



EAST-WEST SEED

**ENVIRONMENTAL MANAGEMENT PLAN**  
**for**  
**Operation of Vegetable Seed Processing Plant**  
**at**  
**Nyaungnitpin Agriculture and Livestock**  
**Breeding Special Zone (2), Hmawbe Township,**  
**Yangon Region**  
**by**  
**East-West Seed (Myanmar) Co., Ltd**  
**(Amended)**



**(Myanmar Environment Sustainable Conservation)**

**May 2019**



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## **DECLARATION**

(By MESC)

We hereby, declare that the information submitted in this report is, to the best of our knowledge, true and accurate up to the date of submitting this report.

The report is confidential between East-West Seed (Myanmar) Co., Ltd and the consultant firm Myanmar Environment Sustainable Conservation (MESC) until the report is submitted to the authorities concerned.

The report has been prepared by MESC with utmost effort with all reasonable skills, care and diligence within the term of contract with the client (East-West Seed (Myanmar) Co., Ltd). Recommendations are based on our experience, using professional judgment and based on the information that is available to us.

Above all, the preparation of this report strictly followed the environmental regulations and guidelines set up, and particularly the IEE/EIA/EMP format laid down, by the Environmental Conservation Department, formerly Ministry of Environmental Conservation and Forestry (MOECAF), now the Ministry of Natural Resources and Environmental Conservation (MONREC).



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## **ACRONYMS AND ABBREVIATION**

AP	Aluminium Phosphide
ASEAN	Association of South-East Asian Nations
AOSA	Association of Official Seed Analysis
BAT	Best Available Technology
CBM	Complaint Grievance Mechanism
CHS	Community Health and Safety
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
CGM	Complaint Grievance Mechanism
CH <sub>4</sub>	Methane
CSR	Corporate Social Responsibility
dBA	Decibel A- weighting
ECD	Environmental Conservation Department
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPS	Environmental Performance Standards
FAO	Food and Agriculture Organization
GDP	Gross Domestic Products
GE	Genetic Engineering
GHGs	Green House Gases (Glass House Gases)
GRE	Grievance Redress Mechanism
IFC	International Finance Corporation
ISO	International Standard Organization
ISTA	International Seed Testing Association
MESC	Myanmar Environment Sustainable Conservation
MIC	Myanmar Investment Commission

MMSP	Management and Monitoring Sub-Plan
MOECAF	Ministry of Environmental Conservation and Forestry
MONREC	Ministry of Natural Resources and Environmental Conservation
MP	Monitoring Plan
NECCCCC	National Environmental Conservation and Climate Change Central Committee
NEQ	National Environmental Quality
NHC	National Health Committee
NO <sub>x</sub>	Nitrogen Oxides
OECD	Organization for Economic Cooperation and Development
OHS	Occupational Health and Safety
PES	Payment for Ecosystem Services
PPE	Personnel Protection Equipment
PM	Particulate Matter
PPM	Parts Per Million
5Rs	Reduce, reuse, recover, recycle and redesign
R&D	Research and Development
SIA	Social Impact Assessment
STD	Sexually Transmitted Diseases
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
VOC	Volatile Organic Compound
WHO	World Health Organization
YCDC	Yangon City Development Committee

## အကျဉ်းချုပ်အစီရင်ခံစာ

ဤသီးသန့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP)သည် ညောင်နှစ်ပင် စိုက်ပျိုးမွေးမြူရေး အထူးဇုန်(၂)၊ မှော်ဘီမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီးတွင် East-West Seed (Myanmar) ကုမ္ပဏီ လီမိတက်မှ ဟင်းသီးဟင်းရွက်အစေ့ ထုတ်လုပ်သန့်စင်ခြင်း၊ စက်ရုံစီမံကိန်းလည်ပတ်ခြင်းအတွက် ဖြစ်ပါသည်။

East-West Seed (Myanmar) ကုမ္ပဏီလီမိတက်သည် ၁၆-၁၁-၂၀၁၅ ရက်နေ့တွင် မြန်မာနိုင်ငံ၌ တရားဝင်မှတ်ပုံတင်ထား ပါသည်။ (ကုမ္ပဏီမှတ်ပုံတင်အမှတ်- ၆၆၈ အက်ဖ်စီ/၂၀၁၅-၂၀၁၆ (ရက)၊ စီမံကိန်းနှင့် ဘဏ္ဍာရေးဝန်ကြီးဌာန။)

ကုမ္ပဏီ၏ ရှယ်ရှင်များမှာ East-West International B.V (Netherland) မှ ၁ ရာခိုင်နှုန်းနှင့် East-West Seed ROH Ltd (Thailand) မှ ၉၉ ရာခိုင်နှုန်းတို့ ဖြစ်ကြသည်။

စီမံကိန်းတည်နေရာမှာ မြေကွက်အမှတ် ၅၄၇/က ညောင်နှစ်ပင် စိုက်ပျိုးမွေးမြူရေး အထူးဇုန်(၂)၊ မှော်ဘီမြို့နယ်တွင် တည်ရှိပါသည်။ ကိုဩဒိနိတ်များမှာ မြောက်လတ္တီကျု ၁၇ ဒီဂရီ၊ ၉ မိနစ်၊ ၀.၂၄ စက္ကန့် နှင့် အရှေ့လောင်ဂျီတွဒ် ၉၆ ဒီဂရီ၊ ၉ မိနစ်၊ ၂၇.၃၅ စက္ကန့်တို့ ဖြစ်ကြသည်။ ပင်လယ်ရေမျက်နှာပြင်အမြင့် ၄၅ ပေ ဖြစ်သည်။

အနီးဆုံးကျေးရွာမှာ တကူတုန်းကျေးရွာဖြစ်ပြီး အရှေ့မြောက်ဘက် ၀.၂၆ မိုင် အကွာတွင် တည်ရှိပါသည်။ အခြားကျေးရွာ (၂)ရွာမှာ အနောက်မြောက်ဘက် (၁)မိုင်အကွာ ဆန်ကြီးကျေးရွာနှင့် အနောက်ဘက် (၁)မိုင်အကွာတွင် ဖိုဒေါ်နကွန်ကျေးရွာ ရှိသည်။

တကူတုန်းကျေးရွာသည် (လူဦးရေ ၅၇၀) သေးငယ်သော ကျေးလက်ဒေသတစ်ခု ဖြစ်သည်။ ဟင်းသီးဟင်းရွက်မျိုးစေ့သန့်စင်သော စီမံကိန်းကြောင့် ကျေးရွာဧရိယာအပေါ် မီးခိုး၊ ဖုန်မှုန့်၊ ဆူညံသံတို့၏ သက်ရောက်မှုများ မကျရောက်ပေ။ (၎င်းသည် မီးခိုး၊ ဖုန်မှုန့်နှင့် စက်မှုဆိုင်ရာစွန့်ပစ်ပစ္စည်းများ (အစိုင်အခဲနှင့် အရည်)ထွက်ရှိသော စက်ရုံမဟုတ်ပေ။ အားသစ်ကုမ္ပဏီလီမိတက်စက်ရုံသည် စီမံကိန်း နေရာနှင့် ကျေးရွာအကြားတွင် ကြားခံတစ်ခုအဖြစ် တည်ရှိပါသည်။)

စီမံကိန်းနေရာသည် ရန်ကုန်မြို့၏ အနောက်မြောက် ၂၄.၈၀ မိုင်အကွာနှင့် မှော်ဘီမြို့၏ အရှေ့ဘက် ၉.၈၆ မိုင်အကွာတွင် တည်ရှိပါသည်။

ခန့်မှန်းဘတ်ဂျက်မှာ အမေရိကန်ဒေါ်လာ ၆,၀၀၀,၀၀၀ ဖြစ်သည်။

ရေကို ကိုယ်ပိုင်အစီစီတွင်းမှ ရယူသုံးစွဲ ပါသည်။

လျှပ်စစ်မီးကို အစိုးရလျှပ်စစ်မီးမှရရှိပြီး ၈၀ KVA ရှိ အရံမီးစက်တစ်လုံး တပ်ဆင်ထားပါသည်။

တည်ဆောက်ရေးကာလသည် (၂)နှစ်ဖြစ်ပြီး စီမံကိန်းလည်ပတ်စဉ်ကာလသည် နှစ်(၃၀)၊ (၁၀)နှစ် နှစ်ကြိမ် သက်တမ်းတိုးနိုင်သည်။ စီမံကိန်းပိတ်သိမ်းကာလသည် (၁)နှစ် ဖြစ်သည်။

အဓိကအလုပ်မှာ East-West Seed ROH ကုမ္ပဏီလီမိတက်မှ ထိုင်း၊ ဖိလစ်ပိုင်၊ အိန္ဒိယ၊ အင်ဒိုနီးရှား၊ ဗီယက်နမ်နိုင်ငံများတွင်နည်းပညာဖြင့် ထုတ်လုပ်ထားသော ဟင်းသီးဟင်းရွက် အမျိုး(၃၀) တင်သွင်းခြင်း ပါဝင်ပါသည်။ ထိုမျိုးစေ့များကို ဈေးကွက်အတွက် ပြန်ထုတ်ပိုးပြီး နိုင်ငံခြား (၃၀)ရာခိုင်နှုန်းနှင့် ပြည်တွင်း (၇၀)ရာခိုင်နှုန်း ရောင်းချပါသည်။

စီမံကိန်းလည်ပတ်စဉ်အတွင်းတွင် မတူညီသော မျိုးစေ့ထုတ်လုပ်မှုမှာ တစ်ရက်လျှင် ၂၀၀ ကီလိုဂရမ်နှင့် နှစ်စဉ် ခန့်မှန်းထုတ်လုပ်မှုမှာ ၆၀,၈၄၀ ကီလိုဂရမ် ထုတ်လုပ်မည် ဖြစ်ပါသည်။

အဓိကအဆောက်အဦများမှာ ထုတ်လုပ်ခြင်းအဆောက်အဦ၊ ရုံးခန်း၊ ဓါတ်ခွဲခန်း၊ သိုလှောင်ရုံ အစရှိသည်တို့ ပါဝင်ပါသည်။

စီမံကိန်းအတွက် စက်ယန္တရားများနှင့် ကိရိယာတန်ဆာပလာများသည် ပြည်ပမှတင်သွင်းသော စက်သစ်များ ဖြစ်သည်။

ဝန်ထမ်းအင်အားမှာ ပြည်တွင်း (၈၄)ယောက်နှင့် နိုင်ငံခြားသား (၅)ယောက်ဖြစ်ပြီး လစာမှာ အမေရိကန်ဒေါ်လာ ၁၅၀ မှ ၁၅၀၀ အထိ ဖြစ်သည်။ အလုပ်လုပ်ချိန်မှာ တစ်ရက် (၈)နာရီနှင့် တစ်ပတ် (၄၀-၄၈)နာရီ ဖြစ်သည်။

စီမံကိန်း၏ အခြေအနေလေးခုလုံးအတွင်းတွင် ထင်ရှားသော ဆိုးကျိုးသက်ရောက်မှု မတွေ့ရှိ နိုင်ပေ။ သို့ပေမယ့် စံချိန်စံညွှန်းမီသော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP) အစီရင်ခံစာ ဖြစ်စေ၍ ဖြစ်နိုင်ခြေရှိသော သက်ရောက်မှုများနှင့် သက်ရောက်မှုအားလုံးကို ခန့်မှန်းအမျိုးအစားခွဲခြား၍ ဖော်ပြ ထားပါသည်။ ထိုအရာများမှာ-

အကြိုတည်ဆောက်ရေးကာလအတွင်းတွင်

ဖြစ်နိုင်ခြေရှိသော သက်ရောက်မှု မရှိပေ။

တည်ဆောက်ရေးကာလအတွင်းတွင်

- ၁။ လေပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှု၊
- ၂။ ဆူညံသံနှင့် တုန်ခါမှုကြောင့် သက်ရောက်မှု၊
- ၃။ ဖြစ်နိုင်ခြေရှိသော ရေပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှု၊
- ၄။ ဖြစ်နိုင်ခြေရှိသော မြေဆီလွှာအပေါ် သက်ရောက်မှု၊
- ၅။ စွန့်ပစ်ပစ္စည်းများကြောင့် သက်ရောက်မှု (တည်ဆောက်ရေးပစ္စည်းများ)၊
- ၆။ ဖြစ်နိုင်ခြေရှိသော ယာဉ်ကြောပိတ်ဆို့မှုအပေါ် သက်ရောက်မှု၊
- ၇။ ဖြစ်နိုင်ခြေရှိသော လူမှုရေး သက်ရောက်မှု၊

၈။ ဖြစ်နိုင်ခြေရှိသော လုံခြုံရေးပြဿနာ၊

၉။ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး (ဖြစ်နိုင်ခြေရှိသော လုပ်ငန်းခွင် မတော်တဆမှု)၊

စီမံကိန်းလည်ပတ်စဉ်ကာလအတွင်းတွင်

၁။ လေအရည်အသွေးအပေါ် သက်ရောက်မှု၊

၂။ ဆူညံသံနှင့် တုန်ခါမှုကြောင့် သက်ရောက်မှု၊

၃။ ဖြစ်နိုင်ခြေရှိသော စွန့်ပစ်ပစ္စည်းများကြောင့် သက်ရောက်မှု (အစိုင်အခဲ၊ အရည်)၊

၄။ ဖြစ်နိုင်ခြေရှိသော ယာဉ်ကြောပိတ်ဆို့မှုအပေါ် သက်ရောက်မှု၊

၅။ စီမံကိန်းကြောင့် ဖြစ်နိုင်ခြေရှိသော လျှပ်စစ်မီးအပေါ် သက်ရောက်မှု၊

၆။ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး၊

၇။ ဖြစ်နိုင်ခြေရှိသော လူမှုရေး သက်ရောက်မှု၊

၈။ ဖြစ်နိုင်ခြေရှိသော လုံခြုံရေးပြဿနာ၊

သက်ရောက်မှုတစ်ခုစီတိုင်းအတွက် ဖြေလျော့နိုင်မည့် နည်းလမ်းများကို အခန်း(၄)တွင် အသေးစိတ် ဖော်ပြထားပါသည်။

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP) ကွင်းဆင်းဆောင်ရွက်ချိန်အတွင်းတွင် တကူတုန်း ကျေးရွာသူ/သားများနှင့် လူထုတွေ့ဆုံဆွေးနွေးပွဲတစ်ခု ကျင်းပခဲ့ပါသည်။ စီမံကိန်းဧရိယာသည် ဆယ်စုနှစ် တစ်ခုကျော်ကတည်းက အစိုးရက တရားဝင်အသိအမှတ်ပြုထားသော ညောင်နှစ်ပင်စိုက်ပျိုးရေးနှင့် မွေးမြူရေး အထူးစီးပွားရေး ဇုန်(၂)အတွင်းတွင်တည်ရှိသော မြေနုရာနှင့်ပတ်သက်ပြီး အငြင်းပွားခြင်း၊ အတင်းအဓမ္မရယူခြင်းနှင့် အင်အားသုံး ပြောင်းရွှေ့ခိုင်းခြင်း အစရှိသည်တို့ မရှိပေ။ ဒေသခံများနှင့် အလွန်ရင်းနှီးသော ဆက်ဆံရေးရှိပြီး လူထုတွေ့ဆုံဆွေးနွေးပွဲအတွင်းတွင် မကျေနပ်ခြင်း မရှိပေ။

**အစီရင်ခံစာတွင်ပါဝင်သည့် အကြောင်းအရာများ**

ဤပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP)အစီရင်ခံစာသည် စီမံကိန်းအခြေအနေ (၄)ခုဖြစ်သော အကြိုတည်ဆောက်ရေးကာလ၊ တည်ဆောက်ရေးကာလ၊ စီမံကိန်းလည်ပတ်စဉ်ကာလနှင့် စီမံကိန်း ပိတ်သိမ်းခြင်း/ပြန်လည်ရှင်သန်ခြင်းကာလတို့အတွက် ပါဝင်ပါသည်။

အစီရင်ခံစာကို ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနမှ ချမှတ်ထားသော ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်(EMP) လမ်းညွှန်ချက်များနှင့် ပုံစံတို့ကို လိုက်နာရေးသား ထားပါသည်။ ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဦးစီးဌာနမှ ချမှတ်ထားသော ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းနည်းလမ်း အမိန့်ကြော်ငြာစာ အမှတ် (၆၁၆/၂၀၁၅)။ အခန်း(၅)၊ ပုဒ်မ ၆၃ (ဇ)၊

အခန်း(၁)သည် စီမံကိန်းအကြောင်းအရာဖြစ်ပြီး၊ ၎င်းသည် နောက်ခံသမိုင်း၊ တည်နေရာနှင့် စီမံကိန်း၏ အသေးစိတ်အကြောင်းအရာ ဖြစ်သည်။ ဤအခန်းတွင် ကုမ္ပဏီ၏ အလုပ်အမှုဆောင်အဖွဲ့၊ အဆောက်အဦနှင့် အပြင်အဆင်၊ စက်ယန္တရားနှင့် ကိရိယာတန်ဆာပလာ၊ စီမံကိန်းဖွံ့ဖြိုးမှုနှင့် ဆောင်ရွက်မှု အချိန်ဇယား၊ လုပ်ငန်းစဉ်နှင့် နောက်ဆုံးတွင် စီမံကိန်းအတွက်အခြားဆောင်ရွက်နိုင်သော နည်းလမ်းများ အကြောင်း ဖြစ်သည်။ ဤအရာများကို အသေးစိတ် ဖော်ပြထားပါသည်။

အခန်း(၂)တွင် ပတ်ဝန်းကျင်ဆိုင်ရာ၊ လူမှုစီးပွားရေးဆိုင်ရာ၊ ကျန်းမာရေးမူဝါဒနှင့် ကတိကဝတ်၊ တရားရေးရာလိုအပ်ချက်နှင့် ဖွဲ့စည်းပုံမူဘောင်တို့ ဖြစ်သည်။ ဤအခန်းတွင် မူဝါဒများ၊ သက်ဆိုင်သော ဥပဒေများနှင့် နည်းဥပဒေများ၊ အမျိုးသားဆိုင်ရာ ပတ်ဝန်းကျင်အရည်အသွေး (NEQ)လမ်းညွှန်ချက်နှင့် မျိုးစေ့သန့်စင်ထုတ်လုပ်ခြင်းနှင့်ဆိုင်သော အပြည်ပြည်ဆိုင်ရာစံချိန်စံညွှန်းများနှင့် လမ်းညွှန်ချက်တို့ ပါဝင်သည်။

စီမံကိန်းအဆိုပြုတင်ပြသူနှင့် အတိုင်ပင်ခံအဖွဲ့အစည်းတို့၏ ကတိကဝတ်များကို ရှင်းပြ ထားပါသည်။

ဤအကြောင်းအရာများကို အသေးစိတ်ဖော်ပြ ထားပါသည်။

အခန်း(၃) သည် ပတ်ဝန်းကျင်၏ ရုပ်ပိုင်းဆိုင်ရာ၊ ဇီဝပိုင်းဆိုင်ရာ၊ လူမှုစီးပွားရေးဆိုင်ရာ၊ ယဉ်ကျေးမှုဆိုင်ရာနှင့်မျက်စိပဒေသာဖြစ်သော ရှုခင်းရှုကွက် များပါဝင်သော အကြောင်းဖြစ်သည်။ ဤအကြောင်းအရာများကို ဤအခန်းတွင် အသေးစိတ်ဖော်ပြထားပါသည်။

အခန်း(၄)တွင် သက်ရောက်မှုများနှင့် ဖြေလျော့နိုင်မည့်နည်းလမ်းများကို အနှစ်ချုပ် ဖော်ပြထား ပါသည်။

ဤအပိုင်းသည် အစီရင်ခံစာ၏ မရှိမဖြစ်အရေးကြီးသော အပိုင်းဖြစ်ပြီး နည်းပညာဆိုင်ရာ အသေးစိတ် ဖော်ပြထားပါသည်။

ဤပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) အစီရင်ခံစာကို ပြင်ဆင်ရေးသားနေသောအချိန်တွင် အကြိုတည်ဆောက်ရေးကာလမှာ ပြီးမြောက်၍ လွန်ခဲ့သော (၆)လလောက်ကပင် စီမံကိန်းလည်ပတ် နေပါသည်။ ပုံမှန်ဖြစ်သော သက်ရောက်မှု/ဖြစ်နိုင်ခြေရှိသော သက်ရောက်မှုများ ဥပမာ--- မြေယာ အငြင်းပွားမှု၊ မြေယာသိမ်းမှု၊ အတင်းအဓမ္မပြောင်းရွှေ့မှု၊ ကန့်ကွက်မှု၊ ပြည်သူလူထု သောင်းကျန်းမှု၊ မြေယာဈေး အဆမတန်တက်မှုတို့ မတွေ့ရပေ။

တည်ဆောက်ရေးကာလသည်လည်းမဲ မည်သည့်ပြဿနာမှမရှိပဲ အဆင်ပြေဖြတ်သန်း ခဲ့ပါသည်။

ဤပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP)သည် နောက်လာမည့် တည်ဆောက်ရေးကာလနှင့် စီမံကိန်းလည်ပတ်စဉ်ကာလအတွက် အဓိကအလေးထား ဆောင်ရွက်ထားပါသည်။ တည်ဆောက်ရေး ကာလအတွင်းတွင် ဖြစ်နိုင်ခြေရှိသောသက်ရောက်မှု/သက်ရောက်မှုများမှာ လေပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှု၊ ဆူညံသံနှင့်တုန်ခါမှု၊ ဖြစ်နိုင်ခြေရှိသောရေပတ်ဝန်းကျင်အပေါ် သက်ရောက်မှု၊

မြေဆီလွှာအပေါ်သက်ရောက်မှု၊ စွန့်ပစ်ပစ္စည်းများကြောင့် သက်ရောက်မှု၊ ဖြစ်နိုင်ခြေရှိသော ယာဉ်ကြော ပိတ်ဆို့မှု၊ ဖြစ်နိုင်ခြေရှိသောလူမှုရေး သက်ရောက်မှု၊ ဖြစ်နိုင်ခြေရှိသော လုံခြုံရေးပြဿနာနှင့် လုပ်ငန်းခွင်ဆိုင်ရာကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးပြဿနာတို့ ဖြစ်သည်။

စီမံကိန်းလည်ပတ်စဉ်အတွင်း ဖြစ်နိုင်ခြေရှိသော သက်ရောက်မှု/သက်ရောက်မှုများမှာ လေအရည်အသွေးအပေါ် သက်ရောက်မှု၊ ဆူညံသံနှင့်တုန်ခါမှု၊ စွန့်ပစ်ပစ္စည်း (အစိုင်အခဲနှင့် အရည်)ကြောင့် သက်ရောက်မှု၊ ဖြစ်နိုင်ခြေရှိသော ယာဉ်ကြောပိတ်ဆို့မှု၊ ဖြစ်နိုင်ခြေရှိသော စွမ်းအင်ထောက်ပံ့မှုအပေါ် သက်ရောက်မှု၊ လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး၊ ဖြစ်နိုင်ခြေရှိသော လူမှုရေး သက်ရောက်မှုနှင့် ဖြစ်နိုင်ခြေရှိသော လုံခြုံရေးပြဿနာတို့ ဖြစ်သည်။

စီမံကိန်းပိတ်သိမ်းချိန်အတွင်းတွင် ဖြစ်နိုင်ခြေရှိသောသက်ရောက်မှုများမှာ လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးနှင့် ဖြစ်နိုင်ခြေရှိသော ကြွင်းကျန်သက်ရောက်မှုတို့ ဖြစ်သည်။

သက်ရောက်မှုတစ်ခုစီအတွက် ဖြေလျော့နိုင်မည့်နည်းလမ်းများကို အတော်အသင့် အသေးစိတ် ဖော်ပြထားပါသည်။

စီမံကိန်းကြောင့် ကောင်းကျိုးသက်ရောက်မှုများမှာ ရင်းနှီးမြှုပ်နှံမှုတိုးလာခြင်း၊ အလုပ်အကိုင်ရရှိမှု တိုးလာခြင်း၊ ဟင်းသီးဟင်းရွက်စိုက်ခင်းများ တိုးလာခြင်းနှင့် စိုက်ပျိုးသူများ ဝင်ငွေတိုးလာနိုင်ခြင်းတို့ကို ရှင်းပြထားပါသည်။

အခန်း(၅)သည် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP)ဆောင်ရွက်ခြင်းအတွက် ဘတ်ဂျက် အကြောင်း ဖြစ်သည်။ ထိုပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် ဆောင်ရွက်ခြင်းအတွက် ဘတ်ဂျက်၏ ၅ ရာခိုင်နှုန်း (အမေရိကန်ဒေါ်လာ ၃၀၀,၀၀၀) ကို ထားရှိရမည်။ ထိုဆောင်ရွက်ခြင်းတွင် စောင့်ကြပ်ကြည့်ရှု လေ့လာခြင်း၊ အရေးပေါ်တုန့်ပြန်မှု၊ အရည်အသွေးမြှင့်သင်တန်းပေးခြင်းနှင့် ဖြေလျော့နိုင်မည့်နည်းလမ်းများ လုပ်ဆောင်ခြင်းတို့ ပါဝင်သည်။ ဤ ၅ ရာခိုင်နှုန်းသည် ရှည်ကြာသော စီမံကိန်းလည်ပတ် ခြင်းအတွက်ဖြစ်ပြီး လိုအပ်လျှင်လိုအပ်သလို ရန်ပုံငွေ ထပ်ထည့်ရမည်။

အစီအစဉ်တစ်ခုစီအတွက် ဘတ်ဂျက်မှာ အောက်ပါအတိုင်းဖြစ်သည်-

- ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအဖွဲ့ ဖွဲ့စည်းရန် - ၃% (အမေရိကန်ဒေါ်လာ ၉,၀၀၀)
  - အရည်အသွေးမြှင့်တင် သင်တန်းပေးရန် - ၇% (အမေရိကန်ဒေါ်လာ ၂၁,၀၀၀)
  - ပစ္စည်းနှင့် ကိရိယာတန်ဆာပလာ ဝယ်ယူရန် - ၂၅% (အမေရိကန်ဒေါ်လာ ၇၅,၀၀၀)
  - စီမံကိန်းလည်ပတ်ခြင်းအတွက် ကိရိယာ တန်ဆာပလာ ဝယ်ယူရန် - ၅% (အမေရိကန်ဒေါ်လာ ၁၅,၀၀၀)
  - ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် အကောင်အထည်ဖော်ရန်
- (က) ဖြေလျော့ရန်လုပ်ငန်းအတွက် - ၂၅% (အမေရိကန်ဒေါ်လာ ၇၅,၀၀၀)

(ခ) စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်း

- လုပ်ငန်းအတွက် - ၂၀% (အမေရိကန်ဒေါ်လာ ၆၀,၀၀၀)
- အရေးပေါ်အစီအစဉ်အတွက် - ၁၀% (အမေရိကန်ဒေါ်လာ ၃၀,၀၀၀)
- အထွေထွေအသုံးစရိတ် - ၅% (အမေရိကန်ဒေါ်လာ ၁၅,၀၀၀)

အခန်း(၆)တွင် အမျိုးအစားခွဲခြားထားသော သက်ရောက်မှုတစ်ခုစီအတွက် စီမံခန့်ခွဲမှုနှင့် စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းအစီအစဉ်ခွဲ (MMSP)ကို ဖော်ပြထားပါသည်။ တည်ဆောက်ရေးကာလ၊ စီမံကိန်းလည်ပတ်စဉ်ကာလနှင့် စီမံကိန်းပိတ်သိမ်းချိန်ကာလများအတွင်းတွင် ဖြစ်ပေါ်နိုင်သော သက်ရောက်မှုများအားလုံးအတွက် စီမံခန့်ခွဲမှုနှင့် စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းအစီအစဉ်ခွဲ (MMSP)ကို ဇယားဖြင့်ရေးဆွဲပြသ ထားပါသည်။ စီမံကိန်းအားလုံးအတွက် အချုပ်ဖြစ်သော (၁၂)ချက်ကို ဖော်ပြ ထားပါသည်။

အခန်း(၇)သည် စီမံခန့်ခွဲမှုနှင့် စောင့်ကြပ်ကြည့်ရှုလေ့လာခြင်းအစီအစဉ်ခွဲ (MMSP)တွင် ပါဝင်သည့် အကြောင်းအရာများ ဖြစ်သည်။ ဤနောက်ဆုံးအခန်းသည် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP)ဆောင်ရွက်ရန် အဖွဲ့အစည်းဖွဲ့ခြင်း၊ ဆောင်ရွက်ရမည့် အစီအစဉ်နှင့် ရည်ရွယ်ချက်၊ စီမံကိန်းအခြေအနေ (၃)ခုလုံးကို လွှမ်းမိုးသော MMSP တစ်ခုစီအတွက် ပါဝင်သည့် အကြောင်းအရာများကို ဖော်ပြသောဇယား၊ စီမံကိန်းအခြေအနေ (၃)ခုအတွက် စောင့်ကြပ် ကြည့်ရှုလေ့လာခြင်းအစီအစဉ် (MMSP)အတွက် လုပ်ဆောင်ရမည့်လူပုဂ္ဂိုလ်များကို ဖော်ပြထားပါသည်။

နောက်ဆုံးအခန်းဖြစ်သော အခန်း(၈)သည် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် ကွင်းဆင်း ဆောင်ရွက်ချိန်အတွင်းတွင် ကျင်းပသော လူထုတွေ့ဆုံပွဲအကြောင်းဖြစ်သည်။ ကုမ္ပဏီမှတာဝန်ရှိသူနှင့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP) အဖွဲ့၏ ခေါင်းဆောင်တို့သည် ဒေသခံများကို စီမံကိန်း အကြောင်းအရာများကို အကျဉ်းချုပ်ရှင်းပြပြီး ဒေသခံများက သူတို့၏အမြင်၊ သဘောထားများကို မေးမြန်း ခဲ့ပါသည်။ ဒေသခံအချို့သည် ဒေသဖွံ့ဖြိုးမှုအတွက် မေးခွန်းများမေးမြန်းခဲ့ပါသည်။ ဤအရာများကို ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် (EMP) အစီရင်ခံစာ၏ ဤအခန်းတွင် အသေးစိတ်ဖော်ပြထားပါသည်။

လူထုတွေ့ဆုံပွဲဆွေးနွေးပွဲကို အဆင်ပြေပြေ စိတ်ကျေနပ်စွာဖြင့် အဆုံးသတ်ခဲ့ပါသည်။ ဒေသခံများသည် ဤနေရာကို ရာစုနှစ် တစ်ခုကျော်ကတည်းက အစိုးရမှ တရားဝင်သတ်မှတ်ထားသော စိုက်ပျိုးရေးနှင့် မွေးမြူရေးအထူးဇုန်(၂)ဟု သိရှိထားပါသည်။ ဒေသခံများသည် မကျေနပ်ခြင်းကို ဖော်ပြတာ မတွေ့ရှိရပေ။ မြေနေရာအတင်းရယူခြင်း၊ အတင်းအဓမ္မပြောင်းခိုင်းခြင်းနှင့် ပြန်လည်နေရာချထားခြင်းတို့ မရှိပေ။

ဒေသခံများသည် လူထုတွေ့ဆုံဆွေးနွေးပွဲအတွင်းတွင် ဒေသဖွံ့ဖြိုးရေးအတွက် ဥပမာ --- အစီစီတွင်း (၁)တွင်းတူးခြင်း (သို့မဟုတ်) ရေကန်တူးဖော်ပေးခြင်းနှင့် ကျောင်းဆောင်တိုးချဲ့ခြင်းအတွက် လှူဒါန်းပေးခြင်းတို့ ဖြစ်သည်။



## EXECUTIVE SUMMARY

This is the standalone Environmental Management Plan (EMP) for the operation of a vegetable seed processing plant at Nyaungnitpin Agriculture and Live Stock Breeding Special Zone (2), Hmawbe Township, Yangon Region by East-West Seed (Myanmar) Co., Ltd.

East-West Seed (Myanmar) Co., Ltd was incorporated as a limited company in Myanmar on 16-11-2015. (Document: Certificate of Incorporation No-668 FC/2015-2016 (YGN); Directorate of National Planning and Finance).

The shareholders of the company are: East-West International B.V (Netherland) 1% and East-West Seed ROH Ltd (Thailand) 99%.

The project site is located at Plot No.547/A, Nyaungnitpin Agriculture and Livestock Breeding Special Zone (2), Hmawbe Township. The coordinates are: N. Lat. 17° 9' 0.24" and E. Long 96° 9' 27.35". The elevation is 45 ft asl.

The nearest village is Ta Gu-Tone village and is 0.26 miles north east. The other two villages in the far vicinity are San Gyi village in the northwest about 1 mile away and Po Daw Nagon village about also about 1 mile in the west.

Ta Gu Tone a small rural village (population 570). Since the project involves the processing of imported vegetable seeds no impact in the form of smoke, dust, noise, on the village area is anticipated. (It is not a factory generating smoke, dust and industrial waste (solid and liquid) Arr Thit Co., Ltd. Warehouse act as a buffer between the project site and the village.)

The site is 24.80 miles northwest of Yangon city proper and 9.86 miles east of Hmawbe Town. The area of the project site is 5 acres (20,000 m<sup>2</sup>).

The estimated budget is USD 6,000,000.

Water is sourced from own tube wells.

Electricity is sourced from National Grid line; 80 KVA, a backup generator is installed.

The Construction Phase is 2 years while the Operation Phase is 30 years (extendable 10+10). The Decommissioning Phase is 1 year.

The main work plan involves the import of 30 kinds of vegetable seeds produced in Thailand, Philippines, India, Indonesia and Vietnam (by the technology introduced by East - West Seed ROH Ltd.) and the processing and packing of the seeds for marketing (30% for export and 70% for domestic sale).

It is estimated that during the operation phase 200Kg of seeds of different type (about 18) can be processed per day and the annual target is 60,840Kg.

The main building components include: main building (production building), office, laboratory, warehouse, etc. All machinery and equipment for the project are brand new imported from abroad.

