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LIFT Livelihoods and Food Security Trust Fund

MYANMAR:

CAPITALIZING ON RICE EXPORT OPPORTUNITIES

Economic and Sector Work Report Number: 85804

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CAPITALIZING ON RICE EXPORT OPPORTUNITIES

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Southeast Asia Sustainable Development Unit
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Acronyms and Abbreviations

ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDI	foreign direct investment
FOB	free on board
GDP	gross domestic product
GMO	genetically modified organism
Ha	hectare
IRRI	International Rice Research Institute
LIFT	Livelihoods and Food Security Multi-Donor Trust Fund
MADB	Myanmar Agricultural Development Bank
MAPCO	Myanmar Agribusiness Public Corporation
MEIC	Myanmar Export Import Corporation
MOAI	Ministry of Agriculture and Irrigation
MOC	Ministry of Commerce
MPA	Myanmar Port Authority
MRF	Myanmar Rice Federation
MRMA	Myanmar Rice Millers Association
RSC	Rice Specialization Company
SAD	Shipping Agency Department
SPS	Sanitary and phyto-sanitary
TFP	total factor productivity
Ton	metric ton
ToT	Terms of Trade
TRQ	Tariff Rate Quota
Government	Government of the Republic of the Union of Myanmar
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
$	United States Dollar

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၂၀၁၄/၁၅ခုနှစ်တွင်စပါးတန်ချိန် ၂သန်းနှင့် ၂၀၁၉/၂၀ခုနှစ်တွင်တန်ချိန် ၄သန်းတင်ပို့ရန် ရည်မှန်းချက်ချမှတ်ထားသည့် ပြည်ထောင်စုမြန်မာနိုင်ငံအတွက် စိုက်ပျိုးရေးထုတ်ကုန်များတိုးတက်အောင်ပြုလုပ်ရေးနှင့် ပို့ကုန်မြှင့်တင်ရေးသည် အဓိကဦးစားပေးအရာများဖြစ်သည်။ အမှန်တကယ်လုပ်ဆောင်မှုများမှာမူ ထိုရည်မှန်းချက်များကိုပြည့်မီအောင်ဆောင်ရွက်ပေးနိုင်ခဲ့ခြင်းမရှိချေ သို့ရာတွင်မြန်မာနိုင်ငံ၏စီးပွားရေးကို ဖွင့်ပေးလိုက်ခြင်းနှင့် ပို့ကုန်တင်ပို့မှု လွတ်လပ်ခွင့်ပေးလိုက်သည့် လတ်တလောမူဂါဒများက ပထမဆုံးသောရလဒ်များကို စတင်ဖော်ဆောင်ပေးခဲ့သည်။ ၂၀၁၂/၁၃ ခုနှစ်စပါးတင်ပို့မှုသည် ၄စနစ်အတွင်းအမြင့်ဆုံးဖြစ်ကာ တန်ချိန်(၁.၃)သန်းနီးပါးအထိရောက်ခဲ့သည်။ ၂၀၁၃/၁၄ခုနှစ်တွင် စပါးတင်ပို့မှုမှာ အလားတူပမာဏအတိုင်းမပြောင်းမလဲရှိနေပြီး ပို့ကုန်ရည်မှန်းချက်ထက် ကျော်လွန် စေရန်အတွက် ပြုပြင်ပြောင်းလဲမှုများ ဆက်လက်လုပ်ဆောင်ရန် လိုအပ်နေသည်။

မြန်မာနိုင်ငံအတွက် စပါးတင်ပို့မှုမြင့်မားစေရန် ကောင်းမွန်သည့်ဈေးကွက်အလားအလာများ ရှိနေသည်။ အနည်းဆုံး လာမည့် ၁၀နှစ်မှ၁၅နှစ်တွင် စပါးအပေါ်ကမ္ဘာ့၀ယ်လိုအားမှာ ဆက်လက်မြင့်တက်နေရန်ရှိသည်။ တရုတ်နိုင်ငံသည် အကြီးဆုံးစပါးတင်သွင်းသော နိုင်ငံအဖြစ်ပြောင်းလာပြီး ဥရောပသမဂ္ဂသည်"လက်နက်ကလွဲပြီးအားလုံးပါ၀င်သည့် သဘောတူညီချက်"အရ မြန်မာနိုင်ငံမှအကောက်ခွန်ကင်းလွတ်သည့် သွင်းကုန်များအားလုံးအတွက် ၎င်းတို့၏အကျိုးအမြတ်များသောဈေးကွက်ကို ဖွင့်ပေးခဲ့သည်။

သို့ရာတွင် ယှဉ်ပြိုင်မှုမှာပြင်းထန်နေသည်။ အိမ်နီးချင်းကမ္ဘောဒီးယားနှင့်ဗီယက်နမ်နိုင်ငံများသည် ၎င်းတို့၏ဆန်စပါးလုပ်ငန်းခေတ်မီတိုးတက်အောင်ဆောင်ရွက်ကာ တန်ဖိုးမြင့်ဆန်စပါးဈေးကွက်အမျိုးမျိုး ပြောင်းလဲကာ ဈေးကွက်များကို စတင်သိမ်းပိုက်နေရာယူနေပြီဖြစ်သည်။ ပို့ကုန်ဦးဆောင်သည့်ဆန်စပါးကဏ္ဍဖြစ်စေရန် အစိုးရကခိုင်မာသည့်ကတိများပေးထားသည့်အတွက် ကမ္ဘောဒီးယားနိုင်ငံ၏ ဆန်စပါးကြိတ်ခွဲမှုလုပ်ငန်းအတွင်း နိုင်ငံခြား တိုက်ရိုက်ရင်းနှီးမြှုပ်နှံမှုများကို သိသိသာသာဆွဲဆောင်လျက်ရှိသည်။ တစ်ဖက်တွင်မြန်မာနိုင်ငံတွင်း၌ နိုင်ငံခြားတိုက်ရိုက်ရင်းနှီးမြှုပ်နှံမှုမှာ အကန့်အသတ်နှင့်သာရှိနေဆဲဖြစ်သည်ကိုတွေ့ရသည်။ မြန်မာနိုင်ငံက လက်ရှိတင်ပို့နေသည့်ဆန်ပို့ကုန်များ၏ ၉၅%နီးပါးမှာ အရည်အသွေးနိမ့်စပါးများဖြစ်ပြီး ထိုစပါးအပေါ်ကမ္ဘာ့၀ယ်လိုအားမှာ လျော့ကျနေသည့်အတွက် မြန်မာနိုင်ငံအနေဖြင့် ဈေးကွက်သစ်အခွင့်အလမ်းများမှ အကျိုးအမြတ်ရရှိစေရန် အရေအတွက်ထက် အရည်အသွေးတိုးတက်ကောင်းမွန်အောင်ပြုလုပ်ရေးအပေါ် အာရုံစိုက်ရန်လိုအပ်လာသည်။ ထိုအာရုံစိုက်ရမည့်အရာများအနက် အဓိကအာရုံစိုက်ရန်လိုသည့်အရာမှာ ဈေးကွက်သစ်ရရှိရန်နှင့်အရည်အသွေးမြင့်စပါးကဏ္ဍအတွင်း ယှဉ်ပြိုင်နိုင်ရန်အတွက်မြန်မာနိုင်ငံသည် ကျန်းမာရေးနှင့်ညီညွှတ်ပြီး မျိုးသန့်စင်သည့်လုပ်ငန်းအပေါ် အဓိကအလေးထားရန်လိုသည်။

အခွင့်အလမ်းသစ်များရှာဖွေရန်အတွက် မြန်မာနိုင်ငံအနေဖြင့် ပို့ကုန်နည်းဗျူဟာကို ပြန်လည်ဆန်းစစ်ရန်လိုအပ်သည်။ အရည်အသွေးနိမ့်စပါးများ ပိုမိုထုတ်လုပ်ရောင်းချခြင်းသည် အလားအလာကောင်းသည့် ရေတိုနည်းဗျူဟာ မဟုတ်ပေ။ မြန်မာနိုင်ငံအနေဖြင့် စပါးအမျိုးအစားအမျိုးမျိုးကို အရေအတွက်တိုးကာထုတ်လုပ်ရောင်းချရေးနှင့် ထိုသို့လုပ်ရာတွင်ထိရောက်စွာလုပ်ဆောင်ရေးကို ရည်မှန်းချက်ထားရမည်ဖြစ်သည်။ စပါးပိုမိုတင်ပို့ရောင်းချရေးအတွက် ပြည်သူ့၀န်ဆောင်မှုလုပ်ငန်းများကိုပံ့ပိုးပေးပြီး အသေးစားနှင့်အကြီးစား လယ်ယာလုပ်ငန်းများအားလုံးကို ရင်းနှီးမြှုပ်နှံမှုအခြေအနေကောင်းများ ပံ့ပိုးပေးရန်လိုသည်။ ယင်းက လယ်ယာထုတ်ကုန်တိုးတက်စေပြီး ကြိတ်ခွဲမှုနှင့် ပို့ကုန်လုပ်ငန်းများကို ထိရောက်မှုရှိစေမည်ဖြစ်သည်။ ထိုနည်းဗျူဟာက မြန်မာနိုင်ငံ၏ထုတ်လုပ်ရောင်းချ၀န်ဆောင်မှုကဏ္ဍအတွင်း ပါ၀င်လုပ်ဆောင်သူများအား ပြည်တွင်းနှင့်ပြည်ပမှဖောက်သည်များအတွက် ပိုမိုကောင်းမွန်သည့် ၀န်ဆောင်မှုများ ပေးနိုင်စေမည်ဖြစ်ပြီး ၀င်ငွေပိုမိုရရှိစေမည်ဖြစ်သည်။ ထို့အပြင်တိုးတက်လာသည့် တန်ဖိုးမြင့်စပါးဈေးကွက်ကို အမိအရဆွဲဆောင်နိုင်ပြီး အခြားဈေးကွက်အမျိုးမျိုးနှင့်ပြိုင်ကာ စွန့်စားမှုအမျိုးမျိုးပြောင်းလဲလုပ်ဆောင်လာနိုင်သည်။

ထိုနည်းဗျူဟာများ အကောင်အထည်ဖော်ရန် ဖြေရှင်းရမည့်ကိစ္စများစွာရှိနေသည်။ အရေးအကြီးဆုံး ပြဿနာများမှာ လယ်ယာလုပ်ငန်းအဆင့်တွင်ဖြစ်သည်။ သို့ရာတွင်ကြိတ်ခွဲမှုကဏ္ဍအတွင်း အားနည်းချက်ရှိခြင်း၊ ပို့ကုန်တင်ပို့မှုတွင် ကုန်ကျစရိတ်များပြီးနေးကွေးနေခြင်းနှင့် ရှင်းလင်းမှုမရှိသည့် စိုက်ပျိုးရေးနည်းဗျူဟာများနှင့် ဆက်စပ်သည့်ပြဿနာများ လည်းရှိနေသည်။ ထိုပြဿနာများအနက် အချို့မှာအချိန်ယူဖြေရှင်းရန်လိုအပ်သည်။ သို့သော်ရေတိုကာလအတွင်း တိုးတက်မှုများရရှိအောင်ပြုလုပ်နိုင်ပြီး လာမည့်လပေါင်း(၃၀)ကာလအတွင်း ဆင်းရဲနွမ်းပါးမှုလျော့ချမည့် အစိုးရ၏ ရည်မှန်းချက်ကို ဖြည့်ဆည်းပေးနိုင်မည်ဖြစ်သည်။

မြန်မာနိုင်ငံ၏ ဆန်စပါးထုတ်လုပ်ရောင်းချဝန်ဆောင်မှုကဏ္ဍခေတ်မီတိုးတက်ရေးအတွက် ပြီးပြည့်စုံသည့် နည်းဗျူဟာ တစ်ခု လိုအပ်ကြောင်း အခြားစပါးတင်ပို့သည့်နိုင်ငံများ၏ အတွေ့အကြုံများက ဖော်ပြနေသည်။ ဆန်စပါးကဏ္ဍဖွံ့ဖြိုးတိုးတက်ရေးအတွက် ကဏ္ဍအသီးသီးတွင်ကုန်ကျစရိတ်လျော့ချရန် ပြည်သူ့လူထုကဏ္ဍတွင် ရင်းနှီးမြှုပ်နှံပေးရေး၊ ပုဂ္ဂလိကကဏ္ဍနှင့် သဟဇာတဖြစ်သည့်စည်းမျဉ်းများထုတ်ပြန်ပေးရေးနှင့် ပွင့်လင်းသည့်ကုန်သွယ်ရေးမူဝါဒများ ချမှတ်ပေးရေးတို့ မရှိမဖြစ်လိုအပ်သည်။ အစိုးရကဆောင်ရွက်ပေးရမည့် အစီအစဉ်များနှင့်ပတ်သက်ပြီး ကမ္ဘောဒီးယားနှင့်ထိုင်းနိုင်ငံတို့၏ အတွေ့အကြုံများကမြန်မာနိုင်ငံအတွက် အကောင်းဆုံးလမ်းညွှန်မှုပေးနေသည်။ နိုင်ငံခြားတိုက်ရိုက်ရင်းနှီးမြှုပ်နှံမှုအပါအဝင် ကြိတ်ခွဲမှုလုပ်ငန်း ခေတ်မီတိုးတက်အောင်ပြုလုပ်ခြင်းနှင့် ပို့ကုန်ကုန်ကျစရိတ်လျော့ချခြင်းက လယ်ယာထုတ်ကုန်များတိုးတက်ခြင်းနှင့် သွင်းကုန်တင်သွင်းသူများ၏ ပြောင်းလဲနေသည့်ဝယ်လိုအားလိုအပ်ချက်နှင့် ကိုက်ညီသည့် လယ်ယာစိုက်ပျိုးရေးအလေ့အထ ပြောင်းလဲမှုများ(စပါးအမျိုးအစားရွေးချယ်ခြင်းအပါအဝင်) ကိုဖြစ်ပေါ်စေကြောင်း ထောက်ပြနေသည်။ စိုက်ပျိုးထုတ်လုပ်ဝန်ဆောင်မှု၏ ကြိတ်ခွဲမှုကဏ္ဍနှင့် ပို့ကုန်တင်ပို့မှုကဏ္ဍအတွင်း ထိုအပြုသဘောဆောင်သည့် အပြောင်းအလဲများမရှိလျှင် လယ်ယာကဏ္ဍဖွံ့ဖြိုးတိုးတက်ရေးကို မည်သည့်အခါမှ အကောင်အထည်ဖော်နိုင် မည်မဟုတ်သည့် အန္တရာယ်ရှိနေသည်။

မြန်မာနိုင်ငံ၏ကြိတ်ခွဲမှုကဏ္ဍကို အရေးပေါ်ခေတ်မီတိုးတက်အောင်ဆောင်ရွက်ရန် လိုအပ်နေသည်။ လောလောဆယ်၌ ကြိတ်ခွဲစက်အများစုသည် ခေတ်နောက်ကျသည့်လုပ်ငန်းစဉ်များဖြင့်သာ လည်ပတ်လုပ်ဆောင်နေဆဲဖြစ်သည်။ ထို့ကြောင့်ကြိတ်ခွဲစဉ်အတွင်း အရည်အသွေးနှင့်ပမာဏ ၁၅%မှ၂၀%အထိ ဆုံးရှုံးမှုဖြစ်ပေါ်နေသည်။ ပျမ်းမျှကြိတ်ခွဲမှုအချိုးအစားမှာ ၆၀%အောက်တွင်ရှိပြီး အိမ်နီးချင်းနိုင်ငံများထက် ပိုမိုနိမ့်ကျနေသည်။ ကြိတ်ခွဲစက်များအဆင့်မြှင့်တင်ရေးအတွက် ကာလရှည်ချေးငွေများရရှိရေး၊ နည်းပညာနှင့်စီမံခန့်ခွဲမှုဆိုင်ရာ အသိပညာများရရှိရေး၊ ကုန်ကျစရိတ်သက်သာပြီး ယုံကြည်အားထားရသည့် လျှပ်စစ်ဓာတ်အားရရှိရေးတို့ လိုအပ်သည်။ လျှပ်စစ်ဓာတ်အားရရှိရေးအတွက် ဓာတ်အားထုတ်လုပ်ခြင်း၊ ဖြန့်ဖြူးခြင်းတွင်ရင်းနှီးမြှုပ်နှံခြင်းနှင့် ပိုမိုထိရောက်သည့်စီမံခန့်ခွဲခြင်းတို့မှတစ်ဆင့် လျှပ်စစ်ဓာတ်အားရရှိရေးကို အကောင်အထည်ဖော်ရာတွင် အချိန်ပိုလိုအပ်မည်ဖြစ်သည်။ သို့သော်ရေတိုကာလတွင် စပါးကြိတ်ခွဲမှုကဏ္ဍအတွင်း နိုင်ငံခြားတိုက်ရိုက်ရင်းနှီးမြှုပ်နှံသူများအတွက် ဖက်စပ်လုပ်ငန်းများလုပ်ကိုင်ရန် အစိုးရထံမှခွင့်ပြုချက်တောင်းခံရသည့် ဥပဒေအပိုဒ်ငယ်ကိုဖယ်ရှားလိုက်ခြင်းနှင့် ပြည်တွင်းကုန်သွယ်မှုဆိုင်ရာချေးငွေအတွက် စည်းမျဉ်းများ ပြန်လည်ပြင်ဆင်လိုက်ခြင်းကြောင့် ခေတ်မီတိုးတက်ရေးလုပ်ငန်းစဉ်ကို စတင်နိုင်မည်ဖြစ်သည်။ ထို့အပြင်အရှေ့တောင်အာရှနိုင်ငံအများအပြားတွင် အသုံးပြုနေသည့်စပါးခွံသုံး သဘာဝဓာတ်ငွေ့ကို လျှပ်စစ်ဓာတ်အားမရသည့်နေရာများတွင် ကြားခံစွမ်းအင်အဖြစ်အသုံးပြုရန် ကြိတ်ခွဲစက်ပိုင်ရှင်များအား နည်းပညာအကူအညီပေးရေးကိုလည်း ထည့်သွင်းစဉ်းစားနိုင်သည်။

တောင်းခံရသည့် ဥပဒေအပိုဒ်ငယ်ကိုဖယ်ရှားလိုက်ခြင်းနှင့် ပြည်တွင်းကုန်သွယ်မှုဆိုင်ရာချေးငွေအတွက် စည်းမျဉ်းများ ပြန်လည်ပြင်ဆင်လိုက်ခြင်းကြောင့် ခေတ်မီတိုးတက်ရေးလုပ်ငန်းစဉ်ကို စတင်နိုင်မည်ဖြစ်သည်။ ထို့အပြင်အရှေ့တောင် အာရှနိုင်ငံအများအပြားတွင် အသုံးပြုနေသည့်စပါးခွံသုံး သဘာဝဓာတ်ငွေ့ကို လျှပ်စစ်ဓာတ်အားမရသည့်နေရာများတွင် ကြားခံစွမ်းအင်အဖြစ်အသုံးပြုရန် ကြိတ်ခွဲစက်ပိုင်ရှင်များအား နည်းပညာအကူအညီပေးရေးကိုလည်း ထည့်သွင်းစဉ်းစား နိုင်သည်။

ပို့ကုန်ကဏ္ဍတွင် အစိုးရအနေဖြင့်လုပ်ငန်းဆောင်ရွက်မှုကုန်ကျစရိတ် လျှော့ချရေးနှင့် မြန်မာနိုင်ငံ၏ ဆိပ်ကမ်းများ တွင် အခြေခံအဆောက်အအုံတိုးတက်ရေးကို အလေးထားဆောင်ရွက်ရန် လိုအပ်သည်။ တရားဝင်တင်ပို့သည့် စပါးများ အားလုံးနီးပါးကို ရန်ကုန်ဆိပ်ကမ်းမှတစ်ဆင့် တင်ပို့ကြသည်။ ကုန်ပစ္စည်းတင်သည့်ဧရိယာမှာ အကန့်အသတ်နှင့်သာ ရှိနေပြီး ပစ္စည်းကိရိယာများ(ဝန်တင်စက်များ၊ ဝန်တင်ခက်ရင်းခွများ၊ ကုန်တင်ရွှေလျားခါးပတ်များအစရှိသဖြင့်) လုံလောက် မှုမရှိဖြစ်နေသည်။ ထို့ကြောင့်ပစ္စည်းတင်ပို့နိုင်မှုပမာဏ လျှော့နည်းကာ ကုန်စည်တင်ပို့မှုကုန်ကျစရိတ်အပေါ် အကျိုးသက် ရောက်မှုဖြစ်နေသည်။ ခြုံငုံပြောရလျှင် ရန်ကုန်ဆိပ်ကမ်းသည် ကမ္ဘာပေါ်တွင်ဈေးအကြီးဆုံး ဆိပ်ကမ်းများအနက်တစ်ခု အပါအဝင်ဖြစ်သည်။ မြန်မာနိုင်ငံဆန်စပါးလုပ်ငန်းကဏ္ဍ တိုးတက်လာစေရေး၊ ရန်ကုန်ဆိပ်ကမ်းတွင် လက်ရှိရှိနေသည့် ကိရိယာများနှင့်အဆောက်အအုံများခေတ်မီရေးနှင့် သီလဝါဆိပ်ကမ်းတွင် ရင်းနှီးမြှုပ်နှံရေး၊ သာမန်နယ်စပ်စပါးတင်ပို့မှု လုပ်ငန်း ပိုမိုပြီးပြည့်စုံစေရန်အတွက် မျိုးသန့်စပါးထုတ်လုပ်ရေးဆိုင်ရာသဘောတူညီချက်တစ်ခု တရုတ်နိုင်ငံနှင့်ချုပ်ဆိုရန် ပြင်ဆင်မှုများကိုထည့်သွင်းစဉ်းစားကာ ကုန်ကျစရိတ်လျှော့ချရေးနှင့် ပို့ကုန်လုပ်ငန်းစဉ်အားလုံးကို ပြန်လည်သုံးသပ် ခြင်းကို မဖြစ်မနေလုပ်ဆောင်ရန် လိုအပ်သည်။

ကြိတ်ခွဲမှုနှင့် ပို့ကုန်ကဏ္ဍများတွင် အပြုသဘောဆောင်သည့်ပြောင်းလဲမှုများကြောင့် စိန်ခေါ်မှုအကြီးဆုံး နေရာဖြစ်သည့် လယ်ယာလုပ်ငန်းတွင် အပြောင်းအလဲများဖြစ်ပေါ်စေမည်ဖြစ်သည်။ မြန်မာနိုင်ငံ၏ စပါးအထွက်နှုန်းသည် အရှေ့တောင်အာရှတွင်အနိမ့်ဆုံးနိုင်ငံများအနက် တစ်နိုင်ငံဖြစ်သည်။ ရွှေဘိုကဲ့သို့ ရေသွင်းရေထုတ်မှုစနစ်ကောင်းမွန်သော နေရာများတွင် စပါးအထွက်နှုန်းမှာ တစ်ဟက်တာကို၄တန်အထိရရှိခဲ့သည်။ မြန်မာနိုင်ငံ၏ စပါးစိုက်ခင်းအများစုတွင် အထွက်နှုန်းမှာတစ်ဟက်တာကို(၂.၇)တန်ခန့်ရှိနေသည်။ ဆန့်ကျင်ဘက်အနေဖြင့် ကမ္ဘောဒီးယားနိုင်ငံတွင် တစ်ဟက်တာ လျှင်ပျမ်းမျှအထွက်နှုန်း ၃တန်၊ ဖိလစ်ပိုင်တွင် ၃.၇ တန်နှင့် ဗီယက်နမ်တွင် ၅.၅တန်ရှိသည်။ ပျမ်းမျှထက်ကျော်လွန်ပြီး ဗီယက်နမ်တွင်ပို့ကုန်တင်ပို့မှု ပမာဏကြီးမားသည့်ဧရိယာများ၌ ဆောင်းဦး-နွေဦးကာလရာသီအတွင်း အထွက်နှုန်းမှာ တစ်ဟက်တာကို ၆.၅တန်မှ၇.၅တန်အထိရောက်ရှိခဲ့သည်။ ထို့အပြင်မြန်မာနိုင်ငံ၏ ဆန်စပါးအရည်အသွေးမှာ အလွန်နိမ့် ကျနေသည့်အတွက် ပို့ကုန်ယှဉ်ပြိုင်မှုနှင့် ဝင်ငွေရရှိရေးအခွင့်အလမ်းများကို နှောင့်နေးမှုဖြစ်ပေါ်စေလျှက်ရှိသည်။ မြန်မာနှင့်ကမ္ဘောဒီးယားနိုင်ငံများသည် စီးပွားရေးတိုးတက်စေရေးနှင့် ဆင်းရဲနွမ်းပါးမှုလျှော့ရေးတွင် အခိုင်အမာ တွန်းအားပေးဆောင်ရွက်နေသောကြောင့် လာမည့်ဝဝနှစ်အတွင်းစပါးအထွက်နှုန်း၂ဆတိုးနိုင်ပြီး ဆန်စပါးအရည်အသွေး တိုးတက်လာနိုင်သော ဒေသတွင်းနိုင်ငံများဖြစ်လာနိုင်ဖွယ်ရှိသည်။

ကမ္ဘောဒီးယားနိုင်ငံရှိ လက်ရှိအတွေ့အကြုံက သာဓကပြသည့်အတိုင်းကြိတ်ခွဲကဏ္ဍပိုမိုထိရောက်မှုရှိခြင်းက လယ်ယာထုတ်လုပ်မှုပြန်လည်နာလံထူရန် ခိုင်မာသည့်ဆွဲဆောင်မှုကိုပေးမည်ဖြစ်သည်။ မြန်မာနိုင်ငံတွင်ရေစီမံခန့်ခွဲရေး လုပ်ငန်း၊ လယ်ယာအကြံပေးဝန်ဆောင်မှုလုပ်ငန်း၊ မျိုးစေ့စျေးကွက်များ၊ လယ်ယာလုပ်ငန်းခွင်မှစျေးကွက်အထိ ထောက်ပံ့ပို့ဆောင်ရေးလုပ်ငန်းများတိုးတက်ရေးကို အလေးထားရန်လိုအပ်သည်။ ပမာဏအင၊ယ်စား ရေသွင်း သည့်စနစ်များ ပြန်လည်ထူထောင်ပေးခြင်းက လျှင်မြန်စွာအကျိုးကျေးဇူးနှစ်ဆတိုးရရှိစေနိုင်ပြီး အထူးသဖြင့်သင့်တော် သည့်လယ်ယာလုပ်ငန်းအကြံပေးသည့် ဝန်ဆောင်မှုကိုပါပံ့ပိုးပေးမည်ဆိုလျှင် စပါးအထွက်တစ်ဟက်တာလျှင် ၂.၅တန်မှ ၃-၄တန်အထိ တိုးတက်ထွက်ရှိမည်ဖြစ်သည်။ တိုးတက်သည့်ရေစီမံခန့်ခွဲရေးဆိုင်ရာ လက်တွေ့လုပ်ငန်းများအတွက်

