

## ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားတို့ကို နှိုင်းယှဉ်လေ့လာချက်

ခင်ချောစု\*

### စာတမ်းအကျဉ်း

ဤစာတမ်းသည် ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားတို့ကို နှိုင်းယှဉ် လေ့လာတင်ပြထားသည့် စာတမ်း ဖြစ်ပါသည်။ ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားတို့၏ တူညီချက်ကွဲပြားချက်တို့ကို ဖော်ထုတ်တင်ပြလိုသည့် ရည်ရွယ်ချက် ဖြစ်ပါသည်။ အလေ့လာခံ ဘာသာစကားဖြစ်သည့် ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားတို့ကို ဘာသာဗေဒနည်းဖြင့် နှိုင်းယှဉ်လေ့လာခြင်းဖြင့် ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားတို့၏ သွင်ပြင်လက္ခဏာ များကို လေ့လာသိရှိနိုင်ပါသည်။ ဤစာတမ်းသည် ဘာသာစကားများ၏ သဘောလက္ခဏာများကို လေ့လာရာ၌ အထောက် အကူပြုမည် ဖြစ်ပါသည်။

သော့ချက်ဝေါဟာရများ - ယင်းကျားဘာသာစကား၊ ယင်းနက်ဘာသာစကား၊ ဗျဉ်းနှိုင်းယှဉ်လေ့လာချက်၊ သရနှိုင်းယှဉ်လေ့လာချက်၊ စကားသံတွဲနှိုင်းယှဉ်လေ့လာချက်။

### နိဒါန်း

မြန်မာနိုင်ငံအတွင်းတွင် မှီတင်းနေထိုင်ကြသော တိုင်းရင်းသားလူမျိုး (၁၃၅) မျိုးရှိရာ တိုင်းရင်းသားတို့သာ ဘာသာစကားအရ မျိုးရိုးတူဘာသာစကားများ ရှိသကဲ့သို့ မျိုးရိုး မတူသည့် ဘာသာစကားများလည်းရှိသည်။ ရှမ်းပြည်နယ်တောင်ပိုင်း လွိုင်လင်ခရိုင်တွင် နေထိုင်ကြသော ယင်းကျားနှင့် ယင်းနက်လူမျိုးများသည် ရှမ်းလူမျိုးနွယ် (၃၀)တွင် အပါအဝင်ဖြစ်သည်။ ရှမ်းလူမျိုးနွယ်တွင် ပါဝင်သော်လည်း ယင်းတို့၏ ဘာသာစကားသည် ကွဲပြားသည်။ ယခု စာတမ်းတွင် မျိုးရိုးတူသော်လည်း ဘာသာစကားကွဲပြားသည့် ယင်းကျားနှင့် ယင်းနက်စကားတို့ကို အလေ့လာခံရွေးချယ်ခဲ့ပါသည်။ ယင်းကျားနှင့်ယင်းနက် ဘာသာစကား များ၏ စကားသံဖွဲ့ပုံကို အနှိုင်းဘာသာဗေဒနည်းဖြင့် နှိုင်းယှဉ် လေ့လာထားပါသည်။ ထိုသို့ နှိုင်းယှဉ်လေ့လာခြင်းဖြင့် မျိုးရိုးတူဘာသာစကားကို ပြောသည့် ယင်းကျားနှင့် ယင်းနက်ဘာသာ စကားတို့၏ တူညီချက်၊ ကွဲပြားချက်တို့ကို သိသာ ထင်ရှားလာစေပါသည်။ ယင်းကျားနှင့် ယင်းနက်ဘာသာစကားများကို လေ့လာရာတွင် ထိုစကားပြောသူများကို တွေ့ဆုံမေးမြန်း၍ လည်းကောင်း၊ မဟာသုတေသနဘွဲ့၊ ပါရဂူဘွဲ့၊ မန္တလေးတက္ကသိုလ်အတွက် တင်သွင်းသော ယင်းကျားနှင့် ယင်းနက်ဘာသာစကားဆိုင်ရာ လေ့လာမှုကျမ်းများကို လေ့လာ၍လည်းကောင်း အချက်အလက်များကို ရွေးထုတ်ထားပါသည်။ ဤစာတမ်းသည် ဘာသာစကားနယ်ပယ်ရှိ မျိုးရိုးတူ ဘာသာစကားတို့၏ သဘောသဘာဝ သွင်ပြင်လက္ခဏာများကို နှိုင်းယှဉ်လေ့လာ ထားသည့် စာတမ်းဖြစ်ပါသည်။

### ယင်းကျားလူမျိုးနှင့်ယင်းနက်လူမျိုးတို့၏ သမိုင်းအကျဉ်း

ယင်းလူမျိုးအခေါ်အဝေါ်နှင့်ပတ်သက်၍ စကော့၏ Gazetteer of the upper Burma and the Shan state စာအုပ်တွင်

ယင်းလူမျိုး နှစ်မျိုးရှိသည်။ ယင်းနက် Yang lam နှင့် ယင်းကျား Yang Hesk တို့ဖြစ်သည်။ ယင်းတို့က မိမိကိုယ်မိမိ ရိယန် Rieng ဟူ၍ ခေါ်ကြသည်။ ရှမ်းတို့က ယင်းကို ယန် Yang ဟူ၍ခေါ်၏။ ရှမ်းတို့က ယန်ဟုခေါ်သည်ကို ဗမာတို့က ယင်းဟုခေါ်သည်။ ထို့ကြောင့် ယင်းဟူသော ဝေါဟာရမှာ ဗမာအခေါ် ဖြစ်သည်။<sup>၁</sup>

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<sup>၁</sup> J-George scott, 1901, 519.

ဟူ၍ ဖော်ပြထားသည်။

ယင်းလူမျိုးများ၏ သမိုင်းအကြောင်းကို မြန်မာသမိုင်းကျမ်း မှန်နန်းရာဇဝင်ကြီး တွင်လည်း တွေ့ရှိရပါသည်။ ညောင်ရမ်းမင်းဆက် မင်းရဲကျော်ထင် မြန်မာသက္ကရာဇ် ၉၃၄-၉၃၉နှင့် စနေမင်းတို့လက်ထက် ၉၅၉-၁၀၆၅တို့လက်ထက်တွင် ဖြစ်ပါသည်။ မှန်နန်း ရာဇဝင်တွင်

၁၀၅၅- တပို့တွဲလဆန်း (၆)ရက် တနင်္ဂနွေနေ့  
ယင်းစစ်ထသည်ဟူ၍ ချီရပြန်သည်။<sup>၂</sup>

၁၀၅၆- ခုနှစ် ကဆုန်လဆန်း (၃)ရက်၊ တနင်္လာနေ့  
မင်းရဲဇေယျကို ဗိုလ်မှူးပြုစေ၍ ယင်းစစ်သို့ ပြန်ရသည်။<sup>၃</sup>

ဟူ၍ တွေ့ရပါသည်။

ယင်းလူမျိုးတို့သည် ရှမ်းပြည်နယ်အတွင်း ညောင်ရမ်းခေတ်ကတည်းက အခြေချ နေထိုင်ပြီး မြန်မာမင်း၏ ရွှေနားတော်ပေါက် လူမျိုးဖြစ်သည်။

**ယင်းကျားလူမျိုး သမိုင်းအကျဉ်း**

ယင်းကျားလူမျိုးတို့နှင့် ပတ်သက်၍ မြန်မာ့စွယ်စုံကျမ်းတွင်

ယန်းလမ် (သို့မဟုတ်) ယင်းနက်နှင့် ယန်းဆက် (သို့မဟုတ်)  
ယင်းကျားဟူ၍ နှစ်မျိုးရှိရာ ယင်းနက်ကို အချို့က  
ကရင်နက်ဟု ခေါ်ဆိုကြ၍ ယင်းကျားကို ကရင်ကြားဟု  
ခေါ်ဆိုကြလေသည်။<sup>၄</sup>

ဟုဖော်ပြထားပါသည်။

ထို့အတူ မြန်မာအဘိဓာန်တွင်

ယင်းကျား/ ယင်းဂျား/ န - ရှမ်းပြည်နယ်တောင်ပိုင်း၊  
နမ့်စန်ဒေသတွင် အများအားဖြင့် နေထိုင်သော  
မြန်မာတိုင်းရင်းသား တစ်မျိုး။<sup>၅</sup>

ဟုတွေ့ရပါသည်။

တိုင်းရင်းသားယဉ်ကျေးမှု ရိုးရာဓလေ့ထုံးစံများ (ရှမ်း)စာအုပ်တွင်

အနီနှင့်အဖြူ ဝတ်စုံစပ်ကြားဝတ်သော ယင်းလူမျိုးကို  
ယင်းကြားဟု ခေါ်ကြသည်။<sup>၆</sup>

ယင်းကျားလူမျိုးတို့သည် ရှမ်းပြည်နယ်တောင်ပိုင်း လွိုင်လင်ခရိုင် နမ့်စန်မြို့နယ်တွင် နေထိုင်သည်။ နမ့်စန်မြို့နယ်တွင် ရပ်ကွက်ပေါင်း (၅)ရပ်ကွက်၊ ကျေးရွာအုပ်စုပေါင်း(၂၀) အုပ်စုနှင့် ကျေးရွာပေါင်း(၁၈၉)ရွာရှိပြီး မြေညီလွင်ပြင်များနှင့် တောတောင်မထူထပ်သော ဒေသဖြစ်သည်။ ယင်းကျားလူမျိုးတို့သည် နမ့်စန်မြို့နယ်အတွင်းရှိ ကျီးအစ်၊ လောက်ကျန်၊

<sup>၂</sup> မှန်နန်းရာဇဝင်၊ တ-တွဲ၊ ၂၀၀၈၊ ၃၁၇။

<sup>၃</sup> -ယင်း-။

<sup>၄</sup> ဘာသာပြန်စာပေအသင်း၊ ၁၉၇၀၊ ၂၆၁။

<sup>၅</sup> မြန်မာစာအဖွဲ့၊ ၁၉၉၁၊ ၃၀၀။

<sup>၆</sup> မင်းနိုင်၊ ဦး၊ ၁၉၆၈၊ ၆၂။

လွယ်ဆိုင်၊ ပုတ်ပျံ၊ တွံတီး၊ လွယ်ပေါင်း၊ လွယ်ဖွီး၊ လွယ်စန်၊ နမ့်ပဲ၊ မောက်စံ၊ သူ ကျေးရွာ (၁၀)ရွာတွင် သီးသန့်နေထိုင်ကြသည်။

**ယင်းနက်လူမျိုး သမိုင်းအကျဉ်း**

ယင်းနက်လူမျိုးတို့နှင့် ပတ်သက်၍ မြန်မာအဘိဓာန်တွင်

**ယင်းနက်/န/ ရှမ်းပြည်နယ်တောင်ပိုင်း နမ့်စန်ဒေသတွင်  
အများအားဖြင့် နေထိုင်သော မြန်မာတိုင်းရင်းသားတစ်မျိုး<sup>၇</sup>**

ဟူ၍ ဖော်ပြထားပါသည်။

တိုင်းရင်းသားယဉ်ကျေးမှုရိုးရာ ဓလေ့ထုံးစံများ (ရှမ်း)စာအုပ်တွင်

**အနက်ရောင်ဝတ်ဆင်သောရိယန်လူမျိုးကိုယင်းနက်ဟုခေါ်ပြီး<sup>၈</sup>**

ဟူ၍ဖော်ပြထားပါသည်။

ယင်းနက်လူမျိုးတို့သည် ရှမ်းပြည်တောင်ပိုင်း လွိုင်လင်ခရိုင်ရှိ ပင်လုံမြို့နယ်နှင့် နမ့်စန်မြို့နယ်တွင် နေထိုင်ကြသည်။ ပင်လုံမြို့နယ်အတွင်းရှိ ကျူရုံးရွာနှင့် နမ့်စန်မြို့နယ် အတွင်းရှိ နောင်လိုင်၊ နမ့်ဟူး၊ လွယ်ဆိုင်၊ နောင်အိန်၊ နမ့်ခုတ်၊ ဆပ်ခါ၊ ဝမ်ပန်၊ ကုန်းတီး၊ နောင်ဘို၊ လွယ်ငင်းလေး၊ နမ့်ဟိုင်း၊ ကုန်းယောင်း၊ ကုန်းလမ်း၊ ပြင်ဦး၊ ကုန်းပုတ်၊ ဗန်ဗွန်း၊ လွယ်ဆောင်၊ လွယ်ငင်းကြီး၊ ဟိုလွယ်ကျေးရွာတို့တွင် သီးသန့် နေထိုင်ကြသည်။ နမ့်ဗန်၊ နမ့်ဗို၊ လွယ်ကပ်စသည့် ကျေးရွာတို့တွင်လည်း ရှမ်းတိုင်းရင်းသားတို့နှင့် ရောနှော နေထိုင်ကြသည်။

**ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားသမိုင်းအကျဉ်း**

မြန်မာနိုင်ငံတွင် ဘာသာစကားမျိုးရိုးကြီး(၂)ခု ရှိကြောင်းကို ဦးဖေမောင်တင်၏ ဘာသာ လောကကျမ်း၌

**ယင်းနက်/န/ ရှမ်းပြည်နယ်တောင်ပိုင်း နမ့်စန်ဒေသတွင်  
အများအားဖြင့် နေထိုင်သော မြန်မာတိုင်းရင်းသားတစ်မျိုး<sup>၉</sup>**

ဟု ဆိုထားပါသည်။

မြန်မာ့စွယ်စုံကျမ်းတွင်

ပလောင်နှင့်ပလေးတို့သည် မွန်-ခမာအစုဝင် ဘာသာစကားကို ပြောဆိုသုံးစွဲကြသူများ ဖြစ်ကြသည်။ ယင်းတို့နှင့် နီးကပ်စွာ အနွယ်တူ ပြောဆိုသုံးစွဲကြသူများမှာ ယန်၊ လမ်၊ ဝ၊ လ၊ လဝတို့ ဖြစ်ကြသည်။ ယင်းတို့ အားလုံးပေါင်း၍ ပလောင်-ဝ အစုကလေးဟု ခေါ်ကြသည်။ ယင်းကျား ယင်းနက်တို့၏ ဘာသာစကားသည် မွန်-ခမာ မျိုးရိုးမှ ဆင်းသက်လာကြောင်း တွေ့ရသည်။<sup>၁၀</sup>

ဟု ဆိုထားပါသည်။

<sup>၇</sup> မြန်မာစာအဖွဲ့၊ ၁၉၉၁၊ ၃၀၀။

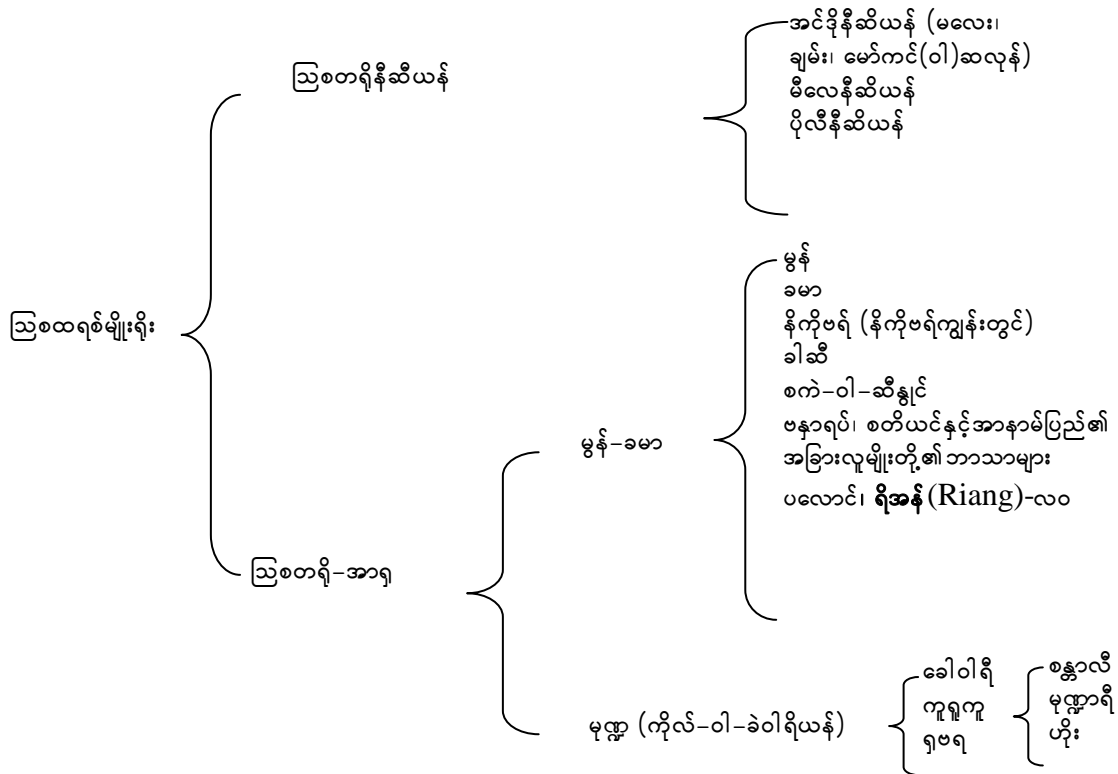
<sup>၈</sup> မင်းနိုင်၊ ဦး၊ ၁၉၆၈၊ ၆၂။

<sup>၉</sup> ဗမာမောင်တင်၊ ဦး၊ ၁၉၆၆၊ ၁၈။

<sup>၁၀</sup> မြန်မာ့စွယ်စုံကျမ်း၊ ၁၉၆၂၊ ၂၆၁။

ရိအန်ဟုခေါ်သော ယင်းကျား၊ ယင်းနက်တို့၏ ဘာသာစကားသည် မွန်ဘာသာစကားနှင့် မျိုးရိုးတစ်ခုတည်းမှ ဆင်းသက်လာသည့် ဘာသာစကားဖြစ်သည်။ မွန်ဘာသာစကားနှင့် ယင်းကျား၊ ယင်းနက်ဘာသာစကားသည် သြစထရစ်ခေါ်တောင်ပိုင်း ဘာသာစကားမျိုးရိုးကြီးမှ ဆင်းသက်လာသော မွန်-ခမာအနွယ်ဝင် ဘာသာစကားဖြစ်ပါသည်။ ယင်းကဲ့သို့ သြစထရစ်မျိုးရိုးဝင် ဖြစ်ကြောင်း အောက်ပါ သရုပ်ပြပုံအရ သိရပါသည်။

### သြစထရစ်မျိုးရိုးဝင်ဘာသာများ



### ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားနှိုင်းယှဉ်လေ့လာချက်

#### ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကား ဗျည်းနှိုင်းယှဉ်လေ့လာချက်

စကားသံများကို အမျိုးအစားခွဲလျှင် အခြေခံကျသော စကားသံနှစ်မျိုးမှာ ဗျည်းသံနှင့် သရသံ ဖြစ်သည်။ ယင်းကျားဘာသာစကားတွင် ဗျည်း (၂၈)လုံးရှိသည်ကို တွေ့ရပါသည်။ ယင်းကျားဘာသာစကားရှိ ဗျည်းများမှာ

ရန်းပွင့်ဗျည်း	/p/ /ph/ /b/ /t/ /th/ /d/ /k/ /kh/ /g/
ရပ်သံဗျည်း	/ʔ/
ရန်းပွင့်ပွတ်တိုက်ဗျည်း	/tɕ/ / tɕh/ / dʒ/
နာသံဗျည်း	/m/ /n/ /ɲ/ /ŋ/

ဘေးလျှာပွင့်ဗျည်း /l/  
 ပွတ်တိုက်ဗျည်း /θ/ /ð/ /s/ /sh/ /r/ /ʃ/ /z/ /h/  
 သရရွေဗျည်း /w/ /j/  
 တို့ဖြစ်ကြသည်။

ယင်းနက်ဘာသာစကားတွင် ဗျည်း (၂၇)လုံးရှိသည်ကို တွေ့ရပါသည်။ ယင်းနက်ဘာသာစကားမှ ဗျည်းများမှာ

ရုန်းပွင့်ဗျည်း /p/ /ph/ /b/ /t/ /th/ /d/ /k/ /kh/  
 ရပ်သံဗျည်း /ʔ/  
 ရုန်းပွင့်ပွတ်တိုက်ဗျည်း /tʃ/ / tʃh/ / dʒ/  
 နှာသံဗျည်း /m/ /n/ /ɲ/ /ŋ/

ဘေးလျှာပွင့်ဗျည်း /l/  
 ပွတ်တိုက်ဗျည်း /v/ /θ/ /ð/ /s/ /sh/ /r/ /ʃ/ /h/  
 သရရွေဗျည်း /w/ /j/  
 တို့ဖြစ်ကြသည်။

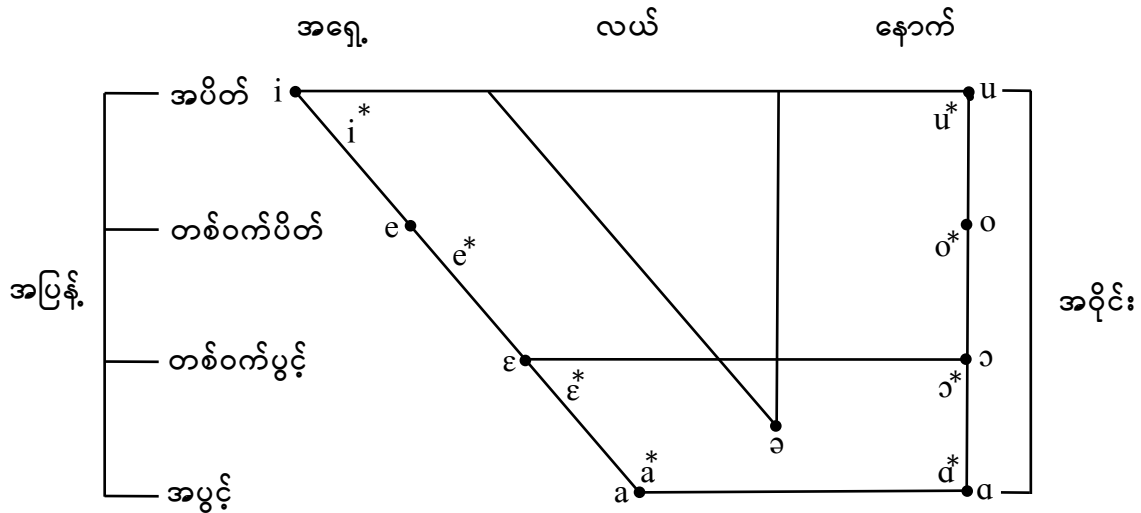
ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားတို့၏ ဗျည်းကို နှိုင်းယှဉ်လေ့လာရာတွင် ယင်းကျားဘာသာစကားတွင် တွေ့ရသော /g/ /z/ ဗျည်းသံကို ယင်းနက်ဘာသာစကားတွင် မတွေ့ရပေ။ ထို့အတူ ယင်းနက်ဘာသာစကားတွင် တွေ့ရသော /v/ ဗျည်းကို ယင်းကျားဘာသာစကားတွင် မတွေ့ရပေ။ ယင်းနက်ဘာသာစကားတွင် သံပြင်းဗျည်း /g/ /z/ အစား သံညင်းဗျည်း /k/ /s/ ဖြင့်သာ ပြောဆိုကြသည်။

**ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားသရ နှိုင်းယှဉ်လေ့လာချက်**

ယင်းကျားဘာသာစကားတွင် သရသန်.သန်. (၈)လုံးရှိသည်ကိုတွေ့ရပါသည်။

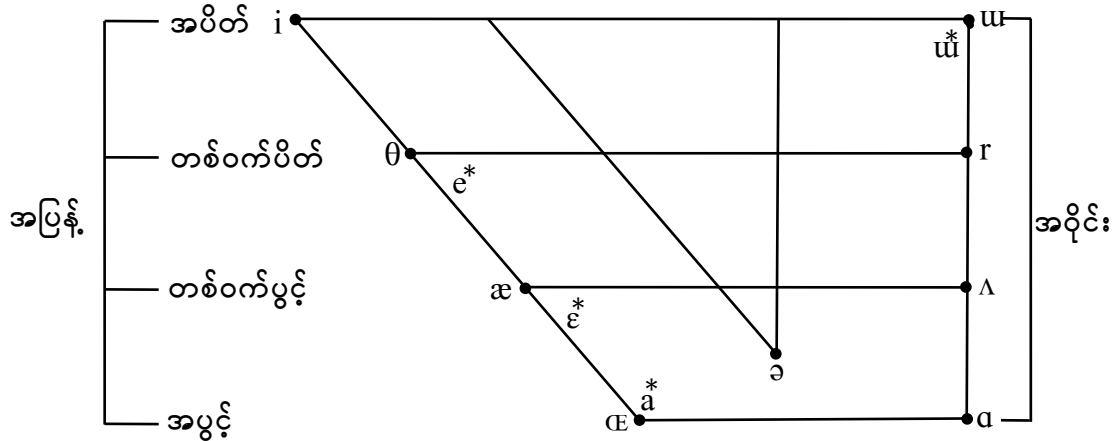
/i/ ရှေ့အပိတ်အပြန်.သရ  
 /e/ ရှေ့တစ်ဝက်ပိတ်အပြန်.သရ  
 /ɛ/ ရှေ့တစ်ဝက်ပွင့်အပြန်.သရ  
 /a/ ရှေ့အပွင့်အပြန်.သရ  
 /ɑ/ နောက်အပွင့်အဝိုင်းသရ  
 /ɔ/ နောက်တစ်ဝက်ပွင့်အဝိုင်းသရ  
 /o/ နောက်တစ်ဝက်ပိတ် အဝိုင်းသရ  
 /u/ နောက်အပိတ်အဝိုင်းသရ

ဟူ၍ သရသန်.သန်.(၈)ခုရှိကြောင်းတွေ့ရပါသည်။



**ယင်းကျားဘာသာစကား၏ မူလအခြေခံသရစနစ်ပြပုံ**

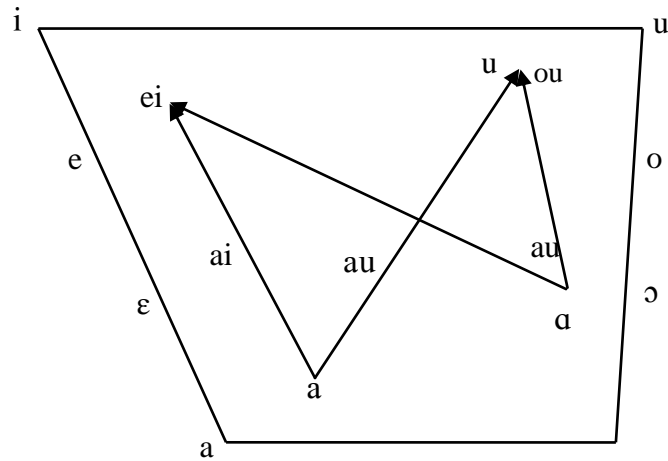
ထို့ အတူ ယင်းကျားဘာသာစကားတွင် ထပ်ဆင့်သရအဖြစ် / ʊ / ကို တွေ့ရပါသည်။



**ယင်းကျားဘာသာစကား၏ ထပ်ဆင့်သရစနစ်ပြပုံ**

ယင်းကျားဘာသာစကားတွင် နှာသံသရ / i / / ɛ / / u / / ai / / ɛ / / au / လုံးတွေ့ရပါသည်။ နှာသံပါ သရတွဲ အဖြစ် / ai / / au / / ou / / ei / ငှ လုံးတွေ့ရပါသည်။ ယင်းနက်ဘာသာစကားတွင် / i / / ɛ / / u / / ɔ / ဟူ၍ တွေ့ရသည်။

ယင်းကျားဘာသာစကားတွင် သရတွဲအနေနှင့် သရ နှစ်လုံးတွဲများကို တွေ့ရပါသည်။ / ai / / au / / ou / / ei / ဟူ၍ သရတွဲတို့ (၂)လုံးနှင့် သရတွဲရှည် (၄)လုံးကိုတွေ့ရပါသည်။



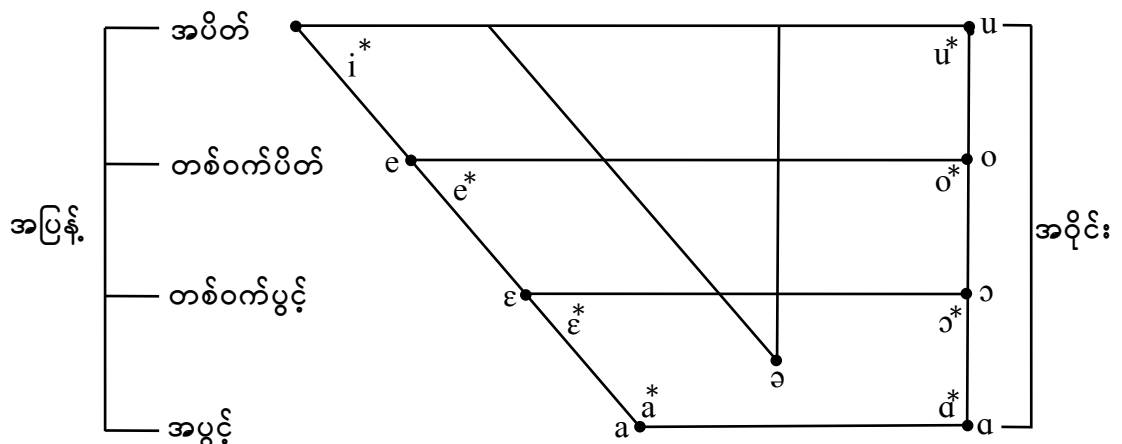
### ယင်းကျားသရတွဲစနစ်ပြပုံ

ယင်းကျားဘာစကားတွင် ရပ်သံပါသရများအဖြစ် / a? / / ε? / / u? / ဟူ၍ သုံးလုံး  
တွေ့ရပါသည်။ ရပ်သံပါသရတွဲများအဖြစ် / au? // ai? / ဟူ၍ (၂)လုံးတွေ့ရပါသည်။

ယင်းနက်ဘာသာစကားတွင် သရသန့်သန့် (၈)လုံးရှိသည်ကိုတွေ့ရပါသည်။

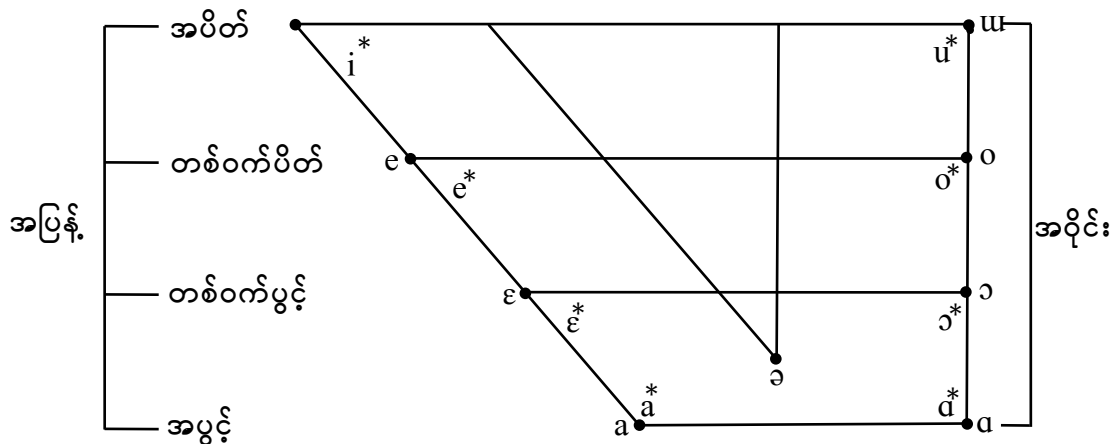
- / i / ရှေ့အပိတ်အပြန်သရ
- / e / ရှေ့တစ်ဝက်ပိတ်အပြန်သရ
- / ε / ရှေ့တစ်ဝက်ပွင့်အပြန်သရ
- / a / ရှေ့အပွင့်အပြန်သရ
- / ɑ / နောက်အပွင့်အပိုင်းသရ
- / ɔ / နောက်တစ်ဝက်ပွင့်အပိုင်းသရ
- / o / နောက်တစ်ဝက်ပိတ် အပိုင်းသရ
- / u / နောက်အပိတ်အပိုင်းသရ

ဟူ၍ သရသန့်သန့်(၈)လုံးရှိသည်ကိုတွေ့ရပါသည်။



### ယင်းနက်ဘာသာစကား မူလအခြေခံသရစနစ်ပြပုံ

ယင်းနက်ဘာသာစကားတွင် ထပ်ဆင့်သရအဖြစ် / u / ကို တွေ့ရပါသည်။



### ယင်းနက်ဘာသာစကား၏ ထပ်ဆင့်သရစနစ်ပြပုံ

ယင်းနက်ဘာသာစကားတွင် နှာသံသရ / ɪ / / ǣ / / ɔ̃ / / ũ / ဟူ၍(၄)လုံး တွေ့ရပါသည်။

ယင်းနက်ဘာသာစကားတွင် နှာသံပါသရတွဲ / eɪ / / aɪ // aũ / / oũ / ဟူ၍ ၄လုံး တွေ့ရပါသည်။

ယင်းနက်ဘာသာစကားတွင် ရပ်သံပါသရ / aʔ / / ɛʔ / နှစ်လုံးတွေ့ရပြီး ရပ်သံပါ ရသရတွဲ / eiʔ / / aiʔ / ဟူ၍(၂)လုံးတွေ့ရပါသည်။

ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားတို့၏ သရများကို နှိုင်းယှဉ် လေ့လာသောအခါ ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားတွင် သရသန်သန် (၈)လုံးစီရှိကြသည်။

ထို့အတူ ထပ်ဆင့်သရ / u / ရှိပုံချင်းလည်းတူညီသည်။

ယင်းကျားဘာသာစကားတွင် နှာသံသရ / ɪ / / ǣ / / ũ / သုံးလုံးသာရှိသော်လည်း ယင်းနက်ဘာသာစကား / ɪ // ǣ / / ɔ̃ / / ũ / ဟူ၍ (၄)လုံးတွေ့ရပါသည်။ ယင်းနက်ဘာသာစကားတွင်တွေ့ရသော / ɔ̃ / သရကို ယင်းကျားဘာသာစကားတွင် မတွေ့ရပေ။

ယင်းကျားဘာသာစကားတွင် နှာသံပါသရတွဲ / aɪ // aũ // eɪ / / oũ / ဟူ၍ ၄လုံး တွေ့ရပါသည်။

ယင်းနက်ဘာသာစကားတွင် နှာသံပါသရတွဲ / aɪ // aũ // eɪ / / oũ / ဟူ၍ တွေ့ရသဖြင့် နှာသံပါသရတွဲ အရေအတွက်ရော အမျိုးအစားပါတူသည်ကို တွေ့ရပါသည်။

ယင်းကျားဘာသာစကားတွင် ရပ်သံပါသရ / aʔ // ɛʔ // uʔ / ဟူ၍ ၃လုံးတွေ့ရ ပါသည်။

ယင်းနက်ဘာသာစကားတွင် ရပ်သံပါသရ / aʔ // ɛʔ / ဟူ၍ (၂)လုံးသာတွေ့ရ ပါသည်။

ယင်းကျားဘာသာစကားတွင်တွေ့ရသော / uʔ / ကို ယင်းနက်ဘာသာစကားတွင် မတွေ့ရပေ။



ယင်းကျားဘာသာစကားတွင် ရပ်သံပါသရတွဲ / ai?/ / au? / ဟူ၍ နှစ်လုံးတွေ့ရပါသည်။

ယင်းနက်ဘာသာစကားတွင် / ai?/ / ei? / ဟူ(၂)လုံးတွေ့ရပါသည်။ ယင်းကျားဘာသာစကားတွင် / au? / သရတွေ့ရသော်လည်း ယင်းနက်ဘာသာစကားတွင် မတွေ့ရပေ။ ထို့အတူ ယင်းနက်ဘာသာစကားတွင် တွေ့ရသော / ei? / ကို ယင်းကျား ဘာသာစကားတွင် မတွေ့ရပေ။

**ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကား၏ ဝဏ္ဏဖွဲ့စည်းပုံနှိုင်းယှဉ်လေ့လာချက်**

စကားသံဖွဲ့ပုံအဆင့်တွင် ဝဏ္ဏ၊ သံရင်းဟူသော အခြေခံစကားသံယူနစ်(၂)မျိုးအနက် ဝဏ္ဏသည် အဆင့်အတန်းအားဖြင့် အမြင့်ဆုံးဖြစ်၍ အရွယ်ပမာဏအားဖြင့်လည်း အကြီးဆုံးဖြစ်သည်။ ဝဏ္ဏနှင့်ပတ်သက်၍ က(န်)ဝေါ့တီက

ဝဏ္ဏဆိုသည်မှာ စကားသံဖွဲ့ပုံအတွင်း အရေးပါသည့်  
ယူနစ်ဖြစ်ပြီး ဝဏ္ဏအားလုံး၏ အလယ်နေရာတွင် သရသည်  
မပါမဖြစ်ဖြစ်သည်။ ဗျည်းသည် ဘေးမှပါရပါမည်။<sup>၁၁</sup>

ဟုဖွင့်ဆိုထားပါသည်။

ဝဏ္ဏတစ်ခု၏ ဖွဲ့စည်းတည်ဆောက်မှုပုံစံကို ကြည့်လျှင် ကဏ္ဍ (၃)ခုတွေ့ရသည်။ ယင်း(၃)ခုမှာ အစကဏ္ဍ၊ အလယ်ကဏ္ဍ၊ အဆုံးကဏ္ဍ တို့ဖြစ်ပါသည်။ အလယ်ကဏ္ဍသည် ဝဏ္ဏတစ်ခုအတွက် မပါလျှင်မဖြစ်ကြောင်းတွေ့ရသည်။ အစကဏ္ဍနှင့် အဆုံးကဏ္ဍတို့မှာ ပါသည်လည်းရှိပြီး မပါသည်လည်း ရှိပါသည်။ စကားသံဖွဲ့ပုံ ရှုထောင့်မှကြည့်လျှင် ဝဏ္ဏဖွဲ့စည်းပုံ (၄)မျိုးကို တွေ့ရပါသည်။ ပို၍ထွေပြားသော ဝဏ္ဏပုံစံများ ovo |cvo | ovc | cvc ဟူ၍ တွေ့ရပါသည်။ ပို၍ထွေပြားသော ဝဏ္ဏပုံစံများသည် ထို(၄)မျိုးပေါ်၌ အခြေခံ၍ ဖြစ်လာပါသည်။

**ယင်းကျားဘာသာစကား၏ ဝဏ္ဏဖွဲ့စည်းပုံ**

ovo ဝဏ္ဏ၏ အစနှင့်အဆုံး ကဏ္ဍ(၂)ခုလုံးတွင် အစိတ်အပိုင်း တစ်ခုမျှမရှိဘဲ အလယ်ကဏ္ဍ၌သာ ဖွဲ့စည်းပုံမျိုးဖြစ်ပါသည်။ ယင်းကျားဘာသာစကားတွင် ovo ဝဏ္ဏဖွဲ့စည်းပုံ ရှိကြောင်း သိနိုင် ပါသည်။

အသံထွက်	အဓိပ္ပာယ်
/ ó/	ကျွန်တော်
/ é/	ပေးသည်
/ -ã /	အဆောင်
/ i/	လူ
/ é /	ငါတို့

<sup>11</sup> Kenworthy, 1991, 44.

## CVO

ဝဏ္ဏ၏ အစကဏ္ဍ၌ ဗျည်း၊ အလယ်ကဏ္ဍ၌ သရပါပြီး အဆုံးကဏ္ဍ၌ အစိတ်အပိုင်းတစ်ခုမျှ မရှိသည့် ဖွဲ့စည်းပုံမျိုးဖြစ်သည်။ ယင်းကျားဘာသာစကားတွင် CVO ဝဏ္ဏဖွဲ့စည်းပုံရှိကြောင်း သိနိုင်ပါသည်။

**အသံထွက်**

/ pé /

/ -pũ/

/ là /

/ tí /

/ tɔ̃ /

**အဓိပ္ပာယ်**

နင်တို.

ပုန်းသည်

အရွက်

ပိတ်(သည်)

ညီ

## CCVO

ဝဏ္ဏ၏အစကဏ္ဍ၌ ဗျည်းအရေအတွက် နှစ်လုံးထိဖြစ်နိုင်ပြီး အလယ်ကဏ္ဍ၌ သရ၊ အဆုံးကဏ္ဍ၌ အစိတ်အပိုင်းတစ်ခုမျှ မရှိသည့်ဖွဲ့စည်းပုံမျိုးဖြစ်သည်။ ယင်းကျားဘာသာစကားတွင် CCVOဝဏ္ဏ ဖွဲ့စည်းပုံရှိကြောင်း သိနိုင်ပါသည်။

**အသံထွက်**

/ -nwã /

/ -lwã /

/ -mwã /

/ ɲwu? /

/ swa? /

**အဓိပ္ပာယ်**

ရေကန်

ရောက်(သည်)

ခေါင်းအုံး

မိချောင်း

ဆား

## OVC

ဝဏ္ဏ၏အစကဏ္ဍ၌ အစိတ်အပိုင်းတစ်ခုမျှမရှိဘဲ အလယ်ကဏ္ဍ သရ၊ အဆုံးကဏ္ဍ၌ ဗျည်း ပါဝင်သည့် ဖွဲ့စည်းပုံမျိုးဖြစ်သည်။ ယင်းကျားဘာသာစကားတွင် OVC ဝဏ္ဏဖွဲ့စည်းပုံရှိကြောင်း သိနိုင်ပါသည်။

**အသံထွက်**

/ ˘ũm/

/ ák /

/ ēp /

/ -ãm/

/ ʼàs /

**အဓိပ္ပာယ်**

ရေ

မြား

အရိပ်

မ၊ အငြင်း

လသာသည်

## CVC

ဝဏ္ဏ၏အစကဏ္ဍ၌ ဗျည်း၊ အလယ်ကဏ္ဍ၌သာရ၊ အဆုံးကဏ္ဍ၌ဗျည်းပါဝင်သည့် ဖွဲ့စည်းပုံမျိုး ဖြစ်သည်။ ယင်းကျားဘာသာစကားတွင် CVC ဝဏ္ဏဖွဲ့စည်းပုံရှိကြောင်း သိနိုင်ပါသည်။

## အသံထွက်

## အဓိပ္ပာယ်

/ -ṇūl /

ပြည့်ဝသည်

/ ṇṓṇ /

စောင့်မျှော် (သည်)

/ lūl /

ဖြတ်(သည်)

/ thūl /

နေး(သည်)

/ hīl /

သံအမျိုးအစား

## CCVC

ဝဏ္ဏ၏အစကဏ္ဍ၌ ဗျည်းအရေအတွက် နှစ်လုံးထိဖြစ်နိုင်ပြီး အလယ်ကဏ္ဍ၌ သရ၊ အဆုံးကဏ္ဍ ဗျည်းပါဝင်သည့် ဖွဲ့စည်းပုံမျိုးဖြစ်သည်။ ယင်းကျားဘာသာစကားတွင် CCVC ဝဏ္ဏ ဖွဲ့စည်းပုံရှိကြောင်း သိနိုင်ပါသည်။

## အသံထွက်

## အဓိပ္ပာယ်

/ -swām /

စား(သည်)

/ ṇmāt /

ငတ်(သည်)

/ -mjaūl /

ကြောင်

/ -trāṇ /

အတောင်ပံ

ယင်းကျားဘာသာစကား ဝဏ္ဏဖွဲ့စည်းပုံစနစ်ကို လေ့လာရာ၌ ဝဏ္ဏဖွဲ့စည်းပုံ (၄)မျိုးလုံးတွေ့ရ သည်မက။ ထိုဖွဲ့စည်းပုံကို အခြေခံ၍ ပွားယူထားသော CCVO၊ CCVC ဝဏ္ဏပုံစံကို တွေ့ရှိရ ပါသည်။

## ယင်းနက်ဘာသာစကား၏ဝဏ္ဏဖွဲ့စည်းပုံ

## OVO

ဝဏ္ဏ၏အစနှင့်အဆုံး ကဏ္ဍ(၂)ခုလုံးတွင် အစိတ်အပိုင်းတစ်ခုမျှမရှိဘဲ အလယ်ကဏ္ဍသာ သရပါသည် ဖွဲ့စည်းပုံမျိုး ဖြစ်သည်။ ယင်းနက်ဘာသာစကားတွင် OVO ဝဏ္ဏဖွဲ့စည်းပုံ ရှိကြောင်း သိနိုင်ပါသည်။

## အသံထွက်

## အဓိပ္ပာယ်

/ é /

ငါတို့ (၃ယောက် အထက်)

/ ó /

ငါတို့ (၂ယောက်)

/ è /

ပေး(သည်)

## CVO

ဝဏ္ဏ၏ အစကဏ္ဍ၌ ဗျည်း၊ အလယ်ကဏ္ဍ၌ သရပါပြီး အဆုံးကဏ္ဍ၌ အစိတ်အပိုင်း တစ်ခုမျှမရှိသည့် ဖွဲ့စည်းပုံမျိုးဖြစ်သည်။ ယင်းကျားဘာသာစကားတွင် CVO ဝဏ္ဏဖွဲ့စည်းပုံ ရှိကြောင်း သိနိုင်ပါသည်။

**အသံထွက်**

/ -kǎ /

/ khè /

/ tɕó /

/ sǎ /

**အဓိပ္ပာယ်**

တံပိုး

ဆေး၊(သည်)

ဆာ(သည်)

ဆွဲခြင်း

## CCVO

ဝဏ္ဏ၏ အစကဏ္ဍ၌ ဗျည်းအရေအတွက် နှစ်လုံးထိဖြစ်နိုင်ပြီး အလယ်ကဏ္ဍ၌သရ၊ အဆုံးကဏ္ဍ၌ ဗျည်းပါဝင်သည့် ဖွဲ့စည်းပုံမျိုးဖြစ်သည်။ ယင်းနက်ဘာသာစကားတွင် CCVO ဝဏ္ဏဖွဲ့စည်းပုံ ရှိကြောင်း သိနိုင်ပါသည်။

**အသံထွက်**

/ kǎ /

/ mweĩ /

/ pjó /

**အဓိပ္ပာယ်**

ကလေး

ပါးစပ်

ရောင်သည်

## OVC

ဝဏ္ဏ၏ အစကဏ္ဍ၌ အစိတ်အပိုင်းတစ်ခုမျှမရှိဘဲ အလယ်ကဏ္ဍ၌သရ၊ အဆုံးကဏ္ဍ၌ ဗျည်းပါသည့် ဖွဲ့စည်းပုံမျိုးဖြစ်သည်။ ယင်းနက်ဘာသာစကားတွင် OVC ဝဏ္ဏဖွဲ့စည်းပုံ ရှိကြောင်းသိနိုင် ပါသည်။

**အသံထွက်**

/ -ũm /

/ ɔl /

/ aʔ /

**အဓိပ္ပာယ်**

စဉ်အိုး

ပြင်(သည်)