The work force is 84 locals and 5 foreigners and their salaries range from USD 150 to 1500. The working house is 8 hrs/day and 40-48 hrs/week.

No significant negative impacts are anticipated during the four phases of the project. However to be fit a standard EMP report the potential negative impacts, all insignificant, anticipated and identified are addressed. They are:

#### During the Preconstruction phase

No potential negative impact anticipated.

#### During the Construction Phase

1. Impact on air environment
2. Noise and vibration
3. Potential impact on water environment
4. Potential impact on soil
5. Impact of waste (construction waste)
6. Potential impact on traffic
7. Potential social impact
8. Potential security issue
9. Occupational health and safety (potential accident at work place)

#### During the Operation Phase

1. Impact on air quality
2. Noise and vibration
3. Potential impact of wastes (solid, liquid)
4. Potential impact on traffic

5. Potential impact of project on gridline electricity and vice versa
6. Occupational health and safety
7. Potential social impact
8. Potential security issue

The mitigation measures to be put in place for each and every impact are addressed in detail in Section-4.

During the EMP survey a public consultation meeting was held with the villagers of Tagu Tone. Since the area is Nyaung-nitpin Agriculture and Livestock Breeding Special Zone (2) officially designated by the Government more than a decade ago there is no issue of land dispute, land grabbing and forced eviction etc. The locals are very familiar with the situation and there was no complaint or concern expressed by them during the public consultation meeting. These are described in detail in Section

### **The content of the report**

This EMP report covers all the four phases of the project life, namely, the Preconstruction Phase, Construction Phase, Operation Phase and Decommissioning/Rehabilitation Phase.

The report is prepared strictly following the EMP guidelines and format prescribed by the Environmental Conservation Department (ECD). Environment Impacts Assessment Procedure Notification No. 616/2015 by ECD, Chapter-5 Articles 63 (h) is strictly followed in the preparation of this EMP report.

The Executive Summary is followed by 6 sections.

**Section 1-** deals with project description and it covers background, location, and details of the project. These include details of the company's executive, building and layout for seed processing facility, machinery and equipment, project development and implementation time schedule, work processes and finally project alternatives. These are described in detail.

**Section 2-** is on environmental, socio-economic and health policies and commitment; legal requirements and institutional framework. The section covers the said policies, applicable laws and rules; National Environmental Quality (NEQ) guidelines on air emission, effluent, noise level and odour; and international standards and guidelines regarding seed processing.

The commitments made by the project proponent as well as the consultant firm are mentioned.

These are described in detail.

**Section 3** - is about brief description of the surrounding environment covering physical, biological, socio-economic, cultural and visual components of the environment. These were described in detail in this section.

**Section 4** - summarizes impacts and mitigation measures.

This section is actually the essence of the report and although it is generally a summary the impacts and mitigation measures to be taken are described in relatively technical details.

By the time this EMP report is prepared the Preconstruction Phase has already passed and the plant is already in operation for 6 months. None of the usual negative/potential negative impacts such as land dispute, land grabbing, forced eviction, mass protests, public outcry, hiking of land and property prices have happened.

The Construction Phase (I) has also passed smoothly without any problem.

This EMP focus on the follow up Construction Phase (II) and the Operation Phase. The negative/potential negative impact anticipated, identified and assessed during the Construction Phase (II) are: impact on air environment; noise and vibration; potential impact on water environment; impact on soil; impact of waste; potential impact on traffic; potential social impact, potential security issue and occupational health and safety (OHS) issue.

The negative/potential negative impacts anticipated identified and assessed during the Operation Phase are: impact on air quality; noise and vibration; impact of waste (solid and liquid) potential impact on traffic, potential impact of power supply on the national demand; occupational health and safety; potential social impact and potential security issue.

The negative/potential negative impacts during the Decommissioning Phase are: occupational health and safety issue and potential residual impact.

Mitigation measures to be put in place for each and every negative impact are described in relative details.

The positive impact of the project in the form of increase investment, increase employment, contribution to the development of vegetable farming and increasing the income of the vegetable growers are mentioned.

**Section 5** - covers the overall budget for implementation of EMP. 5% of the budget (USD 300,000) is set aside for implementation of EMP. The implementation covers monitoring, emergency response, capacity building and taking mitigation measures. This 5% may cover the long Operation Phase and so more fund may have to be added when necessary.

Implementation of EMP will be undertaken by the staff of the plant. A small nucleus organization (EMP cell) is formed and members of this EMP cell will carried out the EMP implementation tasks.

The sub-budgets allotted for each programme under EMP are as follows:

- Cost for organizing EMP - 3% (USD 9,000)
- Cost for capacity building and training - 7% (USD 21,000)
- Cost for procurement of equipment and materials - 25% (USD 75,000)
- Cost for operation of equipment - 5% (USD 15,000)
- Cost for execution and dissemination of EMP in the form of:
  - (a) Taking mitigation action - 25% (USD 75,000)
  - (b) Monitoring action - 20% (USD 60,000)
- Cost for emergency/contingency (allotted for probable emergency cases) - 10% (USD 30,000)
- Miscellaneous (documentation, reporting and casual fees for two villagers, who are members of EMP cell) - 5% (USD 15,000)

**Section-6:** describes the management and monitoring sub-plan (MMSP) for each identified impact. MMSP for all impacts during the Construction, Operation and Decommissioning Phases are depicted in tabulated forms. The 12 overall generalized EMP for the whole life of project are also enumerated.

**Section 7:** deals with the contents for each sub-plan, that is Management and Monitoring Sub Plan (MMSP). This last section also covers, in brief, objective, implementation schedule, organization to implement EMP, content for each MMSP covering the three phases of the project in tabulated form, monitoring plan for the three phases of the project and the project budget and responsibility.

The last section, **Section-8** deals with public consultation meeting held during the EMP survey. The officer of the company and the leader of EMP team briefly explained to the participants about the project and the locals were asked to express their concerns, opinions and views regarding the project. A few local people asked questions and gave comments and asked for community assistance and development. All these were documented and incorporated in this section of EMP report.

The consultation meeting has progressed smoothly and ended satisfactorily. The villagers are very aware of the fact that this area has been designated officially by the Government as an Agriculture and Livestock Breeding Special Zone (2) since more than a decade ago. There was no case of complaints or concern expressed by the locals. Indeed there was no case of land grabbing, land disputes, forced eviction and forced relocation.

All they have asked during the consultation meeting is for community assistance eg. digging of a tube well, building of a community water pond and renovation of school.

## **1. PROJECT DESCRIPTION**

### **1.1 Project background**

The project proponent, East-West Seed (Myanmar) Company Limited was incorporated as a limited company in Myanmar on 16-11-2015 (Document: Certificate of Incorporation No. 668FC/2015-2016 (YGN); Directorate of Investment and Company Administration, Ministry of National Planning and Finance).

The shareholders of the company are East-West International B.V (incorporated in Netherland) 1% and East-West Seed ROH Ltd (incorporated in Thailand), 99%.

East-West Seed (Myanmar) Co., Ltd was established in 1982 and is the market leader for tropical vegetable seeds in Asia. The company develops, produces and markets hybrid and open-pollinated tropical vegetable seeds. The company has revolutionized Southeast Asia vegetable seed market and holds leading market positions in Thailand, Philippines, Indonesia, Myanmar and Sri Lanka. It has also expanded its business activities in India, China, Latin and South America and Africa. East west seeds are planted in the fields of 30 million farmers worldwide. The company is based in Asia with over 2000 employees and 12 R & D stations in 7 countries.

#### Objectives

- To do business in quality seed production, processing, distribution and marketing inside and outside Myanmar and importing raw materials (seeds) for value addition.
- To establish Myanmar's first local integrated seed development and production base; and establish a state-of-the-art seed processing facility
- To introduce new technologies and advanced horticultural knowledge in Myanmar and enhance knowledge transfer to the agricultural sector
- The project proponent is not simply doing business for its own benefit alone but for the benefit of all others
- To improve farmers income and productivity by using high quality commercial seeds.
- To improve the quality of vegetables for both domestic and export markets
- To establish R & D stations in Myanmar as a training ground for the country plant breeders, pathologists and biotechnology in the near future.

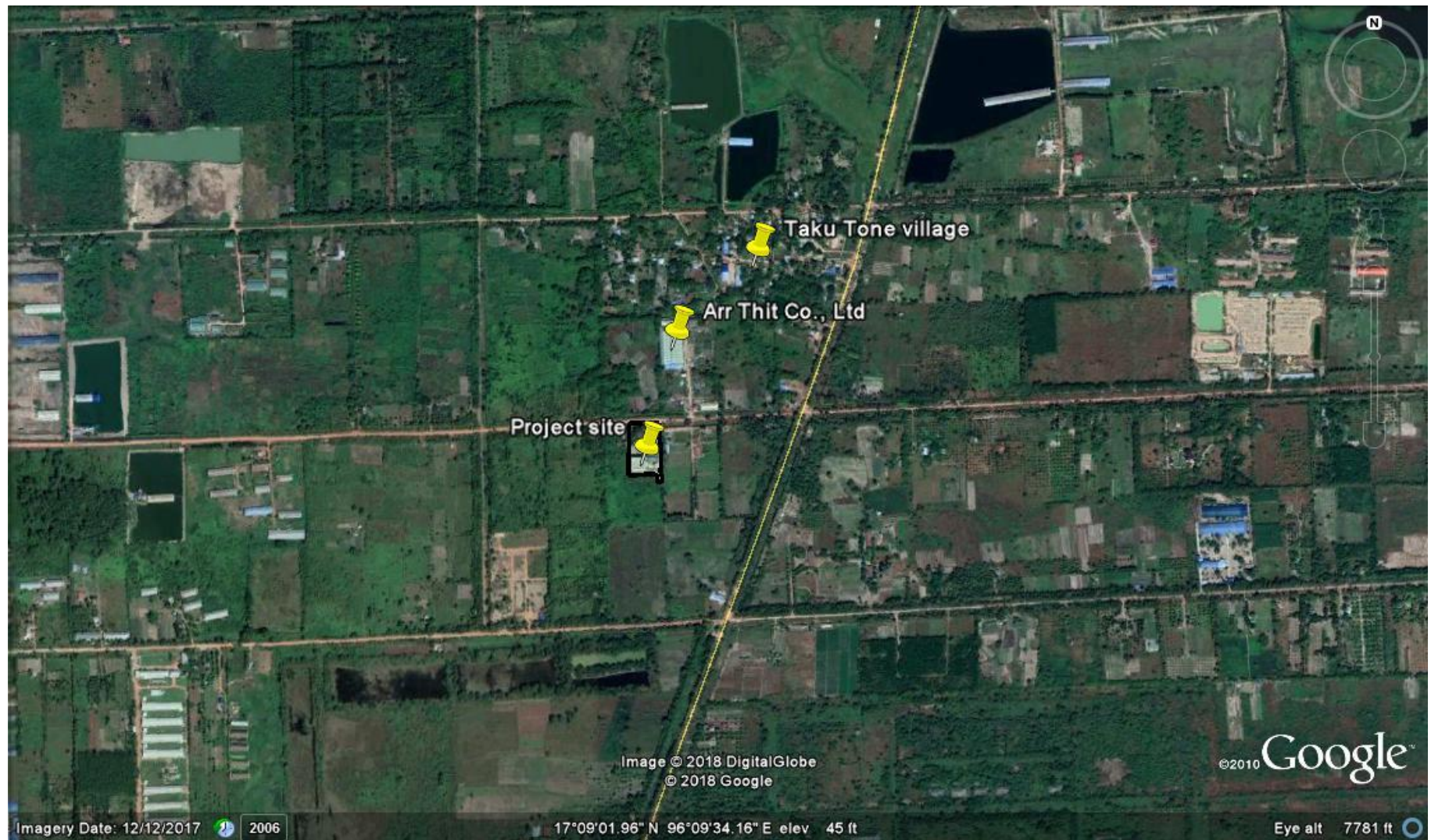
### **1.2 Project location, overview map and layout plan**

The project site is located at Plot No. 547/A Nyaungnitpin Agriculture and Livestock Breeding Special Zone (2), Hmawbe Township, Yangon Region. The site is 24.80 miles northwest of Yangon City proper and 9.86 miles east of Hmawbe Town. The coordinates of the project site are: N. Lat. 17° 9' 0.24" and E. Long. 96° 9' 27.35". The elevation is 45 ft asl.



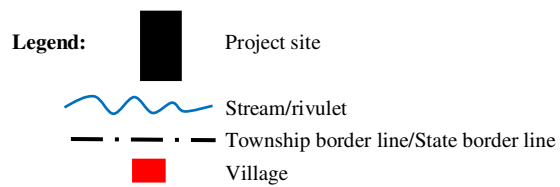
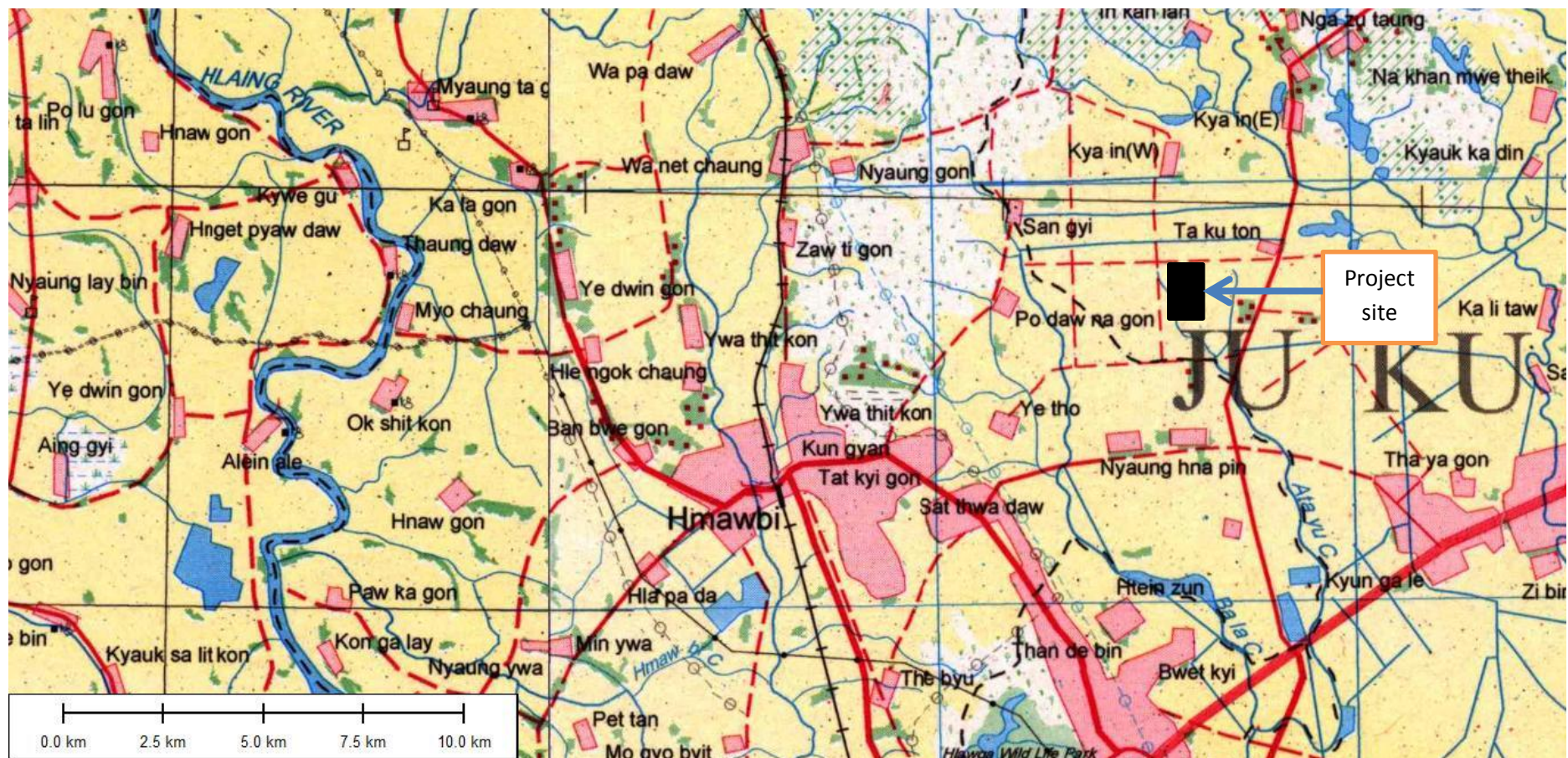
**Figure-1: Close up view of project site**



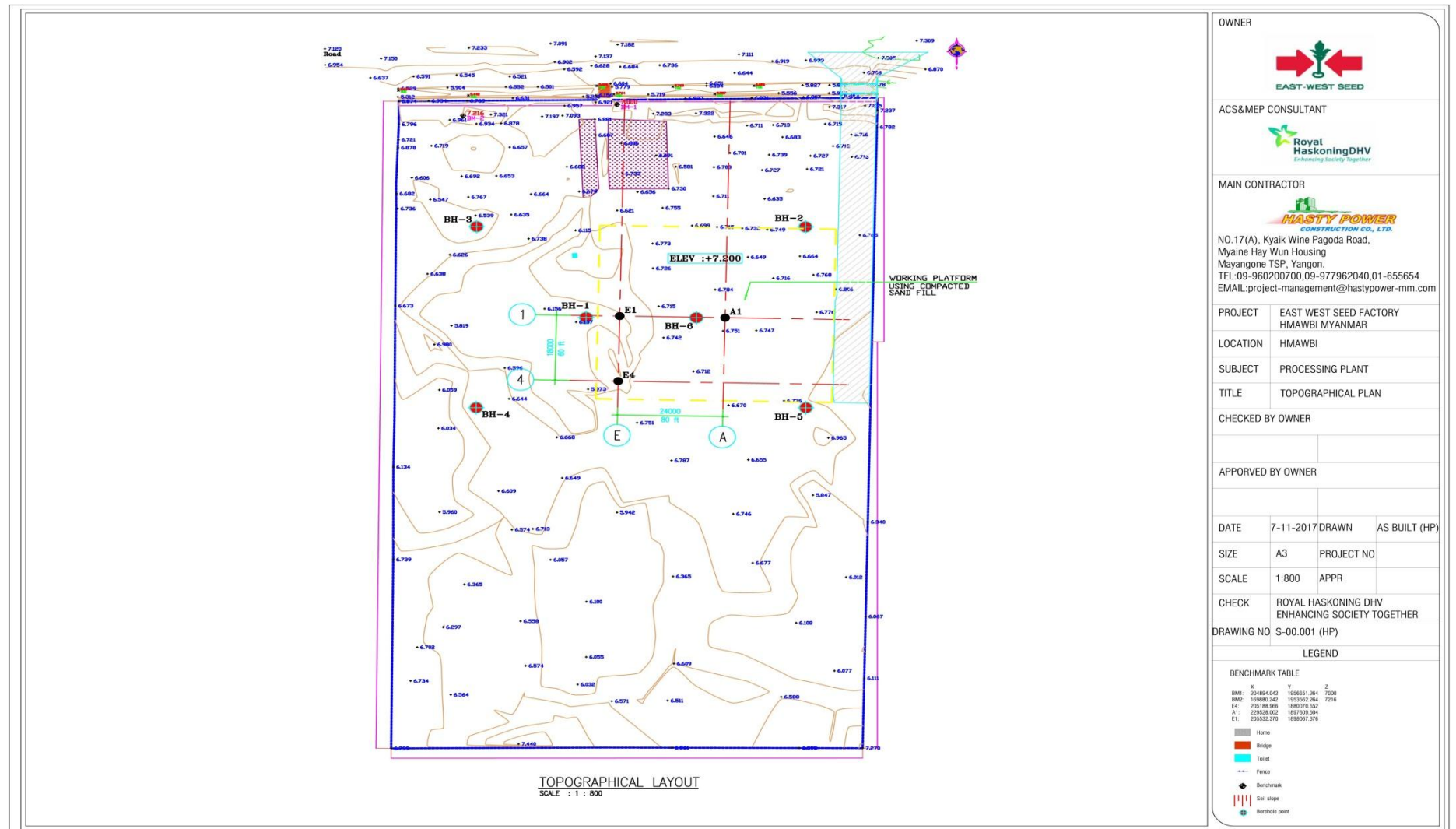


**Figure-2: Satellite image of project site and its environs**





**Figure-3: Map of part of Hmawbe Township showing project site**



**Figure-4: Topographical Layout**

OWNER



ACS&MEP CONSULTANT



MAIN CONTRACTOR



NO.17(A), Kyauk Wine Pagoda Road,  
Mayaone Hay Wun Housing  
Mayangone TSP, Yangon.  
TEL.09-960200700,09-977962040,01-655654  
EMAIL:project-management@hastypower-mm.com

PROJECT	EAST WEST SEED FACTORY HMAWBI MYANMAR	
LOCATION	HMAWBI	
SUBJECT	PROCESSING PLANT	
TITLE	TOPOGRAPHICAL PLAN	

CHECKED BY OWNER

APPROVED BY OWNER

DATE	7-11-2017/DRAWN	AS BUILT (HP)
SIZE	A3	PROJECT NO
SCALE	1:800	APPR
CHECK	ROYAL HASKONING DHV ENHANCING SOCIETY TOGETHER	

DRAWING NO S-00.001 (HP)

LEGEND

BENCHMARK TABLE

	X	Y	Z
BMT	204884.542	1895601.264	7000
BMT	169880.242	1953562.264	7216
E4	205188.966	1890706.602	
A1	225628.002	1897609.244	
E1	205532.370	1898067.376	





The nearest village is Ta-Gu-Tone village and is 0.26 miles northeast. The project site (Plot No.547/A, Nyaungnitpin Agriculture and Livestock Breeding Special Zone (2)) is rectangular in shape.

The total area is 5 acres (20000 m<sup>2</sup>). The land is leased from Shwe Po Kaung Co., Ltd for 30 years (extendable 10+10).

In the adjacent north is the dirt road which is the immediate access road. About 200 yards in the east, is the main asphalt road which leads to Hmawbe Town and thence to Yangon City.

East of the site is a Pitaya (Naga fruit) *Hylocereus* spp. orchard while in the north on the other side of the main road is the "Arrthit Company's warehouse" for tractors and other agricultural machine and equipment.



**Figure-5: Naga fruit orchard (west of project site)**



**Figure-6: The office with Arrthit company building in the background**

### 1.2.1 Details, particular of directors and executives

#### A brief account of East-West Seed (Myanmar) Co., Ltd

As the mentioned earlier the company was registered in 2015 (16-11-2015) and renewed in 2014 (4-8-2014). The factory was in operation since 2002.

Address of the company : No. 10 (B-1), Thukhawati Street, Yankin Township,  
Yangon Region

Telephone : +95 9 43162060

Website : [www.eastwestseed.com](http://www.eastwestseed.com)

Address of project site : Plot no.547/A, Nyaungnitpin Agriculture and Livestock  
Breeding Special Zone (2), Hmawbe Township

Contact person : U Naing Win Aung

Phone : 09 973435185

E-mail : [naingwin.aung@eastwestseed.com](mailto:naingwin.aung@eastwestseed.com)

#### **Particulars of executive and administrative body**

<b>Name</b>	<b>Nationality &amp; National Registration Card No.</b>	<b>Address of resident</b>	<b>Designation</b>	<b>Other business occupation</b>
Mr. Kittitouch Pattanakittipong	Thai PP No. AA 2809287	50/1 Village No.2, Soi Noi- Bang Bua Thong Road, Sai Noi, Sub-district, Sai Noi District, Nonthaburi Province, Thailand	Resigned from Managing Director w.e.f 5 <sup>th</sup> September, 2017	Businessman
Mr. Egbert Johannes van der Feltz	Dutch PP No. BW 9673503	50/1 Village No.2, Soi Noi- Bang Bua Thong Road, Sai Noi, Sub-district, Sai Noi District, Nonthaburi Province, Thailand	Director	Businessman
Mr. Chengrui Kang	Chinese PP No. E	50/1 Village No.2, Soi Noi- Bang Bua Thong Road, Sai	Appointed as Managing	Businessman

	89110723	Noi, Sub-district, Sai Noi District, Nonthaburi Province, Thailand	Director w.e.f 5 <sup>th</sup> Setember, 2017	
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East-West international BV Incorporated in the Netherland  
Reg. No. 37086898 represented by: Mr. Egbert Johannes van  
der Feltz van der Sloot; Number of the shares allotted - 1,500 shares

East-West Seed Roh Ltd, Incorporated in Thailand Reg. No.  
0125549009829 represented by: Mr. Egbert Johannes van der  
Feltz van der Sloot; Number of the shares allotted - 148,500 shares

Nominal amount of the shares so allotted - 150,000

### **1.3 Description of the project**

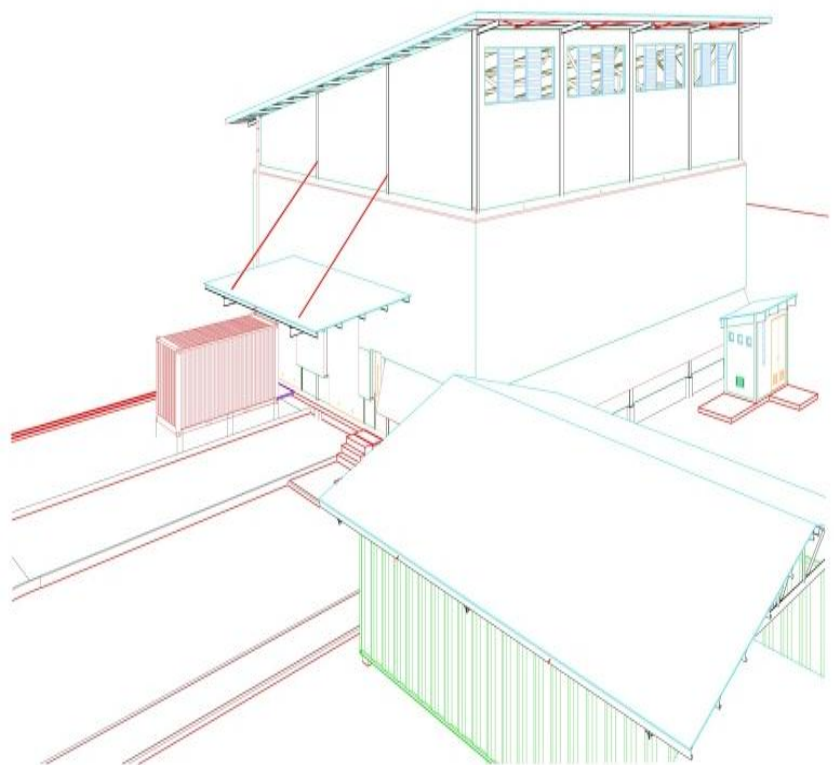
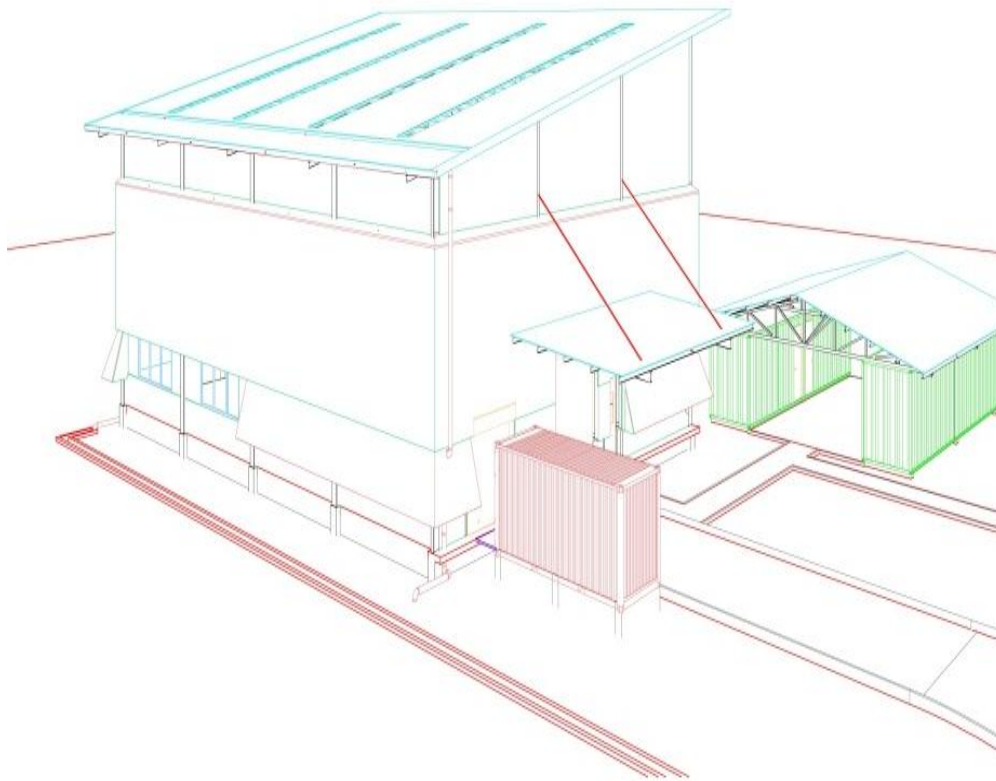
#### Building layout for seed processing facility

The main building components include:

- Production building (main building 3307.33 m<sup>2</sup>)
- Office
- Laboratory
- Canteen
- Ware house
- Guard house (1)
- Bike Park Shed
- Guard house (2)
- Pump house
- Firefighting water tank

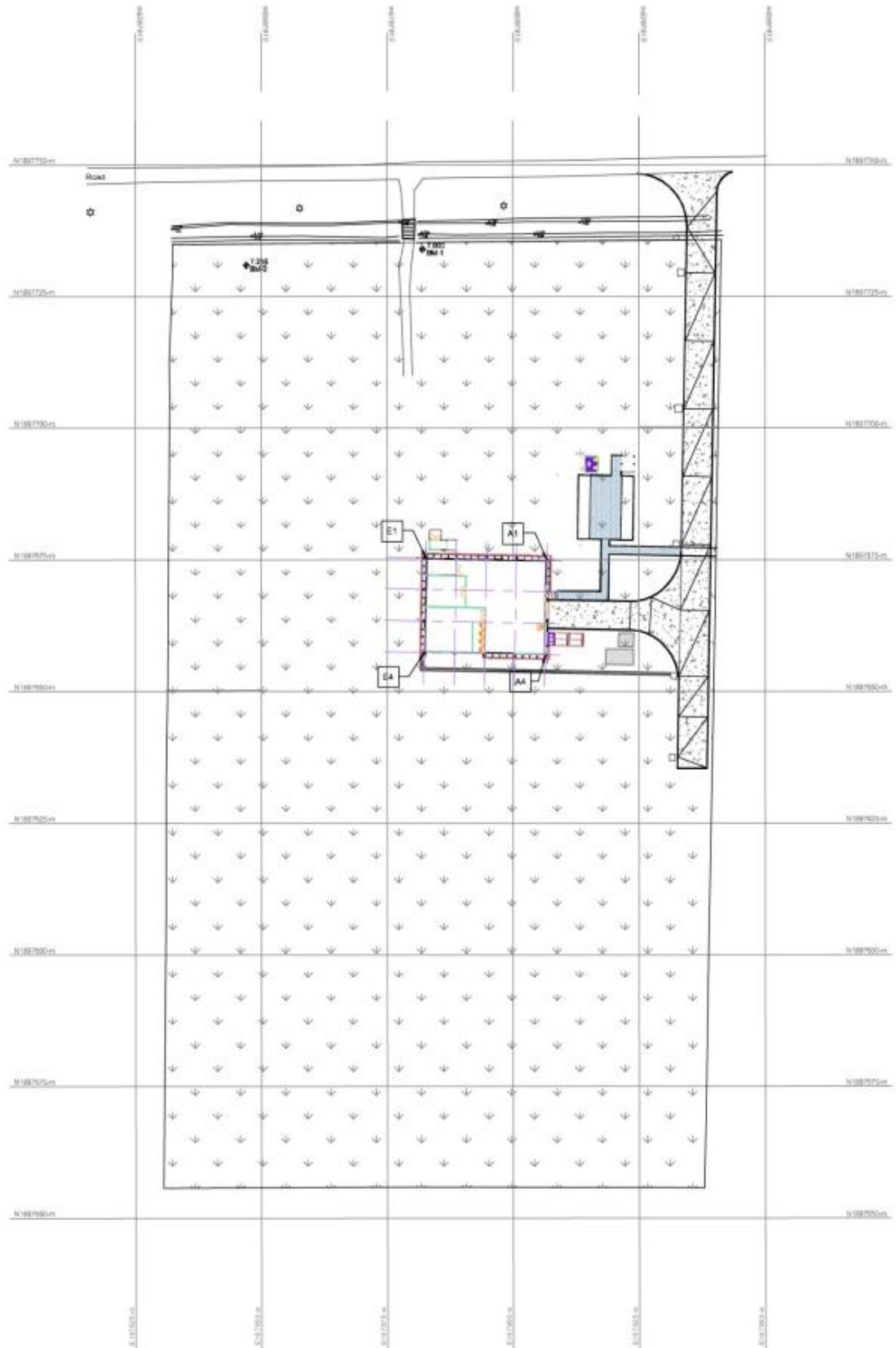


**Figure-7: Design of proposed project**



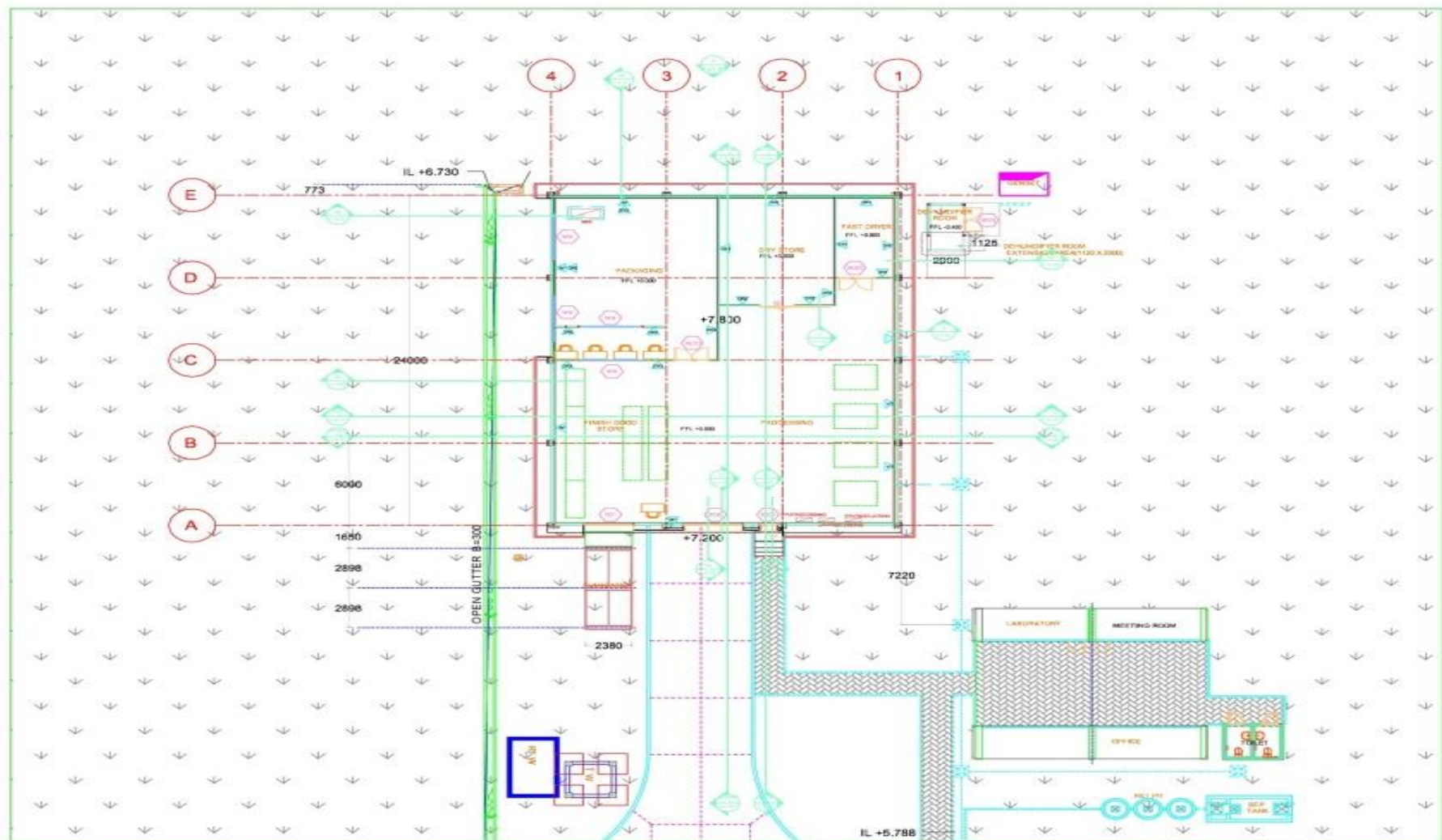
**Figure-8: Perspective**





**Figure-9: Site layout**





**Figure-10: Ground floor plan (as built)**



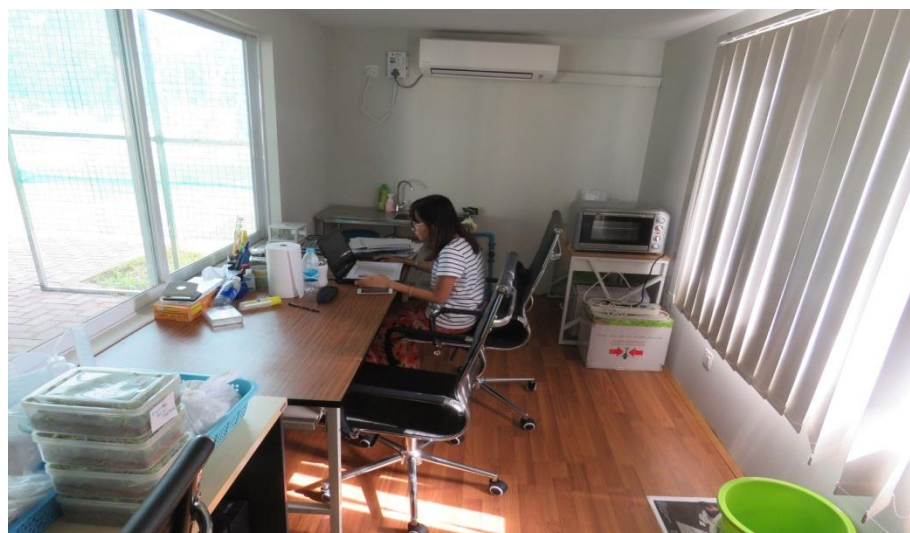
**Figure-11: Elevation**



**Figure-12: Production building**



**Figure-13: Office cum building**



**Figure-14: Inside the laboratory**





**Figure-15: Inside the production building**



**Figure-16: Fumigation unit**



**Figure-17: Blower house (left)**



**Figure-18: Storage area**



**Figure-19: Final product**



### 1.3.1 Machinery, equipment and vehicles etc to be imported

Machinery and equipment to be imported are shown in detail in the ANNEX.

