification of quality. Some large importers contract with independent inspection firms such as SGS to inspect fertilizer cargoes upon arrival in Myanmar. However, this does not appear to be a standard practice. In the case of fertilizer processors in Myanmar, there seems to be a general reliance on their process systems to achieve quality and subsequent LUD analyses (if any). Fertilizers

processed in Myanmar are not routinely tested for quality by processors. The capacity of importers in international procurement of fertilizers and contracting and of importers/processors has not been fully appraised. However, it is of concern based upon prevailing practices.

20. **Fertilizer product registration:** Prior to import, all fertilizers must be registered in accordance with provisions of the Fertilizer Law. The process is relatively straightforward and essential comprises the following:

- a. Intending importer completes registration application and provides to LUD a sample of the fertilizer (provided by supplier) and a photograph of the bag label for the intended import
- b. LUD conducts laboratory analyses of the sample to verify nutrient content vis-à-vis the specifications stipulated by intending importer and as identified on the bag label – all samples for product registration are tested in the LUD Yangon laboratory. LUD’s methodology is based upon the internationally accepted Association of Official Agricultural Chemists methodology for fertilizer analyses.
- c. LUD reports results of the analyses to the Fertilizer Technical Committee for onward consideration of the application for fertilizer product registration.

21. The registration formalities mean that each individual fertilizer import consignment is registered. This results in a very high number (2,071 in 2016) of registered fertilizers. Once registered, the registration for the fertilizer is valid for three years. A reference manual of all registered fertilizers is updated on a continual basis. The manual of “registered fertilizers” includes the name of the fertilizer, technical specifications based upon the Yangon LUD laboratory analyses, and a photograph of the bag. While a rather bureaucratic process, there is value to the “system”. For example, in the event of a quality issue with a fertilizer product, the importer can easily be linked with the fertilizer product in question. The current system may be improved with an “on-line” list of registered products. See Box 6 for good global practices for Myanmar to follow.

**Box 6: Good practices for fertilizer registration**

- Require private companies to register fertilizer products. The registration would ideally be valid indefinitely.
- In countries where registration is limited to a specific time period, ensure: (i) validity of at least 10 years; and (ii) automatic renewal of application.
- Develop efficient and affordable fertilizer product registration.
- List registered fertilizer products in an official catalog that is accessible online.

*Source: World Bank 2016a.*

22. Although LUD is performing its role in fertilizer product registration, capacity-related constraints (human and physical) and the methodologies used in inspections at key points in the fertilizer supply chain limit its effectiveness in quality assurance.<sup>34</sup>

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<sup>34</sup> A full appraisal of LUD staff was not conducted. Based upon multiple meetings with LUD officials and laboratory visits that allowed for interaction with laboratory staff, LUD staff are dedicated to quality performance and eager to

23. **Bulk blending of fertilizers:** The rapid increase in bulk blending of fertilizers presents further quality challenges in Myanmar. Bulk-blending of fertilizers involves precision “mixing” of dry commodity-type fertilizers (e.g., urea, di-ammonium phosphate, muriate of potash) to achieve a specific fertilizer grade. It is an excellent technology that has potential to provide cost-efficiencies relative to multi-nutrient products manufactured under chemical granulation processes. A proven technology that is well established in developed markets (e.g., United States, Europe, Australia), bulk blending allows for tailoring a fertilizer grade to a specific crop requirement. Despite its potentially significant advantages, bulk blending presents challenges. The key challenges are in achieving a “blend” with (i) consistent individual nutrient values in the case of each bag of fertilizer (i.e., each bag of blended fertilizer contains the specific nutrient values identified on the bag label) and (ii) excellent physical properties (i.e., the fertilizer is dry and in a free-flowing condition). Key factors that impact the quality of fertilizer blends are presented in Box 7.

**Box 7: Key issues that impact the quality of fertilizer “blends”**

Problems that arise in fertilizer “blends” are generally due to:

- Variance in nutrient content which results from: (i) poor blending equipment, not specifically designed for fertilizer blending; (ii) operator error (in raw material selection and/or metering, mixing time); (iii) segregation of the blended raw materials due to use of raw materials that are not homogeneously sized, excessive handling after mixing); and (iv) failure to assure mixing vessels are free from fertilizer residue of previous blend batches and/or moisture
- Poor physical properties which results from: (i) incompatibility (chemical and/or physical) of raw materials; (ii) exposure of raw materials and/or finished blends to moisture; and (iii) poor “post-processing” storage/handling.

*Source: WB staff.*

24. **Fertilizer import management:** A more serious issue that impacts fertilizer quality in Myanmar is that private sector importers often forgo their own quality assurance verification, relying instead on the supplier quality control systems and LUD fertilizer inspection at registration. This behavior is not typical of most countries (Box 8). Box 9 presents good practices for fertilizer import management, which are not yet adopted in Myanmar.

**Box 8: Quality assurance in fertilizer import management**

A typical “quality assurance protocol” for fertilizer importers includes the following (at a minimum):

- ✓ Include in contract of purchase:
  - Detailed and complete fertilizer technical specifications in contract for purchase.
  - Detailed bag specifications and bag labelling/markings (for bagged cargoes).
  - Provision for a “clean inspection report” by an independent cargo inspection firm (selected by importer) either at point of loading or at discharge, depending upon

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improve their knowledge in areas that will impact capabilities to conduct analyses for new fertilizer products entering the market.

contract of purchase terms.

- ✓ Contract with independent cargo inspection firm to perform independent inspection as per contract condition.

*Source: WB staff.*

### **Box 9: Good practices for fertilizer import requirements**

- Allow fertilizer products already registered in another country (with good policies, regulations and quality and standards requirements) to be imported without requiring reregistration in the importing country.
- Allow private companies (including foreign ones) to import fertilizer for own use and sale.
- Require private companies to register as importers of fertilizer to sell it.
- Do not limit registration to a specific time period.
- In countries where registration is limited to a specific time period, ensure validity of at least 10 years.
- Ensure that the cost of registration is affordable.
- Allow private companies to import fertilizer without needing to obtain a special permit.
- In countries where a permit is required, do not limit the permit to a specific time period.
- Ensure that the cost of permit is affordable.

*Source: World Bank 2016a.*

**Changes are needed going forward to ensure that any increase in budget improves the current situation. Both the public and private sectors have key roles to play in assuring that only high-quality fertilizers are sold to farmers and in providing farmers access to sound advisory services on crop nutrient management and the most appropriate fertilizer products for their needs. Reform of the Myanmar Fertilizer Law to an accepted international standard will provide a solid foundation to fertilizer sector development and provide clarity on fertilizer quality issues. Fortification of LUD capacity and reorientation of inspection protocols and methodologies based on risk management and risk-based inspections will contribute to fertilizer quality assurance. LUD's attention to upgrading crop/zone-specific fertilizer recommendations for all significant crops in Myanmar will support improved fertilizer use efficiency and increased returns to farmers. Private sector capacity building at the fertilizer importer/processor levels is needed to assure that fertilizers entering the Myanmar market are consistent with the "Truth in Labelling" concept. And, capacity building at the dealer/retailer level will contribute to knowledge transfer to farmers on fertilizer "best management practices" and provide a further measure in fertilizer quality control. A summary of options for reforms, deficiencies negatively impacting the fertilizer market, recommended actions, and expected results are presented in**

25. Table 51.

**Table 51: Extended list of options to improve fertilizer quality and soil nutrient management**

<b>Reform Issue</b>	<b>Deficiency</b>	<b>Recommended Actions</b>	<b>Impact</b>
1. Fertilizer Law/Regulatory System	1. Definitions incomplete/nonconforming with international standard. 2. Poor clarity in language Insufficient detail on accepted values: bag weight, nutrient content, penalties.	Upgrade law to reflect complete set of definitions, clarity in language, and specifics regarding nutrient and bag weight tolerance limits and penalties for violations.	1. Improved stakeholder awareness of legal requirements related to fertilizers and consequences of violations. 2. Solidified foundation for fertilizer quality.
2. LUD inspection protocols	1. Fertilizer inspections not performed at adequate level in key points in value chain. 2. Inspection/sampling methodologies deficient.	1. Continue with product registration formalities in current approach; strengthen systems through routine and ongoing inspections at point of entry for imports, processor/blender sites, and market sales points. Develop fertilizer inspection manual to guide field inspectors and to apply risk management and risk-based inspections principles to maximize LUD human resources.	1. Improved fertilizer quality. 2. Restored stakeholder confidence in fertilizer quality. 3. Improved functioning of fertilizer market with reduced violation of fertilizer product “truth in labelling” concept. 4. Develop risk management system and risk-based inspections to be applied throughout the fertilizer value chain.
3. LUD laboratory operations manual	No fertilizer laboratory operations manual specific to Myanmar.	Develop analytical laboratory operations manual, compliant with reformed Myanmar Fertilizer Law and in conformity with internationally accepted methodologies for fertilizer analyses and safety standards.	1. Clarity in analytical methodologies and laboratory procedures for current and new fertilizer products. 2. Improved safety awareness/safety protocols in laboratory.
4. LUD capacity building – physical facilities	No testing capacity at major point of entry for fertilizer import-- Muse	Establish fully equipped LUD fertilizer laboratory at key border import entry point (Muse) by potentially using PPP model to outsource testing to private sector operated labs to	Improved efficiency in fertilizer inspections and quality checks at import entry.