အသေးစားအစီအစဉ်များကို ရှေ့ပြေးအဖြစ်လုပ်ဆောင်ပေးနိုင်သည်။ ထိုအစီအစဉ်ကရသည့်သင်ခန်းစာများကို ပမာဏအကြီးစားရေသွင်းသည့်အစီအစဉ်များ၌ ရေကိုထိရောက်စွာသုံးစွဲရေးအတွက် နောက်ပိုင်းတွင်အသုံးပြုနိုင်သည်။ ပြည်သူ့လုပ်ငန်းကဏ္ဍ တိုးချဲ့ရေးတွင် လယ်သမားများအား စိုက်ပျိုးရေးသုတေသနနှင့် ခိုင်မာစွာချိတ်ဆက်ခြင်း မှတစ်ဆင့်အပါအဝင် ခေတ်မီနည်းပညာများ၏ အကျိုးကျေးဇူးများကိုအကြံပြု လက်တွေ့ပြသရန်အတွက် လုပ်ငန်းဆောင်ရွက်မှုရံပုံငွေများ ပိုမိုရရှိသင့်သည်။ အရည်အသွေးထိန်းချုပ်မှုနှင့် မျိုးစေ့များပွားများထုတ်လုပ်နေသည့် တောင်သူများအားအထောက်အပံ့များ တိုးပေးခြင်းကိုလည်းတိုးတက်အောင် လုပ်ဆောင်ရမည်ဖြစ်သည်။ စပါးအတန်းအစားသတ်မှတ်သည့် Beale စနစ်ကိုစွန့်လွှတ်ပြီး ပို့ကုန်တင်ပို့ရန်အလားအလာကောင်းရှိသည့် ဆန်ချောနှင့် ဆန်ကြမ်း မျိုးစေ့အမျိုးအစားများ ခွဲခြားဖော်ထုတ်ရန်အတွက် ပြည်သူနှင့်ပုဂ္ဂလိကကဏ္ဍ ပူးပေါင်းအားထုတ်ရန် အရေးတကြီးလိုအပ်နေသည်။ ထိုစပါးမျိုးများအား သင့်တော်သည့်စိုက်ပျိုးစီးပွားရေးဇုန်များတွင် မိမိဆန္ဒအလျောက် စိုက်ပျိုးရေးကိုလည်း အားပေးရန်လိုအပ်သည်။ လယ်ယာမှစျေးကွက်အထိ ထောက်ပံ့ပို့ဆောင်ရေးလုပ်ငန်းများ တိုးတက်ခြင်းကသွင်းကုန်စရိတ်များကို လျော့နည်းစေပြီး သယ်ယူပို့ဆောင်စရိတ်မြင့်မားမှုနှင့် ကြိတ်ခွဲဆန်များအတွက် ဆိပ်ကမ်းကုန်ကျစရိတ်များကြောင့် လယ်ယာထွက်ကုန်စျေးနှုန်းများအပေါ် ဖိအားသက်ရောက်မှုကိုလည်း လျော့ချပေးမည်ဖြစ်သည်။ နောက်ဆုံးအနေဖြင့် မြန်မာ့စိုက်ပျိုးရေးဖွံ့ဖြိုးတိုးတက်မှုဘဏ်က ၆လသက်တမ်းဖြင့်အကန့်အသတ်နှင့် ငွေထုတ်ချေးပေးသည့်စနစ်ကို ပြန်လည်စဉ်းစားသင့်ပြီး နိုင်ငံတကာ၏ကောင်းမွန်သောစနစ်များနှင့် ညှိနှိုင်းဆောင်ရွက်သင့်သည်။

စိုက်ပျိုးရေးမူဝါဒဆိုင်ရာ အပြင်ပန်းအမြင်အရ ရေတိုကာလတွင်လျှင်မြန်သော အကျိုးသက်ရောက် မှုကိုရရှိနိုင်သည်။ စိုက်ပျိုးရေးထွက်ကုန် ကုန်သွယ်မှုကဏ္ဍအတွင်းရှိ အတားအဆီးအများအပြားကို မကြာသေးမီက ဖယ်ရှားလိုက်သော်လည်း ပို့ကုန်မြှင့်တင်ရေး၊ စပါးစျေးတည်ငြိမ်ရေးနှင့် အမျိုးသားစားနပ်ရိက္ခာဖူလုံရေး(နှင့် နိုင်ငံရေးတည်ငြိမ်ရေး) ရည်မှန်းချက်များကြားတွင် သဘောထားကွဲပြားသည့် အလားအလာများရှိနေသည့်အတွက် ပုဂ္ဂလိကကဏ္ဍ မှာသတိထားနေရဆဲဖြစ်သည်။ အနာဂတ်အစိုးရ၏ လုပ်ဆောင်မှုများနှင့်ပတ်သက်ပြီး မသေချာမရေရာမှုများရှိနေသေးသည်။ ပြည်တွင်းရှိစျေးနှုန်းများ နိုင်ငံရေးအရလက်ခံနိုင်သည်ဟု ယူဆထားသည့်အဆင့် အထက် ကျော်လွန်သွားသည့်အခါ အစိုးရကလက်သင့်သလိုကြံရာ ပို့ကုန်တားမြစ်မှုများ ပြန်လည်ထုတ်ပြန်ရန်ဖြစ်နိုင်ခြေမြင့်မားသည်ဟု အများစုကယုံကြည်နေကြသည်။ ထုတ်လုပ်မှုပမာဏနှင့် ပြည်တွင်းသိုလှောင်မှုနှင့်ပတ်သက်ပြီး ယုံကြည်စိတ်ချရသည့်သတင်းအချက်အလက် ပြည့်စုံစွာမရှိသောကြောင့် မူဝါဒရေးဆွဲရေးလုပ်ငန်းစဉ်တွင် ပို၍မသေချာမရေရာမှုကိုဖြစ်စေသည်။ ကြားကာလတွင် စပါးစျေးနှုန်းမတည်ငြိမ်မှုကို မည်သို့ဖြေရှင်းမည်နှင့် ပို့ကုန်ယှဉ်ပြိုင်မှုတွင်မည်သည့် အကျိုးသက်ရောက်မှုရှိမည်ကို ရှင်းရှင်းလင်းလင်းမသိရချေ။ ယခင်ကသိုလှောင်စပါးများကို အတင်းအကြပ်အရှုံးနှင့် ရောင်းချခိုင်းခဲ့သည့်အတွက် ပြည်တွင်းစျေးနှုန်းများတိုးလာသည့်အခါ ဆန်စက်ပိုင်ရှင်များနှင့် ကုန်သည်များ သတိထားနေကြသည်။ မကြာသေးခင်ကသဘောတူခွင့်ပြုလိုက်သော တောင်သူများ၏အခွင့်အရေးကာကွယ်ရေးနှင့် အကျိုးအမြတ်မြှင့်တင်ရေးအက်ဥပဒေတွင် "အနိမ့်ဆုံး/အသင့်တင့်ဆုံး" လယ်ယာထွက်ကုန်စျေးနှုန်းများနှင့် ပတ်သက်ပြီးမသေချာမရေရာသည့် ပြဋ္ဌာန်းချက်များကြောင့် ပို့ကုန်ယှဉ်ပြိုင်မှုကိုလျော့ချနိုင်သည်ဆိုသော မသေချာမရေရာမှုများ ထပ်မံဖြစ်ပေါ်စေသည်။

အထက်ပါစိန်ခေါ်မှုများကို ဖြေရှင်းခြင်းဖြင့်အကျိုးအမြတ်ပိုမိုကာ ပြန်လည်ရရှိစေမည်ဖြစ်သည်။ စပါးပမာဏ ပိုမိုတင်ပို့ခြင်းဖြင့် နိုင်ငံခြားငွေပိုမိုရရှိစေရုံသာမကဘဲ စီးပွားရေးတိုးတက်မှုအပါအဝင် ဆင်းရဲနွမ်းပါးမှုလျော့ချရေးပါ ဖြစ်ပေါ်စေနိုင်သည်။ မြန်မာနိုင်ငံတွင် ဆင်းရဲနွမ်းပါးမှုသည် လုပ်အားထုတ်လုပ်မှုစွမ်းအားနိမ့်ကျမှုတွင် အမြစ်တွယ်နေသည့် ကျေးလက်ဖြစ်စဉ်တစ်ခုဖြစ်သည်။ ဂျီဒီပီနှင့်အလုပ်အကိုင်အတွက် အများဆုံးအထောက်အကူပြုနေသည့် စိုက်ပျိုးရေးကဏ္ဍတွင် ထုတ်လုပ်မှုစွမ်းအား အနိမ့်ဆုံးဖြစ်နေသည်။ စိုက်ပျိုးရေးကဏ္ဍသည် ကျေးလက်ဧရိယာများတွင် တစ်ခုတည်း

သောအသက်မွေးဝမ်းကျောင်းလုပ်ငန်း ဖြစ်ရုံသာမကဘဲ နိုင်ငံဖွံ့ဖြိုးတိုးတက်ရေးအတွက်ယခုလိုအဆင့်တွင် စိုက်ပျိုးရေး ကဏ္ဍသည်အကြီးမားဆုံးဖြစ်သည်။ ထို့ကြောင့်စိုက်ပျိုးရေးထုတ်လုပ်နိုင်စွမ်းအား မြင့်မားမှုမရှိဘဲ ဆင်းရဲနွမ်းပါးမှုလျော့ချ ရေးကို စဉ်းစားရန်မှာခက်ခဲသည်။

စိုက်ပျိုးရေးထုတ်လုပ်မှုစွမ်းအား အလုံးစုံမြှင့်တင်ရေးတွင် စပါးကဏ္ဍသည်အလွန်အရေးပါသည်။ ဆန်သည်အရေး အပါဆုံးသော အဓိကအစားအစာဖြစ်သည်။ ချမ်းသာသည့်အိမ်ထောင်စုများ၏ ၂၅%နှင့် ဆင်းရဲသည့်အိမ်ထောင်စုများ၏ ၅၀%မှာဆန်ကိုစားသုံးကြသည်။ စုစုပေါင်းစိုက်ပျိုးသည့်ဧရိယာ၏ ၃၀%မှာစပါးကိုစိုက်ပျိုးပြီး အသားတင်စိုက်ပျိုး ရေးထုတ်ကုန်၏ ၄၀%မှာစပါးဖြစ်သည်။ စပါးသည်နိုင်ငံဂျီဒီပီ၏ ၁၃% စာရင်းရှိသည်။

လယ်အများစုမှာပျမ်းမျှ ၅ ဧကလောက်နှင့်သာစိုက်ပျိုးသည့် အသေးစားလယ်ယာများဖြစ်ပြီး ထိုလယ်သမား အများအပြားမှာ ဆင်းရဲနွမ်းပါးကြသည်။ ပြည်သူများအကျိုးအတွက် ပံ့ပိုးပေးသည့်ပုံစံမျိုးဖြင့် လုံလောက်အောင် ထောက်ပံ့ပေးမည်ဆိုပါက ထိုတောင်သူများစပါးပိုမိုထုတ်လုပ်နိုင်မည့် အလားအလာရှိနေသည်။ ကမ္ဘောဒီးယား၊တရုတ်၊ မလေးရှား ထိုင်းနှင့်ဗီယက်နမ်နိုင်ငံများတွင် အသေးစားလယ်ယာများတွင် ထိုသို့ထောက်ပံ့ပေးခြင်းကြောင့် အောင်မြင်မှု ကိုရှင်းရှင်းလင်းလင်းလက်တွေ့ပြသနိုင်ခဲ့သည်။ တစ်ချိန်တည်းမှာပင် ပို့ကုန်ပိုမိုတင်ပို့နိုင်ပြီး စားနပ်ရိက္ခာဖူလုံမှုနှင့် စီးပွားရေးတိုးတက်မှုတို့ ဖြစ်ပေါ်စေမည်ဖြစ်သည်။ စပါးတင်ပို့မှုတိုးလာခြင်းကြောင့်ရလာသည့် သာတူညီမျှကြွယ်ဝမှု အလားအလာများသည် တိုးလာသည့်ထုတ်ကုန်များလာသည့်နေရာအပေါ် တည်မှီနေမည်ဖြစ်သည်။ အကယ်၍ထိုထွက် ကုန်များက အဓိကအားဖြင့်စက်မှုလယ်ယာများမှ လာမည်ဆိုလျှင် အကန့်အသတ်နှင့်ဆင့်ပွားအကျိုးသက်ရောက်မှု ရှိမည်ဖြစ်သည်။ အကယ်၍သာ အရှိန်မြှင့်ထားသည့်အသေးစားလယ်ယာ ထုတ်ကုန်များမှလာသည်ဆိုလျှင် တိုက်ရိုက် ဝင်ငွေရရှိမှုနှင့် အလုပ်အကိုင်အကျိုးသက်ရောက်မှု (နောက်ဆက်တွဲဆင့်ပွားသက်ရောက်မှုများ) ပိုမိုမြင့်မားစေမည် ဖြစ်သည်။

စပါးထုတ်လုပ်မှုမြင့်မားလာသည့်အတွက် သီးနှံအမျိုးမျိုးထုတ်လုပ်မှု မြှင့်တင်ရေးကိုလည်း အထောက်အ ကူဖြစ်စေနိုင်သည်။ ဥပမာအားဖြင့် အပူပိုင်းဇုန်တွင်နွေရာသီ၌ ပဲအမျိုးမျိုးထုတ်လုပ်ခြင်းက အကျိုးအမြတ်ပိုမိုရရှိစေပြီး ထိုသို့သောသီးနှံမျိုးကို ပိုမိုစိုက်ပျိုးထုတ်လုပ်ခြင်းဖြင့် တောင်သူများဝင်ငွေပိုရရှိမည်ဖြစ်သည်။ စပါးမဟုတ်သည့်သီးနှံများက ဝင်ငွေပိုရစေနိုင်သော်လည်း စပါးသည်အိမ်ထောင်စုများစားနပ်ရိက္ခာဖူလုံရေးအတွက် အဓိကအစားအစာဖြစ်သောကြောင့် စပါးထုတ်လုပ်မှုကဏ္ဍတွင် ရေရှည်တည်တံ့သောတိုးတက်မှုမရှိလျှင် သီးနှံအမျိုးမျိုးအများအပြားထုတ်လုပ်ရေးမှာ မဖြစ်နိုင်ပေ။ တောင်သူများက အိမ်ထောင်စုများ၏ စားနပ်ရိက္ခာလိုအပ်ချက်ကို ဖြည့်ဆည်းပေးနိုင်လောက်သည့် လုံလောက်သောစပါးပမာဏထုတ်ပေးပြီးမှသာ အခြားသီးနှံများကိုစိုက်ပျိုးရန်ဆန္ဒရှိကြသည်။

ဆန်စပါးကဏ္ဍပြုပြင်ပြောင်းလဲရေးအောင်မြင်မှုကို မြန်မာနိုင်ငံအတွင်း အလုံးစုံသောစိုက်ပျိုးရေး လုပ်ငန်း တိုးတက်မှုနှင့် ဆင်းရဲနွမ်းပါးမှုလျော့ချရေးပမာဏပေါ်တွင် နောက်ဆုံး၌ဆုံးဖြတ်မည်ဖြစ်သည်။ ထို့ကြောင့်ဆန်စပါး တင်ပို့မှုကို ပမာဏတိုးချဲ့တင်ပို့ခြင်းဆိုသည်ထက် နောက်လာမည့်ဆယ်စုနှစ်အတွင်း မြန်မာနိုင်ငံတွင်ပြီးပြည့်စုံသော တိုးတက်မှုရရှိရေးအတွက် တွန်းအားတစ်ခုအဖြစ်ရှုမြင်ရမည်ဖြစ်သည်။ ။

EXECUTIVE SUMMARY

Improving agricultural productivity and promoting exports are top priorities for the Government of the Republic of the Union of Myanmar, which has set ambitious targets of exporting 2 million tons of rice by 2014/15 and 4 million tons by 2019/20. Actual performance has lagged behind these targets, but the opening of Myanmar's economy and recent policy measures liberalizing export have started to produce first results. In 2012/13, rice exports were at a 48-year high of almost 1.3 million tons. In 2013/14, the exports remained about the same, calling for the continuation of reforms to achieve the above export targets.

There are good market prospects to accommodate higher rice exports for Myanmar. The global demand for rice is projected to continue growing, at least during the next 10-15 years. China is turning into a large net importer of rice, and the European Union opened its lucrative market for duty-free imports from Myanmar under the "Everything but Arms Agreement."

The competition is strong, however. Neighboring Cambodia and Vietnam are modernizing their rice industries and are starting to diversify and capture higher-value rice markets. The strong commitment of the government to export-led rice sector development allows Cambodia to attract significant foreign direct investments in the rice milling industry, while foreign investments in Myanmar remain limited. The global demand for low quality rice, which accounts for almost 95 percent of Myanmar's recent exports, is on the decline, necessitating Myanmar to focus on improving quality more than just quantity to benefit from the new market opportunities. Among other things, a high attention needs to be paid to sanitary and phytosanitary measures for Myanmar to access new markets and compete in the higher rice quality segments.

To exploit new opportunities, Myanmar needs to rethink its export strategy. Producing and selling more low-quality rice is not a viable long-term strategy. Myanmar should aim to produce and sell increasing quantities of different qualities of rice and do so more efficiently. Higher rice exports necessitate providing public services and a favorable investment climate to all farms, small and large, that would improve farm productivity, efficiency of milling and trade logistics serving both export and domestic markets. This strategy will allow Myanmar's rice value chain participants to better serve their local and overseas clients, earn higher incomes, capture the growing market of higher value rice, and diversify risks along different markets.

Many issues need to be addressed to realize this strategy. The most acute problems are at the farm level but there are also problems related to inefficiencies in the milling sector, costly and slow export logistics, and unclear agricultural policy. Some of these problems require time for resolution, but many improvements can be made in the short run, contributing to the government's objective to reduce poverty in the next 30-month period.

The experience of other Asian rice exporters shows the need for a comprehensive strategy for modernization of Myanmar's rice value chain. Investments in public goods to reduce costs along the various segments of the value chain, private-sector friendly regulations, and open trade policy are all preconditions for development of the rice sector. In regard to the sequence of government actions, the experience from Cambodia and Thailand offers the best guidance to Myanmar, indicating that modernization of the milling industry, including through foreign direct investments, and reduction of exporting costs could trigger a subsequent growth of farm productivity and changes in farm practices (including the choice of rice varieties) required to match the evolving demands of importers. Without these positive changes in the milling and export segments of the value chain, there is a risk that further development of the farming sector will never materialize.

Myanmar's milling industry needs urgent modernization. Currently, most mills operate with obsolete processing units, leading to about 15-20 percent quality and quantity losses during milling. The average milling ratio is below 60 percent, much lower than in neighboring countries. Upgrading mills requires access to long-term credit, technical and managerial knowhow, and low-cost, reliable electricity. The latter needs more time to be realized, through investments in electricity generation, distribution, and more efficient management. But in the short run, removing the clause for government approval of joint ventures in the rice milling sector for foreign direct investors and revising the rules for domestic commercial loans could

kick-start the modernization process. In addition, technical assistance to millers on the use of husk-based gasifiers used in many countries of Southeast Asia as an intermediate energy source due to lack of access or reliability of energy from the electricity grid could be considered.

In the export segment, government actions need to focus on reducing the costs of doing business and improving the infrastructure in Myanmar's ports. Almost all formal rice exports go through Yangon Port. The loading area is limited and the port does not have sufficient equipment (such as loaders, forklifts, and conveyor belts), which reduces the loading turnover, in turn affecting freight charges. Overall, Yangon Port is among the most expensive in the world. To reduce costs and improve the speed of export logistics, the most important actions include a review of all export procedures and costs with a view towards improving the competitiveness of Myanmar rice; modernization of the existing equipment and facilities in Yangon Port and investments in Thilawa Port; and preparation of a phyto-sanitary agreement with China to complement informal border rice exports.

Positive changes in the milling and exporting segments would trigger changes at the farm-gate, where the challenges are the largest. Paddy yields in Myanmar are among the lowest in Southeast Asia. While paddy yields reach 4 tons per hectare on well-managed irrigation schemes such as Shwebo, yields on most fields in the country are about 2.7 tons per ha. In contrast, the average per ha yield in Cambodia is 3 tons; in the Philippines, 3.7 tons; and in Vietnam, 5.5 tons. Going beyond the average, in Vietnam in the areas from which the bulk of the export originates, yields often reach 6.5-7.5 tons per ha during the winter-spring season. In addition, the quality of Myanmar's rice is very low, hampering its export competitiveness and income-generation opportunities. Myanmar and Cambodia are probably the only countries in the region where paddy yields could double and rice quality could improve within a decade, providing a strong impetus to economic growth and poverty reduction.

A more efficient milling sector would give strong incentives to kick-start farm productivity growth as illustrated by the recent experience in Cambodia, but investments in public goods will be the key to maintain that growth over the long run as illustrated by the experiences in Thailand and Vietnam. In Myanmar, it would require focusing on improving water management, farm advisory services, seed markets, farm-to-market logistics, and rural finance. Rehabilitation of small-scale irrigation systems could offer quick incremental benefits, increasing paddy yields from 2.5 tons per ha to 3-4 tons, especially if supported with appropriate farm advisory services. Smaller schemes can also serve as pilots for improved water management practices, the lessons from which could be later used to improve water use efficiency in large-scale irrigation schemes. Public extension should receive more operational funds to advise and demonstrate the benefits of modern technologies to farmers, including through stronger links with agricultural research. Quality control and extension support to farmers who multiply seeds need to be improved. The Beale system of classifying rice needs to be abandoned and a public-private effort is urgently needed to identify a small number of fragrant and non-fragrant seed varieties with good export potential whose planting could be encouraged on a voluntary basis in appropriate agro-ecological zones. Improved farm-to-market logistics would lower input costs and reduce the pressure on farm-gate prices resulting from high transport costs and port charges for milled rice. Lastly, the current practice of limiting Myanmar Agricultural Development Bank loans to six months should be reconsidered and aligned with good international practices.

Quick impact in the short term can be achieved through outward-looking agricultural policy. Although many barriers to agricultural trade were recently abolished, the private sector remains cautious given the potential conflict between export promotion, rice price stabilization, and national food security (and political stability) objectives. There are many uncertainties about future government actions. Most believe that there is a high probability that the government will reintroduce ad hoc export bans when domestic prices rise above levels considered politically unacceptable. Lack of reliable information about production volumes and domestic stocks further contributes to the uncertainties of the policy-making process. Over the medium run, it remains unclear how rice price volatility will be addressed and what effect it will have on export competitiveness. Having been previously coerced to sell stocks at a loss, millers and traders remain cautious when domestic prices increase. Vague provisions on "minimum/fair" farm prices in the recently

approved Farmers' Right Protection and Benefit Promotion Act add to uncertainty because it could reduce export competitiveness.

Addressing the above challenges offers high rates of return. Larger rice exports could not only bring more foreign exchange but could also trigger inclusive economic growth and poverty reduction. Poverty in Myanmar is a rural phenomenon rooted in low labor productivity. Productivity is the lowest in agriculture, the largest contributor to GDP and employment. While agriculture is not the only source of livelihood in rural areas, at this stage of the country's development, it is the largest. Thus, poverty reduction is difficult to imagine without higher agricultural productivity.

The rice sector takes a critical importance in raising overall agricultural productivity. Rice is the most important staple, accounting for 25 percent of the consumption of richer households and 50 percent of the consumption of poorer households. Paddy accounts for 30 percent of total planted area and 40 percent of gross agricultural output. It is estimated to account for 13 percent of the country's GDP.

Most paddy is produced by small farms with an average size of five acres, and many of these farms are poor. They have a significant potential to produce more paddy if adequate support in the form of public goods is provided, as clearly demonstrated by the successful performance of small farms in Cambodia, China, Malaysia, Thailand, and Vietnam. Higher exports would then contribute to food security and economic growth at the same time. The shared prosperity potential from increased rice exports would depend upon where the incremental output comes from. If it comes primarily from large mechanized farms there would be a limited multiplier effect. If it instead comes from more intensified small farm production, then the direct income and employment effects (and subsequent multipliers) would be much higher.

Raising rice productivity can also help promote crop diversification. In the Dry Zone, for example, production of beans and pulses in the summer season is more profitable than paddy, and farmers can gain higher incomes by producing more of such crops. Yet while non-paddy crops can bring more income, substantial crop diversification will not be possible without sustained growth in rice sector productivity, as rice is the main source of household food security. Farmers are willing to diversify only after they produce enough rice to meet household food consumption needs.

The success of reforms in rice sector will eventually determine the extent of overall agricultural growth and poverty reduction in Myanmar. Thus, exporting rice goes much beyond increasing volumes. Rather, it should be seen and treated as an impetus for inclusive growth in Myanmar in the coming decade.

1. Introduction

1. Improving agricultural productivity and promoting exports are top priorities for the Government of the Republic of the Union of Myanmar.[1] Given the centrality of rice to the rejuvenation of agriculture in Myanmar, the rice sector is of critical importance, especially rice exports. The government announced ambitious targets of 2 million metric tons (tons)2 of rice exports by 2014/15 and 4 million tons by 2019/20. Recent actual performance is falling short of these targets, but the opening of Myanmar's economy has already helped significantly increase rice exports.

2. Going forward, there are more global and regional rice market opportunities. Should they be realized, higher rice exports could stimulate agricultural growth, which in turn could reduce poverty and boost shared prosperity. Poverty in Myanmar is a rural phenomenon rooted in low labor productivity, especially that of agriculture (World Bank 2013a). Better export opportunities and more stable prices, to which a more efficient export system could contribute, would trigger an increase in rice sector productivity and eventually overall agricultural productivity, given the large share of rice in Myanmar's planted area, production, trade, and consumption.

3. Higher agricultural productivity would also help the landless, who often work as seasonal farm workers. Landlessness is highest in the Delta and Dry Zone, where agricultural potential and population density are also the highest. An increase in agricultural productivity there would create more jobs for the landless and reduce poverty among this very vulnerable group. With more and better quality paddy, the milling industry would accelerate its modernization, creating non-farm jobs and stimulating economic growth. Net buyers of rice in rural and urban areas would benefit from the increased supplies and improved quality of rice, potentially at lower prices.

4. Yet several big challenges lie ahead. Strong competition from other exporters and constantly rising demands for the safety and quality of rice on world markets put pressure on Myanmar's rice sector. While field yields are only half of those realized by other exporters, significantly expanding the current exportable surplus will take time and can only be realized if rice farming profitability is considerably increased. In 2013/14, for example, formal rice exports declined compared to 2012/13, illustrating the importance of addressing structural weaknesses along the value chain if Myanmar is to become a reliable rice exporter. A significant increase in exports also necessitates that Myanmar diversify both its overseas markets and the quality of its rice exports. For this to happen, Myanmar's economic policies need to enhance competitiveness, not undermine it.

5. The objective of this report is to analyze rice market opportunities for Myanmar, taking a holistic view of the value chain to identify policy actions required to capitalize on these opportunities. The analysis in this report is based on primary and secondary data and qualitative interviews conducted by the World Bank team (see Box 1), and provides the government, the donor community, and the private sector with improved information and evidence-based analysis of key issues around the rice supply chain, an industry that is the livelihood of millions of farmers. The information and analysis are critical for the design of strategies, public investment programs, and policies to promote exports and eventually develop a more competitive agricultural sector in Myanmar.

1 "Framework for Economic and Social Reforms, Policy Priorities for 2012-15," Myanmar Development Resource Institute, Center for Economic and Social Development, 2012.

2 Rice production and yields in this report refers to paddy and rough rice unless otherwise indicated. All tons are metric tons.

Box 1: Summary of Data and Information Used in This Report

The analysis in this report is based on primary and secondary data. Published and unpublished analyses on the milling and export sectors were used for this report. The team spoke with many farmers in Yangon and Irrawaddy Divisions during field visits in November 2012 and in Mandalay and Sagai Divisions in October 2013. Three of the largest international buyers of Myanmar rice were interviewed, as well as the key Singapore-based firms specializing in Myanmar's import and export trade. To gain an understanding of likely foreign investor interest, the team spoke to Thai rice exporters, who are considering rice milling investments in the region. In Yangon, the country's leading rice exporters were interviewed, most of which own rice mills and some of which have a Rice Specialization Company (RSC).[3] The team discussed the market with the country's largest single private rice trader and visited the two wholesale rice markets in Yangon. It also met traders and millers in Mandalay to discuss border trade via Muse. In addition to talking with officials at the Myanmar Rice Federation (MRF) and Myanmar Rice Millers Association (MRMA), individual millers were interviewed during field trips in Ayeyarwaddy, Bago, and Sagaing to collect economic data and to gain an understanding of their problems and how some of their needs could be met by the World Bank Group and the donor community. To gain an understanding of the logistical constraints, the team spoke with the author of a report on Yangon Port, interviewed a Singapore-based shipping firm, met the Yangon-based representative of one of the international shipping lines, and discussed logistics with an official at Thilawa Port.

6. This report is one of four reports prepared by the World Bank under the Programmatic Analytical Program. Along with "The Review of the Myanmar Agricultural Development Bank (MADB)" and "The Analysis of Farm Production Economics," this report is financed by the Livelihood and Food Security Multi-Donor Trust Fund. The fourth report, "Rice Price Stabilization," is directly financed by the World Bank. The latter report is complementary to this one given the importance of transparent and efficient price stabilization for stimulation of private sector investments in the rice value chain.

7. This report also complements recent rice-related studies prepared by others.[4] Together, they provide a solid analytical underpinning for developing public programs and policies for promotion of rice exports and development of the rice value chain. The value-added of this report comes from several aspects. It brings international experiences from around the world to Myanmar. It includes detailed statistical tables on the rice sector, especially on rice exports. It has detailed overviews of the milling and trade sectors, and it also presents a detailed description of the main export players, information not available in other reports. The presentation of the world rice market, its complexity, and future trends is also new. Most importantly, this report is policy oriented. It focuses on areas critical to achieving the government's export targets and making sure that the gains associated with greater exports trickle down to farmers and other actors along the value chain.

8. The rest of the report is organized as follows. Chapter 2 provides information on recent rice export developments in Myanmar. Chapter 3 presents the evolving export opportunities as well as challenges that must be overcome to capitalize on them. Chapter 4 describes the main constraints at various segments of the value chain and offers possible remedies. Chapter 5 discusses how rice policy should evolve to support modernization of the rice value chain. Chapter 6 offers conclusions and policy recommendations. Seven annexes provide further, more detailed information.