The main items include:

- (a) For warehouse : OP cool storage, Box storage, Reach truck, Fumigation unit, OP racking etc.
- (b) For processing : ASC set (oliver), coating machine, Small ASC, Dust collection, fork lift box turner, drying machine, Brushing machine etc.
- (c) For packing : Filvo machine, volumetric filling machine, Labeler machine, Manual sealer, Thermal printing, etc.
- (d) For shipping : Genset, shipping truck, compressor, racking, air conditioner, hand pallet etc.
- (e) For Quality assurance : germinators, moister meter, seed count, etc.
- (f) For electrical works : low voltage cabling, medium voltage system, generator, data and telephone system, lighting system, conventional fire alarm etc.
- (g) For mechanical works : Air conditioning and mechanical ventilation, fire-fighting system, water supply system, air compressor system etc.



**Figure-20: Genset**

### 1.3.2 Other aspects for operation of seed processing facility

The estimated budget is USD 6,000,000.

#### Work force:

- During Construction Phase : 20
- During Operation Phase : 84 locals – (94.38%)  
5 foreigners (5.62%)

#### Monthly salaries (Operation Phase):

- Range from USD 150 (for assistant) to USD 1500 (for Sales manager).

(See also ANNEX for staff organization and salaries)

#### Working hours

- 8 hours/day, 40-48 hours/week.

#### Source of water

Water will be sourced from own tube well. (The ground water is at a depth of 50 m.)

Annual water requirement : 6,646,500 lit



**Figure-21: Overhead tank**



### Source of electricity

Electricity will be sourced from Grid Line electricity.

Generators will be installed for backup system.

Annual electricity requirement is : 344,690 KW

Annual fuel requirement

Diesel : 1200 lit (for standby generator, 400 KVA)

12000 lit for (vehicles)



**Figure-22: Transformer**

### Annual chemical requirement

- Aluminium phosphide (for fumigation) – 15kgs

### **Raw materials (seeds) to be imported**

30 kinds of vegetable seeds will be imported from Thailand, Philippines, India, Indonesia and Vietnam. These 30 includes:

1. Caisim - *Brassica rapa* sub-sp. *Chinensis*
2. Kailaan - *Brassica oleracea* Albuglabra Group
3. Pakchoy - *Brassica rapa chinensis*
4. Radish - *Raphanus raphanistrum* sub-sp. *Sativus*
5. Bitter gourd - *Momordica chorantia*
6. Cucumber - *Cucumis sativus*

7. Luffa - *Luffa acutangula*
8. Water melon - *Citrullus lanatus*
9. Yard long bean - *Vigna urguilata* sub-sp. *Sesquipedalis*
10. Onion - *Allium cepa*
11. Egg plant - *Solanum melongena*
12. Hot pepper - *Capsicum annuum*
13. Sweet pepper - *Capsicum annuum* Group
14. Tomato - *Solanum lycopersicum*
15. Lettuce - *Loctuca sativa*
16. Kang Kong - *Ipomea aquatica*
17. Sweet corn - *Zea mays*
18. Okra - *Abelmoschus esculentus*, among other

The quantity of 18 kinds of seeds to be imported is shown in **ANNEX** for each type of seed.

In yr 1: The total quantity to be imported is 6080kg.

Later 12 kinds of seeds will be considered for import. They are:

1. Bottle gourd - *Lagenaria siceraria*
2. Broccoli - *Brassica oleracea* var. *italic*
3. Cabbage - *Brassica oleracea* var. *capitata*
4. Mustard - *Brassica nigra*
5. Carrot - *Dacus carota*
6. Coriander - *Coriandrum sativum*
7. Papaya - *Carica papaya*
8. Pumpkin - *Cucurbita maxima*
9. Zucchini - *Cucurbita pepo*
10. Sweet pepper - *Capsicum annum*
11. Wax gourd - *Benincasa hispida*
12. Waxy corn - *Zea mays* var. *ceratina*

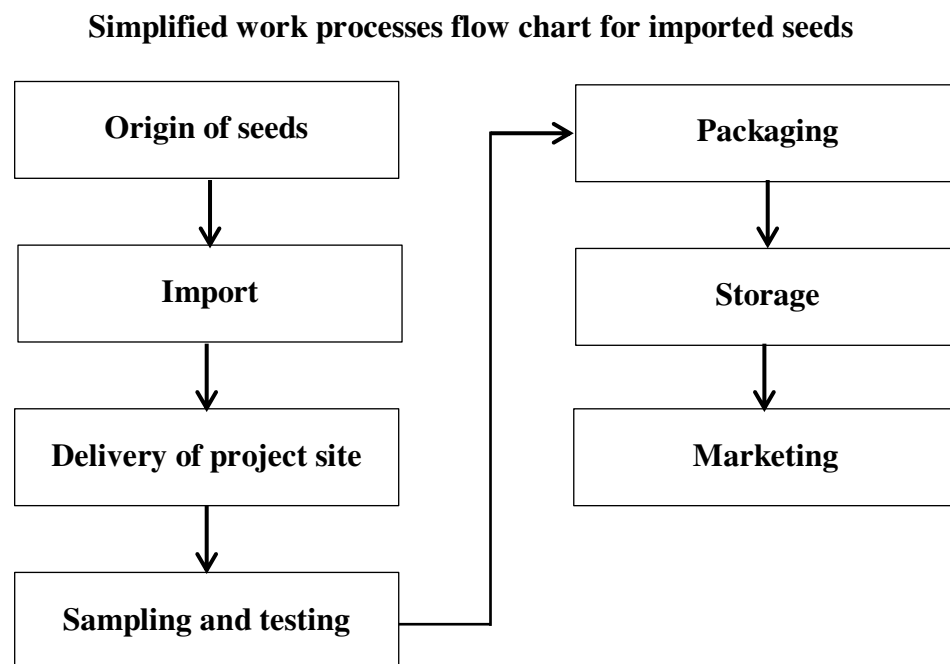
## Goods to be produced

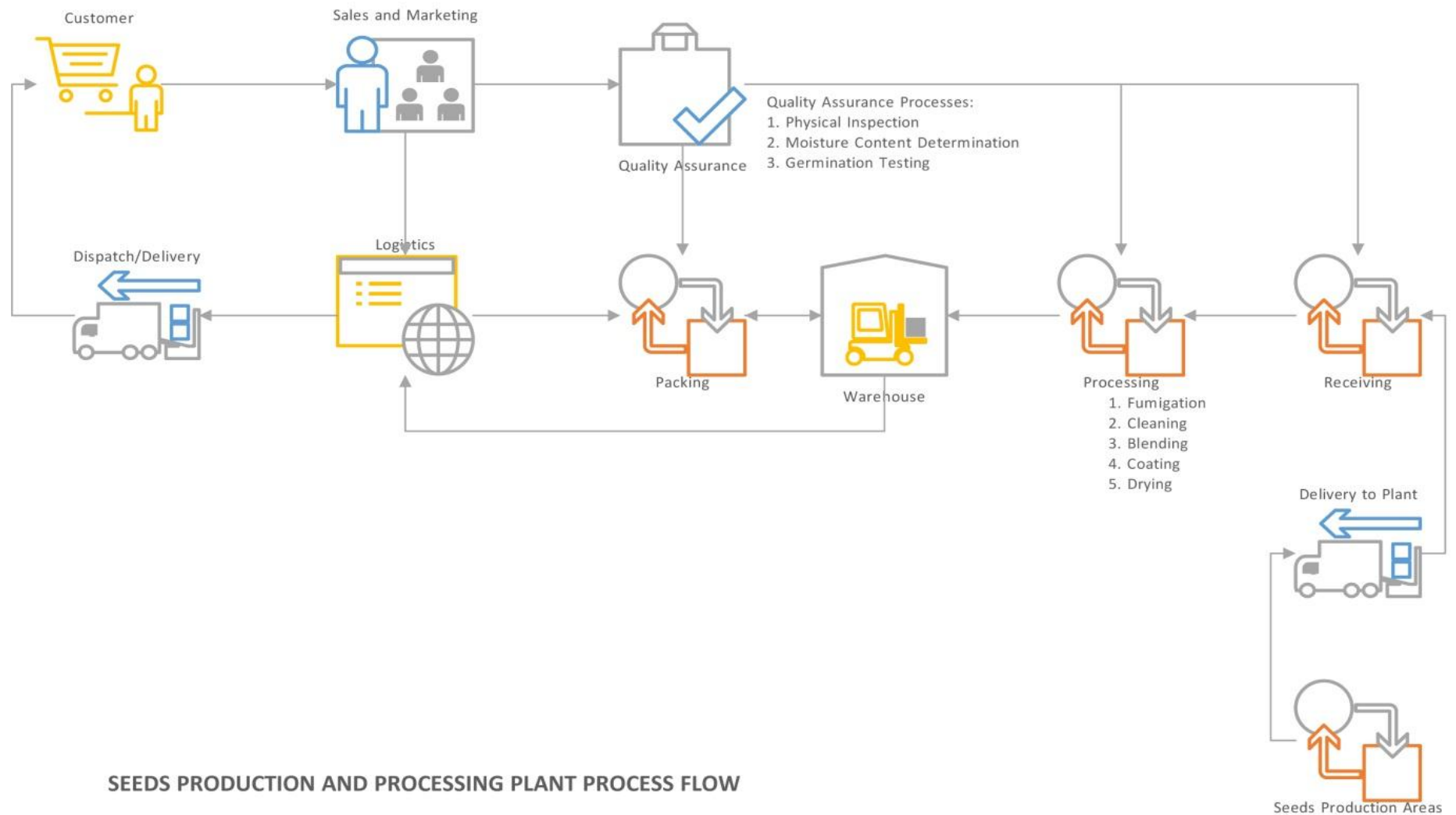
The above-mentioned vegetable seeds will be produced at the processing plant and 30% of the quantity produced will be exported and 70% will be for domestic sales in Myanmar. The seeds of yard long bean will be only for local markets in Myanmar, not for export. Later the seeds of yard long bean will be procured locally, not imported. Viable seeds Yard Long Bean *Vigna urguilata* sub-sp. *Sesquipedalis* will be selectively procured from reliable local farmers of the region.

(See also ANNEX for the seeds and their prices.)

### 1.3.3 Work processes

Work plan and process is depicted as follows.





**Figure-23: Process flow chart for locally purchased seed**

1) Origin of seeds

East-West Seed Company has its vegetable seed producing and R & D facilities in Thailand, Philippines, India, Indonesia and Vietnam. In this project context hybrid seeds are produced in Thailand from contracted farming basis.

2) Import

30 types of vegetable seeds are imported to Myanmar for packing at the project site.

3) Delivery

The imported vegetable seeds are delivered to Nyaungnitpin Agriculture and Livestock Breeding Special Zone (2).

4) Sampling and testing

This is done for quality assurance which includes physical purity, seed moisture and germination. Sampling and testing are conducted in Quality Assurance Laboratory and strictly adhering to International Seeds Testing Association (ISTA) standards, procedures and practices.

5) Packaging

Cans or pouches are used for packing based on number or weight depending on the crop. The packaging of small cans and pouches is mostly carried out manually. As for bulk packaging (500/1000 gram packages) mechanical packaging involving automatic volumetric fill/form and sealing machine are deployed.

Each can, pouch and bulk package comes with information on the percentages of germination and purity of seeds inside.

6) Storage

Packages of seeds are stored in air conditioned room with  $\pm 25^{\circ}\text{C}$  and relative humidity 30%.

7) Marketing and distribution

30% of the seeds will be exported while 70% will be for domestic sales to small holder vegetable farmers (end customers) through the networks of dealers and sub-dealers.

(Each batch will be tested for quality assurance before export or marketing).

## **Waste to be generated**

Virtually no waste will be generated due to the operation of the project. The raw materials (seeds) will be imported mostly from Thailand and will be sorted, dried, enhanced, tested, stored and marketed. There can be negligible waste in the form of dust or debris due to processing work.

As the seeds have to be fumigated emission of chemicals for used for fumigation (Aluminium phosphide) is anticipated. Mitigation measures for Aluminium Phosphide emission is described later in **Section-4, 4.3.**

The solid waste in the forms of packing materials, containers, bags will be quite substantial; given a total of 60,840 Kg of seeds of 18 kinds will be imported. These will be systematically collected and disposed at the approved landfill (by Hmawbe Township Development Committee).

There is virtually no waste water to be generated.

The liquid waste in the form of used fuel oil, engine oil will be negligible given the fact that no heavy machines are involved. Mitigation measures for solid waste and liquid waste are mentioned in **Chapter-4.**

## **Advantages and disadvantages of hybrid vegetables**

### Advantages

- Large, stronger plants;
- Faster growth; early fruiting and early harvest
- Better yield
- Greater uniformity
- Improved colour
- Pests and diseases resistance

### Disadvantages

- Take a lot of time and money to create
- Cost more to buy than other seeds.
- Seeds from hybrid cannot be saved; have to buy again year after year.

The advantages however greatly outweigh the disadvantages.

## **1.4 Project development and implementation time schedule**

### The Preconstruction Phase/Planning Phase

This phase involves all planning and paper works. As the approval and permit from the authority is required it was quite difficult to estimate the duration of the phase.

Duration was 2 years.

### The Construction Phase

The building layout is already mentioned earlier, comprising production building, office, laboratory, ware house and accessories. The buildings on the whole are relatively small.

The Construction Phase was 24 months.

The follow up Construction Phase II will be commenced later.

### The Operation Phase

The land is leased for 30 years (extendable 10 + 10). The Operation Phase will be the same.

The plant is already in the Operation Phase for six months and will be upgraded later.

### The Decommissioning/Rehabilitation Phase

1 year (at most).

## **1.5 Project alternatives**

### Location alternative

There is no other better alternative for location. The proposed site is inside the Agriculture and livestock Special Zone, probably the best suitable site for implementation of the project in Myanmar. There is no issue of land grabbing/land disputes; no protected area; no historical, cultural, and archeological site to be impacted.

### Technology alternatives

The project proponent will apply the state-of-the-art technology for the improvement and advancement of agriculture in Myanmar. This advanced technology is preferred to conventional technology or old fashioned technology. This state-of-the-art technology can raise the standards of living of the farmers.

### Materials alternatives

The project proponent will procure and use materials, machinery and equipment that are eco-friendly rather than conventional/normal ones. Materials that are durable and of good quality; machinery and equipment that use less electric energy, consume less fuel, that emit less smoke and generate lower sound level.



### Input/supply alternatives

When it comes to consumption of water, electricity and fuel the project proponent shall select the conservation approach rather than the conventional/normal approach. The company shall minimize the use of water, electricity and fuel.

### Activities alternatives

The project proponent shall follow the principle of good working practice and good safety practice rather than following the conventional way of doing thing. The company prefers the “work smarter” to “work harder” principle in doing things.

Staffs will be encouraged to walk or ride bicycles rather than commute by cars for conservation of fuel energy and reduction of emission.

### "No go alternative" or "no project alternative"

The company really believes that the advantages outweigh the disadvantages in many aspects and so the “no go alternative” is out of the question. The company will duly implement this project.

The “no go alternative” or “no project alternative” will simply mean no more development in the socio-economic aspects of the local area and the region. There will be no development in agriculture especially in vegetable production. There will be no chance for the farmers and vegetable growers of the nation to increase and improve their products, their income and hence their standards of living. None of the benefits to be generated from this project will be realized by the company, the local community, the region and the country.

## **2. ENVIRONMENTAL SOCIO-ECONOMIC, AND HEALTH POLICIES AND COMMITMENT; LEGAL REQUIREMENT AND INSTITUTIONAL FRAME WORK**

### **2.1 Corporate Environmental and social policy**

East-West Seed (Myanmar) Co., Ltd, one of the leading seed production companies in Asia has environmental policy of its own. The first and foremost policy is to obey, abide and comply with all laws and rules relating to physical and social environment. Most of all, it will follow all the rules and regulations set up by the Environmental Conservation Department, the main agency responsible for environmental management in Myanmar. The company pledges to do a seed business that will be environmentally sound as far as possible.

The company shall endeavour to:

- Operate the seed factory with an environmentally and socially responsible manner and to comply with laws and regulation

- Prevent pollution of surrounding area; monitoring and adopting suitable measures for environment protection
- Implement EMP effectively to mitigate pollution of water, land, air, noise and dust and proper disposal of waste
- Develop green belt in available space
- Conserve natural resources and energy as far as possible
- If possible recycling of waste through the principles of 5Rs (reduce, reuse, recover, recycle, redesign), and
- Create environmental awareness among employees and local community through education and training

### **Corporate Social Responsibility (CSR) and community development**

The company very well realizes that the ethic code of 21<sup>th</sup> century big business is not to make profit at the expense of the environment and the local community. And that the big business should not focus only on economically viable venture but also on environmentally and functionally sound, ecologically viable as well as socially sustainable venture.

CSR has become mandatory in many countries and it is also now an official policy of most big companies. East-West Seed (Myanmar) Co., Ltd will implement CSR programmes as far as possible and carry out community assistance and community development. Generous compensation would be provided if there is any loss or damage due to the implementation of this project.

The company will follow the principle of CSR, which are:

- Not to destroy the environment
- Not to infringe on human right
- Not to get involve in child labour and forced labour, and
- Not to get involve in bribery and corruption in league with corrupt officials/authorities when doing business.

## **2.2 Environmental policy and legal frame work**

### Environmental policy

The environmental policy of Myanmar is to protect and conserve the environment while striving for national development. In other word to aim for sustainable development.

The National Environmental Policy (1994) is:

- to achieve harmony and balance between socio-economic, natural resources and environment through the integration of environmental considerations into the development process enhancing the quality of life of all its citizens

In short, the policy covers three strategic areas:

- (a) Clean environment and health, functioning ecosystem
- (b) Sustainable development, and
- (c) Mainstreaming environmental protection and management.

Myanmar is cooperating with the international community to draft a national environment policy and adopt its main tasks in order to contribute to sustainable development, policies, strategies and work programmes relating to climate change, a framework for a green economy and strategies and work programmes for waste management.

The nation is in the process of formulating a new and comprehensive national environmental policy. Since 2015 United Nations Development Programme (UNDP) has been supporting the government to formulate a new national environmental policy that places environmental consideration at the centre of efforts to promote economic and social development, reduce poverty and mitigate and adapt to climate change and natural disasters.

This national environmental policy will ensure environmental protection and sustainable development across the country.

The pragmatic aim is to integrate environmental governance into the national economic development programme. This is indeed a new multifaceted national environmental policy and strategic frame work that address new challenges.

### **2.2.1 Applicable laws and rules**

1. Environmental Conservation Law, 2012
2. Environmental Conservation Rule, 2014
3. Farm Land Law, 2012
4. The Seed Law, 2011
5. Law Amending the Seed Law, 2015
6. Myanmar Pesticide Law, 2016
7. The Plant Pest Quarantine Law, 1993
8. Myanmar Agricultural Development Bank Law (Amended), 1997
9. Foreign Investment Law, 2012

10. Myanmar Insurance Law, 1993
11. The Social Security Law, 2012
12. Workmen's Compensation Act, 1923
13. Minimum Wages Law, 2013
14. Labour Organization Law, 2013
15. Settlement of Labour Dispute Law, 2012
16. The Fire Service Law, 2015
17. The Public Health Law, 1972
18. The related laws enacted by the Yangon Region Hlutaw and Rules issued by Yangon Region Government.

The said 17 laws and rules are directly or indirectly related to this proposed project. The company shall comply with all these laws. Since these laws cover a very wide spectrum and various aspects, the company is not in a position to read and study all these laws. The company shall hire a legal expert to deal with the details of these laws. When implementing the project the company will apply common sense and simple logics not to pollute the air, water land and the community. When it comes to detail the legal expert hired by the company will assist the company to comply with the laws, accordingly.

Myanmar does not have any regulatory control on the import of G.E food or animal products. There are no comprehensive guidelines or regulation that govern plant or animals genetic engineering. There have been previous attempt to develop a natural biosafety framework but no law has been passed, it is learnt. The country is in the process of formulating a national agricultural development policy which incorporates biotechnology, it is learnt.

The project proponent on its parts will comply with internationally accepted laws, rules, and regulation regarding and will strictly follow the internationally accepted practices. The project proponent has a lot of experience working in various countries, both developed and developing ones.

The company has obtained certificates from ISTA (International Seed Testing Association).

Certificate of Accreditation Standards regarding: Quality Assurance 15-7-2015 and sampling, purity, germination, vigour etc 7-8-2018, **See also ANNEX.**

### **2.2.2 National and international standards and guidelines**

East-West Seed (Myanmar) Co., Ltd shall follow the NEQ guidelines values (Notification No.615/2015, December 2015, by ECD, MOECAP).

### 2.2.2.1 National Environmental Quality (NEQ) Standards Guidelines by ECD

#### (a) Air quality guidelines

Parameter	Averaging Period	Guideline Value $\mu\text{g}/\text{m}^3$
Nitrogen dioxide	1-year	40
	1-hour	200
Ozone	8-hour daily maximum	100
Particulate matter $\text{PM}_{10}^{\text{a}}$	1-year	20
	24-hour	50
Particulate matter $\text{PM}_{2.5}^{\text{b}}$	1-year	10
	24-hour	25
Sulfur dioxide	24-hour	20
	10-minute	500

<sup>a</sup> Particulate matter 10 micrometers or less in diameter

<sup>b</sup> Particulate matter 2.5 micrometers or less in diameter

#### (b) Emission guidelines

Small combustion facilities emission guidelines (NEQ guideline prescribed by ECD, 2015)

Combustion Technology/fuel	Particulate matter $\text{PM}_{10}$	Sulfur Dioxide	Nitrogen Oxide
Gas	-	-	200 <sup>b</sup> $\text{mg}/\text{Nm}^3$ <sup>c</sup> 400 <sup>d</sup> $\text{mg}/\text{Nm}^3$ 1,600 <sup>e</sup> $\text{mg}/\text{Nm}^3$
Liquid	100	3%	1,600-1850 <sup>f</sup> $\text{mg}/\text{Nm}^3$
Natural gas (3-<15 MW <sup>g</sup> )	-	-	90 <sup>h</sup> $\text{mg}/\text{Nm}^3$ 210 <sup>i</sup> $\text{mg}/\text{Nm}^3$
Natural gas (15-<50 MW)	-	-	50 $\text{mg}/\text{Nm}^3$
Fuels other than natural gas (3-<15 MW)	-	0.5% sulfur	200 <sup>h</sup> $\text{mg}/\text{Nm}^3$ 310 <sup>j</sup> $\text{mg}/\text{Nm}^3$
Fuels other than natural gas (15-<15 MW)	-	0.5% sulfur	150 $\text{mg}/\text{Nm}^3$
Gas	-	-	320 $\text{mg}/\text{Nm}^3$
Liquid	150 $\text{mg}/\text{Nm}^3$	2,000 $\text{mg}/\text{Nm}^3$	460 $\text{mg}/\text{Nm}^3$
Solid	150 $\text{mg}/\text{Nm}^3$	2,000 $\text{mg}/\text{Nm}^3$	650 $\text{mg}/\text{Nm}^3$

**(c) Drinking water guideline values (WHO)**

<b>Parameter</b>	<b>Unit</b>	<b>WHO Guideline Values (March, 2018)</b>
Aluminum	mg/l	0.05 – 0.02
Chloride	mg/l	250
Colour	mg/l	15 colour unit
Copper	mg/l	1.0
Corrosivity	mg/l	Non – corrosive
Fluoride	mg/l	2.0
Foaming agent	mg/l	0.5
Iron	mg/l	0.3
Manganese	mg/l	0.05
Odour	-	3 threshold odour number
pH	S.U	6.5 – 8.5
Silver	mg/l	0.1
Sulphate	mg/l	250
Total dissolved solids	mg/l	500
Zinc	mg/l	5

**(d) Effluent guidelines**

- (i) During Construction Phase (site runoff and waste water discharge) (NEQ guideline by ECD, 2015)

<b>Parameter</b>	<b>Unit</b>	<b>Maximum Concentration</b>
Biochemical oxygen demand	mg/l	30
Chemical oxygen demand	mg/l	125
Oil and grease	mg/l	10
pH	S.U. <sup>a</sup>	6-9
Total coliform bacteria <sup>4</sup>	100 ml	400
Total nitrogen	mg/l	10
Total phosphorus	mg/l	2
Total suspended solids	mg/l	50

<sup>a</sup> Standard unit

**Effluent levels (NEQ guideline)**

<b>Parameter</b>	<b>Unit</b>	<b>Guideline value</b>
Arsenic	mg/l	0.1
Biochemical oxygen demand	mg/l	30
Cadmium	mg/l	0.1
Chemical oxygen demand	mg/l	125
Heavy metals (total)	mg/l	10
Lead	mg/l	0.1
Mercury	mg/l	0.01
pH	S.U. <sup>a</sup>	6-9
Total coliform bacteria	100 ml	400
Total nitrogen	mg/l	10
Total organochlorine pesticides	mg/l	0.1
Total phosphorus	mg/l	2
Total suspended solids	mg/l	50

<sup>a</sup> Standard unit

(ii) During the Operation Phase (waste water, storm water runoff, effluent, sanitary discharge general application)

(Waste water, storm water runoff, effluent and sanitary discharges (general application))  
(NEQ guideline)

<b>Parameter</b>	<b>Unit</b>	<b>Guideline value</b>
5 day biochemical oxygen demand	mg/l	50
Ammonia	mg/l	10
Arsenic	mg/l	0.1
Cadmium	mg/l	0.1
Chemical oxygen demand	mg/l	250
Chlorine (total residual)	mg/l	0.2
Chromium (hexavalent)	mg/l	0.1
Chromium (total)	mg/l	0.5
Copper	mg/l	0.5
Cyanide (free)	mg/l	0.1
Cyanide (total)	mg/l	1
Fluoride	mg/l	20
Heavy metals (total)	mg/l	10
Iron	mg/l	3.5
Lead	mg/l	0.1
Mercury	mg/l	0.01
Nickel	mg/l	0.5



Oil and grease	mg/l	10
pH	S.U. <sup>a</sup>	6-9
Phenols	mg/l	0.5
Selenium	mg/l	0.1
Silver	mg/l	0.5
Sulphide	mg/l	1
Temperature increase	°C	<3 <sup>b</sup>
Total coliform bacteria	100 ml	400
Total phosphorus	mg/l	2
Total suspended solids	mg/l	50
Zinc	mg/l	2

<sup>a</sup> Standard unit

<sup>b</sup> At the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity; when the zone is not defined, use 100 meters from the point of discharge

#### 2.2.2.2 International standards and guideline

1. Analytical method – ISTA on line. <https://www.seedtest.org/>) analytical
2. Association of Official Seed Analysis (AOSA) standard procedures for sampling and testing seeds.
3. FAO International Standards for phytosanitary measures.
4. General Seed Certification Standards. <https://seednet.gov.in/PDF-file>
5. GMO in seed testing: the ISTA perspective. [gmo.crl.jrc.ec.europa.eu>docswork](http://gmo.crl.jrc.ec.europa.eu/docswork)
6. International Seed Testing Association (ISTA) - Guideline. <https://www.seedtest.org/cms/user064>
7. ISO standards, 6644, 1369
8. ISO 24276. Detecting of GMO [bch.cbd.int>cms>forum](http://bch.cbd.int/cms/forum).
9. ISTA Handbook of Seed Sampling
10. New ISO standards for detecting genetically modified organism (GMO) in food. <https://www.iso.org/2006/0.3/Ref>.
11. OECD seed scheme. [https://www.oecd.org/Tad.code>int](https://www.oecd.org/Tad/code/int).
12. Seeds. OECD. [www.oecd.org>tad.code>seeds](http://www.oecd.org/tad/code/seeds)
13. Vegetable Seed Production good quality guide. International Seed Federation. [www.worldseed.org>uploads>2017](http://www.worldseed.org/uploads/2017)

### **2.3 Contractual and other Commitments**

East-West Seed (Myanmar) Co., Ltd has made a sincere commitment to comply with all the laws, rules, regulations and statutory requirements for doing a seed business that is environmentally sound and socially sustainable as practical as possible.

First of all the company has confirmed the accuracy and completeness of this EMP standalone report. (All the data and information are, to the best of its knowledge, true and accurate).

Secondly the company has confirmed that this EMP standalone report has been prepared in strict compliance with all applicable laws and also strictly follow the guideline and procedures prescribed by the Environmental Conservation Department (ECD) under the Ministry of Natural Resources and Environmental Conservation (MONREC) (Environmental Impact Assessment Procedure Notification No.616/2015, Chapter-5, Section 63(8); Chapter-7, Section 76, 77).

Lastly the company has made a commitment that the project will at all time comply fully with the commitments, mitigation measures to be taken and EMP to be implemented described in this EMP report.

The company has also committed to creating a healthy and safe working places and working conditions. First priority is given to Occupational Health and Safety (OHS) of the employees and the Environmental Health and Safety for employees as well as the neighbourhood as practical as possible. The company will strictly follow the National Environmental Quality (NEQ) Guideline (emission, effluent, noise level, odour) 2015, prescribed by ECD.