		establish efficient process and lab management.	
5. LUD equipment upgrades	1. Mandalay LUD laboratory not fully equipped for micro-nutrient analyses. 2. Appropriate sampling equipment not available.	Upgrade LUD equipment at Mandalay laboratory to allow for complete fertilizer analyses; field inspectors equipped with sampling equipment and materials.	1. Fertilizer quality improved. 2. Inspection capacity upgraded.
6. LUD capacity building for staff	1. Laboratory analyst knowledge in accepted fertilizer analytical methodologies uncertain. 2. Fertilizer inspector knowledge weak in internationally accepted sampling methodologies, security of samples, on-site interrelationships with importers/processors.	1. Complete training of LUD fertilizer inspectors on sample procedures to achieve representative samples, protect sample integrity, sample recording, bag closure at sample site. 2. Training of LUD laboratory analysts in internationally accepted methodologies for fertilizer analyses.	Fertilizer quality improved with increased efficiency in inspection protocols/ methodologies and laboratory analyses.
7. Private sector capacity: import/wholesale level actors in	1. Limited knowledge of international fertilizer import procurement management to assure quality. 2. Limited knowledge of fertilizer quality detection.	Upgrade knowledge in import procurement management- emphasis on quality control: fertilizer technical specifications, bagging, independent inspection services, etc.	Fertilizer quality improved with reduction in import of poor-quality products
8. Private sector capacity - retailers in farmer advisory services, detection of fertilizer quality issues, quality control systems in inventory management	1. Poor capacity to provide fertilizer advisory services to farmers 2. Uncertain quality detection capacity and inventory management knowledge.	1. Complete training of dealers in basics of crop nutrient management, fertilizer products and best use practices, nutrient deficiency symptoms in crops, fertilizer quality control and identification of quality deficiencies.	1. Improved fertilizer use management by farmers due to increased knowledge transfer on best use practices 2. Fertilizer quality improved with better detection of quality issues at retail/dealer point of sale.
9. Private sector: fertilizer processors/ blending	1. Uncertain capacity of processors/bulk-blend companies in making multi-nutrient products. 2. Uncertain quality control systems at processor/bulk blend company level.	Train operators in fertilizer processing/blending to achieve high-quality fertilizer blends: basics in technology, problem identification in fertilizers, sampling and testing to support quality assurance.	Fertilizer quality improvement for locally processed/bulk-blend fertilizers at processing point.
10. MOALI fertilizer recommendations upgraded	Fertilizer recommendations not current and limited to only 10 crops.	Update and expand fertilizer recommendations – all crops by agro-ecological zone. Disseminate to members of Myanmar Fertilizer Association and	1. Updated information available to farmers through dealers/retailers and government extension staff and private sector. 2. Improved product mix of

		make available to retailers.	importers/processors based upon updated crop and zone-specific requirements.
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*Source: WB staff assessment.*

## Annex 5: Agricultural Finance

### *Recent developments*

1. Despite its potential, Myanmar's agriculture sector has insufficient financing. In 2013/14, the total amount of credit provision for the rural economy was only 10.3 trillion Kyats; the largest volumes (52.8 percent) were provided by informal moneylenders, other providers, and agricultural input companies. Formal credit provision was led by banks, pawnshops, MFIs, and cooperatives, in descending order (UNCDF 2014). Banks provided 41.7 percent of the total credit, in particular the state-owned bank Myanmar Agricultural Development Bank (MADB). Other banks rarely finance smallholder farmers, who dominate Myanmar's agriculture sector. About 98 percent of MADB loans financed crop production, while only 2 percent sought to promote farming businesses. MFIs provided 0.8 percent and cooperatives provided 0.6 percent.
2. Myanmar's population is very thinly served by the current financing system. A huge financing gap exists between commercial banks and other formal financial institutions. At the low end, the maximum loan size an MFI can produce by law is 5 million Kyats but only a few MFIs can serve big loans above 0.2 million Kyats, and to only a few of their clients. Although MADB has more clients, it is like cooperative societies in serving loans of under 0.5 million Kyats. At the high end, bank loans can be as big as 70 million Kyats, but these go to very few clients. Most people have creditworthiness of between 0.2 million Kyats to 70 million Kyats; these clients have access only to informal moneylenders, whose interest rates are unregulated. Most of these clients are individual smallholders, agri-entrepreneurs, microbusinesses, and smaller SMEs along the agricultural supply chain (UNCDF 2014). It is thus safe to say that currently only microfinancing is available for agricultural lending.
3. Myanmar farmers have access to formal financial services through MADB, which provides agriculture loans to farmers based on their registered land tenure. Loans are provided for up to 10 acres. According to the latest MADB figures, its coverage reached 2.2 million farmers in 2016, focusing mainly on paddy production. Yet apart from the specific type of loans given by MADB, the types of products provided by MADB are extremely limited to serve the needs of the agriculture sector to date.
4. Since the Microfinance Law was enacted in November 2011, over 200 entities have received licenses from the MOPF. These MFIs have served an estimated 2.8 million micro-clients, with a total loan portfolio of 236 billion Kyats (equivalent to \$283 million) in 2013, including those previously serviced by the Central Cooperative Society (CCS) MFIs. These MFIs include rice and other agriculture-specialized companies that serve about 200,000 farmers through commodity trade loans. Most of these specialized companies support advance purchase of farm products from farmers while providing loans when selling them seeds, fertilizers, and other inputs. MFIs mainly finance nonfarm business loans and their outreach to farmers has been rather small compared to that of MADB.
5. Another provider of formal finance in rural areas is the Department of Cooperatives (DOC) of the MOALI, which complements MADB by supporting the needs of rural farmers for their agriculture operations. DOC has some advantages over MADB as its lending conditions are not confined only to paddy farmers; other farmers who grow any profitable crops can also access loan programs while their eligibility of membership in a cooperative does not require tenure registration. In addition, cooperative loans can be used to purchase capital goods such as

agriculture machines and tools, which is not always permissible under other microfinance programs. From this standpoint, DOC activities are complementary and supportive of the government's agriculture credit programs as well as private MFIs, although their impact on access to finance is still smaller than that of other MFIs.

### ***Policy environment for agricultural financing***

6. Financial inclusion has been a challenge for Myanmar, which has the highest unbanked population in the Association of Southeast Asian Nations (ASEAN): less than 15 out of 100 people have access to formal financial services (UNCDF 2014). When Myanmar chaired the ASEAN in 2014, it took the lead in promoting financial inclusion as a regional agenda. Since then, microfinance and other inclusive financial service programs have expanded greatly across Myanmar. These microfinance programs now better serve borrowers' needs and preferences (i.e., the demand side of agricultural finance).

7. Most loans in Myanmar finance working capital. According to the previous Financial Institution Law,<sup>35</sup> all banks require collateral such as land, buildings, agricultural commodities and products, or gold and cash deposits to back loans, with a maximum loan-to-value ratio of 50 percent. As most farmers do not have such collateral, this requirement precludes them from using loan programs to invest in capital goods or agricultural machines.

8. The existing policy environment is not conducive for creation of an effective agricultural finance system. Establishing a proper agricultural financing system would require an increase in credit volume for agribusinesses along agricultural supply chains, starting from smallholder farmers, nonfarm agri-entrepreneurs, and household microbusiness to millers, wholesalers, and retailers to other supporting industries such as transportation, mechanization, and agrifinance services; that volume would need to provide new loan products and supporting services in a stable and sustainable way. The system would need to be financially healthy and strong enough to mobilize credit from investors to businesses. The system should accommodate a wide range of innovative loan products with their purpose, amount, terms, and repayment schedule designed to match agribusinesses' activities. The scope of financial products is as follows:

- a. **One year loans**, which they can be: for seasonal repayment of seasonal crops (paddy, peas and beans, vegetable, tapioca/cassava, horticulture, flowers, etc.); bridging loans to relieve financial difficulty between crop harvests; social loans during family emergencies; and business loans with a regular repayment plan for farm and nonfarm agribusinesses. Loan size would vary with clients' need.
- b. **Short-term loans (up to four years)** that are necessary for farm machinery, vehicles, farming tools, storage facilities, and upgrade and repair of infrastructure. Costs for land preparation and irrigation for planting can be covered. Moreover, perennial crops and plantations, orchards, and fruits can be financed through these loans. Currently, few such loans take place.
- c. **Long-term loans (over four years)** that can be designed for infrastructure development of land, irrigation facilities, mills, processing plants, storage facilities, and wholesale and retail markets. They also can be designed to finance support industries, nonbank financing, transportation, communication, media and information, R&D, business management, and technological development.

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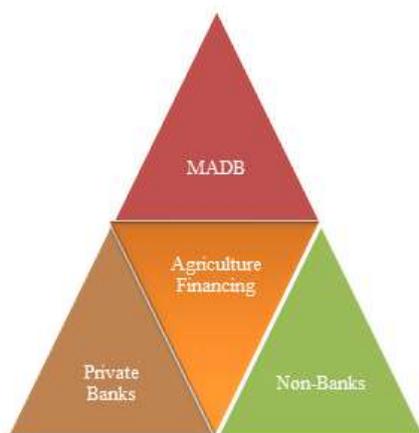
<sup>35</sup> The revised edition of this law was approved by the Parliament in August 2016.

- d. **Insurance (or) guarantee programs** such as crop insurance, infrastructure insurance, credit insurance and loan guarantee programs need to be developed and become operational to relieve the risk of all financial institutions.
- e. **Remittance transfer services:** In recent decades, a large share of Myanmar’s rural population migrated to cities and abroad in search of job opportunities. Their remittances effectively support many rural families’ consumption, livelihood upgrades, and investment for lands and infrastructure for their agribusinesses. Remitted cash is mainly transferred through informal money transfers so remittance transfer services need to be integrated into the formal financial system.

**Key financial institutions**

9. To close the financing gap in rural areas, strong financial institutions are needed to provide financial products effectively. These consist of commercial (private) banks, MADB, and nonbanks (Figure 52). To more effectively serve the rural population, commercial banks should make a downward expansion to small and SME agribusinesses with smaller loans, while MADB and other formal institutions should undertake an upward expansion with bigger loans.

**Figure 52: Strong agricultural financing requires private banks, MADB, and other formal institutions**



**Banks**

10. Banks have the most potential to effectively finance Myanmar’s agriculture. Currently, Myanmar has 10 state-owned banks, including MADB, and 14 private banks licensed by the Central Bank of Myanmar (CBM). Nine foreign banks were licensed to operate in Myanmar by the CBM in 2014 and four more in 2016.<sup>36</sup> In the wave of such change, former state-owned or state-sponsored banks such as Rural Development and Livestock and Fishery Banks transformed to private commercial banks with a chance of becoming fully functional banks.

11. **MADB** is the only state-owned bank financing the agriculture sector. After its proper reform it is anticipated to operate as a development bank and to become the biggest credit

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<sup>36</sup> The four new banks that have been given initial approval are Vietnam's Bank for Investment and Development, Taiwan's E.SUN Commercial Bank, South Korea's Shinhan Bank, and the State Bank of India, according to the Global New Light of Myanmar, quoting the Central Bank of Myanmar. See more at: <http://www.mizzima.com/business-domestic/four-more-foreign-banks-get-myanmar-licence#sthash.Z0JMteAB.dpuf>.

provider to all agriculture supply chain actors, with short- to long-term innovative loan and guarantee products. As it enjoys freedom from the interest rate cap, it could become a strategic partner to other development banks, commercial banks, and financial institutions. It could support agricultural finance such as warehouse insurance for crops through its strategic partners, and could give project-based funding to MFIs for their agribusiness financing operations and to other agencies responsible for development of agricultural and rural infrastructures, for example.

12. MADB is established under the Myanmar Agricultural and Rural Development Bank Law. The State Law and Order Restoration Council enacted the law on July 6, 1990. MADB's main aim is to effectively support the development of agricultural, livestock, and rural socioeconomic enterprises in the country by providing banking services. There are 12 departments at MADB's Head Office and 16 state/divisional offices across the country. It has a relatively large network, with branches in nearly two-thirds of Myanmar's 325 townships. State/divisional managers are responsible for all functions of loan disbursement and collection at the branches under their control.