3 RSCs are firms that provide inputs, knowhow, and credits to farmers.
4 See the references for a list of recent rice value chain studies and other literature.

2. Recent Rice Export Developments in Myanmar

9. Once the world's largest rice exporter, Myanmar's exports dwindled as successive governments nationalized exports. As shown in Table 1, exports started to sharply decline in the 1940s and almost disappeared in the 1970s (see Annex 1 for a history of Myanmar's rice exports). Accompanying this downward spiral in exported volume was a decline in the quality of rice shipped. After the 1997 low, overseas shipments went through several boom-bust periods in which large stocks were built, followed by overseas shipments of 1 million tons (2002 and 2009), followed subsequently by a steep fall-off.

Table 1: Myanmar: Rice exports by decade, '000 tons

Period	Average	Minimum	Maximum
1990-1919	2,262	1,646	2,999
1920-1929	2,638	2,107	3,148
1930-1939	2,981	2,584	3,428
1940-1949*	1,288	428	2,851
1950-1959	1,450	970	1,864
1960-1969	1,211	331	1,749
1970-1979	508	157	844
1980-1989	595	368	750
1990-1999	244	15	645
2000-2009	421	31	1,052

Note: * = 1940 and 1945-1949.

Source: 1910-1936, 1950-1960 from U Khim Win. 1940 and 1945-1949 from Barker, Herdt and Rose 1985. 1961-2009 – from FAS/USDA.

10. In 2009, exports exceeded 1 million tons for the second time since the 1960s, though they remained small compared to domestic utilization, estimated at 10 million tons. In 2012, exports were at a 48-year high of almost 1.3 million tons, the largest volume exported since 1965, up 57 percent from the respectable 2011 performance (Table 2). This was fueled by 0.68 million tons of informal border trade with China, a new feature of Myanmar's export.[5] In 2013, the informal export increased to 0.75 million tons in contrast to the decline of the formal exports. The government's target is for rice exports to reach 2 million tons by 2014/15 and 4 million tons by 2019/20.

Table 2: Myanmar: Recent rice exports, '000 tons

	2010	2011	2012	2013
Formal	485	816	605	530
Informal/border	4	6	684	747
Total	489	821	1,289	1,277

Source: Ministry of Commerce (MOC) and Slayton & Associates.

5 "Formal exports" in this report refers to cargo shipped by an ocean-carrying vessel, including via container. Trade with China conducted via "border trade" is called "informal exports." Frequently the official reports cover only formal export statistics.

11. The increase in exports was triggered by many factors, among the most important of which were the recent policy measures liberalizing export. These measures included:

- Dropping the requirement for permits to transport rice to areas near the border;
- Reducing the export tax from 10 percent to 2 percent and then suspending it;
- Unifying the official and parallel currency markets;
- Eliminating minimum export prices;
- Dropping the requirement that exporters have in stock 50 percent of the rice for which an export license is sought; and
- No longer giving Rice Specialization Companies a priority in obtaining export licenses (i.e., excluding/restricting others).

12. Despite the recent increase in export volumes, there are still many weak points. Formal exports in 2013/14 may decline due to a number of reasons, including low private stocks caused by the large exports in 2012 and the slow growth of paddy production in 2013, rising domestic prices, and difficulties at the border to sell rice to China. Formal exports traditionally peak in January-April (Table 3), putting extra pressure on logistics. The rainy season usually ends in mid-October, followed by peak harvesting of the main crop in November-December. With carryover supplies typically depleted, rice exports reach a nadir in November and then build through the dry season, which ends in mid-May. Benefiting from the dry season harvest in the Ayeyarwaddy Delta in March and April, peak exports occur in those two months. Rice loadings slow significantly during the rainy season to approximately half of the volume occurring in March-April. Part of the problem during the rainy season is that loading is virtually impossible at night, as there are no visual indications of when rain clouds are threatening. Over the last five years, only 38 percent of exports were executed during the six-month period that encompasses the Southwest monsoon.

Table 3: Myanmar: Rice exports by month, average for 2007/08-2011/12, %

	Rainy Season							Dry Season			
May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
7	7	7	3	7	7	4	8	12	8	14	11

Source: Slayton & Associates.

13. Although some farms produce high quality aromatic rice such as Paw San and more of such rice could be produced to capture higher-value segments of the rice market, due to the lack of investment in modern rice mills and other problems along the rice value chain, 92 percent of Myanmar's exports over the last three years were of 25% brokens, a low-quality rice (Table 4). Most of the formal exports were shipped to Africa, which accounted for 75 percent of all rice shipped, while Bangladesh accounted for another 14 percent. Within Africa, key markets include the Ivory Coast, Guinea, and Burkina Faso (Table 5). Informal trade to China has also been mostly that of low-quality 25% brokens rice (see below).

Table 4: Myanmar: Rice exports by grade, '000 tons

	Fragrant	100% S	5%	10%	15%	Parboiled	25%	Brokens	Other	Total
2010	*	2	12	9	5	0	456	0	*	485
2011	*	5	20	1	12	1	737	39	1	816
2012	*	1	53	0	6	8	504	30	2	605

Note: * Less than 500 tons. Rice 15% broken means 85% head rice and 15% broken rice, and so on. The category "Brokens" does not include any head rice.
Source: Slayton & Associates.

Table 5: Myanmar: Rice exports by destination, 1995-2012, '000 tons

Destination	1995-99	2000-04	2005-09	2008	2009	2010	2011	2012
EU	**0**	**15**	*	*	*	**0**	**12**	**28**
Former Soviet Union	**0**	**0**	*	**0**	**2**	**11**	**19**	**44**
AFRICA	**43**	**195**	**261**	**196**	**899**	**318**	**506**	**460**
of which:								
Burkina Faso	0	11	9	10	29	64	71	82
Cameroon	2	13	14	25	24	15	37	21
Guinea	7	31	70	44	246	85	125	173
Ivory Coast	2	49	73	25	252	95	122	125
Sierra Leone	5	18	18	20	44	0	4	9
Togo	0	4	13	22	40	11	33	6
ASIA	**170**	**264**	**129**	**403**	**150**	**156**	**276**	**72**
of which:								
Bangladesh	10	108	99	385	70	116	215	0
China	0	1	0	0	1	0	0	13
Indonesia	122	132	5	0	11	5	2	10
Philippines	27	2	9	0	47	16	13	33
Total	**222**	**484**	**391**	**598**	**1,052**	**485**	**816**	**605**

Note: * Less than 500 tons.
Source: Slayton & Associates.

14. Due to location, quality, and risk, Myanmar rice sells at a discount. For example:

- Most of Myanmar's rice is sold to Africa, where consumers are extremely price conscious. In part because of the longer sailing time, freight ex-Yangon to West Africa is $15 per ton more expensive than shipments from either India or Pakistan, so international traders typically will only buy Emata 25% at a substantial discount from prices offered from these two origins.[6]

- Over 90 percent of Myanmar's formal exports are moved as break bulk shipments rather than via containers.

- Loading costs are significantly higher in Myanmar, export procedures are more costly, and Myanmar has a history of non-performance due to government export policy changes, all of which contribute to the discounting of Myanmar's rice prices.

- The uneven appearance and cooking characteristics of Myanmar's rice are considered inferior due to the mixing of varieties and because the rice originates from so many small mills.[7]

15. Myanmar loses a lot of money from these inefficiencies and problems. During the last two years, Emata 25% was sold at an average discount of $30-40 per ton vis-à-vis Pakistan and India (Table 6). Of note, Vietnam 25% traded below Myanmar quotations during March-September even though its freight costs are comparable. During 2011 and 2012, however, Myanmar rice traded at a substantial discount to Vietnam.

Table 6: Selected export prices, 25% brokens, FOB, $/ton

	Myanmar	Vietnam	Pakistan	India	Spread with Myanmar		
					Vietnam	Pakistan	India
2011							
Oct	400	520	405	410	-120	-5	-10
Dec	345	425	390	385	-80	-45	-40
2012							
Mar	360	415	415	375	-30	-55	-15
Jun	350	415	415	395	-15	-65	-45
Sep	390	400	400	414	-30	-10	-24
Dec	350	365	365	390	-32	-15	-40
2013							
Mar	380	365	380	415	15	0	-35
Jun	370	340	410	415	30	-40	-45

Note: FOB Bangkok, HCMC, and Yangon at end of the month.

Source: LiveRiceIndex for India, Pakistan, Thailand and Vietnam. Exporter quotes for Myanmar.

6 Some exporters sell basis FOB unstowed, which is at a discount of $2.50-5.00 per ton from FOB stowed. Because of sanctions that were only recently lifted, most sales are made with advance payment via Telegraphic Transfer rather than via Letter of Credit. Some firms, however, set up Singapore-based offices which serve as a conduit for financing. While a Letter of Credit in theory can now be opened directly, Myanmar's banks and the exporters prefer to continue to use Telegraphic Transfers. Also, some banks are not yet set up to receive Letters of Credit. According to one buyer, Telegraphic Transfer-based export prices are at a $5-7 per ton discount to Letter of Credit-based purchases.

7 Upon arrival in warehouses in Yangon, rice from different mills is often mixed together to improve the uniformity of appearance.

16. In addition to formal exports via ocean-going vessels, Myanmar periodically exports large quantities of rice to its neighbors, especially China. Border trade with China was opened in 1988 with the signing of a bilateral trade agreement. There are four recognized border trade crossings between the two countries – Muse, Lweje, Chin Shwe Haw, and Kan Pite Tee – but rice moves through Muse. In 2012, exports amounted to 0.8 million tons (Table 7). While trade is periodically prohibited by Myanmar authorities,[8] these exports are otherwise legal and documented by Myanmar, but do not officially exist from China's perspective. Over three-quarters of a million tons of export licenses were issued for rice to be shipped to China in the 12-month period ending March 2013, but official Chinese import data show only 6,200 tons imported from Myanmar during the same period.[9]

17. In addition to the border trade with China, small tonnages of rice also move to Thailand, via the Myawaddy-Mae Sot border crossing (Table 7). Myanmar also has two border crossings each with Bangladesh (Sittwe and Maungdaw) and India (Tamu and Rikawhta). Official data show no rice moving to these two countries via border trade, but many in the trade believe that smuggling does occur, especially to Bangladesh.

Table 7: Myanmar: Exports via border trade, '000 tons

	China	Thailand	Total
2009-2010	68	11	79
2010-2011	0	0	0
2011-2012	136	0	136
2012-2013	752	8	760

Source: MOC.

18. Border trade with China offers many opportunities. The Chinese buyers are described as not choosy, with an estimated 70 percent of the rice 25% brokens. Only 10 percent of the rice is 5% brokens and the balance comprises brokens and glutinous rice. With the 2013 drought in the Dry Zone, about 80 percent of the rice supplied to China last year is estimated to have originated in the Delta, with roughly equal volumes coming from Ayeyarwaddy and Bago. According to the Mandalay Paddy and Traders Association, the mode of transportation varies, with about three-fourths of the rice from Ayeyarwaddy shipped via barges, while all of the rice originating in Bago comes by rail or truck. Transportation costs from the Delta range from $75 to over $100 per ton depending on the transportation mode and whether the rice is initially delivered to Yangon (Table 8). Notwithstanding the huge additional transportation costs, the price of 25% brokens ex-Muse is nearly $200 per ton below Chinese wholesale prices.

8 According to official data, no border trade occurred from April 2010 through October 2011. Opinions are sharply divided on the extent to which rice is smuggled to China during those periods when the border trade in rice is not officially sanctioned. The official data seem to be credible given that the mountainous terrain is not conducive to large-scale shipments of relatively low-valued contraband such as rice, via either pack animals or on foot.

9 This is believed to include containers transshipped via Singapore.

Table 8: Myanmar: Border trade costs with China, $/ton

	Average Cost
Freight between:	
Pathein-Yangon	10.60
Yangon-Mandalay	42.40
Ayeyarwaddy- Mandalay (via barge)	27.50
Mandalay-Muse	49.18
Pathein-Muse	102.81
Ayeyarwaddy- Muse	77.50
Other expenses:	
Brokers	4.24
Border crossing (formal+ informal)	9.00
Export tax	8.48

Source: Slayton & Associates.

19. Yet there are also risks. Border trade with Myanmar is not officially recognized by the Chinese authorities. Although this helps avoid the limits of the import tariff rate quota (see Chapter 3 for details), trade prospects are not predictable, bringing extra volatility to the domestic market and hampering private investment. Reportedly, there are some 200 traders involved from the Myanmar side, but only about 10 Chinese buyers. Trucks with rice are reported to have been periodically seized by Chinese customs officials before they reach Ruili (4 km from Muse across the border), which could be part of the negotiating tactics of the Chinese buyers.

20. With this recent performance as a background, Chapter 3 presents some new export opportunities for Myanmar. It also describes a number of challenges to be overcome if Myanmar is to become a reliable exporter. A possible decline in 2013/14 exports to well below the export target could be an eye-opener for the government, given its ambitious export promotion plans.

3. New Export Opportunities and Challenges

21. The recent increase in rice exports has encouraged the government to consider further export increases. Opening Myanmar's economy and lifting the sanctions have indeed brought new world market opportunities. Yet realizing them and allowing gains from the larger exports to trickle down to farmers and other players along the rice value chain is not simply about producing and selling more but rather producing and selling more of a different quality of rice and doing so more efficiently. This strategy would allow Myanmar's rice value chain participants to earn higher incomes, capture the growing market of higher value rice, and diversify risks along different markets. This chapter starts by describing the evolving rice export opportunities followed by an analysis of the challenges lying ahead.

Opportunities

22. While representing only 8 percent of world rice production, as reported by the U.S. Department of Agriculture (USDA), the international rice market has expanded sharply over the last several decades, fueled by petro-dollar wealth, increased production in exporting countries, continuing global urbanization, and changing diets driven in part by the premium placed on the ease of food preparation. The USDA recently reported that world rice trade jumped by 3 million tons in 2012 to over 39 million tons (Table 9). This record volume was more than 11 million tons over that averaged during the turn of the 21st century (2000-2009).

Table 9: World rice trade, million tons

Decade	Quantity
1970s	8.8
1980s	11.9
1990s	18.2
2000s	27.9
2010	31.5
2011	36.2
2012	39.2
2013	38.3

Source: USDA February 2014.

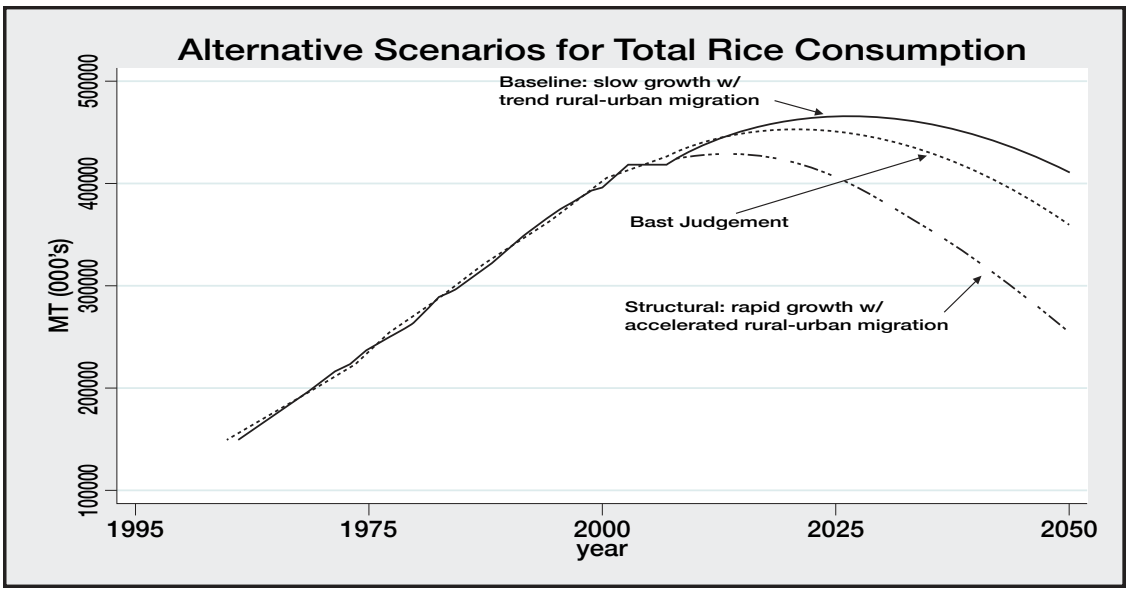
23. World trade was buoyed by record import demand from China and Nigeria, as well as higher-than-normal bookings by Senegal and the Ivory Coast. Nigeria, Senegal, and the Ivory Coast are the three largest importers in Africa – a key regional driver in the volume of rice traded internationally. The combined imports of these four markets soared by over 4 million tons in 2012. A detailed look at the composition of the 2012 trade shows global trade in white brokens jumped 1.3 million tons to over 3.0 million tons while demand for fragrant brokens withered by over 150,000 tons to an estimated 660,000 tons. Equally important, Senegal (the world's largest importer of white brokens) increased its imports by 275,000 tons and brokens figured prominently in China's purchases in Pakistan and, to a lesser extent, Vietnam. Record purchases by Nigeria bolstered global parboiled rice demand to an unprecedented 7.8 million tons, up 165,000 tons from the already rich year-earlier volume. Modest gains were observed in high-quality white rice movement, but strong African (and, to a lesser extent, Chinese) bookings contributed to a 1.4 million ton rebound in the low-quality white rice trade, to over 5 million tons.

24. The world rice market is thin and segmented.[10] Including the unprecedented 39.1 million tons in 2012, world trade averaged 36.6 million tons over the last three years.[11] The rice market is heavily asymmetrical – five exporting countries (Thailand, the U.S., India, Vietnam, and Pakistan) account for some 80 percent of the rice exported. The principal importing countries are usually developing countries and the 10 largest importing countries account for a much less significant portion of the rice traded. Beginning in the 1970s, rice import demand became increasingly dispersed as a result of rising consumption in West Africa (in the face of stagnant production) and the Middle East, as well as the spread of high yield varieties in Asia. Over the last several years, the 10 largest rice importers annually imported on average 15.0 million tons, or over 40 percent of the world trade.

25. Although thin and highly volatile, the world rice market is growing and Myanmar can benefit from its growth. According to Wailes and Chavez (2012) of the Asian Development Bank (ADB), global rice consumption is projected to increase 1.14 percent annually between 2010/11 and 2021/22. Global rice trade is expected to grow even faster, by 2.27 percent annually. Thailand, Vietnam, and India are expected to remain top exporters, but more exports are also anticipated from Cambodia and Myanmar.

26. It should be noted, however, that in the longer term, there is a high likelihood that global rice consumption will actually decline. The inflection is anticipated to occur in 2025 (Figure 1). This decline is driven by rapid income growth and rural-urban migration in Asia, the major rice consuming region. The lower long-term demand for rice would reduce incentives for higher production and increase competition based on quality differentials.

Figure 1: Alternative projections of world rice consumption, 1950-2050



Source: Timmer 2012.

27. In the near term, Myanmar will especially benefit from duty-free access to the European Union (EU). The EU imports 1.5 million tons of rice annually (Table 10). As of July 19, 2013, the EU restored duty-free imports to Myanmar (under the "Everything but Arms Agreement"), retroactive to June 13, 2012. The Agreement's waiver for milled rice at current exchange rates is worth $235 per ton (€175). Previously, only Cambodia enjoyed the "Everything but Arms Agreement's" treatment for rice.[12] While about half of Cambodia's current sales to the EU are of fragrant rice, it is expected that Myanmar will principally be a seller of high-quality white and parboiled rice and brokens. This rice will be shipped primarily via containers, avoiding port constraints, which are expected to increase in the near future.

10 The world rice market is complex. See Annex 2 for a description of these complexities.
11 This includes higher estimates of border trade for Cambodia and Myanmar than are captured by USDA. World trade in 2012 was 39.2 million tons and the average for 2010-12 was 35.6 million tons.
12 Laos PDR also has "Everything but Arms" privileges, but its exportable surplus is very small.

Table 10: EU: Estimated rice imports, '000 tons, 2012

Quality	Volume
Basmati	450
Jasmine	250
White brokens	400
High-grade white and parboiled	400

Source: Slayton & Associates.

28. **But the largest export opportunity will be in China**, which only became a net rice importer in 2011, opening new market opportunities to Myanmar and other exporters. China recently reduced its food self-sufficiency targets from 100 percent to 90-95 percent of domestic production for different products, signaling its openness to future larger imports. As a result of three years of double-digit farm support price increases (Table 11) in an effort to narrow the rural-urban income gap and because of rising production costs, China's rice prices are currently well above world prices for long-grain rice. In mid-2013, local wholesale prices for medium-quality rice were at around $620 per ton, compared with Emata 25% values at $428 per ton at the China border and Vietnam 5% values of $368 per ton FOB. This considerable price gap resulted in a sharp rise in commercial imports in 2012 and again in 2013, with most of this rice destined for urban markets in southern China.

Table 11: China: Early rice crop paddy support price, $/ton

Year	Price
2010	273
2011	316
2012	381
2013	436

Source: USDA.

29. **Notwithstanding the 2012 normal harvest, officially-recorded imports to China quadrupled to a record 2.3 million tons, compared to 578,000 tons arriving during all of 2011**. Approximately half of the rice imports are 5% brokens, intended for blending or use in high-end markets such as hotels, while the lower grades are used for making rice noodles, snack foods, brewing, and vinegar production (USDA 2013). Using existing connections with local importers, Thai exporters and Singapore-based traders have played a significant role selling Vietnamese and Pakistani rice to China (Table 12).

Table 12: China: Rice imports by origin, '000 tons

Importers	Avg. 2005-09	2008	2009	2010	2011	2012	Share
TOTAL	468	296	338	366	578	2,345	100
of which:							
Laos	6	4	17	7	7	22	1
Myanmar	1	3	*	2	1	6	*
Pakistan	*	*	*	*	9	580	25
Thailand	439	286	317	299	326	175	7
Vietnam	22	1	3	56	234	1,545	66

Note: * Less than 500 tons or 1 percent.

Source: World Trade Atlas.

30. As a condition of joining the World Trade Organization, China agreed to allow grain imports under a Tariff Rate Quota (TRQ). For rice, the TRQ has been unchanged at 5.32 million tons since 2004, and half of the quantity is allocated to long-grain rice and the balance to medium-grain rice (Table 13). The import tariff rate for in-quota trade is an attractive 1 percent, compared to a 65 percent tariff for out-of-quota imports. With domestic long-grain prices in China so high relative to world prices, an estimated 88 percent of the long-grain TRQ was used in 2012.

Table 13: China: Rice import tariff quota in 2012, million tons

	Total TRQ, quantity	Used TRQ, quantity	Use as % of total	Import duty for TRQ	Import duty outside of TRQ
Long-grain	2.66	2.34	88	1	65
Medium-grain	2.66	0.01	0	1	65
Total	5.32	2.34	44	1	65

Source: World Trade Atlas and Slayton & Associates.

31. With China's official imports through October 2013 running 6 percent behind last year's imports, the TRQ may again be largely exhausted in 2013. Given health concerns about cadmium-laced rice produced in Hunan, there may be political pressure to increase the long-grain TRQ. This would be politically unpopular with China's rice farmers, who already complain about competition from cheap imported rice. The Myanmar rice that moves via border trade, however, does not officially exist and therefore does not count against the TRQ. As such, future border trade shipments are expected to surpass the 2012's record volumes. For Myanmar to be able to sell rice directly to importers in southeast China in addition to exporting informally over the border, it needs to negotiate a sanitary and phyto-sanitary (SPS) agreement with Beijing.

Challenges

32. Capitalizing on these export opportunities requires changing the current status quo in Myanmar. Although the closing yield gap with Vietnam, for example, could generate about 13 million tons of surplus available for export,[13] this does not mean that all of it could be exported. And closing the yield gap is a big task, achievable only in the long run. Many constraints at various stages of the rice value chain will need to be overcome (as discussed in Chapters 4 and 5), and in the next decade, exports are unlikely to exceed 3 million tons. According to the ADB's projections for ASEAN countries (Wailes and Chavez 2012), Myanmar formal rice exports are anticipated to increase to 1.64 million tons in 2021. There are no projections of informal exports but there may also be limits to its growth given China's political pressure to minimize imports.

33. To export more, attention will need to be paid to rice quality. As shown in Table 4 of Chapter 2, more than 90 percent of recent exports have been of low-quality rice. In addition to the fact that the export of low-quality rice does not generate sufficient income to farmers and other actors along the rice value chain, exporting much more low-quality rice may not be even possible in the future. The current world import demand for this quality is about 5 million tons (Table 14) and is projected to decline as a share of world trade; thus with 2-4 million tons, Myanmar would compete with itself. Focusing on a single market segment is risky and encourages a "race to the bottom," whereby prices are constantly reduced to remain competitive at the expense of profit margins. This is not a viable strategy. In the future, Myanmar needs to diversify exports to include more higher-quality rice, and for this it needs to focus on quality improvements along the rice value chain, not solely on quantitative export targets.

34. The most important recent feature of the world market is the increasing share of higher-quality rice in world market trade. As shown in Table 14, the largest growth since the mid-1990s has been in higher qualities – imports of aromatic, white, and parboiled rice have roughly tripled and now represent over half of world trade. Its volume is now in excess of 22 million tons or roughly double its volume in the mid-1990s. Low-grade white (Indica) rice represents a declining share of the world rice trade, as lower prices shift marginal import demand to higher grades of rice and higher incomes in many importing countries result in increased demand for better quality rice.

Table 14: World rice trade estimates by rice type, million tons

	Mid-1990s	2005-2007	2010-2012
Basmati	0.89	2.00	3.64
Jasmine (for mid-1990s, inc. fragrant brokens)	1.20	1.90	2.52
High-quality Indica	3.20	5.10	8.32
Parboiled	2.15	4.37	6.07
Japonica	1.50	2.58	2.42
Jasmine brokens (exc. Patum brokens)	0.0	0.91	0.73
Glutinous	0.28	0.34	0.46
Rough Indica	0.50	2.07	2.36
Brown Indica	0.60	0.70	0.64
Medium-quality Indica	2.50	2.85	2.97
Low-quality Indica	3.86	5.27	4.63
Brokens Indica	0.83	1.82	1.83
World total	17.51	29.91	36.59

Source: Slayton & Associates.

13 This surplus is derived from the assumptions (using the 2013/14 USDA estimates) that planted area for paddy (6.5 million ha), domestic rice consumption (10.3 million tons), and the average milling ratio (64 percent) remain unchanged, and the average paddy yield in Myanmar (2.64 tons per ha) reaches the level of the average paddy yield in Vietnam (5.66 tons per ha).

35. Higher incomes around the world largely explain this shift. Even in Africa, demand for higher-quality rice is increasing. Removal of state-buying monopolies allowed the African market to diversify from importing just low grades of rice to a mix of qualities. Africa's share of the world trade climbed from 31 percent in the mid-1990s to 39 percent during 2010-2012. Government import agencies such as Bulog in Indonesia and National Food Authority in the Philippines have changed their procurement standards to respond to consumer demand. For example, Bulog switched from 25% to 15% brokens rice; National Food Authority added 5% and 15% to its 25% brokens purchases; and Iran is shifting purchases from 5% white rice to Pusa 1121, a Basmati variety.

36. Myanmar could join this higher-quality market. While continuing to export low-quality rice, some Myanmar exporters could initially focus on exporting high-quality white and parboiled rice to the EU, and possibly fragrant rice (Paw San). Even more inviting targets for Paw San are Singapore, Hong Kong, and Malaysia. To increase the likelihood of approaching its export target of 4 million tons by the end of the decade, Myanmar must address many weaknesses along the rice value chain. Other countries have done so and Myanmar can follow suit. For example, Vietnam, known for its large exports of low-quality rice, successfully increased its share of higher- and medium-quality rice in total exports, from 61 percent in 2008 to 70 percent in 2012 (Table 15).

Table 15: Vietnam: Rice exports by quality, '000 tons

	High		Medium	Low	Brokens		Other	Total
	Fragrant	Non-fragrant			Fragrant	Non-fragrant	Unknown	
2008	164	1,585	1,089	1,525	45	160	110	4,679
2009	162	2,376	1,301	1,652	47	413	102	6,053
2010	222	2,270	1,561	2,232	18	251	199	6,754
2011	437	1,945	3,166	3,857	29	405	289	7,128
2012	438	3,242	2,145	117	117	442	430	7,720

Note: High-quality – less than 10% brokens. Medium-quality – 10-20% brokens. Low-quality – more than 20% brokens. *Source*: Vietnam Food Association.