The company pledges not to pollute the air, water and land environment as practical as possible, throughout the entire life of the project. The company shall endeavor to operate the seed processing factory in an environmentally and socially responsible manner. The company shall follow all the mitigation measures to be put in places and implement the EMP as prescribed in this report. Or its part the company shall monitor and adopt any suitable measures for environmental protection.

The company pledges to spend 2% of its net profit for the implementation of CSR.

### **3. BRIEF DESCRIPTION OF THE SUROUNDING ENVIRONMENT**

#### **Note**

Although not included in the former EMP standalone report this chapter is now incorporated in this amended EMP standalone report to summarize the situation of the surrounding environment.

### 3.1 Physical components

#### Climate

The climate is tropical monsoon climate with a hot and dry season (premonsoon), a rainy season with moderate rainfall (monsoon) and a cool season (postmonsoon). The area also has the typical hot and humid climate of southern Myanmar.

The hot dry season (summer) generally starts from March to June and is a period of hot spell. The monthly record for temperature from 2010-2018 is shown in **Table-1**. The monthly maximum temperature for 2010-2018 was recorded at 39.3°C in April (2010). The monthly minimum temperature for 2010-2018 was recorded at 14.4°C in January (2014).

The rainy season (monsoon season) generally starts from the middle of June to the end of September. The monthly record for rainfall from 2010-2018 is shown in **Table-2**. The monthly heaviest rainfall for 2010-2018 was recorded at 828 mm in July (2015). The cool season (winter) generally starts from November to and continue till the end of February.

**Table-1: Monthly minimum and maximum temperature (°C) of Hmawbe Township during 2010-2018**

Monthly maximum temperature												
Max	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
2010	33.1	35.1	37.0	39.3	36.1	31.3	31.1	30.0	31.4	31.9	34.2	32.0
2011	31.1	33.6	33.2	36.1	32.1	30.2	30.1	29.6	29.9	32.2	34.9	31.1
2012	34.7	36.6	37.6	38.2	34.7	30.6	29.8	29.3	31.0	33.1	33.4	32.6
2013	32.8	36.7	37.8	39.2	35.4	30.6	29.0	29.6	30.2	31.6	33.0	30.2
2014	31.9	34.3	37.5	37.8	34.8	30.8	29.8	30.0	31.2	33.1	30.0	32.9
2015	31.9	34.5	37.6	38.0	36.0	31.8	30.9	30.8	31.8	32.4	34.5	33.5
2016	31.8	34.7	37.1	38.8	37.2	30.8	30.6	30.4	31.9	31.9	33.7	33.1
2017	32.5	34.9	36.9	36.1	37.4	31.8	29.8	30.2	32.6	32.6	24.7	32.7
2018	33.0	34.9	37.1	38.1	35.8	30.9	29.9	30.2	32.1			

Monthly minimum temperature												
Min	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
2010	18.4	17.5	22.4	24.6	25.6	24.4	24.9	24.2	24.4	24.1	21.2	18.5
2011	16.7	17.9	20.8	23.8	24.8	24.9	24.6	24.5	24.5	23.7	20.9	16.9
2012	14.9	15.8	19.9	23.7	24.5	24.3	24.3	24.1	24.3	24.1	22.9	17.1
2013	14.9	18.3	20.2	22.3	24.0	23.7	23.0	23.1	23.2	23.1	21.8	16.2
2014	14.4	16.5	18.7	24.1	24.8	24.4	23.7	23.8	23.9	23.2	21.3	19.2
2015	17.1	16.3	19.9	23.6	25.0	24.6	24.6	24.7	24.7	24.0	21.8	18.1
2016	14.6	18.1	22.1	24.0	24.6	24.9	24.9	24.8	23.8	24.2	21.9	20.3
2017	18.4	18.2	20.2	23.4	25.2	24.9	24.5	24.7	24.7	24.0	22.6	18.8
2018	17.9	17.4	21.0	23.5	24.1	23.9	23.6	23.4	23.2			

**Table-2: Monthly rainfall (mm) of Hmawbe Township during 2010-2018**

Month	Total rainfall per month (mm)								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
January	8	81	Trace	Trace	0	0	38	Trace	2
February	0	0	Trace	1	0	0	1	0	0
March	0	108	Trace	0	0	Trace	23	0	0
April	0	Trace	18	0	0	29	0	98	35
May	253	284	113	222	182	256	387	319	258
June	434	789	492	543	390	358	310	427	434
July	278	490	686	590	760	828	581	643	666
August	399	357	745	759	547	315	509	491	562
September	230	453	481	603	249	264	332	326	303
October	229	118	73	254	82	197	208	328	
November	0	Trace	128	25	190	25	6	10	
December	61	Trace	2	Trace	0	0	0	0	
<b>Total rainfall</b>	<b>1892</b>	<b>2680</b>	<b>2738</b>	<b>2997</b>	<b>2400</b>	<b>2272</b>	<b>2395</b>	<b>2642</b>	<b>2260</b>

**Table-3: Monthly humidity (%)**

Month	Humidity (%)								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
January	67	73	67	69	68	71	70	71	67
February	70	72	75	67	73	71	73	70	71
March	78	76	78	70	74	73	79	72	75
April	70	70	73	64	72	69	94	73	72
May	70	85	79	72	77	75	76	81	78
June	87	92	89	88	89	87	88	87	92
July	88	91	91	92	94	90	91	93	95
August	91	92	91	92	93	90	91	92	95
September	88	90	86	92	89	86	92	89	92
October	84	83	79	83	80	84	88	89	
November	68	67	79	74	70	77	80	80	
December	72	67	73	71	71	72	75	72	

A comparison of the values of mean monthly humidity (%) for the years 2010-2018 showed that the highest value, 95, was recorded in July and August 2018 while the lowest value, 64, was record in April 2013.

### **Topography and basic geology**

The area is a flat low terrain area with farms garden (orchards), vacant plots of land and residential area (the village).

The area can be classified as that of quaternary age formed out of deposits of alluvial and deltaic sediments of the Hlaing River and its tributaries. The sediment is estimated to be 50 feet thick and mainly consists of yellowish grey, bluish grey, brownish grey silts and clays.

The rock generally is fluvisol type some organic matter such as decomposed wood are also included. Sands are scattered through the area in surface and at depths.

Deposits were probably deposited in Pleistocene Epoch (about 200,000 years ago) up to Recent Epoch.

Information on general soil structure is secondary data obtained from the report of UNO consultant Geotechnical Engineering Group, 2014.

General geological condition of the site is mostly Alluvial Deposit in upper layers and sand formation in deeper layers. The alluvial deposit (plastic soil) exists generally at the surface to a depth of 8-10 feet. The sand formation (non-plastic) generally exists at a lower layer between the depth of 8-10 feet and 45 feet. The soils of alluvial deposits are mostly plastic soil and semi-cohesive soil in nature. Most of the plastic soils (cohesive soils) have very small particles sizes. The particles tend to stick together (the result of water particles interaction and attraction forces between particles). Cohesive soils are, therefore, sticky and plastic.

During the EMP study surface soil was collected for analysis.

Soil sample was collected from factory site. The coordinates of the collecting site are: N. Lat. 17° 08' 59.98"; E. Long 96° 09' 28.98" and the elevation is 40 ft asl.

Since the sample was collected inside the factory compound it very well represents the true soil (the real situation) inside the compound.

The soil samples were brought back to Yangon and analysed at Ministry of Agriculture and Irrigation (Department of Land use) laboratory.

#### Soil test results

Sr. No	Sample plot	pH	Texture	Total N	Available Nutrient P
1.	Factory site	Strongly acid	Clay Loam	Low	Low

At the Factory site : N. Lat. 17° 08' 59.98"; E. Long 96° 09' 28.98" and the elevation is 40 ft asl.

#### Soil analytical data sheet

Sr. No	Sample plot	Moisture %	pH soil: Water 1: 2.5	Texture				Total N %	Available Nutrient P ppm (Bray)
				Sand %	Silt %	Clay %	Total %		
1.	Factory site	1.34	4.87	41.12	19.00	39.88	100.00	0.14	3.24

**Note:** Soil samples are free of contamination by hydrocarbon, SO<sub>2</sub> and toxic substances.

## Hydrology

The site is near the upper reach of a very small stream, the Ata Yu Chaung which flows from north to south. In the west about 1.5 miles away is another stream, Ra La Chaung which also flows from north to south. The Hlaing River which generally flows from north to south is about 20 miles away. The upper reach of Ata Tu Chaung is ephemeral and there is water only during the wet months.

## Ground water

The company has sunk a tube well and sourced water from the ground water at a depth of 50m.

The water sample of the ground water was taken for analysis.

The water sample is brought back to Yangon and analysis was made at a registered laboratory, the ISO-TECH laboratory, Insein Township.

Since the sample was collected from the tube well inside the factory compound it very well represents the true ground water (the real situation) inside the compound.

The results are shown in the ANNEX.

Impact on the ground water is not anticipated due to the implementation of the project.

## Ambient air quality

Ambient Air quality sampling and ambient noise level measurement were undertaken with the help of technician from the Health Department, Nay Pyi Taw.

The values area show in the ANNEX.

No considerable negative impacts on the air environment are anticipated during the Operation Phase of the project. The potential impact during the Construction Phase will be transient or temporary and extent will be just within the foot print.

## 3.2 Biological components

### Flora

A total of 100 plant species, natural vegetation, big and small, belonging to 43 families were found in the study area and recorded. 23 cultivated species (artificial) were also recorded.

**Table-4: Inventory list of natural plant**

No.	Botanical Name	Myanmar Name	Family	Habit
1.	<i>Ageratum conyzoides</i> L.	Khway-thay-pan	Asteraceae	H
2.	<i>Albizia procera</i> (Roxb.) Benth.	Sit	Mimosaceae	T
3.	<i>Alpinia zerumbet</i> B.L Rurtt.	Padegaw	Zingiberaceae	S
4.	<i>Alstonia scholaris</i> (L.) R.Br	Taung-mayo	Apocynaceae	T
5.	<i>Alternanthera sessilis</i> L.	Pazonsar-yaing	Amaranthaceae	H
6.	<i>Alysicarpus vaginalis</i> (L.) DC.	Thanmanaing-	Fabaceae	H

		kyaukmanaing		
7.	<i>Anthocephalus cadamba</i> Miq.	Mau-bin	Rubiaceae	T
8.	<i>Arundo donax</i> L.	Alokyu	Poaceae	G
9.	<i>Axonopus compressus</i> (Sw.) P. Beauv.	Ngat-taw-myi	Poaceae	G
10.	<i>Bombax ceiba</i> L.	Let-pan	Bombacaceae	T
11.	<i>Borreria alata</i> (Aubl.) DC.	Tadaung-sa-pin	Rubiaceae	S
12.	<i>Butea superba</i> Roxb.	Pauk-nwe	Fabaceae	C/C
13.	<i>Calamus rotang</i> L.	Kyein-khar	Arecaceae	C
14.	<i>Cassia alata</i> L.	Pway-kaing-mezali	Caesalpiniaceae	S
15.	<i>Centella asiatica</i> (L.)	Myin-kwar	Apiaceae	H
16.	<i>Chloris barbata</i> Sw.	Sin-ngo	Poaceae	G
17.	<i>Cleome burmanii</i> Wight & Arn.	Taw-hin-galar	Capparaceae	S
18.	<i>Clerodendrum indicum</i> L.	Nga-yant-padu	Verbenaceae	S
19.	<i>Clerodendrum serratum</i> Spreng.	Yin-byar-net	Verbenaceae	S
20.	<i>Colocasia affinis</i> Schott.	Pein	Araceae	H
21.	<i>Commelina paludosa</i> Blume.	Wet-Gwut	Commelinaceae	H
22.	<i>Corchorus olitorius</i> L.	Pilaw-yaing	Tiliaceae	S
23.	<i>Costus speciosus</i> Sm.	Phalaung-taung-mway	Costaceae	H
24.	<i>Crotalaria striata</i> DC.	Taw-Pike-san	Fabaceae	S
25.	<i>Croton oblongifolius</i> Roxb.	Thet-yin-gyi	Euphorbiaceae	ST
26.	<i>Curcuma caesia</i> Roxb.	Ga-mone-tein-pyar	Zingiberaceae	S
27.	<i>Curcuma petiolata</i> Roxb.	Malar	Zingiberaceae	S
28.	<i>Cynodon dactylon</i> (L.) Pers.	Myay-sa-myat	Poaceae	G
29.	<i>Cyperus compressus</i> L.	Wet-lar	Cyperaceae	G
30.	<i>Cyperus diffusus</i> Vahl.	Wet-kyan	Cyperaceae	G
31.	<i>Dactyloctenium aegyptium</i> (L.) Willd	Myat-laykwa	Poaceae	G
32.	<i>Dalbergia foliacea</i> Wall.	Dauk-ta-laung	Fabaceae	C/C
33.	<i>Dendrocalamus longispathus</i> Kurz.	Wa-ya	Poaceae	B
34.	<i>Desmodium pulchellum</i> Benth.	Taung-ta-min	Fabaceae	S
35.	<i>Dioscorea japonica</i> Thunb.	Myauk-u	Dioscoreaceae	C
36.	<i>Eichhornia crassipes</i> (Mart.) Solms.	Beda	Pontederiaceae	Aquatic
37.	<i>Eragrostis nigra</i> Nees ex Steud.	Myat-thin-don	Poaceae	G
38.	<i>Eugenia kurzii</i> Duthic.	Thabye-nyo	Myrtaceae	T
39.	<i>Eupatorium odoratum</i> L.	Taw-bizet	Asteraceae	S
40.	<i>Ficus glomerata</i> Roxb.	Ye-tha-phan	Moraceae	T
41.	<i>Ficus heterophylla</i> L.f	Kanwe-pin	Moraceae	C/C
42.	<i>Ficus hispida</i> L.	Kha-aung	Moraceae	T
43.	<i>Flemingia strobilifera</i> R.Br.	Phalan-phyu	Fabaceae	S
44.	<i>Galinsoga parviflora</i> Cav.	Bizet-wa	Asteraceae	H
45.	<i>Gigantochloa wanet</i> E.G Camus	Wa-net	Poaceae	B
46.	<i>Glochidion rubrum</i> Blume.	Hta-masok	Euphorbiaceae	ST
47.	<i>Gouania leptostachya</i> DC.	Tayaw-nyo-new	Rhamnaceae	C
48.	<i>Gynandropsis gynandra</i> (L.) Merr.	Taw-hin-galar	Capparaceae	H
49.	<i>Heliotropium indicum</i> L.	Sin-na-maung	Boraginaceae	S



50.	<i>Hymenodictyon excelsum</i> (Roxb.) Wall.	Khu-than	Rubiaceae	T
51.	<i>Imperata cylindrical</i> (L.) P. Beauv.	Thet-kal	Poaceae	G
52.	<i>Ipomoea alba</i> L.	Kya-hin	Convolvulaceae	C/C
53.	<i>Ipomoea aquatica</i> Forsk.	Yay-kazon	Convolvulaceae	C/C
54.	<i>Ipomoea cairica</i> (L.) Pers.	Kazon-nwe	Convolvulaceae	C/C
55.	<i>Ipomoea cymosa</i> Roem.& Sch.	Zizaw	Convolvulaceae	C/C
56.	<i>Ipomoea sepiaria</i> Koenig. ex Roxb.	Taw-kazon	Convolvulaceae	C/C
57.	<i>Ixora chinensis</i> Lam.	Pon-nayiek	Rubiaceae	S
58.	<i>Jussiaea sufruticosa</i> L.	Taw-lay-nyin	Onagraceae	S
59.	<i>Kclipta alba</i> Hassk.	Kyeik-man	Asteraceae	H
60.	<i>Lagerstromia speciosa</i> (L.) Per.	Pyin-ma	Lythraceae	T
61.	<i>Leucaena leucocephala</i> (Lam.) De wit	Baw-sa-gaing	Mimosaceae	ST
62.	<i>Leucas aspera</i> Spreng.	Taw-pin-sein	Lamiaceae	S
63.	<i>Limnocharis flava</i> L.	Tap-pyar-pin	Limnocharitaceae	Aquatic
64.	<i>Ludwigia adscendens</i> (L.) H.Hara	Ye-kanyut	Onagraceae	H
65.	<i>Luffa acutangula</i> (L.) Roxb.	Thabut-khar-new	Cucurbitaceae	C/C
66.	<i>Lygodium palmatum</i> (Bernh) Swartz.	Mi-gyaung-theik-new	Lygodiaceae	C
67.	<i>Malvastrum coromandelianum</i> (L.) Garcke	Taw-pilaw	Malvaceae	H
68.	<i>Matteuccia struthiopteris</i> L.	Dayin-gauk	Onocleaceae	H
69.	<i>Melastoma malabathricum</i> L.	Say-o-poke-kyi	Melastomataceae	S
70.	<i>Melilotus alba</i> Lam.	Pae-yaing	Fabaceae	C/C
71.	<i>Microcos paniculata</i> L.	Mya-ya	Tiliaceae	ST
72.	<i>Mikania micrantha</i> H. B. k.	Bizet-new	Asteraceae	C/C
73.	<i>Mimosa pudica</i> L.	Hti-ka-yone	Mimosaceae	S
74.	<i>Mimosa rubicaulis</i> Lam.	Japan-htika-yone	Mimosaceae	S
75.	<i>Monochoria vaginalis</i> (Presl) Kunth.	Kadauk-sat	Pontederiaceae	Aquatic
76.	<i>Narenga porphyrocoma</i> (H.ex T) Bor	Thet-ngal-gyi	Poaceae	G
77.	<i>Nauclea orientalis</i> L.	Mau-lat-tan-shae	Rubiaceae	T
78.	<i>Ocimum canum</i> Sims.	Taw-pin-sein	Lamiaceae	S
79.	<i>Oldenlandia corymbosa</i> L.	Sula-napha	Rubiaceae	H
80.	<i>Oroxylum indicum</i> (L.) Kurz	Kyaung-sha	Bignoniaceae	ST
81.	<i>Panicum repens</i> L.	Myat-kha	Poaceae	G
82.	<i>Passiflora foetida</i> L.	Taw-suka	Passifloraceae	C/C
83.	<i>Phyllanthus reticulatus</i> Poir.	Ye-chin-ya	Euphorbiaceae	S
84.	<i>Phyllanthus urinaria</i> L.	Taung-zi-phyu	Euphorbiaceae	S
85.	<i>Saccharum spontaneum</i> L.	Kaing	Poaceae	G
86.	<i>Scoparia dulcis</i> L.	Danna-thukha	Scrophulariaceae	S
87.	<i>Sesbania aegyptiaca</i> Pers.	Ye-tha-gyi	Fabaceae	S
88.	<i>Sida acuta</i> Burm.	Tabyatsi-ywet-chon	Malvaceae	S
89.	<i>Sida cordifolia</i> L.	Tabyatsi-ywet-wine	Malvaceae	S
90.	<i>Sphaeranthus indicus</i> L.	Kadu	Asteraceae	H
91.	<i>Stenochlaena palustris</i>	Akar Paku	Blechnaceae	Fern
92.	<i>Tabernaemontana divaricata</i> (L.) R.Br.ex.Roem	Zalat-sat-kyar	Apocynaceae	S

93.	<i>Terminalia bellerica</i> Roxb.	Thit-seint	Combretaceae	T
94.	<i>Thyrsostachys siamensis</i> (Kurz ex Munro)	Hti-yo-wa	Poaceae	B
95.	<i>Trichosanthes cordata</i> Roxb.	kyi-ar-gyi	Cucurbitaceae	C/C
96.	<i>Urena lobata</i> L.	Ket-si-nae	Malvaceae	S
97.	<i>Vernonia cinerea</i> (L.) Less.	Kadu-pyan	Asteraceae	H
98.	<i>Vitis barbata</i> Wall.	Yin-naung-new	Vitaceae	C/C
99.	<i>Waltheria indica</i> L.	Bauk-phyu	Sterculiaceae	S
100.	<i>Wedelia calendulacea</i> Nees.	Nay-kyar-kalay	Asteraceae	H

**Table-5: Inventory list of artificial (cultivated) plant**

No.	Botanical Name	Myanmar Name	Family	Habit
1.	<i>Acacia auriculiformis</i> A.Cunn.	Malaysia-padauk	Fabaceae	T
2.	<i>Acacia mangium</i>	Man-jan-sha	Fabaceae	T
3.	<i>Anacardium occidentale</i> L.	Thiho-thayet	Anacardiaceae	T
4.	<i>Ananas comosus</i> (L.) Merr.	Nar-net	Bromeliaceae	S
5.	<i>Artocarpus heterophyllus</i> Lam.	Pein-ne	Moraceae	T
6.	<i>Averrhoa carambola</i> L.	Zaung-laya	Oxalidaceae	T
7.	<i>Bambusa vulgaris</i> Schrad. Ex.J.C Wendl.	Shwe-wa	Poaceae	B
8.	<i>Cassia fistula</i> L.	Ngu-shew-wa	Caesalpiniaceae	T
9.	<i>Cassia siamea</i> Lam.	Mal-za-li	Caesalpiniaceae	T
10.	<i>Citrus medica</i> L.	Than-payo	Rutaceae	ST
11.	<i>Cordyline fruticosa</i> Goeppert.	Zaw-gyi-taung-way	Agavaceae	S
12.	<i>Delonix regia</i> (Bojer ex Hook. Rof)	Sein-pan-gyi	Caesalpinaceae	T
13.	<i>Dracaena alectrifomis</i> (Haw) Bos	Takodaw	Dracaenaceae	S
14.	<i>Eucalyptus globulus</i> Labill	Eu-ka-lit	Myrtaceae	T
15.	<i>Leea aequata</i> L.	Naga-mauk-thi	Leeaceae	S
16.	<i>Mangifera indica</i> L.	Tha-yet	Anacardaceae	T
17.	<i>Mimusops elengi</i> L.	Khayay	Sapotaceae	T
18.	<i>Musa rubra</i> Wall. ex Kurz.	Shwe-nget-pyaw	Muasaceae	H
19.	<i>Musa sapientum</i> L.	Yakhine-nga-pyaw	Musaceae	H
20.	<i>Polyalthia longifolia</i> (Lam.) B. & Hook. f.	Ar-thaw-ka	Annonaceae	T
21.	<i>Psidium guajava</i> L.	Malaka	Myrtaceae	ST
22.	<i>Pterocarpus indicus</i> Willd	Padauk	Fabaceae	T
23.	<i>Pterocarpus marsupium</i> Roxb.	Padauk	Fabaceae	T

T = Tree

C/C = Climber/Creeper

ST = Small Tree

B = Bamboo

H = Herb

G = Grass

S = Shrub

F = Fern

C = Climber

**Table-6: List of IUCN**

No.	Botanical Name	Myanmar Name	Family	Habit	IUCN
1.	<i>Alstonia scholaris</i> (L.) R.Br	Taung-mayo	Apocynaceae	T	LC
2.	<i>Alternanthera sessilis</i> L.	Pazonsar-yaing	Amaranthaceae	H	LC
3.	<i>Arundo donax</i> L.	Alokyu	Poaceae	G	LC
4.	<i>Centella asiatica</i> (L.)	Myin-kwar	Apiaceae	H	LC
5.	<i>Cyperus compressus</i> L.	Wet-lar	Cyperaceae	G	LC
6.	<i>Cyperus diffusus</i> Vahl.	Wet-kyan	Cyperaceae	G	LC
7.	<i>Mimosa pudica</i> L.	Hti-ka-yone	Mimosaceae	S	LC
8.	<i>Saccharum spontaneum</i> L.	Kaing	Poaceae	G	LC

LC - Least Concern

None of them are in the IUCN globally threatened species List (2018).

## Fauna

### (a) Avian fauna (birds)

A total of 14 species of birds belonging to 10 families were recorded.

**Table-7: Species List of avifauna (birds)**

Sr. no	Family name, Common name & <i>Scientific name</i>
	<b>ALCEDINIDAE: Small kingfishers</b>
1.	Common Kingfisher <i>Alcedo attbis</i>
	<b>APODIAE: APODINAE: Typical swifts</b>
2.	House Swift <i>Apus affinis</i>
	<b>MEROPIDAE: Bee-eaters</b>
3.	Little Green Bee-eater <i>Merops orientalis</i>
	<b>COLUMBIDAE: COLUMBINAE: Typical pigeons &amp; doves</b>
4.	Rock Pigeon <i>Columba livia</i>
5.	Spotted Dove <i>Streptopelia chinensis</i>
	<b>ARDEIDAE: ARIDEINAE: Herons &amp; egrets</b>
6.	Chinese Pond-heron <i>Ardeola bacchus</i>
7.	Little Egret <i>Egretta garzetta</i>
	<b>DICRURINI: Drongos</b>
8.	Black Drongo <i>Dicrurus macrocercus</i>
	<b>STURNIDAE: STURNINAE: Mynas, starlings &amp; allies</b>
9.	Common Myna <i>Acridotheres tristis</i>
	<b>PYCNONOTIDAE: Bulbuls</b>
10.	Red-vented Bulbul <i>Pycnonotus cafer</i>
	<b>MOTACILLIDAE: MOTACILLINAE: Wagtails &amp; pipits</b>
11.	White Wagtail <i>Motacilla alba</i>
	<b>PASSERIDAE: Sparrows &amp; allies</b>

12.	House Sparrow <i>Passer domesticus</i>
	<b>PASSERIDAE: ESTRILDINAE: Munia</b>
13.	Scaly-Breasted Munia <i>Lonchura punctulata</i>
	<b>TIMALIIDAE</b>
14.	White-throated babbler <i>Turdoides gularis</i>

## (b) Herpetofauna

3 species of Amphibia (frog) and 6 species of Reptilia (lizards and snake) were found and recorded (3 families of frog; 3 families of lizards and 3 families of snakes).

**Table-8: Species List of Herpetofauna**

No.	Family	Scientific name	Common name
1.	Bufonidae	<i>Duttaphyrnus melanostictus</i>	Common Toad
2.	Dicroglossidae	<i>Fejervarya limnocharis</i>	Paddy Frog
3.	Microhylidae	<i>Kaloula pulchra</i>	Common Bull Frog
4.		<i>Microhyla fissipes</i>	Sand Frog
5.	Agamidae	<i>Calotes versicolor</i>	Garden Fence Lizard
6.		<i>Calotes mystaceus</i>	Blue-crested Lizard
7.	Gekkonidae	<i>Hemidactylus brookii</i>	Brook's Gecko
8.	Scincidae	<i>Eutropis multifasciata</i>	Common Sun Skink
9.	Colubridae	<i>Dendrelaphis pictus</i>	Painted Bronzeback Snake
10.		<i>Xenochrophis piscator</i>	Chequered Keelback Water Snake
11.	Homalopsidae	<i>Homalopsis semizonata</i>	Puff-faced Water Snake
12.	Lamprophiidae	<i>Psammodynastes pulverulentus</i>	Mock Viper

## (c) Mammalian fauna

With the exception of rodents (rats and mice) there are no wildlife in this area (They are the common rat *Rattus rattus*; bandicoot rat, *Bandicoota indica* and house mouse, *Mus musculus*).

All belong to the families Muridae.

## 3.3 Socio-economic components

The area is a rural area and the majority of households are involved in farming while a very few are involved in animals rearing (Ta-naing-ta-paing manageable rearing of poultry and pigs).

## Basic demography

Population : Ta Gu Tone has a population of 570

(F: 295; M: 275) with 120 households, (130 houses)

Religion : Buddhist 100%

Ethnicity : Bamar 30%; Kayin 40%; Shan 30%

Occupation : Farming --- the main crops are bean, gourd, cucumber; pumpkin and main plants cultivated are Kinmone and ASEAN *Euginia*. At the moment of villagers are working at the company while 40 (women) are working in garment factories. There is one soldier and one nurse who are in the government services.

Economic status : majority are poor rural people

Unemployment rate : relatively high.

Illiteracy rate : Low (more than 80% are literate).

Health : Fever and malaria are still health issues of the villagers.

### **Infrastructure and services**

Ta Gu Tone village is accessible by hard top motor road. It has easy access to Hmawbe Town and Yangon City.

The village is electrified by gridline electricity from Hlegu Town.

The village has an affiliated middle school (BEMS), with 274 students and 6 teachers. There is no village clinic and no village library.

### **Land use**

As the area is an officially designated Agriculture and Livestock Breeding Special Zone the land use is a mixture of agriculture area, livestock breeding area and residential area (village). There are no factory or industrial enterprise in the area; no industrial zone.

**Material possession:** All the village houses (130) are wooden house. The village has two private cars (Dyna). Every household has one motorcycle, one hand phone and one television set.

### **3.4 Cultural and religious, and visual components**

The village has one Buddhist monastery with 3 monks. The village does not have a village pagoda.

The village does not have a village "Nat Shrine" or shrine for the village guardian spirit.

Although the villagers are Buddhist some still worship or propitiate the "Nat" spirit or "guardian spirit". There are no annual religious festival or nat festival.

There are no historical, religious or cultural monuments or buildings and also no archeological site in the area.

There are also no prominent landmarks or sports of scenic beauty of tourist attraction in the area. It is anticipated that the proposed project, being a seed processing project, will not have any considerable negative impacts on the physical, biological, socio-economic, cultural and visual components of the surrounding environment.

#### **4. SUMMARY OF IMPACTS AND MITIGATION MEASURES**

This chapter presents the potential environmental and social impacts and recommends appropriate mitigation measures to be put in place.

During the EMP study visit by the consultant firm, MESC, baseline data on ambient air/air emission, water quality effluent and soil were collected. There were shown in the ANNEX. A rapid assessment of the biodiversity of the area and a rapid visual inspection on the socio-economic component of the area were conducted.

As the Preconstruction/Planning Phase and the Construction Phase have been completed and passed and the facility is already in operation since March 2018 these two earlier phases will be skipped over and focus will be made only on the Operation Phase and Decommissioning/Rehabilitation Phase.

However, to uphold the standard of an EMP standalone report the two earlier phases, namely, the Preconstruction Phase and the construction will be very briefly and superficially mentioned. (There will be a Construction Phase (II) during the Operation Phase where more building and structure will be constructed.)

##### **4.1 During the Preconstruction/Planning Phase**

The Preconstruction Phase lasted for more than 2 years due to paper works, bureaucracy, red tape etc.

None of the usual issues/impacts such as: land disputes, land grabbing, forced eviction and relocation have happened. The land was officially leased to the company (the lessee) for 30 years (10 + 10 years).

Another issue/impact such as protest and outcry by the locals due to instigation by activists and radical environmentalists did not happen. The site is within the Agriculture and Live Stock Breeding Special Zone (2) designated by the previous government more than a decade ago.

There was/is no known issue such as the hiking of land price due to the emergence of this project. High inflation is quite a normal phenomenon in Myanmar and it has become a way of life for the people.

The area is not prone to disaster and there was no precedent of floods and violent storms.

## **4.2 During the Construction Phase**

The Construction Phase lasted for 24 months.

The usual negative impacts associated with the construction works, no doubt, have happened but none of them are significant or serious.

Due to civil works the impacts on the air environment in the forms of fugitive dust emission and exhaust emission (smoke) have occurred.

There were also impacts of noise and vibration due to construction work.

There is no water course nearby only a small ephemeral spring in the far vicinity and therefore no impact on surface water has happened. There could be certain minor impact on the ground water due to existence of temporary latrine for construction workers.

There were certain minor impacts on soil in the form of soil profile/structure destruction (digging, excavation, filling, earth work); soil compact due to vehicular movements, accidental oil spill on soil etc.

As there were no big trees to be cleared the impact on biodiversity (flora) if any, would be minor impact on small herbs and grass. (There is no natural biodiversity or forest in the vicinity, only artificial plants, fruit trees and shade trees).

In the adjacent north is the dirt road which is also the access road for the site. The road users are mostly motorcyclists there was no road accident or traffic congestion during the Construction Phase.

As the construction was not a major construction only a few construction workers (20) were deployed. There were no frictions or social impacts in the form of disputes, quarrels, brawls among the workers or between the workers and locals. There were no cases of thefts, vandalism, sexual offensive, unethical sex and cases of STD and HIV/AIDS.

There is no residential area in the near vicinity and the nearest village, Ta-gu-tone is about 0.3 miles away. There was no impact on the infrastructure, fields/farms and water sources of the village and on the socio-economic life of the village. There was no cultural, religious, historical and archeological monument, site or object to be impacted during the Construction Phase.

### **4.2.1 Potential impacts during the follow up construction works (Construction Phase II)**

The vegetable seeds processing plant is already in operation for 6 months. But there are some follow up construction works to be undertaken during the Operation Phase. More buildings and structures will be constructed.

The potential impacts predicted, anticipated, identified and assessed for this follow up Construction works to be implemented are described.

The mitigation measures to be put in place for each and every impact are addressed.

#### **4.2.1.1 Impact on air environment and mitigation measures to be taken**

The impact on the air environment will be in the form of smoke/exhaust emission and fugitive dust emission.

Construction machinery, equipment and vehicles will release exhaust emission containing CO, CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CH<sub>4</sub>, VOC and PM<sub>2.5</sub>.

Civil engineering earth works such as digging, excavation, leveling, loading and unloading of earth, sand etc, and vehicular movements will cause fugitive dust emission. The usual components of dust are PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO and VOC. Nuisance and health impacts are associated with smoke and dust. PM<sub>10</sub> is quite easy to protect with face masks or mouth and nose covers. The smaller PM<sub>2.5</sub>, PM<sub>1</sub> (respiratory PM) are more risky. The emission of GHG can contribute to climate change.

As the construction work on the whole is not a major one that involves construction of very large buildings the emission on the whole can be termed insignificant and can be mitigated. The impact is transient or temporary; after construction works the impact will cease.

#### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

##### **(i) For fugitive dust emission**

When clearing the ground vegetation shall be removed together (mixed) so that the plant material helps to hold the soil. Or vegetation can be stripped and spread on the newly made soil stockpile; this will minimize emission of dust due to wind. The company will avoid clearing vegetation too far advance of construction.

The company shall undertake the following measures:

Spray water regularly for suppression of dust. Plant trees along the periphery of the premise; select hardy, fast growing species and create green zone and green belt. Trees play an important role in minimizing dust; they reduce wind speed and trap a lot of dust.