13. MADB urgently needs a disruptive transformation to play aforementioned leading role in agricultural financing because:

- a. It is not performing as a development bank as mandated by the Myanmar Agricultural and Rural Development Law.
- b. It is not a financially sustainable institution that can expand its business operations without government subsidies or preferential treatment.
- c. It requires a significant increase in funding not only to implement its banking functions but also to cater agricultural lending to new clients along the entire value chain with the changing economic landscape in Myanmar. Among the many duties and powers given to MADB in the 1990 Law, the only one thing MADB does is seasonal (annual) loan disbursement.
- d. It needs to modernize its operations by strengthening corporate governance and performance of the Board and management. In 2016, the Board of Directors of MADB still comprised only MOALI staff. The 1990 Law of MADB stated that the Board shall be constituted with a member appointed ex-officio by the MOPF, but no one from the MOPF is on the Board. MADB's corporate governance is weak and far from the standards followed by the banking industry. MADB's internal control system is rudimentary and there is no audit committee. The internal audit function reports directly to the bank's management team, not to the Board. "Fit and proper" requirements for Board members or senior management do not exist. Board meetings are few and far between and management is subject to strict administrative controls by the MOALI. Accountability of management and Board members is limited. Transparency and information disclosure are extremely limited as well. MADB has not published its annual report for many years. MADB's accounts are not audited by a third party, and MADB's financial statements are not prepared according to international standards.
- e. MADB has no risk management department. To start with, MADB's interest rates on loans and deposits are not set by MADB itself but by the MOALI, without consideration of borrowers' risk profile. Moreover, the total volume of credit to be disbursed by MADB each year is set by the MOALI. MADB does not conduct any

- analysis nor does it take any measures to mitigate its risk exposure by commodity or region.
- f. It needs to restructure its human resources development program and modernize its banking functions and facilities. MADB's Head Office has 252 staff and 2,192 staff are employed across 16 states/divisions. Because of MADB's mandate, there has not been a strong emphasis on recruiting experienced bankers at senior levels, or business and accounting majors at entry levels. Nor is there a formal banking training program for staff. MADB will need substantial reforms to become a self-sustainable, market-oriented rural finance institution. Skills for credit assessment, risk management, accounting and auditing, asset valuation, business planning, and marketing integral to function on a market basis must be built over time.
14. The most fundamental issue is to decide what type of institution MADB should be. The main aim stated in MADB Law (1990) Chapter II, Article 4 is "to effectively support the development of agricultural, livestock and rural socioeconomic enterprises in the country by providing banking services." In addition, Chapter II, Article 6 mandates MADB to pursue the following objectives:
- a. Provide loans for the development of agricultural, livestock and rural socioeconomic enterprises in a simple procedure.
  - b. Promote rural banking.
  - c. Encourage saving habits to bring about a self-help spirit among the rural population.
  - d. Support socioeconomic development in rural areas.
  - e. Cultivate a habit of using bank services.
  - f. Develop banking business.
15. Based on the findings of a MADB diagnostic review (LIFT and World Bank 2014a), two options were proposed for transferring MADB back to the MOPF:
- a. A moderate transformation, with ownership of the MOPF as a corporatized entity. The Board will consist of 40 percent government officials and 60 percent independent members (private bankers) allowing the Board to charge interest at the market rate. Funding will be sourced from Myanmar Economic Bank at market rate and from multilateral institutions. CBM will supervise the bank.
  - b. A rapid transformation, with 51 percent MOPF and up to 49 percent strategic investor ownership as a listed public company. The Board will consist of government officials and strategic investors according to the equity ratio and it will be allowed to lend at the market interest rates. Funding will be sourced from Myanmar Economic Bank at the market rate and from multilateral institutions. CBM will supervise the bank.
16. The previous administration selected an advanced version of the second option. The Government's Office issued an instruction letter dated April 6, 2015, to the three ministries (Agriculture and Irrigation; Livestock, Fisheries and Rural Development; and Finance) to form a joint entity – government (40 percent) and private (60 percent) – and, if possible, to merge with Rural Development Bank. No active implementation had yet occurred when the government changed in April 2016. The MOPF has assumed oversight and monitoring of MADB with effect from April 1, 2017. The Government of Myanmar asked the World Bank to provide technical

assistance in the special diagnostics of MADB to ascertain its operational, financial, and institutional position in guiding the decision on MADB's transformation.

17. Fundamental decisions for the MOPF to make soon include: What role will MADB play – should it remain a bank only for smallholder farmers or should it broaden its role to finance other stakeholders in the value chain, such as food processors, wholesalers and retailers? To be financially sustainable and independent of government assistance, should MADB be given the authority to set and modify interest rates on its deposit and lending products?

18. In the long run, the biggest constraint to MADB's rapid transformation will be the lack of human resources at every level, including the need to reconfigure the role and performance of the Board and management. According to 1990 MADB Law, Article 12 (b), the Chairman and four members are all appointed by the government. The Minister of the MOALI is the Chairman of the Board. As all four Board members are ex-officio government representatives of the present MOALI and MOPF, they are practically obliged to follow the mandates provided by the higher senior-level officials of the departments they represent.

### ***Private Banks***

19. Apart from MADB, no other financial institutions offer significant agricultural financing in Myanmar. Some formerly state-owned banks were corporatized into public entities. For example, the former Livestock and Fishery Bank became Global Treasure Bank, and Rural Development Bank corporatized as a public company. Nonetheless, all are commercial banks without ample operation for agribusinesses and the agriculture sector. Private commercial banks currently provide commercial loans, but their validation systems, collateral requirement, interest rates, and loan terms are not designed for farmers and agribusinesses. The risk management system for the agriculture sector has not developed properly either. Credit risk (due to lack of collateral and of a collateral registry system), production risk, marketing risk, and price risk are all anticipated by private banks in lending to the agriculture sector. Private banks have no information about borrowers to measure their creditworthiness, especially their credit score. No mechanism exists to liquidate land user right (Form 7) taking as collateral, which is the most common asset of farmers for defaulted loans. And the profit margin is narrow, with a small return on equity between the 13 percent interest rate and the 8 percent deposit rate, and inflation around 10 percent.

20. Commercial banks are careful with agricultural lending due to covariant risk in agricultural price and production. The operating costs of providing credit are high given the number of small loans dispersed widely across the country. Their strength is in having an established banking network across Myanmar, and a sufficient loan to deposit ratio (liquidity). On the other hand, opportunity exists to leverage their existing clients with agricultural exposure, considering agricultural commodities and receivables as collateral with the right investment and technical support. A few initiatives and successful examples should be recognized and encouraged by agricultural finance policy actions.

21. **Promotion of Development Banks (A Bank):** Noting that MADB's full reformation would take time, the previous government encouraged establishment of regional development banks in every state and region and endorsed the formation of Farmer Development Banks. When applying, Farmer Development Banks were to register at the CBM, the sole regulator of all commercial banks. The CBM issued the Regulation for Farmer Development Bank on July 30, 2014.

22. One initiative arose in response to the government agenda. A Bank in Ayeyarwaddy Region proposed a tri-pillar structure to support farmer's development, regional development, and industries development.<sup>37</sup> However, the CBM's regulation to accept only deposits of more than a one-year term precluded A Bank from acquiring enough operating capital. Finally, A Bank sought only a commercial bank license in 2015, without the functions, rights, and privileges of a development bank. Nonetheless, A Bank currently operates as a development bank, upholding its vision and mission.<sup>38</sup> It provides short-term loans of 100,000 Kyats per acre to farmers in Ayeyarwaddy Region, and had disbursed 14 billion Kyats of loans in Patheingyi and Bogale Townships by the end of fiscal year 2014/15.

23. Still, A Bank cannot survive as a development bank without being empowered as one. Moreover, it cannot reach its original purpose of building a strong rural finance system if no other development banks exist to collaborate with in areas outside of Ayeyarwaddy Region. In this context, it is safe to say that no development bank has been successfully established under the CBM's Farmer Development Bank regulation.

24. **MAB Innovating Risk-Management System in Agriculture Financing:** Another commercial bank piloting agricultural financing is Myanmar Apex Bank (MAB), linked to contract farming in rice production and originating from rice-specialized companies' practices in 2008/09.<sup>39</sup> As of 2016, MAB had disbursed 596 million Kyats to farmers from Danubyu Township in Ayeyarwaddy Region. Both A Bank and MAB take collateral in the form of land ownership certificates (Form 7) issued by the MOALI by Farmland Law 2012. Both disburse loans at the bank interest rate of 13 percent per year. Both banks request a recommendation from the Myanmar Rice Federation from loan applicants.

25. **Yoma Bank Partnering with International Institutions:** Hire-purchase financing, which enables farmers to buy vehicles and machinery with short- or medium-term installments, is also occurring in Myanmar. Yoma Bank finances the private sector to buy agricultural machines; the purchasing agreement includes support for technical assistance and training for operating and maintaining the vehicle. The LIFT, in partnership with ADB, RaboBank, and USAID, supports the portfolio guarantee and technical assistance to Yoma Bank under its Agriculture Finance Program to increase mechanization, stimulate savings, and improve access to finance for farmers, with funding for risk facility, attractive savings product design, and technical assistance for product development. Total financial support to date is \$18 million over three years in the dry zone, delta, and upland areas. As of 2016 December, a total of \$40 million in loans were disbursed. About 2,700 loans were disbursed for the purchase of tractors, harvesters, and trucks with low minimum down payments ranging between 10–30 percent, making these more affordable.<sup>40</sup> Yoma Bank with its development partners is the best example of a partnership program in agricultural financing.

### ***Nonbank Financial Institutions (Microfinancing by MFIs and Cooperatives)***

26. In the nonbank category, MFIs and cooperative societies play an important role in closing the financing gap by replacing unregulated moneylenders. MFIs and cooperative societies' advantage is in providing financial and education services to low-income families and

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<sup>37</sup> Interview with a senior executive from A Bank.

<sup>38</sup> Interview with a senior executive from A Bank.

<sup>39</sup> Interview with an executive from MAB.

<sup>40</sup> Interview with a senior executive from Yoma Group.

individuals at their doorsteps. They can directly interact and maintain social relation with them for financing, financial and business education, counseling and capacity building.

27. **Transformation Post-1988:** The military government restored cooperatives' basic functions in the early 1990s. Cooperative schools were upgraded to become universities under the direct supervision of the DOC to disseminate much-needed education and awareness training at lower-tier cooperatives. It also set up a Small-Scale Industries Department to promote nonfarm economies in rural areas of the country. The ministry also ended the requirement that cooperative shops sell less competitive consumer goods. Most importantly, lower-tier cooperatives were allowed to reorganize their societies and elect their own representatives to the state and regional unions and finally to the top-tier CCS.