လှသည်။

## CVC

ဝဏ္ဏ၏ အစကဏ္ဍ၌ ဗျည်း၊ အလယ်ကဏ္ဍ၌သရ၊ အဆုံးကဏ္ဍ၌ ဗျည်းပါဝင်သည့် ဖွဲ့စည်းပုံမျိုးဖြစ်သည်။ ယင်းနက်ဘာသာစကားတွင် CVC ဝဏ္ဏဖွဲ့စည်းပုံရှိကြောင်းသိရပါသည်။

အသံထွက်	အဓိပ္ပာယ်
/ ၇ဲ၇ /	ခါး
/ dāl /	နဖူး
/ lút /	ဆိုင်ကယ်

CCVC

ဝဏ္ဏ၏ အစကဏ္ဍ၌ ဗျည်းအရေအတွက် နှစ်လုံးထိဖြစ်နိုင်ပြီး အလယ်တွင် သရ၊ အဆုံးကဏ္ဍ၌ ဗျည်းပါဝင်သည့် ဖွဲ့စည်းပုံမျိုးဖြစ်သည်။ ယင်းကျားဘာသာစကားတွင် CCVC ဝဏ္ဏဖွဲ့စည်းပုံ ရှိကြောင်း သိနိုင်သည်။

အသံထွက်	အဓိပ္ပာယ်
/ swām /	စားသည်
/ nwār /	ကြိုး

ယင်းနက်ဘာသာစကားတွင် ဝဏ္ဏဖွဲ့စည်းပုံ(၄)မျိုးလုံးတွေ့ရသည် OVO၊ CVO၊ OVC၊ CVC၊ (၄)မျိုးလုံးတွေ့ရသည်။ ထို(၄)မျိုးပေါ်အခြေခံ၍ CCVO ၊ CCVC ဝဏ္ဏဖွဲ့စည်းပုံများကို တွေ့ရပါသည်။

### ခြုံငုံသုံးသပ်ချက်

ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားသည် သြစထရစ်မျိုးရိုးဝင် သြစထရစ်-အာရှမျိုးရိုးဖြစ်သည့် မွန်-ခမာ မျိုးရိုးဝင်ဖြစ်သည်။ မျိုးတူဘာသာစကား ဖြစ်သော်လည်း ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားကို နှိုင်းယှဉ်လေ့လာသည့်အခါ ဗျည်းစနစ်တွင် ဗျည်း(၂၇)လုံးရှိသည်။ ယင်းနက်ဘာသာစကားတွင် ဗျည်း(၂၈)လုံး ရှိသည်။ ယင်းကျားဘာသာစကားတွင် ရှိသော/g/ နှင့် /z/ ဗျည်းကို ယင်းနက်ဘာသာတွင် မတွေ့ရပေ။ ထို့အတူ ယင်းနက်ဘာသာစကားတွင် တွေ့ရသော /v/ ဗျည်းကိုလည်း ယင်းကျားဘာသာစကားတွင် မတွေ့ရပေ။ ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကား၏ သရစနစ်တွင် အခြေခံသရ (၈)လုံး ရှိသည်မှာ တူညီကြပြီး ထပ်ဆင့်သရ /w / ကိုလည်း ယင်းကျားနှင့် ယင်းနက်တွင် တွေ့ရသည်။ ယင်းကျားဘာသာစကားတွင် နှာသံသရ /i/ / ā / / ū/ (၃)လုံး တွေ့ရပြီး ယင်းနက်ဘာသာစကားတွင် /ī/ / ā/ / ū/ / ǐ / / ǔ/ ဟူ၍ (၄)လုံး တွေ့ရပါသည်။ ယင်းနက်ဘာသာစကားတွင် တွေ့ရသော /ǐ/ နှာသံသရကို ယင်းကျားဘာသာစကားတွင် မတွေ့ရပါ။ ယင်းကျားဘာသာစကားတွင် နှာသံပါသရတွဲ / aī / / aū / / oū / / eī / (၄)လုံး တွေ့ရသကဲ့သို့ ယင်းနက်ဘာသာစကားတွင်လည်း / aī / / aū / / oū / / eī / ဟူ၍နှာသံပါသရတွဲများကို တွေ့ရသဖြင့် နှာသံပါသရရှိပုံချင်း တူညီသည်ကို တွေ့ရပါသည်။

ယင်းကျားဘာသာစကား၏ ဝဏ္ဏဖွဲ့စည်းပုံကို လေ့လာကြည့်သည့်အရ OVO, CVO, OVC, CVC ဟူ၍ အခြေခံဝဏ္ဏဖွဲ့စည်းပုံ(၄)မျိုးနှင့် ထိုဖွဲ့စည်းပုံကို အခြေခံ၍ ပွားယူထားသော CCVO, CCVC ဝဏ္ဏပုံစံတို့ကို တွေ့ရှိရပါသည်။ ယင်းနက် ဘာသာစကားတွင် OVO, CVO, OVC, CVC ဟူ၍အခြေခံဝဏ္ဏဖွဲ့စည်းပုံ (၄)မျိုးနှင့် ထိုဖွဲ့စည်းပုံကို အခြေခံ၍ ပွားယူထားသော CCVO, CCVC ဟူ၍ ဝဏ္ဏပုံစံတို့ကို တွေ့ရှိရာ ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားသည် ဝဏ္ဏဖွဲ့စည်းပုံချင်း တူညီကြသည်ကို တွေ့ရပါသည်။

### နိဂုံး

ဤစာတမ်းသည် ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားတို့ကို နှိုင်းယှဉ်လေ့လာထားသည့် စာတမ်းဖြစ်ပါသည်။ ယင်းကျားဘာသာစကားနှင့် ယင်းနက်ဘာသာစကားတို့သည် မျိုးတူဘာသာစကားများ ဖြစ်သည်။ အရေးဘာသာစကားမရှိဘဲ အပြောဘာသာစကားသာရှိသည့် ဘာသာစကားများလည်းဖြစ်သည်။ မျိုးရိုးတူသော်လည်း ဗျည်းအရေအတွက်၊ သရအရေအတွက်၊ ဝဏ္ဏဖွဲ့စည်းပုံတို့ မတူညီသည်ကို တွေ့ရသည်။ အပြောဘာသာစကားသာရှိပြီး အရေးဘာသာ စကားမရှိသည့် ဘာသာစကားများဖြစ်သည့်အတွက် မပျောက်ပျက်ရန် ထိန်းသိမ်းကြရမည်ဖြစ်သည်။ ဘာသာစကားများကို နှိုင်းယှဉ်လေ့လာခြင်းဖြင့် တူညီမှု၊ ကွဲပြားမှုတို့ကို တွေ့မြင်ရပါသည်။

### ကျမ်းကိုးစာရင်း

- ပညာရှင်များ။ (၂၀၀၈)။ **မှန်နန်းရာစဝင်သုံးတွဲပေါင်း၊ ပ-ကြိမ်**။ ရန်ကုန်၊ မုံရွေးပုံနှိပ်တိုက်။
- ဖေမောင်တင်၊ ဦး။ (၁၉၅၈)။ **ဘာသာလောကကျမ်း**။ ရန်ကုန်၊ စာပေဗိမာန်ပုံနှိပ်တိုက်။
- မင်းနိုင်၊ ဦး။ (၁၉၆၈)။ **တိုင်းရင်းသားယဉ်ကျေးမှုရိုးရာဓလေ့များ(ရှမ်း)**။ ရန်ကုန်၊ စာပေဗိမာန်ပုံနှိပ်တိုက်။
- မြန်မာစာအဖွဲ့။ (၁၉၉၁)။ **မြန်မာအဘိဓာန်**။ ရန်ကုန်၊ ဖိုတိုလစ်သိုပုံနှိပ်တိုက်။
- မြန်မာနိုင်ငံဘာသာပြန်စာပေအသင်း။ (၁၉၇၀)။ **မြန်မာ့စွယ်စုံကျမ်း၊ အတွဲ-၁၁**။ ရန်ကုန်၊ စာပေဗိမာန်ပုံနှိပ်တိုက်။

## Converting the EFL students' Translation errors into positive Feedbacks

Daw Myint Myint Thi\*

### Abstract

The importance of teaching translation has long been ignored. In this paper, the translation errors committed by Myanmar EFL students are explored and analyzed. Their knowledge of translation skills is analyzed. Two tests were provided the target group (the third-year English specialization students). The maximum type of errors in translating the texts from Myanmar to English is found out. Then, The maximum type of errors is discovered in translating to English texts to Myanmar. The theoretical model of Poposau (2013) is used in this research. The focus is made on linguistic errors, comprehension errors and translation errors. The research findings show that students are most likely to commit linguistic errors. These errors are viewed as positive feedback. Some suggested activities are provided as reinforcement exercises.

**Key words:** *Translation, linguistic errors, comprehension errors, translation errors, positive feedback*

### Introduction

With the rise of supranational communities the role of translator and interpreter has been given priority to build better political, social, economical cooperation based on understanding. In other words, misunderstanding brings no profit for a country. At this point, translation and interpretation should be done carefully in order to avoid misunderstanding.

Even though it is difficult to convey the original meaning in the most natural way, hands-on training can surely nurture efficient translators. Taking the example of Japan and China, a specific group translates the latest publications in other languages into their mother tongue. As a result, the public are able to read these materials although they may not have the knowledge for the target language. This is the fruit of translation.

In the teaching and learning process of translations, it is important to make students to be aware of the errors since this translation product is judged by the error they commit. According to Na Pham (2005), if there are more errors, the translation work will be worse. In order to avoid that the teachers should identify the errors committed by students, especially by explaining them in the translation training process (Seguinot, 1990). In this way, the students will come to notice the errors.

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### **Literature Review**

An error is the reflection of a gap in student's knowledge while a mistake is a fault in student's performance (Goff-Kfour, 2004). Na Pham (2005) stated that there will be less profit, especially for country, if there were a lot of errors in translation. Identifying the translation errors committed by students and explaining them in the translation training process are mentioned as the way to better performance in student's translation, (Seguinot, 1990). "An analysis of translation errors: A Case Study of Vietnamese EFL students" by Kim Cue was conducted in 2018. The main objectives are to analyse the translation errors, to identify the source of errors and to inform some implications of pedagogy. 36 Vietnamese EFL students were asked to take Vietnamese to English translation test. Errors were analysed according to Popescu (2013): linguistic errors, comprehension errors and translation errors. The most common errors of translation types are linguistic errors. It was found out that source of errors are come from inter-lingual and intra lingual inference. Suggestions to do more specific exercises and to encourage learners to read more are informed as some implications.

The subjects were 26 third-year English major students at Kasetsart University. The data was collected from students' exercises and examination. In addition, interviews and stimulated recall were also done. The findings revealed that syntactic errors were the most common, followed by semantic errors and miscellaneous errors like omissions and additions are the least. Carelessness, low self-confidence and anxiety are possible explanations for the courses of errors. It is, therefore, recommended to do group work activities.

In 2016, Tamdikombong, Atmowardoyo and Weda did a research on 'Grammatical errors in the English translation made by the students of English Study program of UKI Toraja.' The objectives are to find out the type of errors, to find out the most frequent errors, to find out the source of errors and to find out the differences in number of grammatical errors made students of different levels. There are altogether 60 participants: 30 students form fourth semester and 30 students from six semester. They took an Indonesian - to - English translation test. Grammatical errors were analysed in accordance with eight parts of speech. The most frequent errors were verbs and nouns. The sources of error are overgeneralization and ignorance of rule restriction. There was little difference in making errors made by students of different levels, eventhough students of lower level made more errors.

In order to analyse the translation errors committed by Myanmar EFL students, the taxonomy for translation errors analysis applied by Pospesu (2013) was used in this paper. According to Pospesu (2013), there are three types, namely linguistic errors, comprehension errors and translation errors. Linguistic errors are divided into three sub categories: morphological, syntactic and collocational. Misunderstanding of the lexis and misunderstanding of the syntax are under the category of comprehension errors. The last type, translation errors, includes distorted meaning, additions, omission and inaccurate rendition of lexical items.



### Research Methodology

The research questions formulated in this paper are as follows: What are the translation errors committed by Myanmar EFL Students?, What is the maximum type of errors in translating the text from Myanmar to English? What is the maximum type of errors in translating the text from English to Myanmar? and What are the similarities and differences in translating the texts from Myanmar to English and English to Myanmar? 43 third-year English specialization students were the subjects of the present study. Two translations tests (Myanmar to English, and English to Myanmar) were used to collect the data. For the analysis of the errors, the three types, linguistic errors, comprehension errors and translation errors proposed by Poposou (2013) were used. The translation errors committed by the students were analyzed in nine sub categories: morphological, syntactic, collocational (linguistic errors), misunderstanding of the lexis, misunderstanding of the syntax (comprehension errors), distorted meaning, additions, omissions, inaccurate rendition of lexical items (translation errors).

### Findings and Discussion

This study aims to explore the translation skills of Myanmar EFL Students. In this session, the translation errors committed by Myanmar EFL students, the maximum type of errors in translating the text from Myanmar to English, the maximum type of errors in translating the text from English to Myanmar and the similarities and differences in translating the texts from Myanmar to English and English to Myanmar are described with tables and figure.

Table1 shows the translation errors committed by the students in translations the test from Myanmar to English.

**Table 1: Translation errors (Myanmar to English)**

Linguistic Errors	Morphological	16	6.75%
	Soyntactic	23	9.79%
	Collocational	67	28.27%
Comprehension Errors	Misunderstanding of the lexis	30	12.66%
	Misunderstanding of the syntax	7	2.95%
Translation Errors	Distorted meaning	13	5.49%
	Additions	13	5.49%
	Omissions	41	17.30%
	Inaccurate renditions of lexical items	27	11.39%
Total errors		237	100%

According to the above table, collocational errors stood the first place with the percentage of 28-27%. It is followed by omission 17-30% which is under the category of translation errors. The third place goes to misunderstanding of the lexis nearly 13%. All in all, the maximum type of errors in translating of the text from Myanmar to English is linguistic errors.

The followings are some examples of Myanmar to English translation errors by students for each type.

### **Linguistic Errors**

1. Morphological: becoming (becomes), priority, (priority)
2. Syntactic: has been changing (is changing)
3. Collocational: essential subject (important subject), separate our transactions (divide our tasks)

### **Comprehension Errors**

4. Misunderstanding of the lexis: in accordance with time, through time (in line with the time )
5. Misunderstanding of the syntax: It is developing quickly nowadays (Nowadays, everything is changing rapidly.)

### **Translation Errors**

6. Distorted meaning: Everything is changing so rapidly. (Everything is changing easily.)
7. Additions: today's young people (people)
8. Omissions: for life (for our lives)
9. Inaccurate renditions of lexical items: Everything is changing through the time in this age. (Nowadays, everything is changing rapidly.)

The following table describes the translation errors committed by the students in translating the text from English to Myanmar.

**Table 2: Translation errors (English to Myanmar)**

Linguistic Errors	Morphological	49	38.28%
	Syntactic	19	14.84%
	Collocational	5	3.91%
Comprehension Errors	Misunderstanding of the lexis	0	0.00%
	Misunderstanding of the syntax	3	2.34%
Translation Errors	Distorted meaning	24	18.75%
	Additions	0	0.00%
	Omissions	20	15.63%
	Inaccurate renditions of lexical items	8	6.25%
Total errors		128	100%

Table.2 states that morphological stood the first place with the percentage of 38-28. It is followed by distorted meaning 18.75%, which is under the category of comprehension errors. The third place goes to omission 15-63%. All in all the maximum type of errors in translating the text from English to Myanmar is linguistic errors. It is found out that there were no errors for misunderstanding of the lexis and addition.

The followings are some examples of English to Myanmar translation errors by students for each type.

### Linguistic Errors

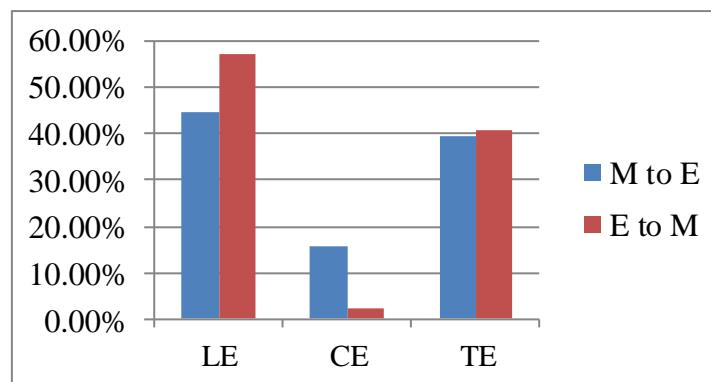
1. Morphological: မြို့နယ် (ခရိုင်) ကျောင်းဝန် (ကျောင်းကုန်)။
2. Syntactic: ပေးအပ်ခဲ့သည် (ပေးအပ်လျက်ရှိသည်)။
3. Collocational: လက်လွှဲပေး (လွှဲပြောင်းပေးအပ်သည်)။

### Comprehension Errors

4. Misunderstanding of the lexis:
5. Misunderstanding of the syntax: ချီးမြှင့်ခဲ့သည် (လွှဲပြောင်းပေးအပ်သည်)။

### Translation Errors

6. Distorted meaning: လူယက်ထားသောမြေ (ပြန်လည်စွန့်လွှတ်သည့်မြေ)။
7. Additions:
8. Omissions: တိုင်း (တိုင်းဒေသကြီး)။
9. Inaccurate renditions of lexical items: လက်ဆင့်ကမ်းသည် (ယာယီပြန်လည်ပေးအပ်သည်)။



**Figure 1: Comparing the type of errors in translating the texts from Myanmar to English and English to Myanmar**

As can be seen in figure 1, linguistic errors are the most common type of errors in translating the texts from Myanmar to English and English to Myanmar. The least common type of errors is also the same for both translation tests. It is comprehension errors. However, there is a big gap in this category because the students commit fewer errors in translating the text from English to Myanmar. It suggests that translating the text into mother tongue is less difficult for the students.

### Conclusion

The present study tried to find out the translation errors committed by Myanmar EFL Students in the context of MUFL. For the first category linguistic errors, collocation is the most common error in translating the text from Myanmar to English while morphological is the type of errors with the highest percent in translating the text from English to Myanmar. Under the comprehension errors, the most common errors is misunderstanding of the lexis, the goes for Myanmar to English translation test and misunderstanding of the syntax for English to Myanmar translation test. For the last translation errors, omission is the one that the students made most of the errors from Myanmar to English translation and in translating the text from English to Myanmar, the students made most of errors concerning with distorted meaning.

More hands - on training for translation is recommended. Doing group work activities using realia like newspaper and video can be used in the training process of translation. Recommendation for further research includes investigating the performance of students in translation after one or two months intensive training.

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## **Students' Opinion on Three Listening Activities Done in Second Year English Specialization at Banmaw University**

Myo Khant Zaw<sup>\*</sup>

### **Abstract**

This research paper presents three listening activities used in second year English specialization class at Banmaw University. It also presents how these activities are used in teaching listening in the class. Finally, the data of students' opinion on these activities are collected by using a set of questionnaire. The result of this paper is that the students have positive attitude towards the use of active listening activities in teaching listening. Most of the students like to do listening activities in the class and they also like listening to music activity more than any other listening activity.

**Key words:** listening activities, second year students, teaching listening

### **Introduction**

Listening is an active, purposeful processing of making sense of what we hear. (Helgesen, 2003.p.24) Listening is "the mental process of constructing meaning" from spoken "input" (Rost.2002 p.279) Listening is a receptive skill and decoding process (searching for meaning)Listening is the ability to identify and understand what the speaker is saying through understanding his accent, pronunciation, grammar, vocabulary and grasping his meaning. Although it is the most critical communication skill, most students have little or no listening instruction. It may be because of the lack of preparation, time or material. And also the students do not want to do listening practice because listening skill is not examined in their final examination. So, the teacher has to use listening activities to take their interests.

### **Aim and Objectives**

The aim of this paper is to explore the opinions of second year English specialization students at Banmaw University towards the idea of using listening activities to improve their listening skill.

The objectives are first to present some listening activities used in the class, secondly to express how to use them and finally to investigate students' opinion by using questionnaires.

### **Literature Review**

In this chapter, theoretical background of this paper is to be identified first. It is followed by procedure for each activity.

### **Theoretical Background**

This paper focuses on some listening activities used in second year English specialization class. Therefore, key terms such as dictation, listening to music and watching movie will be reviewed.

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## **Dictation**

In the classroom, dictation refers to a teacher reading some text aloud so that the students can write down what is being said by the teacher, word for word, later checking their own text against the original and correcting the errors made. Dictation activity works well in the classroom. It can be done with any level, depending on the text used and it requires very little preparation for the teacher.

## **Listening to Music**

Music plays an important part in the ELT classroom. Many students listen to music or songs with English lyrics. There are two types of listening: those who listen because they have some knowledge of the language and want to improve it and those who have little or no knowledge of the language and want to listen to the music for the fact that the singer's voice is nice or the melody is beautiful. Music motivates language learners. Music normally reflects real life situations and therefore can be very useful in the classroom. Music is an important tool to teach and learn English.

## **Watching Movies**

Watching English movies is also an interesting listening activity and it can be used to improve students' listening skill. If the students are exposed to English movies, they can learn new words, phrases and how to use them in everyday life. Watching English movies is popular entertainment among the students. Ryan (1998) points out that "Students will often express an interest in using movies as a medium for language learning..." Teaching listening can be made fun if it is associated with movies. While student listens to the music he/she has to make a great level of effort to understand what is being sang because he/she only listens to what the singer sings but when he/she watches a film the level of effort is less because he/she has a set of images that helps him/her understand what is heard from the characters. Moreover student is able to understand most of the details in the film given that he/she can hear what a character is saying and see how the character expresses him/ herself. According to his/her body or facial expressions and tone of voice the character provides the listener better comprehension. When there are visual images the listening activity is more interesting and the student feels more involved in such an activity.

## **Procedure for each activity**

### **Dictation activity procedure**

The teacher plays the audio CD and asks the students to write what the speakers said. And then the teacher plays the audio CD for the second time and asks them to check their errors. Finally, the teacher gives feedback.

### **Listening to music activity procedure**

The teacher chooses a song by well-known singer to draw students' attention. Before playing audio CD, the teacher gives the students a piece of paper with lyric randomly. After that the teacher plays the audio CD and asks the students to rearrange the lyric orderly. After doing that the teacher gives feedback and asks them to guess the title of the song. Finally, the teacher checks their answers and tells them the right title of the song.

**Watching movie activity procedure**

The teacher plays the movie clip by using projector. When the movie reaches its climax, the teacher pauses the movie and then he asks the students to guess what will happen next. After playing it till the end, the teacher asks the students to write summary of the video clip.

**Research Methodology****The nature of Data and Data Collection**

In this paper, students' opinions on three listening activities are explored. The aim of this paper is to explore the opinions of second year English specialization students at Banmaw University towards the idea of using listening activities to improve their listening skill.

Listening activities such as dictation, listening to music and watching movie were used to collect data.

The data were collected in the class with sixty students by using questionnaires. According to questionnaires, the data were analyzed for each activity. **Procedures for Analyzing Data** Firstly, the data were classified according to their respective category. Secondly, the frequencies of each of activity were counted. Finally, the number of different opinions were converted into percentage form.

**Analysis of Data**

Students' opinions on three listening activities were first identified and classified.