Restrict vehicular movements; car driven at reduced speed generates much lesser dust; maintain road clear of mud and dirt. Limit open stockpile of earth and minimize drop height when loading and unloading earth. Stop earth works eg- digging, excavation, loading, unloading etc. for a while when strong wind is blowing.

Provide Personnel Protection Equipment (PPEs) such as face mask, nose and mouth cover, to workers exposed to dust during earth works or other construction works and so on.

Manage dust and smoke as practical as possible. Try to meet the NEQ (emission) guideline values prescribed by ECD.

The local community should be able to file complaints regarding dust and smoke. Maintain liaison with the local community.



(ii) For smoke/gas emission

The company shall take the following measures :

Regularly check the engine of vehicles and other machines; well-maintained and operated engines reduce smoke emission; use fuel oil with low sulphur; use environmentally friendly up-to-date instrument, for example, engine with higher fuel efficiency; equip instruments and machines with air pollution control devices to minimize exhaust emission.

Avoid vehicles and instruments left running unnecessary; avoid open burning of solid wastes of all kinds, through segregate, recycle and then for disposal at approved dump site (land fill).

Keep equipment, machinery, vehicles and motorcycles well-maintained, well-operated and well-lubricated to minimize smoke.

Provide PPEs such as nose and mouth covers and face masks to workers exposed to smoke. Trees in the site will effectively sequesterate (remove) CO<sub>2</sub> in the smoke. Therefore, plant trees.

**4.2.1.2 Impact: noise and vibration and mitigation measures to be taken**

During the Construction Phase the source of noise are from construction such as cement batching, carpentry work that involve noisy saws and planes, noisy drilling machine and the sound of hammers etc. Movements of vehicles, loading and unloading of materials etc. also produce noise. Gravel roads also produce more noise than tarred ones.

ECD guideline values for noise level is shown earlier in **Chapter-4**. Internationally accepted noise level in the work place should not exceed 85dBA. Prolonged exposure above 85dBA can impair hearing and can be a major health impact. Noise generally causes nuisance and disturbance to the community.

Vibration is generated from machinery or mechanical operation during construction work and also from heavy vehicles on the access road. Vibration is usually associated with loud noise; it can damage machines and equipment and also buildings or structures. The handling of equipment can cause hands-arms and body vibration

**Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

Plan and implement in the Preconstruction Phase for procurement of equipment and vehicles that are eco-friendly and emit lower noise level.

As the project site is isolated noise is not an issue for the community. Noise can have minor impact on the employees.

The best way to mitigate noise is at its source. Noise specification of equipment and vehicles should be taken into consideration when ordering equipment and vehicles. (This will be mentioned in EMP in Planning Phase.)

All noisy machines and equipment shall be fitted with noise muffler or silencers. Place noisier machines away from other working units. No construction work at night. Schedule high noise activity only at certain period during day time hours.

Big trees and vegetation, if any, in and around the project site effectively absorb noise. Keep trees intact as far as possible; avoid unnecessarily cutting of trees.

Provide adequate PPEs such as ear muffs, ear plugs etc. to workers at all activities/locations that exceed permissible occupational noise level limit standard (85dBA).

Vibration due to heavy truck from road can be mitigated by ensuring a flat and smooth road surface; paved road is much better than unpaved road; tarred road is better than concrete road. Limit the speed of vehicular movements to reduce noise and vibration.

Well-maintained, well-operated and well-lubricated machine produce less vibration, therefore, shall give priority to maintenance and efficient operation of machines. Foundation for the installation of the machine shall be firm and durable. This reduces vibration and protects machinery and equipment from damage. It is standard practice to mount machines in such a manner to minimize vibration. Install vibration absorbers where possible.

Plan and execute the management of noise and vibration as practical as possible.

Try to meet the NEQ (emission) guidelines for noise level prescribed by ECD (**Chapter-4**).

The community should be able to file complaint regarding noise and vibration. Maintain liaison with the community.

#### **4.2.1.3 Potential impact on water environment and mitigation measures to be taken**

There is no water course nearby. The potential, if any, will be only on ground water at a depth of 50 feet.

Relatively large quantity of water has to be used in mason work or concrete work. The suppression of dust and the watering of plants as well as washing vehicles and machinery need quite a lot of water. The domestic consumption by construction workers can have certain impact on the water.

There can be potential contamination to ground water due to percolation of oil and hydrocarbons and chemically contaminated water. There can be also potential contamination of ground water due to seepage of ablutions and domestic wastes generated from activities of construction workers.

There can be also domestic sewage which can percolate into ground water.

### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

Shall try to minimize the use of water; apply low consumption appliances. Discipline workers for conservation of water for domestic uses. Rain water shall be harvested for drinking purpose and other uses during the rainy months.

The following measures will be also taken:

- Ensure that the temporary latrines of construction workers do not impact ground water (apply soil or ash)
- Avoid indiscriminate disposal of wastes (solid and liquid)
- Fuel depot shall be bunded to prevent spread of spilled fuel oil.
- Avoid spillage of oil and chemical on the soil which can percolate and contaminate the ground water. Oil and chemical spills shall not be washed down with water but absorbents or saw dust shall be applied. Maintain vehicle and machinery to prevent spillages resulting in groundwater contamination.

#### **4.2.1.4 Impact on soil and mitigation measures to be taken**

The earth work which is an integral part of construction work can alter the profile and structure of soil. Spillage of fuel oils and chemicals during the construction work, from machinery and vehicles can contaminate the soil.

There is also the potential of erosion of soil and soil loss due to the removal of vegetation for construction work. Other impacts are: soil compaction due to repetitive movements of vehicles and heavy machinery and the potential percolation of domestic sewage into the sub-surface layer and hence underground water.

If the construction work happen to be during the rainy season there is the potential for erosion of soil and siltation and sedimentation of natural drainage system (There is a dry ditch/trench not far away). Solid waste generated during the Construction Phase in the form of debris; construction tailings, can have impact on the land if not managed in time.

### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

Plan and execute the management and conservation of soil; avoid unnecessarily destruction of soil profile during the construction work.

When doing the clearing work or excavation of earth, remove top soil with vegetation (grass, herbs) on it. Stockpile top soil in conical heaps; allow grass and herbs to grow on top soil. Remove and stockpile subsoil separately. Maintain the topsoil against erosion. When

backfilling of earth has to be done subsoil will be replaced first, and then the top soil on top. This will greatly help in greening or landscaping work.

Maintain all vehicles and machinery to prevent spill of fuel oil and hydraulic oil. Avoid washing down oil spill with water because this will only help percolate oil underground. Soak oil spill and then dispose the soak at approved disposal site. Pave vehicles and cranes parks and collect run off; bund the fuel depot to prevent spreading of spilled oil. Properly train workers with respect to handling of fuel and cleanup of spills.

Vehicles and equipment shall not be repaired in the site. If unavoidable, impervious sheathing will be used to avoid soil and water contamination.

Used oils/waste oils will be collected in drums and sold to recycling contractors, if any, in the area, or disposed at approved landfill.

For disposal of domestic waste water construct a small septic tank together with soak pit to collect the sewage from kitchen, bath etc. Occasionally sprinkle sand or dirt into the pit latrines to mitigate the impact of bad odour.

Schedule the construction works so that large area of soil were not laid bare during the monsoon months. Do not clear the land in advance more than necessary. Phase the earth work (in the early period of construction) so that it was limited to workable size only to a minimum area.

Resurface and stabilized the exposed ground surface as soon as possible, that is, after earth work.

To prevent subsequent siltation or settlement, drain or ditch must have adequate backfill and after completion of back fill the surface shall be restored to its original condition. Prevent wash water from carrying earth and materials into drainage system causing siltation.

Manage the overall erosion and sedimentation control during the Construction Phase, particularly during the rainy season. Soil compacted by heavy and vehicles shall be raked and restored to original condition.

Pit and dents shall be backfilled and ground will be leveled after construction work.

#### **4.2.1.5 Impact of wastes and mitigation measures to be taken**

The waste here refers to construction tailings and debris and domestic waste (solid and liquid) generated by construction workers during the follow up Construction work.

Solid waste generated during the construction work will be large quantity of debris in the form of bits and pieces of building materials, iron materials, timber, soft wood, bamboo, used as scaffolds, left over construction tailings.

Many of the leftover materials are unused or surplus materials because even well-experienced planning and design engineers may not be able to estimate the exact quantity of building materials to be used. There will always be unused or surplus timbers and other building

materials. Unless systematically resold, reused and recycled and systematically disposed these materials can pose a great impact on the area. After construction work, ill-disciplined workers without good house-keeping practice can also litter the site to a great extent.

Domestic waste (solid and liquid) comes from office; housings for workers, kitchen, messing hall etc.

The waste can be in the form of solid waste, waste water and spill or leak that contaminated the soil.

Solid wastes from the camp is in the form of domestic waste and office waste, while waste water is in the form of domestic waste (from kitchen, toilet, bath) and oil spill or leakage.

### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

Plan and execute the management of waste (solid and liquid) and try to meet the statutory requirements regarding waste (solid, liquid) disposal.

All unused or surplus building materials can be sold to others who need it. The large majority of debris can be also put up for sale since most can be reused or recovered. Even left over building materials can be sold. Those that should be disposed of shall be disposed at an approved land fill.

Always avoid open burning of debris.

The best thing to do would be to hire a contractor for the clearing job after the construction work.

There will not be any substantial waste water during the construction work. All required water will be used mostly for domestic consumption.

Domestic waste water from temporary housing or camp will go to a small septic tank and associated soak pit. Instead of toilets, pit latrines are provided during the construction work and so there will be no sewage from toilets. From purely environmentalist point of view, pit latrines are not so eco-friendly since it can have impact on ground water. But this is so far the pragmatic way of implementing sanitation during the temporary construction work.

Discipline workers for good house-keeping practice; demand the building contractor to do this and ask him to take responsibility for the conducts of his construction workers.

#### **4.2.1.6 Potential impact on traffic and mitigation measures to be taken**

The site is within a rural area, not on a high way with heavy traffic. However activities during the Construction Phase (II) have the potential for impact on traffic. The mobilization activities involve the mobilization of building materials, machinery and equipment and construction workers and amenities, and the transportation activities later. All these activities represent a noticeable increase in the number of vehicles travelling along the highway and

then the access road. These can have impacts on traffic in the forms of traffic congestion, and traffic accidents. The later can involves vehicular collisions and collision with human and domestic animals.

Heavy trucks and all kinds of vehicles as well as large number of motorcycles travelling through or travelling pass a village can cause nuisance and disturbance to the locals eg. noise, vibration, dust etc.

Although traffic on the whole is relatively light in this area drivers and motorcyclists shall be trained for defensive driving and zero accident, especially when passing through villages.

### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

- Plan and implement traffic management; schedule the timing for vehicular movement to avoid busy traffic hours.
- Educate the drivers for defensive driving and try to maintain zero accident.
- Also educate them for driving heavy truck, with slow speed; especially reduce the speed when passing near or through the village for prevention of road accident and for reducing the generation of dust due to trucks movements.
- Set up speed limit and traffic sign board along the road at suitable spots. Keep the vehicles well-maintained and well-operated, well-lubricated for safety reason.
- Schedule the logistics; avoid rush hour; if possible avoid road with heavy traffic.
- Avoid over loading vehicles; comply with the requirement of Road Authority; always check the weight when loading.
- Avoid spilling of earth or other material from trucks during transportation.
- Avoid driving at night as far as possible.

(This impact will be temporary. After mobilization of building materials for construction most activities will cease. Anyway the project proponent has the responsibility to ask the truck owners/contractor for compliance with rules and regulation regarding traffic No traffic accidents/issues have occurred during the Construction Phase I. The company, however, shall be prepared for this when the Construction Phase (II) commences).

#### **4.2.1.7 Potential social impacts and mitigation measures to be taken**

This impact can be a two-way impact. The project which attracts a large number of construction workers can have an impact on the workers which come from different parts of the country. On the other hand, these workers can have an adverse impact on the project.

Such an issue usually occurs during the Construction Phase. When a large number of workers are camped inside the site there is always the potential for the occurrence of undesirable

social issues. Some examples are: disputes, quarrels, brawls among themselves or with locals; theft; misappropriation of materials and money, vandalism, unethical sexual practices or sexual offences and so on. All these have potential to hinder the progress of construction works.

East-West Seed (Myanmar) Co., Ltd will deploy only a couple of dozens of construction workers when Construction Phase (II) commence. However, as this Construction Phase (II) will be implemented during the Operation Phase of the project there will be interaction between the staffs of the company and the Construction workers and the situation will be a little more complex.

### **Mitigation measures to be taken**

East-West Seed (Myanmar) company shall take the following mitigation measures:

Education and disciplinary action are necessary. Ask the building contractor to discipline his construction workers and to take responsibility for the conducts of his workers. Take punitive measures such as suspension or sacking of the wrongdoer.

Keep separate dormitory (housing), if any, for male and females construction workers; the two housings must be appropriately far apart. Provide adequate sanitation for workers eg- latrine, bath, small septic tank and adjoined soak pit for treatment of waste water.

Prohibit the drinking of alcohol and the use of narcotics in the site.

Educate the workers for dealing with the locals; educate them to respect the local culture, etiquette and custom. Do not let the construction workers mingle freely with the locals.

Prevent all kinds of quarrels and brawls taking place between the construction workers and the locals and also between these construction workers and staffs of the company. Draw up a plan and manage misbehavior and social illness among workers.

Plan to avoid the potential negative impacts on the socio-economic life of the locals as well as workers.

Try to build and maintain good relation with the locals; conduct public consultation from time to time so that the locals will have a positive perception of the project; consider and plan for more CSR activities.

Do not get involve in land and property speculation activities with the locals.

Community should be able to file complaints regarding any grievances.

Set up a Grievances Redress Mechanism (GRM) to tackle the issue, if any.

(There was no case of social issue during the Construction Phase (I) and the project has progressed smoothly. However East-West Seed (Myanmar) Co., Ltd shall be prepared for this potential impact when Construction Phase (II) commence).

#### **4.2.1.8 Potential security issue and mitigation measures to be taken**

The Construction Phase is the period when it is usually difficult to maintain security. The working atmosphere is rather fluid and dynamic in nature. The in (entering the jobs) and out (quitting the jobs) of workers tend to happen almost all the time. This is the period when cases of thefts, misappropriations and vandalisms happen most.

As the Construction Phase (II) will be implemented during the Operation Phase of the project the situation will become more complex as the construction workers and the permanent staffs are working in the same site.

Unlike the permanent employees during the Operation Phase who are well-disciplined, the temporary workers during the Construction Phase are usually quite difficult to discipline. The building contractor usually has no chance to hand pick them but to select them in haste due to the nature of construction work.

There is always the potential security issue for the seed processing plant. If left unchecked the construction workers can pose a potential for security issue.

The site is within the Agriculture and Livestock Breeding Zone (2). So the site is not so isolate some of the locals may pose a potential security issue for the project.

#### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

Draw up a plan and implement security management.

The fencing or walling of the whole compounds shall be undertaken to keep the intruder at bay.

Access control shall be implemented. Security gates shall be set up; set up watch towers if necessary; no unauthorized access is permitted. The company and the building contractor must prohibit the workers from entering the neighboring village without preauthorization from the company or the elders of the villages. All entering and leaving of the site shall be checked. Do not let the construction workers mingle freely with the locals.

Identity Card (ID) for construction workers may not be necessary.

Heavy building materials (which cannot be lifted easily) such as iron bars, iron rod, big timber etc. and materials of less value, for example, bricks, sand, gravel etc. can be piled up in the open. Materials of certain value, for instance, iron work, timber work, frame, iron nails, and associates, corrugated iron sheets, glass panels, bags of cement etc. shall be kept in store or ware house under lock and key.

Ask the contractor to discipline his construction workers.

The condition should include punitive measures if found to be in contravention of the requirement, for instance, suspension or termination of the employment.



(There was no case of theft during the Construction Phase (I) and the project has progressed smoothly. However East-West Seed (Myanmar) Co., Ltd shall be prepared for this potential impact when Construction Phase (II) commence).

#### **4.2.1.9 Occupational health and safety issues and mitigation measures to be taken**

Accidents can occur from time to time during construction work either to construction workers or neighbors if they happen to come near the site. The issue can become quite serious if the workers are ill-disciplined and not well-managed. Certain accidents can be fatal.

Accidents in the work place can be in the form of slips and falls; the risk associated with working at height; struck by objects; struck by moving or rotating machinery; risk associated with hot work and work in confined space; eyes hazard, electrocution due to faulty electric devices etc.

The hazards at the work place can be in the forms of exposure to severe heat, to high level of noise and vibration, to dust and smoke and to chemical and toxic substances.

The lack of emergency and health service can be a constraint regarding provision of health care for workers in potential emergency. If an accident that effect many people occurs the available service in the area may be prone to inadequate. The Township hospital at Hmawbe, of course, cannot solve such a serious problem. Most of the serious health cases are to be referred to the Yangon General Hospital.

Unless there is no management plan for emergency and logistics the issue can be serious.

#### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

The company shall first of all taken into consideration all the potential chemical hazards, physical hazards, biological hazards and other hazards such as dust, noise, heat, confined space, radiation etc. and create safety conditions for all work places.

- The company shall ask the building contractor to educate, train and supervise his construction workers for good working practice, good safety practice and good housekeeping practice.
- The company shall try to avoid and prevent accidents and try to achieve accident at the construction work places.
- It is not practical to train these temporary construction workers for fire-fighting and First Aid training. The company shall provide these trainings for some of its permanent staff.

The basic requirements for work place shall be considered, eg -- integrity work place structure, work place and exit, fire precaution, toilets and baths, potable water supply, clean

eating area, lighting safe access, first aid, air supply, work environment temperature etc. and appropriate conditions shall be created.

In addition, community health and safety shall be also taken into consideration for the nearby villages.

Careful planning of emergency procedures shall be formulated and implemented.

Provide adequate First Aid Kits, Fire extinguishers (cylinder) and water jet pumps. Most of all provide Personnel Protective Equipment (PPE) to workers exposed to dust, smokes, heat, vibration etc.

Display phone numbers and addresses of nearest Red Cross Society, Ambulance Service, Fire Brigade, Police Station, Hmawbe Township Hospital and Yangon General Hospital on the wall so that every worker can see easily.

- Shall draw detail plan for prevention of fire and emergency plan
- Shall take out insurance for the project and insurance for fire.

### **4.3 During the Operation Phase**

The vegetable seed processing plant is not a big factory that spews out billows and billows of dark smoke, generates large quantity of industrial waste water and generates high level noise and vibration. No significant negative impacts are anticipated, and virtually all impacts, if any, will be insignificant or minor.

Once the main construction activities cease the quality of the physical environment, especially air and water will improve. High level noise and vibration due to construction works will stop.

However, one cannot expect the operation of a project to be devoid of any impact. There can be always insignificant or minor or negligible impacts.

#### **4.3.1 Impacts/potential impacts during the Operation Phase**

##### **4.3.1.1 Impact on air quality and mitigation measures to be taken**

Various machinery, equipment and vehicles will release exhaust emission containing CO, CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CH<sub>4</sub>, VOC and PM. Vehicles and motorcycles movement can generate fugitive dust containing PM larger PM, SO<sub>2</sub>, NO<sub>x</sub>, CO and VOC.

There is the potential for release of organic dust during handling and processing of seeds. Phosphine gas will be released from the aluminium phosphide, the widely used fumigant. (The impact of phosphine will be elaborated later under another sub-heading).

On the whole the impact of emission during the operation phase will be insignificant.

### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

- Try to control and mitigate air emission as practical as possible.
- Comply with the National Environmental Quality (NEQ) guidelines for emission prescribed by ECD (eg. SO<sub>2</sub> 20µg/m<sup>3</sup>, NO<sub>2</sub> 200 µg/m<sup>3</sup>, PM<sub>10</sub> 50 µg/m<sup>3</sup> etc).
- Consider and procure equipment and vehicles with air emission specification in the first place. In other word procure eco-friendly equipment/vehicles that minimize emission and generate less smoke.
- Minimize gas emission (smoke) by proper training, operation and maintenance of machinery and vehicles.
- Regularly check all machinery and vehicles, motorcycles --- well-maintained, well-operated and well-lubricated and vehicles reduce smoke emission.
- If possible, use fuel oil with low sulphur content.
- Always avoid open burning of trash and debris; use an incinerator or dispose debris at a landfill.
- Regularly spray water for dust suppression (wet suppression can reduce dust emission up to 75%).
- Restrict vehicles and motorcycles movements; set up speed limit for truck to minimize emission of dust (a speed reduction from 30km/hr to 15km/hr will reduce 50% of dust emission).
- Control emission of organic dust usually associated with seeds
- Regular cleaning of road surface by sweeping.
- Try to control smoke and dust biologically. Plant trees and create a green belt around the factory premise. Trees are efficient dust trappers and controllers. Trees sequesterate CO<sub>2</sub> in smoke and produce O<sub>2</sub>.
- Provide adequate personnel protective equipment (PPEs) eg. face masks, nose and mouth covers for workers exposed to long hours of smoke and dust.

The local community should be able to file complaint regarding smoke and dust; heed to the complaint; liaise with the local people.

#### **4.3.1.2 Impact: noise and vibration and mitigation measures to be taken**

A variety of machinery and equipment are deployed at the facility, including ASC set, brushing machine, coating machine, blending machine, drying machine, reach truck forklift etc.

There are also generators, compressor and pump. A small truck will be also deployed.

However no heavy machinery, equipment and heavy trucks will be deployed.

The noise and vibration level on the whole will be relatively low. As the plant is not inside a residential area noise is not an issue for the local community. Generally noise can have only minor impact on the employees. The operation of backup generator, genset during power outage can emit relatively high noise level.

### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

- Plan and execute the management of noise and vibration.
- Try to meet NEQ guideline for noise and vibration by ECD; noise level less than 80dBA.
- Use environmental friendly equipment, those that generate lower noise level and less vibration; if necessary install silencers or noise abators on machinery that generate high noise level.
- Well-operated, well-maintained and lubricated machinery generate lower noise level.
- Restrict noise level to working hours only.
- Plant trees (fruit trees, shade trees) along the periphery of the premise; trees absorb noise.
- Manage vibration of machinery; install vibration absorbers/vibration insulator where possible; most of all create stable foundation for any machinery/equipment that tend to vibrate.
- Plant trees around the periphery to mitigate noise (planting of fruit/shade trees of medium size is part of the regulation of the Zone II).
- The local community should be able to file complaint regarding high noise level, if any. Liaise with the local people.

#### **4.3.1.3 Potential impact of wastes (solid and liquid) and mitigation measures to be taken**

The impact will be minor or insignificant. As the plant is not a big factory no industrial solid waste and industrial waste water of substantial quantity are anticipated. Small quantity of organic dust associated with seed will be generated. Oil wastes and associated wastes will be generated due to the operation of machinery, equipment and vehicles. The wastes generated from the facility will be mostly domestic solid waste and liquid waste (office waste, kitchen or food waste, waste from dormitory, sanitary waste water --- etc).

From time to time soil waste in the form of packing materials, bags, containers for imported seeds will be generated (60,840 kg of seeds of 18 kinds will be imported during Year 1 of the project life. The amount of packing materials can be quite substantial).

Domestic wastes (solid and liquid), if not well-managed can be potentially contaminate soil and underground water thus negatively affecting nearby community and water resources of the area.

### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

#### For solid waste

- Shall plan and implement the management of solid waste.
- Shall comply with NEQ emission guideline (**Chapter-4**).
- Educate and train employees for good housekeeping practice until the good practice become good habit ingrained in their mindsets.
- Set up signage “Do not litter” at appropriate places for all to see; no disposal of solid waste in the area.
- Place waste/trash bins at appropriate places; regularly collect waste for disposal.
- Segregate waste into categories: waste that can be recycled and that have to be disposed, using at least two different waste bins. (Hazardous waste not anticipated).
- Avoid open burning of solid waste / trash / debris
- Use an incinerator or dispose at an approved landfill. (Designated by Hmawbe Town Development Committee).
- Always avoid contamination of soil (and subsequently ground water) due to disposal of waste.
- Waste generated from handling processing of seeds (eg. dust, debris etc) will be separately collected and disposed at the said landfill.

#### For liquid waste

- Shall plan and execute the management of waste water and also plan and execute for the reduction of waste water.
- Shall comply with NEQ effluent guideline (**Chapter-4**).

- Shall educate and train employees for good housekeeping practice, handling of waste water and for the efficient use and conservation of water.
- Appropriate treatment and disposal system for liquid waste, such as septic tanks and soaking pits with adequate capacity will be constructed and (no sewer system in the area, septic tank is the only option).
- No untreated waste effluent will be released to the environment.
- Waste oils will be collected in drums and sold to the recycling contractors, if any in the area (or disposed at approved landfill/dumping site).
- Segregate non-contaminated storm water (5-10 minutes after the start of rain) from contaminated storm water (during the first 5-10 minutes of rain) for use in washing machinery, watering plant and suppressing dust later, if necessary.
- Check and monitor the daily or weekly consumption of water.
- Regularly check the water tanks, pipes, taps etc for water leakage and fix them immediately.

#### **4.3.1.4 Potential impact on traffic and mitigation measures to be taken**

The access road to the facility (the dirt road in adjacent north) is used mostly by motorcyclists but few vehicles. However the main hard top road about 200 yards away is heavy with traffic for most part of the day by all kinds of vehicles and motorcycles. Most of the staffs will use motorcycles for community to facility.

There is the potential for traffic issue at the intersection of the access road and the main road, where vehicles and motorcycles leave or enter the main road. The eighty or so staffs at the facility can increase traffic to a certain extent.

#### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

- Prepare a traffic management plan even though the impact/issue can be a minor one-
- Plan and manage for road safety at the access road and at the intersection.
- Liaise with road/traffic authority and also with the local elders.
- Set up signage (speed limit) on the access road.
- Also set up signage at the entrance of the site.
- Schedule the logistics of the company's vehicles and motorcycles of staffs; avoid peak traffic hours, if possible.

- Educate the company's drivers for defensive driving and to comply with rules and regulation.
- Ensure that drivers are not overworked and over-tired; keep roster for drivers.
- Also educate the employees for safety driving of cars or safety riding of motorcycles; drive or ride at reduced speed for long term safety.
- Avoid over loading of trucks or cars; comply with regulation
- Keep a log book for each vehicle.
- Try to achieve zero traffic accident for all employees.
- Provide adequate first Aid Kits and medicine.
- Display phone numbers and address of Police Station, Ambulance Service, Red Cross society, Clinics and hospitals so that everyone can see.
- The local community should be able to file complaint regarding traffic issue; heed to the complaint, if any.

#### **4.3.1.5 Potential impact of power supply on national demand vice versa and mitigation measures to be taken**

The annual electricity requirement for the project is 344,690 KW. This is quite a considerable increase in national power demand given the percentage of electrification in Myanmar is the lowest in ASEAN.

The nation is witnessing power outage from time to time due to defect in electricity, natural disasters and deliberate load shedding. Due to lack of efficient means of regulating power supply, so far, the easiest and pragmatic way is power load shedding when there is a case of over load. This is widely practice in Myanmar. The project proponent is aware of this and realizes that it cannot rely entirely on national grid line for all times.

#### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

- Shall plan to minimize consumption in the first place, including procurement of eco-friendly machinery and equipment that use less energy.
- Educate staffs to save energy as far as possible.
- Use low energy efficient lighting; apply solar panels; apply direct solar water heating if possible.
- Keep backup generator to operate in case of grid line power failure.

- Design contingency measures and/or downtime procedures to implement in case of power out stage.
- Maintain liaison with township electricity authority.
- Regularly monitor and check the consumption of electricity --- consumption shall be within the work frame.

#### **4.3.1.6 Occupational health and safety (OHS) issue and mitigation measures to be taken**

Potential common safety hazards in the work place of a seed processing plant are:

- Falls, slips, trips (due to spillage of water or oil on floor; uneven floor).
- Machinery/equipment hazards (due to carelessness or lack of good training).
- Chemical hazards (due to inhalation and dermal contact of phosphine).
- Fire hazard (from engine, welding equipment, electrical equipment) and
- Working at height (fall) and/or working in confined space (O<sub>2</sub> depletion).

Working in seed processing plant seems to be safe but when working for long hours over a long period unexpected occupational hazards and accident can happen. Shared dining, shared hygiene facility (eg. toilet, bath) and crowded condition can contribute to spreading of diseases. Monotonous nature of work at a work to place can lead to psychological disorder eg. outbreak of hysteria.

Workers who are working standing up for long hours can suffer from stress and strain, sore feet, swelling of legs, general muscular fatigue, lower back pain etc. Minor injuries known as repetitive strain injuries can happen when a worker is doing the same movement over and over wearing out bones, ligaments, cartilages, nervous system and muscles. Working repetitive work for long hours can lead to carelessness and slackness of attention resulting in accidents.

The occupational health and safety (OHS) impact can be two ways. OHS can impact the workers while the impacted workers (in the form of sick leave, worker turnover) can have negative impact on the project (decline in productivity).

The seed processing plant is not a big factory that involves heavy machinery and equipment and therefore the OHS issue, if any, will be insignificant.

Organic dust can be generated due to handling and processing of seeds.

The widely used fumigant, Aluminum Phosphide (AP) generates phosphine gas which can pose serious health issue when inhaled (Inhalation is the most dangerous route of exposure). However it is well-accepted worldwide and can be termed a safe fumigant if it is well-managed. Side effect of Phosphine: coughing, nausea, vomiting, sweating, secretion of saliva, red eyes; itch skin, labored breathing and a running stomach.



## **Mitigation measures to be taken**

### **(i) For general OHS issue**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

- Plan and manage for a safe and health atmosphere inside the plant.
- Create a safety work place and try to achieve zero accidents at the work place.
- Conduct medical checkup for all staffs prior to employment; screen then for communicable diseases.
- Comply with Factory Acts 1974; Myanmar Labour Law, 2016; the Social Security Law, 2012 and Workmen's Compensation Act, 1923.
- Comply with NEQ guideline for emission and noise level, by ECD.
- Educate, train and supervize workers for good working practice good safety practice good housekeeping practice and good health and hygiene practice until all these practices are ingrained in their mindsets and become good habits.
- Especially educate, train and supervize them for skill, for handling and operation of equipment, handling and application of chemicals.
- Educate and train them for environmental awareness and OHS hazards.
- Keep all machinery and equipment well-maintained, well-operated (regular check necessary).
- Provide adequate PPEs eg. outfit, boots, helmet, gloves, face mask, goggles, ear muff etc where necessary.
- Beware of all the common accidents that used to happen and implement prevention, protection and mitigation measures.
- Carefully plan for emergency procedure.
- Organize first aid training and firefighting training for some workers.
- Provide adequate First Aid Kits well-stocked with medicines and drugs.
- Provide adequate Fire Extinguisher, firefighting equipment and other associated device; keep water tank always full for firefighting.
- For emergency response organize mock drill and rehearsal from time to time.
- Phone numbers and addresses of Red Cross Society, Ambulance Service, Fire Brigade, Police Station, Hmawbe Township Hospital must be displayed so that everyone can see easily.

- Take out insurance for the factory; and also take out fire insurance.

**(ii) protective/mitigation measures for the use of the fumigant, Aluminum phosphide (phosphine gas)**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures.

- Ensure that the area is well-ventilated (a critical safety aspect of fumigation).
- Comply with the threshold limits exposure of phosphine (exposure limit is 0.3 ppm; generally < 14 ppm; gas mask OK to 15 ppm); or Aluminum Phosphide 12 gm/mt).
- Shall educate, train and supervise staff for conducting fumigation.
- Ensure that the bin is sealed.
- Prevent unauthorized entry into the treated space.
- Every precaution shall be taken to avoid exposure to escaping fumigant (phosphine).
- Shall prohibit staff from working alone when fumigating, no matter how small the dosage or scale of work; at least another staff shall be present in case of emergency.
- Provide PPEs especially face mask, mouth and nose cover for respiratory protection. (Respirator (gas mask) is the best; totally avoid inhalation by all means.)
- Shall take scrupulous care and ensure that fumigant does not come into contact with the skin.
- Effected area of the skill shall be washed thoroughly with soap and water.
- If clothing and foot wears become contaminated they shall be removed immediately.
- Warning sigh shall be put in appropriate place and removed after fumigation treatment is completed.
- Aerate the area after treatment; after adequate aeration ensure that harmful level of gas does not subsequently accumulated.
- Keep the bin closed and post warning signs until the gas concentration is below 0.3 ppm.
- Do not enter the bin during or after fumigation until gases have been reduced to safe concentration (0.3 ppm).

- All members of fumigation crew shall be trained in basic first aid, especially with artificial respiration techniques for gas poisoning, an antidote.
- Shall conduct regular medical checkup of fumigation crew.
- Regular air quality of SO<sub>2</sub>, NO<sub>x</sub>, PM shall measures.
- Fire safety shall be addressed.

#### **4.3.1.7 Potential social impacts and mitigation measures to be taken**

These are already mentioned in the Construction Phase. Such cases are unlikely to occur during the Operation Phase as all workers are handpicked by the executive members of the factory. Unlike the blue collar construction workers who are employed for short term (two years) the workers in the Operation Phase are permanent workers. It is expected that they are better well-disciplined than the construction workers.

Any way the authority of the factory has to deal with these workers on a long term basis. Measures for creating a peaceful and productive atmosphere should be taken into account.

Impacts on the socio-economic component of the area can be in the form of:

- Continual uses of vehicles and motorbikes moving to and from the sites can impact the safety of people and domestic animals.
- Generation of dust, and noise causing potential disturbance or nuisance to the local people.
- Friction can happen between workers and locals.
- Ill-social behavior of workers or locals can lead to quarrels and brawls among themselves or with locals; theft, misappropriation of materials and money, vandalism, unethical sexual practice or sexual offences, spread of Sexually Transmitted Diseases (STD) and so on. These can have also certain negative impact on the project.

#### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

Educate employees to be good workers who are dutiful, well-disciplined and diligent. Give them proper training on factory and work place regulation, and code of conducts.

Apply punitive measures such as termination of job or demotion to wrongdoer. Also apply incentives to boost production.

As for dealing with local community educate them regarding local cultural behavior and awareness to achieve responsible and healthy community interactions.