28. **First Civil Government (2011 to 2015):** The idea of cooperatives was significantly emphasized in the previous government's signature initiative on poverty reduction and rural development. However, it was recognized that cooperatives alone cannot bring financial inclusion. The government thus identified eight priority tasks on poverty reduction, including microfinancing, which the government recognized as the cornerstone of its rural development strategy as well as its agriculture sector strategy in alleviating poverty. Since the country's transformation to foster a market-oriented economy in 2011, there has been more policy inclination toward private sector development, legitimizing MFIs.

29. **Emergence of MFIs:** Microfinance was operationalized in 2011 with enactment of the Myanmar Microfinance Law. Under the law, any legal organization, company, NGO, or association can apply for a business license. More than 100 organizations registered in the first year. Since then, microfinance has been adapted and nurtured by regulators and is now a strong cornerstone in rebuilding the country's financial system.

30. In the last five years, regulators have adjusting and adapted the regulations to foster healthy growth of the microfinance sector. Rules and regulations stipulating improvements include Ministry of Finance and Revenue (No. 277/2011) and Directives from Microfinance Supervisory Committee (Directive 1/2011, 2/2011, 1/2014). The latest policy reforms of Financial Regulatory Department (Directive 1/2016) demand better qualification of MFIs, a higher paid-up capital requirement, a requirement of two consecutive years of profitability, and stricter regulations on management and internal control. The directive also permits more products such as micro-insurance, higher-purchase, and remittance transfers.<sup>41</sup> Above all, MFIs are requested and encouraged by regulators to operate more in rural areas, particularly in the agriculture sector.

31. **Cooperatives as MFIs:** With enactment of the Microfinance Law, DOC was assigned to promote microfinance services through primary cooperative societies and to merge previously defunct central banks into a single entity, called Microfinance Bank, as the main financial foundation of cooperatives. Universities were reoriented to provide more practical and market-friendly training courses, educating young people about the value of cooperatives, building cooperative societies' capacity, and rebranding the cooperative model for the future. The CCS was allowed to elect its own independent Board of Directors, and for the first time, a private sector representative was elected as Chairman. Retired officials and former MOALI employees

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<sup>41</sup> Myanmar Microfinance Directive (1/2016).

took part in the CCS to ensure quality of autonomous decision of the movement as all member organizations still rely on government finances to organize their enterprise activities.

32. Proposals from lower-tier cooperatives needed a sound business plan and a financial or risk assessment to receive microfinance loans from the CCS, and subsequently from its private sector partners such as the Cooperative Bank. Although DOC gave priority to reforming its business and syndicate operations, it has lagged in rationalizing its regulatory functions, as it has followed the procedural rules of the 1998 Law, which conflict with the Microfinance Law of 2011. While DOC has successfully rebranded the cooperative movement, particularly in rural areas, its focus was more on promotional and start-up activities rather than regulating viability and sustainability, as DOC is not fully equipped with a monitoring and evaluation capacity. Thus in 2015/16, cooperatives were once again transferred under MOALI regulation rather than Myanmar Microfinance Law, to focus more on service to Myanmar's rural and agricultural population.

### ***Cooperatives' Current Operation***

33. COC currently operates agricultural financing from two different sources of funding. It borrowed \$400 million from China EXIM Bank to provide loans to farm cooperatives and \$100 million from Daedong Industrial Co. to finance the medium-term credit for Daedong agricultural machinery. Both loan programs have passed their grace period and repayment schemes are in process for the first time. The sustainability of such a strategy in terms of managing microfinance programs with smallholders, on the one hand, and mitigating exchange rate and other risks of debt management, on the other, is being monitored. The basic project profiles of the two loan programs are as follow.

34. Program 1: China EXIM Bank Loan:

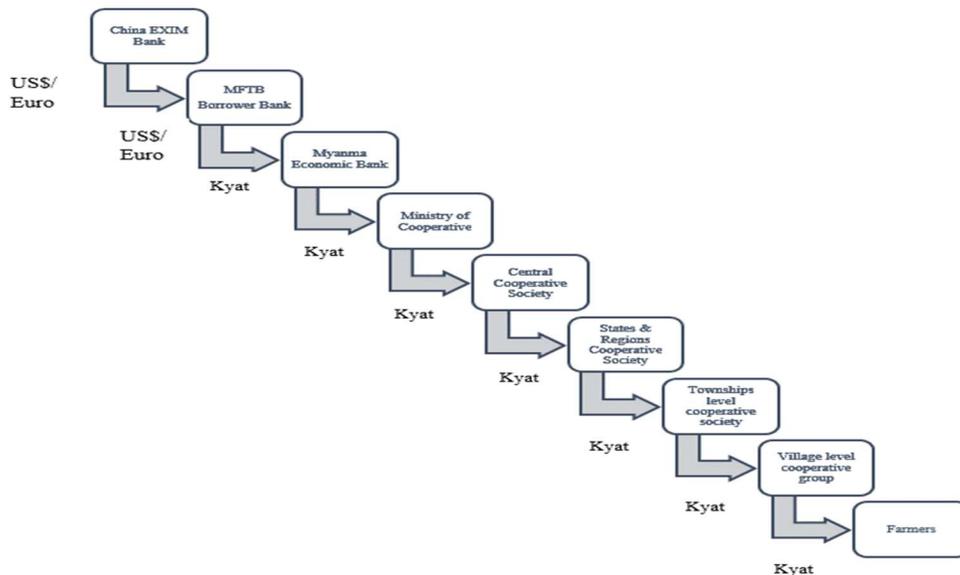
- a. \$400 million portfolio with interest rate of 4.5 percent per year (two tranches: first loan of \$100 million and second loan of \$300 million).
- b. Loan period: 10 years for both loans.
- c. First loan (\$100 millions) (loan period: December 2013–2023) – with grace period of two years and repayment in eight years (December 2015–2023).
- d. Second loan (\$300 millions) (loan period: May 2015–2025) – with grace period of two years and repayment in eight years (May 2017–2025).
- e. The Union government of Myanmar has to pay management fees of \$1.5 million to China EXIM Bank (1 percent for first loan and 0.5 percent for second).
- f. The loan was disbursed to lower-tier cooperatives through the CCS and the final borrower (members of the lowest-tier cooperatives) has to pay 18 percent interest rate, of which DOC set aside 4.55 percent for repayment to China EXIM Bank, while the following share of the premium is divided between different tiers:
  - i. Central Cooperative Society and Reserve Money 7.02 percent
  - ii. State and region cooperative unions 0.63 percent
  - iii. Township cooperative unions 2.9 percent
  - iv. Village cooperative unions 2.9 percent
  - v. China EXIM Bank repayment interest rate 4.55 percent
  - vi. Total (interest rate charged to final borrowers) 18.00 percent

35. Program 2: Daedong Industry Co. Ltd. loan program:
- \$100 million portfolio with purchase agreement for agriculture and farm machines from Daedong Co. Ltd. The loan program has two components: a credit line from Daedong Co. Ltd in the amount of \$15 million and a commercial loan from Shinhan Bank of Korea of \$85 million.
  - Loan period: For Daedong loan, \$15 million must be paid back before December 2015 at the interest rate of 2 percent for both interest and principal. For Shinhan Bank loan, interest rate of 2 percent to be paid after one year of loan and then, one twelfth of principal and 2 percent interest must be paid every six months within the next six years after first year grace period (January 2016–March 2022).

36. **Beneficiaries:** For the China EXIM Bank loan, the focus is on the agriculture and livestock cooperative groups (31,865 groups exist around the country). As of July 2016, the program covered 2,679,636 beneficiaries from 294 townships of 15 states and regions. Total amount of loan allocated was 513 billion Kyats. For the Daedong and Shinhan Bank loans for farm mechanization, the program covers 2,947 farmers from 197 townships from 15 states and regions, who received 2,947 machines valued at about 6.6 billion Kyats as of July 2016. A total of 1,777 machines are in hand, is valued at \$3.3 million, plus spare parts valued at \$1.1 million.

37. In addition to the loans, DOC provides support activities and services to the benefiting cooperatives. One complication DOC has to deal with is managing the effects of sanctions, as China EXIM Bank could not effectively remit USD directly to Myanmar. As a result, two state-owned banks exchange USD into Euros first, then back to USD before finally converting to Kyats. Figure 53 shows how the money flows through hierarchical tiers, from China EXIM Bank all the way through cooperatives, which distribute money to final borrowers.

**Figure 53: Money flows from central organization to lower-tier cooperatives**



Source: DOC.

38. The Cooperative Bank is the fiscal agent of the loan program, as it provides fiduciary and internal control mechanisms at the state and regional levels. As the Cooperative Bank does not

have branches at every township involved in the loan program, the state-owned Myanmar Economic Bank provides additional services at the township level. Although the division of labor between the two banks in providing internal control mechanisms is not clear, the several tiers and chains of command involved in the disbursement process lead to high transaction costs. The CCS thus must charge the highest ratio of profit sharing between various stakeholders along the value chain.

39. **Repayment schedule and actual repayment of \$400 million loan from China EXIM bank and Daedong program:** For the EXIM Bank loan, every year on January 5 and July 5, the members of cooperative groups in villages have to pay back the loan; this is collected at the township level on January 7 and July 7. At the township level, cooperative groups use Myanmar Economic Bank's branches; and the loan collection for state and regional cooperative groups is due on January 13 and July 13. At the state and regional level, cooperative societies use the Cooperative Bank (private bank). The CCS collects all returns on January 16 and July 16. Then the Myanmar Economic Bank collects everything on January 18 and July 18; the Myanmar Foreign Trade Bank then converts this to USD and the CBM subsidize the exchange rate. Due to the sanction, the MFTB converts the bank loan to Euros.