Table 1 shows a survey of students' opinions on three listening activities. Table 2 shows percentage of students' opinions on these listening activities. Percentage of students' attitude towards each listening activity is shown in table 3. Percentage of Students' attitude towards all these listening activities is described in table 4 as follows:

**Table 1 A Survey of Students' Opinions on Some Listening Activities Class size=60**

No.		Dictation	Listening to Music	Watching Movie
1	It is the most difficult way to catch all the words the speakers said.	60		
2	It is the easiest way to catch all the words the speakers said.		35	25
3	I find it difficult to understand the meaning of words which are not pronounced clearly.	47	11	2
4	I find it difficult to understand well when speaker is too fast.	56	4	
5	It is interesting.	2	33	25
6	It is boring.	52		8
7	It is enjoyable.	1	37	22
8	I can get many new words and phrases.	18	16	26
9	I can learn correct pronunciation.	14	18	28
10	I can improve my listening skill.	23	32	5
11	I can understand unfamiliar accents and dialects.	10	8	42
12	It is the most effective way in teaching listening.	18	33	9
13	It improves my use of everyday English.	17	22	21
14	I feel more motivated.	12	37	11
15	Time consuming.	18	11	31
	<b>Total</b>	<b>348</b>	<b>297</b>	<b>255</b>



**Table 2 .Percentage of Students' Opinions on Some Listening Activities**  
**Class size=60**

No		Dictation	Listening to Music	Watching Movie
1	It is the most difficult way to catch all the words the speakers said.	100%		
2	It is the easiest way to catch all the words the speakers said.		58%	42%
3	I find it difficult to understand the meaning of words which are not pronounced clearly.	78%	18%	4%
4	I find it difficult to understand well when speaker is too fast.	93%	7%	
5	It is interesting.	3%	55%	42%
6	It is boring.	87%		13%
7	It is enjoyable.	1%	62%	37%
8	I can get many new words and phrases.	30%	27%	43%
9	I can learn correct pronunciation.	23%	30%	47%
10	I can improve my listening skill.	38%	53%	9%
11	I can understand unfamiliar accents and dialects.	17%	13%	70%
12	It is the most effective way in teaching listening.	30%	55%	15%
13	It improves my use of everyday English.	28%	37%	35%
14	I feel more motivated.	20%	62%	18%
15	Time consuming.	30%	18%	52%

**Table 3. Percentage of Students' attitude towards each listening activity**

<b>Attitude</b>	<b>dictation</b>	<b>Listening to Music</b>	<b>Watching Movie</b>
Positive attitude	13%	30%	24%
Negative attitude	26%	3%	4%

**Table 4. Percentage of Students' attitude towards all listening activities**

<b>Positive attitude</b>	67%
<b>Negative attitude</b>	33%

### **Findings and Discussion**

In this chapter, the findings of different opinions on three listening activities done in second year English specialization class will be discussed.

As seen in table 1, the most significant point is that all the students choose dictation activity as the most difficult way to catch all the words the speakers said.. In table 2, 93% of students think that dictation is difficult to understand well when speaker is too fast. 87% of students choose dictation as a boring activity but listening to music activity was chosen as enjoyable and interesting activity with the percentage of 62 and 55. 13% of students gives positive attitude to dictation activity. Another prominent figure is that 70% of students can understand unfamiliar accents and dialects by watching movie. Table 3 expresses the percentage of students' attitude towards each listening activity. 30% of student gives positive attitude to listening to music activity and 3% of students describe their negative attitude. Table 4 describes percentage of students' attitude towards all listening activities. According to the data, 67% of students favour to do listening activities and 33% gives negative attitude towards all listening activities.

Through this paper, it can be seen that the students do not like dictation activity because they think that it is more difficult than other activities and they are boring to do it. It was seen clearly that most of the students are more interested in listening to music and watching movie because listening to music makes them relax and happy and watching movie makes them easy to understand what the speakers said by looking the performance of the characters in the movie.

### **Conclusion**

The paper has focused on three listening activities such as dictation, listening to music and watching movie. In this paper, students' opinion on these activities was explored to know how using listening activities are effective to teaching listening. The data were analysed by using questionnaires. In this paper, it was found that most of the students like to do listening activities in the class. They also like to do listening to music and watching movie activities. They also think that listening to music is the most suitable activity for them. Most of the students have positive attitude towards doing listening activities. These activities make them motivated. So, listening activities should be done in teaching listening as much as possible to motivate students' interest.

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## **Assessment on the Water Quality of Manyut Village in Banmaw Township**

Aye Aye Chit\*

### **Abstract**

This present study investigated the ground water quality to assess by comparing with WHO Standards. The study area chosen is Manyut Village situated on the Banmaw-Mandalay Strategic Road. Most residents in Manyut Village depend on mainly ground water to supply water for drinking, bathing and other activities. 46 ground water samples were collected from different sites within the study area and water quality was analysed by using Waterproof Tester. The examined parameters were pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS) and Temperature. In the study, it is found that the average values of parameters were observed as pH (5.7), EC (160.04  $\mu$ S), TDS (80.52 ppm), temperature (29.93°C) and depth (49.56 feet). The values of pH, EC and TDS of most water samples are less than the WHO standard values. Therefore, if water quality is not maintained, their water resources will be diminished than the present.

### **Introduction**

Water is the basic requirement for human life and any development. Clean, safe and adequate freshwater is vital to the survival of all living organisms and the smooth functioning of ecosystems, communities and economies. The quality of water is affected by human activities and is declining due to the rise of urbanization, population growth, industrial production, climate change and other factors. Clean water is essential for life.

### **Aim and Objectives**

- To study the characteristics of underground water
- To analyse the water quality parameters of pH, EC, TDS and temperature
- To assess the ground water quality and compare with WHO standards

### **Sources of Data and Methods**

Water samples in the study area are collected on 15<sup>th</sup>, June, 2018. The water samples (the groundwater) were taken with one liter plastic bottle (drinking water bottle) from open wells, hand pumps and artesian wells. They were measured through temperature, pH, Electric Conductivity (EC), and Total Dissolved Solid (TDS) by using Waterproof Tester in the Geography Department. Quantitative and qualitative methods are applied. Some questionnaires were designed and used to interview the people in the study area. Water quality data have been analyzed by statistical method.

### **Geographical Background of Study Area**

The Study area is located in the eastern most part of Banmaw Township and on the Banmaw-Mandalay Strategic Road. It lies between north latitude 24° 10' 56" and 24° 11' 31" and east longitude 97° 16' 25" and 97° 16' 48". It is 6 miles (9.66 km) far from Banmaw Town. It has an area of 3,520 acres (14.245 sq. km). (Map 1)

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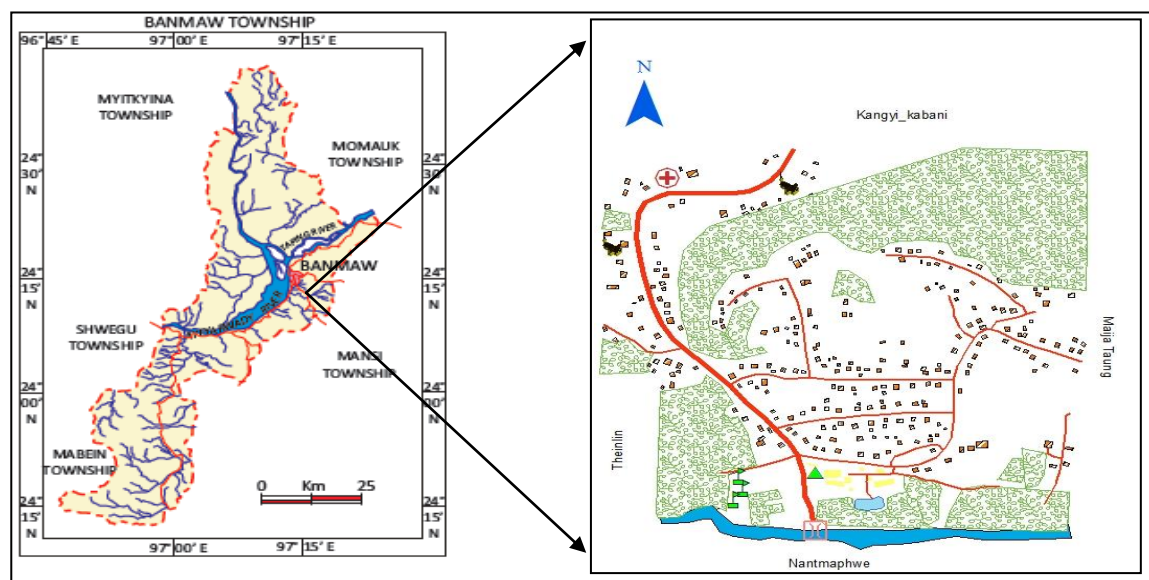
\* Dr., Associate Professor, Department of Geography, Banmaw University

Topography of Manyut village is generally uneven. It is divided into two parts: lowland area and highland area. The land surface is lower along the Banmaw-Mandalay motor road and higher in the eastern part of Manyut village. It is bordered by agricultural lands and stream. Manyut *Chaung* flows in the south of Manyut village. It is useful for agriculture. It is bounded on the north by Kangyi-kabani village tract, on the east by Maija *Taung*, on the south by Nantmaphwe village and on the west by Theinlin village tract.

Climate can control and influence the types of vegetation, the soil formation and effect water quality. The type of climate of Manyut village is the same condition of Banmaw because it is located in near Banmaw Town. Therefore, it received humid subtropical climate type.

The total population of Manyut village is 1,011 persons and 260 households in 2018. The density of population is about 70 persons per square kilometer. The people in Manyut village engage in agriculture, livestock, fishing, forest producing, gold mining and sellers. Agriculture is the main occupation.

**Map (1) Location of Manyut Village in Banmaw Township**



Source: Google Earth (2015) and Field Observation

### Water Supply System in the Study Area

In study area, there is no water pipeline system. Water was obtained from underground water. Well, artesian well and hand-pump (token) are used for getting water. The largest numbers of hand-pumps are found in Manyut village. There are also small number of open wells and artesian wells.



### Open Well



Source: Field Observation (15-6-2018)

### Open Well



Source: Field Observation (15-6-2018)



### Open Well



Source: Field Observation (15-6-2018)

### Artesian Well



Source: Field Observation (15-6-2018)



### Hand-Pump

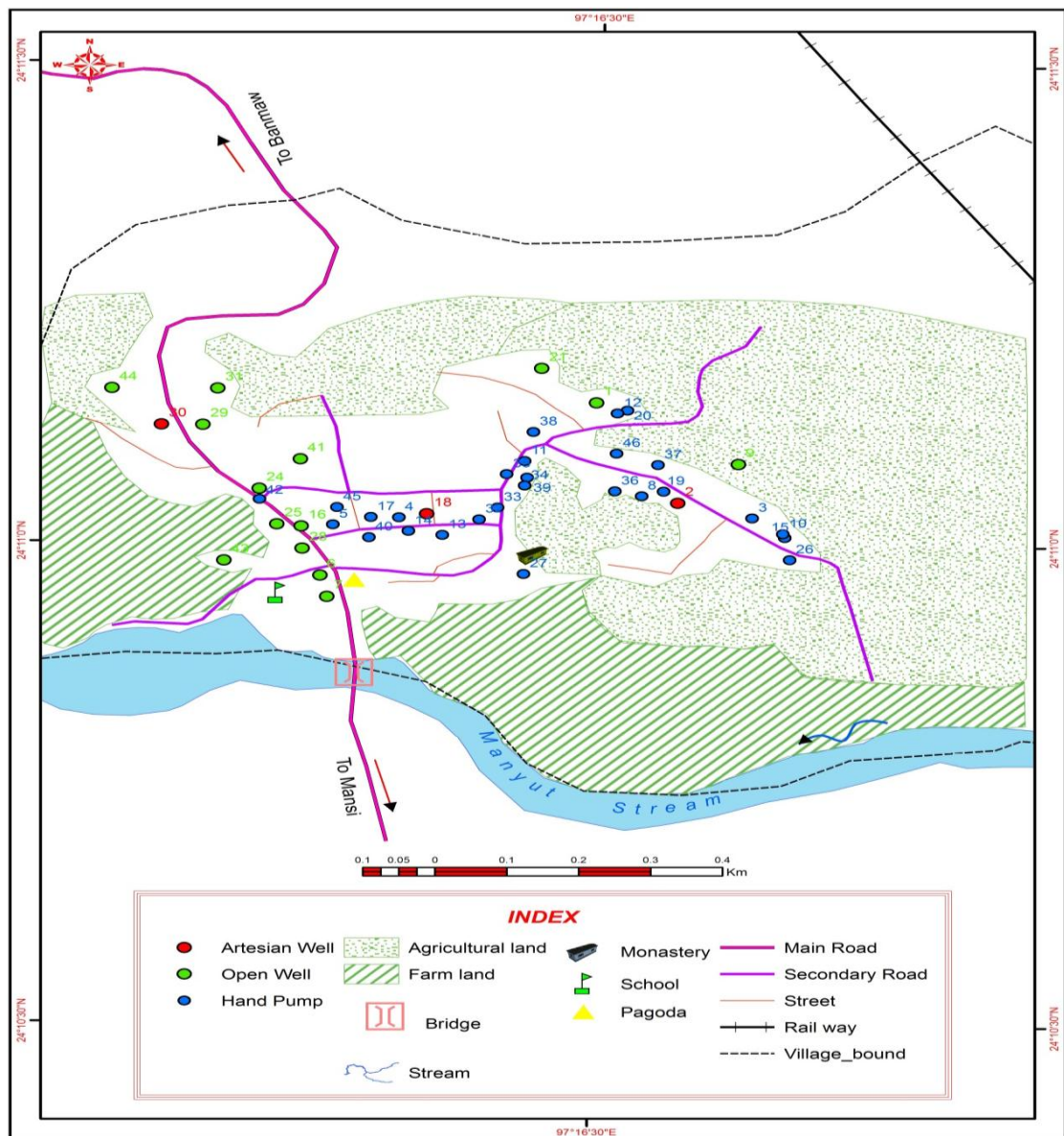


Source: Field Observation (15-6-2018)

### Distribution of Water Sample Sites in the Study Area

Most of the people in study area possessed each of hand-pump for water supply. Hand-pumps are found in nearly the whole village. Open-wells are found mainly in the lowland area of Manyut village especially along the Banmaw-Mandalay motor road. Artesian wells are found in the higher part of the village. The depth of hand-pumps is from 20 feet to 60 feet and artesian wells are above 200 feet. Open wells are from the lowest 7 feet to the highest 60 feet. 46 water samples are taken from 27 hand-pumps, 3 artesian wells and 16 open wells in Manyut village. Water sample sites are shown on map 2.



**Map (2) Water Sample Sites in Manyut Village**

Source: Google Earth (2015) and Field Observation

### Water Quality Analysis of Study Area

Water quality is the physical, chemical, and biological characteristics of water. These parameters are directly related to the safety of the drinking water to human use. Water quality parameters provide important information about the health of the water body. These parameters are used to find out the quality of water for drinking purpose. 46 water samples were collected from various sites in study area and analyzed the selected chemical parameters such as pH, Electric Conductivity (EC), Total Dissolved Solid (TDS) and Temperature. The results were then matched and discussed with WHO standards. Water quality sample's results are shown in table 1.

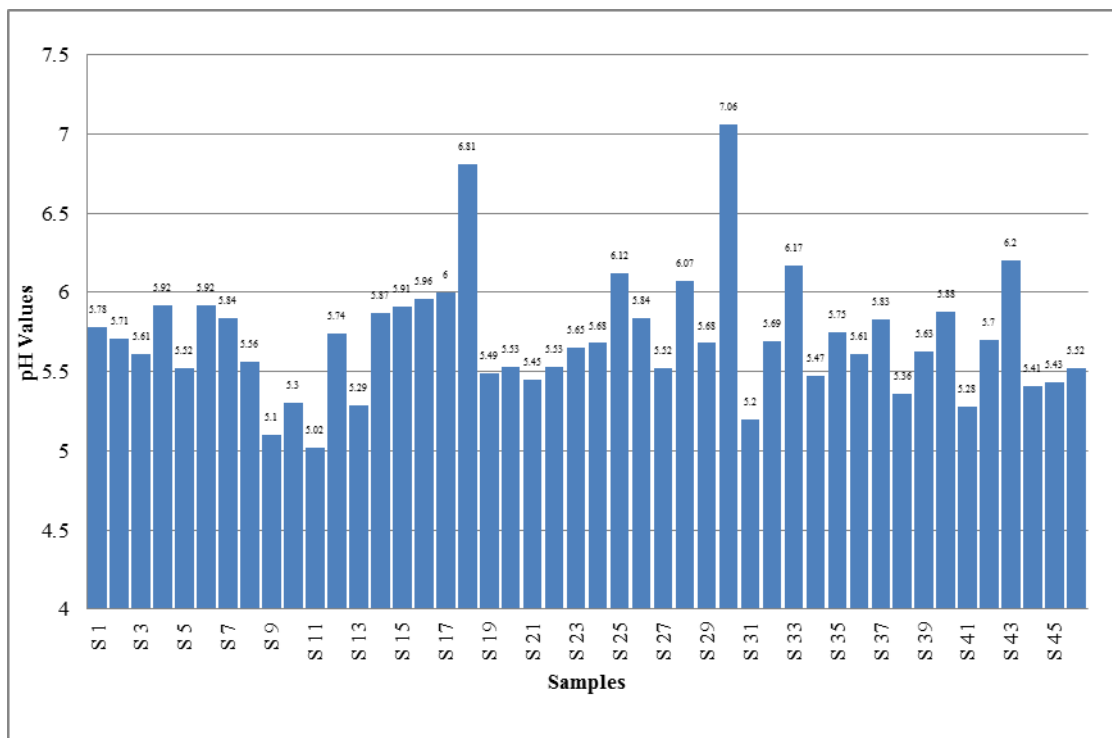
**Table (1) Water Quality Analysis Results of the Study Area**

Code No.	Types	Parameters				Depth (ft)
		pH	EC (µs)	TDS (ppm)	Temp (°C)	
S 1	Open well	5.78	30	15	30	11
S 2	Artesian well	5.71	64	34	29.6	200
S 3	Hand-Pump	5.61	46	25	29.7	20
S 4	Hand-Pump	5.92	131	68	29.8	7
S 5	Hand-Pump	5.52	195	99	29.7	40
S 6	Open well	5.92	419	213	29.7	18
S 7	Open well	5.84	240	122	29.9	10
S 8	Hand-Pump	5.56	57	31	30.2	58
S 9	Open Well	5.1	87	46	30.3	8
S 10	Hand-Pump	5.3	67	34	30.2	20
S 11	Hand-Pump	5.02	92	47	30	58
S 12	Hand-Pump	5.74	86	43	30.2	54
S 13	Hand-Pump	5.29	108	54	30	80
S 14	Hand-Pump	5.87	166	84	30	80
S 15	Hand-Pump	5.91	87	43	30	50
S 16	Open well	5.96	436	217	30.1	18
S 17	Hand-Pump	6	142	71	30.2	36
S 18	Artesian Well	6.81	176	85	30.3	230
S 19	Hand-Pump	5.49	53	28	30	50
S 20	Hand-Pump	5.53	244	122	30.1	54
S 21	Open well	5.45	39	21	30.1	15
S 22	Open well	5.53	37	17	30.3	20
S 23	Open well	5.65	218	109	30.4	13
S 24	Open well	5.68	206	103	30.2	7
S 25	Open well	6.12	577	290	30.1	20
S 26	Hand-Pump	5.84	146	73	30.1	30
S 27	Hand-Pump	5.52	54	26	30.2	30
S 28	Open well	6.07	382	192	29.7	10
S 29	Open well	5.68	86	44	29.6	9
S 30	Artesian well	7.06	171	85	29.1	270
S 31	Open well	5.2	109	55	29.6	8
S 32	Hand-Pump	5.69	102	51	29.8	40
S 33	Hand-Pump	6.17	217	108	29.1	57
S 34	Hand-Pump	5.47	92	46	29.4	38
S 35	Hand-Pump	5.75	65	33	29.8	46
S 36	Hand-Pump	5.61	49	25	29.6	56
S 37	Artesian Well	5.83	85	43	30.1	56
S 38	Hand-Pump	5.36	57	29	30.1	60
S 39	Hand-Pump	5.63	111	55	30.4	60
S 40	Hand-Pump	5.88	173	87	30.2	70
S 41	Open well	5.28	284	142	30.2	60
S 42	Hand-Pump	5.7	161	80	30.1	19
S 43	Open well	6.2	630	317	29.9	50
S 44	Open well	5.41	147	74	29.5	35
S 45	Hand-Pump	5.43	188	94	29.6	20
S 46	Hand-Pump	5.52	50	24	29.7	38
	<b>WHO</b>	<b>6.5-8.5</b>	<b>400</b>	<b>1000</b>		

### Results and Discussion

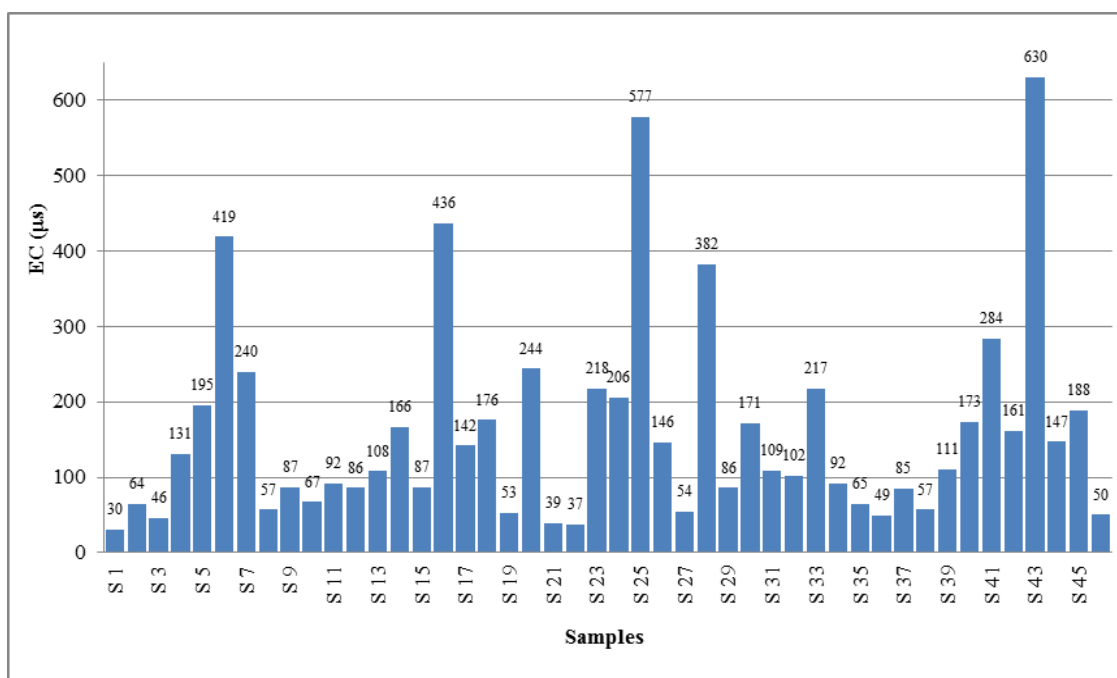
The **pH** of pure water refers to the measure of hydrogen ions concentration in water. It ranges from 0 to 14. In general, water with a pH of 7 is considered neutral while lower of it referred acidic and a pH greater than 7 known as basic. The range of pH value from 6.5 to 8.5 is suggested to the good water quality by WHO (World Health Organization). In study area, it is found that the majority of the sources had a pH lower than the neutrality. The sources of low pH values are mainly hand-pumps and open wells. The lowest pH value is 5.02 and the highest is 7.06. Out of 46 samples, 44 samples are less than the standards of WHO and only two samples (S 18 and 30) lies within an acceptable range of 6.5 and 8.5. These two samples are from artesian wells and the depths are above 200 feet. These are located in highland area of Manyut Village. Low pH water can be corrosive and cause damage to equipment and indirectly affect human health. (Figure 1)

**Figure (1) pH Level of 46 Water Samples in the Study Area**



Source: Based on Table (1).