37. However, Myanmar will have to compete vigorously with Vietnam and other exporters in this higher-quality segment. The rice export environment in Southeast Asia is competitive and old players are quickly replaced by new ones. While Thailand has been losing its competitiveness because of rising costs of production and populist farm protection policies (see more details on Thai rice policies in Chapter 5), the market is being captured by others (e.g., Vietnam). As shown in Table 15, no longer is Vietnam the exporter of only low-quality rice as when it captured the rice world's attention beginning in 1988. During the last three years, Vietnam's high-quality rice exports have averaged 2.85 million tons, or 40 percent of the country's total exports. This includes soaring volumes of fragrant rice. Combined exports of fragrant rice and brokens are likely to have hit 700,000 tons in 2013, nearly three times the volume shipped in 2010 and close to five times that exported in 2008.

38. Another challenger is Cambodia. Whereas previously nearly its entire exportable surplus was being smuggled to Vietnam and Thailand as paddy, an increasing volume is now being formally exported as milled rice. Cambodian fragrant rice has been a primary driver of this export push, but this is likely to change fairly quickly as several new rice mills are located in areas where non-fragrant rice is grown. Cambodia's rice industry is rapidly growing stronger, encouraged by a liberal and improving business environment. There is no government intervention in trade nor are there price supports. Its exports increased from 16,000 tons in 2009 to 378,800 tons in 2013 (Table 16). About two-thirds of its exports go to the EU under the "Everything but Arms Agreement."

Table 16: Cambodia: Rice exports, '000 tons

Year	Total	To EU
2009	16	12
2010	51	45
2011	175	98
2012	205	136
2013	379	200-225
Jan-Oct		
2012	146	98
2013	294	189

Source: 2009-11 from GDCE; 2012 from One Window Secretariat.

39. Initially, the expansion of Cambodia's modern milling industry was financed by reinvestment of profits, but a growing number of well-financed foreign investors are now building rice mills. Between 2009 and 2012, there was a threefold increase in the larger size mills and a quintupling in polishing capacity. As of mid-2012, there were 16 mills/milling companies with a capacity of at least 10 tons per hour, including seven with 20 tons per hour or higher. At that juncture, it was forecasted that by the end of 2013, Cambodia's modern milling capacity could double and that many of the new entrants were very well-capitalized, making them particularly formidable competitors (Slayton and Muniroth 2012). Notably, Cambodia produces less than half of the amount of rice that Myanmar does.

40. Despite the challenges associated with international competition, most challenges in Myanmar are homegrown. These range from lagging paddy production to lack of credible statistics, inefficient mills, high-cost infrastructure, and policy uncertainty. Addressing these challenges is a prerequisite for capitalizing on export opportunities and catching up with other exporters. The next chapters analyze these issues in more detail.

4. Addressing Weaknesses Along the Rice Value Chain

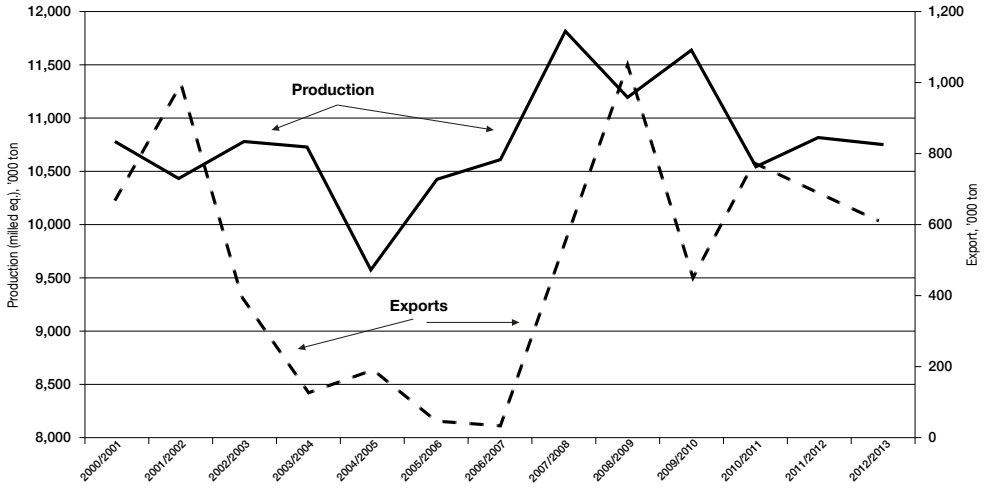
41. Many barriers to larger and more diversified exports exist in Myanmar. The most important problems start at the paddy production stage so this chapter begins with an analysis of this aspect. To trigger a rise in agricultural productivity and generate a larger surplus available for exports, positive changes are also required in the milling and export sectors. International experience demonstrates that a modernized milling sector stimulates farmers to increase productivity and improve quality of paddy, while improved logistics facilitate exports. Chapter 5 analyzes policies around rice price stabilization, farm income support, and macro stability to close the loop of understanding the current weaknesses in order to identify remedies.

Paddy Production

42. Myanmar's export orientation is underpinned by its geography. Myanmar and other countries in mainland Southeast Asia located in large river delta catchments, such as Cambodia, Thailand, and Vietnam, have a comparative advantage in rice production as evidenced by their net export positions. Island nations such as Indonesia, Malaysia, and the Philippines do not have that comparative advantage and therefore have traditionally been net importers (Dawe 2013). However, for Myanmar to realize this comparative advantage many factors are at play.

43. The volume of rice exported strongly depends on the volume of paddy produced. As shown in Figure 2, production and exports were strongly correlated in the most recent decade. The exceptions were after the Nagris cyclone in 2009 and before the elections in 2001, when exports were banned. For going forward, more production in itself is insufficient to guarantee larger exports but is still absolutely necessary.

Figure 2: Myanmar: Correlation between production and exports of rice, 2000-2012



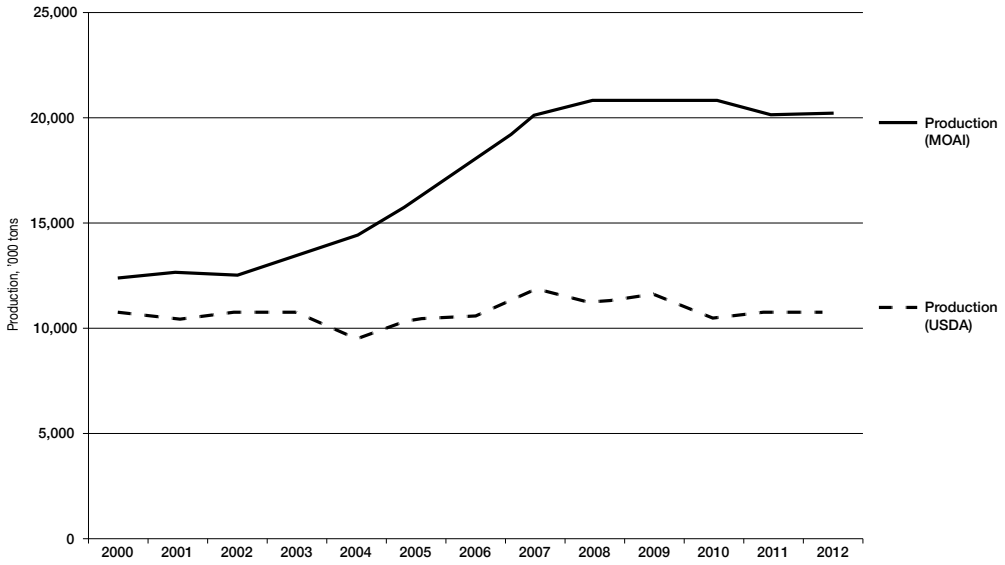
Source: USDA.

44. Annual growth of paddy production would need to reach at least 4-5 percent to achieve Myanmar's growth targets. This would translate into 2-3 percent growth per capita, given the 2 percent annual population growth. Achieving such growth is a big challenge for Myanmar, as paddy production stayed fairly flat over the last decade. Irrespective of the source of the data, which differ tremendously,[14] in the last six to seven years, production has stagnated (Figure 3). In per capita terms, it has even declined, reducing the surplus available for export.

14 Production data remain very uncertain in Myanmar. See Annex 3 for a discussion of official data and alternative estimates from the USDA.

45. Paddy is mostly produced by small family farms. Farms in Myanmar are large by Southeast Asian standards, however, which could contribute to its agricultural potential. Out of 5.8 million farm landholdings, about one-third are smaller than 1 ha, while another one-third of landholdings are between 1-2 ha. About 2 million landholdings (one-third of all farm landholdings) fall between 2-7 ha, and command 55 percent of the total agricultural land area of 34 million ha. If one adds farm holdings with 1-2 ha to those of 2-7 ha, then there are about 3.5 million and large-scale farmers who hold just more than two-thirds of total farmland. In total, there are about 2.1 million farm landholdings with more than 2 ha. In contrast, in Vietnam, about 70 percent of households have landholdings below 0.5 ha; only 6 percent of landholdings have more than 2 ha; and there is a minimal private large-scale subsector. In Indonesia, another Asian country with very small farm landholdings, only 11 percent of farm landholdings were larger than 2 ha in 2003. This illustrates that Myanmar is better positioned compared to its peers to overcome the constraints that smaller farms often face to accelerate commercialization once enabling conditions for growth and commercialization are in place.

Figure 3: Myanmar: Paddy production (milled equivalent), '000 tons, 2000-2012

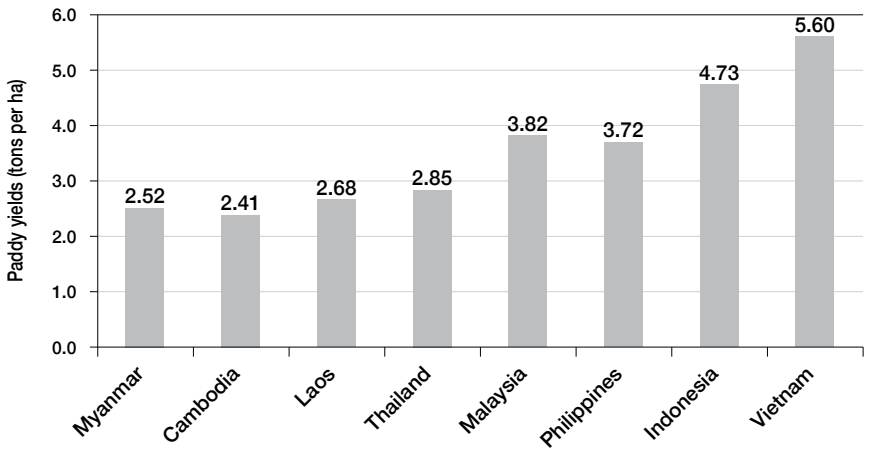


Note: Milling rates used by MOAI 60 percent and USDA 64 percent.
Source: MOAI and USDA.

46. Experience from around the world shows that small farms can respond to market signals and increase their productivity, managing land and other assets more efficiently than very large farms. But they require good quality public goods. Without access to extension services supported by agricultural research systems, rural roads and water transport systems, electricity, and other public goods such as input quality control and development of rural finance, farmers are not able to generate sufficient profits nor respond quickly to incentives.

47. Going forward, high attention should be paid to raising paddy yields. According to the Ministry of Agriculture and Irrigation (MOAI), the average paddy yield in Myanmar is 4.0 tons per ha. This seems to be at the very high end. Such yields are possible at well-managed irrigation schemes such as Shwebo but in most places in Myanmar paddy yields are much lower. According to USDA data, average paddy yields in Myanmar in 2010-2012 were 2.5 tons per ha, among the lowest in the Association of Southeast Asian Nations (ASEAN) (Figure 4). There may be limited scope for additional area expansion in high potential areas, which already have the highest rural population densities in the country. Area expansion is also limited by increasing labor shortages as young people migrate to Thailand in search of better paying jobs. As such, future growth of rice production is expected to come from increased Total Factor Productivity (TFP) along intensive margins and mechanization. This would require increased use of good seed for varietals demanded by markets, along with improved paddy cultivation methods and technology packages through extension and research and improved irrigation systems.

Figure 4: Paddy yields in selected ASEAN countries, avg. 2010-2012



Source: USDA (2013).

48. Increasing yields are expected to make the largest contribution to higher rice production and overall agricultural growth in Myanmar. McKinsey Global Institute estimates that the contribution of Myanmar's agriculture to GDP could more than double from $21 billion in 2010 to $49 billion in 2030 (MGI 2013), mainly from increased crop yields ($10.4 billion). Other growth-inducing areas are: shifting to higher-value crops ($5.3 billion); increasing land under cultivation ($2.4 billion); increasing livestock production ($2.4 billion); intensifying fishery production ($6 billion); and reducing losses ($1.4 billion). These increments amount to an overall agricultural growth of 4.3 percent per year during 2010-2030.

49. Increasing yields (and also improving quality) requires solving the problem of access to *good seeds*. Most farmers use their own seed from previous harvests. This seed is often of mixed varieties, due to the fact that in the last decades, public breeder seed producers were pushed to issue new varieties as frequently as possible. The largest bottleneck occurs, however, between farms multiplying seeds and farms buying seeds. Poor quality control and weak extension support to seed multiplication farms have led to low-quality outcomes. Most seed produced by these farms are sold as paddy and not as seed, and many farmers simply cannot buy good quality seed even if they can afford it.

50. In addition, there is an overabundance of varieties, which complicates aggregation along the value chain and ultimately reduces quality of consignments. The Beale classification system, established in 1927, groups rice varieties based on paddy length and ratio of length and breadth and still exists today. The categories are Emata, Ngasein, Letywezin, Meedon, and Byat. Most international traders, however, are only familiar with the first two groups – Emata and Ngasein. While there has been a narrowing of the number of varieties in the intervening period of the last three-quarters of the century, 250 varieties with plant characteristics are recorded by the seed division of MOAI, and 1,074 varieties listed just by name, grain type, and location are regarded as local varieties. The major varieties are presented in Table 17.

Table 17: Myanmar: Rice groups and varieties

Group	Varieties	Dimensions (rice)		Description
		Length (mm)	Length/ Width (ratio)	
Emata	Aye Yar Min, Hmawbi 2, Kyaw Ze Ya, Shwe War Htun, Sin Thwe Latt, Sin A Kari 3, Thee Dat Yin	=> 7.00	=> 3.00	Long-grain, slender, translucent
Letyezin	Manwthukha, Shwebo Manaw, Zeera	6.00-7.00	2.40-3.00	Long-grain, slender, translucent
Ngasein	Kamakyi, Kamar, Shwe-ta-soke	5.60-6.40	2.00-2.40	Short- and medium-grain, usually translucent
Byat	Lin Pan Chaw	6.40-7.35	2.00-2.50	Long-grain, broad, kernel opaque and chalky
Meedon	Ka Ma Kyi, Paw San, Paw San Hmwe, Paw San Yin, Shwebo Paw San	5.00-6.80	1.60-2.00	Short-grain, broad, kernel opaque and chalky

Source: Winn 1991 and Oo and Kudo 2003.

51. The large number of varieties planted, use of impure seed, poor post-harvest practices by farmers, and the mixing of paddy from different growers by paddy traders make it difficult for the country's rice millers to produce good quality milled rice. Planting patterns change over time and different varieties are often planted during the wet rather than the dry season. Indeed, large numbers of farmers switch varieties in a single season depending on the outcome of the last crop. Rice observers estimate that about 30 percent of the crop is typically planted to each of the main rice groups: Emata, Letywezin, and Meedon. Sowings of Ngasein account for about 5 percent, while the balance is divided between glutinous varieties, Byat, and hybrids. This is in contrast to the mid-1990s, when Emata accounted for 70 percent of the sowings, while Ngasein and Letywezin were each 12-13 percent of the total, and Meedon accounted for only 5-6 percent (Okamoto 2005).

52. Most varieties in Myanmar have long durations. Due to this fact and the lack of efficient irrigation,[15] more than 70 percent of paddy in Myanmar is produced in just two months – November and December (Table 18). The dry season crop, which accounts for just 8 percent of the total harvest, is so minor that its peak harvest (March-April in the Delta region, and the beginning of July in the Central Dry Zone) has a modest impact on prices. The lack of plantings with varieties of different durations prevents a spreading of the harvest more evenly over time, putting a significant downward pressure on paddy prices. Prices immediately after the harvest are often half of the level reached in March-April. In contrast, in Bangladesh, due to the availability of seeds with different durations and access to irrigation, the dominant *boro* crop accounts for only 60 percent of total rice production, the average for 2006/07-2008/09. In Vietnam, the dominant crop, the winter-spring harvest, accounts for 50 percent of the total crop, spreading from March to May. The summer-winter harvest accounts for 28 percent and the 10th Month (*mua*) harvest accounts for 24 percent. In the Philippines, the production distribution is much more evenly spread. In 2012, for example, 23 percent of paddy was produced in the first quarter, 21 percent in the second quarter, 20 percent in the third quarter, and 37 percent in the fourth quarter of the year.

15 About 23 percent of paddy land in Myanmar is classified as irrigated, including the areas with non-functioning irrigation systems often reaching 40-50 percent.

Table 18: Myanmar: Paddy production by month, avg. 2003-2007, %

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
4	1	4	5	3	2	3	1	1	6	36	36

Source: ASEAN Food Security Information System.

53. The currently used Beale classification system lumps together some varieties that share a common length and shape but have different cooking characteristics. While rice is traded by variety in the local market, this is not the case for exported rice. The country's grade standards should be revised and consideration should be given to discarding the "Emata" name for rice destined for export; instead rice should be sold by variety (e.g., Shwe War Htun). During the last wet season crop, 10 "varieties" reportedly accounted for 57 percent of the planted area (Table 19). This, however, is misleading, as the "varieties" in Table 19 actually include related progeny. For example, the more than 390,000 ha of "Paw San" include at least eight different varieties.

Table 19: Myanmar: Leading rice variety families, 2012/13 wet season

Variety	Group	Area ('000 ha)	As % of total
Manwthukha	Letywezin	1,237	20
Paw San Hmwe	Meedon	391	6
Shwe War Htun	Emata	346	6
Aye Yar Min	Emata	299	5
Sin Thwe Latt	Emata	266	4
Zeeyar	Letywezin	314	5
Sin A Kari 3	Emata	221	4
Thee Htet Yin	Emata	208	3
Kyaw Ze Ya	Emata	206	3
Hmawbi 2	Emata	116	2

Source: MOAI.

54. There is an acute need for a public-private effort to identify a limited number of rice varieties (both fragrant and non-fragrant) whose planting should be encouraged in appropriate agro-ecological areas. The Myanmar Rice Federation (MRF) has identified eight varieties (Table 20) that could be a starting point for such discussions. Some of them have been also recommended by USDA for scaled-up production. Planting of these varieties could be encouraged on a voluntary basis in specific zones through the demand from mills and exporters. These efforts should be part of a new Seed Policy under preparation that would support the development of a competitive seed industry in the country (Aung and Goletti 2013).

55. In addition to access to good quality and more uniform seeds, farmers need more and better *agricultural extension services*. So far, few receive any service at all. Agricultural and extension systems are underfinanced, accounting for only 1-2 percent of the MOAI budget (Aung and Goletti 2013). In Mandalay Region, for example, one extension officer serves more than 2,000 farmers, too many to serve with a daily travel allowance of only 1,500 Kyats. Research programs are not linked to extension, so extension workers have little practical knowhow to share with farmers. Access to ***affordable inputs such as high-quality fertilizers*** has also been limited,[16] as has ***access to credit***. In 2012, the Myanmar Agricultural Development Bank (MADB) served 1.9 million customers, mainly paddy farmers, with limited amounts of short-term credit (World Bank 2013b). Loans are usually for six months, due for repayment just after the harvest, when paddy prices are lowest. This has been reported to be insufficient to meet the demand of most market-oriented farmers, and weak access to affordable finance is considered the largest challenge to modern Myanmar agriculture (Dapice 2012b; Wong and Wai 2013). Many market-oriented farms are reportedly insolvent.

Table 20: Myanmar: Recommended seed varieties

MRF	USDA	Variety	Description
	X	Bay Gyar Yin	High-quality fragrant; > 4 mm, opaque;155 days
X	X	Hmawbi 2	High-quality; > 7 mm, translucent
	X	Inn Ma Yebaw	High-quality; < 7 mm, translucent
X	X	Lone Thwe Hmwe	High-quality fragrant; > 7 mm, translucent
X		Nant Thar Hmwe	High-quality fragrant; > 7 mm, translucent; 125-130 days, non-photo sensitive
X		Paw San	High-quality fragrant; 180 days; has yellow color on husk
	X	Paw San Yin	High-quality fragrant; < 7 mm, opaque; 155 days
X		Sin Nwe Yin	High-quality fragrant; > 7 mm, translucent
X	X	Sin Thwe Latt	High-quality; > 7 mm, translucent
X		Yadanar-toe	> 7 mm, translucent
X		Yezin Lone Thwe	High-quality; > 7 mm, translucent; 125-130 days, non-photo sensitive
	X	Zeera	High-quality; > 6 mm, translucent, thin, slender; Highly valued in Middle East

Note: Grain length refers to milled rice.

Source: MRF and Tun Winn (personal communications).

56. The temporary solution to these problems was the establishment of RSCs. Introduced in 2008 the RSCs have been seen as a vehicle to expand production by encouraging the private sector to invest in providing needed inputs and knowhow to the country's rice farmers, who were/are not being well serviced by the extension service.[17] The participation of private firms in this endeavor was encouraged by loans from the government, access to rice export licenses, and the general linkage between granting import licenses for other products to those firms that had export records.

16 This limited use of fertilizers and pesticides has helped minimize the negative environmental footprint of agricultural production. The intensification of rice production would require higher use of these inputs, the potential negative environmental impacts of which would need to be managed through promotion of integrating pest management practices, safe handling of chemicals, and awareness campaign for farmers and input suppliers.

17 Ownership of 24 RSCs is detailed in "Mapping Study of Government, Private Sector, UN, Ingo's and NGOs who are Engaging in Agriculture and Rural Development Activities in Ayeyarwaddy Region," by Kyaw Kyaw Thwin, Pyoe Pin Programme, September, 2011.

57. According to data reported to the MRF, the acreage covered by RSCs hit a high of 270,000 ha during the 2011/12 wet season, with two RSCs (Adipati Agricultural Production and Gold Delta) accounting for 42 percent. Although the total acreage covered by RSCs increased by 56 percent compared to the prior crop, it was as little as 4 percent of total harvested acreage.[18] While Ayeyarwaddy division accounts for just over one-fourth of the country's rice production, 27 of the 55 RSCs operate there.[19] Twelve of the firms operated in Bago and only five in Sagaing. There were only two RSCs in Yangon division, even though 7 percent of the country's rice was produced there (for a listing of RSCs and pertinent details, see Annex 4).

58. Debt repayment rates were reported to have plunged for many RSCs. The reasons included: (i) the weak supply response to inputs provided by RSCs and thus only moderate growth in paddy production; (ii) localized production shortfalls; and (iii) the increase of production costs. Combined with policy changes that no longer reward participating firms with either rice export or import licenses, this has resulted in most of the RSCs going dormant. As such, there is a need to come up with an alternative vehicle to provide inputs, technical knowhow, and credit to the country's rice farmers while the extension service is overhauled. It is time to reform the public extension system to respond better to the needs of farmers and to increase funding so that appropriate technology can be effectively transferred.

59. Better *water management* is also needed to increase yields and volumes of paddy production through higher crop intensity. The majority of Myanmar rice farmers produce only one crop per year (during the wet season) yet cropping intensity could be increased to at least two crops. This would require cost-effective investments in *irrigation and drainage infrastructure,* better utilization of existing water storage capacities, and the access to varieties with shorter durations for production as discussed above. Improved water management is also important for reducing production volatility and making farmers more resilient to climate change.

60. Addressing high *transport costs* is another challenge going forward. Beginning in the 1990s, there was a "substantial shift from water to land transportation" as the country's road network improved. The shortened transportation time allowed a more rapid turnover, increasing the profitability of the traders, lessened the chance of quality deterioration of the milled rice, and reduced pilferage (Okamoto 2005)<?> A substantial quantity of the rice shipped to Yangon (and especially to upper Myanmar), however, still moves by river.

61. Transport costs are high in Myanmar partially because of the poor quality of roads; only 13 percent of rural roads and 46 percent of main roads are all-weather paved (ADB 2012a). Public investment in farm-to-market roads in Ayeyarwaddy Delta, where half of the rice is grown, would reduce transport costs of both inputs and rice. According to Myanmar Paddy Rice Trading Association, domestic trucking costs have recently increased even further, from $5-7 per ton (comparable to Vietnam) to up to $25 per ton, due to new regulations based on ASEAN standards, which restrict the load weight of trucks from about 20-22 tons per truck to 8.5 tons per truck. Increasing domestic transport costs have negative implications on the marketing costs of rice in Myanmar, indirectly putting downward pressure on farm-gate paddy prices.

62. Last but not least, resolving *land tenure* issues is important for supporting sustainable development of the rice value chain. Industry experts report this as one of the major issues affecting farmers' incentives to increase rice production and productivity. Currently, all land is owned by the state and farmers have only land use rights. Investments in on-farm irrigation infrastructure in other countries are highly correlated with land tenure and the same should be true in Myanmar. In Cambodia, for example, provinces with greater proportions of farm households holding some form of land title have higher levels of investments in productive farm assets and higher levels of irrigation (World Bank 2007) and farmers with secure land title have two-thirds higher crop yields than those without a title (Cambodia National Institute of Statistics 2004). Therefore, ongoing and planned policy changes in Myanmar in land use and ownership rights need to recognize the importance of secure rights for attracting investment in land development (leveling, soil and water management) and in land transfer and consolidation needed for farm mechanization.

18 Of the 55 RSCs, no acreage data were reported to the MRF by 12 firms, apparently because some of the firms were reluctant to share this information with the Federation. As such, the total area covered by RSCs is likely understated.

19 Due to double counting, it is sometimes reported that there are as many as 58 RSCs.

Milling Industry

63. Myanmar farm-gate prices are lower than those in Vietnam, and certainly lower than those in Thailand. This competitive advantage, however, is threatened by the higher costs of milling, transport, and trading.

64. Currently, the vast majority of rice mills in Myanmar are old and inefficient and use outdated processing units, mostly a mixture of Chinese and local technology. Inefficiencies in the milling industry stem from a combination of historical factors. Misrule in the past, an export sector monopolized by the state, frequent export bans, and the introduction of more profitable rice hullers have resulted in a milling sector characterized by small mills utilizing antique equipment.[20] According to MRMA, there are about 1,500 rice mills and 15,000 hullers in the country (Annex 6). Most of the rice mills operate with obsolete processing units, leading to quality and quantity losses of about 15-20 percent during milling. The average milling ratio is estimated to be 60 percent, lower than in Cambodia and many other neighboring countries (Table 21), and less than one-fourth of the mills are capable of producing medium to high quality milled rice (Annex 6).

65. The biggest problem facing mid- and large-scale mills is the dilapidated condition of their milling facilities and equipment. Important parts of the mills, such as engines, have been in use since the 1930s and are now very old; the most recent are from the 1960s. Even millers who started business after the 1987 liberalization often did not construct new rice mills, but made use of secondhand equipment or purchased old mills (Annex 6). The majority of large mills use husk-burning boilers as an energy source due to lack of access to or the unreliability of energy from the electrical grid. Milling quality is also poor due to mixed paddy, as farmers cultivate hundreds of varieties aggregated by traders, and improper drying. Milling capacities need to be updated through better access to credit and technical knowhow.

Table 21: Average milling ratio in selected countries, avg. 2008-2011

Countries	Milling rate, %
Cambodia	64
China	70
Indonesia	64
South Korea	75
Philippines	63
Malaysia	65
Thailand	66
Vietnam	63

Source: USDA.

66. Meetings with rice millers around the country revealed that millers' main problem, after outdated equipment, is the lack of affordable and reliable power. Myanmar depends on hydropower for three-fourths of its electricity generation. Myanmar's electricity rates are subsidized, which has led to inadequate investment in new power sources and maintenance of existing plants and transmission lines. This has resulted in insufficient capacity to meet the country's needs, especially during the dry season when the dams cannot generate electricity at full capacity due to the lack of water and peaks in demand for air conditioning. This problem is worsening as the government liberalizes its economic policies and foreign investment interest grows. From a shortfall of 500 mega-watts during the dry season, "load shedding may need to increase to between 800 mega-watts and 1,000 mega-watts in 2014" if no new generating capacity is added (ADB 2013). Planned investments in electricity generation over the next five years indicate supply increases of less than 5 percent per year (Dapice 2012a), while ADB forecasts that demand will increase by 13 percent per annum from 2012 to 2018 (ADB 2012b).