40. A full evaluation of this program has not been done, but a quick analysis and discussion with DOC led to the following recommendations to improve performance:

- a. Loan repayments should be linked to progress on mechanization at the community or farmer level: At this stage, DOC assesses the borrower repayment's capacity by checking household income and membership status of the primary level associations, but not the capacity of these borrowers to use the equipment or the community's readiness to utilize farm machinery. When the loan program was initiated, DOC did not coordinate well with AMD because the latter was under a separate ministry. Now both departments are under the same ministry and greater coordination between two departments can quickly improve the loan processing required to determine the prospects of potential use of machines and resulting prospects of repayment. To achieve this outcome, DOC needs capacity building on the "Know Your Customers" practices and risk management planning on monitoring and evaluation of loan utilization.
- b. The program should adopt technical criteria to determining eligible borrowers or communities, setting loan terms and enforcing repayment: With cooperation from AMD, DOC can set technical criteria for viable borrowers, such as technical fit between the machines and the groups that are lending, the terrain and environmental conditions of the communities that are operating, and a cost-benefit analysis of the use of machines in local economic settings. Although DOC may have tested the fit between particular types of machines to different communities and terrains, the challenges of conducting thorough technical feasibility of machines to different agroclimatic zones and varying types of terrains in Myanmar are quite high. In this regard, it is important to negotiate with the equipment supplier to have flexible arrangements to supply appropriate machinery and equipment that can adapt to particular terrain and soil settings.
- c. Equipment loan can be linked to savings mechanisms: There are many rural communities where agriculture machines are in high demand. The DOC loan program should be able to empower these communities to set up commodity savings to

- purchase capital equipment for common use. In the absence of such an existing arrangement, the DOC program could devise parallel saving mechanisms to help communities or individual members buy spare parts and other investment needed to support proper maintenance of equipment.
- d. Portfolio risks can be diversified: In Myanmar, reliance on a single type of machine for a large part of the country exposes the program to multiple risks, such as shortage of spare parts, lack of repair services, and incompatibility with terrain, soil, or crop in particular regions. Given Myanmar's rich diversity of agroclimatic zones, the DOC program needs to import machines with changeable accessories suited to the specific needs of communities while supplying a wide range of additional tools and accessories to use the machines for different agricultural mechanization operations. Such financing programs should follow the market demand for agricultural machinery in terms of both type and brand. In addition, the DOC loan program can diversify other varieties of loan products that could enable borrowing households to engage in alternative livelihood options that are not totally dependent on machine use.
  - e. Repayment terms and conditions can be flexibly adjusted to accommodate cyclical cash flows and bulky investments: For farming communities in Myanmar, cash flows are highly cyclical as well as seasonal, with high variation between different regions of the country. However, the DOC loan program is set uniformly across the country without taking into consideration such variations. If additional administrative resources are available, more flexible management on repayment terms and schedules can support the needs of communities than fixed payment terms.
  - f. Contractual arrangements on warranty of machine parts and services should be enforceable: Given a high degree of wear and tear from rough terrain and low-skill operators, it is important that the DOC program require adequate coverage of warranty against any premature impairment of the machine. Replacement and refund warranties should also be made enforceable under the laws of Myanmar.

### ***MFI's Current Operation***

41. Microfinancing with its distinctive methodologies would boldly go where more conventional financial institutions dare not (Turnell 2009). Commercializing microfinancing activities by former cooperatives and the UNDP was enabled with the enactment of Myanmar Microfinance Law 2011. As of November 2016, 5 international NGOs, 24 NGOs, 24 foreign companies, 109 local companies, and 4 joint venture companies were licensed, while licenses were revoked from 2 NGOs, 77 cooperatives, and 14 local companies.

42. Currently, around 167 MFIs are operating in 15 regions and states, 217 townships, 1,818 quarters, 5,182 village tracks, and 14,556 villages, serving 2.23 million clients with 1,583 billion Kyats in loan disbursement and 96 billion Kyats in outstanding deposits. The total paid-up capital of the whole sector is 139 billion Kyats:

- a. Although with different methodologies, the Law and regulations from the Financial Regulatory Department set and uphold the minimum legal frameworks that all MFIs follow. The Financial Regulatory Department's inclusion strategy fosters "client protection priority" and "responsible financing" that necessarily demand "Finance Plus" service characterized by good governance, management and accounting, a viable business model, and an operation system.

- b. The latest law states that deposit-taking MFIs must have minimum paid-up capital of 300 million Kyats and non-deposit takings of 100 million Kyats.
- c. The interest rate for loans is capped at 30 percent per year, so MFIs can earn only 1.4–1.5 percent per month according to loan repayment schedule from their loan portfolio. The former interest rate cap of 15 percent per year for clients’ savings was lowered to 10 percent, relaxing the interest margin a bit.
- d. MFIs must prove their reliability and operational efficiency with two consecutive years of profit, with a strong accounting and management information system, preferably digitalized.
- e. All MFIs, national or international, can now seek external funding locally and abroad. Most importantly, the Financial Regulatory Department encouraged MFIs to operate for the rural and agricultural population.

### **Example of MFIs in Agricultural Financing**

43. Along with policy development, MFIs are improving their products and capacity to increase coverage of good service.

44. **PACT Global Microfinance** has the biggest microfinance operation, as it inherited former UNDP operations across the country supporting nonfarming (livestock) loans. Cooperating with the Small Scale Industrial Department of the MOALI, PACT Global Microfinance microfinances cottage industries in six region/states (Yangon, Mandalay, Sagaing, Magway, Ayeyarwaddy, and Shan), totaling 10,685 villages and 69,440 active borrowers. It has disbursed a total of 12 trillion Kyats in loans. It offers: (i) 500,000 Kyats for regular loans; (ii) 250,000 Kyats for extra loans; (iii) 500,000 Kyats for micro-enterprise loans; (iv) 980,000 Kyats for agriculture; and (v) 100,000 Kyats for social loans with a one-year term. It also offers a hire-purchase loan of 5,000,000 Kyats, designed for one- to two-year terms. PACT Global Microfinance is the largest NGO-turned-MFI intensively financing Myanmar’s rural and agricultural population.

45. **Proximity Finance** is another MFI financing agriculture through loans to purchase farming-related equipment. Also, with encouragement of the Regulator, many MFIs are planning rural expansion with new products; such as bridging loans to farmers in harvest time to enable them to hold their harvest and sell later at higher prices.

46. Also in cooperation with the Small Scale Industrial Department, **Entrepreneur Demont Microfinance** operates in Yangon Region, Dala Township, covering 38 villages with 2,429 active borrowers, and has disbursed 1.1 billion Kyats in loans. It provides simple loan products, starting from 100,000 Kyats for the first loan cycle, 300,000 Kyats for the second, and 500,000 Kyats for the third. It has a special product for agriculture and livestock, amounting to 1,500,000 Kyats. It is the smallest, most efficient MFI focusing on lending to the agriculture sector.

47. A seven-year portfolio guarantee program started in 2016 with USAID and five eligible MFIs: PACT Global Microfinance, Myanmar Development Partners Co., ASA, LOLC, and Proximity Design. This program provides development assistance worth \$10.5 million to support Myanmar’s agricultural financing. With guarantee fees of only 0.35 percent of the guarantee portfolio, the program pledges to refund 50 percent of all defaulted loans. This is an example of a much-needed program among local and international development partners to reduce the high risk on MFIs to encourage them to intensify their agricultural lending.

## **The Merit and Challenges of Microfinancing Institutions (MFIs and Cooperatives)**

48. The strength of MFIs and cooperative societies, if functioning well, is that they directly interact and maintain friendly relations with their clients for education, health, and social support, especially in financial and business education, counseling, and capacity building on family money management. Microfinancing favors the empowerment of women for their role in family and business. For direct impact, microfinancing enhances job opportunities for local youth, providing job experience and technological enhancement. Most importantly, MFIs can replace informal moneylenders and protect the poor from the downward spiral of indebtedness.

49. To transform MFIs into sustainable and reliable commercialized financial institutions, the following challenges must be overcome.

50. ***High risks:***

- a. Unlike commercial loans, microfinance loans without collateral have a more frequent repayment schedule, while agribusiness demands seasonal loans with a flexible repayment scheme. As commercialized MFIs are risk-sensitive by nature, they perceive that diversifying products with different features and wide repayment flexibility would impose risk and might be costly to execute.
- b. The success and failure of crops determines the creditworthiness and repayment capability of a farmer or agribusiness; this is highly complicated by different crops, different cropping cycles, different business models, weather, climate, and natural phenomena. Myanmar's financial sector as a whole still lacks proper assessment tools and practices. The many unknown factors and lack of empirical data impose a high risk on corporate financial institutions' operations.
- c. On the other hand, attempting to mitigate risk by "collateral taking" imposes even more risk. For banks, using immovable assets such as land as collateral complicates the situation, as no central registry exists to record land ownerships. Also, political risk over enormous land disputes throughout the country should be taken into account. Although the CBM recently allowed other assets such as gold, jewels, vehicles, and harvested agricultural produce to be used as collateral, developing suitable skills, techniques, procedures, and practices to do so will take time.
- d. Likewise, there is no credit bureau or similar credit registry service to track people's credit performance and indebtedness, especially in the agriculture sector. Studies show that Myanmar's rural population has slightly higher access to credit than that of the urban poor due to agricultural production loans from MADB, in addition to those of specialized companies, informal input providers, and various government rural financing projects.
- e. In that context, it is more important to know the population's credit information or loan performance record, so that credit providers can decide on the appropriate kind of credit. The lack of clients' credit information is riskiest for MFIs operating without taking collateral because already-poor clients with low income, if under pressure of over indebtedness, could easily default on their loans.

51. ***High costs:***

- a. High costs, together with moderate profitability and sustainability could lessen small MFIs' incentives to continue operation.

- b. Cost of credit: The interest rate prescribed by law is fixed and unresponsive to inflation, thus a high cost of credit significantly affects the profitability and sustainability of commercial financial institutions.
- c. Operation costs: Increasing prices of resources and poor basic infrastructure (such as transportation, telecommunications, electricity, Internet, and security) by strong rule of law have led to high operation costs.
- d. Transaction costs: Procedures and processes to validate the fund from foreign funding sources should be thorough and in-depth but also fast and efficient to reduce transaction costs. Likewise, legal and tax submission procedures should be transparent and streamlined.
- e. Labor costs: Human resources are a serious issue for banks and MFIs. Financing staff should be of high caliber and quick learners. At the same time, the labor market is highly competitive. Decades ago UNDP's microfinance program recognized and reported a high staff turnover rate. Small institutions use tremendous time and effort training new recruits just to lose them to bigger institutions capable of paying high salaries. On the other hand, it is costly for big institutions to recruit and maintain capable staff whose skills are not always matched with price.