**Electrical conductivity (EC)** measures the ionic process of a solution that enables it to transmit current. Generally, the amount of dissolved solids in water determines the electrical conductivity. According to WHO standards EC value should not exceed 400  $\mu\text{S}/\text{cm}$ . In study area, the lowest EC value is 49  $\mu\text{S}/\text{cm}$  and the highest is 630  $\mu\text{S}/\text{cm}$ . Out of 46 samples, EC value in 42 samples is less than 400  $\mu\text{S}/\text{cm}$  and greater than 400  $\mu\text{S}/\text{cm}$  in 4 samples (Figure 2). These four samples (S 6, S 16, S 25, S 43) were taken from open wells located along the Banmaw-Mandalay motor road in the lowland area of Manyut Village. These results clearly indicate that water in study area is considerably ionized and has the higher level of ionic concentration activity due to excessive dissolve solids.

**Figure (2) EC Levels of 46 Water Samples in the Study Area**

Source: Based on Table (1).

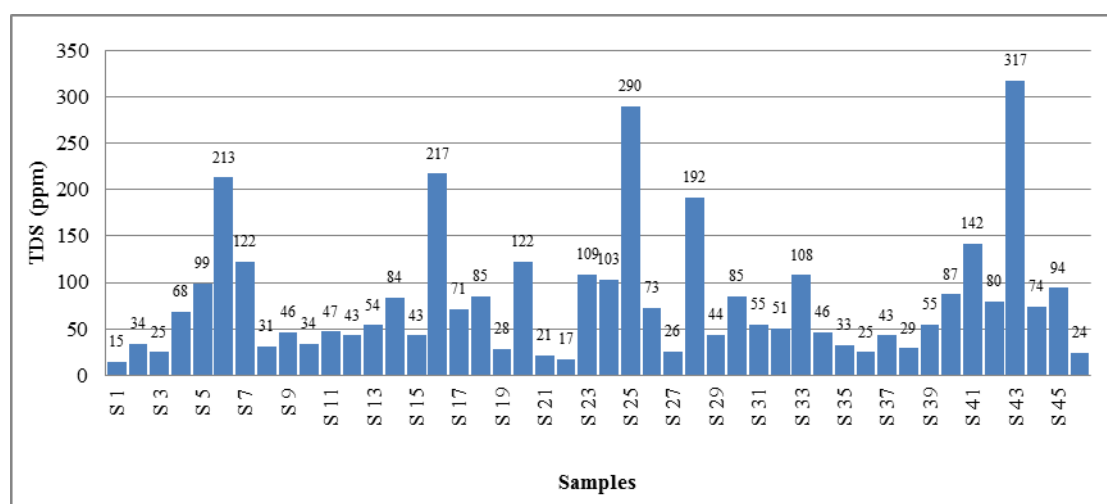
**TDS** includes a mixture of inorganic salts, mostly sodium, chloride, potassium, calcium, and magnesium. The level of TDS is one of the characteristics of water quality. According to World Health Organization (WHO), TDS concentration of 1,000 mg/l is considered acceptable for water consumers but this acceptability factor may change as TDS concentration has a direct impact on the taste of water. A very low concentration of TDS produces undesirable taste of water, as many people buy mineral water, which has natural levels of dissolved solids. The following table is the preferable level of TDS in water.

**Preferable Level of TDS in Water**

Level of TDS (milligrams per litre)	Rating
Less than 300	Excellent
300-600	Good
600-900	Fair
900-1,200	Poor
Above 1,200	Unacceptable

Source: Internet

In study area, the highest TDS is 317 ppm and the lowest is 15 ppm. Out of 46 samples, TDS value in 45 samples is less than 300 ppm, and greater than 300 ppm in only one sample (Figure 3). Although these ranges are acceptable and concentration of TDS and it is not harmful, water with extremely low concentrations of TDS like sample 1 and 22 may also be unacceptable because of its flat and insipid taste. TDS values can be changed between summer and rainy season. Therefore, it needs to test again in summer during low water level.

**Figure (3) TDS Levels of 46 Water Samples in the Study Area**

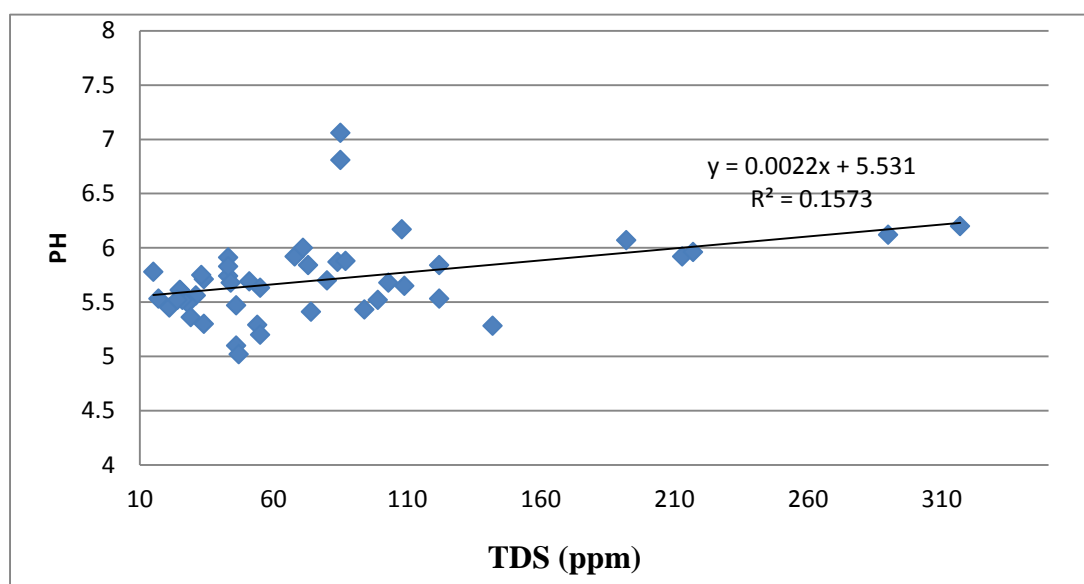
Source: Based on Table (1).

Accurate temperature measurements are required for accurate determinations of pH, specific electrical conductivity, and dissolved oxygen. Warm water is less capable of retaining dissolved oxygen than cold water. In study area, the highest temperature of water samples is 30.4° C and the lowest is 29.1° C. In a normal temperature of 25° C, it is water in liquid state. Temperature affects the chemical and biological reactions in water. A rise in temperature of water accelerated chemical reactions, reduces solubility of gases, effects taste and odor, and enhances metabolic activity of organisms.

The appearances of all the tested samples of ground water have colour, odour and taste. 25 households have colourless and 21 households have yellowish, reddish and grayish colour. 40 households have no taste and the rest are slightly brackish and flat. 28 households have no smell and 18 households have rusty smell due to the use of water pipe.

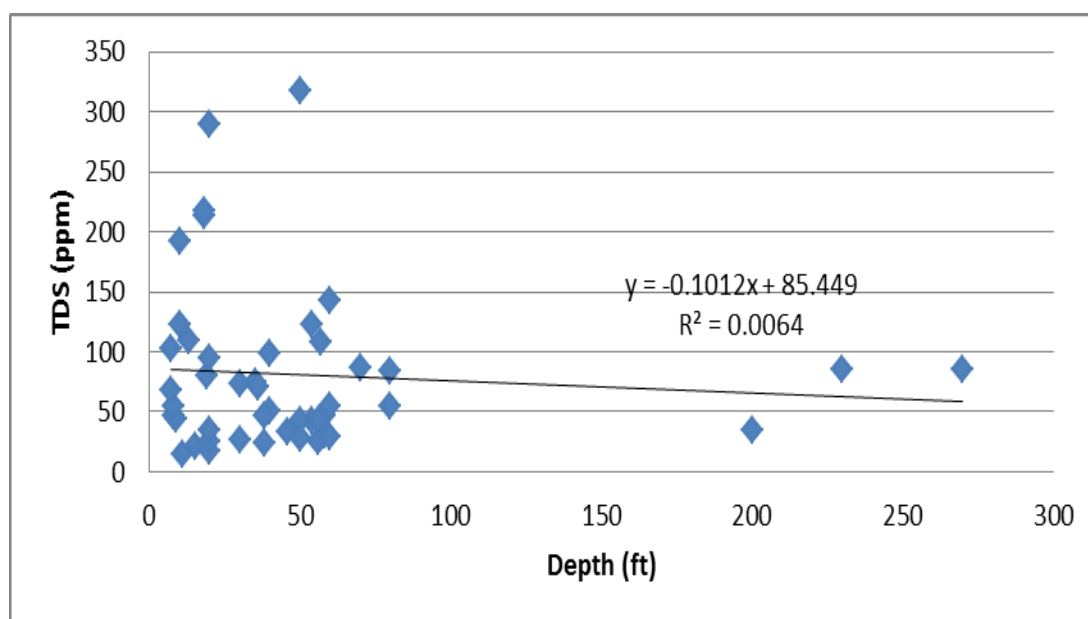
### Correlation between TDS and Other Selected Parameters

Power of Hydrogen (pH) and Total Dissolved Solids (TDS) are two ways to measure water quality and are two very important aspects of drinking water. (TDS) and (pH) of water samples are plotted as scatter diagram (figure 4). According to the scatter diagram, TDS and pH of water samples are some correlation with correlation coefficient of ( $r = 0.397$ ). These two parameters are directly related in each other. Therefore, pH of water is changed with the changes of total dissolved solids in water.

**Figure (4) Correlation between TDS and pH of the Water Samples**

Source: Based on Table (1).

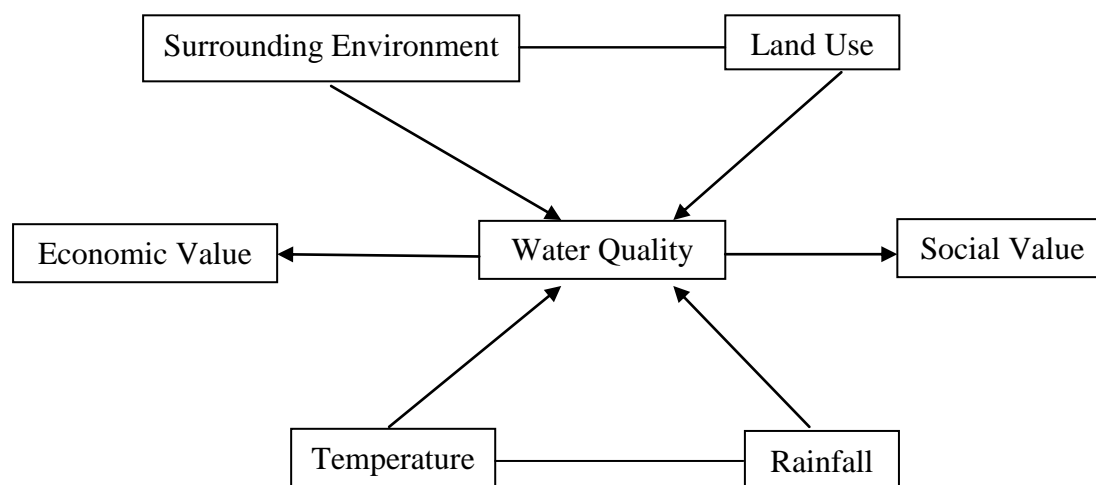
Comparison of TDS and depth of water are plotted as scatter diagram (Figure 5). There is very low correlation between TDS and depth of water. It is reversely correlated with low correlation coefficient ( $r = -0.08$ ).

**Figure (5) Correlation between TDS Values and Depth of Water**

Source: Based on Table (1).

Factors affecting the water quality in study area are surrounding conditions, climate conditions, various land use, human activities (Economic and social) and climatic conditions. Most households in the study area bathe and wash their clothing and household utensils near the open well and hand pump. Moreover, some local inhabitants raise some livestock, including cattle, buffalo, pig and poultry. As they are not systematically kept, some animal especially pig and poultry move on the well and tank and their feces not infrequently contaminate the well and their tank.

### Factors affecting the water quality

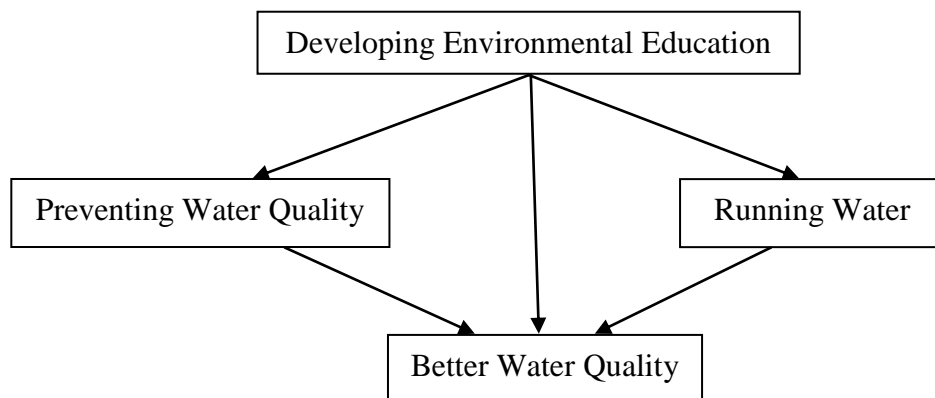


### Conclusion

The quality of water depends primarily on the concentration of bacteria, lead, pesticides, nitrites/nitrates, chlorine, hardness, and the water's pH. The residents of study area are directly derived from ground water for drinking, bathing, washing and other purposes. pH, electrical conductivity, total dissolved solids and temperature of groundwater in Manyut Village were studied. By comparing the WHO standards some groundwater in study area is not suitable for drinking and also other purposes. In study area, the pH studies showed that the pH of the water samples was range from 5.02 to 7.06 (mean 5.7) which is less than the permissible limits (WHO). The electrical conductivity of water samples ranged from 30  $\mu\text{S}$  to 630  $\mu\text{S}$ . However, the prescribed limit is 400  $\mu\text{S}/\text{l}$  according to WHO. Few water samples possess higher values than the permissible limits. In some areas where the TDS content of the water supply is very low with 15 and 17 ppm. A very low concentration of TDS has been found to give water a flat taste, which is undesirable to many people. TDS correlated some positively with pH and negative correlation with depth of water. In study area, it is found that most people are mostly carrying out their bathing, washing and other activities such as use of toilet, raising animal and planting vegetable near the water supply system. These activities can change the values of pH, EC, TDS and Temperature, taste, odour and colour of water.

This is a great need of the suitable environment management plan which may be adopted to control drinking water pollution. Therefore, the individual constituents should be identified and the local public health authorities consulted. To obtain the better water quality, the residents in the study area should have environmental awareness and should protect from contamination of water.

### Improvement of Water Quality



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## **AN ASSESSMENT ON THE REASONS FOR INTRA-DISTRICT MIGRATION IN BANMAW DISTRICT**

Nang San <sup>\*</sup>

### **ABSTRACT**

Banmaw District is located in Kachin State. As the armed groups emerged soon after Myanmar attained independence (1948-62), there was no security in the rural areas of Banmaw District. As a result, people have been moved from one place to another for fulfillment of required and better facilities for safety and amenities that leads to migration in the study area. The main reason of the migration of Banmaw District was weakness in security in both urban and rural areas. The results show that there are five major pull and push factors regarding to both in and out migration of the study area. Pull factors include job opportunity, business opportunity, education opportunity, security and other reasons. On the other hand, government service, low income, poor facilities for education, poor security and other reasons are prominent in push factors. By comparing these two factors, it is now clear that the security is the most crucial factor in both in and out migration issues. If the area is become peaceful, the migrations for the security purpose within Banmaw District can come to an end.

### **INTRODUCTION**

Migration, as a spatial reallocation of human resources, is of central interest to the spatially oriented discipline of geography, particularly with the modern emphasis in human geography on spatial interaction. Migration-stimulating conditions are graduation, marriage, lack of marriage, employment offers, employment opportunities of bonanzas, migratory work, special skills, transfer of employment, sale of business, loss of farm, discharge from employment, low wages, retirement, death of relative, military service, medical care, imprisonment, political, racial or religious oppression, natural disasters, invasion or infiltration by outsiders, inheritance, maladjustment to community, wanderlust, social rejection and forced movement.

### **Aim and Objectives**

The main aim of this paper is to explain the pull and push factors for intra-district migration in Banmaw District.

The objectives are:

1. To examine the reasons for in- migration in Banmaw District.
2. To assess the reasons for out- migration in Banmaw District.

### **Data Collection and Methodology**

As a first phase, secondary data were collected from departments and offices. As a second phase, primary data were collected. The interesting information that relates somewhat to the problem would be obtained from internet downloading. For purpose of clarity and comparability the data are represented in varied forms of tables, maps and figures, supplemented by occasional photographs.

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### Geographical Background of the Study Area

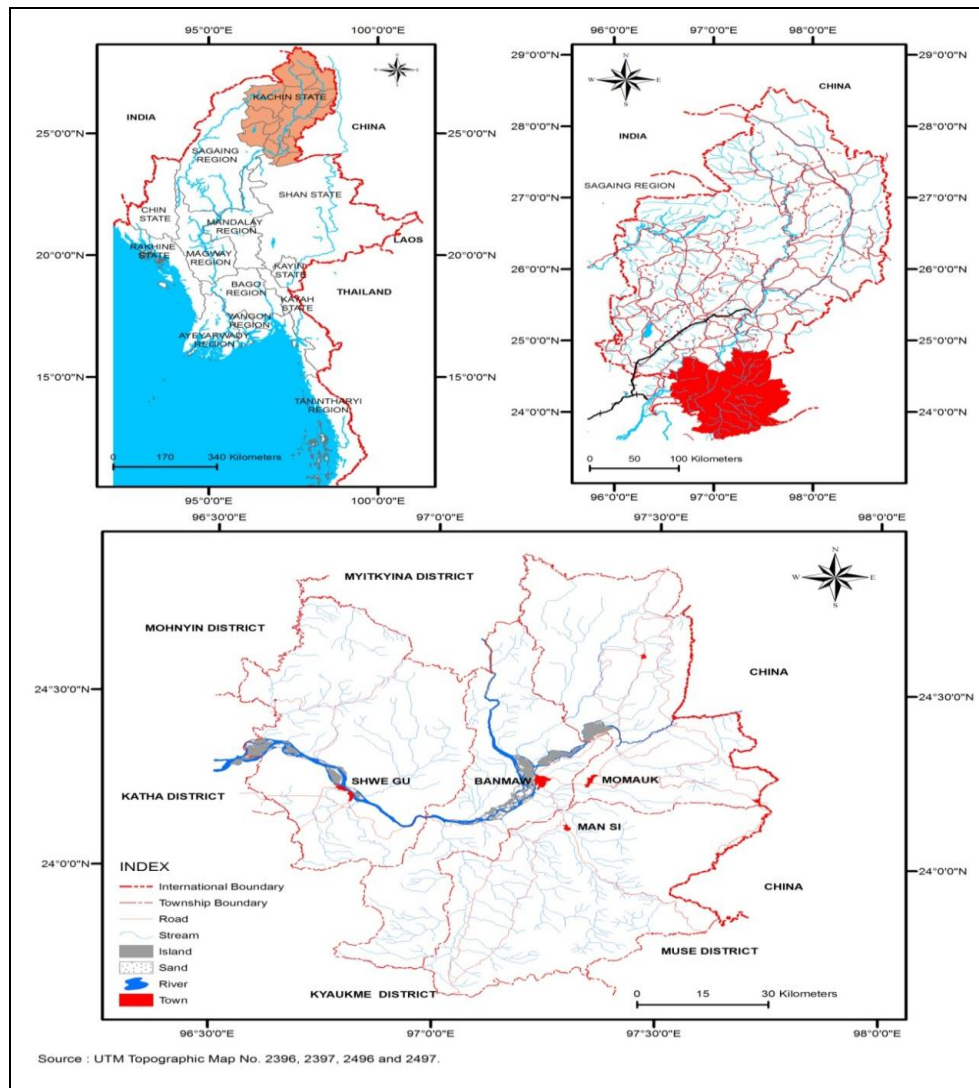
Banmaw district is located in Kachin State of Northern Myanmar and lies between the latitudes of 23°38' 01" North and 24° 54' 54" North and the longitudes of 96° 33' 58" East and 97° 46' 21" East.

Banmaw District is composed of four townships, three sub-townships and 174 village tracts. The districts extend for 138 km (86 miles) in north-south and for 121 km (75 miles) in east-west directions. The area of Banmaw District is 10,742.93 sq.km (4,147.85 sq.miles). The areal extents of each township are shown in table (1). Banmaw District is bounded on the north by Myitkyina District; on the east by the People's Republic of China; on the south by Muse and Kyaukme Districts (Northern Shan State); and on the west by Katha District (Sagaing Region) and Mohnyin District. (Map 1)

**Table (1) Township-wise Areal Extents of Banmaw District (2017)**

No.	Township/Sub-Township	Area (sq. km)	Area (sq. miles)
1.	Banmaw	1,965.84	759.01
2.	Momauk	991.40	382.78
3.	Mansi	2,932.81	1,132.36
4.	Shwegu	1,457.06	562.57
5.	Dawphonyan	1,361.12	525.53
6.	Lweje	416.06	160.64
7.	Myohla	1,618.65	624.56
	<b>Total</b>	<b>10,742.93</b>	<b>4,147.85</b>

Source: General Administration Department, Banmaw District.

**MAP 1 LOCATION MAP OF BANMAW DISTRICT IN KACHIN STATE**

### Reasons for In-migrating: Pull factors

According to the data from Immigration and National Registration Department of Banmaw District, there are five groups of pull factors for in-migration in Banmaw District. They are as follows:

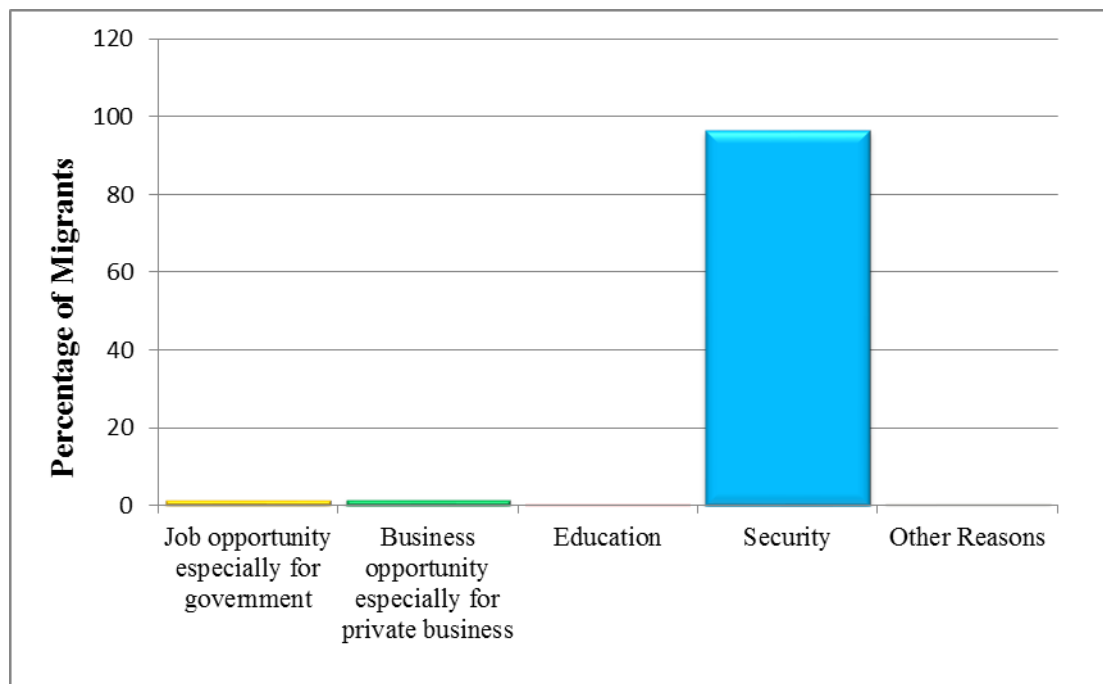
- (1) Job opportunity especially for government service,
- (2) Business opportunity especially for private business,
- (3) Education opportunity,
- (4) Security and
- (5) Other Reasons

**Table (2) Volume of In-migration due to Different Reasons in Banmaw District (2017)**

Sr. No.	Reasons	Percentage of Migrants
1	Job opportunity especially for government	1.3
2	Business opportunity especially for private business	1.5
3	Education	0.2
4	Security	96.5
5	Other Reasons	0.5
	Total	100

Source: Calculated by Researcher based on the data from Immigration and National Registration Department, Banmaw District

**Figure (1) Volume of In-migration due to Different Reasons in Banmaw District (2017)**



Source: Table (2)

According to Table (2), among all the pull factors, security 96.5 percent is considered as the single largest reason for in-migration of Banmaw District. While after security, business opportunity especially for private business 1.5 percent is second important reason for in-migration followed by job opportunity especially for government service 1.3 percent and education opportunity 0.2 percent.