The company shall deal with the employees on a fair and square basis. The company shall be aware of widespread cases of workers unrest in Yangon as a result of overworked, underpaid, and unhealthy relation between the employees and the factory authority.

In addition to regular medical checkup, voluntary HIV testing on the workers is necessary as they are permanent workers of the factory.

- Consider hiring locals in the future when there are vacant posts, especially unskilled jobs.
- Try to reduce the potential impact to quality of existing life style of the local community in the area.
- Implement CSR programme for the community.
- Maintain cordial relation with the local community.
- Listen to the views, thoughts and opinion of the local people, heed to their concerns.

The local community should be able to file complaint regarding social issues; heed to their complaint. Maintain liaison with the local community.

#### **4.3.1.8 Potential security issue and mitigation measures to be taken**

Security issue can be in the form of theft, vandalism and sabotage. This is already mentioned in the Construction Phase. Unlike the hectic nature of works during the Construction the working atmosphere during the Operation Phase is stable.

However, security tends to slacken when plant operation is going on for several years. So for the long term Operation Phase the plan for security should be more practical. It is expected that the permanent employees hand-picked by the company's authority will not pose any security threat to the mining site. But outsiders, the locals, can at one time or another can cause security issues such as theft and vandalism.

#### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

- Draw up a security management plan.
- Undertake effective walling of the whole compound.
- Effectively control all accesses; set up security gates, deploy adequate guards.
- Do not let the workers enter the neighbouring village without preauthorization.
- Do not let workers mingle freely with locals.
- Store certain valuable materials under lock and key as far as possible.

- Apply punitive measures, such as suspension or termination of employment, if necessary.
- Provide ID cards for all workers for easy identification.
- Also provide uniforms for all workers.
- Regularly monitor the security system; check wall or fence and gate and security guards to ensure effective security.

#### **4.3.1.9 Impacts not anticipated**

The following usual impacts are not anticipated during the Operation Phase:

- (a) There are no natural flora or natural forest or bush land to be impacted.
- (b) There is no surface water environment --- eg. water courses and water body to be impacted.
- (c) There will be no impact on the socio-economic life of the community --- eg. village infrastructure, houses, public utilities, amenities, cultivated land, drinking water source to be impacted.
- (d) No impact on the cultural, religious, historical and geological components to be impacted --- eg. no Buddhist monastery, pagoda, church, mosque, hinder temple, no historical monument, no geological site or object etc nearby to be impacted.
- (e) No impact on the visual component --- eg. no buildings and structures that are huge and standout prominently against the surrounding. There are no outstanding structures or land marks to be impacted. East-West Seed will not use excessive bright light at night that can pose light pollution and attract large number of insect at night to their death.

#### **4.3.1.10 Positive (beneficial) impacts**

During the Construction Phase (I) of the project 20 construction workers were employed for two years. The project has boosted to a certain extent, the local economy and economic benefits to the local, who are involved in provision of basic building materials, eg. sand, gravel, earth, bricks. Some local have able to sell their produces and/or have catered for the workers of the Construction Phase. As Construction Phase (II) will continue similar benefit can be expected.

During the long Operation Phase 84 permanent jobs for the local and 5 for the foreign technicians will be provided.

On national level the project has already brought to the country in the form of direct investment of US\$ 6,000,000 for the project. This will contribute to the increase of GDP of the nation. The country has benefited from increase in investment, increase in employment, increase in earning, increase in taxes, duties and revenues etc.

The most important benefit will be the provision of high quality vegetable seeds for the farmers and vegetable growers. Being an agricultural nation this most important benefit cannot be overstated. East-West Seed (Myanmar) Co., Ltd is not simply doing business for its own benefit but will introduce new technology and advanced horticultural knowledge in Myanmar and enhance knowledge transfer to the agricultural sector of the nation. The project can contribute to improving farmers' incomes and productivity by using high quality seeds. Most of all the project can contribute to the improvement of quality vegetables for both domestic and export market and hence the economic development of the nation.

While East-West Seed (Myanmar) Co., Ltd shall try to mitigate or minimize negative impacts it shall, on the other hand, enhance and maximize the positive impacts to their optimum.

#### **4.4 During the Decommissioning Phase**

At the end of the long Operation Phase (30 years) the project will be terminated and decommissioning task will have to be undertaken. The decommissioning task, in brief, includes:

- Isolation of the site and shutdown.
- Dismantling and demolition of the buildings and structures.
- Put up machinery and equipment that are still useable for sale or send to smelting mill as iron scrape.
- Put up old construction materials for sale or disposed of at appropriate dump site.
- Restoration of the ecology of the site.

(In this project context the seed factory can probably be still operational after 30 plus years of operation. East-West Seed (Myanmar) Co., Ltd shall then decide if the plant will be redeployed or decommissioned. Since this will happen 30 plus years later this report deals only with the Decommissioning Phase.)

##### **4.4.1 Impacts/potential impacts during the Decommissioning Phase**

###### **4.4.1.1 Occupational health and safety issue and mitigation measures to be taken**

As in the case during the Construction Phase the impact such as accidents in work place, due to lack of management and training, can occur. This can be prevented and/or mitigated.

###### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

- Plan and manage for safe and effective decommissioning work.

- Hire decommissioning contractor for the demolition of buildings and structures and dismantling of equipment; and also tidying up the site.
- Dispose those that are no longer useable at an approved land fill.
- Machinery and equipment that are obsolete must be made into iron scrap and sent to smelting mill.
- Remove all soil contaminated by oil spill and dispose of at an approved land fill or dump site.
- Put up for sale or reuse certain equipment that are still usable.
- Level the ground; plant trees and commence rehabilitation work and restore the site to its original condition.

#### **4.4.1.2 Potential residual impacts and mitigation measures to be taken**

After 30 plus years of operation the soil can be contaminated by fuel spills or residual chemicals including those that are hazardous. The contaminated soil has to be removed and disposed of to an approved landfill. The last chemical testing may be required. The soil structure/profile has to be restored to its quasi-original condition as practical as possible.

#### **Mitigation measures to be taken**

East-West Seed (Myanmar) Co., Ltd shall take the following mitigation measures:

- Plan and manage for effective removal and clearing of all residuals.
- Test the soil for any contamination by fuel oils or hydrocarbons; hire technicians
- Also test the water in the vicinity (ground water) for pollutants; hire technicians.
- Remove soils contaminated by fuel oils and chemical-; dispose at an approved land fill.
- Ensure that all contaminants are removed; conduct final chemical testing.
- Also remove all other residuals, if any, resulting from 3 plus decades of activities.
- Test the air, water and soil for the last time to ensure that none are contaminated; no trace of pollution left.
- Restore the soil to its natural condition as far as possible and commence rehabilitation task; continue the work until a green zone is created (or) put up the plot for sale (or) redeploy the plot for any business.

## **5. OVERALL BUDGET FOR IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT PLAN (EMP)**

Since EMP involves the management of all environmental issues there have to be adequate budget for the implementation of EMP.

This budget will be only for the implementation of EMP but it will cover the procurement of certain devices, and equipment for uses in monitoring and certain materials for uses in emergency aspects eg- PPEs first aid facility medicines etc.

In order to effectively execute EMP and MP the company has set up a fund for the implementation of EMP and MP (in addition to a separate fund for the implementation of CSR). 5% of the project budget, (that is USD 300,000) is set aside for EMP fund which will cover the initial costs and the recurring expenses for the effective implementation of EMP and MP.

### **5.1 Implementation**

Implementation of EMP will be undertaken by the staff of the seed processing plant. A small nucleus organization (EMP cell) comprising 5 staffs and 2 locals is formed. The supervisor, U Naing Win Aung, is the EMP cell leader and all other 6 are EMP cell members.

<b>Sr no.</b>	<b>Name</b>	<b>Destination</b>	<b>Responsibility</b>
1.	U Naing Win Aung	Supervisor	EMP cell leader
2.	U Sai Tin Say Nom	Technician	Cell member
3.	U May Lin Oo	Technician	Cell member
4.	U Lin Maung Maung	Technician	Cell member
5.	U Ye Lin Tun	Technician	Cell member
6.	U Kyaw Soe	Village administrator	Cell member
7.	U Kyaw Oo	Villager	Cell member

A few more staff will be added to the list if necessary. This EMP cell will supervise and implement EMP.

EMP is a new subject even in many developed countries and so Myanmar does not have competent expertise yet, regarding EMP work. It is not yet possible to hire a contractor and party for execution of EMP as no such contractor exists in Myanmar yet.

The company has to make do with his staff for the implementation of EMP.

U Naing Win Aung will be the leader of the organization, EMP cell. U Sai Tin Say Nom will be Environmental Protection Officer. His duty is to familiarize all workers/employees with impacts/potential impacts and the subsequent mitigation measures to be taken for each and



every impact. He shall also educate employees for environmental awareness and execution of environmental friendly practices --- eg. minimize the use of water, fuel, electricity.

U Lin Maung Maung will be Safety Officer. He is responsible for creation of safety working place and environment. He is also responsible for educating, training and supervising workers for all aspects of good working practice, good safety practices and good health and hygiene practices eg. safety handling, operation and maintenance of machinery, equipment, vehicles, lifts etc; the safety handling and application of chemicals etc.

Most of all EMP cells will be also involved in all monitoring activities.

The two villagers are simply to watch the EMP activities to ensure transparency in EMP activities.

The monitoring works will cover the Construction Phase, Operation Phase and Decommissioning Phase of the project life. The EMP cell leader (monitoring committee leader) members are responsible for execution of the EMP and monitoring programme.

The EMP fund (USD 300,000) will be used for the actual implementation of EMP during the Construction Phase and Operation Phase.

Because the Decommissioning/Rehabilitation Phase will come 30-50 years later the EMP budget for this last phase will be raised only during the last year of the Operation Phase.

Since mitigation and monitoring are integral part of EMP (and each and every EMP has to be based from each every impact) all the cost for implementing mitigation and monitoring are actually the main expense for the execution of EMP and MP.

## **5.2 Allotment of EMP fund**

The sub-budgets allotted for each programme under EMP are as follows:

- Cost for organizing EMP - 3% of EMP fund (USD 9,000)
- Cost for capacity building and training - 7% of EMP fund (USD 21,000)
- Cost for procurement of equipment and materials - 25% of EMP fund (USD 75,000)
- Cost for operation of equipment - 5% of EMP fund (USD 15,000)
- Cost for execution and dissemination of EMP in the form of:
  - (a) Taking mitigation action - 25% of EMP fund (USD 75,000)
  - (b) Monitoring action - 20% of EMP fund (USD 60,000)
- Cost for emergency/contingency (allotted for probable emergency cases) - 10% of EMP fund (USD 30,000)

- Miscellaneous (documentation, reporting and casual fees for two villagers, who are members of EMP cell) - 5% of EMP fund (USD 15,000)

Labour cost will be kept at a minimum. Only staffs will be involved in the implementation of EMP. Staff will be first trained for this EMP purpose.

Most of the EMP fund will be used up for the procurement and operation of equipment and materials that are essential for the execution of EMP. eg. firefighting equipment such as fire extinguishers, water jet pumps and other accessories; Personnel Protective Equipment (PPEs) such as outfit, helmet, boot, gloves, goggles, mask, ear plug/ear muff, etc. And also potable equipment for casual measurement of water and air one water pond for firefighting shall be also constructed. In addition adequate First Aid Kits with adequate medicine and drugs and other First Aid Kit accessory will have to be purchased.

Most of the EMP fund will be used up for the implementation of mitigation measures (which an integral part of EMP) and implementation of MP (which is also integral part of EMP). Mitigation and Monitoring have to be carried out almost on a routine basis or daily basis, and that is why a large percentage of EMP has to be used. Sometime experts and/or technicians have to be hired since certain physical and chemical parameters cannot be tested or measured by the staffs.

For capacity building and for training for emergency trainers from Fire Brigade and trainers from the Red Cross Society will have to be hired.

The cost for emergency/contingency programme is difficult to estimate. Unfortunately if a major accident happen this fund has to be considerably increased.

The above mentioned cost estimation is based on the current unit price. Because the project will be implemented over many years (even decades) price fluctuation and inflation will be unavoidable. A contingency amount shall be prepared for any unavoidable event in the future.

## **6. MANAGEMENT AND MONITORING SUB-PLAN FOR EACH IDENTIFIED IMPACT**

Environmental Management Plan (and subsequent monitoring plan) has to be based on each and every negative impact (and subsequent mitigation measures) for its effective and meaningful implementation.

Environmental Management Plan can be also drawn based from generalized impacts on the physical, biological, socio-economic, cultural and visual components of the surrounding environment and also on generalized mitigation measures for impact on each component.

The first option mentioned above is much better since it is comprehensive covering all impacts identified in detail.

Environmental Management Plans and Mitigation Measures are indeed the two different sides of the same coin and each is the integral part of the other, or, in other word, each is the integrated part of the whole.

### **6.1 Management and monitoring sub plan for each identified impact during the project's life**

Management and monitoring sub-plan (MMSP) for each impact (significant or insignificant) are described in tabulated forms for the three phases of the project (Preconstruction/Planning/Design Phase not included).

#### **6.1.1 Management and Monitoring Sub-Plan (MMSP) during the Construction Phase**

**Table-9: During the Construction Phase**

<b>Sr. No</b>	<b>Impacts</b>	<b>Management and monitoring sub-plan (MMSP)</b>	<b>Frequency of monitoring</b>	<b>Responsible persons</b>
1.	Impacts on air environment	- plan and manage for mitigation of dust and smoke - monitor the mitigation actions	- Daily to weekly	- EMP cell members
2.	Impact: noise and vibration	- plan and manage for mitigation of high noise level and vibration - monitor the mitigation actions	- Weekly	- EMP cell members
3.	Impacts on water environment	- plan and manage for protection of water environment - monitor the management works	- Weekly	- EMP cell members
4.	Impacts on soil	- plan and manage on the protection of soil - monitor the management works	- Weekly	- EMP cell members
5.	Impact of wastes	- plan and manage waste control - monitor the management works	- Weekly	- EMP cell members
6.	Potential impact on traffic	- plan and manage traffic - monitor the management works	- Weekly	- EMP cell members
7.	Potential social impact	- plan and manage for prevention/mitigation of		

		social impact - monitor the mitigation actions	- From time to time	- EMP cell members
8.	Potential security issue	- plan and manage for security of the site - monitor the management actions	- Weekly or monthly	- EMP cell members
9.	Occupational health and safety issue	- plan and manage for zero accident - monitor the management works	- Weekly	- EMP cell members

### 6.1.2 Management and Monitoring Sub-Plan (MMSP) during the Operation Phase

**Table-10: During the Operation Phase**

Sr. No	Impacts	Management and monitoring sub-plan(MMSP)	Frequency of monitoring	Responsible persons
1.	Impacts on air environment	- plan and manage for mitigation of dust and smoke - monitor the mitigation actions	- Weekly	- EMP cell members
2.	Impact: noise and vibration	- plan and manage for control of noise and vibration - monitor the management actions	- Weekly	- EMP cell members
3.	Impacts on waste (solid & liquid)	- plan and manage waste control - monitor the management actions	- Daily	- EMP cell members
4.	Potential impact on traffic	- plan and manage traffic - monitor the management actions	- Weekly	- EMP cell members
5.	Potential impact on national demand (gridline)	- plan and manage for the use of electricity within the workframe - monitor the management activities	- Weekly	- EMP cell members
6.	Occupational health and safety issue	- plan and manage for zero accident - monitor the management activities	- Weekly	- EMP cell members
7.	Potential social impact	- plan and manage for prevention/mitigation of		

		social impacts - monitor the management actions	- From time to time	- EMP cell members
8.	Potential security issue	- plan and manage for security of the site - monitor the management actions	- Monthly	- EMP cell members

East-West Seed (Myanmar) Co., Ltd shall implement all the management and monitoring sub-plans (MMSP) mentioned above. 30 plus years later after the end of the long Operation Phase the Decommissioning Phase will arrive. Since the project proponent (the company) is responsible for the whole life (and also the aftermath) management and monitoring sub-plans have to be implemented for this last phase.

### **6.1.3 Management and Monitoring Sub-Plan (MMSP) during the Decommissioning/Rehabilitation Phase**

**Table-11: During the Decommissioning/Rehabilitation Phase**

<b>Sr. No</b>	<b>Impacts</b>	<b>Management and monitoring sub-plan(MMSP)</b>	<b>Frequency of monitoring</b>	<b>Responsible persons</b>
1.	Potential dismantling, demolition and clearing impact	- plan and manage for zero accident at decommissioning site - monitor the management activities	- Weekly	- EMP cell members
2.	Potential residual impacts	- plan and manage soil and water are not contaminated - monitor the management activities	- Weekly	- EMP cell members

## **6.2 Overall generalized EMP for the whole project life**

In addition to implementing each and every sub-plan for management relating to each and every impact the company shall also implement the following overall generalized EMP.

- 1) EMP for application of environmentally sound idea and technology
- 2) EMP for procurement of ecologically friendly equipment and machinery
- 3) EMP for air pollution management
- 4) EMP for water pollution management
- 5) EMP for land pollution management
- 6) EMP for biodiversity protection and conservation

- 7) EMP for protection of the socio-economic component
- 8) EMP for the protection and conservation of the cultural and religious component
- 9) EMP for good working practices and good safety practices
- 10) EMP for conservation of water, fuel and electricity
- 11) EMP for rehabilitation after completion of project
- 12) EMP for maintenance of high Environmental Performance Standards (EPS)

These 12 points are simply enumerated in this report. (These are already mentioned in a direct or indirect ways in **Section-4** in the forms of mitigation/remediation measures.) In addition to implementing each and every sub-plan for monitoring relating to each and every impact the company shall also implement the overall generalized monitoring plan mentioned above.

## **7. CONTENTS FOR EACH SUCH MMSP PLAN**

### **7.1 Objectives**

- To ensure that all EMP and monitoring plan (MP) are implemented and most of all each and every mitigation measures to be taken are not neglected or overlooked and duly taken.
- To ensure that the company comply with environmental laws, rules, regulations and statutory requirements etc.
- To ensure that the workers comply with the above laws, rules and regulations.
- To ensure that there is little or no negative impacts on the environment due to the operation of the project and that should impacts occur all shall be mitigated.

### **7.2 Legal requirements**

These are already described earlier in detail in **Section-2** and will not be repeated here.

### **7.3 Overview maps and layout map**

These are already described earlier in detail in **Section-1** and will not be repeated here.

### **7.4 Implementation schedule**

Environmental Management Plan (EMP) and Monitoring Plan (MP) shall cover virtually all 4 phases of the project life.

The management and monitoring sub-plan (MMSP) shall cover all the four phases of the project.

### During the Preconstruction (Planning) Phase

First of all the authority of the company shall plan and manage for the application of environmentally sound idea and technology.

The authority of the company shall plan and manage for the procurement of eco-friendly machinery, equipment, vehicles and materials etc (that generate less smoke, lower noise level, that consume less fuel oil, use fewer energy etc).

Shall undertake EMP not to have any negative impact on the socio-economic life of the local community eg --- no land grabbing, no forced eviction in the acquisition of land.

### During the Construction Phase

The project proponent shall plan and manage for the construction of the seed processing facility in an eco-friendly manner. The use of eco-friendly building materials and the application of ecologically sound methodology in construction activities will be applied. All the impact/potential impacts anticipated for this construction will be taken into consideration and subsequent mitigation measures duly taken during the construction of the seed processing plant. The construction works will be undertaken with environmental awareness always in mind. The anticipated impacts during this phase will be always kept in mind and the mitigation measures to be taken will be duly taken.

EMP and MP will be executed for the project not to have any negative impacts on the physical, biological, socio-economic, cultural and visual components of the surrounding environment. Ensure that the construction works do not have any negative effect on the socio-economic life of the locals. Should impacts occur compensation will be generously implemented.

### During the Operation Phase

During this long Operation Phase the main task will be sustainable operation of seed processing plant; maintenance and repair works. These works will be undertaken with environmental awareness always in mind. The predicted or anticipated impacts during this long phase will be kept in mind and the subsequent mitigation measures to be taken will be duly put in place.

The task of implementation of EMP and MP during this long phase will cover these aspects: EMP for air, water, land pollution control; and EMP for biodiversity protection and conservation, if any. EMP will endeavor for good working practice and good safety practice for workers; conservation of water, fuel, electricity; and EMP for sustainable operation of the seed processing plant.

### During the Decommissioning/Rehabilitation Phase

After the end of the Operation Phase affective and meaningful decommissioning task will be carried out. The project proponent will ensure that there is no residual impact left and there is

no contaminated soil or substance left. Then re-vegetation of the site will be undertaken. In the aftermath of the project the site will be restored to its original condition.

The generalized implementation schedule is depicted below.

Pre-construction Phase	Construction Phase	Operation Phase	Decommissioning/ Rehabilitation Phase
1-2 year	2 years	30 years EMP (duration)	1 year
		Monitoring Plan (duration)	

**Figure-24: Generalized time frame for planning and implementation of management and monitoring plan during the enter life (4 phases) of the project (not in same scale for duration)**

EMP shall commence since the start of the Preconstruction Phase of the project, through Construction Phase and to the end of the Operation Phase (and probably into half the duration of Decommissioning Phase, depending on situation).

MP shall commence from the start of the Construction Phase, through the Operation Phase and to the end of the Rehabilitation Phase.

## 7.5 Management actions and content for each MMSP

### 7.5.1 Organization to implement EMP

To effectively carry out EMP works a small nucleus organization, the EMP cell will be formed.

This has been already described in **Section-5.1** and will not be repeated here.

Monitoring will be the main portion of EMP.

The monitoring works will cover the Construction Phase, Operation Phase and Decommissioning Phase of the project life. The EMP cell leader (monitoring committee leader) and members are responsible for execution of the EMP and monitoring programme.

They shall be specially trained for doing this. As for monitoring specific parameters eg- air quality, water quality and soil, technicians or experts from Yangon shall be hired to do the analysis works.

It is not pragmatic for the EMP members, especially the five employees, of the company to get involve solely in EMP and MP activities because their main task is for the routine seed



processing works while EMP and MP activities are actually supplementary works. The company shall not be in a position to set aside 5 well-paid employees just to engage in EMP or MP work alone; it will otherwise result in under-staffed situation for the project. Therefore the EMP cell leader and members have also to get involved in the routine operation work as far as possible. An additional 5 employees will be deployed as assistant EMP cell members if necessary.

In developed countries there are EMP contractors, it is learnt. As there are none in Myanmar yet, the company will have to train its staffs for execution of EMP and MP. And EMP is a new subject even in developed nations).

### 7.5.2 Contents for each sub-plan (MMSP)

Management and monitoring sub plan for each identified impact are already mentioned earlier in **Section-6.1**.

Contents for each sub plan (MMSP) are shown in tabulated form.

#### (1) Content for each sub plan during the Construction Phase

**Table-12: During the Construction Phase**

Sr. no.	Management and monitoring sub plan (MMSP)	Content
1.	MMSP for impact on air environment	<ul style="list-style-type: none"> <li>- Manage dust and smoke.</li> <li>- Comply with NEQ guideline of ECD.</li> <li>- Avoid open burning of debris.</li> <li>- Suppress dust with water spray.</li> <li>- Restrict vehicular movements, reduce the speed.</li> <li>- Stop earth work or loading and unloading of earth, sand when strong wind is blowing.</li> <li>- Limit open stockpiles of earth, sand, lime powder.</li> <li>- Minimize drop height when loading and unloading earth and other loose materials.</li> <li>- Plant fast growing trees to trap dust.</li> <li>- Procure equipment and vehicles that are eco-friendly.</li> <li>- Keep equipment and vehicle well-maintained and well-operated.</li> <li>- Use fuel with low sulphur content.</li> <li>- Provide adequate PPEs.</li> <li>- Heed to complaint of the local concerning dust and smoke.</li> <li>- Re: <b>Section-4</b>.</li> <li>- Monitor all the management activities.</li> </ul>
2.	MMSP for noise and vibration	<ul style="list-style-type: none"> <li>- Manage noise and vibration.</li> <li>- Comply with NEQ guideline of ECD.</li> <li>- Procure eco-friendly equipment and vehicles.</li> <li>- Restrict noise to working hours only (no work at night).</li> <li>- Install silencers on certain machinery.</li> <li>- Switch off or throttle down equipment during idle hours.</li> <li>- Limit/restrict the movement and speed of vehicles.</li> <li>- Keep equipment and vehicles well maintained and well-</li> </ul>

		<p>operated.</p> <ul style="list-style-type: none"> <li>- Manage vibration (of machinery, vehicles); provide suitable foundation.</li> <li>- Plant fast growing trees to absorb noise.</li> <li>- Provide PPEs.</li> <li>- Heed to the complaint of the local regarding noise.</li> <li>- Re: <b>Section-4.</b></li> <li>- Monitor all the management activities.</li> </ul>
3.	MMSP for impact on water environment	<ul style="list-style-type: none"> <li>- Try to minimize the use of water</li> <li>- Educate workers for conservation of water</li> <li>- Avoid indiscriminate disposal of waste (solid, liquid) in to the water courses, if any</li> <li>- Bund fuel depot to prevent spread of spilled oil.</li> <li>- Check water quality regularly</li> <li>- Avoid accidental spillage of chemical and fuel oil into any water body.</li> <li>- Should accidental spillages occur do not want down with water; use absorbent for clear up to prevent percolation of oil to underground water</li> <li>- There is no water course (surface water) nearby but avoid by ground water</li> <li>- Manage temporary latrines of construction workers to prevent impact on ground water; sprinkle sand, dust, or ash regularly to mitigate odour and percolation</li> <li>- Monitor the mitigation works</li> <li>- Re: <b>Section-4.</b></li> </ul>
4.	MMSP for impact on soil	<ul style="list-style-type: none"> <li>- Manage the soil.</li> <li>- Avoid unnecessary destruction of soil profile.</li> <li>- Separate top soil from sub-soil (separate stockpiles); top soil for re-vegetation; sub-soil for construction.</li> <li>- Keep stockpiles from physical disturbance (wind, water).</li> <li>- Prevent soil erosion and siltation.</li> <li>- For stabilization of stockpiles plant grass (or let them grow) on the stockpiles.</li> <li>- After construction work resurface and stabilize exposed ground.</li> <li>- Do not keep the ground bare for long period during wet season.</li> <li>- Rake and restore soil compacted by vehicles or machinery.</li> <li>- Avoid fuel oil spill on soil; remove the spill immediately; do not wash down with water but use absorbent.</li> <li>- Train workers for handling of fuel and cleanup of spills.</li> <li>- Display warning sign at fuel depot.</li> <li>- Re: <b>Section-4</b> for more.</li> <li>- Monitor all the management activities.</li> </ul>
5.	MMSP for impact of waste (especially debris, construction tailing)	<ul style="list-style-type: none"> <li>- Manage solid waste</li> <li>- Comply with rules and regulations</li> <li>- Avoid open burning of debris</li> <li>- Dump waste at approved landfills</li> <li>- Educate and train workers for good house keeping</li> <li>- Put up left over construction materials for sale</li> </ul>

		<ul style="list-style-type: none"> <li>- Hire a contractor for tidying up the site after completion of construction work</li> <li>- Monitor the mitigation works</li> <li>- See also <b>Section-4</b> for more.</li> </ul>
6.	MMSP for potential impact on traffic	<ul style="list-style-type: none"> <li>- Plan and manage traffic</li> <li>- Schedule the timing for vehicular movement,</li> <li>- Educate the drivers for defensive driving</li> <li>- also educate employees for safety driving of car and riding of motorcycles</li> <li>- Try to maintain zero road accident</li> <li>- Keep vehicle well-operated, well-maintained and well-lubricated</li> <li>- Educate heavy truck driver for driving with reduced speed</li> <li>- Do not overload the truck; comply with regulation</li> <li>- Avoid spilling of earth or other materials from truck during transportation</li> <li>- Reduce the speed when driving near or through a village</li> <li>- Set up speed limit at appropriate spot along access road</li> <li>- Monitor the mitigation effort</li> <li>- See also <b>Section-4</b> for more.</li> </ul>
7.	MMSP for potential social impact	<ul style="list-style-type: none"> <li>- Avoid the potential negative impacts on the socio-economic life of the locals</li> <li>- Maintain good relation with the locals</li> <li>- Conduct public consultations from time to time; heed to their opinions</li> <li>- Educate workers for appropriate behaviours when dealing with locals</li> <li>- Manage misbehaviour and social illness of workers</li> <li>- Keep separate dormitories for male and female workers</li> <li>- Ask the construction contractor to discipline his workers</li> <li>- Apply punitive actions for wrong doer</li> <li>- Prohibit the drinking of alcohol during working hours; ban the use of narcotics</li> <li>- Train workers for good housekeeping</li> <li>- Heed to the voice of the locals</li> <li>- Monitor the mitigation works</li> <li>- See also <b>Section-4</b> for more.</li> </ul>
8.	MMSP for potential security issue	<ul style="list-style-type: none"> <li>- Manage for the security of site</li> <li>- Wall or fence the site</li> <li>- Control all accesses; set up gates and deploy security guards</li> <li>- Do not let workers enter the neighbouring village without pre-authorization;</li> <li>- Do not let them mingle freely with locals (Construction Phase only)</li> <li>- Keep certain materials under lock and key</li> <li>- Ask the building contractor to discipline his workers (construction phase only)</li> <li>- Take punitive actions for wrong doer</li> <li>- Monitor the mitigation works</li> <li>- See also <b>Section-4</b> for more.</li> </ul>
9.	MMSP for occupational health	<ul style="list-style-type: none"> <li>- Plan and create safety condition for work place during the</li> </ul>

	safety issue	<p>Construction Phase.</p> <ul style="list-style-type: none"> <li>- Ask the building contractor to educate and train his workers in good safety practice, good working practice and good housekeeping practice.</li> <li>- Try to achieve zero accident.</li> <li>- Provide adequate PPEs to workers.</li> <li>- Draw up a plan for emergency; carefully plan effective emergency contingency response and procedures.</li> <li>- Train some workers for firefighting while some for first aid programme.</li> <li>- Provision of firefighting equipment and tools; provision of first aid kits and adequate medicines.</li> <li>- Provide adequate PPEs.</li> <li>- Give priority to installation of lightning rods and arresters.</li> <li>- Apply safe and effective procedures for storage of fuel and chemical.</li> <li>- Display warning signs.</li> <li>- Accidents, or near-misses to be duly reported.</li> <li>- Display addresses/phone numbers of Fire Brigade, Ambulance Service, Hospital, Police Station.</li> <li>- Take out insurance for the plant and also fire insurance.</li> <li>- Educate workers for safety awareness and also awareness of health and hygiene.</li> <li>- Provide proper sanitation facility, eg. bath rooms, toilets etc.</li> <li>- Re: <b>Section-4</b> for more.</li> <li>- Monitor all the management activities.</li> </ul>
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(2) Context for each sub-plan during the Operation Phase

**Table-13: During the Operation Phase**

Sr. no.	Management and monitoring sub plan (MMSP)	Content
1.	MMSP for impact on air quality	<ul style="list-style-type: none"> <li>- Comply with NEQ emission guideline by ECD</li> <li>- Try to control and mitigate air emission as practical as possible</li> <li>- Procure eco-friendly equipment/machinery/vehicles that generate less smoke</li> <li>- Apply ash reduction equipment, eg. dust collector, filter bag</li> <li>- Proper training, operation and maintenance of machinery/equipment</li> <li>- Avoid open burning of solid waste</li> <li>- Restrict vehicular movements</li> <li>- Prevent spillage of earth and sand,</li> </ul>

		<ul style="list-style-type: none"> <li>- Plant trees around the compound to mitigate dust and smoke</li> <li>- Spray water for dust suppression.</li> <li>- Provide adequate PPEs to workers</li> <li>- Monitor the mitigation works</li> <li>- See also <b>Section-4</b> for more.</li> </ul>
2.	MMSP for noise and vibration	<ul style="list-style-type: none"> <li>- Comply with NEQ guideline by ECD</li> <li>- Try to manage and mitigate noise and vibration</li> <li>- Procure machinery/equipment/vehicle that are eco-friendly; emitting lower noise level</li> <li>- Maintain and operate machinery/vehicle well</li> <li>- Install silencer</li> <li>- Install noise barrier/sound insulation</li> <li>- Limit the speed of truck</li> <li>- Install absorber on machine that vibrate violently</li> <li>- Implement stable foundation</li> <li>- Create green belt to absorb noise</li> <li>- Provide PPEs</li> <li>- Monitor the mitigation actions</li> <li>- See also <b>Section-4</b> for more.</li> </ul>
3.	MMSP for impact of wastes (solid, liquid)	<p><u>For solid waste</u></p> <ul style="list-style-type: none"> <li>- Plan and execute management of solid waste</li> <li>- Educate and train staffs for good housekeeping; do not litter, do not dirty</li> <li>- Use appropriate waste bins</li> <li>- Avoid indiscriminate disposal of solid waste</li> <li>- Avoid open burning of solid waste</li> <li>- Always avoid contamination of solid and hence underground water due to waste duly dispose waste at landfill if not incinerate</li> </ul> <p><u>For liquid waste</u></p> <ul style="list-style-type: none"> <li>- Plan and execute for management of water including conservation</li> <li>- Comply with NEQ: effluent guideline (<b>Section-2</b>)</li> <li>- Educate, train and supervise workers for good working practice and good housekeeping practice and for efficient use of water</li> <li>- Treat waste water before discharge (septic tank, soaking pit)</li> <li>- Collect waste oil and dispose at appropriate site</li> <li>- Check and monitor the daily or weekly consumption of water</li> <li>- Re: <b>Section-4</b></li> <li>- Monitor all the management activities</li> </ul>
4.	MMSP for potential impact on traffic	<ul style="list-style-type: none"> <li>- Plan and manage for road safety</li> <li>- Try to achieve zero road accident</li> <li>- Comply with Highway Law, 2000</li> <li>- Set up signage for speed limit at appropriate places</li> <li>- Educate and train the drivers for defensive driving and safety driving (also motorcyclists)</li> <li>- Avoid over loading of truck</li> </ul>