**52. *Issues of sustainability, creditworthiness, business skills, and repayment capacity:***

- a. Corporate management and responsible operation:
  - i. When financing is for heavily social-mandated programs and poverty reduction actions, 100 percent repayment is often reported at the conclusion of projects, which cannot be always the case. Incidents of delinquency and loss by loan defaults should arise. Very often, while successful projects continuing with brilliant results, unsuccessful ones cease operation silently, usually without any complaint or claim or any record on study. In both MFIs and banks, hesitation to report correctly on nonperforming loans and portfolios at risk is not news.<sup>42</sup>
  - ii. Such a practice encourages more delinquency and damages clients' perceptions about their MFI and the accountability of its loans, undermining the goal of financial inclusion by damaging the population's creditworthiness.
- b. Creditworthiness, clients' business skills, and repayment capacity:
  - i. Financial services operate on trust between providers and clients (Turnell 2009). Banks are hardly willing to lend to the poor because they cannot trust their repayment capability. Microfinancing can boldly lend to the poor in hopes of building that trust over time. However, repayment capability and creditworthiness go beyond personal trust. The success or failure of a loan depends on a client's income-generating activities, in turn determined by his financial literacy level and business skills, and other factors such as the institutional and macroeconomic environment.
  - ii. A traditional microfinance model of mass lending with intensive expansion, hopefully maintaining a healthy repayment ratio, would build trust but would undermine the true creditworthiness of targeted beneficiaries. When their

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<sup>42</sup> Penal Discussion, Seminar on Present & Future of Myanmar Finance Sector, June 2016.

inability to repay loans is revealed over time, the mode of delinquency could go viral, damaging the quality of the MFI's loan portfolio, threatening its sustainability and even its survival.<sup>43</sup>

### ***Recommendation***

53. The vital task for MFIs is to achieve sustainability. Their social mandate to serve the poor should be matched with a viable business model. This transformation will require a tremendous shift in the perception of regulators, existing MFIs, and their clients.

54. The Microfinance Law 2011 draws all microfinancing activities, social or commercial, into one legal framework. The development of regulations and directives over the last five years reflects regulators' attempts to guide the sector toward sustainability. The favor for strong governance and profitability ultimately demands responsible operation. Even though cooperatives are not under the Microfinance Law anymore, the fundamental concepts for success are the same:

- a. **Focus on improving institutional capacity:** An MFI needs strong institutional capacity to become sustainable. A strong financial institution exhibits strong governance, management, and operation, and follows a sound business model that enshrines client protection and responsible financing techniques and skills for professional service providers. Transparency and an internal control system enforced by ICT-supported information management systems are a must. Product and service innovation to serve the agricultural and rural population is also a must. Most importantly, a sound system for creditworthiness validation and maintenance of a quality loan portfolio is recommended. Loan decisions should not be pressured by unrealistic expansion goals; rather, they should be made based on systematic validation of clients' creditworthiness, business skills, and repayment capability.
- b. **Enhance capacity building for clients and the general population:** Capacity building of MFI clients with the concept of creditworthiness and education and training on financial and business literacy should be done. Regulators could provide references and teaching materials, standardize the teaching curriculum, and encourage and support MFIs' capacity-building efforts, individually or collectively with Myanmar Microfinance Association, NGOs, and civil society organizations.
- c. **Encourage domestic funding sources:** For MFIs, capital investments, grants, or loans from foreign sources can directly finance without passing Myanmar Investment Commission. The former restriction of using only foreign sources for foreign MFIs and local sources for local MFIs was lifted under recent Directive 1/2016. Regulators are reportedly collaborating with the CBM for a faster fund validation process. As of 2017, four MFIs have been funded by TCX with prospects for more. International institutions such as the United Nations Capital Development Fund are also helping Myanmar MFIs, local and foreign, with long-term loan programs with reasonable interest rates. At this point, it is important that local funding sources such as local banks also perform capital and debt finance for qualified MFIs and foster credit mobilization across the entire financial system to attain financial stability in long term.

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<sup>43</sup> Interview with an MFI senior executive.

- d. **Assist in risk reduction:** (i) Rule of Law: To be involved in agricultural financing, MFIs need innovative new services and products tailored to the unique nature of agribusiness and farmers. At the local level, a strong and reliable rule of law system is needed to protect clients and providers equally; (ii) Central Client Registry: As MFIs seek low-income but productive residential citizens with creditworthiness, a registry of villagers and households should be developed and appraisal made of those eligible for membership and financing. In disputes or delinquency measures, the authority upholding the laws can be effectively involved as negotiator and facilitator between two parties; and (iii) Portfolio Guarantee: At the national level, a portfolio guarantee granted to qualified MFIs for their agriculture-related loan disbursement is strongly suggested to encourage MFIs to disburse loans to farmers, rural households, and very small enterprises. For example, USAID successfully initiated such a program for five MFIs in 2016 (see earlier discussion).
- e. **Help reduce costs:** (i) Transaction costs can be reduced with clear policies, transparent procedures, and streamlined process by regulators, and by the Department of Tax and Revenue in its function of regulating MFIs with monthly reporting, capital registration, complaint resolution, annual tax application, and submission process. The same applies to the process of CBM's approval on foreign funds for their sources, terms and conditions, amount, currency, and interest rate or cost for credit; and (ii) Operational costs can be recovered only with revenue increase. For that purpose, the interest rates prescribed by law should gradually become more responsive and flexible, internalizing external factors such as inflation, market prices of commodities, and poor infrastructure-related rentals, transportation, telecommunication, electricity, Internet, and security. The ultimate goal to reach gradually should be a flexible interest rate for MFIs to decide in designing their products. This will give MFIs room to diversify their products with different terms and conditions that will best serve individuals and microbusinesses according to their specific needs.

## Annex 6: Fisheries Sector and Department of Fisheries

1. Myanmar’s fisheries sector continues to play a crucial role in contributing to employment, exports, and economic development and growth. It also contributes greatly to Myanmar’s food security at both the national and household level. It employs 3–4 million people and provides the main source of protein and micronutrients in local diets, to the extent that “rice-fish” is often considered as Myanmar’s core diet. The country is endowed with substantial resources that support fisheries, from inland water resources – four major rivers systems, of which three originate within Myanmar’s own borders; lakes; 230 reservoirs of varying size; and a huge delta and long coastline (of almost 3,000 km) that offers significant potential for future development.

2. The sector is administratively categorized into marine fisheries (comprising inshore and offshore or deep sea fisheries), inland fisheries (comprising leasable, open, and reserved fisheries), and aquaculture and marine culture (comprising fresh and sea water fishes (in ponds and net-cages), prawn/shrimp, and others like soft shelled crab, eel, and seaweed).

3. As the majority of households in Myanmar live along the four main rivers and in the delta regions, freshwater fish from inland capture fisheries are a mainstay of both daily diet and trade. Households generally prefer to consume freshwater fish over marine fish with national average annual consumption of fish and fish products at 55 kg per capita. Not surprisingly, aquaculture has grown tremendously despite policy and administrative constraint accounted for almost 20 percent of total production in recent years.

4. The annual fish and prawn production in 2015/16 was estimated by the Department of Fisheries (DOF) at 5.6 million tons, of which 53.6 percent was from marine waters, 18.1 percent from aquaculture, and 28.3 percent from freshwater bodies. This is a substantive growth, up from 718,000 tons in 1990/91 and 2.9 million tons in 2006/2007 (Table 52). Total export in 2015/16 was 369,270 tons, valued at \$502 million, increasing marginally compared to 2006/07 (Table 53).

**Table 52: Fishery production doubled in 10 years in Myanmar**

Year	Total, '000 tons	Aquaculture	Leasable fisheries	Open fisheries	Marine fisheries
2006/07	2,860	616	170	548	1,525
2007/08	3,194	688	191	625	1,690
2008/09	3,542	775	210	690	1,868
2009/10	3,922	859	238	765	2,061
2010/11	4,164	830	250	913	2,170
2011/12	4,478	900	283	964	2,333
2012/13	4,716	929	290	1,012	2,484
2013/14	5,047	964	304	1,077	2,702
2014/15	5,317	1,000	315	1,148	2,854
2015/16	5,592	1,015	339	1,242	2,997

*Source: DOF.*

5. Myanmar has 113 registered fish and prawn processors, of which 20 are registered and approved to export to the EU with about 60 processors focusing on high-value species such as black tiger prawn, giant freshwater prawn, pangasius, and sea bass. Currently, Thailand and

China represent the most important trading partners but exports to the EU have been increasing due to the duty and quota free “Everything but Arms” arrangement since 2013. Similarly, it is well positioned to increase exports to the United States, once the Generalized System of Preferences is reinstated, building on the ongoing fish and prawn exports (and other agricultural products) to the United States.

**Table 53: Myanmar’s fish export increased modestly**

	Fish		Prawns		Others		Total	
	Tons	\$ million	Tons	\$ million	Tons	\$ million	Tons	\$ million
2006/07	235,858	240	25,370	121	82,189	108	343,427	466
2007/08	245,473	315	21,061	110	85,118	136	351,652	561
2008/09	234,061	273	18,382	89	72,268	121	324,711	483
2009/10	277,824	310	17,440	56	79,829	130	375,092	497
2010/11	273,044	342	19,143	69	81,706	144	373,893	556
2011/12	283,687	397	17,996	86	85,298	171	386,981	654
2012/13	266,465	378	17,268	89	93,113	186	376,846	653
2013/14	237,142	287	16,509	62	91,616	187	345,267	536
2014/15	225,975	259	17,527	57	94,788	167	338,291	482
2015/16	247,271	274	13,674	50	108,327	179	369,271	503

*Source: DOF.*

6. The FAO reported world fisheries production in 2012 at 158 million tons. Marine capture fisheries accounted for 50 percent of global production or 80 million tons. Myanmar was the tenth highest producer of marine fisheries. Between 2003 and 2012, marine catch in Myanmar increased by 121 percent, the highest among 18 major producing countries underscoring the continuing importance of marine fisheries and perhaps also that of overfishing leading to declining fish stocks.

7. **Regulatory overview:** The fisheries sector is governed by several laws. Fisheries laws include: (i) 1989 – Law related to the fishing rights of foreign fishing vessels; (ii) 1989 – Aquaculture Law; (iii) 1990 Myanmar Marine Fisheries Law; and (iv) 1991 – Freshwater Fisheries Law. In 1993, the Marine Fisheries Law and the law relating to the fishing rights of foreign fishing vessels were amended. A new fishery law, covering both marine fisheries and aquaculture, is under preparation but is already in its 13th draft with little indication when it will be passed and enacted.

8. By law, marine fisheries are directly under the purview of the Union government while freshwater fisheries are under that of state and regional governments. Relatedly, aquaculture development has grown disproportionately in different states and regions. Some regions (Ayeyarwaddy and Yangon) have been less strict on requirements of La Na 39, which is more complex and costly (permission to convert to aquaculture requires only Form 105), while regions such as Mon enforce land conversion much more strictly.

9. **Structure of the sector:** A distinguishing feature of Myanmar’s aquaculture subsector is its dichotomous structure, with both big/mega fish farms ranging from a few hundred to 3,000 acres and small fishers who operate fish farms of less than 10 acres. Most of the large or mega fish farms have their own hatcheries, nurseries, and grow-out ponds (ranging from 10 to 30 acres each) with some having their own ice plants, trucks, and outlets in fish wholesale markets in Yangon. Some smallholdings, including some operated by ex-DOF staff, are also involved in

hatcheries, including backyard hatcheries, and nurseries rearing fish from fingerlings for a year and selling foot-long fish to grow-out ponds of larger operations.