### Job opportunity especially for government service

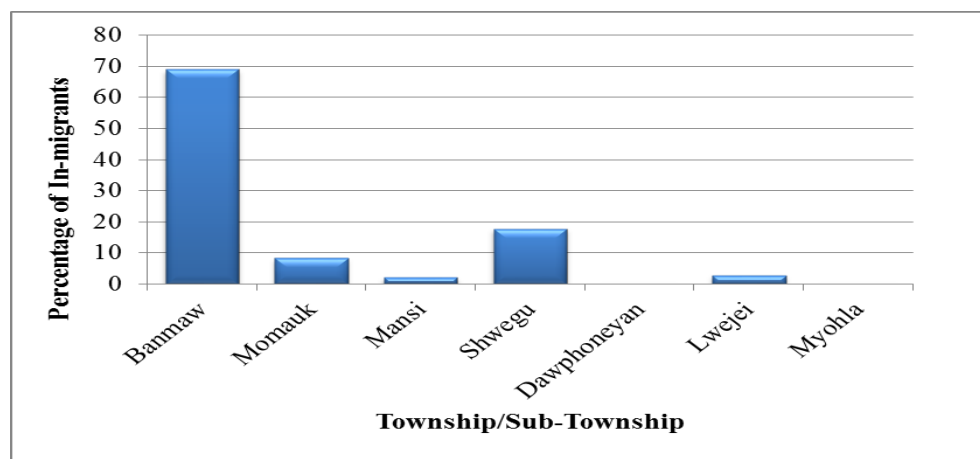
As Banmaw is the Headquarter of the district, Banmaw Township has the largest number of in-migrants due to job opportunity especially for government service. According to table (3), 6.9 percent the total in-migrants due to job opportunity especially for government service are found in Banmaw Township. Mansi Township has the least number of in-migrants due to job opportunity especially for government services. Dawphoneyang and Myohla Sub-townships have no in-migrants due to job opportunity especially for government service because of the small number of government offices in these sub-townships.

**Table (3) Volume of In-migrats in Banmaw District due to Job Opportunity Especially for Government services (2017)**

Sr. No.	Township/ Sub-Township	Percentage of In-migrants
1.	Banmaw	69
2.	Momauk	8.3
3.	Mansi	2.1
4.	Shwegu	17.8
5.	Dawphoneyan	-
6.	Lwejei	2.8
7.	Myohla	-
	Total	100

Source: Compiled by Researcher based on the data from Immigration and National Registration Department, Banmaw

**Figure (2) Volume of In-migrants in Banmaw District due to Job Opportunity Especially for Government services (2017)**



Source: Table (3)

### Business opportunity especially for private business

This reason is the most important and common reason for in-migrants of all townships and two sub-townships in Banmaw District. According to Table (3) out of the total in-migrants due to business opportunity especially for private business 56.3 percent are found in Banmaw Township. As Banmaw Township is centrally placed in relation to the rest of Kachin State and Myanmar Proper, it has more private business than other townships of Banmaw District. Moreover it is also on the route of China border and is a very important centre for overland trade with People's Republic of China. As a result the largest number of in-migrants moved into Banmaw Township from other townships of Banmaw District due to the business opportunity especially for private business. Table (4) shows the private business attracted to the in-migrants of Banmaw Township. Myohla Sub-township does not have in-migrants due to the business opportunity especially for private business because of poor transportation facility.

**Table (4) Numbers of In-migration in Banmaw District due to Business**

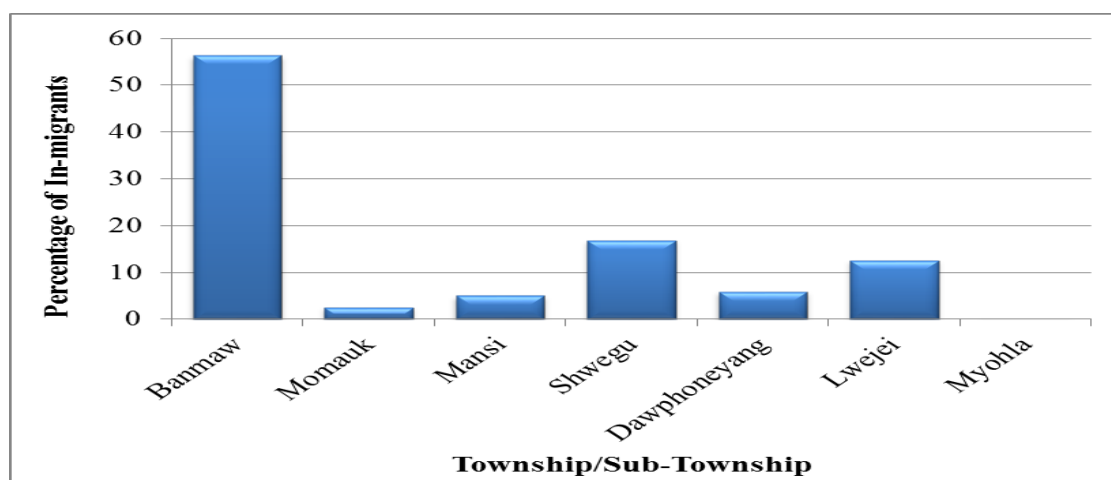
#### Opportunity especially for Private Business (2017)

Sr. No.	Township/ Sub-Township	Percentage of In-migrants
1.	Banmaw	56.3
2.	Momauk	2.5
3.	Mansi	5.0
4.	Shwegu	16.8
5.	Dawphoneyang	5.9
6.	Lwejei	12.6
7.	Myohla	-
	<b>Total</b>	<b>100</b>

Source - Compiled by Researcher based on the data from Immigration and National Registration

**Figure (3) Numbers of In-migration in Banmaw District due to Business**

#### Opportunity especially for Private Business (2017)



Source: Table (4)

**Table (5) Types of Private Business in Banmaw Township (2017)**

<b>Sr. No.</b>	<b>Types</b>	<b>Number</b>	<b>Percentage</b>
1.	Computer Printing works	40	19.4
2.	Photo Studio	10	4.9
3.	Goods Sales	25	12.1
4.	Phone Sales	25	12.1
5.	Purified Drinking Water factories	4	1.9
6.	Fashion shops	15	7.3
7.	Textile sales	20	9.7
8.	Food stalls	55	26.7
9	Rice Mill	12	5.9
	<b>Total</b>	<b>206</b>	<b>100</b>

Source: Compiled by Researcher based on the field data

### **Education Opportunity**

Education opportunity is the reason of in-migrants which moved into Banmaw and Momauk Townships. 85 percent of in-migrants due to education opportunity are found in Banmaw Township. The remaining 15 percent of in-migrants due to education opportunity are found in Momauk Township. There are no in-migrants for this reason in other townships and sub-townships of Banmaw District. In Banmaw District, very few numbers of in-migrants reveal that education opportunity is the reason of their movement.

### **Security**

Soon after Myanmar attained independence, the armed struggle groups emerged. Kachin Independence Organization (K.I.O) was founded in 25<sup>th</sup> October 1959 and Kachin Independence Army (K.I.A) was found in 5<sup>th</sup> February, 1961 for the weakness of 1947 constitution. Kachin Independence Organization (KIO) has returned into legal fold in 24<sup>th</sup> February 1994 and co-operated with the Government in the regional and national development in almost all fields. However the fighting between *Tatmadaw* (Myanmar army) and KIA are continuing in Kachin State due to the political conflicts. As a result Internally Displaced Persons (IDP) in Banmaw District in-migrate into Internally Displaced Person's Camps (IDP Camp) located in Banmaw, Momauk and Mansi townships. In Banmaw Township, there are six IDP camps. The first IDP camp, Roberts IDP camp was opened in 11<sup>th</sup> August 2011. According to Table (5), the total numbers of Internally Displaced Persons in IDP Camp within Banmaw Township are 6,714 persons in 2014 and among them 53 percent are female and 47 percent are male. Most of these IDP migrated from the eastern and southeastern parts of Banmaw Township for their security.

According to Table (6), there are living in three IDP camps within Momauk Township. These IDP camps are opened since 2011. Most of the IDP moved from the northern, eastern and northeastern parts of Momauk Township due to their security.

In Mansi Township there are two IDP Camps in the year 2017 as shown in table (7). Most of these IDP moved from the northeastern, eastern and southeastern parts of Mansi Township due to the fighting's between *Tatmadaw* and KIA.

**Table (6) IDP Camps in Banmaw Township (2017)**

<b>Sr. No</b>	<b>Camp Name</b>	<b>Opening Date</b>
1.	Roberts IDP Camps	11.8.2011
2.	Shwekyina (Tagonetine)	17.5.2012
3.	Aungtha Baptists Church	3.12.2013
4.	Htoisan Baptist Church	1.12.2014
5.	AD(2000)	16.7.2014
6.	Hpankhagone	22.11.2014
	Total	-

Source: Compiled by the Researcher Based on data from IDP Camps in Banmaw.

**Table (7) IDP Camps in Momauk Township (2017)**

<b>Sr. No</b>	<b>Camp Name</b>	<b>Opening Date</b>
1.	Momauk Baptist Church	13.8.2011
2.	Arthawka (Monastery)	13.8.2011
3.	Mandalay Monastery	13.8.2011
	Total	

Source: Compiled by the Researcher based on data from Momauk IDP Camps

**Table (8) Number of IDP in IDP Camps of Mansi Township (2017)**

<b>Sr. No</b>	<b>Name of Camp</b>	<b>Opening date</b>
1.	Mansi IDP Camp	14.12.2014
2.	Maikhaung Baptist Church	19.12.2014
	Total	

Source: Compiled by the Researcher based on data from Mansi IDP Camps.

### **Other Reasons**

The other pull factors for in-migration of Banmaw District include marriage, health opportunity, religious contract and family movement. The in-migrants due to other reasons can be found in Banmaw, Momauk and Mansi Townships and Lwejei Sub-township. The volume of in-migrants due to other reasons are presented in Table (9).



**Table (9) Numbers of In-migration in Banmaw District due to Other Reasons (2017)**

<b>Sr. No.</b>	<b>Township/sub township</b>	<b>Percentage of in-migrants</b>
1.	Banmaw	40.4
2.	Momauk	51.1
3.	Mansi	2.1
4.	Shwegu	-
5.	Dawphoneyan	-
6.	Lwejei	6.4
7.	Myohla	-
	<b>Total</b>	<b>100</b>

Source: Compiled by the Researcher based on data from Immigration and National Registration Department Banmaw District

#### **Reasons for Out-migrating: Push factors**

The people moved out of one township to another township due to five reasons within Banmaw District. These reasons for out-migrating or push factors are as follows:

1. Government service
2. Low income
3. Poor facilities for education
4. Poor security and
5. Other Reasons

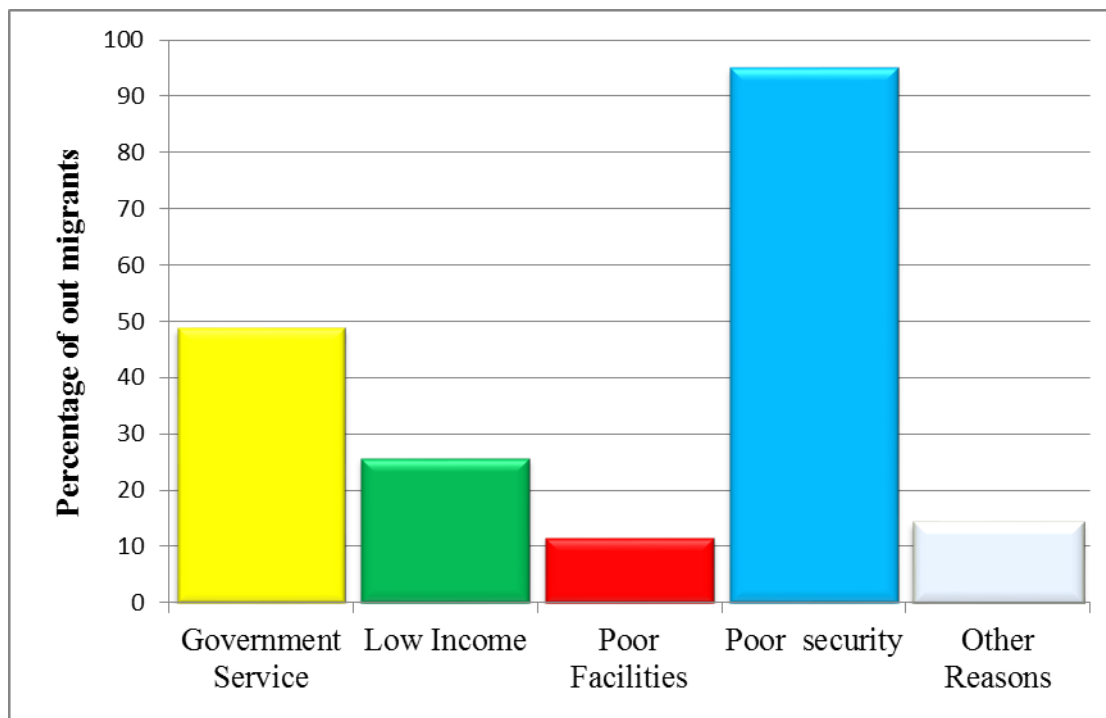
According to table (10), among the emigrants, 95.1 percentages moved out of their region to another place due to poor security. Therefore among all the reasons of out- migration, poor security can be considered as the largest reasons for migration.

**Table (10) Volume of Out-migrants due to Different Reasons in Banmaw District (2017)**

<b>Sr. No</b>	<b>Reasons</b>	<b>Percentage of out-migrants</b>
1	Government Service	48.8
2	Low Income	25.6
3	Poor Facilities	11.5
4	Poor security	95.1
5	Other Reasons	14.1
	<b>Total</b>	<b>100</b>

Sources: Calculated by Researcher based on the data from Immigration and National Registration Department, Banmaw District

**Figure (4) Volume of Out-migration due to different Reasons in Banmaw District (2017)**



Source: Based on table (9)

**Plate (1) IDP Camps in Banmaw Township**





**Lisu Baptist Church IDP Camp**



**Htoisan Baptist Church IDP Camp**

Source: Field Observation

**Plate (2) IDP Camps in Momauk Township**



**Momauk Baptist Church IDP Camp**



**Arthawka Monastery IDP Camp**

Source: Field Observation

**Plate (3) IDP Camps In Mansi Township**



**Mansi Baptist Church Camp**



**Maikhaung Baptist Church IDP Camp**

Source: Field Observation

### Government service

The public service personals have to be transferred for position from one place to another due to the nature of their job. According to the table (11), Banmaw Township has the largest number of out-migrants due to government service sharing 42.6 percent of the total out-migrants of Banmaw District for this reason. This push factor is also pronounced in Momauk Township 17.5 percent and Dawphoneyang Sub-township 15.2 percent. Lwejei Sub-township has the least number of out-migrants due to government service.

**Table (11) Volume of Out-migration in Banmaw District due to Government Service (2017)**

Sr. No	Reasons	Percentage of out-migrant
1	Banmaw	42.6
2	Momauk	17.5
3	Mansi	9.5
4	Shwegu	11.8
5	Dawphoneyang	15.2
6	Lwejei	3.4
7	Myohla	-
	Total	100

Source: Compiled by the Researcher based on the data from Immigration and National Registration Department, Banmaw District

### Low Income

People migrate from one place to another for the development of their overall living standard and to enhance their social position. Therefore low income is responsible for out-migration of Banmaw District. According to table (12) there are 138 out-migrants due to low income within Banmaw District in the year 2014. Among these out-migrants 54.3 percent are found in Banmaw Township, Momauk and Mansi Townships have the second largest number of out-migrants sharing 14.5 percent of the total number of out-migrants due to low income.

**Table (12) Volume of Out-migrants in Banmaw District due to Low Income (2017)**

Sr. No	Reasons	Percentage of out-migrant
1	Banmaw	54.3
2	Momauk	14.5
3	Mansi	14.5
4	Shwegu	7.3
5	Dawphoneyan	5.1
6	Lwejei	4.3
7	Myohla	-
	Total	100

Source: Compiled by the Researcher based on the data from Immigration and National Registration Department, Banmaw District

### Poor Facilities for Education

In Banmaw District, 30 households with 62 persons migrated from one place to another for their education. In Banmaw District, most of people moved from rural area to urban areas due to poor facilities for education. Among the out-migrants for this reason, the largest number can be found in Banmaw Township. Mansi Township has the second largest number of emigrants due to poor facilities for education. The occurrence of out-migration for education is not found in three sub-townships of Banmaw District. Among the push factors for intra-district migration of Banmaw District, the factor regarding poor facilities for education is the least reason for migration.

**Table (13) Volume of Out-migration in Banmaw District due to Poor Facilities for Education (2017)**

Sr. No.	Township/ sub-township	Percentage of out-migrants
1	Banmaw	37.1
2	Momauk	27.4
3	Mansi	29.0
4	Shwegu	6.5
5	Dawphoneyan	-
6	Lwejei	-
7	Myohla	-
	Total	100

Source: Compiled by the Researcher based on the data from Immigration and National Registration Department, Banmaw District

### Poor Security

Among all the reasons of migration, poor security can be considered as the single largest reason for intra-district migration of Banmaw District. In 2017, Banmaw District rewarded 10,407 volumes of out-migrants due to poor security. Mansi Township rewarded about 75.43 percent of the total out-migrants of the district due to poor security. The occurrence of out-migration due to poor security is also high in Momauk Township 20.53 percent. In Banmaw District, the fighting's between *Tatmadaw* and KIA mostly occurred in the northern, eastern and northeastern parts of Momauk Township and in the northeastern, eastern and southeastern parts of Mansi Township.

As a result the people from these areas moved from their villages to the IDP Camps located in Momauk, Mansi and Banmaw Townships for their security. In Shwegu Township, the migration due to the security does not occur because of its locational advantage.

**Table (14) Volume of Out-migrants in Banmaw District due to Poor Security (2017)**

Sr.No.	Township/Sub-Township	Percentage of out-migrants
1	Banmaw	0.12
2	Momauk	20.53
3	Mansi	75.43
4	Shwegu	-
5	Dawphoneyang	3.76
6	Lwejei	0.12
7	Myohla	0.04
	Total	100

Source: Compiled by the Researcher based on the data from Immigration and National Registration Department, Banmaw District

### Other Reasons

The other push factors for out-migration of Banmaw District include marriage, governmental services and family movement. According to Table (15), 40 households with 46 persons moved from one place to another within Banmaw District for other reasons of migration. In this case, Mansi Township rewarded 32 out-migrants sharing about 42.1 percent of the total out-migrants of the district. The occurrence of out-migration is also found in Banmaw Township 36.8 percent and Momauk Township 21.1 percent. The out-migration for other reasons cannot be found in Shwegu Township and three sub- townships.

**Table (15) Volume of Out-migrants in Banmaw District due to Other Reasons (2017)**

Sr.No.	Township/Sub-Township	Percentage of out-migrants
1	Banmaw	36.8
2	Momauk	21.1
3	Mansi	42.1
4	Shwegu	
5	Dawphoneyang	
6	Lwejei	
7	Myohla	
	Total	100

Source: Compiled by the Researcher based on the data from Immigration and National Registration Department, Banmaw District

### Conclusion

The main reason of the Intra-Migration of Banmaw District was because there were wars and fighting within the townships of Momauk and Mansi which cause less and weakness for the security in the townships. Because of the weakness for the security of the rural regions, the IDP camps were established and were cropping up IDP in the towns of Banmaw, Momauk and Mansi. If the wars and the fighting came to an end and peace is maintained, the IDPs who took shelter at the IDP Camp can return to their own villages and homes. Moreover, as a result of getting peace, the migrations for the security purpose within the Banmaw District can be stopped. If IDPs who left the IDP camps and returns to their former villages can carry out their livelihood peacefully, the development of the region in Banmaw District can be attained.

### Acknowledgement

First and fore most, I would like to express my gratitude to Dr Zaw Jat, Rector, and Dr Aye Aye Han, Pro-rector, Banmaw University, for their permission and encouragement about this paper. I would also like to express my heartfelt thanks t Dr Kyin Kyin Win, Professor and Head, and Dr Win Naing, Professor, Department of Geography, Banmaw University and all staffs in IDP camps who have helped me with kindness and patience.

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### ကျမ်းကိုးစာရင်း

- သူတို့တိုက်ခိုက်သောစစ်နှင့် သူတို့ရှာနေသော ငြိမ်းချမ်းရေး၊ သန်းဝင်းလှိုင် (၂၀၁၅) ဇွန် ရန်ကုန်။
- ခရိုင် အထွေထွေဧရာဝတီ ဆေးရုံကြီး၊ တင်ပြချက် အစီရင်ခံစာ၊ ဗန်းမော်မြို့၊ ကချင်ပြည်နယ်။
- ခရိုင်အထွေထွေ အုပ်ချုပ်ရေး ဦးစီးဌာနများ၊ ဒေသဆိုင်ရာ အချက်အလက်များ၊ ဗန်းမော်ခရိုင်။ (၂၀၁၄)



## A Study on Noteworthy Royal Females of the Bagan Period

Ni Ni Aung\*

### Abstract

It is generally accepted that females are under the leadership of the males in Myanmar society. Also in the Bagan period, as very small number of females were engaged in the administrative affairs. As a result, less information about the females were seen in the records of the Bagan period. Only the royal queens, the highest among the females in the society took little pages in the records. However, the stone inscriptions recording the meritorious deeds show that there were queens in the Bagan society who were very influential or wealthy. They are discussed in this little paper as noteworthy royal female donors.

**Key words:** female, queen, Bagan, Phwa Saw

### Introduction

Monarchical society can roughly be divided into two: the ruling class and the ruled. Among the ruling class were kings, his royal families and ministers. Chief queens, queens, lesser queens, royal daughters and wives of ministers were very wealthy persons in the Bagan society as evidenced by the stone inscriptions recording their meritorious deeds. It may be guessed that as they were members of the ruling class, they enjoyed social and economic privileges compared to other females of the society. In both ruling class and the ruled, chief queens and queens took the highest position in the monarchical society. Therefore, they may be regarded as the most powerful and wealthy females in the society. The inscriptions left by them prove the above said assumption.

### Saw Mya Kan The

Saw Mya Kan The, one of the queens of King Narapati Sithu (AD 1174-1211) who was known in history as Sithu II was one of the influential queens of the Bagan period. It may be guessed that King Narapati Sithu had six queens and they were (1) Taung Pyin The (chief queen or queen of southern palace), (2) Myauk Pyin The (queen of northern palace), (3) Saw Mya Kan The or Mya Kan Mibaya Saw, (4) Mibaya Saw or Mibaya Asawlwun who received the title of Vatamsaka, (5) Queen Veluwati and (6) Saw Sanay. Although Queen Saw Mya Kan The was not a chief queen, she was very influential because she received royal favor. Her influence upon the king made her son Nadaungmya crown prince and succeed King Narapati Sithu.