		<ul style="list-style-type: none"> <li>- Conduct public education campaign for road safety</li> <li>- Keep a log book for each vehicle</li> <li>- Schedule vehicular movements</li> <li>- Monitor the mitigation actions</li> <li>- Re: <b>Section-4</b></li> </ul>
5.	MMSP for potential impact on gridline electricity	<ul style="list-style-type: none"> <li>- Plan and execute procurement of eco-friendly machinery, equipment that consume less electricity energy in the first place</li> <li>- Ensure that electricity consumption of the project is within the work frame</li> <li>- Educate staffs for conservation of energy; use energy efficient equipment lightings and other energy efficient equipment and device; apply solar energy in certain aspects – eg. lighting, heating water etc.</li> <li>- Ensure that the backup generator is reliable in case of power outage.</li> <li>- Liaise with Township Electricity authority</li> <li>- Regularly monitor electricity consumption</li> <li>- Re: <b>Section-4</b></li> </ul>
6.	MMSP for occupational health and safety issue	<p>(i) <u>For overall mitigation for OHS issue</u></p> <ul style="list-style-type: none"> <li>- Plan and manage for a safe and health atmosphere inside the factory.</li> <li>- Create a safety work place and try to achieve zero accidents at the work place.</li> <li>- Educate, train and supervize workers for good working practice good safety practice good housekeeping practice and good health and hygiene practice until all these practices are ingrained in their mindsets and become good habits.</li> <li>- Especially educate, train and supervize them for skill, for handling and operation of equipment, handling and application of chemicals.</li> <li>- Keep all machinery and equipment well-maintained, well-operated and well lubricated (regular check necessary).</li> <li>- Provide adequate PPEs eg. outfit, boots, helmet, gloves, face mask, goggles, ear muff etc where necessary.</li> <li>- Beware of all the common accidents that used to happen and implement prevention, protection and mitigation measures.</li> <li>- Carefully plan for emergency procedure.</li> <li>- Organize first aid training and firefighting training for some workers.</li> <li>- Provide adequate First Aid Kits well-stocked with medicines and drugs.</li> <li>- Provide adequate Fire Extinguisher, firefighting equipment and other associated device; keep water tank always full for firefighting.</li> <li>- For emergency response organize mock drill and rehearsal from time to time.</li> <li>- Phone numbers and addresses of Red Cross Society, Ambulance Service, Fire Brigade, Police Station,</li> </ul>

		<p>Hmawbe Township Hospital must be displayed so that everyone can see easily.</p> <ul style="list-style-type: none"> <li>- Take out insurance for the plant; and also take out fire insurance.</li> </ul> <p>(ii) <u>For fumigation</u></p> <ul style="list-style-type: none"> <li>- Ensure that the area is well-ventilated. (A critical safety aspect of fumigation.)</li> <li>- Comply with the threshold limits exposure of phosphine (exposure limit is 0.3 ppm; generally &lt; 14 ppm; gas mask OK to 15 ppm); or Aluminum Phosphide 12 gm/mt.)</li> <li>- Shall educate, train and super vise staff for conducting fumigation</li> <li>- Comply with regulation and detail procedure for fumigation</li> <li>- Provide PPEs especially face mask, mouth and nose cover for respiratory protection. (Respirator (gas mask) is the best; totally avoid inhalation by all means.)</li> <li>- Shall take scrupulous care and ensure that fumigant does not come into contact with the skin</li> <li>- Effected area of the skill shall be washed thoroughly with soap and water</li> <li>- If clothing and foot wears become contaminated they shall be removed immediately.</li> <li>- Warning sigh shall be put in appropriate place and removed after fumigation treatment is completed</li> <li>- Aerate the area after treatment; after adequate aeration ensure that harmful level of gas does not subsequently accumulated</li> <li>- Keep the bin closed and post warning signs until the gas concentration is below 0.3 ppm.</li> <li>- Do not enter the bin during or after fumigation until gases have been reduced to safe concentration (0.3 ppm)</li> <li>- Shall conduct regular medical checkup of fumigation crew</li> <li>- Monitor mitigation activities</li> <li>- <b>Re: Section-4</b></li> </ul>
7.	MMSP for potential social impact	<ul style="list-style-type: none"> <li>- Prevent or minimize negative impact on socio-economic life of the local</li> <li>- Build and maintain good relation with locals</li> <li>- Hold public consultation from time to time</li> <li>- Educate the workers for etiquette, and respect the custom and tradition of the locals</li> <li>- Manage misbehaviours and social illness of workers</li> <li>- Keep separate housing for male and female workers</li> <li>- Provide proper training on work place regulation and code of conducts</li> <li>- Provide welfare programme</li> <li>- Educate and discipline workers</li> <li>- Deal with workers on a fair and square basis</li> <li>- Take punitive action to wrong doer</li> <li>- Prohibit the drinking of alcohol during working hours;</li> </ul>

		ban the use of narcotics - Provide adequate sanitation eg-toilet, baths etc. - Heed to the voice of the locals - Plan and implement CSR as practical as possible - Monitor the mitigation actions - Re: <b>Section-4</b>
8.	MMSP for potential security issue	- Manage security of the site - undertake effective fencing/walling of the site - Control all accesses; set up security gates; deploys guards - Do not let workers mingle freely with locals - Do not let the workers enter the neighbouring village without pre-authorization; - Put certain materials under lock and key - Apply punitive measures to wrong doer - Provide ID cards for all for easy identification - Provide uniform for all - Monitor the mitigation works - See also <b>Section-4</b> for more.

(3) Contents for each sub-plan during the Decommissioning Phase

**Table-14: During the Decommissioning Phase**

Sr. no.	Management and monitoring sub plan (MMSP)	Content
1.	MMSP for Occupational Health and Safety issue	- Plan and manage for effective decommissioning of site. - Hire decommissioning contractor to do the work. - Dispose materials that are no longer useable; redeploy or put up for sale those that are useable. - Restore the ground and soil profile. - Revegetate and rehabilitate the ground; plant trees. - Remove and clear all debris and tidy up the place. - Re: <b>Section-4</b> for more. - Monitor all the management activities.
2.	MMSP for potential residual impacts	- Plan and manage for effective decommissioning and rehabilitation. - Clear and remove all residuals, if any. - Remove all soil contaminated by fuel oils or chemicals; if any. - Test the soil; ensure that no contaminants remain. - Also test the river water for possible pollutant. - Restore the soil to its natural condition. - Revegetate and rehabilitate the site. - Re: <b>Section-4</b> for more. - Monitor all the management activities.



## 7.6 Monitoring Plan

Members of the EMP cell will carry out the monitoring activities.

**Table-15: Summary of monitoring programme in tabulated form for the Construction Phase (tabulated form)**

Sr. No	Components	Parameters to be monitored	Frequency	Responsible persons
1.	Weather	- monitor weather - listen to weather news (meteorology news), forecasts	- Daily - Daily	- EMP cell members - EMP cell members
2.	Mobilization and preparation works	- monitor the haulage of trucks - monitor stockpiling, storage of building materials	- Daily - Weekly	- EMP cell members - EMP cell members
3.	Traffic	- monitor schedule of vehicle movements	- Weekly	- EMP cell members
4.	Air environment	- monitor SO <sub>2</sub> , NO <sub>2</sub> , PM and others, if possible	- Once	- Hired technicians
5.	Noise and vibration	- monitor noise level in dBA	- Once	- Hired technicians
6.	Contamination of soil and ground water	- monitor spillage of fuel oil, grease, hydraulic oils etc	- Weekly	- Hired technicians
7.	Erosion and siltation	- monitor earth work and drainage system	- Weekly (during rainy season)	- EMP cell members
8.	Water environment	- monitor pH, oil & grease, TDS, TSS, BOD, COD, sulphate, nitrate, chloride	- Once	- Hired technicians
9.	Waste (solid), construction tailings, debris	- monitor type, amount generated, reused, recycled, transported off site and disposal	- Weekly	- EMP cell members
10.	Biodiversity component	- monitor clearing of vegetation - monitor the nursery of saplings for planting during Operation Phase	- Monthly - Monthly	- EMP cell members - EMP cell members
11.	Social illness; disciplinary action	- monitor the conducts of workers - monitor the effectiveness of disciplinary action	- Weekly or monthly - From time to time	- EMP cell members - EMP cell members
12.	Emergency, health and safety	- monitor facilities for emergency preparedness - monitor emergency and response programme - monitor training (firefighting and first aid) and drills and their effectiveness	- Quarterly  - From time to time - Regularly	- EMP cell members  - EMP cell members - EMP cell members

13.	Potential security	- monitor performance of security staffs	- From time to time	- EMP cell members
14.	Construction work	- monitor overall construction work for health and safety	- Daily	- EMP cell members
15.	Material procurement and consumption	- monitor procurement of building materials, and consumption	- Weekly or monthly	- EMP cell members
16.	Fuel oil consumption	- monitor oil purchased, used, used oil generated, oil waste	- Weekly or monthly	- EMP cell members
17.	Routine operation of equipment	- monitor operation hours of equipment - distance traveled of vehicles - log books	- Weekly  - Weekly - Weekly	- EMP cell members  - EMP cell members - EMP cell members
18.	Buildings, structure and facility	- Monitor the progress in construction works	- Weekly	- EMP cell members

**Table-16: Summary of monitoring programme in tabulated form for Operation Phase (tabulated form)**

Sr. No	Components	Parameters to be monitored	Frequency	Responsible persons
1.	Weather	- monitor weather - listen to weather news, forecasts	- Daily - Daily	- EMP cell members
2.	Air quality	- monitor SO <sub>2</sub> , NO <sub>2</sub> , PM and other, if possible	- Annually	- Hired technicians
3.	Noise and vibration	- monitor noise level in dBA	- From time to time	- Hired technicians
4.	Soil	- monitor contamination of soil (if any) - monitor erosion and siltation	- From time to time  - During rainy season	- Hired technicians  - Hired technicians
5.	Water quality	- test pH, oil & grease, TSS, TDS, BOD, COD chloride etc	- Annual	- Hired technicians
6.	Water	- monitor water consumption - monitor flow rate and water level at the river	- Weekly - Monthly	- EMP cell members - EMP cell members
7.	Waste water	- monitor amount generated, treated, recycled and reused	- Weekly	- EMP cell members
8.	Solid waste	- monitor trash and general waste amount generated, reused or landfilled, or incinerated	- Weekly	- EMP cell members
9.	Traffic	- monitor schedule of vehicle movement, log book for each vehicle	- Weekly	- EMP cell members
10.	Materials	- monitor all materials purchased,	- Monthly	- EMP cell members

	procurement	consumed and unaccounted for		
11.	Fuel oil consumption	- monitor oil purchased, used, used oil generated, oil waste	- Monthly	- EMP cell members
12.	Energy consumption	- monitor electricity consumption units	- Weekly	- EMP cell members
13.	Routine operation of machinery equipment etc.	- monitor operation hours of equipment and machines - monitor distance travelled of vehicles - monitor log books	- Weekly - Weekly - Weekly	- EMP cell members - EMP cell members - EMP cell members
14.	OHS measures taken	- monitor Occupational Health Safety measures taken	- Weekly	- EMP cell members
15.	Emergency	- inspect facilities for emergency preparedness - monitor training (firefighting and first aid) and drill for emergency - monitor overall occupational health and safety including occupational accident and diseases	- Quarterly - Regularly - From time to time	- EMP cell members - EMP cell members - EMP cell members
16.	Social illness	- check disciplinary action taken - monitor conducts of workers	- From time to time - Regularly	- EMP cell members - EMP cell members
17.	Security	- monitor performance of security staffs	- Weekly	- EMP cell members
18.	Capacity building	- monitor effectiveness of capacity building programme and other training including first aid	- From time to time	- EMP cell members
19.	Environmental performance standard	- monitor the overall programme for high environmental performance standard - monitor the overall effectiveness of pollution management	- Monthly - Monthly	- EMP cell members - EMP cell members
20.	Compliance with regulation, a legal requirement	- monitor all main activities to ensure compliance with legal requirement and corporate commitment	- Monthly	- EMP cell members
21.	Effectiveness of mitigation measures	- monitor mitigation measures taken and check their effectiveness	- From time to time	- EMP cell members
22.	Green belt and landscaping	- monitor the creation of green belt and landscaping - monitor the maintenance of green belt and landscaping	- Weekly - Monthly	- EMP cell members - EMP cell members

23.	Occupational health and safety	<ul style="list-style-type: none"> <li>- monitor the condition of work place; to ensure that there is progress</li> <li>- keep a log book on accidents injuries, sickness</li> </ul>	<ul style="list-style-type: none"> <li>- From time to time</li> <li>- From time to time</li> </ul>	<ul style="list-style-type: none"> <li>- EMP cell member</li> <li>- EMP cell member</li> </ul>
24.	Community health and safety	<ul style="list-style-type: none"> <li>- monitor the activities taking place in the seed processing plant</li> <li>- keep a log book for accident, injuries and sickness, if any, happening inside the compound</li> </ul>	<ul style="list-style-type: none"> <li>- Daily</li> <li>- Daily</li> </ul>	<ul style="list-style-type: none"> <li>- EMP cell member</li> <li>- EMP cell member</li> </ul>
25.	Local employment	<ul style="list-style-type: none"> <li>- monitor the local employment condition; prioritize locals employment whenever vacant post occurs</li> </ul>	<ul style="list-style-type: none"> <li>- From time to time</li> </ul>	<ul style="list-style-type: none"> <li>- EMP cell member</li> </ul>

### 7.6.1 Summary of monitoring program for Decommissioning Phase

**Table-17: Summary of monitoring programme in tabulated form for Decommissioning Phase (tabulated form)**

Sr. No	Components	Parameters to be monitored	Frequency	Responsible persons
1.	Decommissioning and Rehabilitation (at the end of project)	<ul style="list-style-type: none"> <li>- monitor the Decommissioning process</li> <li>- monitor rehabilitation process</li> </ul>	<ul style="list-style-type: none"> <li>- Daily</li> <li>- Monthly</li> </ul>	<ul style="list-style-type: none"> <li>- EMP cell members</li> <li>- EMP cell members</li> </ul>

### 7.7 Project budget and responsibility

The overall budget for implementation of EMP has been already mentioned earlier (**Section-5**).

- Five percent of the project budget, that is, USD 300,000 is set aside as EMP fund.
- 25% of this EMP fund, that is USD 75,000 is allotted for the implementation and taking action for mitigation measures. Actually this is considered only for the Operation Phase as the Construction Phase is already completed. As mitigation measures here to be taken on a regular (almost a daily routine) basis throughout the Operation Phase most of the EMP fund is allotted for this programme.
- 5% of the EMP fund, that is USD 15,000, is allotted for implementation of monitoring plan. It is expected that monitoring work needs less money than mitigation work. However, technicians have to be hired from time to time, eg. every 6 months for testing and monitoring air, water and soil quality. It is roughly estimated that the specific fund for MP can cover at least 5 years. Depending on condition more money may have to be added to the EMP fund later.

As mentioned earlier price fluctuation and inflation are unavoidable. And this will be taken into consideration in the allotment of the fund.

All the EMP cell members are responsible for the execution of EMP and MP. Reserves cell members are also responsible for this task. Contractor will not be hired for doing EMP and MP. Of course there are no such contractors in Myanmar yet.

## **8. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE**

### **Note**

During the EMP field survey a public consultation meeting was held at Ta Gu Tone village. And that is a practice normally conducted by MESC during its EIA, IEE and EMP field studies. And as the official format for EMP does not include the chapter/section on public consultation that chapter was deliberately omitted.

Now in accordance with the instruction from ECD this chapter on public consultation is incorporated in this amended EMP standalone report.

### **8.1 Methodology and approach**

Standard methodology applied here includes:

- (i) **Consensus building:** First of all a pre-sensitizing visits to the local authority (Village Administrator and party, elders) and briefing on the proposed project was carried out, and ask for their approval and assistant for holding the public consultation.
- (ii) **Transect walk:** site visit (visit to the village) and conduct observation and visual inspection.
- (iii) **Actual public consultation meeting:** mainly involves disclosure of the proposed project and giving complete and accurate information; consultation mainly in the form of two-way conversation --- listening and talking; waiting for their response; further discussion.
- (iv) **Interviews and discussions:**
  - In the form of KII/SS, (Key Informant Interview/Secondary Source) for the gathering of secondary baseline socio-economical data and community profile with the aid of questionnaires (pre-designed questionnaire).
  - In the form of FGD (Focal Group Discussion); interview with few selected people (authority, knowledgeable persons) especially for ranking the pressing need of the locals for prioritizing the needs for community assistance and implementation of CSR.

## 8.2 Summary of consultation and activities taken

### At Ta Gu Tone village,

Date : 20-7-2018

Time : 12:45hrs to 14:30hrs

Venue : Residence of the Village Administrator, U Kyaw Soe

Attendance : 13 persons from the village (Every household was invited but rate of attendance was low)

### **Minutes of meeting**

U Naing Win Aung, responsible officer East-West Seed (Myanmar) Co., Ltd: The headquarter of our company is in Thailand. Vegetable seeds were processed in Thailand about 10 year ago and since 5 years ago seeds were packed in Yangon region. A warehouse for seeds was constructed at Hlegu Town in 2016 and completed in 2017. Since May 2018, we have daily wagers working at the warehouse. Now work at this site is carried out on area of the site. Construction work will be expanded to 4 acres later. We will then employ permanent staff when the operation phase commences. In accordance with instruction by the authority last month we are now conducting EMP study to submit an EMP report to the authority.

U Myint Kyaw Thura, MESC: The Environmental Conservation Law has come to existence in 2012 and since then EIA, IEE and EMP have become legal requirements for all major project to be implemented in the country. Comprehensive studies on the physical and social environment of a proposed project site and its environs have to be duly conducted in accordance with the rules, regulations and procedures prescribed by the Environmental Conservation Department (ECD) of the Ministry of Natural Resources and Environmental Conservation (MONREC) and report have to be submitted. Based on this EMP report the authority will decide whether the proposed project will proceeds taking into consideration concerns of the locals community regarding the project. So I invite all of you to express your views, opinions and concerns, if any, frankly so that we will know the real situation. The company on its part will implement the CSR programme as practical as possible for community assistance and development.

U Kyaw Soe, Village Administrator: I thank the East-West Seed (Myanmar) Company for the project since there is employment opportunities for our villagers. I would like to ask for assistance regarding improvement of village road, community water for the village and village clinic.

U Kyaw Myint, a village elder: I am glad that our unemployed youths will have employment opportunities due to implementation of this project.

U Tin Nwe, a village elder: The main thing I want to say it is employment for our villagers.

U Htun Shwe, a village elder: I like the seed processing plant because it is not a factory that generates smoke and dust. It is also a clean plant.

U Win Shwe, a village elder: I would be nice if we can buy vegetable seeds from this seeds processing plant at a reasonable price.

U Kyaw Soe, the Village Administrator: I too like this plant. Because the salary is good and more than 50 villagers have applied for the jobs at this plant. Since there will be no industrial emissions and wastes I like this plant. What I want to ask for help from the company is for provision of water for the community. Our village need a tube well of 200 feet with 4 inch pipes. The plot needed for the tube well will be 50' x 50'. The estimate cost is Kyat 25 lakhs. At present we have to harvest rain water for uses.

It possible I would like the company for assistance for the renovation of our village middle school. The wall of the school building has yet to be completed due to inadequate budget.

The responsible officer of the company replied that he and his party has documented all the minutes of the meeting and will duly report this matter to the authority of the company.

U Myint Kyaw Thura, MESC: Thank you all for expressing your views, opinions and needs.

The public consultation meeting was ended at 14:30hrs.



**Figure-25: Public consultation meeting**

### **8.3 Result of consultation**

The consultation meeting has progressed smoothly and ended satisfactorily. The villagers are very aware of the fact that this area has been designated officially by the Government as an Agriculture and Livestock Breeding Special Zone (2) since more than a decade ago. There was no case of complaints or concern expressed by the locals. Indeed there was no case of land grabbing, land disputes, forced eviction and forced relocation.

Indeed when this Agriculture and Livestock Breeding Special Zone (2) was established lands were confiscated without any compensation. That was the policy of the previous government and that was done for the sake of national development. That was the situation in 2000. More than 100 acres were confiscated and 30 villagers had lost their land. This is beyond the scope of this EMP study.

The acceptance of the project by the locals seems to be high.

The EIA team has recorded and documented all the questions asked and the comments given, by the stakeholders and the participants.

The responsible officer of the company has replied to all the questions asked and has tried to tackle the issue as far as possible. The main issue, ash water was reported back to the authority of the company. The EIA team has also incorporated all the minutes of the consultation meeting in its EIA report.

#### **8.4 Future ongoing consultation**

As mentioned earlier public consultation must be a continuous process throughout the project period, from the Pre-construction Phase, through the Construction Phase and Operation Phase to the Decommissioning Phase. More public consultation meeting should be held later. As regards the long Operation Phase (30 years) there should be regular public consultations annually or bi-annually depending on the situation, or from time to time whenever there is a need for public consultation. This is very important for maintaining the long term cordial relationship with the locals and hence the long term benefit for the business.

The Complaints and Grievances Mechanism (CGM) or Grievance Redress Mechanism (GRM) programme shall be implemented throughout the entire project period. It shall be practical and applicable and effective, not a formality. The public relation officer and EMP cell leader should always give special attention to CGM or GRM.

The complaints handling and response must be effective. A hotline for complaint must be set up. The date and time of complaints; detail of complaint; action taken and if no action is required the reason why must be explained and all recorded and documented.

Future public consultation shall involve the continuation of CSR programme (affordable programme) and donation and charity works as far as possible.

#### **8.5 Information disclosure**

Two days before the public consultation meeting invitation cards were sent to each and every household of the village and were informed of the meeting in advance.

Public consultation meeting held at the Ta Gu Tone village on 20-7-2018 involving the local community, responsible persons from the company and EMP team was made public by mean of launching at the Facebook website page of MESC, [www.http://Myanmar Environment Sustainable Conservation](http://Myanmar Environment Sustainable Conservation).

When the EMP report is approved by the authority it will be launched at the website of the company: [www.eastwestseed.com](http://www.eastwestseed.com). The company will also keep copies of the EMP report at its office in Yangon and also at its project site for any interested person for perusal.



## REFERENCE

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# ANNEX



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ  
စီမံကိန်းနှင့် ဘဏ္ဍာရေးဝန်ကြီးဌာန  
ကုမ္ပဏီမှတ်ပုံတင်လက်မှတ်

အမှတ်...../ ၂၀၁၅-၂၀၁၆ (ရက)

မြန်မာနိုင်ငံ ကုမ္ပဏီများ အက်ဥပဒေအရ အိ(စ်) - ဝက်(စ်) စီ(ဒ်) (မြန်မာ) ကုမ္ပဏီ  
လီမိတက် .....အား ပေးရန်တာဝန် ကန့်သတ်ထားသော လီမိတက်  
ကုမ္ပဏီအဖြစ် ၂၀၁၅.၁၁.၁၆ ရက်နေ့တွင် မှတ်ပုံတင်ခွင့်ပြုလိုက်သည်။

ညွှန်ကြားရေးမှူးချုပ်(ကိုယ်စား)  
(နီလာမူ၊ ညွှန်ကြားရေးမှူး)

ရင်းနှီးမြှုပ်နှံမှုနှင့်ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန

THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR  
MINISTRY OF PLANNING AND FINANCE

### CERTIFICATE OF INCORPORATION

NO. ....668-FC..... of 2015-2016 (YGN)

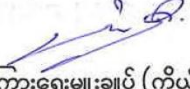
I hereby certify that .....EAST WEST SEED (MYANMAR).....  
COMPANY LIMITED.....is this day incorporated  
under the Myanmar Companies Act and that the company is Limited.

Given under my hand at Yangon this .....SIXTEENTH.....day  
of .....NOVEMBER, TWO THOUSAND AND FIFTEEN.....

For Director General

Directorate of Investment and Company Administration

ဤကုမ္ပဏီမှတ်ပုံတင်လက်မှတ်သည်(၁၆-၁၁-၂၀၁၅)မှ(၁၅-၁၁-၂၀၂၀)  
ရက်နေ့ အထိ (၅) နှစ် သက်တမ်းအတွက်သာ ဖြစ်သည်။ သက်တမ်း မကုန်ဆုံးမီ  
(၃)လအလိုတွင် သက်တမ်းတိုးရန် ရင်းနှီးမြှုပ်နှံမှုနှင့် ကုမ္ပဏီများညွှန်ကြားမှု  
ဦးစီးဌာနသို့လျှောက်ထားရမည်။

  
ညွှန်ကြားရေးမှူးချုပ် (ကိုယ်စား)  
(သက်ပိုင်၊ ဒုတိယညွှန်ကြားရေးမှူး)



# International Seed Testing Association Certificate of Accreditation

This is to certify that the ISTA Member Laboratory **TH03**

***East West Seed Company Limited***

*Quality Assurance*

*T. Sainoi, A. Sainoi, Nonthaburi 11150*

*THAILAND*

is accredited to the ISTA Seed Testing Laboratory Accreditation Standard by ISTA in accordance with Article 15(c)(15) of the Articles of the International Seed Testing Association (ISTA).

**The scope of accreditation includes:**

Sampling from the lot  
Purity and identification of other seeds  
Germination  
Vigour

as detailed in the accompanying appendix to this certificate. This accreditation is valid for three years commencing **26.03.2018** subject to continuing compliance with ISTA requirements. During this period accredited laboratory is authorised to issue ISTA Seed Analysis Certificates.

Bassersdorf 07.08.2018

Craig McGill, ISTA President



This certificate is only valid with the corresponding sticker





## INTERNATIONAL SEED TESTING ASSOCIATION CERTIFICATE OF ACCREDITATION

This is to certify that the ISTA Member Laboratory TH03

East West Seed Company Limited  
Quality Assurance  
Attn: Mrs. Tapanee Attamangkune  
50/1 Moo 2, Sainoi-Bangbuathong Road,  
Sainoi District  
11150 Nonthaburi  
TH-Thailand

is accredited to the *ISTA Seed Testing Laboratory Accreditation Standard* by ISTA in accordance with Article 15(c)(15) of the Articles of the International Seed Testing Association (ISTA).

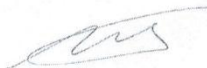
The scope of accreditation includes:

Sampling  
Purity and other seed determination  
Germination

as detailed in the accompanying appendix to this certificate.

This accreditation is valid for three years commencing 27 April 2015, subject to continuing compliance with ISTA requirements. During this period the accredited laboratory is authorised to issue ISTA Seed Analysis Certificates.

Bassersdorf, 15 July 2015

  
Joël Léchappé  
ISTA President



This certificate is only valid with the corresponding sticker



### Undertaking of compliance with environmental and social impact regulations

East-West Seed (Myanmar) Co., Ltd (the "Company" ) undertakes that the Company will comply with all mandatory legal requirements relating to the environmental impact and social impact of the project, including the new environmental regulations when they are implemented, and we undertake the follows:

1. We will make the necessary arrangement for establish farming practices and production methods which reflect the concern for conservation and farm land protection; and
2. We will follow all the rules and regulations of Hmawbe Township for keeping the factory, cultivated area and surrounding area free from environmental and social impacts.

Yours sincerely,

Mr. Chengrui Kang

General Manager

East-West Seed (Myanmar) Co., Ltd





### Undertaking of compliance with social security requirements

East-West Seed (Myanmar) Co., Ltd undertakes that it will comply with all mandatory legal social security requirements and helping local people for their social welfare and development.

Yours sincerely,

Mr. Chengrui Kang

General Manager

East-West Seed (Myanmar) Co., Ltd







### Undertaking of Contribution for Corporate Social Responsibility

East-West Seed (Myanmar) Co., Ltd undertakes that it will contribute minimum 2% of the annual net profit for Corporate Social Responsibility (CSR) derived from its activities in Myanmar.

Yours sincerely,

Mr. Chengrui Kang

General Manager

East-West Seed (Myanmar) Co., Ltd





### Commitments made by the project proponent

- (a) The project proponent declares that the information in the report is, to the best of its knowledge, true, accurate and complete.
- (b) The EMP report has been prepared in strict compliance with applicable laws, rules, regulations, guidelines and including this procedures as prescribed by ECD.
- (c) All the commitments made regarding EMP and mitigation measures described in the report will be at all times duly undertaken. (Re: EIA procedure number 616/2015, section-77, a-c)

During the implementation of the project, should there arise any directives for amendment for the improvement of the EMP report regarding up-to-date technology, the project proponent shall duly comply with the directives and implement this.

If the project proponent is desirous to amend and revise the report it shall submit the case to the authority concerned and proceed with the amendment after approval by the authority.

Yours sincerely,

Mr. Chengrui Kang

General Manager

East-West Seed (Myanmar) Co., Ltd



List of machinery and equipment to be imported into Myanmar

No.	Section	Type/Cap	Total	Import
	<u>Warehouse</u>			
1.	OP Cool Storage	375 – 500 ton	\$ 355,000	\$ 355,000
2.	F1 Coll Storage	Max 120 ton		
3.	OP Ref. System	One set with storage		
4.	F1 Ref. System	One set with storage		
5.	Fumigation Room	24 ton/6 days	\$ 12,000	
6.	OP Racking	350 ton	\$ 20,000	\$ 20,000
7.	F1 Racking	120 ton		
8.	Box Storage	700 kg	\$ 60,000	\$ 60,000
9.	Pallet	Plastic Pallet	\$ 7,000	
10.	Cotton Bag	25 kg	\$ 5,000	\$ 5,000
11.	Polybag	40 kg	\$ 2,500	
12.	Weighing Scale	150 kg	\$ 1,000	\$ 1,000
13.	Reach Truck	7 m	\$ 30,000	\$ 30,000
	<u>Processing</u>			
1.	ASC set (Oliver)	4 ton/hour	\$ 175,000	\$ 175,000
2.	Small ASC	50 kg/hour	\$ 50,000	\$ 50,000
3.	Brushing Machine	25 kg/hour	\$ 10,000	\$ 10,000
4.	Coating Machine	2.4 ton/day	\$ 100,000	\$ 100,000
5.	Disc Mill	1.2 ton/day	\$ 2,500	\$ 2,500
6.	Blending Machine	300 kg/cycle	\$ 7,500	\$ 7,500
7.	Box Turner	>700 kg	\$ 13,500	\$ 13,500
8.	Over Flow	>700 kg	\$ 1,000	
9.	Drying Machine	60 kg/3 hour	\$ 17,500	\$ 17,500
10.	Dust Collection	3 way	\$ 20,000	\$ 20,000
11.	Weighing Scale	100 kg	\$ 2,000	\$ 2,000
12.	Fork lift	1.5 ton	\$ 20,000	\$ 20,000
	<u>Packing</u>			
1.	Filvo Machine	35 pcs/minute	\$ 125,000	\$ 125,000
2.	Volumetric Filling Machine	22 pcs/minute	\$ 75,000	\$ 75,000
3.	Labeler Machine	35 pcs/minute	\$ 25,000	\$ 25,000
4.	Manual Sealer	35 pcs/minute	\$ 7,500	\$ 7,500
5.	Thermal Printing	35 pcs/minute	\$ 7,500	\$ 7,500
6.	Weighing Scale	50 kg	\$ 2,500	\$ 2,500
7.	Manual Table	Local Material	\$ 1,000	
8.	Hand Pallet	Manual hand pallet	\$ 2,500	
9.	Air Conditioner	2 HP	\$ 2,500	
	<u>Shipping</u>			
1.	Preparation Table	Local Material	\$ 500	
2.	Stripping Band	Local Supply	\$ 500	
3.	Racking	Local Material	\$ 5,000	
4.	Air Conditioner	2 HP	\$ 2,500	
5.	Hand Pallet	Local Supply	\$ 2,500	
6.	Shipping Truck	4-6 ton	\$ 30,000	\$ 30,000
7.	Genset	350 kva	\$ 100,000	\$ 100,000
8.	Compresor	Screw Type 2.4m <sup>3</sup> /mi	\$ 15,000	\$ 15,000

List of machinery and equipment to be imported into Myanmar

No.	Section	Type/Cap	Total	Import
	<u>QA</u>			
1.	Moisture meters	2 pcs	\$ 15,000	\$ 15,000
2.	Sample equipment	Several	\$ 5,000	\$ 5,000
3.	Seed count	1	\$ 5,000	\$ 5,000
4.	Tables	Several	\$ 2,500	
5.	Germinators	2	\$ 20,000	\$ 20,000
6.	Freezers	1	\$ 2,500	
	<b>Total Estimation</b>		<b>\$ 1,366,000</b>	<b>\$ 1,321,500</b>

No.	Section	Quantity	TOTAL Amount	IMPORTED Imported
<b>ITEMA</b>	<b>CIVIL WORKS</b>		<b>USD</b>	<b>USD</b>
1.	GATE & FENCE	1	\$ 100,000	\$ 55,000
2.	PRODUCTION BLD	1	\$ 550,000	\$ 350,000
3.	OFFICE BLD	1	\$ 170,000	\$ 100,000
4.	CANTEEN	1	\$ 25,000	\$ 15,000
5.	GURDHOUSE 1 & BIKE PARK	1	\$ 70,000	\$ 40,000
6.	GUARDHOUSE 2	1	\$ 10,000	\$ 6,000
7.	PUMPHOUSE	1	\$ 80,000	\$ 60,000
8.	ROAD & PAVEMENT	1	\$ 200,000	\$ 30,000
	SUMMARY (VAT 10% EXCLUDED)		\$ 1,205,000	656,000
<b>ITEMA</b>	<b>ELECTRICAL</b>		<b>TOTAL</b>	<b>IMPORTED</b>
9.	MEDIUM VOLTAGE SYSTEM	lot	\$ 140,000	\$ 125,000
10.	LOW VOLTAGE CABLING	lot	\$ 175,000	\$ 160,000
11.	MAIN BUILDING-EARTH BOND	lot	\$ 11,500	\$ 10,000
12.	GENERATOR	lot	\$ 80,000	\$ 75,000
13.	LIGHTING SYSTEM	lot	\$ 50,000	\$ 45,000
14.	SOCKET, SWITCH AND INSOLA	lot	\$ 7,500	\$ 6,000
15.	LIGHTNING SYSTEM	lot	\$ 12,000	\$ 10,000
16.	DATA AND TELEPHONE SYSTEM	lot	\$ 60,000	\$ 45,000
17.	CONVENTIONAL FIRE ALARM	lot	\$ 40,000	\$ 35,000
	TOTAL (NOT INCLUDING VAT 10%)		\$ 576,000	\$ 511,000
<b>ITEMA</b>	<b>MECHANICAL</b>		<b>TOTAL</b>	<b>IMPORTED</b>
<b>No.</b>	<b>Description</b>	<b>Unit</b>	<b>Amount</b>	<b>Imported</b>
18.	ACMV	lot	\$ 300,000	\$ 275,000
19.	WATER SUPPLY SYSTEM	lot	\$ 20,000	\$ 18,000
20.	FIRE FIGHTING SYSTEM	lot	\$ 120,000	\$ 115,000
21.	AIR COMPRESSOR SYSTEM	lot	\$ 30,000	\$ 25,000
	TOTAL (NOT INCLUDING VAT 10%)		\$ 470,000	\$ 433,000
<b>ITEM A,B,C</b>	<b>Estimated project cost for seed processing facility i</b>		<b>\$ 2,251,000</b>	<b>\$ 1,600,000</b>