10. Unlike in other countries, the plight of Myanmar's inshore fishermen is hardly addressed by government, researchers, and civil society alike. Elsewhere, they are generally considered as the "poorest of the poor"; most are susceptible to the impact of climate change, which is threatening their livelihood; and their villages are threatened by coastal erosion control works and development of beach resorts. Moreover, they have to contend with the annual three-month closed season imposed since 2013.

11. From another perspective, it should be noted that in 1988 the Myanmar government rolled back its direct involvement in fishery business activities, with the exception of hatcheries, whereby all state-owned infrastructure like fishing vessels, ice plants, processing plants' cold rooms, fishmeal plants, and canning plants were sold or leased to the private sector. In 2015/16, DOF owned 26 hatcheries producing 609 million freshwater fries and fingerlings, while 39 private hatcheries produced 1,614 million fries and fingerlings.

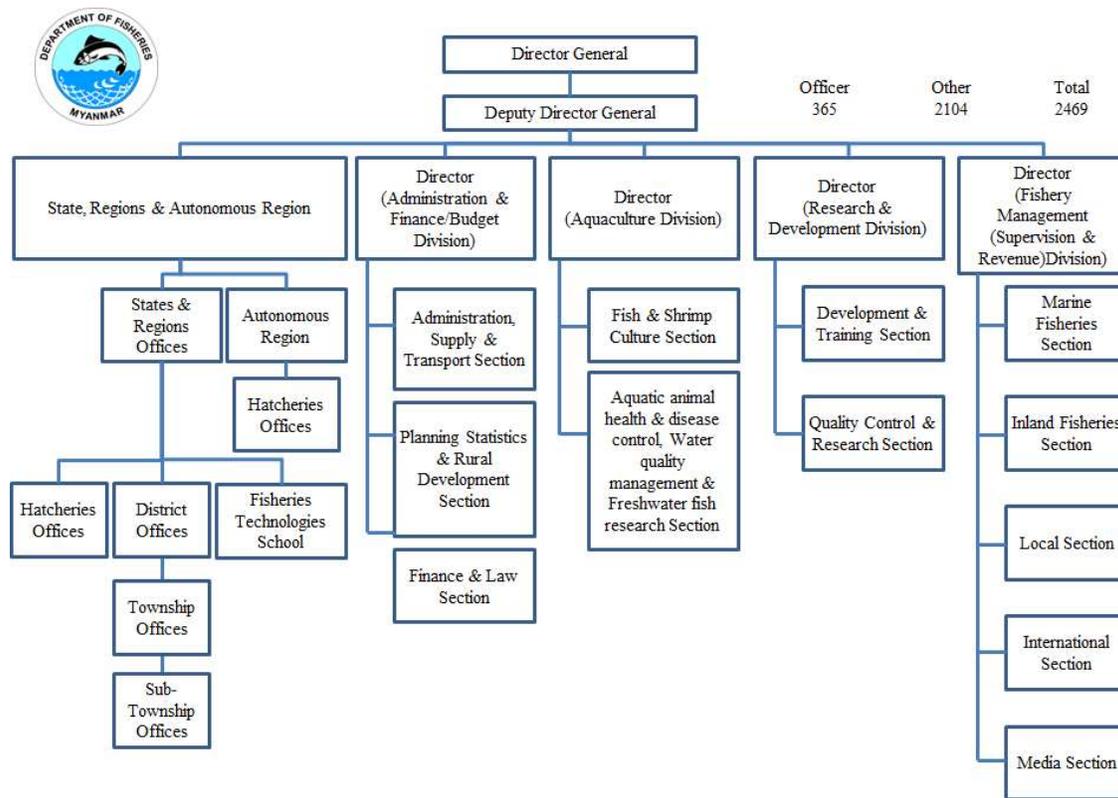
12. **DOF Mandate:** DOF is entrusted with development and management of the fisheries sector in Myanmar. Its responsibilities include: conservation and rehabilitation of fishery resources; promotion of fisheries and surveys; collection and compilation of fisheries statistics and information; extension services; supervision of the fisheries sector; and sustainability of fisheries resources.

13. **Organization of DOF:** To fulfill these functions, DOF is organized in the following manner (Figure 54). At the **Union level**, it consists of the following divisions:

- a. Administration and Finance Division is made up of the following Sections:
  - (a) Administration, Supply and Transport.
  - (b) Planning, Statistics and Rural Development.
  - (c) Finance and Law.
- b. Fisheries Management Division is made up of the following sections:
  - (a) Management Measures in Marine Fisheries.
  - (b) Inland Fisheries Management.
- c. Aquaculture Division is made up of the following sections:
  - (a) Fish and Shrimp Culture.
  - (b) Aquatic Animal Health and Disease Control, Water Quality Management and Freshwater Fish Research.
- d. Research and Development Division is made up of the following sections:
  - (a) Inspection and Certification.
  - (b) Analytical Laboratory.
  - (c) Research and Development Training Supervision.
  - (d) Marine Fisheries Resources Survey & Research Unit.

14. At the **Region level**, the Regional DOF office is supported by the District Office (Township and Sub-Township Offices), Hatcheries Offices, and Fisheries Technologies Schools.

**Figure 54: DOF's organizational structure**



15. **Budget:** Overall allocation to DOF has been totally disproportionate to its contribution to GDP, employment, and export earnings and to food and nutritional security and its potential to contribute much more toward inclusive and sustainable development. The allocation to DOF averaged 1 percent of the total agricultural budget during the review period.

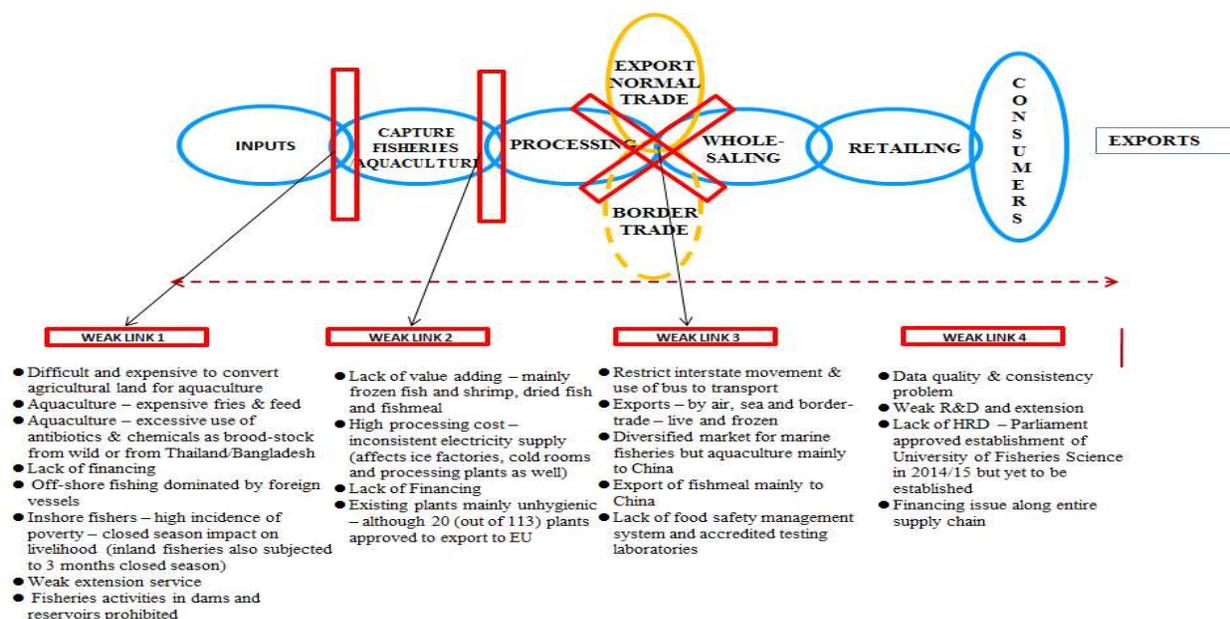
16. In terms of DOF's organization, the mechanism for synergizing research, development and extension is not clear. There seems to be a lack in clarity in the overall direction, which the sector should develop in the immediate, medium, and longer term. Consequently, it is unclear how the various sections, even if they are acting in tandem, can facilitate this development path. Speaking to DOF staff and key informants operating in the sector, an on-again, off-again relationship exists between DOF and the Myanmar Fisheries Federation (in stark contrast with the stable relationship between DOA and the Myanmar Rice Federation), often correlated with the senior management of the day. This underscores institutional weaknesses that need to be addressed together with reallocation of budgets arising from this review.

17. Most attention and budget is given to aquaculture, which may be reasonable given its obvious potential. However, attention to public hatcheries has been excessive, given that the private sector has been developing its own hatcheries, including backyard hatcheries, and engaging in nurseries to grow fingerlings to a reasonable size before selling to larger operators of grow-out ponds (some with operations as large as a few thousand acres). Furthermore, DOF's focus continues to be on Rohu and carp rather than higher-value species, especially those whose fries are currently imported (even from Australia), or on developing specific pathogen-free brood stock.

18. **Private financing:** Contrary to general perception and what has been reported in the literature, Golden Treasure Bank’s annual report for 2015/16 stated that it continued to provide loans to the fisheries sector after its name change (in January 2013 it changed from Myanmar Livestock and Fisheries Development Bank and became a public company by shares subscription). In 2015/16, the bank’s loans to the livestock and fisheries sector totaled 114 billion Kyats, or 33.7 percent of its total loan disbursement of 340 billion Kyats.

19. **Value chain:** For a more holistic approach it would be prudent to identify and examine the key weaknesses along the fisheries value chain so as to prioritize and sequence interventions by DOF and other government agencies as well as other stakeholders (Figure 55). The following discussion helps contextualize and explore potential interventions and hence reallocation of public expenditure, including loans and donor funding.

**Figure 55: Myanmar fisheries value chain: strength of chain is determined by its weakest links**



Source: Adapted from Wong 2014.

20. **Weak Link 1:** Aquaculture has seen an increase in the cost of fries and feed. Antibiotics and chemicals are used excessively, which will have a negative environmental impact if left unchecked. Although Golden Treasure Bank continues to provide loans to the sector, the entire finance remains inadequate.