20 Annex 5 provides a detailed description of the history of the development of Myanmar's milling sector.

67. Faced with a cutoff in electricity, rice millers can either idle their plants or use a diesel generator. Diesel, however, is five times as costly as electricity. Gasifiers burning readily available rice husks offer an alternative to diesel, cutting diesel usage by three-fourths if good equipment is used (see Box 2). Rice millers are generally aware of this alternative, but are uncertain about employing it as they realize that the technology can both pollute the environment and poison workers (there is a pressing need for donors to provide information on sources of "green" biomass gasifiers and proper operating practices). Citing the uncertainty of the government's rice policy and the lack of reliable electricity, many millers have reportedly been reluctant to reinvest their profits to upgrade their rice mills and have instead put this money into the real estate market where returns have been much better.

68. Additionally, official banking policies have limited millers' *access to long-term commercial lending,* which would facilitate their investment in new mills or upgrading of existing equipment. Due to government restrictions, commercial loans have a maximum duration of only 12 months which, while suitable for operations, is inadequate for capital investments. Also, collateral rules are too strict, limiting loans to 30 percent of the value of the land and residence, while excluding commercial structures and equipment.

Box 2: Insufficient Electricity and Gasifiers' Potential Role

While Myanmar has abundant energy resources, particularly hydropower and natural gas, its electricity use and connection rates are the lowest in Asia; even Nepal and Afghanistan have higher rates. From average growth rates of 3.8 percent from 1987 until 2008, energy consumption per capita has tripled during the last three years, although electricity supply is only about half of projected demand. As economic growth accelerates, the inadequacy of Myanmar's power generation capacity can be expected to worsen before it improves - especially as it pins its hopes on hydropower, with its relatively long development periods.

With only 16 percent of the rural population having access to electricity, rice husk-burning gasifiers offer an alternative source of power both for rice mills and surrounding locales. Using USDA's more conservative production series, Myanmar annually produces 4.0-4.5 million tons of rice husks. First, a rice husk-burning gasifier can save 70-87 percent of the diesel that otherwise would be used. Further, a rice mill needs only one-fourth of the rice husks that it generates to power the factory; the balance can be supplied to other users in the same locale. Gasifiers do produce bio-waste in the form of tar and waste water and can result in carbon monoxide poisoning if care is not exercised. If good technology is selected and good operating practices are adopted, these problems can be minimized (IFC and EU 2012).

Electricity Connectivity & Consumption (2009)

	% Connect	Use Per Capita (kWh)
Myanmar	13	104
Cambodia	24	131
Thailand	99	2,045
Vietnam	98	919

Source: Dapice 2012a.

69. The milling industry could benefit from *foreign direct investment* (FDI) to foster modernization under the domestic capital constraints. Yet the new FDI law in Myanmar precludes joint ventures in rice milling and trading unless special approval is granted by the government. Many Thai and other potential investors find the new investment law and implementing regulations both unclear and seemingly unwelcome. Most foreign firms are instead pursuing investments elsewhere in the region. Three of the 10 largest Thai rice exporters are investing in rice mills in Cambodia and others are looking at Vietnam; virtually all are hesitant to invest in Myanmar.

70. Although there are some recent positive developments with regard to attracting FDI, more needs to be done to attract investors. The Myanmar Investment Commission recently approved a joint venture between a French firm, Societe Industrielle Agricole Et Commercial D'Outre Mer, and XY Trading to set up a white and parboiled rice mill in Ayeyarwaddy's Hinthada Township. According to press reports, a second joint venture involving Thailand's CP Intertrade will build a large white rice mill in Lewei Township, Naypyitaw.[21] It is unclear if these joint ventures will break the current logjam among the other Thai rice exporters considering investing in Myanmar. But it is clear that given the dilapidated condition of milling facilities and equipment in the country and the lack of knowhow, modernization of the milling industry will be greatly handicapped without large-scale FDI.

Exports

71. Over the last five years, the number of firms engaged in exporting rice has consolidated. To a certain extent, this reflects changes in the size of the export orders. In 2008, a large number of relatively small contracts from Bangladesh were particularly attractive to small firms. Additionally, the government no longer plays such an active role in allocating export licenses to firms based on their operating an RSC. In 2008, the five most active firms accounted for only 55 percent of total formal shipments, but during 2009-2011, the five largest firms accounted on average for almost three out of every four tons exported. This fell back to 62 percent last year with the entrance of two new players – MAPCO and Bayint Naung Business Group – and stepped-up activity by three existing exporters – Tharyawaddy District, XY Trading, and Golden Lace.[22]

72. Despite this consolidation, competition among exporters remains strong. But they face high export costs. One of the largest costs comes from Yangon Port. Myanmar Port Authority (MPA), a government body, owns several of the wharves and sets tariffs and practices in a manner that largely precludes competition in service provision. As a result, the port facilities are reportedly saddled with over-manning and antiquated practices and have suffered from underinvestment. A high incidence of delays adds to the costs.

73. In addition to mandating the use of its own pilots and tugs, MPA requires that all ships use its Shipping Agency Department (SAD) as their agent, for which it charges a rate of 1.25 percent of the freight. If the vessel has not brought its own dunnage (loose packing material for stowage), SAD is the sole supplier at relatively expensive rates. On a vessel carrying 20,000 tons of rice, it charges the equivalent of $1 per ton, more than double the fee in Vietnam.[23] Even though representatives of the shipping lines do the actual work, SAD charges a fee for supervising the cargo loading. All port charges are collected by SAD according to the single MPA-set tariff. Stevedoring costs are $4 per ton, for example, compared with $1-1.50 in Thailand and Vietnam and $2-3 in India and Pakistan.[24]

74. The net result is that Yangon Port is one of the most expensive in the world, a conclusion supported by recent interviews. Table 22 compares the estimated loading costs for a vessel loading 20,000 tons of rice during the dry season. As indicated below, loading rates are substantially lower during the rainy season, increasing many costs, especially stevedoring. "Apart from the high tariff it is the fairly high incidence of delays at Yangon Port... Delays can arise for a number of reasons or more often from a combination of factors: the limited number of times vessels can enter or leave the port due to draught constraints and tides; delays related to permissions for berthing/sailing; delays resulting from port congestion; delays due to paperwork and delays in the physical handling of the goods. Demurrage costs are those financial penalties incurred when the vessel spends longer at the wharf-side than originally provisioned for. Thus tackling the causes of delays is central to raising port efficiency and lowering costs... Factors that affect the loading rate for rice are the type of truck used for delivery to the shipside, whether there are many rejections in onsite inspection, condition of the vessel's cranes, weather conditions..., and the quality of the stevedores" (Larkin 2010).

21 "A new rice mill in Naypyitaw," *The Mirror*, September 10, 2013.
22 See Table 37 and Annex 7 for a summary of key foreign and domestic rice exporters in Myanmar.
23 Based on personal communications with traders.
24 Based on personal communications with traders.

Table 22: Estimated loading and port charges, $/20,000-ton vessel

Port	Port Disbursement Account*	Stevedore	Total
Yangon (Myanmar)	65,000	80,000	145,000
Karachi (Pakistan)	60,000	50,000	110,000
Kakinada (India)	25,000	50,000	75,000
Koh Sichang (Thailand)	45,000	20,000	65,000
HCMC (Vietnam)	30,000	30,000	60,000

Note: * Port Disbursement Account includes charges on buyer's account, stevedoring on seller's account on FOB stowed sale. Lightering and fumigation costs are not included.

Source: Authors' interviews with traders.

75. Export procedure costs add to the burden. The cost of export procedures in Myanmar is estimated at $8.50 per ton compared to $0.05 in Vietnam and $0.10 in Thailand (Table 23). In addition to various certificates and licenses, Myanmar's exporters face a recently imposed 2 percent "advance income tax" on virtually all exports and imports, including rice.[25] At the same time, an export tax of $8.49 per ton (Kyat 400/50 kg) is reported to have been imposed on rice exported via border trade. A planned move to allow exporters to apply for export licenses in Yangon, however, is an important first step in reducing these export procedure expenses.

Table 23: Government export procedure costs, selected countries, $/ton

	Myanmar	Vietnam	Thailand
Export license*	0.74	0.00	0.01
Inspection fee	0.16	0.00	0.03
Certificate of origin	0.09	0.00	0.00
Tax**	7.50	0.00	0.00
Estimated informal charges	NA	0.05	0.05
Total	**8.49**	**0.05**	**0.10**

Note: The costs are for basis 5 containers, each of 24 tons. This table does not include non-governmental fees, e.g., third party inspection, fumigation, etc. Nor does it include GMO certificates for shipments to the EU. * includes customs registration for Myanmar. ** 2 percent advance income tax based on $370 per ton.

Source: Myanmar from draft of ESCAP's "A BPA Study on Export of Mango and Rice and Import of Palm Oil in Myanmar," Vietnam and Thailand from Slayton and Muniroth 2012.

76. Low capacity to operate during the rainy season adds to the costs. According to traders interviewed, loading rates during the dry season average 2,000 tons per day, but this falls to only 500 tons per day during the wet season. Part of the problem during the rainy season is that loading is virtually impossible at night, as there are no visual indications of when rain clouds are threatening. A covered conveyor loading system may provide a solution, but it is unclear if this is both technically feasible and cost-effective given the problems created by Yangon's very wet rainy season. It does, however, merit further investigation, as finding effective means of loading in the wet season could greatly increase Myanmar's rice export capacity. It could also allow for more exports after the paddy harvest, thereby helping to reduce paddy price decreases.

25 "New 2 percent tax on imports and exports," by Stuart Deed. *Myanmar Times,* June 10, 2013.

77. Another looming challenge is Yangon Port's capacity to handle large vessels. Due to sand bars, only vessels with 15,000 dwt and below can use the inner harbor, though the cargo-carrying fleet in Myanmar has been shifting to increasingly larger vessels as the older, smaller vessels have been scrapped and replaced with more efficient, larger bottoms (Table 24). Larger vessels bound for Africa are loaded at Thilawa, closer to the river's mouth. With the increased reliance on exports to Africa, Thilawa assumes greater importance, despite higher road transport costs of $3 per ton. Yet this and the attendant increased reliance on Africa have important implications regarding the maximum amount of rice that can be exported with the current facilities.

78. According to Larkin's (2010) estimates, Yangon and Thilawa Ports are capable of handling 1.5 million tons of rice exports. This assessment appears to be too optimistic, however, as it does not anticipate the growth in port volumes resulting from the current economic liberalization. Further, the increased reliance on rice exports to West Africa limits the quantity of rice that can be loaded in the inner harbor. Finally, priority over the next several years will be given to unloading project cargo for the Thilawa Special Economic Zone. Port officials and market participants interviewed believe that the port capacity will increasingly act as a constraint to exports over the next several years. Reportedly, however, the new Thilawa Special Economic Zone will include the construction of additional berths. Also, both Diamond Star and a joint venture of the MRF and the Myanmar Pulses, Beans and Sesame Seeds Association have plans to build port facilities. Given the long lead times, construction on new loading facilities needs to occur in the near future if the likely limitations are to be avoided.

Table 24: Myanmar: Distribution of the size of rice vessels loading in Yangon Port

	2009	2010	2011	2012
Number of vessels				
5,000-15,000 tons	23	15	21	6
Over 15,000 tons	31	12	22	17
Quantity shipped, '000 tons				
Less than 5,000 tons*	148	99	134	152
5,000-15,000 tons	301	139	223	86
Over 15,000 tons	603	247	460	367
Total	1,052	485	816	605
% of quantity shipped				
Less than 5,000 tons*	14	20	16	25
5,000-15,000 tons	29	29	27	14
Over 15,000 tons	57	51	56	61

Note: * Includes containers. *Source*: Slayton & Associates.

79. Similar to formal exports, border trade with China and other neighbors also faces many challenges. Although the Chinese buyers are described as not choosy (an estimated 70 percent of the rice exported is 25% brokens) and despite the informal trade bypassing the TRQ described in Chapter 3, the long-term gains are reduced by high uncertainty over future exports and the high cost of transporting rice from the Delta. The informality of border trade makes it sporadic, adding to price volatility and deterring investments in milling and trade infrastructure. With most of the rice supplied to China originating in the Delta region, with roughly equal volumes coming from Ayeyarwaddy and Bago,[26] the cost of transportation ranges from $75 to over $100 per ton (see Table 8 in Chapter 2). In comparison, ocean freight to China is estimated at $30-35 per ton.

80. To formalize exports and receive more benefits in the long run, Myanmar should prepare a phyto-sanitary agreement with China. As China is the single largest importer of rice in the world, Myanmar needs an SPS agreement with China to maximize its sales. Ocean freight costs to China are only $30-35 per ton, or one-third of the land transport costs from the Delta region to Muse. This should be a priority going forward in Myanmar's efforts to promote rice exports, and Myanmar can learn from similar experiences of the neighboring countries (see Box 3:).

Box 3: SPS Agreement between Cambodia and China

Cambodia signed an SPS Agreement with China to export rice in 2010. In accordance with the Agreement, the Cambodia milled rice exported to China shall comply with the Chinese plant quarantine laws and regulations. Cambodian rice should be free from the quarantine pests of Chinese concern, such as *Leptochloa chinensis, Striga asiatica, Aphelenchoides besseyi*, and *Ditylenchus angustus*, and this pest-free status needs to be ensured by the Ministry of Agriculture, Fisheries and Forestry of Cambodia. Among other things, the Agreement requires Cambodia to provide survey methods and results to the Chinese authorities and have regular quarantine inspections by Chinese Inspection and Quarantine.

To comply with SPS rules, Cambodia put in place a third-party inspection system; exports to China during January-October 2013 increased to 17,000 tons, up from 1,000 tons last year at this time. Yet the success over the medium term depends upon enhancing the ability of existing government laboratories to undertake SPS testing and surveillance, and consolidating SPS control functions across a large number of players.

Myanmar can learn from such experiences to inform its process to prepare a similar SPS Agreement with China.

26 According to interview with Mandalay Paddy and Traders Association, the mode of transportation varies, with about three-fourths of the rice from Ayeyarwaddy shipped via barges, whereas all of the rice originating in Bago comes by rail or truck.

5. Improving the Rice Policy Environment to Promote Exports

81. Successful rice value chain modernization and stimulation of a farm supply response will ultimately hinge on the quality of rice policies. Although many barriers to trade have been recently abolished (see Chapter 2), the private sector remains cautious over potential conflicts between export promotion, rice price stabilization, and food security objectives. There are many uncertainties about future actions and implementation arrangements. Most believe that the government will continue to use *ad hoc* export bans when domestic prices rise substantially. Over the medium term, it remains unclear how rice price volatility will be addressed and what effect this will have on exports. Having been previously coerced to sell stocks at a loss, millers and traders remain cautious when domestic prices show a sustained increase. At the same time, international buyers are wary about whether the government will allow its purchases to be executed. The government's limited explanations regarding the inconsistency of the proposed minimum farm prices and its objective of increasing export competitiveness also add to uncertainty.

82. These uncertainties hamper private investment in the rice value chain, which in turn puts at risk achievement of Myanmar's export targets and eventually the sustainable development of its rice sector. The government needs to better articulate a strategic vision for the rice sector and how it intends to achieve various objectives. It is important to remember that while the public spending program reforms required to address the weaknesses described in Chapter 4 will take time to materialize, some policies can have immediate effects. A small change of policy or even its clear communication and implementation can have a lasting positive impact without any cost to stretched national or local budgets. With this in mind, policies should be considered the most effective vehicle for attracting private investment in the rice value chain in the short run and should therefore be used strategically. Policies related to the use of export restrictions, price stabilization, and farm income supports are the most important in this respect. They are discussed in turn.[27]

Export Restrictions

83. Currently, there is no official rice export ban in Myanmar. But when domestic prices rise to high levels, there is always a risk of exports being banned. The most recent export bans were in: ***2004,*** after only a little more than half of the licensed exports of 0.5 million tons had been executed; ***2008,*** when the government signaled that it would allow about 400,000 tons of rice to be exported by 22 private companies but suspended their licenses after cyclone Nagris hit (Okamoto 2009); and ***2011***, when exports were limited in the lead-up to the 2011 election, and a few months ago in **2013**. Historically, when domestic prices periodically rose to levels that worried the government, it not only restricted exports but also forced domestic millers and traders to release stocks at below-market prices.

84. While helping to contain short-term price increases for consumers, export bans harm rice farmers, millers, and traders. Even if they do not harm farmers in the short run when implemented during lean periods when farmers run out of rice stocks, export bans have significant longer-term negative impacts. They slow down the modernization of the milling and trade sectors, resulting in inefficient logistics, unable to mitigate large drops in paddy prices after the harvest. Every year, paddy prices tend to drop significantly in November and January. More rapid paddy milling and rice exporting could partially mitigate these drops but the rice industry currently remains unequipped to accelerate the movement of rice from fields to local and world markets.

85. An alternative to export bans as a means of mitigating the impact of rice price surges on poor consumers could be a temporary scale-up of safety net supports. This would prevent the taxation of paddy producers and also prevent the benefits of lower rice prices from being captured by wealthier consumers. *Yet there is no safety net system in Myanmar that would allow a quick and targeted scale-up of cash or in-kind support to the poor and vulnerable*. Establishment of well-functioning safety nets will take a long time, especially since most people still live in rural areas where urban-type safety nets are difficult to implement. Myanmar has a population of about 64 million people (many of them very poor) and only 1 million tons of the exportable surpluses. When the price of rice (the main food staple) significantly increases, food security concerns understandably rise.

27 The World Bank report on "Rice Price Stabilization" being prepared in addition to this report will provide details on how these policies can be used to stabilize prices without hurting export competitiveness.

86. If impossible to avoid, export restrictions should be implemented in a way that minimizes damage. *First*, the government should guarantee that once issued, export licenses will not be canceled or subject to taxes higher than those prevailing at the time the permission is authorized. Such a policy would help ameliorate the credit risk currently borne by exporters. Fears of shortages due to excessive exports can be assuaged by having in place a flexible import policy for rice. *Second*, the government needs to improve the way it collects statistics on rice production and consumption. The official statistics significantly deviate from the alternative market estimates (see Table 30 in Annex 3), yet most traders seem to make their day-to-day decisions based on the latter. The lack of reliable official production and consumption data handicaps governmental efforts to implement any rice export policy that seeks to maximize domestic price stability while increasing farm incomes.

Rice Price Stabilization

87. Some Asian countries such as China, Indonesia, and the Philippines use large public stocks in combination with government controls over rice imports to stabilize prices. Although an exporter seeking to expand overseas sales, Myanmar has also begun experimenting with price stabilization through the use of stocks partially financed by the government.[28] In 2013/14, MRF (with the assistance of government financing) aimed to procure about 200,000 tons of rice (or 2 percent of rice production using USDA data).[29] In August 2013, some stocks were released in Mandalay Region and reportedly helped stabilize local prices. Should Myanmar scale up this program? The operational details of the price support buying remain sketchy but it does not look like a suitable instrument for Myanmar to stabilize prices.

88. While buffer stocks can play a positive role, Myanmar should be realistic about what they can and cannot achieve. Countries keeping large government-owned stocks are usually net importers. Aside from China and India, which are special cases because of their large size, the key difference between exporting and importing countries is that the latter have relatively high levels of government-owned stocks while exporting countries hold much lower levels. There is a good reason for this difference in stock policy: importing countries hold stocks in case there is a delay between the time it is decided imports are needed and the time the imports actually arrive in country. Importing countries are also vulnerable to export bans, while exporting countries are not. The two major Southeast Asian rice exporting countries, Thailand and Vietnam, have both historically held low (or zero) government-owned stocks. The current situation in Thailand is an exception, as the government is actively trying to raise world market prices, as opposed to trying to stabilize domestic prices. Thus, historical Thai experience from the 1950s to 1970s is more relevant to Myanmar today than current Thai rice policy.

89. There is no question that government-owned stocks have been successful in stabilizing domestic prices in net importing countries. Their wholesale prices are less volatile than prices in net exporting countries (Table 25). Higher volatility in net exporting countries is partially a result of the transmission of higher volatility from a thin, segmented, and imperfect world rice market (see Annex 2) to their domestic markets. And Myanmar, a net exporter, would have to accept higher price volatility to some degree, even above the recent relatively low levels (from 2009 to 2012). However, more important to note is that large buffer stocks are not suitable in Myanmar (which seeks to promote exports) due to their upward effects on price levels which makes the export origin less competitive in the world market.

28 In Myanmar, the government acts through MRF to manage the public stock program.

29 "Government to buy 100,000 tons of rice for state reserve" in *Eleven Myanmar*, April 7, 2013, and in December 2013, Mizzima announced the procurement of an additional 100,000 tons. Under the ASEAN regional stockpiling program, Myanmar has committed to hold 20,000 tons of stocks.

Table 25: Rice price volatility, selected countries, 2004-2012, %

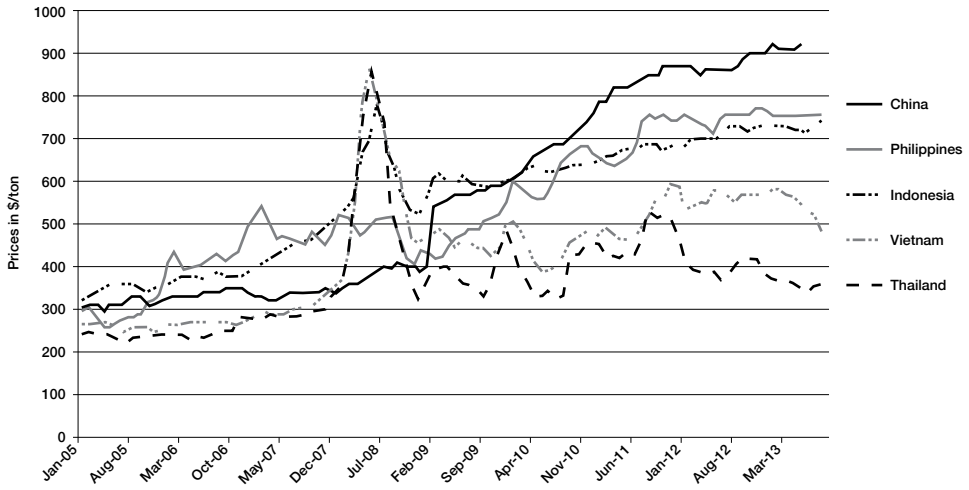
	Net exporters				Net importers		
	Cambodia	Myanmar	Thailand	Vietnam	China	Indonesia	Philippines
Jan. 2004-Dec. 2012	8.0	5.8	6.4	8.3	3.5	5.2	3.4
Jan. 2009-Dec. 2012	6.8	5.6	4.3	7.6	4.3	3.3	2.3

Note: Volatility is defined as a standard deviation of the logarithm of monthly price changes in nominal terms.
Source: Authors' estimates based on FAO-GIEWS.

90. One common outcome of large buffer stock programs is that domestic prices are pushed above world market prices (see Figure 5). Such an outcome could be acceptable for net importing countries (to replace imports with higher domestic production), but this would be unacceptable for a net exporter such as Myanmar. *Higher prices would simply undermine its export competitiveness*. Thailand recently used government-owned stocks to maintain "fair and stable prices" to farmers; as a result, its exports plummeted from 10.6 million tons in 2011 to 6.9 million tons in 2012 and 6.7 million in 2013, according to the USDA, in addition to many other problems (see next subsection).

91. Myanmar's authorities also need to be aware of other visible and invisible costs associated with large buffer stock programs. Fiscal costs too frequently escalate to unsustainable levels, up to 2 percent of GDP (World Bank 2012). High prices hurt poor consumers, increasing their level of poverty. Large stocking programs crowd out the private sector, weakening its contribution to economic growth and job creation. Some of these costs are related to political economy but some arise from difficulties in efficiently managing reserves because there are many decisions to be made, including those related to management structures, size of reserves, composition of stocks (one commodity, several commodities, and food versus cash), location of buying and selling points, financing mechanisms, price bands, replenishment and release rules, and rotation arrangements (World Bank 2012). The end result of this complex decision tree is often worse than that of strategic use of trade policy.

Figure 5: Average wholesale prices of rice in selected countries, $/ton



Source: FAO GIEWS.

92. In view of these and other examples from around the world, Myanmar needs to be careful as it expands its buffer stock program. It is important not to use government-owned stocks to try to change long-term prices – they need to be kept in line with international prices. Government-owned stocks instead need to be refocused on protecting consumers against relatively large, short-term price shocks and natural disasters. Meeting these objectives requires smaller reserve sizes, which would cost less and not necessarily compromise the price stability objective. A very clear operational manual needs to be prepared and communicated so that market players can factor governmental plans into their investment and operational decisions. Keeping these plans secret, on the other hand, adds unnecessary anxiety, harming the development of Myanmar's rice value chain.

93. The most successful government-owned stock programs target the poor in times of significant food price spikes. If rice is being used as a safety net for emergency responses, the size of the program should be *small and targeted* so as not to distort the market and should focus on vulnerable population groups. Maintaining *low program costs* ensures a program's sustainability. Keeping transaction costs low also ensures it does not erode the net value of transfers. It is also worth noting that in-kind food is not always the best way to help the poor. *Targeted cash transfers* are often preferable to food-based transfers as they involve less distortion to production and consumption choices, and have relatively lower administrative costs, leakage, and pilferage. The Philippines, for example, has begun to move from poorly targeted and largely ineffective in-kind food subsidies from government-owned stocks to more targeted cash transfer programs, inspired by the success of countries such as Mexico in transitioning to conditional cash transfer programs such as PROGRESA. Some other Asian countries are considering doing the same.

94. Most important in Myanmar, however, is understanding the reasons for price volatility to effectively reduce it in the longer term. The likely drivers of price volatility, particularly the large drops in farm-gate prices after the monsoon harvest, are the heavy concentration of paddy production in November and December, high drying costs due to expensive energy costs and old equipment, high storage costs, inefficient domestic and export logistics, excessive export procedure costs, and exchange rate fluctuations.[30] The recent consideration to introduce minimum farm prices (discussed below) would be a false solution, as it would not address any of the likely causes of price volatility.

Minimum Farm Prices

95. There is a new, potentially troubling development in Myanmar. Under the recently enacted "Farmers' Right Protection and Benefit Promotion Act," Myanmar may establish price supports for rice, which would be implemented through General Leading Committees and Farm Product Managing Groups. The Act is vague about the terms of references of these committees and there is a high risk of the introduction of minimum farm prices.

96. While price supports are popular with farmers globally, they create many problems. This is especially true for exporting countries if the support and release prices are set too high**,** which can easily occur when politicians get in a bidding war for farmers' votes in contests where farmers represent a large share of the electorate. If set too high, they cannot easily be reduced, exports are restricted, and the government then needs to subsidize exports, which is costly. To have the intended price impact, the quantities purchased must be stored a considerable time, incurring storage and interest costs. If held too long, quality problems arise. Finally, intervention efforts can often breed corruption. The Thai experience is particularly instructive.

30 The forthcoming World Bank report on "Rice Price Stabilization" will carefully assess the sources of rice price instability in Myanmar.

97. The Thai original rice pledging scheme introduced in 1981 provided a soft loan to farmers who wanted to avoid selling their crop immediately after harvest when prices were often lowest. The price was initially set at 80-90 percent of the expected market price of the paddy pledged; it was limited to the wet season harvest; and the volumes involved were relatively small. The pledging price, however, became a key political campaign issue beginning with the 2001 election. In that contest, the winning contestant promised to raise the pledging price to 100 percent of the expected market price and also extended the program to cover the dry season crop. During the next three crop years, the average volume pledged climbed four-fold, to 4.6 million tons. With the 2004/05 crop, support prices were boosted by 25-43 percent and the government-held stocks swelled as annual deliveries averaged almost 30 million tons, or one out of every five tons produced. In 2005/06, the last year of the program before the military deposed Thaksin, one estimate placed the net cost of the program at Baht 19.1 billion, or over $490 million at prevailing exchange rates (Poapongsakorn 2010).

98. The pledging price was a central campaign issue again in the 2011 election, with the incoming prime minister promising to raise paddy prices by 50-67 percent above prevailing prices and to buy every grain of rice produced. The promise of high prices proved to be an effective vote-getter for the new prime minister. The results have been predictable: (i) over half of all rice produced was purchased by the government; (ii) exports fell by 35 percent in 2012 (a year of record world import demand) and are estimated to have fallen by a further 4 percent last year; (iii) government-held stocks soared to around 18-20 million tons; and (iv) sales from the stockpile incurred huge losses.