<b>Total</b>	<b>Estimated project cost for seed processing facility i</b>	<b>\$ 3,617,000</b>	<b>\$ 2,921,500</b>
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**List of raw material to be imported**

Item	Type of seeds	Unit	Yr-1	Value	Yr-2	Value	Yr-3	Value	Yr-4	Value
1.	Caisim	KG	150	554	270	997	360	1,329	525	1,938
2.	Kailann	KG	75	300	135	540	240	960	315	1,260
3.	Pakchoy	KG	75	349	135	628	180	837	210	977
4.	Radish	KG	1,500	5,233	3,375	11,773	6,000	20,930	7,875	27,471
5.	Bitter ground	KG	4,500	180,000	5,063	202,500	5,400	216,000	5,775	231,000
6.	Cucumber	KG	3,900	180,000	4,388	202,500	5,700	263,077	6,300	290,769
7.	Luffa	KG	300	9,231	675	20,769	1,800	55,385	2,100	64,615
8.	Watermelon	KG	75	6,092	135	10,966	240	19,495	263	21,323
9.	Yard Long Bean	KG	7,500	34,615	13,500	62,308	24,000	110,769	31,500	145,385
10.	Onion	KG	-	-	338	6,279	600	11,163	1,050	19,535
11.	Eggplant	KG	75	2,308	135	4,154	180	5,538	263	8,077
12.	Hot	KG	750	46,154	1,350	83,077	1,800	110,769	2,100	129,231
13.	pepper	KG	15	3,000	34	6,750	48	9,600	53	10,500
14.	Tomato	KG	150	22,154	338	49,846	480	70,892	525	77,538
15.	Lettuce	KG	150	1,615	405	4,362	480	5,169	525	5,654
16.	Kangkong	KG	37,500	80,769	101,250	218,077	120,000	258,462	131,250	282,692
17.	Sweet Corn	KG	3,750	13,846	6,750	24,923	18,000	66,462	31,500	116,308
18.	Okra	KG	375	4,615	1,013	12,462	1,800	22,154	2,625	32,308
<b>Total</b>			<b>60,840</b>	<b>590,835</b>	<b>139,286</b>	<b>922,910</b>	<b>187,308</b>	<b>1,248,992</b>	<b>224,753</b>	<b>1,466,581</b>

### List of raw material to be imported

Item	Type of seeds	Unit	Yr-5	Value	Yr-6	Value	Yr-7	Value	Yr-8	Value	Yr-9	Value	Yr-10
1.	Caisim	KG	567	2,094	612	2,261	661	2,442	714	2,637	771	2,848	833
2.	Kailann	KG	340	1,361	367	1,470	397	1,587	429	1,714	463	1,851	500
3.	Pakchoy	KG	227	1,055	245	1,139	265	1,230	286	1,329	309	1,435	333
4.	Radish	KG	8,505	29,669	9,185	32,042	9,920	34,605	10,714	37,374	11,571	40,364	12497
5.	Bitter ground	KG	3,455	138,180	4,316	172,620	5,177	207,060	6,321	252,840	6,919	276,763	7,574
6.	Cucumber	KG	2,951	136,177	3,691	170,342	4,835	223,165	5,691	262,662	6,169	284,741	6,688
7.	Luffa	KG	3,001	92,335	3,749	115,338	5,471	168,323	6,909	212,585	7,577	233,145	8,310
8.	Watermelon	KG	284	23,029	306	24,871	331	26,861	357	29,010	386	31,331	417
9.	Yard Long Bean	KG	34,020	157,015	36,742	169,577	39,681	183,143	42,855	197,794	46,284	213,618	49,987
10.	Onion	KG	1,134	21,098	1,225	22,785	1,323	24,608	1,429	26,577	1,543	28,703	1,666
11.	Eggplant	KG	284	8,723	306	9,421	331	10,175	357	10,989	386	11,868	417
12.	Hot	KG	2,268	139,569	2,449	150,735	2,645	162,794	2,857	175,817	3,086	189,882	3,332
13.	pepper	KG	57	11,340	61	12,247	66	13,227	71	14,285	77	15,428	83
14.	Tomato	KG	567	83,742	612	90,441	661	97,676	714	105,490	771	113,929	833
15.	Lettuce	KG	567	6,106	612	6,595	661	7,122	714	7,692	771	8,307	833
16.	Kangkong	KG	141,750	305,308	153,090	329,732	165,337	356,111	178,564	384,600	192,849	415,368	208,277
17.	Sweet Corn	KG	34,020	125,612	36,742	135,661	39,681	146,514	42,855	158,235	46,284	170,894	49,987
18.	Okra	KG	2,835	34,892	3,062	37,684	3,307	40,698	3,571	43,954	3,857	47,471	4,166
<b>Total</b>			<b>236,830</b>	<b>1,317,304</b>	<b>257,372</b>	<b>1,484,962</b>	<b>280,749</b>	<b>1,707,342</b>	<b>305,409</b>	<b>1,925,584</b>	<b>330,073</b>	<b>2,087,946</b>	<b>356,733</b>

### Goods to be produced

Item	Type of seeds	Unit	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10
1.	Caisim	KG	150	300	450	750	810	875	945	1,020	1,102	1,190
2.	Kailann	KG	75	150	300	450	486	525	567	612	661	714
3.	Pakchoy	KG	75	150	225	300	324	350	378	408	441	476
4.	Radish	KG	1,500	3,750	7,500	11,250	12,150	13,122	14,172	15,306	16,530	17,852
5.	Bitter ground	KG	4,500	5,625	6,750	8,250	4,935	6,165	7,395	9,030	9,884	10,820
6.	Cucumber	KG	3,900	4,875	7,125	9,000	4,215	5,273	6,908	8,130	8,813	9,555
7.	Luffa	KG	300	750	2,250	3,000	4,287	5,355	7,815	9,870	10,825	11,872
8.	Watermelon	KG	75	150	300	375	405	437	472	510	551	595
9.	Yard Long Bean	KG	7,500	15,000	30,000	45,000	48,600	52,488	56,687	61,222	66,120	71,409
10.	Onion	KG	-	375	750	1,500	1,620	1,750	1,890	2,041	2,204	2,380
11.	Eggplant	KG	75	150	225	375	405	437	472	510	551	595
12.	Hot	KG	750	1,500	2,250	3,000	3,240	3,499	3,779	4,081	4,408	4,761
13.	pepper	KG	15	38	60	75	81	87	94	102	110	119
14.	Tomato	KG	150	375	600	750	810	875	945	1,020	1,102	1,190
15.	Lettuce	KG	150	450	600	750	810	875	945	1,020	1,102	1,190
16.	Kangkong	KG	37,500	112,500	150,000	187,500	202,500	218,700	236,196	255,092	275,499	297,539
17.	Sweet Corn	KG	3,750	7,500	22,500	45,000	48,600	52,488	56,687	61,222	66,120	71,409
18.	Okra	KG	375	1,125	2,250	3,750	4,050	4,374	4,724	5,102	5,510	5,951

## Pricelist

No.	Var	Pack size	Price Kyat	Rate	Price = \$	Unit	1 kg = 1000	No unit per KG	Price per kg
1.	Bitter Gourd, Best 165	20 g/p	3,450	970	\$ 4	20	1000	50	\$ 177.84
2.	Bitter Gourd, Maya 009	20 g/p	3,450	970	\$ 4	20	1000	50	\$ 178
3.	Bitter Gourd, Palee	20g/p	3450	970	\$ 4	20	1000	50	\$ 178
4.	Bottel Gourd, Anmol	20g/p	3,450	970	\$ 4	20	1000	50	\$ 178
5.	Bottel Gourd, Lina	20g/p	3,450	970	\$ 4	20	1000	50	\$ 178
6.	Broccoli, Harumi	10 g/p	4,200	970	\$ 4	10	1000	100	\$ 433
7.	Cabbage, Byzaja	10 g/p	2,800	970	\$ 3	10	1000	100	\$ 289
8.	Cabbage, Rasai	10 g/p	2,800	970	\$ 3	10	1000	100	\$ 289
9.	Carrot, Chike	250 g/can	6,000	970	\$ 6	250	1000	4	\$ 25
10.	Carrot, Thima	250 g/can	6,000	970	\$ 6	250	1000	4	\$ 25
11.	Cauliflower, Atria 153	10 g/p	5,000	970	\$ 5	10	1000	100	\$ 515
12.	Cauliflower, Poornima 008	10 g/p	5,600	970	\$ 6	10	1000	100	\$ 577
13.	Chaisim, Oni	100 g/can	1,400	970	\$ 1	100	1000	10	\$ 14
14.	Coriander, Ramses	500 g/p	4,500	970	\$ 5	500	1000	2	\$ 9
15.	Cucumber,Hyper C	10 g/p	2,400	970	\$ 2	10	1000	100	\$ 247
16.	Cucumber,Kanene	10 g/p	2,400	970	\$ 2	10	1000	100	\$ 247
17.	Cucumber,Kasinda	10 g/p	2,400	970	\$ 2	10	1000	100	\$ 247
18.	Cucumber,Nandini	10 g/p	2,400	970	\$ 2	10	1000	100	\$ 247
19.	Cucumber,Saira	10 g/p	2,400	970	\$ 2	10	1000	100	\$ 247
20.	Eggplant,EW 5640	5 g/p	2,350	970	\$ 2	5	1000	200	\$ 485
21.	Eggplant, Kermit	5 g/p	2,350	970	\$ 2	5	1000	200	\$ 485
22.	Eggplant, Orma	5 g/p	2350	970	\$ 2	5	1000	200	\$ 485
23.	Eggplant, Runako	5 g/p	2,350	970	\$ 2	5	1000	200	\$ 485
24.	Eggplant Nancy	5 g/p	2,350	970	\$ 2	5	1000	200	\$ 485
25.	Hot Pepper, Azuma	5 g/p	2,800	970	\$ 3	5	1000	200	\$ 577
26.	Hot Pepper, Demon	5 g/p	2,700	970	\$ 3	5	1000	200	\$ 557
27.	Hot Pepper, Demon 222	5 g/p	2,700	970	\$ 3	5	1000	200	\$ 557
28.	Hot Pepper, Fighter	5 g/p	2,700	970	\$ 3	5	1000	200	\$ 557
29.	Kailaan, Dara	100 g/can	1,400	970	\$ 1	100	1000	10	\$ 14
30.	Kailaan, Dara	50 g/p	800	970	\$ 1	50	1000	20	\$ 16
31.	Kangkong, Liao	1 kg/p	5,500	970	\$ 6	1,000	1000	1	\$ 6
32.	Kangkong, Yangzte	25 kg/bag	100,000	970	\$ 103	25	1000	40	\$ 4,124
33.	Lettuce, Rapido	50 g/can	1,400	970	\$ 1	50	1000	20	\$ 29
34.	Lettuce, Rapido	20 g/p	580	970	\$ 1	20	1000	50	\$ 30
35.	Luffa Angula, Naga	20 g/p	3,450	970	\$ 4	20	1000	50	\$ 178
36.	Mustard, Jailing	100 g/can	1,400	970	\$ 1	100	1000	10	\$ 14
37.	Okra, Basanti 447	100 g/can	2,000	970	\$ 2	100	1000	10	\$ 21
38.	Okra, Beendiya	20 g/p	1,600	970	\$ 2	20	1000	50	\$ 82
39.	Okra, Kirti	20 g/p	1,600	970	\$ 2	20	1000	50	\$ 82
40.	Okra, Maha	20 g/p	1,600	970	\$ 2	20	1000	50	\$ 82
41.	Pakchoy, Mayleen 281	10 g/p	800	970	\$ 1	10	1000	100	\$ 82
42.	Papaya, Red Royale	5 g/p	19,000	970	\$ 20	5	1000	200	\$ 3,918
43.	Pumpkin, Arjuna	20 g/p	3,500	970	\$ 4	20	1000	50	\$ 180
44.	Radish, Ural	100 g/can	800	970	\$ 1	100	1000	10	\$ 8
45.	Radish, Ural	250 g/can	1,800	970	\$ 2	250	1000	4	\$ 7
46.	Radish, Ural	500 g/can	3,500	970	\$ 4	500	1000	2	\$ 7
47.	Sweet Corn, Golden Cob 806	500 g/p	14,000	970	\$ 14	500	1000	2	\$ 29
48.	Sweet Corn, Sugar Queen	500 g/p	14,000	970	\$ 14	500	1000	2	\$ 29
49.	Sweet Pepper, Kaveri	5 g/p	4,600	970	\$ 5	5	1000	200	\$ 948
50.	Tomato, Inlay 019	5 g/p	4,400	970	\$ 5	5	1000	200	\$ 907
51.	Tomato, Makis	5 g/p	4,400	970	\$ 5	5	1000	200	\$ 907
52.	Tomato, Nirvana 044	5 g/p	4,400	970	\$ 5	5	1000	200	\$ 907
53.	Tomato, Platinum 701	5 g/p	4,400	970	\$ 5	5	1000	200	\$ 907
54.	Tomato, Tejas	5 g/p	4,400	970	\$ 5	5	1000	200	\$ 907
55.	Water Melon, EW 2668 (Sugar Baby)	20 g/p	5,600	970	\$ 6	20	1000	50	\$ 289
56.	Water Melon, EW 2662 (Crimson)	20 g/p	5,600	970	\$ 6	20	1000	50	\$ 289
57.	Wax Gourd, Benyue 619	20 g/p	3,450	970	\$ 4	20	1000	50	\$ 178
58.	Waxy Corn, Iggi	500 g/p	7,800	970	\$ 8	500	1000	2	\$ 16
59.	Waxy Corn, Jumbo Merry	500 g/p	5,100	970	\$ 5	500	1000	2	\$ 11
60.	Waxy Corn, Norma (Violet White)	500 g/p	11,000	970	\$ 11	500	1000	2	\$ 23
61.	Yard Long Bean All varieties	100 g/can	1,300	970	\$ 1	100	1000	10	\$ 13
62.	Zucchini	20 g/p	4,400	970	\$ 5	20	1000	50	\$ 227



## Staff organization

Position	Department	Basic monthly salary In USD	2015	2016	2017	2018
Product Manager	Sales & Marketing	700	9,240	10,080	10,920	11,340
Sales Manager	Sales & Marketing	1,500	19,800	21,600	23,400	24,300
Sales & Marketing Supervisor- Mandalay	Sales & Marketing	600	7,920	8,640	9,360	9,720
Sales Representative- Hmawbe, Ayeyarwaddy & Pyay	Sales & Marketing	400	5,280	5,760	6,240	6,480
Sales Representative- Magway	Sales & Marketing	300	3,960	4,320	4,680	4,860
Sales Representative- Nay Pyi Taw	Sales & Marketing	300		4,320	4,680	4,860
Sales Representative- Southern Shan State	Sales & Marketing	250		3,600	3,900	4,050
Spot Promoter- Southern Shan State	Sales & Marketing	200	2,640	2,880	3,120	3,240
Spot Promoter- Sint Kaing	Sales & Marketing	200	2,640	2,880	3,120	3,240
Spot Promoter- Nay Pyi Taw	Sales & Marketing	200	2,640	2,880	3,120	3,240
Spot Promoter- Pyin Oo Lwin	Sales & Marketing	200	2,640	2,880	3,120	3,240
Spot Promoter- Moneywa, Chaung Oo	Sales & Marketing	200	2,640	2,880	3,120	3,240
Spot Promoter- Central Area	Sales & Marketing	200		2,880	3,120	3,240
Spot Promoter- Pyay	Sales & Marketing	200	2,640	2,880	3,120	3,240
Human resource manager	Human resource	400	5,280	5,760	6,240	6,480
Human resource assistant	Human resource	150	1,980	2,160	2,340	2,430
Ser Accountant	Finance & Accounting	500	6,600	7,200	7,800	8,100
Assistant Accountant	Finance & Accounting	200	2,640	2,880	3,120	3,240
Assistant Accountant	Finance & Accounting	200			3,120	3,240
Assistant Accountant	Finance & Accounting	200	2,640	2,880	3,120	3,240
Assistant Accountant	Finance & Accounting	200	2,640	2,880	3,120	3,240
Admin Assistant	Finance & Accounting	150	1,980	2,160	2,340	2,430
Admin Assistant	Finance & Accounting	150		2,160	2,340	2,430
Admin Assistant	Finance & Accounting	150	1,980	2,160	2,340	2,430
Logistic Supervisor	Logistics	360	4,752	5,184	5,616	5,832
Logistic Supervisor	Logistics	210	2,722	3,024	3,276	3,402
PDS Specialist (PYAY-Farm)	Product Development support	400	5,280	5,760	6,240	6,480
PDS Specialist	Product Development support	300	3,960	4,320	4,680	4,860
Farm Assistant	Product Development support	200	2,640	2,880	3,120	3,240
PDS Specialist	Product Development support	300		4,320	4,680	4,860
Coordinator	Product Development support	250	3,432	3,744	4,056	4,212
			-	-	-	-
Assistant Manager-Extension	Agricultural Extension	1,000	13,200	14,400	15,600	16,200
Agricultural Extension Supervisor	Agricultural Extension	400	5,280	5,760	6,240	6,480
Agricultural Extension Supervisor	Agricultural Extension	400	5,280	5,760	6,240	6,480
Agricultural Extension Supervisor	Agricultural Extension	400			6,240	6,480
Ser. Extension Staff	Agricultural Extension	350		5,040	5,460	5,670
Ser. Extension Staff	Agricultural Extension	350	4,620	5,040	5,460	5,670
Agricultural Extension Staff	Agricultural Extension	250	3,300	3,600	3,900	4,050
Agricultural Extension Staff	Agricultural Extension	250		3,600	3,900	4,050
Agricultural Extension Staff	Agricultural Extension	250			3,900	4,050
Agricultural Extension Staff	Agricultural Extension	250			3,900	4,050
Agricultural Extension Staff	Agricultural Extension	250		3,600	3,900	4,050
Agricultural Extension Staff	Agricultural Extension	250		3,600	3,900	4,050
Agricultural Extension Staff	Agricultural Extension	250	3,300	3,600	3,900	4,050
Agricultural Extension Staff	Agricultural Extension	250	3,300	3,600	3,900	4,050
Plant manager seed operation	Seed processing	1,000	13,200	14,400	15,600	16,200
Supervisor seed cleaning/drying	Seed processing	400	5,280	5,760	6,240	6,480
Operator seed cleaning	Seed processing	200	2,640	2,880	3,120	3,240
Operator seed cleaning	Seed processing	200		2,880	3,120	3,240
Operator seed cleaning	Seed processing	200			3,120	3,240
Operator seed cleaning	Seed processing	200			3,120	3,240
Supervisor Seed packing	Seed processing	400	5,280	5,760	6,240	6,480

Operator Seed packing	Seed processing	200	2,640	2,880	3,120	3,240
Operator Seed packing	Seed processing	200	2,640	2,880	3,120	3,240
Operator Seed packing	Seed processing	200	2,640	2,880	3,120	3,240
Operator Seed packing	Seed processing	200		2,880	3,120	3,240
Seed storage/inventory manager	Seed processing	1,000	13,200	14,400	15,600	16,200
FG storage inventory manager	Seed processing	1,000	13,200	14,400	15,600	16,200
Operator inventory	Seed processing	200		2,880	3,120	3,240
Operator inventory	Seed processing	200	2,640	2,880	3,120	3,240
Production manager	Seed production	1,500	19,800	21,600	23,400	24,300
Production manager OP	Seed production	1,000	13,200	14,400	15,600	16,200
Production manager F1	Seed production	1,000	13,200	14,400	15,600	16,200
Production supervisor OP	Seed production	750	9,900	10,800	11,700	12,150
Production supervisor F1	Seed production	750	9,900	10,800	11,700	12,150
Field inspector OP	Seed production	250	3,300	3,600	3,900	4,050
Field inspector OP	Seed production	250	3,300	3,600	3,900	4,050
Field inspector OP	Seed production	250		3,600	3,900	4,050
Field inspector OP	Seed production	250			3,900	4,050
Field inspector OP	Seed production	250			3,900	4,050
Field inspector F1	Seed production	250	3,300	3,600	3,900	4,050
Field inspector F1	Seed production	250	3,300	3,600	3,900	4,050
Field inspector F1	Seed production	250			3,900	4,050
Field inspector F1	Seed production	250		3,600	3,900	4,050
Field inspector F1	Seed production	250	3,300	3,600	3,900	4,050
OA manager	Quality Assurance	1,000	13,200	14,400	15,600	16,200
OA support germination	Quality Assurance	300	3,960	4,320	4,680	4,860
OA support germination	Quality Assurance	300		4,320	4,680	4,860
OA support germination	Quality Assurance	300	3,960	4,320	4,680	4,860
OA support sampling	Quality Assurance	250	3,300	3,600	3,900	4,050
OA support sampling	Quality Assurance	250	3,300	3,600	3,900	4,050
General Manager	Expat staff	1,5000	198,000	216,000	234,000	243,000
Sale Manager	Expat staff	10,000	132,000	144,000	156,000	162,000
Plant Manager	Expat staff	10,000	132,000	144,000	156,000	162,000
Seed production manager	Expat staff	2,500	33,000	36,000	39,000	40,500
Product Develop Manager	Expat staff	2,500	33,000	36,000	39,000	40,500
			<b>866,976</b>	<b>999,072</b>	<b>1,121,328</b>	<b>1,164,456</b>

Seed operation	16,500	18,000	23,400	24,300
Sales & Marketing	173,580	209,520	244,920	254,340
Technology transfer	84,876	107,712	116,688	121,176
General & Admin	38,280	57,600	76,440	79,380
Plant	25,740	30,240	35,880	37,260
	528,000	576,000	624,000	648,000
	<b>866,976</b>	<b>999,072</b>	<b>1,121,328</b>	<b>1,164,456</b>

### Ambient air quality

The ambient air quality at the site was measured by technicians from the Health Department.

#### Ambient air at the site

Sr. No	Parameters	Existing values at site	NEQ guideline values
1	PM <sub>10</sub>	29.1 µg/m <sup>3</sup>	50 µg/m <sup>3</sup> (24 hrs)
2	PM <sub>2.5</sub>	22.7 µg/m <sup>3</sup>	25 µg/m <sup>3</sup> (24 hrs)
3	NO <sub>2</sub>	69 µg/m <sup>3</sup>	200 µg/m <sup>3</sup> (1 hr)
4	SO <sub>2</sub>	39.2 µg/m <sup>3</sup>	20 µg/m <sup>3</sup> (24 hrs)
5	Ozone (O <sub>3</sub> )	39.6 µg/m <sup>3</sup>	100 µg/m <sup>3</sup> (8 hrs)
6	CO	74.6 ppb	-
7	VOC	9 ppb	-
8	Hydrocarbon (HC)	359.4 ppm	-
9	Methane (CH <sub>4</sub> )	3875 ppm	-

The values at the site are generally lower than the National Environmental Quality (NEQ) guideline values prescribed by ECD (Guideline values for CO, VOC, Hydrocarbon (HC), and Methane CH<sub>4</sub> not available).

#### Quality of Ambient noise by sample site

L <sub>eq</sub> in dBA			L <sub>max</sub> in dBA			NEQ guideline values	
Day	Night	Total	Day	Night	Total	Day	Night
47	36	46	32	27	30	70	70

The noise levels are lower than the National Environmental Quality (NEQ) guideline values prescribed by ECD.

## Results of water analysis



Laboratory Technical Consultant: U Saw Christopher Maung

B.Sc Engg: (Civil), Dip S.E (Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LWSE 001.  
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)



WTL-RE-001

Issue Date - 01-12-2012

Effective Date - 01-12-2012

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### WATER QUALITY TEST RESULTS FORM

Client MESC Co., Ltd.  
Nature of Water Tube Well Water  
Location Hmawbi (Project site)  
Date and Time of collection 21.7.2018  
Date and Time of arrival at Laboratory 23.7.2018  
Date and Time of commencing examination 24.7.2018  
Date and Time of completing 29.7.2018

### Results of Water Analysis

### WHO Drinking Water Guideline (Geneva - 1993)

pH	7.6	6.5 - 8.5
Colour (True)	TCU	15 TCU
Turbidity	NTU	5 NTU
Conductivity	micro S/cm	
Total Hardness	mg/l as CaCO <sub>3</sub>	500 mg/l as CaCO <sub>3</sub>
Calcium Hardness	mg/l as CaCO <sub>3</sub>	
Magnesium Hardness	mg/l as CaCO <sub>3</sub>	
Total Alkalinity	mg/l as CaCO <sub>3</sub>	
Phenolphthalein Alkalinity	mg/l as CaCO <sub>3</sub>	
Carbonate (CaCO <sub>3</sub> )	mg/l as CaCO <sub>3</sub>	
Bicarbonate (HCO <sub>3</sub> )	mg/l as CaCO <sub>3</sub>	
Iron	mg/l	0.3 mg/l
Chloride (as CL)	mg/l	250 mg/l
Sodium Chloride (as NaCL)	mg/l	
Sulphate (as SO <sub>4</sub> )	mg/l	200 mg/l
Total Solids	mg/l	1500 mg/l
Suspended Solids	39 mg/l	
Dissolved Solids	mg/l	1000 mg/l
Manganese	mg/l	0.05 mg/l
Phosphate	Nil mg/l	
Phenolphthalein Acidity	mg/l	
Methyl Orange Acidity	mg/l	
Salinity	ppt	

Remark: This certificate is issued only for the receipt of the test sample.

Tested by

Signature: Zaw Hein Oo

Name: B.Sc (Chemistry)

Sr. Chemist

ISO TECH Laboratory

(a division of WEG Co., Ltd.)

Approved by

Signature: Soe Thit

Name: B.E (Civil) 1980.

Technical Officer  
ISO TECH Laboratory

No.18, Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.

Ph: 01-640955, 09-73225175, 09-73242162, Fax: 01-644506, E-mail: isotechlaboratory@gmail.com, Website: weg-myanmar.com



LABORATORY



Laboratory Technical Consultant: U Saw Christopher Maung

B.Sc Engg: (Civil), Dip S.E (Delft) Lecturer of YIT (Retd), Consultant (Y.C.D.C), LWSE 001.  
Former Member (UNICEF, Water quality monitoring & Surveillance Myanmar)

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W0718 477

## WATER QUALITY TEST RESULTS FORM

Client MESC Co.,Ltd.  
Nature of Water Tube Well Water  
Location Hmawbi (Project site)  
Date and Time of collection 21.7.2018  
Date and Time of arrival at Laboratory 23.7.2018  
Date and Time of commencing examination 24.7.2018  
Date and Time of completing 29.7.2018

### Results of Water Analysis

### WHO Drinking Water Guideline (Geneva - 1993)

Temperature (°C)	°C	
Fluoride (F)	mg/l	1.5 mg/l
Lead (as Pb)	Nil mg/l	0.01 mg/l
Arsenic (As)	Nil mg/l	0.01 mg/l
Nitrate (N.NO <sub>3</sub> )	0.5 mg/l	50 mg/l
Chlorine (Residual)	mg/l	
Ammonia (NH <sub>3</sub> )	mg/l	
Ammonium (NH <sub>4</sub> )	mg/l	
Dissolved Oxygen (DO)	mg/l	
Chemical Oxygen Demand (COD)	32 mg/l	
Biochemical Oxygen Demand (BOD) (5 days at 20 °C)	4 mg/l	
Cyanide (CN)	mg/l	0.07 mg/l
Zinc (Zn)	mg/l	3 mg/l
Copper (Cu)	mg/l	2 mg/l
Silica (Si)	mg/l	

Remark: This certificate is issued only for the receipt of the test sample.

### Tested by

Signature:

Name:

Zaw Hein Oo  
B.Sc (Chemistry)  
Sr. Chemist  
ISO TECH Laboratory

### Approved by

Signature:

Name:

Soe Thit  
B.E (Civil) 1980,  
Technical Officer  
ISO TECH Laboratory

(a division of WEG Co.,Ltd.)

No.18, Lanthit Road, Nanthargone Quarter, Insein Township, Yangon, Myanmar.

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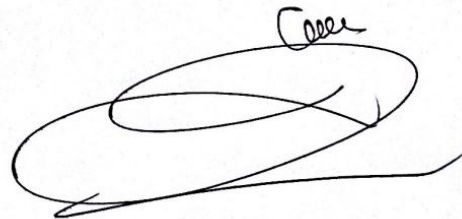


ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ  
စိုက်ပျိုးရေး၊ မွေးမြူရေးနှင့် ဆည်မြောင်းဝန်ကြီးဌာန  
စိုက်ပျိုးရေးဦးစီးဌာန  
( မြေအသုံးချရေးဌာနခွဲ )  
ရန်ကုန်မြို့

စာအမှတ် - ၈၈ - ၂/( ၁ )၊ ၁၈ - ၁၉ ( ၀၆၉ )  
နေ့စွဲ၊ ၂၀၁၉ ခုနှစ်၊ ဖေဖော်ဝါရီလ ( ၁၅ ) ရက်

အကြောင်းအရာ ။ ။ မြေနမူနာ ဓါတ်ခွဲအဖြေပေးပို့ခြင်း။  
ရည်ညွှန်းချက် ။ ။ MESC မှ ( 24.1.2019 ) နေ့တွင် ပေးပို့သောနမူနာ။

အထက်အကြောင်းအရာပါ ကိစ္စနှင့်ပတ်သက်၍ ရည်ညွှန်းစာဖြင့်  
ပေးပို့လာသော မြေနမူနာ ( ၁ - မျိုး ) အား ဓါတ်ခွဲစစ်ဆေးပြီးဖြစ်၍ ဓါတ်ခွဲတွေ့ရှိချက်  
အဖြေများကို ဤစာနှင့်အတူ ပူးတွဲပေးပို့ပါသည်။



( ခင်ဝင်းမာ )  
ဒုတိယညွှန်ကြားရေးမှူး  
ဓါတ်ခွဲခန်းတာဝန်ခံ  
မြေအသုံးချရေးဌာနခွဲ

MESC

မိတ္ထူကို

- ရုံးလက်ခံ

**DEPARTMENT OF AGRICULTURE ( LAND USE )**  
**SOIL INTERPRETATION OF RESULTS**

Division - Yangon

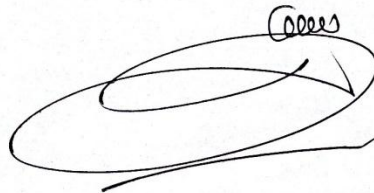
MESC ( 24.1.2019 )

Sheet No. 1

Township - မှော်ဘီ

Sr No. S-1/18-19

Sr No.	Sample plot	pH	Texture	Total N	Available Nutrient P
1	မြေနီ	Strongly acid	Clay Loam	Low	Low



**Khin Win Mar**  
Deputy Director  
Laboratory Incharge  
Land Use Division

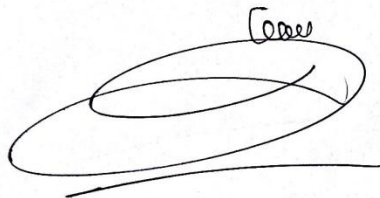
**DEPARTMENT OF AGRICULTURE ( LAND USE )**  
**SOIL ANALYTICAL DATA**

Division - Yangon  
Township - မေတ္ထီ

MESC ( 24.1.2019 )

Sheet No. 1  
Sr No. S-1/18-19

Sr No.	Sample plot	Moisture %	pH Soil : Water 1 : 2.5	Texture				Total N %	Available Nutrient P ppm (Bray)
				Sand %	Silt %	Clay %	Total %		
1	မေတ္ထီ	1.34	4.87	41.12	19.00	39.88	100.00	0.14	3.24





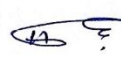


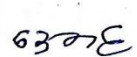
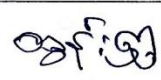


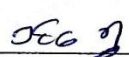
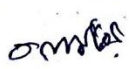
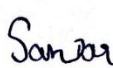
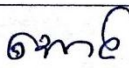
**Khin Win Mar**  
Deputy Director  
Laboratory Incharge  
Land Use Division



ကျေးရွာအမည်-တမုတုန်း-----

နေ့စွဲ- ၇၀.၇.၂၀၁၈

အစည်းအဝေးတက်ရောက်သူများစာရင်း

စဉ်	အမည်	လက်မှတ်	မှတ်ချက်
၁။	ဦးကျော်စိုး		( ဥက္ကဋ္ဌ )
၂။	ဦးကျော်စိုး		
၃။	ဦး မြတ်နိုင်		
၄။	ဦးတင်လွယ်		
၅။	ဦးသန်းရွှေ		
၆။	ဦး စောင့်စောင့်		
၇။	ဦး ထွန်းရွှေ		
၈။	ဦး စိန်ဌေးစောင့်		
၉။	ဦးဝင်းလွင်		
၁၀။	ဦးဝင်းရွှေ		
၁၁။	ဦးကျော်မြင့်		
၁၂။	ဒေါ်စန္ဒာစောင့်နု		
၁၃။	ဦး ဆိုးညွန့်စောင့်		

Lists of attendees



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