In reality, Queen Saw Mya Kan The was not a descendant of the upper social class and she was a daughter of a common gardener.<sup>1</sup> The chief queen of King Narapati Sithu was a great grand-daughter of Bagan hero Nyaung-U Phi. The quality of Queen Saw Mya Kan The can be guessed from the fact that although there were royal sons born of the queens who were descendants of upper social class, they were not selected as crown prince and Zeya Theinkha, son of Queen Saw Mya Kan The was appointed crown prince. The chronicler recorded the kind treatment of Saw Mya Kan. The upon the king as follows;

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<sup>1</sup> *The Glass Palace Chronicle of the Kings of Burma* (translated by Pe Maung Tin and G. H. Luce), Oxford University Press, 1921, pp 140-141 (Henceforth: *The Glass Palace, 1921*)



Once there was a whitlow on the king's hand, and though medicine was applied, the pain did not grow less but ached grievously. Only when Zeyyatheinkha's mother kept it to her mouth did the pain subside. While thus she did continuously, the humour burst in her mouth; and she swallowed it, fearing that if she spued it out the king would awake from sleep.<sup>2</sup>

The kind treatment of Queen Saw Mya Kan The like a mother resulted in the appointment of her son Zeyyatheinkha as crown prince by King Narapati Sithu who previously did not keep his words.

King Narapati Sithu was a cruel king who did not keep his words. The chronicler recorded his cruelty as follows;

Then he seized Anantathuriya, tutor to his brother Minyin Naratheinhka, and gave him over to the executioners to slay him. Now Anantathuriya was of a brave and constant heart; about the time of his death he spake four stanzas of linke, and gave them saying, "Offer them, I pray thee, to the king!" But the executioners tarred out but slew him, and afterwards gave the writing to the king. When these four stanzas were read before the king and he heard them, he commanded, saying, "Set free him free." But the executioners spake into his ear and said, "The deed is done!" And the king slew those executioners, saying, "Ye should have offered the writing before ye killed him, but behold, ye killed him first and offered the writing after."<sup>3</sup>

The above record clearly shows the cruelty and quick decision of the king. Instead of seeing his weakness, he slew the executioners. Queen Saw Mya Kan The was a queen who could persuade the cruel king to fulfill her desire for the appointment of her son as crown prince and thus she should be recorded in history.

### **Queens under the titles of Phwa Saw**

There were four queens in the Bagan Period who assumed the title of Phwa Saw. They are:

- (1) Phwa Saw (Myaukkuni), chief queen of King Naratheingha Uzana (1231-1235),
- (2) Phwa Saw (Min Waing), queen of King Naratheingha Uzana (1231-1235) and mother of King Uzana (1249-1256),
- (3) Phwa Saw (Saw Hla Wun or Yazathu), chief queen of King Narathihapate (1256-1287) and
- (4) Phwa Saw (Thitmadi), chief queen of King Kyaw Swa (1293-1297).

### **Phwa Saw (Myaukkuni)**

Myaukkuni Phwa Saw was a donor who built a cave pagoda in 1241 during the reign of King Kya Swa (1235-1249). It is known that since the inscription records its donor as Queen Phwa Saw, the chief queen of the King of Law who assumed the title of Sri Tribbavana Ditra Pavara Dhamma Rajad Raja Danapati Nara Theingha Uzana and mother of Theingha Pati and Tarapya, she was the chief queen of King Nara Theingha Uzana.<sup>4</sup>

<sup>2</sup> The Glass Palace, 1921, 141

<sup>3</sup> The Glass Palace, 1921, 139

<sup>4</sup> Lines 1-4 Inscription erected within the porch of the Myaukkuni Pagoda

(a) Dr. Forchhammer, *Inscriptions of Pagan, Pinya and Ava*, Rangoon, Government Printing, 1892, p155

The inscription erected in 1261 states that “Asaw lat, daughter of Nara Theingha Uzana who was the crown prince and royal son of Sri Tribhavana Dhitya Pavara, and her husband Zayya Theikdi, who was the minister.” From that inscription, it can be noted that King Nadaungmya appointed his son Nara Theingha Uzana as the crown prince. Myaukkuni Phwa Saw was his chief queen and they had two royal sons-Theingha pati and Tarapya.

According to the stone inscription dated 1241 A.D., which was found within the porch of the Myaukkuni Pagoda and now placed in the Bagan Museum, she made generous offerings, building of cave-pagoda, monastery, and rest-house, and dedication of lands, slaves and cattle. From her generous dedication, it may be guessed that she was a wealthy female in the Bagan period. She built a cave-pagoda and dedicated 178 slaves, 260 pes of paddy-land and two gardens, 100 head of cows from Myinmu in charge of 20 herdsmen to it. The offerings she dedicated to the monastery consisted of 174 slaves from Kawde village, 300pes of paddy lands and 100 cows from Sinbyu village in charge of 10 herdsmen. Her dedication of 352 slaves, 560 pes of paddy-lands, 500 cows and 30 herdsmen to the pagoda and monastery indicates that she was a very wealthy queen.

Her management of dedication is also remarkable. The inscription states her management as follows;

Let all these offerings be under the control of the presiding monk of the monastery, and let him execute all necessary repairs. Let five baskets of paddy a month be given for every ten scholars in the monastery. On the full-moon days if Kason, Waso, Wagaung and Thadingyut, let offerings be made to the devas, and let each offering consist of one and half baskets of rice, four baskets of paddy and six baskets more of paddy for the purchase of fruit, betel, and other necessities. For the rice-offering at the pagoda let three baskets of red rice, one of white rice, and seven and a quarter of paddy be given for each Lenten period.<sup>5</sup>

Because of her management of offerings stated in the above, she should be recorded as a disciplined queen.

### **Phwa Saw (Min Waing)**

In addition to the disciplined queen, Chief Queen Phwa Saw, King Nara Theingha Uzana had another queen who was named Phwa Saw (Min Waing) after the fact that she donated the religious establishments at Min Waing and recorded her meritorious deeds on the store inscription. Her stone inscription is now located within the wall of the pagoda in Min-nan-thu of Bagan. The inscription records that Phwa Saw built the cave pagoda, monastery and the Dhammas Sala (hall for holding lectures on Buddhist philosophy) in Amana in 1265 for three gems. Slaves, cultivated lands and gardens were also donated to these religious establishments. She also donated the slaves, cultivated lands and gardens to her religious edifices in 1269 and 1271. In the inscription she mentioned how she received her slaves, cultivated lands and gardens.<sup>6</sup>

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(Henceforth: Forchhammer, 1892)

<sup>4</sup>(b) U Nyein Maung, Nyein Maung, U, *She-haung Myanmar Kyauk-sa-mya* (Ancient Myanmar Stone Inscriptions), vol. II, (Thakayit 600 to 622), Yangon, Archology Department, 1982, p 24  
(Henceforth: Nyein Maung, 1982)

<sup>5</sup> Lines 22-28 Inscription erected within the porch of the Myaukkuni Pagoda

(a) Forchhammer, 1892, 156

(b) Nyein Maung, 1982, 25-26

<sup>6</sup> Inscription erected within the cave near the Minwainggyaung Pagoda

According to that inscription, Phwa Saw (Min Waing) was queen of King Nara Theingha Uzara (1231-1235), mother of King Uzara (12349-1256) and grandmother of King Uzara (1249-1280), who was also known in history as Tayoke Pyay Min (the king who fled due to Chinese invasion).<sup>7</sup> Although no evidence was found concerning the parents of Queen Phwa Saw (Min Waing), her two elder brothers were high administrative officers. One was Tharbyin Thamartta Gonhtar and Minister Maha Thamar.

During her lifetime, Phwa Saw (Min Waing) saw the succession of the Bagan Kingdom by six kings her father-in-law king Nadaungmya, her husband King Nara Theingha Uzara, her brother-in-law King Kya Swa, her son King Uzara, her grandsons King Min Yin and King Nara Thiha Pate. One garden and 20 pes of paddy land were awarded to her by her father-in-law King Nadaungmya in 1212. Her brother-in-law King Kya Swa gave her one Tharlyin (royal palanquin). A total of 159 slaves to carry that royal palanquin and 150 pe of paddy land were also provided to her. King Kya Swa also gave 193 slaves of Harlin and 170 pe of paddy land to her in 1242. However, the inscription has no mention of what her husband King Nara Theingha Uzana gave his wife Queen Phwa Saw. She enjoyed the royal favour during the reign of her son King Uzana. The king offered the cultivated lands and slaves to his mother in 1252.

Although she was not the chief queen, Queen Phwa Saw was richer than the Chief Queen as evidenced by the donation dated 22 December 1265. The inscription recorded that the lands and slaves dedicated for the upkeep of her donated religious edifices were: Tahnmyinni land, 100 pes and 193 slaves village paddy-lands, 170 pes and 159 slaves; another field 150 pes;; Mapalan land, 25 pes; Theinga-Piyan land, 204 pes; Nyaunggyun garden and 24 slaves; Monbaung garden; Sataung land, 10 pes; Seikmalan land, 10 pes; 85 slaves from Bagan; 21 slaves from Kandaw. Her dedication proves the fact that she was richer than the Chief Queen.

Compared to other queens, Queen Phwa Saw was very generous and she dedicated the offertories more than the other queens did. On 7 January 1270 Phwa Saw built a large brick monastery and dedicated to it the whole island of Kyalaung-Putlet; the island of Inzaya; 104 purchased slaves, 3,598 pes of paddy-land; 133 Indian slaves. On 19 October 1271 he dedicated the following offerings to the three "Gems", namely, 29 gardeners, 300 pes of paddy-land, a garden, a grand staircase for her monastery, and a herd of cows and goats. The difference between Queen Phwa Saw and Chief Queen Phwa Saw was that the former did not record in her inscription her management for her dedication. She was weak in her management for the long existence of her dedication.

Her prayers were also interesting to be noted. She divided her prayers for herself and others. She simply prayed for her husband king, her son king and her grandson king, "May my lord the king (Kyazwa), my son the king (Uzana), and my grandson the king (Narathihapate), and all their successors, as well as every being inhabiting every universe between the highest heaven and the lowest hell, obtain a share of my merit, and reach Nirvana."

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(a) Forchhammer, 1892, 262-264

<sup>6</sup> (b) *She-haung Myanmar Kyauk-sa-mya* (Ancient Myanmar Stone Inscriptions), vol. III, (Thakayit 622 to 699), Yangon, Archology Department, 1983, pp 58-61 (Henceforth: Nyein Maung, 1983)

<sup>7</sup> Lines 1-4, Inscription erected within the cave near the Minwainggyaung Pagoda

(a) Forchhammer, 1892, 262

(b) Nyein Maung, 1983, 58

She prayed for herself as follows;

May I be beloved by all men and nats and be the possessor of vast wealth.  
May I become the most famous and powerful ruler of kingdoms. May I,  
in my every existence, be wise and charitable and be possessed of every  
good virtue, and may I ultimately obtain the bliss of Nirvana.<sup>8</sup>

Therefore, for her prayers without own efforts for Nirvana, Professor G. H. Luce remarked that she made impossible prayers. Queen Phwa Saw should be recorded in history for her many dedications, and impossible prayers.

### **Phwa Saw (Saw Hla Wun or Yazathu)**

She was the donor who recorded her meritorious deeds on two stone inscriptions one in the north and other in the south within the compound of Saw Hla Wun Pagoda situated in Min Nan Thu Village of Bagan. In the inscription she was mentioned as Yazathu Phwa Saw. Phwa Saw (Saw Hla Wun or Yazathu) recorded her relatives in her inscription dated AD 1264 thus:

May my grandfather King Kya Swa, grandmother Saw  
Min Hla, my husband the king, my son the king, my  
parents, my two sons, my uncle Theinghalthu, aunt  
Thonelula, elder sister Yadanabon, my three brothers and  
two younger sisters ---<sup>9</sup>

From the above evidence, it may be noted that Yazathu Phwa Saw's grandfather was King Kya Swa and grandmother, Queen Saw Min Hla; that her husband the king in the inscription was King Nara Thiha Pate (1256-1287); that her son the king was the reigning monarch King Kyaw Swa (1289-1297). The inscription confirms that Yazathu Phwa Saw had seven brothers and sisters including her. The father of Yazathu Phwa Saw was Minister Thaye and her mother was daughter of King Kya Swa and Queen Saw Min Hla. However, there was no mention of her mother's name in the inscription.

As have been stated in the above, Yazathu or Saw Hla Wun Phwa Saw's elder sister was Queen Yadanabon of King Nara Thiha Pate (1256-1297) and she was known as Phwa Saw (Thitmadi) as evidenced by the inscription near the Thitmadi Pagoda of Bagan thus:

On Friday, the 12<sup>th</sup> waxing of Waso 664 Sakkaraj, Queen Phwa Saw's sister built a brick monastery in place of the nured one erected by her aunt, wife of King Kya Swa, and dedicated thereto the following lands and slaves, namely, Tharbyingyin land, 100 pe's which were granted her by the king after the death of her elder sister Queen Phwa Saw and when she was raised to the throne --<sup>10</sup>

<sup>8</sup> Lines 31-35, Inscription erected within the cave near the Minwainggyaung Pagoda

(a) Forchhammer, 1892, 276

(b) Nyein Maung, 1983, 74

<sup>9</sup> Taw Sein Ko, *Inscriptions of Pagan, Pinya and Ava, Rangoon (Translations with Notes)*, Government Printing, 1899, p 119 (Henceforth: Taw Sein Ko, 1899)

Lines 20-36, Reverse, Inscription erected within the porch of the Sawlawun Pagoda

(a) Forchhammer, 1892, 260

(b) Nyein Maung, 1983, 151

<sup>10</sup> Lines 19-21, Inscription erected near the Thamati Pagoda

Forchhammer, 1892, 294

From the above evidence, it may be assumed that Yazathu Phwa Saw's elder sister was queen and one of her two younger sisters was also a queen. Therefore, three of the four sisters were queens of the Bagan kings. No evidence is found concerning the rest of her sisters.

Like other queens under the title of Phwa Saw, Saw Hla Wun Phwa Saw also made many dedications. The inscription erected within the porch of the Sawlawun Pagoda states that on 31 October 1264 Sawlawun Phwa Saw made dedication to the monastery erected by her father of Myegan-Myingan land, 200 pes and five slaves; Muthaw-Monshan land, 10 pes and on 7 waxing moon day of Waso 652 M.E., 150 pes of mango-gardens at Taungdwin and 10 slaves; Osuban-Tanyaukku land 300 pes to the same monastery. On the occasion of the festival of the full-moon of Tazaungmon, she dedicated 2,000 slaves together with all the slaves attached to the same to the monks and on Thursday, the full-moon of Tagu 653 M.E.(15 April 1292), the queen made the offerings of Mokso village lands, 300 pes and 15 slaves; Talok lands, 30 pes and 30 slaves; Mingun lands, 100 pes and 10 slaves; 600 pes adjacent to the Tanmaka circle; Kywezein lands, 200 pes and 7 slaves.

Sawlawun Phwa Saw who possessed these many lands and slaves may be noteworthy as a wealthy female who received royal favor. It is interesting to note that her elder sister Yadanabon and her younger sister Thitmahti Phwa and were also queens.

#### **Phwa Saw (Thitmadi)**

Phwa Saw (Thitmadi) was the chief queen of King Kyaw Swa (1289-1297) and her senior sister Sawlawun Phwa Saw, and King Saw Hnit (1297-1305) and recorded her meritorious deeds on the stones erected in Thitmadi near Phwa Saw Village west of Bagan. She left five inscriptions recording her donations. Thitmadi Phwa Saw dedicated lands and slaves to the monastery built by her grandfather and father in Yangon in 1299 and her meritorious deeds were recorded on the stone inscription found in the Kuhtwe Forest Monastery of Kamar Village, Kyaukse. In the same year she constructed a ceti, a monastery and a sima (ordination hall) in Thitmadi of Bagan and the tripitaka (Three Baskets), lands, slaves and eight kinds of monastic necessities were dedicated to her religious establishments and Buddhist monks. The stone inscription erected in Sutaungpyay Pagoda of West Phwa Saw Village in Bagan recorded her meritorious deeds in Thitmadi. The stone inscription dated 1302 erected near the Thitmadi Pagoda and Monastery mentions that she repaired the monastery dedicated by her step-mother, queen of King Kya Swa and donated lands and slaves to it. The stone inscription in Adhihtar Pagoda of Phwa Saw Village states that Thitmadi Phwa Saw dedicated lands and slaves to the cave pagoda and monastery donated by Mahe Thathteik, son of her brother.

Thitmadi Phwa Saw was queen of King Saw Hnit (1287-1295) as evidenced by the inscription erected within the inscription cave attached to the Sutaungpyay Pagoda of Bagan and dated 1299, which reads thus:

On Saturday, the 3<sup>rd</sup> waxing of Tabodwe 661 Sakkaraj, corresponding with the year of the Religion 1843, Queen Phwa Saw, wife of King Sri Tribhavana Dittyia Pavara Dhamma Raja, who reigned Arimaddanapura (Bagan) and known as Lord of White Elephants, being desirous of escaping the miseries of sarisara

and attaining Nirvara, built a beautiful be jeweled pagoda surrounded by a brick wall at Thitamadi.<sup>11</sup>

Lines 16 and 17 in the above stone inscription reads thus:

My grandson and Buddha-to-be King Sri Tribhavara Dittya Pavara Dhamma Raja came to the high festivities and heard the Teaching.<sup>12</sup>

From the above evidence, it is noted that although Queen Phwa Sas (Thitmedi) was the chief queen of King Saw Hnit, she regarded the king as her grandson. It is true that since Thitmedi Phwa Saw was sister of Saw Hla Wun (Yazathu) Phwa Saw, she was also cousin of King Uzara known as Tayoke Pyay Min (1256-1287). Therefore, she was really the grandmother of King Saw Hnit.

The inscription dated 1301 and 1378 situated within the inscription cave attached to the Sutaungpyay Pagoda supports the fact that Thitmedi Phwa Saw was sister of Saw Hla Wun or Yasthu Phwa Saw. The evidence reads thus:

On Saturday, the full-moon of Wagaung 663 Sakkaraj, the king, during on illness, dedicated to the royal monastery the Kaunggamu land, measuring 100 pe's and 17 slaves; and the Tarlaing land at Sagu, 100 pe's. These lands were originally granted by the king to my elder sister Mibaya Saw, and on her death and my succession to her position they were transferred to my possession.<sup>13</sup>

The above evidence clearly shows the fact that Yazathu Phwa Saw passed away during the reign of King Kyaw Swa and when her sister was raised to her position, her possession was also transferred to her sister, Thitmedi Phwa Saw by King Kyaw Swa.

Similarly, lines 24 and 25 of the inscription dated 1299 situated within the inscription cave attached to the Sutaungpyay Pagoda supported the transfer by the king of the lands and slaves of Yazathu Phwa Swa to her sister Thimadi Phwa Saw. These lines of the inscription read thus:

For the making of the rice-offerings, the upkeep of the religious edifices and the maintenance of the monks throughout the period of the Religion, the following lands and slaves were dedicated, namely, Magyigyo land and slaves; Salin land and slaves; and the slaves from Bagan consisting of the weavers and other Indians. The Magyigyo land was originally obtained by Phwa Saw's elder sister from the king, and on her death it passed onto Phwa Saw.<sup>14</sup>

King Kyaw Swa succeeded the Bagan throne in 1289 and was dethroned in 1297, enjoying the royal pleasure for eight years. The inscription dated 1299 mentions that Phwa Saw was queen of King Thiri Yarzar (King Kyaw Swa). However another inscription of Phwa Swa dated that same year states that (Thitmedi) Phwa Saw was queen of King Sri Tribhavara Dittya Pavara Dhamma Raja, the title of King Saw Hnit.

From these two inscriptions, it may be assumed that Thitmedi Phwa Saw was raised to the queen of King Saw Hnit in the year 1299.

<sup>11</sup> Lines 1-9, Inscription erected within the inscription case attached to the Sudaungbye Pagoda Forchhammer, 1892, 297

<sup>12</sup> Forchhammer, 1892, 298

<sup>13</sup> Lines 1-5, Inscription erected within the inscription case attached to the Sudaungbye Pagoda Forchhammer, 1892, 304

<sup>14</sup> Lines 21-25, Inscription erected within the inscription case attached to the Sudaungbye Pagoda Forchhammer, 1892, 298

According to the chronicles, she was involved in the palace affairs and had an influence upon the ministers. Joining hands with three Shan brothers, Yaza Thingyan, Athin Khaya Saw Yun and Thihathu, she dethroned King Kyaw Swa. After the king had been dethroned by three brothers, she returned to Thitmadi village of Bagan and built the pagoda and monastery. Because of her involvement, she should be recorded as the queen who dethroned the king. She was responsible for the emergence of the new dynasties in Sagaing, Pinya and Innwa in the post-Bagan period.

### Conclusion

To sum up, queens took the highest position among the females in the Bagan society. Some who received royal favor and love were very wealthy females. As they were devout Buddhists, they dedicated their property to the pagodas, monasteries and monks. In doing so, they mentioned in their inscriptions the purposes for their meritorious deeds and prayers, and thus it is known that some were disciplined and some were very greedy females. There was a queen who was involved in the dethronement of her royal husband. Due to their roles in the society and meritorious deeds, they should be recorded in history.

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## Women's Right from the *Dhammathat*

Tin Moe Latt\*

### Abstract

Myanmar women are considered to be the underprivileged persons in Myanmar history. However, the laws that prohibited women from doing something or from participating in something were very rare. In this paper, how women in Myanmar society enjoyed rights are discussed. In Konbaung period, women enjoyed the same rights with men concerning divorce and some property rights. Although there were laws for the protection of women's rights, classism was practiced as the country was under the feudal system.

**Key words:** right, *Dhammathat*

### Introduction

In this paper, the researcher presents women rights from *Dhammathats* (a treatise on judicial trial). The *Dhammathats* reveals the social conditions of ordinary women. In Konbaung Period, women had the same rights their husbands enjoyed as to divorce and inheritance. Although there were laws for the protection of women's rights, classism was practiced as the country was under the feudal system. There were no instances in which a woman sued someone for husband stealing. However, if a woman desired to get a divorce, she could seek it according to customs. The women had the same rights their husbands enjoyed as to divorce and inheritance

It is necessary to study under whose protective supervision and guardianship the women were in the Myanmar society. Women were classed into eight categories depending on who their guardians were:

1. those under the care of their mothers,
2. those under the care of their fathers,
3. those under the care of their parents,
4. those under the care of their brothers,
5. those under the care of their sisters,
6. those under the care of their families,
7. those under the care of their relatives, and
8. those under the care of their companions.<sup>1</sup>

With the exception of those over twenty years old, the marriage of Myanmar women would normally be arranged by their parents or guardians.<sup>2</sup> According to the *dhammathats* (a treatise on judicial trial), even the divorced women and widows could

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<sup>1</sup> "Mahayazathat Htwetsochet (Statements in the Mahayazathat)", *Purabai* MS, Department of Old Myanmar Literature, Botahtaung, Yangon, *pu* 340 (Henceforth: Mahayazathat, *pu* 340)

<sup>2</sup> U Gaung, *A Digest of the Burmese Buddhist Law Concerning Inheritance and Marriage; Being a Collection of Texts from Thirty Six Dhammathas, Vol. II, Marriage*, Rangoon, the Superintendent, Government Printing, Burma, 1899, pp. 58-59 (Henceforth: Gaung, 1899)



not remarry without the consent of their parents or guardians.<sup>3</sup> However, the rules were not as strict as in other Asian countries.