99. In the first year of operation, official losses at the end of January 2013 were estimated at Baht 137 billion ($4.6 billion at the prevailing exchange rates on that date). Informed observers, however, believe that the loss is closer to Baht 179 billion ($6.0 billion), or 1.6 percent of GDP, once actual operating costs, interest, quality losses, and the value of stocks on that date are included (Poapongsakorn 2013). Further, it will take several years for existing holdings to be sold as they represent the equivalent of two years' worth of Thai rice exports and almost half of all the rice traded globally in a single year. Barring a major crop failure, these sales will have a bearish impact on world prices in the short and medium term. Not including old crop stocks held by the government prior to the 2011 election and purchases made from the recent dry season crop, one conservative estimate by Thailand Development Research Institute indicates that it will cost $9.6 billion to liquidate the stocks held by the government on May 1, 2013. Meanwhile, the Thai government still accumulates stocks as the pledging program continues.

100. With ballooning financial costs, the government has attempted to curtail the program's unexpectedly high costs, with limited success. In mid-June 2013, it announced that the pledging price would be reduced by 20 percent and that a household limit of Baht 500,000 would be implemented, effective July 1. Faced with a backlash from farmers, the government quickly scrapped the price reduction and dismissed the minister in charge of the program. After wrestling with various options for the better part of two months, the government left the support prices unchanged for the 2013/14 main crop, while lowering the maximum household limit to Baht 350,000; only for the 2014 dry season crop will the price be reduced to Baht 13,000/ton and the maximum amount to be pledged capped at 23 tons or Baht 300,000 per household.[31] These changes are intended to limit government losses to no more than $3.25 billion, but are unlikely to help reduce the size of the Thai rice mountain.

101. Though sold as a program to help poor farmers, most of the benefits went to medium-sized and large farmers, millers, traders, and politicians. It is estimated that farmers received less than 58 percent of the benefit from the government's expenditures in the 2011/12 cropping season. Poor, smaller farmers – who account for 44 percent of all rice farmers – received only 18 percent of the benefit (Poapongsakorn 2013).

31 "Thai Rice Panel Adjusts Prices Slightly," *Wall Street Journal,* August 26, 2013.

102. Beyond the financial impacts, there are other important effects:

- Thailand's reputation of exporting high-quality rice for which a premium is paid is being undermined by farmers switching to varieties with the shortest growing seasons and highest yields. These are varieties with inferior palatability.
- Widespread corruption is occurring, including the delivery of Cambodian and Myanmar rice to government-rented warehouses.
- The long-term storage of milled rice is resulting in a deterioration of its quality and leading to reports of the presence of excess chemicals.
- The already overbuilt rice milling industry is being expanded, which will lead to the closure of mills not enrolled in the program.
- Farmers' costs of production are rising, reflecting a doubling of land rents and increased use of and a 20 percent increase in the prices of fertilizer and pesticides.[32] The higher land rents are a direct consequence of the pledging policy.
- Unable to supply their customer base of over 10 million tons with Thai rice, Thai exporters have started to trade third country rice on a large scale and invest in rice mills in competitor countries. Both actions directly enhance the long-term competitiveness of other countries.

103. In Myanmar, the best approach to support farm income and address the basic dilemma of agricultural policy[33] is to help farmers reduce their production and marketing costs through the provision of public goods (irrigation, extension, roads, electricity, etc.) and market-friendly economic policy. *This would keep farm income rising without hurting consumers by high prices, and is compatible with the objective of increasing rice exports*. It would also stimulate high-quality growth that could fuel other sectors as well. While agriculture can help create jobs directly by employing more people and providing raw materials for the agro-processing industry, it can also help create non-farm jobs indirectly by reducing the cost of food. When food represents a large share of consumers' budgets, as is the case in Myanmar, the cost of food is an important determinant of wage rates in manufacturing and services, and is thereby a contributor to the overall competitiveness and ability of an economy to attract new labor-intensive investments.

104. Despite differences in the global context and in national economic circumstances, the contribution of agricultural productivity growth to the economy more generally in the U.S. in the past 45 years holds some useful lessons for Myanmar for the decades ahead. In the U.S. from 1960 to 2005, the real prices of most agricultural commodities declined by 20-50 percent (Table 26). Despite a recent reversal in direction, most food prices in 2010 (in constant US$) were lower than those in 1960. As a result, primary food products were available at lower prices, which resulted in employment-generating additional transformation of foods for final consumption and greater consumer expenditures on non-food categories.

Table 26: The U.S.: Change in prices of selected food products

Period	Wheat	Maize	Sugar	Beef
1960-2005	-43%	-52%	-19%	-23%
2006-2010	8%	41%	50%	22%
1960-2010	-24%	-18%	24%	-10%

Source: World Bank Pink Sheets.

32 "Broken Rice," *Wall Street Journal,* July 26, 2013.

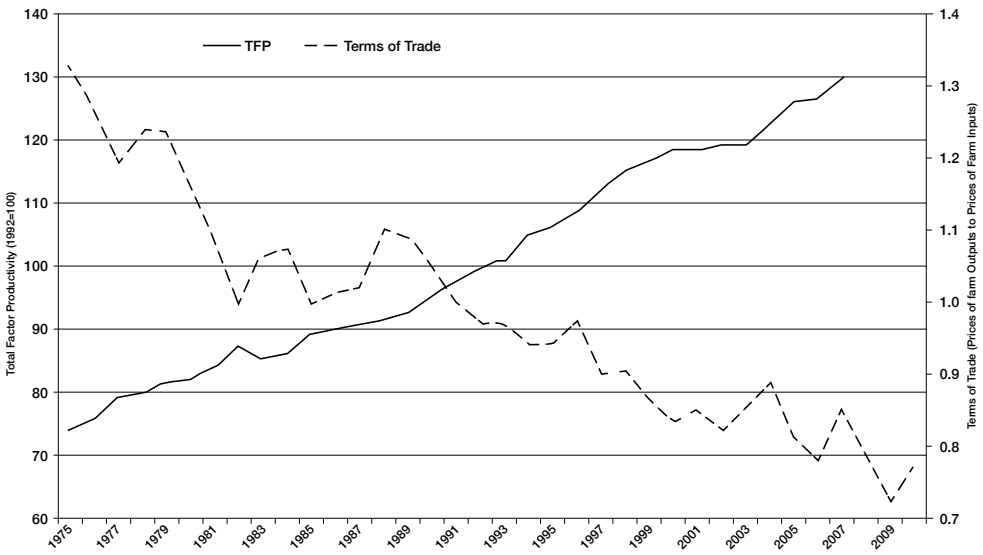
33 Agricultural policymakers everywhere in the world face the same basic dilemma. Producers of agricultural commodities prefer high prices for farm products, while consumers prefer low prices. Policymakers can implement policies that support prices and thus benefit producers, but this imposes a cost on consumers. If supporting consumers is a priority, policymakers can implement measures that depress prices, but this imposes a cost on producers. There is no magic price level that satisfies everyone.

105. The decline in real agricultural prices in the U.S. was accompanied by an increase in the cost of inputs and factors of production. The terms of trade (ToT) for agriculture, defined as the ratio of prices received by farmers for their output to prices paid by farmers for factors of production and inputs, declined by 1.2 percent annually between 1975 and 2010 (Figure 6), even accounting for the well-recognized commodity programs that supported farm-gate prices. Farmers in the U.S. maintained profitability by shifting technologies to use inputs more efficiently and to achieve a different mix of outputs. In the U.S., TFP rose annually by 2.2 percent over this period, low by historic standards, but sufficient to maintain profitability in the face of deteriorating ToT (Figure 6).

106. In Asia, the countries that succeeded in transforming their agriculture have followed a similar approach. As shown in Figure 7, China and Malaysia, for example, promoted TFP-based growth, achieving a significant increase of agricultural output from 1960 to 2007 by reducing the amount of inputs used but improving efficiency. The Philippines, on the other hand, has been less successful in promoting high-quality agricultural growth. Its agricultural output growth was mainly driven by higher input use encouraged by food self-sufficiency policy that maintained high farm prices, which consequently triggered higher use of inputs.

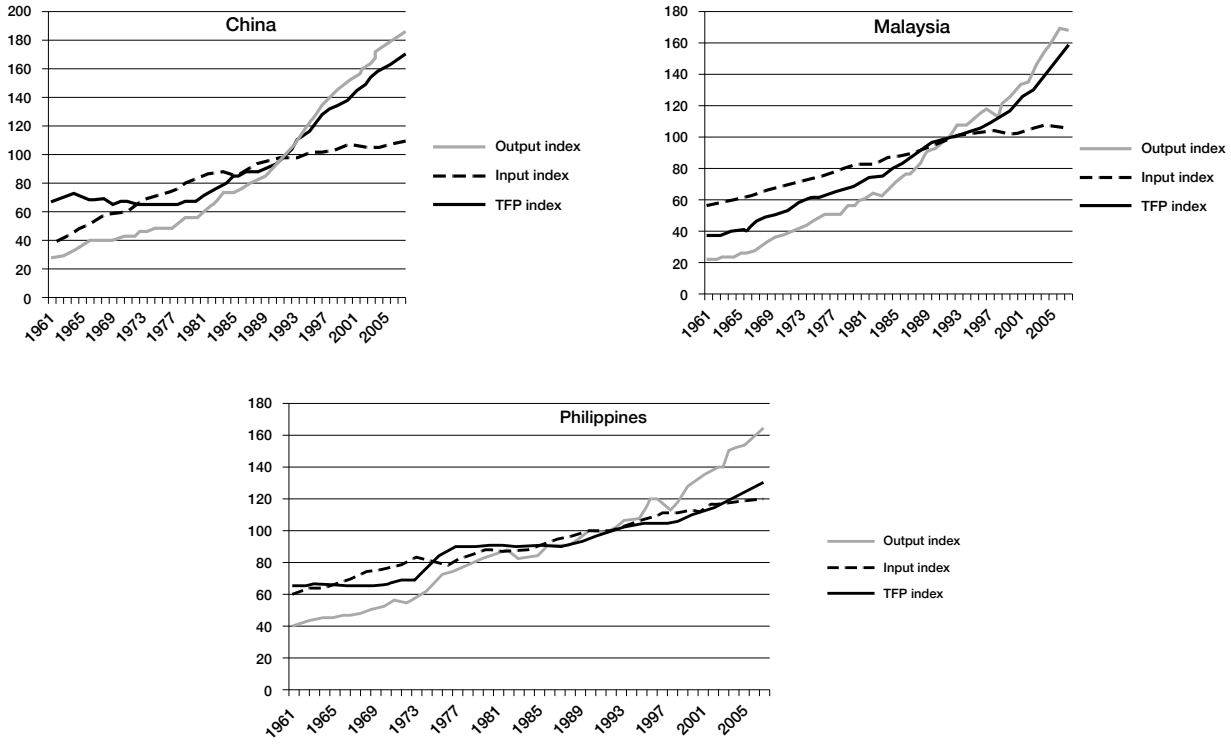
107. Myanmar should also aspire to enhance agricultural growth by increasing TFP. This is the only way to simultaneously increase long-term farm incomes, promote exports, and provide benefits to consumers.

Figure 6: Higher TFP helped U.S. farmers compensate for declining ToT



Source: USDA ERS and the Executive Office of the President 2011.

Figure 7: TFP-based agricultural growth in China and Malaysia vs. input-based growth in the Philippines



Source: Presentation based on the FAOSTAT and USDA data.

6. Conclusions and Recommendations

Conclusions

108. Myanmar has new global and regional rice market opportunities. Should they be captured, higher rice exports could eventually stimulate agricultural growth, which in turn could reduce poverty and boost shared prosperity. Better export opportunities and more stable prices, to which a more efficient export system could contribute, would trigger an increase of rice sector productivity and eventually overall agricultural productivity, given the large share of rice in Myanmar's planted area, production, trade, and consumption. Higher agricultural productivity would also help the landless, who often work as seasonal farm workers. With more and better quality paddy, the milling industry would accelerate its modernization, creating non-farm jobs and stimulating economic growth. Net buyers of rice in rural and urban areas would benefit from a larger variety and improved quality of rice, potentially at lower prices.

109. Yet several big challenges lie ahead. Strong competition from other exporters and constantly rising demands for the safety and quality of rice on world markets puts pressure on Myanmar's rice sector. While field yields are only half of those realized by other exporters, significantly expanding the current exportable surplus will take time and can only be realized if rice farming profitability is considerably increased. With reduced carryover stocks, rice exports in 2013/14 are currently trailing the same period in 2012/13, illustrating the importance of addressing structural weaknesses along the value chain if Myanmar is to become a reliable rice exporter. A significant increase in exports also necessitates that Myanmar diversify both its overseas markets and the quality of its rice exports.

110. Taken as a whole, the policy recommendations will go a long way towards improving the prospects for more profitable rice farming. Policymakers need to understand that the rice milling sector and exporters also need a conducive policy environment without an anti-export bias to ensure that their performance is upgraded to become internationally competitive. While public spending programs take time to materialize, policies can have an immediate effect. A small change of policy or even its clear communication and implementation can have a lasting positive impact without any cost to stretched national or local budgets. With this in mind, policies should be considered the most effective vehicle for attracting private investment in the rice value chain in the short run and should be utilized strategically.

111. With more consistent enabling economic policies, alignment of public investment with the strategic objective of export promotion is the key to the long-term prospects for rice exports. The focus should change from producing and selling more low-quality rice to producing and selling increased quantities of different qualities of rice and doing so more efficiently. This strategy would allow Myanmar's rice value chain participants to earn higher incomes, capture the growing market of higher value rice, and diversify risks in different markets.

Recommendations

112. In the short term, improving economic regulations and policies is the most powerful instrument to help Myanmar trigger the structural changes along its rice value chain necessary to capitalize on new market opportunities. Policies range from development of rural financial markets and promotion of FDI to trade and pricing policies. In most cases they do not require public finances and can be implemented quickly. The main policy actions include the following:

- **Provide more information to market participants:** Timely provision of accurate market information collected by the government on production, consumption, exports, prices, and stocks is the key to allow a smooth functioning of the rice market and enable more informed policy decisions. While improving the reliability of some data such as production and consumption will take time, information on prices and exports, as well as the main parameters of rice policy and agricultural spending programs, can be better disseminated immediately. This would also create more trust between the private and public sectors.

- **Lift the rules limiting the maturity of commercial loans and broaden the type of assets that can be pledged as collateral to access credit:** Commercial loans have a maximum duration of only 12 months which, while suitable for operations, is inadequate to finance capital investments by mills and other agribusinesses, which usually require a period of at least three years to be fully repaid. Also, collateral rules are too strict, focusing on land and residence, while excluding commercial structures and equipment. These restrictions should be removed and financial institutions should be able to decide the terms of their loans. Moreover, to expand the availability of credit, authorities should broaden the type of assets that financial institutions can accept as collateral, including movable and non-movable assets, and promote a full range of financial services to agriculture and agribusinesses following good international practices (Box 4).

- **Revise the rules for FDI:** Foreign investment rules for rice milling, warehousing, and trading need to be revised and the requirement for a special approval of joint ventures with foreign investors removed. Many Thai and other potential investors find the new investment law and implementing regulations both unclear and seemingly unwelcoming. This is in contrast to the situation in Cambodia. As a result, three of the top ten Thai rice exporters are investing in rice mills in Cambodia and others are likely to follow.

- **Avoid holding large government-owned stocks and using minimum farm prices:** These policy instruments are not suitable for Myanmar, which aspires to increase exports and improve farm incomes. Such policies tend to raise domestic prices. While this could provide short-term income relief to farmers, in the longer run, higher domestic prices trigger a rise in production costs. In this situation, maintaining "fair incomes" for farmers over time requires constant increases in support prices at the expense of consumers, taxpayers, and exporters. This is not possible. Policies and spending programs that increase TFP increase farm incomes and improve export competitiveness at the same time and should be supported. Such programs range from promotion of adoption of modern technologies through agricultural research and extension, better water management, improved road connectivity, access to electricity and affordable credit, and other programs of a public good nature. This report includes many examples of such programs.

- **Increase the predictability of trade policy:** Export bans need to be avoided. Once issued, export licenses should not be canceled or subject to taxes higher than those prevailing at the time the permission is authorized. Such a policy would help ameliorate the credit risk currently borne by exporters as a result of frequent export bans by prior governments in response to rising domestic prices.

- **Lower port charges and reduce export procedure costs.** All export procedures and port costs should be revised with a view towards improving the competitiveness of Myanmar rice.

Box 4: Good International Practices in Agricultural and Agribusiness Lending

Lack of access to finance continues to persist in developing countries, especially for smallholder farmers, despite recurring attempts by both the public and private sectors. These efforts are successful when access to finance is seen as a part of a broader strategy of delivering financial services to induce innovations, not just to provide capital. There are three key evolving elements to innovative agricultural finance: (i) reducing delivery costs through efficient lending approaches and the use of technology; (ii) adapting agricultural finance to agricultural cash flow cycles; and (iii) utilizing value chains to ensure proper loan use and repayment.

Maximizing the use of value chains is the key to many innovative developments in agricultural finance. Warehouse receipt financing, for example, provides added value that goes beyond merely providing finance to farmers: a secure storage system to help reduce post-harvest losses, manage price risks, and incentivize farmers to increase the quality of their yields because the warehouse grades and certifies their products upon arrival. This in turn opens up new markets for farmers. However, for warehouse receipt financing to function effectively, appropriate regulatory and legal frameworks must be put in place.

Microfinance can help but it requires proper support and supervision. Minimalist microfinance is not enough as credit alone is insufficient to raise agricultural productivity. Instead, bundling credit with financial literacy and technical assistance programs is essential not only to increase productivity but also to avoid over-indebtedness.

Another innovation in agricultural finance comes from the use of modern technologies, especially mobile phones. Mobile phones are increasing outreach and thereby efficiency to previously unbanked poor farmers. The use of information communication technology carries huge potential to create real and lasting impact on agricultural finance.

Many of the innovations in agricultural finance are pioneered by the private sector. However, the role of governments in facilitating and regulating financial services should not be underestimated. Governments should not distort or crowd out the sector with ineffective policies such as interest rate subsidies or price distortions. Instead, governments need to create a legal and regulatory framework that recognizes and enforces contractual obligations.

Source: AgriFin based on AFC (2012).

113. The list of the necessary longer-term actions is longer. Most of the short-term policy-related recommendations will remain valid in the longer run, but increasing farm profitability is a precondition for sustainable increases in rice exports. Unless paddy production grows at 4-5 percent a year, as has occurred in Cambodia and Vietnam, and its quality improves, it is difficult to imagine Myanmar exporting more than 2 million tons a year. Some of the recommended actions would require significant public funds. The main actions required at this level include:

- **Update the existing seed management system:** A new national seed policy that would support the development of a competitive seed industry should be prepared. Quality control and extension support to farmers multiplying seeds need to be improved. Rice research efforts need to be refocused on developing varieties with grain characteristics desirable to overseas buyers. The Beale system of classifying rice needs to be abandoned and a public-private effort is urgently needed to identify a small number of fragrant and non-fragrant seed varieties with good export potential whose planting could be encouraged on a voluntary basis in appropriate agro-ecological zones.

- **Strengthen public extension services:** Due to the combination of deteriorating repayment rates and removal of export license's incentives, many RSCs have stopped operating. They can no longer be relied on to provide extension services to the majority of smallholders. It is time to strengthen public agricultural extension by increasing its funding and exploring partnerships with the private sector to effectively transfer appropriate technology and respond better to the needs of farmers.

- **Improve water management:** Major investments are needed to improve irrigation and drainage so as to ameliorate what appears to be growing weather instability. There is a need for more focus on water management to enhance the ability of farmers to respond to market opportunities and increase their incomes.

- **Reduce transport costs:** Poor farm-to-market roads add to input costs, depress farm-gate prices especially after the harvest, and raise marketing costs. Priority should be given to investing in farm-to-market roads in the Ayeyarwaddy Delta, where half of the nation's rice is grown.

- **Resolve land tenure issues:** This is important for supporting sustainable development of the rice value chain. Currently, all land is owned by the state and farmers have only land use rights. The ongoing and planned policy changes in land use and ownership rights need to recognize the importance of secure rights as a condition for investment in the land development, transfer, and consolidation needed for further farm commercialization.

114. The milling industry will be instrumental in diversifying away from low-quality to higher-quality rice segments and in offering good prices to farmers and exporters. In addition to **capital constraints**, the key challenge to upgrading its dilapidated equipment is access to a **reliable electricity supply**. Like the rest of the economy, Myanmar's rice mills are crippled by the lack of reliable electrical power. Diesel is not an attractive alternative because it costs two to three times the price of electricity. In the near future, gasifiers powered by rice husks provide a solution that can replace 75 percent of diesel costs, but some of the technology is inefficient and pollutes the environment. The donor community could provide technical assistance in the form of experts who can provide information and contacts for green gasifier equipment.

115. In the export segment, government actions need to focus on reducing the costs and expanding the capacity of the ports. This could include: (i) modernization of the existing equipment and facilities in Yangon Port and building new berths in Thilawa Port; (ii) investment in lighting buoys and a radar system to permit nighttime sailing of vessels; and (iii) a feasibility study for equipment that allows covered loading during the rainy season. These investments could be expensive and therefore merit a rigorous cost-benefit analysis to avoid negative fiscal impacts. Lastly, Myanmar should (iv) prepare an SPS agreement with China to complement its informal border trade by formal exports through the sea ports. Ocean freight costs to China are only $30-35 per ton, or one-third of the land transport costs from the Delta region to Muse.

116. The recommendations by the segment of the value chain are summarized in Table 27. They are presented along with constraints to be addressed, timeframe, fiscal impact, and implementing agencies.

Table 27: Summary of the recommendations

Constraints	Recommendation	Time-frame	Fiscal impact	Implementing agency
Farming sector				
Low productivity of rice production systems and low levels of cropping intensity limit growth of paddy production, and thus exportable surpluses. Fresh seed can generate significant yield increases when combined with good farming practices.	• Increase the quality control over seed multiplication • Develop the seed classification system in line with international standards and promote seed production demanded by overseas buyers • Invest in irrigation and water management • Strengthen the public agricultural extension service	Medium to long run	Significant, in particular for invest-ments in irrigation and extension services	Ministry of Agriculture and Irrigation, in collaboration with Myanmar Rice Federation
Poor rural infrastructure increases input prices and reduces output prices.	• Invest in farm to market roads, in particular in the Ayeyarwaddy Delta where the half of the nation's rice is grown	Medium to long run	Significant	Ministry of Livestock, Fisheries and Rural Development, in collaboration with Ministry of Agriculture and Irrigation
Unresolved land tenure issues increase risks of investing in land improvements and farm commercialization.	• Remove the condition in the Land Law allowing the government to determine crops to be grown • Strengthen land tenure security	Short to long run	Small	Ministry of Agriculture and Irrigation, Ministry of Home Affairs, the Parliament, other ministries and agencies
Milling industry				
Poor access to knowhow and finance slows down the modernization of milling industry.	• Remove the requirement for special approval of joint ventures with foreign investors and promote FDI • Lift the rules limiting the maturity of commercial loans and broaden the type of assets that can be pledged as collateral to access credit	Short run	Nil	Ministry of Commerce, Central Bank, and the Parliament, in collaboration with Myanmar Rice Federation
Unreliable and limited electricity supply increases milling costs and worsens rice quality.	• Invest in electricity generation and distribution • Support technical assistance to mills on green gasifier equipment	Short to long run	Significant for investment in electricity	Ministry of Energy and Ministry of Livestock, Fisheries and Rural Development

Constraints	Recommendation	Time-frame	Fiscal impact	Implementing agency
Export sector				
High port charges and export procedure costs worsen Myanmar's export competitiveness.	• Lower port charges and reduce export procedure costs	Short to medium run	Small	Ministry of Commerce and Port Authority, in collaboration with Myanmar Rice Federation
Poor port infrastructure increases the costs of exports.	• Modernize the existing equipment and facilities in Yangon Port and build new berths in Thilawa Port • Invest in lighting buoys and a radar system to permit nighttime sailing of vessels • Invest in equipment that allows covered loading during the rainy season	Medium to long run	Significant	Ministry of Commerce and Port Authority, in collaboration with Myanmar Rice Federation
Lack of SPS agreement with China does not allow formal exports to complement informal border trade.	• Prepare and implement an SPS Agreement with China	Medium run	Significant, due to investment in food labs and control agencies	Ministry of Commerce, in collaboration with Myanmar Rice Federation
Limited information on commodity balance, prices, and export projections creates uncertainty in the market.	• Provide more timely and accurate market information	Short to medium run	Small	Ministry of Commerce, in collaboration with Myanmar Rice Federation
Unpredictable trade policy reduces investments in rice value chain.	• Avoid export bans and honor export license commitments	Short run	Small	Ministry of Commerce, in collaboration with Myanmar Rice Federation
The use of unsuitable farm protection instruments distorts market and worsens Myanmar's export competitiveness.	• Keep government-owned stocks small and design clear implementation arrangements for their management • Do not use the policy of minimum farm prices	Short to medium run	Significant fiscal savings	Ministry of Commerce, in collaboration with Myanmar Rice Federation

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8. Annexes

Annex 1: History of Myanmar's Export Performance

1. With British annexation of the Ayeyarwaddy Delta in 1853 and the shutting off of imports of U.S. rice because of the American Civil War, rice was introduced as a cash crop in the Delta. Its expansion was facilitated by "considerable government investment in opening new lands to increased surplus production for exports... Canals were built principally to provide transportation, and irrigation did not become a serious undertaking until after World War I" (Barker *et al*. 1985). Also, export was further facilitated by the opening of the Suez Canal in 1869. Under the British, Myanmar's exports were primarily destined for Europe, the Indian subcontinent, and what is now Malaysia and Singapore – all of which were also under British colonial rule.

2. While British nationals owned the larger mills and major rice exporting firms, financing for land purchases, improvements, and crop loans were provided in large measure by the Chettiars, Indian moneylenders from what is now Tamil Nadu. The Chettiars were the chief providers of capital to the cultivators in Myanmar throughout the colonial era. Chettiar lending was secured against collateral, mostly against title to the land.

3. Myanmar's rice exports declined during the second half of the 1920s as world rice prices trended lower. With the onset of the global depression in 1930, prices collapsed, causing widespread defaults by farmers. The Chettiars took control of the land – prompting a bitter, anti-foreigner reaction among the populace. This, however, did not seriously impact rice exports, which hit a peak of 3.4 million tons during 1934/35. Myanmar's exports averaged under 3 million tons during the 1930s, up from 2.6 million tons in the1920s. Exports accounted for up to two-thirds of the colony's rice production (Slayton 1984) and almost one-third of world trade. Between the 1870s and the 1930s, export volume to Europe remained fairly steady, but by the 1930s, this volume represented about a quarter of total exports while India alone accounted for more than 50 percent of Myanmar's exports (Barker *et al*. 1985).

4. With the Japanese invasion in 1941, the British and the Chettiars moved to India. World War II resulted in widespread destruction and disruption in Myanmar. "Much of agricultural infrastructure was destroyed during the Second World War and the Japanese occupation... resulting in a substantial decline in agricultural production. It is estimated that more than one-third of the agricultural infrastructure and working animals were destroyed during the period" (Soe and Fisher 1989). This included most of the large rice mills. When the British ousted the Japanese in 1945, the Chettiars were not invited to return and were denied full compensation for their losses. When Myanmar became independent in 1948, the new government outlawed both foreign ownership of land and loans being secured by land. While exports in 1940 were 2.85 million tons, in 1945 they totaled only 428,000 tons.[34] With independence in 1948, the new government nationalized rice exports and overseas sales averaged 1.1 million tons by the end of the decade (Barker *et al*. 1985).

5. Due to a dwindling post-Independence performance with the destruction during the war and the onset of civil war immediately after independence, Myanmar's economy got off to a rocky post-war recovery. Rice exports in the 1950s averaged 1.45 million tons – less than half of the level averaged immediately before the war (see Table 1). During that period, demand from India and Sri Lanka for parboiled rice was quite substantial, especially among rubber plantation workers, since it remained unspoiled throughout the day after it was cooked (Oo and Kudo 2003). Parboiled rice exports ranged from almost a quarter of a million tons to over one-half of a million tons.

34 Absent any records, it is assumed that Myanmar's exports were minimal during 1942-1944.

6. With the military's takeover in 1962, the state monopoly on rice export was continued.[35] With production stagnating, the surplus available for export increasingly declined. Although a key source of foreign exchange, average rice exports during the 1960s declined by 16 percent to 1.2 million tons, but plunged further to an average of 0.5 million tons in the subsequent decade as farmers found the government's purchase prices increasingly unattractive, and responded by delivering their lowest quality paddy and resisted providing the full quantities stipulated.

7. During the 1970s, 70 percent of all exports were to neighboring destinations, with India, Indonesia, Sri Lanka, and Bangladesh figuring most prominently. In the early 1970s, the Myanmar Export Import Corporation (MEIC) typically exported 55% brokens and low-quality parboiled rice. Myanmar's parboiled rice is of low quality, with a distinctive taste and often an odor.[36] In contrast, African shipments, despite spiking in 1979, accounted for only 13 percent of the sales.