21. Fisheries activities have been prohibited in dams and reservoirs since 1984. In view of the 230 dams and reservoirs constructed, if net cage aquaculture can be allowed in selected reservoirs (those not used for household water supply, for instance) in consultation with Regional Governments as well as DOF, the subsequent increase in fish production would contribute significantly toward food security and improve the livelihood and incomes of many in the surrounding rural areas. A Norwegian joint venture in Malaysia does net cage culture for specially bred, sushi-grade tilapia in a pristine reservoir; fish are filleted and exported to regional and EU markets.

22. In the case of marine fisheries, offshore fishing is dominated by foreign-owned vessels that create problems by encroaching on inshore areas. They also land valuable fish like yellowfin and other tuna and take it back to their own country (mainly Thailand) without generating any onshore benefits for Myanmar. Increasing fuel cost is a problem as is weak extension service.

23. The government needs to relax regulations on land use (La Na 39), grant fish farmers greater access to credit, and increase private investment and competition in the fish feed industry. In the regard, a good sign is the opening in October 2016 near Yangon of a €10 million, 240,000-tons of feed per year animal feed mill owned by the De Heus Group of Netherlands (a global top 15 feed supplier). Indications suggest that other international (China and the United States) feed millers plan to follow suit. These developments will address the issues of low-quality and adulterated feed as well as rising prices arising from local feed millers' dependence on local feed materials.

24. **Potential response:** The first measure to address the weaknesses above would be to strengthen input markets for and promote fishers' access to seeds/fries from quality specific pathogen-free brood stock and feed through targeted investments and enforcement of regulation. It would also be necessary to focus less on hatcheries operation and more on high-value species and synergism/integration with private sector hatcheries, nurseries, and grow-out farms. There is also a need to improve Myanmar's maximum sustainable yield framework and mitigate the impact of the three-month closed season, especially for inshore fishermen. This may involve but not be limited to training and reskilling for part- or full-time alternative employment. R&D and extension should target more productive and profitable farming systems, including poultry over fish ponds (as poultry is gaining popularity), rice and fish, and aquaponics. Finally, more public expenditures are needed for research and extension, and organization of small fishers and fisherman and their subsequent integration in fish value chains.

25. **Weak Link 2:** Processing is largely limited to dried fish and fishmeal besides that of frozen fisheries products. However, processing costs are high due to inconsistent electricity supply. A lack of financing also exists. Many existing processing plants do not meet the EU requirement of using flake ice, potable water, and steel boxes.

26. **Potential response:** It is possible to attract foreign direct investments in strategic and integrated processing, for example organic tilapia following the United States' HQ model in Hainan, China, and a Norwegian joint venture in Malaysia for cage culture of specially bred, sushi-grade tilapia in a reservoir. Strategic investments could be promoted along the entire fish value chain, from seed to shelf. An interesting example is a new initiative to produce Japanese "glass eel" and improve the value chain from breeding, hatchery, nursery, grow-out, processing, and distribution locally and in strategic overseas markets. Lastly, more R&D and innovation to other higher-value end uses of aquatic products need to be encouraged.

27. **Weak Link 3:** While there seem to be expanding and diversified markets for marine fisheries (e.g., to Bangladesh, China, Japan, Malaysia, UAE, Saudi, Kuwait, Singapore, Viet Nam, Thailand, Australia, Sweden, Qatar, Hong Kong, Philippines, Bahrain, South Africa, and Egypt), Myanmar's aquaculture exports mainly go to China, comprising fish and prawns and increasingly live eels and soft shelled crab. The export of fishmeal is also mainly to China. A major weakness going forward is the lack of a food safety management system and accredited fisheries product testing laboratories.

28. **Potential response:** Improve safety and quality assurance by upgrading or establishing labs that are accredited to key targeted export markets (EU, Japan), and reduce costs associated with exports through enhanced port and border trade facilities, and greater efficiency of regulation.

29. **Weak Link 4:** The serious lack of human resources development relating to fisheries is recognized. Parliament's approval to establish a University of Fisheries Science is a positive development, but seems to have stalled. Quality and consistency of data are often compounded by reluctance to pool and share data. This setback needs to be addressed urgently.

30. **Potential response:** It is suggested to reform data collection and information sharing to enable evidence-based policies as well as attract strategic investments. Resolving financing issues would help galvanize and leverage innovative combinations of MFIs, cooperatives, development banks, and private banks' participation, while facilitating stakeholders' cooperation with donors and international and domestic NGOs would help bring more resources to the sector.

## Annex 7: Why Minimum Farm Prices Are Not Suitable for Myanmar

1. In the end of 2016, rice prices suddenly dropped in Myanmar, triggering renewed discussion about minimum paddy prices, a topic that resurfaces in Myanmar from time to time. Minimum prices were not introduced but the discussion itself caused serious concern in the private sector about the government's commitment to promote export competitiveness and sustainable development of value chains. This Annex provides a brief analysis of the causes of the price reduction, explains why minimum farm prices go against other government policies, and presents better alternatives to manage price volatility.

2. Average wholesale rice prices in Yangon dropped from 550,000 Kyats/ton in June 2016 to 328,000 Kyats/ton in October 2016 (Figure 56). The price drop in USD terms was even larger, due to the Kyat's depreciation. This price drop was larger than the usual seasonal price decline occurring each year before the wet season harvest (November-December). What were the reasons for the price drop?

**Figure 56: Rice prices dropped sharply in Yangon in end of 2016**

Wholesale prices of Manawthukha rice, Yangon



Source: FAOGIEWS.

3. Some of the decline was due to the entrance of new (wet season) harvest into the market and expectation of a higher incoming harvest: the harvest in 2016 was 3 percent higher than in 2015. The second reason was delayed monsoon rains, making harvested paddy wetter, which in turn had to be sold at discounted prices. The third reason was declining global prices. All major rice exporters had good harvests in 2016 and the stocks of major exports remained large. Vietnam and Thailand all faced lower prices in 2016 than in 2015 (Figure 57).

4. The fourth reason was that rice prices in Myanmar before the drop were well above the historical average (Figure 56). The 2015 floods reduced paddy production by 1 million tons, while the continued export to China, where prices are much higher than on international markets, along with the large depreciation of Kyats against USD, all contributed to relatively high domestic prices in Myanmar. The high price period was a *temporary* phenomenon in Myanmar, but the return to a more normal, lower level was seen by many as an emergency rather than as a market self-adjustment.

**Figure 57: Rice prices in Thailand and Vietnam also declined**



Source: FAOGIEWS.

5. The final reason was China’s decision (in September 2016) to close the cross-border trade route for Myanmar’s rice. In the last three years, 60-80 percent of Myanmar’s total rice export went to China, though Muse border point (Table 54). China closed the Muse route several times in the past to prevent informal (from China’s point of view) rice exports. As a result, many Myanmar traders reported to having large unsold stocks from the spring harvest, while the incoming wet season harvest could not be sold to China, pushing prices down.

**Table 54: Myanmar’s rice exports largely went to China**

In ‘000 tons	2012		2013		2014		2015		2016	
	FOB	China								
Jan.-June	289	130	344	207	472	410	173	633	180	342
Jan.- Dec.	503	617	514	650	514	838	243	1,166		
% of cross-border trade		55%		56%		62%		83%		66%

Source: WB staff using data from the Ministry of Commerce of Myanmar.

6. Farmers asked the government for support, and explicitly for minimum paddy prices. This request brought back a discussion similar to that held in 2013, when the draft law for minimum farm prices was discussed at the Parliament. The law was never approved, as the implementation of minimum prices could not satisfy producers, consumers, exporters, and the Treasury. In addition, the large cost of the Thai rice pledging scheme became visible at that time and might have impacted the decision in Myanmar.

7. The main argument against minimum prices was the negative impact on export competitiveness: Myanmar cannot compete internationally if minimum prices are set above market prices. If minimum prices are set below or at the level of market prices, are they needed? In addition, implementation constraints such as lack of storage facilities, public expenditures, spatial differences in prices, and the wide range of rice types and qualities were also discussed and agreed to prevent achievement of the stated objectives (i.e., increase farm-gate prices). It was essentially reconfirmed that high rice prices are simply not suitable for Myanmar, an exporter of low-quality rice that mainly competes by lowering prices rather than improving quality.

8. A number of better short-term alternatives to minimum prices exist in Myanmar, such as:
  - a. The procurement of rice for institutional needs (military, prisons, etc.) can be accelerated to help maintain prices during certain periods of time. The military's needs for rice are large and it has the necessary storage and transport infrastructure to handle the accelerated rice purchase.
  - b. This price crisis could be turned into an opportunity to recapture foreign markets lost in 2015–2016 due to the high domestic prices in Myanmar. As of October 2016, the country was (again) competitive at FOB market, as its prices were below that of Thailand and Vietnam (Figure 57). In this “improved price competitiveness situation”, the priority action would be to help traders export rice through the Port of Yangon to FOB destinations as fast as possible by removing all administrative bottlenecks.
  - c. Proactive engagement with large buyers such as African countries would facilitate Myanmar exports. Countries such as Nigeria, Cote d’Ivoire, and Senegal showed steady increases in rice imports in recent years while purchases from the Philippines and Indonesia declined due to favorable harvests, and Indonesia is imposing a strict quota.
  - d. Cross-border trade with China is also important, calling for proactive engagement with Chinese authorities to reopen their border for trade. Chinese companies bring a lot of construction materials, fertilizers, and other products through the border posts into Myanmar, giving Myanmar’s authorities strong leverage to lobby for more predictable cross-border trade with rice. Once cross-border trade returns, domestic prices in Myanmar will rise again.
  - e. Extension in repayment of MADB loans by two to three months could be considered. Most MADB loans are due at the end of December, and if prolonged to February, rice prices would increase, thereby reducing farm losses. This may not have significant impact on MADB solvency because farmers would struggle to pay in the first place. One challenge, though, would be for the government to commit additional funds in its revised budget for MADB to make funds available for dry season loans.
9. In the long run, the menu of options for avoiding sharp fluctuations of rice prices is even larger. Seasonal increases and declines of prices can be smoothed by: (i) more effective use of water and irrigation; (ii) supply of better seeds with different durations; (iii) incentives for rice mills to invest in better storage and drying facilities; (iv) adoption of international standards for rice; (v) collection and timely provision of accurate information on market and commodity balance development; and (vi) removal of any nontariff barriers for exports (World Bank 2014).
10. Some price volatility is unavoidable and even desirable. Price fluctuations are a common feature of well-functioning agricultural markets. Price fluctuation should be expected in such markets, since output varies from period to period due to factors such as weather, pests and disease, and because demand and supply are inelastic in the short run. Moreover, some amount of seasonal and spatial price movements is useful as they signal scarcity in the market and facilitate a supply response, foster arbitrage between surplus and deficit regions, and guide post-harvest handling, storage, and trade decisions. Minimum prices are therefore not a good solution for Myanmar and need to be avoided.