8. Beginning in 1979, increasing quantities of rice have been exported to various African destinations. By 1981, half of all of the country's overseas rice sales were shipped to Africa, while Asia declined to only 31 percent of the total. During the early 1980s, Emata replaced Ngasein as the principal rice type exported and the standard quality improved to 35 percent. Government-to-government sales accounted for 49 percent of all exports during 1980-1984. With the scaling back of the food subsidy scheme in the late 1980s, the amount of rice left over for export declined sharply, even though it was a key source of foreign exchange for the government. Rice exports fell from 0.7 million tons during the first half of the decade to less than half of that level.

9. Saddled with unreliable production statistics and non-existent notions of privately-held stocks, Myanmar's successive military governments have pursued erratic, stop-go rice policies that have impeded orderly rice exports. During the 1990s, exports collapsed further by an additional half and averaged only 244,000 tons, including a low of only 15,000 tons in 1997. After the 1997 low, overseas shipments went through a couple of boom-busts in which large carryover stocks were built, followed by exports of 1 million tons (2002 and 2009), only to be followed by steep drops in the following years. Exports staged a rebound during the 2000-2009 period by averaging over 420,000 tons, up 73 percent from the preceding 10-year period.

10. As part of a larger liberalization effort, the government privatized rice exports in April 2003 under a licensing system in which the government would take half of the foreign exchange earnings, taking into account an export tax of 10 percent. Exports, however, were halted in January 2004 after a little more than half of the licensed exports of 0.5 million tons had been executed. More than 20 export companies had been set up in preparation for liberalization, and these efforts were completely wasted. At the end of 2007, the government signaled that it would allow about 400,000 tons of rice to be exported by 22 private companies in 2008, but these licenses were also suspended after cyclone Nargis hit (Okamoto 2009). In the lead up to the 2011 election, exports were also limited.

11. In 2009-2012, exports rebounded and in 2012, Myanmar exported 1.3 million tons. A further increase in exports depends on the success of addressing investment and policy constraints as described in this report.

35 Interviewed millers reported that some of the privately-owned mills were returned after a short period, but often with the equipment looted. The foreign-owned rice mills were not returned to their owners. The State Agricultural and Marketing Board, established in 1946, was reorganized and renamed Trade Corporation (1) in 1964. This was the government entity charged with buying paddy, having it milled, distributing it within the country, and engaging in exports. The rice export functions of TC (1) were handled in the early 1980s by MEIC. In 1989, the Agricultural Farm Produce Trading Corporation was reorganized as Myanmar Agricultural Production and Trading.

36 This discussion of trade during the 1970-1983 period is drawn from Slayton (1984).

Annex 2: Pieces of the World Rice Market Puzzle

1. **Description of the market**. Rice is consumed by about half of the world's more than 7.1 billion people, but it is the least understood of the major grains from an economic perspective. Approximately 90 percent of the world's rice crop is produced in Asia. With an estimated 45 percent of the Asian crop unirrigated, the delicate balance between world rice supply and demand depends crucially on the performance of the Asian monsoon. Much of the harvest is consumed within a few kilometers of the fields in which it is grown, although this is changing as urbanization rates steadily increase. Not only is the marketed surplus limited, but only 8 percent of the harvest enters world channels. Thus, production variation in one or two important markets can have a significant impact on world import demand. Because rice is a subsistence crop in most countries, production shortfalls or surpluses are somewhat tempered by changes in on-farm consumption. In addition, changes in stocking levels at both the farm and national levels absorb some of the production variation.

2. As a preferred staple in many countries, per capita consumption of rice is almost completely unresponsive to changes in world rice prices. This is in part due to domestic prices in these national markets being somewhat insulated from changes in the world market. With demand in the world market tending to be highly inelastic with respect to its own price, relatively small changes in import demand can result in significant price movements. Although not accurately gauged, world stock levels compared to consumption are relatively low and are often held by governments. This tends to accentuate price swings.

3. The world rice market is a thin, segmented, and imperfect market in which governments are key actors. Including the unprecedented 41 million tons in 2012, world trade has averaged 37 million tons during the last three years.[37] Most of the rice moving in world commerce is fully milled and bagged.

4. The rice market is heavily asymmetrical: five exporting countries (Thailand, the U.S., India, Vietnam, and Pakistan) typically account for some 80 percent of the rice exported. The principal importing countries are usually developing countries and the 10 largest importing countries account for a much less significant portion of the rice traded. Beginning in the 1970s, rice import demand became increasingly dispersed as a result of rising consumption in West Africa (in the face of stagnant production) and the Middle East, as well as the spread of high yield varieties in Asia. Over the last several years, the 10 largest rice importers annually imported 15 million tons on average, or over 40 percent of world trade.

5. Given the political importance of ensuring sufficient rice supplies (particularly in urban areas) and the often conflicting goal of providing for the welfare of rice farmers, who account for a significant percent of the population, the domestic trade and the import of rice in many developing countries (especially in Asia) are often tightly controlled or conducted directly by the government. Several Asian governments seek to purchase a significant share of the marketed rice that meets certain quality standards at a specified support price. Government stocks of domestically produced and/or imported rice are also used to ensure that retail prices do not exceed a certain predetermined level.

6. Much of the rice traded in the international market is conveyed in ship lots of about 15-30,000 tons each, and trade is conducted through direct negotiations rather than tenders. In addition, most export sales are executed on a FOB basis. At the international level, the role of government trading, which was heightened after the rice crisis in the early 1970s, has declined. Additionally, some governments on their own accord have allowed the private sector to begin importing, although often with government monitoring or licensing requirements. This move away from government involvement in world rice trade, however, is being seriously questioned in the aftermath of world prices reaching 30-year inflation-adjusted highs in 2008.

37 This includes higher estimates of "border trade" for Cambodia and Myanmar than are captured by USDA. USDA estimates that world trade last year was 39.2 million tons and the average for 2010-12 was 35.6 million tons.

7. Because of the perceived instability of the world rice market, many governments in countries where rice is a staple pursue policies of self-sufficiency by limiting imports as well as encouraging the use of high-yield varieties and fertilizer through subsidized prices and/or by extending short-term credit. In addition, many have undertaken to hold large stocks of rice to ensure not only adequate supplies of rice at any given time, but also to compensate for years with disappointing harvests. These actions, of course, contribute to the global market's instability. Governments can end up overcompensating in their effort to ensure self-sufficiency every year. This leads to difficulties if adequate storage is insufficient, as the surplus can usually only be exported with a hefty subsidy. An export subsidy is needed in part because the domestic support price is often above world prices. Moreover, the rice must often be sold at a discount because buyers are unsure whether the quality is uniformly standard and acceptable. Further, the local logistics system is set up to import rice, not to export it. Uncertain if the rice will be available at the port when the ships arrive, most buyers are reluctant to be exposed to the significant demurrage expenses resulting from delayed vessel loadings.

8. Prices. Because most governments treat the international rice market as a residual market, the quantity imported by a given country can vary sharply from year to year. In addition, the origins where the rice is purchased can also vary significantly from year to year. These factors, combined with the fact that direct negotiations are used as the primary means to purchase rice, result in high search costs and the primacy of information regarding current prices and a given country's nearby import needs for a particular quality of rice. In this race to negotiate sales, a keen watch is kept on the competitions' vessels with an eye towards discerning newly emerging sales opportunities and risks, if cargo afloat has a home, and whether an end buyer may be getting anxious as the promised delivery period is stretched. With the absence of an efficient price discovery mechanism and the generally inadequate information in developing countries – the primary importers – price and supply-demand information are tightly held.

9. The world rice market is imperfect. There is no single "world market" price in part because of the diverse range of qualities and the lack of commonly used grades. The price of rice depends on the specific quality characteristics of the rice. Further, prices for a given quality of rice can vary significantly from one origin to another depending on the local supply-demand situation. These spreads may also be based, in part, on actual or perceived differences in quality (which can be reinforced by the use of brands), transportation differentials, and commercial risk.

10. In certain markets, for example, high-quality U.S. rice has historically been able to command a premium of up to $60 per ton with Thai 100% B.[38] Persistence of larger-than-normal spreads, however, leads to lost sales as buyers increasingly discover that actual quality differences are often not as great as earlier thought. Once the competing rice makes inroads, it can only temporarily be dislodged through narrower spreads and/or the absence of any spreads altogether.

11. Vietnamese rice normally trades at a discount to Thai rice prices. The premium that buyers are willing to pay can change over time, but varies from market to market depending on the grade, relative loading and shipping costs, consumer acceptance at the end destination, etc. For high-quality rice, many buyers prefer Vietnamese 5% rice if it is priced at least $30 per ton below Thai 100% B. Iran, though, has been willing to pay a premium of up to $50 for Thai rice. Due to high Thai support prices, the gap between 100% B and Viet 5% during January-June 2013 averaged $154, resulting in a very limited market for Thai high-quality white rice. It subsequently declined to less than $30 per ton as the Thai government more aggressively seeks to dispose of its rice mountain.

12. For the lower qualities, buyers are less forgiving. As the appearance of Vietnam 25% (from the dry season harvest) is better than Thai 25% due to superior polishing, buyers are willing to pay a modest differential – if any – based on commercial risk and/or transportation differentials. On the other hand, some African buyers report that they find the Vietnamese material hard cooking and presently prefer Myanmar low-quality rice. Within a given market, the price spreads between different grades of rice can vary dramatically depending on the quality of the local crop and the distribution of demand between qualities. In January-June 2013, for example, the price spread between Thai 100% B and 5% was a not untypical $10 per ton, but during the same period three years ago it was $33.

38 As of mid-June 2013, the U.S. long-grain was trading at a premium of $160 despite recent high Thai price supports and weak global demand.

13. Price discovery for rice is difficult for firms not active in the market. In the absence of an effective futures market for rice, rice is traded on a flat price basis – with the possibility of either large profits or losses being incurred by the international traders and/or their suppliers. While hard data on trading margins are lacking, margins are sharply above those enjoyed in the much larger wheat and coarse grain markets, but much reduced from several years ago.

14. **Market segmentation**. While approximately 37 million tons (milled rice equivalent) are traded annually, the existence of very distinct markets based on different rice types, qualities, and methods of processing precludes perfect substitution. In fact, consumer preferences are so strong in some countries that consumers refuse to eat rice other than that to which they are accustomed. This phenomenon results in prices of different types/qualities moving somewhat independently of each other based on the supply-demand factors for that market segment.

15. After rice is harvested, threshed, and dried, it is milled, either directly or after parboiling (a process of soaking rice in water under pressure, steaming, and drying). Brown rice is an intermediate product produced by removing the pericarp or hull. In the milling process, some kernels are broken – the amount of which varies by variety, the condition of the milling equipment, and growing and drying conditions.

16. In the world market, considerable emphasis is placed on grain length (long, medium, or short) and on the percentage of brokens as criteria of quality. In addition, kernel shape (length/breadth, e.g., slender, medium, bold, or short), chalkiness, and translucency are considered. For purposes of this report, it is useful to classify "high-quality" rice as that with less than 10% brokens, "medium-quality" rice as that with 10-20% brokens, and "low-quality" rice as that with over 20% brokens. The absence of chalkiness and high translucency in the rice endosperm are quality characteristics associated with good grain appearance. Uniformity of quality is also important to rice traders and buyers.

17. There are basically four types of rice: glutinous, aromatic, Japonica, and Indica. The tenderness and stickiness of cooked rice are inversely correlated with the amylose content of the starch. Each of these can be traded on the basis of its stage of processing – rough, brown, or milled – and several can be parboiled.[39]

18. **Glutinous** rice (also known as waxy or sweet rice) has very low amylose content. When cooked it forms a gelatin-like mass without distinct grain separation. Most rice consuming countries in Asia produce small amounts of glutinous rice for use in desserts, ceremonial foods, and sweet dishes. In Northeast and North Thailand and Laos, however, it is the staple food. It is usually sold at a discount to non-glutinous rice with the same amount of brokens.

19. Relatively limited quantities of glutinous rice enter world trade channels, with shipments averaging over 450,000 tons during the last three years. The international market for glutinous rice, though limited, has expanded significantly over the last decade. During the early 1980s, world trade was typically 100,000 tons per year. Crop shortfalls in Laos during those years periodically caused world trade to soar to 300-400,000 tons. Thailand is the primary exporter of glutinous rice, although increasing quantities are shipped out of Vietnam.

20. China and Indonesia have emerged in recent years as the largest importers of glutinous rice – accounting for four out of every five tons imported. Malaysia, which typically imported less than 10,000 tons in the early 1980s, has emerged as the third largest importer of glutinous rice, annually taking 40-50,000 tons. The second-tier markets for glutinous rice are Singapore, the Philippines, Taiwan, and the U.S., each annually taking 20-30,000 tons. Laos, where glutinous rice is the staple, remains the wild card in the market. While its imports in recent years have been limited, it can take anywhere from 50,000 tons to multiples of that number should it experience a poor monsoon.

21. **Japonica** type rice, having a fairly low amylose content, is semi-sticky and moist when cooked. Japonica type rice is a round-shaped grain found in Japan, the Koreas, Taiwan, parts of China, Australia, the Mediterranean area, Brazil, Australia, and California. Because of its cooking characteristics, the demand for this type is relatively limited, with the principal importers being Turkey, Japan, Jordan, the Koreas, and Papua New Guinea. When sold into what is normally an Indica market, Japonica rice must be sold at a discount. The amount of Japonica rice traded internationally varies widely. Usually, however, about 2.5 million tons of Japonica type rice are traded internationally, including 100,000 tons as brokens.

39 Indica and Basmati lend themselves to parboiling, but Jasmine, Japonica, and glutinous rice do not.

22. **Indica** type rice is long-grain rice grown principally in China, South and Southeast Asia, the southern U.S., and South America. With an intermediate to high amylose content, Indica type rice cooks fluffy and shows high volume expansion as well as grain separation. Indica accounts for all but about 10 million of the 37 million tons that enter international trade channels.

23. About 2.4 million tons of the 23.5 million tons of Indica rice traded are shipped as **rough** rice or paddy. Up until relatively recently, the amount of rough rice entering world trade channels was limited, as the relative value of the rice hulls usually makes it uneconomical to ship long distances in this form. Further, many countries prohibit the export of rough rice, although the U.S., Argentina, and Uruguay are notable exceptions. In addition to trade policies that restrict imports of cheap Asian rice for "phytosanitary" reasons, reduced budgetary outlays and a more liberalized trade regime have resulted in significant surplus milling capacity in many Latin American markets, which have high costs of production. With Cambodia's rising exportable surplus, the U.S. share of total paddy trade has fallen and currently accounts for 45 percent of this market, down from an 88 percent market share during the mid-1990s. Although the U.S. exports significant tonnages of rough rice to Turkey, over the past three years 90 percent of all U.S. paddy exports have gone to Latin America. The U.S. shipments to the EU were significant before a GMO scare in 2006 but have not since recovered.

24. While accurate data are not fully available, only about 1.5 million tons of **brown** rice are traded annually – usually in bulk form. Over one-third of this is long-grain rice. The principal brown rice markets are Japan, South Korea, the EU, Canada, and South Africa. Japan, Taiwan, and South Korea import mostly brown Japonica rice. The EU and Canada import both regular and parboiled brown long-grain rice, while South Africa historically bought parboiled brown Indica rice from the U.S., but this trade has largely dried up because of sustained uncompetitive prices.

25. Broadly speaking, the world market for milled long-grain or Indica rice can be divided into parboiled and regular milled. Just as there is only limited substitution between Japonica and Indica rice, there is also very limited substitution between regular milled and parboiled rice.

26. World trade in **parboiled** rice has averaged about 6 million tons per year over the last three years.[40] The U.S., Thailand, and India are the major exporters of parboiled rice. In recent years, Brazil has begun to export significant quantities of parboiled rice. Milled parboiled rice is traded in two distinct markets depending on the quality of the product. High-quality parboiled rice has a golden tinge. The U.S., Thailand, and, most recently, India are the principal producers of high-quality parboiled rice and Saudi Arabia, Yemen, Somalia, and Nigeria are the largest importers of fully milled high-quality parboiled rice. Low-quality parboiled rice has, in addition to a higher number of brokens and foreign matter, a dark color and, sometimes, a strong odor. Low-quality parboiled rice is exported principally by India and Thailand. The most important importers are Bangladesh, Sri Lanka, and Liberia. Low-quality parboiled rice sells at about the price of broken rice.

27. The market for **regular milled long-grain** rice is approximately 16 million tons annually. Like other rice types, it can be subdivided further into high (less than 10% brokens), medium (10-20% brokens), and low (more than 20% brokens) quality based on the brokens content. The volumes moving in each class can vary dramatically from year to year depending on which countries have major crop shortfalls and on the relative price spreads between qualities. A number of countries, of course, import/export a mix of rice qualities.

28. **High-quality regular milled long-grain**. The U.S., Thailand, Vietnam, and India are the principal exporters. Smaller tonnages are exported out of Mercosur (Argentina, Brazil, and Uruguay) and Australia. Significant consumer demand exists for this quality of rice in Iran, Iraq, the U.S., Western Europe, Brazil, Peru, Haiti, Colombia, and Malaysia.

29. **Medium-quality regular milled long-grain**. Thailand, Vietnam, India, and Pakistan are the principal exporters. Indonesia, Malaysia, certain markets in Africa, and the former Soviet Union are the principal importers of this quality of rice.

40 Including brown parboiled and parboiled brokens.

30. **Low-quality regular milled long-grain**. The principal exporters of low-quality rice are Vietnam, Thailand, Pakistan, China, India, and Myanmar. The Philippines is the single largest importer of this quality of rice. Most of West Africa, China, Bangladesh, and Sri Lanka are important importers of low-quality rice.

31. **Brokens** are usually considered the lowest quality of milled rice. Brokens are purchased by countries that have either a history of milling rice by hand pounding or a severe foreign exchange position. In addition, low-quality brokens are used by the brewing industry in many countries. Over the last three years, world trade in brokens has exceeded 4.5 million tons, including 2 million tons of non-aromatic or white brokens traded annually. The volume, however, can fluctuate significantly depending on the price spread with fragrant brokens. In 2012, for example, over 3 million tons of white brokens were traded - sharply above the 1.7 million tons one year earlier and less than the 1.3 million tons in 2010. Where some markets import brokens for price considerations, in certain West African markets, brokens are preferred, as traditional milling methods produce mostly brokens and the local cuisine is derived from this occurrence. About 800,000 tons of brokens are usually imported by West Africa, with three-fourths of this directly imported by Senegal.

32. The volume of brokens imported into various Asian markets has been on the rise in recent years. In particular, Indonesia has been buying significant tonnages of non-glutinous (as well as glutinous) brokens as raw material for noodle manufacturing. Also, it is believed that some of the brokens are blended with locally produced rice when pricing relationships are favorable. Singapore and Hong Kong, traditional importers of Thai brokens, have recently been joined by China, where rising local prices have made imports attractive in recent years. North Korea, due to price considerations, can be an importer of brokens.

33. Thailand traditionally dominates this market, supplying anywhere from one-third to one-half of all material entering world trade channels. This, however, has changed with the current government's high price supports. Thailand exported only 17,000 tons of white brokens last year. India, Vietnam, South America, and Pakistan are now major origins for this quality of rice.

34. At just under 7 million tons, **scented or aromatic rice** accounts for 19 percent of total world trade. The three leading exporters of aromatic rice are Thailand, Pakistan, and India. Reflecting aggressive prices, Vietnam is making increasing inroads. Relatively small tonnages of Jasmine rice are formally exported from Cambodia, but large tonnages move as paddy to both of its neighbors – Thailand and, to a lesser extent, Vietnam. While aromatic rice commands significant premiums over other rice due to its quality and relative scarcity, these premiums have been under pressure as the trade in aromatic rice has skyrocketed and the quality has been deteriorated by the introduction of high-yield varieties and widespread mixing with non-aromatic lookalikes.

35. The **Jasmine** and **Basmati** rice markets are mirror images of one another. In contrast to Basmati, with its sales focus in the Middle East, Asian Jasmine or fragrant rice is sold primarily to other Asian markets, the U.S., and Africa. Of the 2.5 million tons of fragrant rice exports averaged in 2010-12 (comprised principally of Thai F 100%), about one of every three tons was shipped to Asian markets. Up until 2008, China was the largest market for Thai Jasmine, lifting on average 375,000 tons annually. Exports over the last three years have steadily declined to around 100,000 tons as high Thai price supports have prompted many buyers to switch to either local aromatic rice (Patum Thani) or Viet fragrant. Other major markets include Hong Kong, Singapore, and Malaysia. The U.S. is also a growing market for Jasmine rice, with the product starting to enjoy consumer acceptance outside of the Southeast Asian immigrant community. With Iran no longer a large direct buyer, only 7 percent of Thai Jasmine is marketed in the Middle East, while a mere 4 percent of Basmati is sold in the Far East.

36. Patum Thani exports typically are not separately reported, but they totaled less than 75,000 tons in 2012, down over 60 percent from one year earlier and a far cry from the high of almost 350,000 tons five years earlier. Typically, China is the largest market by far. Last year, however, exports contracted to only 5,000 tons – well short of the nearly 40,000 tons shipped one year earlier. According to the Thai Rice Exporters' Association, Patum Thani now trades at a discount of over $435 per ton to Thai fragrant 100% A. Thai fragrant brokens averaged over 670,000 tons during the three-year period ending last year, while Vietnam shipped over 100,000 tons. Almost 90 percent of the shipments are destined for Africa. Typically Thai fragrant brokens are sold at a premium of $30 per ton over white brokens, but currently the spread is $70.

37. But adulteration and abundance are both problems. Like other luxury goods, aromatic rice commands a premium due to its quality and relative scarcity. According to FAO, Thai Jasmine values traded over the last three years at an average premium of over $500 per ton compared to 100% B – the top grade of non-aromatic Thai rice. These premiums have been under pressure as supplies have increased due to the introduction of high-yield varieties and widespread mixing with non-aromatic lookalikes.

38. Thus, rice is not rice. The world rice market is both opaque and complicated. It comprises interconnected submarkets that at times can move in separate directions. Following the soaring 2008 values, the Indica market has been weak due to ample availabilities and the expectation that the Thai government will be forced to substantially reduce its burdensome stocks. One cannot pick up a newspaper or easily search the internet for the levels at which rice is trading in the world market.

Annex 3: Paddy Production in Myanmar

1. Paddy production in Myanmar is geographically concentrated. While rice is grown throughout the country, half is grown in the Ayeyarwaddy Delta in three "divisions" – Ayeyarwaddy, Bago, and Yangon (Table 28). Almost one-fourth is produced in the Central Dry Zone's Sagaing, Magwe, and Mandalay provinces. The production of the dry season crop is even more concentrated, with the Delta accounting for over 60 percent of the harvest. Myanmar's rice surplus is primarily produced in three provinces – Ayeyarwaddy, Bago, and Sagaing, with the rest of the divisions and states essentially rice deficit (but not necessarily food deficit) (Table 29). These three divisions in the Delta comprise about one-third of the total Myanmar population. Meeting domestic rice consumption needs thus requires efficient flows of rice from surplus areas to deficit areas.

Table 28: Myanmar: Paddy production by crop and province, 2004/05-2011/12

	2004/05 – 2008/09			2009/10			2010/11			2011/12		
	Wet	Dry	Total	Wet	Dry	Total	Wet	Dry	Total	Wet	Dry	Total
DELTA												
Ayeyarwaddy	5,563	2,303	7,866	5,944	2,563	8,507	5,944	2,563	8,507	5,972	2,510	8,482
Bago	4,259	585	4,844	4,790	791	5,581	4,790	791	5,581	4,803	630	5,433
Yangon	1,625	283	1,909	1,709	333	2,042	1,709	333	2,042	1,710	320	2,031
Subtotal	11,447	3,171	14,618	12,443	3,687	16,130	12,443	3,687	16,130	12,485	3,461	15,946
DRY ZONE												
Naypyitaw	NA	NA	NA	NA	NA	NA	NA	34	34	287	43	329
Magwe	1,162	271	1,433	1,467	262	1,729	1,501	322	1,823	1,524	332	1,856
Mandalay	1,401	435	1,836	1,298	346	1,644	1,307	369	1,675	993	331	1,324
Sagaing	2,746	751	3,497	3,131	874	4,005	3,179	865	4,044	3,109	745	3,855
subtotal	5,309	1,457	6,766	5,896	1,482	7,378	5,986	1,590	7,577	5,913	1,451	7,364
COASTAL												
Mon	1,213	181	1,394	1,278	222	1,500	1,278	222	1,500	1,294	206	1,499
Rakhine	1,638	31	1,669	1,825	31	1,856	1,825	31	1,856	1,697	29	1,727
Tanintharyi	534	43	577	544	24	568	544	24	568	510	25	535
subtotal	3,385	255	3,640	3,647	277	3,924	3,647	277	3,924	3,501	260	3,761
MOUNTAINOUS												
Chin	103	*	103	120	*	120	120	*	120	127	*	127
Kachin	680	27	707	925	45	970	925	45	970	945	18	963
Kayah	123	15	138	137	17	154	137	17	154	140	17	156
Kayin	595	173	768	721	215	936	721	215	936	755	217	972
Shan	2,099	171	2,269	2,394	160	2,554	2,394	160	2,554	2,409	154	2,563
subtotal	3,600	386	3,986	4,297	437	4,734	4,297	437	4,734	4,374	407	4,781
TOTAL	**23,742**	**5,269**	**29,010**	**26,283**	**5,883**	**32,166**	**26,283**	**5,882**	**32,165**	**26,346**	**5,718**	**32,064**

Source: MOAI.

Table 29: Myanmar: 2010/11 Production, domestic use, and surplus, million tons, milled rice

Region/Province	Population, million		Production		Domestic Utilization			Surplus/ Deficit
	Urban	Rural	Paddy	Rice	Food	Seed	Waste	
DELTA								
Ayeyarwaddy	1.52	6.52	8.54	5.13	1.44	0.12	0.19	3.37
Bago (East)	0.88	2.49	3.17	1.90	0.59	0.05	0.07	1.19
Bago (West)	0.77	2.02	2.30	1.38	0.48	0.04	0.05	0.82
Yangon	5.44	1.58	2.05	1.23	1.10	0.03	0.05	0.04
subtotal	8.61	12.62	16.06	9.64	3.61	0.24	0.37	5.42
DRY ZONE								
Magwe	1.06	4.56	1.84	1.10	1.01	0.03	0.04	0.03
Mandalay	2.85	5.58	1.72	1.03	1.46	0.02	0.04	-0.49
Sagaing	1.24	5.31	4.07	2.44	1.17	0.06	0.09	1.13
subtotal	5.15	15.44	7.63	4.58	3.64	0.11	0.16	0.67
COASTAL								
Mon	1.09	2.04	1.51	.91	0.54	0.02	0.04	0.30
Rakhine	0.66	2.65	1.74	1.04	0.59	0.03	0.05	0.38
Tanintharyi	0.53	1.19	0.54	0.32	0.30	0.01	0.01	0.00
subtotal	2.28	5.88	3.79	2.27	1.43	0.06	0.10	0.68
MOUNTAINOUS								
Chin	0.12	0.43	0.13	0.08	0.10	*	0.01	-0.03
Kachin	0.45	1.13	0.97	0.58	0.28	0.02	0.02	0.26
Kayah	0.12	0.24	0.16	0.09	0.06	*	0.00	0.03
Kayin	0.28	1.54	0.98	0.59	0.33	0.02	0.03	0.22
Shan (South)	0.60	1.61	0.91	0.55	0.39	0.02	0.02	0.12
Shan (North)	0.66	1.88	1.00	0.60	0.45	0.01	0.02	0.12
Shan (East)	0.25	0.67	0.67	0.40	0.16	0.01	0.02	0.21
subtotal	2.47	7.49	4.81	2.89	1.76	0.08	0.12	0.93
TOTAL	**37.00**	**82.87**	**32.29**	**19.37**	**10.44**	**0.49**	**0.74**	**7.70**

Source: MOAI, using milling rate of 60 percent.

2. The official data on paddy production are heavily inflated compared with alternative estimates made by the USDA, but both data sources show the decline in paddy production from 2009/10. As shown in Table 30, there has been an increasing divergence between official production figures (as reported by FAO) and USDA estimates of the crop. In the decade before 1980 there were minimal differences between the two production series. The divergence started in 1980/81 and has become particularly pronounced since the 2005/06 crop. In 2011/12, the difference was estimated at 14.6 million tons. This large difference makes it difficult to make informed public policy decisions.[41]

3. USDA's production figures are based on periodic travels to the key production areas where interviews are conducted with both farmers and millers. Price changes are also taken into account in arriving at USDA's production estimates. Official wet season acreage figures were accepted as part of its calculations, but it comes up with its own estimates of plantings of the much smaller dry season crop. It is important to note that domestic and foreign analysts who have examined the two series find the USDA figures to be a closer fit with reality. The lack of reliable official production numbers handicaps governmental efforts to implement any rice export policy that seeks to maximize domestic price stability while increasing farm incomes.

Table 30: Myanmar: Paddy production, million tons

Period	Official Data	USDA Data	Difference
Avg '70-71/'74-75	8.18	8.19	-0.01
Avg '75-76/'79-80	9.79	9.79	0.00
Avg '80-81/'84-85	14.08	11.05	3.03
Avg '85-86/'89-90	13.81	12.14	1.67
Avg '90-91/'94-95	15.40	14.20	1.20
Avg '95-96/'99-00	17.90	16.17	1.73
Avg '00-01-'04-05	22.59	18.03	4.55
Avg '05-06/'09-10	31.06	18.09	12.97
Avg '05-06/'09-10	31.06	18.09	12.97
2008-09	32.57	17.50	15.07
2009-10	32.68	18.19	14.49
2010-11	32.58	16.45	16.13
2011-12	31.50	16.90	14.60

Source: FAOSTAT and Production, Supply & Distribution Data Base, FAS/USDA.

41 "Myanmar: Memorandum of Economic and Financial Policies," an attachment of a Letter of Intent signed by Minister of Finance Shein and Central Bank of Myanmar Governor Than Nyein to IMF Managing Director Christine Legarde, dated December 28, 2012, contained in "Myanmar Staff-Monitored Program," IMF 2013.

Annex 4: Rice Specialization Companies, 2011/12 Wet Season

Name	Group	Mills	Warehouses 1/		Exporter	Division	Township	Area
			Paddy	Rice				'000 ha
Adipati Agric. Prod'n	MEHL	5		50.0	Adipati	Ayeyarw'y	Myaungmya/ Mawkyun/Kaiklat/ Dadaye	
Ayer Dipar Pathein					Ayeyar Pathein Paddy	Ayeyarw'y	Pathein/ Kangyidaunt	1.5
Ayer Kyangin			0.7	25.6		Ayeyarw'y	Kyangim	4.7
Ayer Pathein Rice Trade		1				Ayeyarw'y	Pathein	1.5
Ayer Shwe Hinthar					Ayer Shwe Hinthar	Ayeyarw'y	Hinthada	
Ayer Tharbaung Rice			0.5	8.5		Ayeyarw'y	Thabaung	4.4
Ayer Wun		4			Ayer Wun, Eternal Victory	Ayeyarw'y	Lewyethna	1.6
Ayertakun Ngarthike Chaung			5.0			Ayeyarw'y	Ngartike Chaung	
Ayerwaddy Green Land	Yuzna	6			Ayeyarwaddy Green Land	Ayeyarw'y	Pyapon	4
Ayeyar Delta	Htoo	2		5.2		Ayeyarw'y	Bogale	5.3
Delta Kyonpyaw	Max Myanmar	2				Ayeyarw'y	Kyonpyaw	12.1
Eineme Ayeyar						Ayeyarw'y	Eineme	3.6
Gold Delta	Eden	9		24.8	MAPCo	Ayeyarw'y	Danubyi/ Pantanaw	24.4
Hinthada Rice & Paddy		3		2.0		Ayeyarw'y	Hinthada	1.6
Kaiklat Rice Prod'n 2/					Kyaiklat Rice Prod'n Co.	Ayeyarw'y	Kaiklat	2.4
Myaungmya Nagar 3/			84.3		Myaungmya Nargar	Ayeyarw'y	Myaungmya	6.2
Pyapon Yadanar Theinga						Ayeyarw'y	Pyapon	1.2
Sein Kyun Yadanar		5		17.0	Nine Seas Trading	Ayeyarw'y	Mawlamyinegyun	.7
Shwe Kan Thar Rice Trade	Ayeyar Shwe War					Ayeyarw'y	Yegyi/Kangyidaunt/Kyaungpon/ Thabaung	.2
Shwe Myae Kyaungpon	Asia World		1.2	9.7		Ayeyarw'y	Kyaungpon	7
Toe Ayer Co.		2				Ayeyarw'y	Dedaye	1.5
United Agric. Prod'n		2		1.0		Ayeyarw'y	Nyaungdon	1.4
Wakema Trading	Pann Thapay			5.2	Wakehema	Ayeyarw'y	Wakema	4
Yay Kyi Rice Trade	Max Myanmar					Ayeyarw'y	Yegyi	12.1
Yay Waddy	Yuszna				Ayeyarwaddy Green Land	Ayeyarw'y	Maubin	1.6
Zalun Ayeyar	Aung Naing Thit Sar	1		4.0	Zalun Ayeyar, True Visions	Ayeyarw'y	Zalun	2.4
Zalun Forward Link		4	1.4	15.0	Zalun Link	Ayeyarw'y	Zalun	6.5
Kaytu Yadanar		8				Bago (E.)	Taungoo	5.1
Oka Thar Myay Rice Develop.						Bago (E.)	Bago	
Paddy Growers' Prosperity		1				Bago (E.)	Wull	5.7
Shwe Kawa Myay		1		4.0		Bago (E.)	Kawa	4
Aung Naing Yoe Ma thitsar				3.0		Bago (W.)	Thegon	3.5
Green Land Myanmar Rice		6	26.8			Bago (W.)	Nattalin	.4
Khittayar Hinthar			1.0	64.0	Ayeyar Hintar Trading	Bago (W.)	Pyay/ Shwedaung Pataung/ Pak Khaung Paungde/ Thegon	20
Letpadan Rice						Bago (W.)	Letpadan	2.6
Minhla Agric. Prod'n		5			Minhla Trdg, XY Trdg	Bago (W.)	Minhla	0.8
Paungde Shwe Myay		1				Bago (W.)	Paungde	3.2
Shwe Pyar		3	0.8		Shwe Pya	Bago (W.)	Gyobingauk	4
Shwe War Hinthar			5.3	17.8	Shwe Wah Hinthar	Bago (W.)	Gyobingauk/ Okpho	10.1
Dawna Land Develop.						Kayin	Kayin	
Myakyun Yarmanya						Mon	Mudon	
Mrauk-U Specialization						Rakhine	Mrauk-U/ Kyuaktaw	1.5
Mrauk-U Top Rice Trade						Rakhine	Mrauk-U	
Rakhine Rice Develop.				3.0		Rakhine	Kyuaktaw/ Mrauk-U/ Minbya/ Paungbyun	.8
Yadanar Taung Goke		2				Rakhine	Tougup/ Thandwe Yanbyae/ Gwa	0.8
Dana Tharha Rice						Sagaing	Khin-U	
Hla Taw Myay		3			Hla Taw Land	Sagaing	Wetlet	1.9
Shwe Kaw Lin						Sagaing	Kawlin	0.7
Zayyar Aung Myay						Sagaing	Dipaeyin	3.2
Zayyar Theinga				5.0	Zayar Theinga	Sagaing	Shwebo	.6
Shan State Agric'l Prod'n Develop.						Shan (E.)	Kyine Hhone	
Shwe Supine Rice Trade						Shan (E.)	Dike Oo	
Shan State Mileyung Agric'l Prod'n						Shan (N.)	Min Yaung	
Shwewar Thiha Rice						Yangon	Tanlyin/ Kyauktan	
Tongwa Shwemyay Trade						Yangon	Thongwa	
TOTAL		76	127.1	264.8				269.6

1/ 1,000 tons

2/ 17 members own 34 mills

3/ 14 members own 20 mills

Source: authors' interviews, MRF, MOC, Wong and Wai, Kyaw Kyaw Thwin

Annex 5: Background of the Rice Milling Sector in Myanmar[42]

1. At the turn of the 20th century, European companies owned most of the rice mills in Myanmar and their capacities were quite large. The largest rice mill in the world at that time was built in Myanmar with an output capacity of 1,500 tons per day.[43] By 1934, soaring export demand resulted in the number of rice mills reaching 637, the larger ones having a capacity of over 1,000 tons. There were "about half a dozen European firms" that owned the big mills "handling about one-third of the rice output in [Yangon] province... However, most of the big rice mills and some small rice mills were destroyed during World War II."

2. Since 1962, nationalization of some of the rice mills, central planning, and the continuation of the state's monopoly of rice exports had a large impact on the milling industry.[44] Like the rest of the economy, the rice sector stagnated. The government mandated that farmers sell fixed quotas of paddy at what became increasingly unattractive prices. This paddy, in turn, was milled by state-owned rice mills or privately-owned factories that were contracted by the state. The rice produced was distributed to the public and any surplus exported. There was little role for the privately-owned rice mills, as domestic rice marketing and exports were the exclusive purview of the state. Aside from mills owned by the government,[45] commercial mills were relegated to toll milling of the government's rice and that of farmers. While games may have been played by those contracted by the government, the milling fees paid were not adequate to replace worn out spare parts and the owners had no incentive to renovate their rice mills to improve productivity and capacity.

3. During the 1980s, the number of hullers exploded, further undermining the viability of the commercial mills. From about 2,000 in 1980, the number of village mills soared to almost 15,500 at present, according to MRMA, accounting for over half of the country's installed milling capacity.[46] As a result, the number of commercial mills dwindled from 1,877 in 1980 to less than 1,450 commercial mills in 2000s – many of which suffer from low utilization rates.[47]

4. With the cost of the food subsidy scheme ballooning and becoming increasingly unaffordable and with mounting resistance from rice farmers to meet their sales quotas, the government suspended the domestic procurement system in September 1987. The system was reinstated in 1989 at a much reduced level, as the ration was limited only to civil servants and members of the military and the quantities they received were reduced as well. This allowed the government to scale back its procurement quotas by half, from over 4 million tons to 1.5-2.2 million tons in the period 1988/89 through 2002/03 (Okamoto 2009).

5. With the removal of restrictions on private traders and millers and on the interdivision/state transport of rice, the volume of rice on the free market reached 30-40 percent of total production by the end of the 1990s. Throughout the 1990s, private traders and mill owners vigorously entered the rice industry to fill the gap created by the withdrawal of the public sector (Kudo *et al*. 2012). In April 2003, 16 years after the first liberalization, the rice ration system for civil servants and the paddy procurement system were finally abolished (Okamoto 2005).

6. **Government-owned mills.** During the 1980s, the government constructed five modern rice mills using loans from Japan, the Asian Development Bank, and the World Bank. Some private mills were also renovated with financial assistance from an International Development Association loan of the World Bank.

42 Unless otherwise indicated, this section is also primarily drawn from Oo and Kudo (2003).

43 Contrary to international usage, most milling capacity figures in Myanmar are based on rated milled rice output - assuming 24 hours or, sometimes, 20 hours per day of operation. A more accurate metric is the amount of paddy that can be milled during a single hour as this obviates the question of how many hours each day the mill operates, which cannot only vary significantly from mill to mill depending on the owner's financial strength, the availability of paddy (which is subject to large seasonal swings depending on the cropping pattern), and the availability of electrical power.

44 Interviewed millers reported that some of the privately-owned mills were returned after a short period, but often with the equipment looted. The foreign-owned rice mills were not returned to their owners.

45 The government's rice procurement, milling, and marketing were done first by the Agricultural and Farm Produce Trading Corporation, reorganized in 1989as Myanmar Agricultural Produce Trading.

46 About 56.6 percent of the milling capacity is used to process rice at the farm level by small-scale rice hullers fairly crudely made by local manufacturers (Thein 2006).

47 According to Wong and Wai (2013), most of the mills have a capacity of around 1 ton per hour and only 230 are large enough to mill over 2.5 ton per hour. The convention in Myanmar is to cite milling capacity on the basis of tons of output per day, assuming 20-24 hours of operation - which often is not the case.

7. During the 1990s, the government also constructed two larger rice mills (each with a capacity of 10 tons of paddy per hour) and two rice reprocessing or polishing factories. This increased the government rice milling industry to 68 factories. After the state ended its role in paddy procurement, most of these mills were sold to two firms – Myanmar Economic Company and Myanmar Economic Holdings Ltd. The rest of the mills fell into disrepair and were subsequently sold off, some to RSCs to either be repaired or upgraded; some were even sold off as scrap (Wong and Wai 2013).

8. The current state of the milling sector. The combination of hullers and a half century of economic mismanagement have left the commercial rice mills in shambles. Caught between the more cost-efficient hullers and a state monopoly on exports, there was little modernization of the rice mills prior to 2012. Nearly 85 percent of them have a milling capacity of only 1 ton per hour. The biggest problem facing the mid- and large-scale mills now is the dilapidated condition of their milling facilities and equipment. Important parts of the mills, such as engines, are now very old and have been in use since the 1930s; the majority of the most recent are from the 1960s. Even millers who started business after the 1987 liberalization often did not construct new rice mills, but made use of secondhand equipment or purchased old mills.

Annex 6: Statistical Tables on Myanmar's Rice Milling Industry

Table 31: Myanmar: Registered rice mills by capacity, 2012/13

Region/Province		+100 tons		40-100 tons		20-40 tons		15-20 tons		Total	
		#	Capacity	#	Capacity	#	Capacity	#	Capacity	#	Capacity
Delta	Ayeyarwaddy	5	500	46	1,973	267	7,805	269	5,376	587	15,654
	Bago	5	500	17	778	119	3,010	144	2,377	285	6,665
	Yangon	10	1,730	40	1,965	30	779	145	2,208	225	6,682
	Subtotal	20	2,730	103	4,716	416	11,594	558	9,961	1,097	29,001
Dry Zone	Mandalay	0	0	0	0	0	0	21	315	21	315
	Sagaing	0	0	4	166	76	1,925	83	1,651	163	3,742
	Subtotal	0	0	4	166	76	1,925	104	1,966	184	4,057
Coastal	Mon	0	0	0	0	6	180	26	427	32	607
	Tanintharyi	0	0	0	0	1	25	3	45	4	70
	Subtotal	0	0	0	0	7	205	29	472	36	677
Mountain.	Kachin	0	0	0	0	0	0	6	90	6	90
	Kayah	0	0	0	0	0	0	39	780	39	780
	Subtotal	0	0	0	0	0	0	39	780	39	780
Total		**20**	**2,730**	**107**	**4,882**	**499**	**13,724**	**736**	**13,269**	**1,362**	**34,605**
As %		1	8	8	14	37	40	54	38	100	100

Note: Capacity basis tons per day output assuming 24 hours of operation.

Source: MRMA.

Table 32: Myanmar: Equipment in modern rice mills, 2012/13

Regions/Province		Color Sorters		Wet Polishers		Verified Whitener	
		#	Capacity	#	Capacity	#	Capacity
Delta	Ayeyarwaddy	15	635	21	878	131	3,010
	Bago	1	60	11	480	78	1,716
	Yangon	9	930	7	1,170	1	30
	Subtotal	25	1,625	39	2,528	210	4,756
Dry Zone	Mandalay	0	0	0	0	0	0
	Sagaing	13	321	0	0	50	1,114
	Subtotal	13	321	0	0	50	1,114
Coastal	Mon	0	0	0	0	0	0
	Tanintharyi	0	0	0	0	0	0
	Subtotal	0	0	0	0	0	0
Mountainous	Kachin	0	0	0	0	0	0
	Kayah	0	0	0	0	0	0
	Subtotal	0	0	0	0	0	0
TOTAL		**38**	**1,946**	**39**	**2,528**	**260**	**5,870**

Note: Capacity basis tons per day output assuming 24 hours of operation.
Source: MRMA.

Table 33: Myanmar: Registered rice mills by milling quality, 2012/13

Region/Province		A grade (100%)		B grade (100%)		C grade (25%)		E grade (35%)		Total	
		#	Capacity	#	Capacity	#	Capacity	#	Capacity	#	Capacity
Delta	Ayeyarwaddy	15	635	124	3,860	268	6,110	180	5,049	587	15,654
	Bago	24	761	48	1,493	79	1,833	134	2,578	285	6,665
	Yangon	17	1,564	46	2,327	135	2,386	27	405	225	6,682
	Subtotal	56	2,960	218	7,680	482	10,329	341	8,032	1,097	29,001
Dry Zone	Mandalay	0	0	0	0	21	315	0	0	21	315
	Sagaing	8	416	45	1,203	62	1,074	48	1,049	163	3,742
	Subtotal	8	416	45	1,203	83	1,389	48	1,049	184	4,057
Coastal	Mon	0	0	2	45	30	562	0	0	32	607
	Tanintharyi	0	0	0	0	0	0	4	70	4	70
	Subtotal	0	0	2	45	30	562	4	70	36	677
Mountain.	Kachin	0	0	0	0	6	90	0	0	6	90
	Kayah	0	0	0	0	39	780	0	0	39	780
	Subtotal	0	0	0	0	39	780	0	0	39	780
Total		**64**	**3,376**	**265**	**8,928**	**640**	**13,150**	**393**	**9,151**	**1,362**	**34,605**
As %		5	10	19	26	47	38	29	26	100	100

Note: Capacity basis tons per day output assuming 24 hours of operation.

Source: MRMA.

Table 34: Myanmar: Registered rice mills by power source, 2012/13

Region/Province		Electric Power		Boiler		Gasifier		Diesel Engine		Total	
		#	Capacity	#	Capacity	#	Capacity	#	Capacity	#	Capacity
Delta	Ayeyarwaddy	57	1,485	278	8,856	137	3,014	115	2,299	587	15,654
	Bago	138	3,076	99	2,788	43	721	5	80	285	6,665
	Yangon	52	1,894	40	2,404	45	847	88	1,537	225	6,682
	Subtotal	247	6,455	417	14,048	225	4,582	208	3,916	1,097	29,001
Dry Zone	Mandalay	21	315	0	0	0	0	0	0	21	315
	Sagaing	51	1,326	77	1,716	19	371	16	329	163	3,742
	Subtotal	72	1,641	77	1,716	19	371	16	329	184	4,057
Coastal	Mon	1	15	23	472	1	15	7	105	32	607
	Tanintharyi	0	0	0	0	1	25	3	45	4	70
	Subtotal	1	15	23	472	2	40	10	150	36	677
Mountain.	Kachin	0	0	6	90	0	0	0	0	6	90
	Kayah	19	380	0	0	0	0	20	400	39	780
	Subtotal	19	380	0	0	0	0	20	400	39	780
Total		339	8,491	523	16,326	246	4,993	254	4,795	1,362	34,605
As %		25	25	38	47	18	14	19	14	100	100

Note: Capacity basis tons per day output assuming 24 hours of operation.
Source: MRMA.

Table 35: Myanmar: Registered mills by age, 2012/13

Regions/Province		65 years +		30-64 years		Below 30 years		Total	
		#	Capacity	#	Capacity	#	Capacity	#	Capacity
Delta	Ayeyarwaddy	40	1,961	165	4,657	382	9,036	587	15,654
	Bago	38	877	61	1,957	186	3,831	285	6,665
	Yangon	7	282	60	1,329	158	5,071	225	6,682
	Subtotal	85	3,120	286	7,943	726	17,938	1,097	29,001
Dry Zone	Mandalay	0	0	0	0	21	315	21	315
	Sagaing	0	0	82	1,694	81	2,048	163	3,742
	Subtotal	0	0	82	1,694	102	2,363	184	4,057
Coastal	Mon	0	0	30	577	2	30	32	607
	Tanintharyi	0	0	0	0	4	70	4	70
	Subtotal	0	0	30	577	6	100	36	677
Mountainous	Kachin	0	0	0	0	6	90	6	90
	Kayah	0	0	0	0	39	780	39	780
	Subtotal	0	0	0	0	45	870	45	870
TOTAL		85	3,120	398	10,214	879	21,271	1,362	34,605
As %		6	9	29	30	65	61	100	100

Note: Capacity basis tons per day output assuming 24 hours of operation.
Source: MRMA.

Table 36: Myanmar: Registered rice hullers

Regions/Province		2010-2011		2011-2012		2012-2013	
		#	Capacity	#	Capacity	#	Capacity
Delta	Ayeyarwaddy	3,892	19,460	3,927	19,804	3,927	19,804
	Bago	1,508	5,450	1,528	5,632	1,564	5,711
	Yangon	764	2,292	775	2,413	681	2,886
	Subtotal	6,164	27,202	6,230	27,849	6,172	28,401
Dry Zone	Mangwe	906	2,718	909	2,723	914	2,742
	Mandalay	1,276	6,380	1,280	6,421	1,275	6,395
	Sagaing	1,504	7,520	1,517	7,635	1,571	7,855
	Subtotal	3,686	16,618	3,706	16,779	3,760	16,992
Coastal	Mon	539	1,364	539	1,364	518	1,295
	Rakhine	1,354	5,246	1,354	5,246	1,354	5,246
	Tanintharyi	1,119	2,238	1,118	2,236	1,117	2,234
	Subtotal	3,012	8,848	3,011	8,846	2,989	8,775
Mountainous	Kachin	1,652	4,956	1,652	4,956	1,652	4,956
	Kayah	44	220	44	220	44	220
	Kayin	21	63	21	63	21	63
	Shan	813	1,647	813	1,647	835	1,669
	Subtotal	2,530	6,886	2,530	6,886	2,552	6,908
TOTAL		**15,392**	**59,554**	**15,477**	**60,360**	**15,473**	**61,076**

Note: Capacity basis tons per day output assuming 24 hours of operation.
Source: MRMA.

Annex 7: Key Players in the Rice Export Market in Myanmar

1. **Key foreign players:** Virtually all of Myanmar's exports are made on a FOB basis. Its buyers largely comprise two separate groups: Singapore-based firms that specialize in trading with Myanmar and international rice trading firms. The first group is comprised of firms that either sell the rice on a CNF basis to Bangladesh and East Africa or resell on a FOB basis to the international rice traders. The most prominent of these firms are Agro Corp, Universal Navigation, Swiss Singapore Overseas Enterprises, and TWT. These firms exclusively utilize payment by Telegraphic Transfer, which makes them an attractive customer to underfinanced exporters as the funds help to pre-finance the purchase of cargo.

2. Louis Dreyfus is both the largest of the international rice trading firms (trading roughly 3 million tons annually) and the biggest buyer of Myanmar rice (around 240,000 tons annually). The second largest international rice trading firm is Olam, a publicly traded firm domiciled in Singapore that handles about 1 million tons of rice annually, including on average over 85,000 tons from Myanmar. Other international buyers include Voest-Alpine Intertrading, Ameropa, and Phoenix Commodities. Beginning in 2012, a number of new buyers started buying rice in Yangon, including almost 80,000 tons by Singapore-based Mewah Oils International and smaller tonnages by Suvannaphum, a Thai rice exporter.

3. **Key domestic players:** Identifying the largest exporters would appear to be a straightforward exercise, but it is not uncommon for an undercapitalized company to share an overseas order with other firms that either have an existing export license and/or have some of the requisite supplies. This might involve subcontracting part of the export order or having the second firm as a "co-shipper." Where the actual seller is known, the full shipment is ascribed to that firm. As such, there may be instances where the volume actually handled by a given firm is understated.

4. Over the last five years, the number of firms engaged in exporting rice has consolidated. To a certain extent, this reflects changes in the size of export orders. In 2008, there were a large number of relatively small contracts from Bangladesh, which were particularly attractive to small firms. Additionally, the government no longer plays such an active role in allocating export licenses to firms based on their operating an RSC.

5. In 2008, the five most active firms accounted for only 55 percent of the total shipments, but during 2009-2011, the five largest firms accounted on average for almost three out of every four tons exported. This fell back to 62 percent in 2012 with the entrance of two new players – Myanmar Agribusiness Public Corporation (MAPCo) and Bayint Naung Business Group – and stepped up activity to three existing exporters – Tharyawaddy District, XY Trading, and Golden Lace. These five firms are credited with loading over 95,000 tons, or 16 percent of all sailings (Table 37).

6. As the sole supplier to Louis Dreyfus, Diamond Star is the largest single exporter of Myanmar rice. Over the last four years, it has handled just under one-third of all exports, or almost 240,000 tons annually. It is part of the Capital Diamond Star Group and in addition to exporting corn and rubber, this agro-food group is the country's largest wheat miller and distributes bakery products, fertilizer, ag chemicals, and pharmaceuticals. It owns the Premier brand instant coffee and is the Pepsi distributor for Myanmar. It also owns and runs the Capital Hypermarket chain. As indicated earlier, it has plans to build a large rice polishing factory and a rice loading port in Thilawa.

Table 37: Myanmar: Exports by major shippers, '000 tons

Firm	2008	2009	2010	2011	2012
Adipati Agr'l Produce Tdg #1/	5	30	45	144	40
Ayerwaddy Rice Paddy & Other Crops	59	25	0	*	1
Ayeyar Hintar Trading 2/	53	103	20	37	17
AYS Mfg	5	38	4	*	0
Bayint Naung Business Group	0	0	0	0	14
CEIE # 3/	9	*	0	29	0
Diamond Star 4/	77	397	175	228	151
Eternal Victory 5/	6	29	0	17	8
First Rice & Paddy Trdg Co.	10	39	0	0	0
Golden Lace	0	0	0	2	15
Golden Land East	16	0	7	1	3
Kyaiklat Rice Prod'n Co.	0	6	12	3	0
MAPCo 6/	NA	NA	NA	NA	21
MEC # 7/	116	179	119	156	88
Shwe Wah Yaung 8/	0	9	10	34	72
Tharyarwaddy District	24	0	0	0	21
Theinga Yadana	12	25	2	13	0
Wakehema	0	0	10	2	2
XY Trading	0	29	7	15	25
Yangon Technical	0	0	0	1	16
Others	207	143	74	135	112
Total	**598**	**1,052**	**485**	**816**	**605**
Top 5 firms +	329	756	371	598	375
As % of total	55	72	76	73	62

Note: * Less than 500 tons. # Government-owned firm. + Different firms each year. 1/ Part of Myanma Economic Holdings Ltd (MEHL); includes sister company Myawaddy Trading; 2/ Includes sister companies Global Myanmar and Kittayar Hintar; 3/ Cooperative Export Import Corporation; 4/ Also known as L & Z; 5/ Includes sister company Ayeyar Wun; 6/ Myanmar Agribusiness Public Corporation; 7/ Myanmar Economic Corporation; 8/ Includes sister company Shwe Wah Hintar.

Source: Slayton & Associates.

7. Over the last four years, 28 percent of Myanmar's exports have been handled by two conglomerates – Myanmar Economic Corporation and Myanma Economic Holding Ltd.[48] Myanma Economic Holding's rice trading arm is Adipati Agricultural Produce Trading, which also has the largest RSC. When the government sold off the milling and warehousing assets of Myanama Agricultural Produce Trading, most of these facilities were turned over to these two firms. MEC owns nine rice mills, while Adipati has five. Each also owns a rice reprocessing factory.

8. Ayeyar Hintar Trading is one of the trading arms of the Ayeyar Hintar Group, exporting not only rice but also beans and pulses. It reports that it annually trades 180,000 tons and owns a rice polishing factory. Its Khittayar Hintar is the country's second largest RSC and its Ayeyar Rice subsidiary distributes packaged rice domestically. The conglomerate is involved in construction, mining, engineering, oil and gas, real estate, plantation crops, automotive sales, and health care, while also importing vegetable oil. Shwe Wah Yaung, which also exports under the name of Shwe War Hintar, operates a RSC and two rice polishing factories. It reportedly has strategic alliances with 16 rice mills.

9. MAPCo is a publicly-owned company formed in 2012 as the trading and investment arm of the MRF. In its first full year of operation, it was the 6th largest exporter. It envisions itself playing a key role in modernizing the rice sector through technology transfer to both farmers and millers. One of its signature efforts is the Integrated Rice Complex Project. It has plans to build 15 projects, each with a price tag of $40 million. Each Integrated Rice Complex Project would have white and parboiled rice mills, dryers, storage, a rice bran oil plant, a rice noodle factory, and a rice husk-fired generator.

10. Green Land Agricultural Cooperative Society is one of the country's largest rice traders, active both in border trade and in supplying rice for formal exports. It is believed to trade between 200-300,000 tons annually. It has nine rice mills and two rice polishing factories and also operates a major rice farm. It is aggressively adding to its milling and polishing capacities and is increasingly active as an exporter either in its own name or that of its Singapore-based trading house, Vimalar Global Trade.

48 Myanmar Economic Corporation was formed in 1997 with an emphasis on heavy industries. Myanma Economic Holding Ltd. was established in 1990 with an emphasis on light industries and commercial trading. It has 37 wholly owned businesses and describes itself as "the biggest conglomerate in Myanmar." One of its trading companies is Mywaddy Trading, which is sometimes listed as a rice exporter.

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