The *dhammathats* prescribed that parents should marry off their daughter when the latter was fifteen or sixteen years old, although women over twenty years old were allowed to marry without the consent of their parents or guardians.<sup>4</sup> Therefore, the marriageable age of females according to the *dhammathats* was fifteen or sixteen; and parents generally married their daughters off when the latter were fifteen or sixteen years old as it was their duty.

As the saying *yaung nauk zadon pa* (the hairdo follows the topknot) suggests, a wife normally would move to her husband's house. Occasionally, however, they would enter into an agreement that the bridegroom would stay at the bride's house after marriage. A legal suit involving such an agreement, which was heard and decided by the *myowun* (governor) of Ratanatheinga in 21 December 1789, may be cited here. In this case, Nandakyawthu demanded his wife Mi Hpyu to move to his house. Yekyawwera, Mi Hpyu's father, stated that he married his daughter off to Nandakyawthu so that she could care for them, that is, her parents, Nandakyawthu wanted her to stay at his parents' home after about five or six months; therefore, he insisted that she should not accompany her husband. As the *dhammathats* stipulated that a daughter was not free to leave her parent's home for three years and as a man could not leave his parents-in-law within three years after marriage without their consent if they had married their daughter off to him to look after them according to local custom, the governor decided that Nandakyawthu and Mi Hpyu were to continue to live with Mi Hpyu's parents.<sup>5</sup>

The phrases *nauk maya*,<sup>6</sup> *einthigya naukhta thumaya*, *hnaung maya ne thi*,<sup>7</sup> *naukne maya*<sup>8</sup> and *eingyane meinma*<sup>9</sup> indicate that polygamy was practiced by common citizens. In addition to a *mayagyi*, a man could have *letsonpyaing mayange* and up to six *apyaung maya* as his wives,<sup>10</sup> ie concubines.<sup>11</sup> The six *apyaung mayas* mentioned in a legal document were:

<sup>3</sup> Yandameit Kyaw Htin, *Yezagyo Hkondaw Hpyathton* (Rulings of the Judge of Yezagyo ), Rangoon, Hanthawady Press, 1965, 18 (Henceforth: Yandameit Kyaw Htin, 1965)

<sup>4</sup> Gaung, 1899, 43-44

<sup>5</sup> (a) "Seba Mingyi Kauktaumugyet Hpya," *Purabaik* MS, Universities Historical Research Department's Collection, *pu* 74 (Henceforth: Seba Mingyi, *pu* 74)

(b) Yandameit Kyaw Htin, 1965, 9-11

<sup>6</sup> "Thetkayit dated the 8<sup>th</sup> day of the waning of First Wazo, 1217 ME (6 July 1855), Mortgage of paddy land," *Purabaik* MS, the collection of U Thila (Yezon village), *pu* 14047, Manuscript collection of Maung Lin, Tutor, Department of History, Meiktila University (Henceforth: Mortgage of paddy land, *pu* 14047)

<sup>7</sup> "Judgement made by Maha Minkyaw Sithu, judge, Myinmu, on the 2<sup>nd</sup> day of the waxing moon, 1235 ME," *Purabaik* MS, collection of Kyaw San Htun, Tutor, Department of History, Myingyan University (Henceforth: Minkyaw Sithu's judgement, *pu*)

<sup>8</sup> "Thetkayit, Mortgage of human labour by Nga Yauk and wife Mi Chein", *Purabaik* MS, National University Collection, *pu* 1268 (Henceforth: Nga Yauk, *pu* 1268)

<sup>9</sup> Than Tun, *The Royal Orders of Burma, A.D. 1598-1885 Part Five, A.D. 1788-1806*, Kyoto, The Center for Southeast Asian Studies, Kyoto University, 1986, p. 812 (Henceforth: Than Tun, 1986b)

<sup>10</sup> U Gaung, *A Digest of the Burmese Buddhist Law Concerning Inheritance and Marriage: being a Collection of Texts from Thirty-Six Dhammathats, vol. I, Inheritance*, Rangoon, The Superintendent, Government Printing, 1898, p. 36 (Henceforth: Gaung, 1898)

<sup>11</sup> Manung Maung Thaik, "Konbaung Hkit Luhmuye Ache-ane" (Social Conditions in the Konbaung Period), *Pyidaungzu Myanmar Nainggan Sarpe Hnint Luhmuyetheikpan Journal*, Vol. II, no.i, 1969, 56

1. an *apyauung maya* who came along with the wife,
2. an *apyauung maya* who came along with the husband,
3. an *apyauung maya* bought by a married couple,
4. an *apyauung maya* given by the husband's parents after he got married,
5. a *kyunpyaungma* (female slave who was to be treated as a concubine) given by the wife's parents,
6. a concubine to whom one did not give one's money and with whom one did not eat together.<sup>12</sup>

Thus, it is learnt that the people cohabited with female slaves in the Konbaung period. A creditor not only could treat a female slave as a servant, but also could take her as a wife. Although polygamy was permitted, a man could not take a lesser wife if he could not afford to provide food and shelter for and look after her.<sup>13</sup>

As to inheritance, however, women had the same rights enjoyed by men. According to a royal order issued by King Badon on 3 March 1782, if a married couple had no descendants, one of them had the right to inherit the property of his or her spouse after the latter's death.<sup>14</sup> Inheritance was categorized into *payin* or *ahet oatsa* and *lethtetpwa* or *auk oatsa* (the property the deceased person and his or her spouse accumulated after their marriage). According to an edict of King Badon issued on 24 May 1809, the *ahet oatsa* (the property before their marriage) passed on to the descendants of the deceased person's principal wife, while the *auk oatsa* went to those of his lesser wife or wives.<sup>15</sup> Therefore, both the principal wife and lesser wife or wives of a person and their descendants were entitled to the right of inheritance in the property of their deceased husband or father. In some cases, the son of a deceased person's lesser wife even had the right to inherit his father's hereditary office. For instance, in an inheritance suit, Maha Minkyawsitu, the judge of Myinmu, decided that the son of Mi Shwe Mi, the Lesser wife of a *myothagyi* (town headman) of Salin, was to assume the office of his deceased father, who had no offspring with his principal wife Mi Chan.<sup>16</sup> According to an edict issued on 23 May 1810 (the son of the principal wife of an hereditary officer was deprived of his right to inherit his father's office because his mother's name was not mentioned in the list submitted to the crown; the son of the officer's lesser wife inherit his father's office and became *myedaing*-a hereditary officer who had to record and take a commission on sales of immovable property. Nga Taung, the *myedaing thagyi*, after having a son, Nga Cho Aye, with his first wife Mi Win Nyo, divorced her. Later he remarried Mi Win San, Nga Shwin's mother, and when he had to submit a list to the crown in 1783, he mentioned Mi Win San instead of Mi Win Nyo as his wife. Therefore, his office passed on to Nga Shwin, the son of Mi Win San whose name was mentioned in the list.<sup>17</sup> Therefore, even though a man was allowed to marry more than one wife, none of the wives lost their rights. Not only the principal wife and

<sup>12</sup> (a) Maha Yazathat, *pu* 340

(b) Gaung, 1898, 595

<sup>13</sup> (a) Maha Minkyaw Sithu's Judgement, *pu*

(b) Yandameit Kyaw Htin, 1965, 4

<sup>14</sup> Than Tun, *The Royal Orders of Burma, A.D. 1598-1885 Part Four, A.D. 1782-1787*, Kyoto, The Center for Southeast Asian Studies, Kyoto University, 1986, p. 231 (Henceforth: Than Tun, 1986a)

<sup>15</sup> Than Tun, *The Royal Orders of Burma, A.D. 1598-1885 Part Six, A.D. 1807-1810*, Kyoto, The Center for Southeast Asian Studies, Kyoto University, 1987, p. 631 (Henceforth: Than Tun, 1987)

<sup>16</sup> Maha Minkyaw Sithu's judgement, *pu*

<sup>17</sup> Than Tun, 1987, 752

her descendants, but also the lesser wife and her descendants had the right of inheritance. A man had to support his wife by providing food and clothing even if he had married a woman who was insane or crippled. A man had to care for his wife if the latter was pregnant. If he could not look after her himself, he was required to hire a female servant to look after her. If one's wife died because of her pregnancy, he had to perform funeral rights over her; if someone else buried her, he was required to pay the cost.<sup>18</sup>

It is also learnt that there was sexual equality concerning divorce. According to the *dhammathats*, women had the same rights as their husbands when they get divorced. It is prescribed in the *Kaingza Manuyaza Dhammathat* that if a man wanted to divorce his wife even though the latter had committed no wrong, he would have to settle all the debts and turn over the entire family estate-both animate and inanimate property to her, and was to leave the house with the clothes he was wearing.<sup>19</sup> On 28 January 1795, King Badon issued a royal order that anybody who sought a no-fault divorce was to be caned although the marriage was to be dissolved as usual.<sup>20</sup> Thus, sex was not taken into account concerning a divorce; what really counted was the couple's behaviour. The law was also equitable concerning property rights upon the termination of marriage. Each spouse was to take the property he/she owned before his/her marriage, and was to receive half the property he/she and his/her spouse accumulated while they were married; the husband and the wife were to share the debts and the legal expenses equally; and the children could choose with which they would live.<sup>21</sup> In a divorce case Nga Aung Min, the *Myowan* (town officer) of Saka and Mi Hnin which was decided on 16 July 1809, the judgement was that all the couple's possessions were to be given to the wife Mi Hnin and the husband was to leave their home with the clothes he had on as he sought a no-fault divorce.<sup>22</sup> Thus, the women enjoyed equal rights; the law prescribed that the spouse who sought a no-fault marriage was to be caned; in a divorce by mutual consent, both the husband and the wife had to share the family property as well as their debts equally; in a no-fault divorce, the spouse who sought the divorce had no property right, but had to leave the family with a single set of clothes he/she was wearing.

Even a slave whom a man had taken as wife had such rights according to the *dhammathats*. If the owner of a female slave ate together with the latter, she was recognized as his legitimate wife from that day on. If a man showed that he loved a female slave by dining with her, she became his legitimate wife and mistress of the house. If the man wanted to divorce her and remarry another woman, she had the right of winning everything they acquired from the day they became man and wife. The man was also responsible to pay off the debts they had incurred since their day of marriage. However, he would get everything he owned before that date and the value of a female slave. If a man battered a female slave he had taken as wife as if she had committed any wrong although she did not because he wanted the family property, he would get the value of the female slave and the property he owned before their marriage, and was responsible to settle the debts he had incurred before their marriage. The husband and his slave wife had to share the property-both animate and inanimate-they obtained while

<sup>18</sup> Kaingza Manuyaza Dhammathat (Kaingza Manuyaza's dhammathat), n.p., n.d., pp. 46-47 (Henceforth: *Kaingza*)

<sup>19</sup> *Kaingza*, 42

<sup>20</sup> Than Tun, 1986b, 470

<sup>21</sup> U Thauung, "Padetharit Hkiy Hma Kyeywa Tayayon Mya" (Village courts in the feudal period), *Working People's Daily*, 4 May 1970, vol. VII, no. 204, p. 6 (Henceforth: Thauung, 1970)

<sup>22</sup> Yandameit Kyaw Htin, 1965, 44-45

they were married equally, and they had the same responsibility to settle the debt they incurred while they were married.<sup>23</sup> If the wife could prove that the husband had battered her by showing the injuries she had sustained, the husband had to turn over the family property to her and would also be responsible to settle the debts they had run up while they were married; their marriage would be annulled, and the husband would have to leave their home with the clothes he was wearing.<sup>24</sup> Thus, the *dhammathats* protected women from being battered by their husbands, and also ensured that they would be supported by their husbands. In 1879, a certain Mi Shwe Pu filed a petition for divorce. Mi Shwe Pu and Nga San Paw, claiming that Nga San Paw failed to fulfill his duty as a husband as he did not provide her with food and did not come near her till she was pregnant. In this case, the judge decided that Nga San Paw was to give 30 coins to Mi Shwe Pu in compensation, that the child was to be cared for by the mother, and that when the child came of age Nga San Paw was to take him or her by paying *nobo* to the child's mother, and the divorce was granted.<sup>25</sup> This court decision shows that a woman could divorce her husband if he was not dutiful, and that the husband was also responsible to pay maintenance for his children. Thus, the husband and wife had the same rights concerning divorce either according to the *dhammathats* or according to the legal cases.

Seducing a maiden, who was under the care of her parents or of a guardian was a punishable offence.<sup>26</sup> The *dhammathats* list twenty one types of women with whom a man should not have an affair with as follows:

1. an old woman
2. an insane woman
3. a leper
4. a pregnant woman
5. a young girl
6. a woman who came from another locality
7. a woman whom one had confined as security for the repayment of a loan
8. a woman under the care of her father
9. a woman under the care of her mother
10. a woman under the care of her grandmother
11. a woman under the care of her grandfather
12. a woman under the care of her elder sister
13. a woman under the care of her younger sister
14. a woman under the care of her younger brother
15. a woman under the care of her elder brother
16. a woman under the care of her mother's elder sister

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<sup>23</sup> *Kaingza*, 37-38

<sup>24</sup> *Kaingza*, 42

<sup>25</sup> "Court decision in a divorce case (Mi Shwepu and Nga San Paw), the 3<sup>rd</sup> day of the waxing moon, 1241 ME", *Purabaik* MS, Mandalay University Library Collection, *pu* 37 (Henceforth: divorce case, *pu* 37)

<sup>26</sup> Than Tun, 1986b, 468

17. a woman under the care of her mother's younger sister
18. a woman under the care of her father's elder brother or the husband of her mother's elder sister
19. a woman under the care of her father's younger brother or the husband of her mother's younger sister
20. a woman under the care of her paternal uncle's wife
21. a woman under the care of her mother's elder brother.<sup>27</sup>

The punishment, however, depended on the social status of the woman with whom a person had a sexual relationship.

1. If a man, whatever his social class was, seduced a daughter or wife of a courtier of the first or second rank, he was to be sentenced to death.
2. If a man had an illicit love affair with a daughter or wife of a courtier of the other three ranks, both the man and woman were to be exposed to public derision, and pilloried at the city gate from which corpses were taken out and to be flogged; their property, both animate and inanimate, was to be confiscated; and the children and wife of the offender were to be reduced to slavery.
3. If a man had a sexual relationship with the daughter or wife of an officer who was not one of the five ranks, both the man and the woman were to be exposed to public derision and to be pilloried and given fifty lashes, and were to be sent to a labour group for gathering food for elephants and horses. No compensatory damages were to be awarded.
4. If a man had a sexual relationship with the daughter or wife of a commoner, he was to be required to pay a slave to her parents or husband in compensation.<sup>28</sup>

With regard to adultery, in a court decision made on 28 January 1795, the punishment for a married woman who committed adultery was the lash, whereas that for the man who had adulterous relationship with her was the lash with proclamation (*maungkyaw*). According to a royal order, a man who was guilty of "wife-stealing" was to be among the six types of persons taken out of the palace by the gate which was reserved for talking out corpses; and a minister who had an illicit love affair within the palace compound was to be banished from the kingdom. Thus, the punishments for illicit sex differed depending on the severity of the offence and the rank of the offenders.<sup>29</sup> In another case, a royal order was issued on 12 September 1787 that Nga Talok, who committed adultery Thayewun Minhlakyawswa's wife, and Mi Naw, Nga Talok's wife were to be confined in pillories at the open hall at the cemetery naked to be exposed to public derision.<sup>30</sup> On 13 September 1787, Mi Naw was ordered to serve in the Rice Milling Service, and Nga Talok was made to join the group responsible for gathering elephant food; additionally, the phrase *luzomyo* (relative of a criminal) was tattooed on the chest of Nga Talok's father.<sup>31</sup> Thus, not only the offender Nga Talok,

<sup>27</sup> *Manugye Dhammathat* (Manu's comprehensive dhammathat), Rangoon, Hanthawaddy News Printing, 1903, pp. 162-63 (Henceforth: *Manugye; 1903*)

<sup>28</sup> Than Tun, 1986b, 447

<sup>29</sup> Than Tun, 1986b, 467-68

<sup>30</sup> Than Tun, 1986a, 594

<sup>31</sup> Than Tun, 1986a, 595

but also his father and wife were punished. All the family members of the offender were punished seemingly so that other people would not dare to have illicit sex. Thus, there were laws to protect the interests of the woman. The punishments, however, differed according to the social status of the persons involved.

The prostitution was legal in the Konbaung Period. Married women who committed adultery were also turned into prostitutes. According to a royal order issued on 10 July 1806, Nga Shwe Po who had an adulterous relationship with a married woman named Mi Kya was to be sent to a forest after marking his face with tattoos, and Mi Kya was also to be tattooed on the face and to be made to live in the area fixed for prostitutes near the western gate of the city.<sup>32</sup> The *dhammathats* prescribed that a person who was guilty of “wife-stealing” was to be made to pay 30 *kyats* to her husband as compensation; and if he was convicted four times, he was to be made to pay the cost for using the service of a prostitute.<sup>33</sup>

### Conclusion

To sum up, in accordance with the *dhammathat*, women were classed into eight categories depending on their guardians so that they would obey their parents or guardians and behave with proper decorum. They again were grouped into ten age groups. They needed their parents’ or guardian’s consent to get married. Parents, as they were responsible for the marriage of their daughters, normally arranged their marriage. Although the marriageable age according to the *dhammathats* was fifteen or sixteen, there were marriages of girls under fifteen. The saying *yaung nauk zadon pa* indicates that a woman normally accompany her husband to his parents’ house after marriage. However, the husband moved to the wife’s house occasionally due to the agreement they had made before their marriage. There were legal cases involving such agreements. Polygamy was practiced in Konbaung Period. Although no woman would want of to accept her husband having other sexual partners, sometimes they had such kind of the situation. There were no instances in which a woman sued someone for stealing her husband. However, if a woman desired to get divorced, she could seek it according to customs. The women had the same rights as their husbands enjoyed as to divorce and inheritance. Although there were laws to protect the interests of women, there was social discrimination in the feudal period.

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<sup>32</sup> Than Tun, 1986b, 921

<sup>33</sup> Mahayazathat, *pu* 340

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## The Capital Royal Servicemen in early Konbaung Period

Tin Tin Moe\*

### Abstract

This paper presents to the duty of ministers. In this paper, the researcher discusses the importance of cavalry at that time. Moreover the paper investigates the duty of *A-thi-wun* and assistant ministers and interior's management for security of court. The royal servicemen in early Konbaung Period were divided into two, capital royal servicemen and provincial royal servicemen. Among these capital royal servicemen, the minister was the highest authorized person.

**Key word:** capital royal servicemen, *wungyi*

### Introduction

In early Konbaung Period, the royal servicemen were divided into two; capital royal servicemen and provincial royal servicemen. Among these capital royal servicemen, the minister was the highest authorized person and the duty of ministers and appointment to four ministers for capital administration. Moreover the duties and the insignias of the *Myin -su-gyi-wun*, *A-thi-wun*, *Wun-htau* and *A-nauk-wun* were presented.

There were two types of the Royal Serviceman in early Konbaung Period: Inner officers and the provincial officers. The *Wun-gyi* (Minister) was the highest in rank among the Inner officers. The persons who were very clever at instances based on *Dhamma*, matters related to kings and world affairs were appointed as *Wun-gyi* and they also should be pious to the religion and faithful to the king and the royal family, the king's sons and daughters and grandchildren.<sup>1</sup>

Duties of *Wun-gyi* were quite wide: from religious affairs, educational affairs, foreign affairs, home affairs to criminal cases and revenue cases.<sup>2</sup> In deciding home affairs, they had to try to free themselves of the four<sup>3</sup> infidelities, and three<sup>4</sup> bribes.<sup>5</sup>

Four *Wun-gyis* were generally appointed. Among the four *Wun-gyis*, there included one *Wun-gyi* named Thatoe Thudhamma Maha Thettaw Shae. He was allowed to wear eighteen sashes worn as insignia honoured by the king. The sash was not only

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<sup>1</sup> Taw Sein Kho, *Hlut-taw Hmat-tan* (Records of the Hut-taw), Yangon The Council of Culture, 1960, p. 18 (Henceforth: Taw Sein Kho, 1960)

<sup>2</sup> Maung Maung Tin, U, *Shwenan-thon Waw-hara A-bhi-dan* (Dictionary of Royal Terms), Yangon, Yarbyae Press, 2005, p.166 (Henceforth: Maung Maung Tin, 2005)

<sup>3</sup> (a) The four infidelities: that occasioned by selfish desire, that occasioned by ill-will, that occasioned by ignorance, and that occasioned by fear

(b) Tin, U, *Myanmar-min Ok-chok-pon Sar-dan hnint Bodawphaya ei Ya-za-that Khaw A-meint-daw-dan-gyi* (Royal Administration of Myanmar and Royal Orders of King Bodaw Phaya), Vol.I, Yangon, Ministry of Culture, 2007, p. 82 (Henceforth: Tin, 2007)

<sup>4</sup> (a) bias, bribes and affection

(b) Tin, U, *Myanmar-min Ok-chok-pon Sar-dan hnint Bodawphaya ei Ya-za-that Khaw A-meint-daw-dan-gyi* (Royal Administration of Myanmar and Royal Orders of King Bodaw Phaya), Vol.IV, Yangon, Ministry of Culture, 1976, p. 52 (Henceforth: Tin, 1976)

<sup>5</sup> *The Royal Orders of Burma (A.D. 1598-1885)*, Part.IV (A.D. 1782-1787), Kyoto, The Center for Southeast Asian Studies, Kyoto University, 1986, p. 319 (Henceforth: Than Tun, 1986)



the insignia of honour but also high moral values.<sup>6</sup> The *Wun-gyi* who had gained the title Maha Thettaw Shae was higher in rank and authority than other *Wun-gyis* Thettaw Shae was exempted from death sentence by the king. He was a very reliable person for the king. Therefore he was the person who dared to tell the kings what was right or wrong.<sup>7</sup> *Wun-gyi* U Hnaung was Maha Thettaw Shae during the reign of King Badon.<sup>8</sup>

In early Konbaung period, the *Wun-gyi* was the highest in rank in the king's palace. The second in rank was *Myin-su-gyi-wun* (the officer in charge of the mounted militia). This was a gazette officer<sup>9</sup> or rank by the king. This rank was appointed to a person who was the king's nearest relative or the king's most reliable follower. Sometimes, however, this post was appointed to a person who was not fully qualified for a minister's post. *Myin-su-gyi-wun* was responsible only for the mounted militia. He had no right to administrative responsibilities. He only had to manage the cases among the mounted militia.<sup>10</sup> Nay Myo Nawrahta Sithu was appointed as *Myin-su-gyi-wun* during the reign of King Badon.<sup>11</sup>

Next in order of high rank after *Myin-su-gyi-wun*, *A-thi-wun*, a special officer who had charge of the non-official citizens, was the third important and powerful rank. *A-thi-wun* was a person who administered the *A-this*,<sup>12</sup> the civilian tax payer living permanently, *Kap-pa*,<sup>13</sup> persons taken up residence in a locality which is not their place, and the *A-lar*,<sup>14</sup> persons born of *A-thi* and *Kap-pa*. *A-thi* did not obey the orders of *Hlut-taw*, they only obeyed *A-thi-wun*'s orders and instructions. *A-thi-wun*, like *Myin-su-gyi-wun*, was appointed by the royal decree of the king. The *A-thi*, the *A-lars* and the *Kap-pa* lived in all the villages, towns and cities. Therefore the areas administered by the *A-thi-wun* were quite wide.<sup>15</sup> During the reign of King Badon, Min Hla Thiri was appointed as *A-thi-wun*.<sup>16</sup> *A-thi-wun* had to collect the twelve types<sup>17</sup> of taxes from the tax-payer villages and towns for the king.

<sup>6</sup> J. G. Scott and J.P. Hardiman, *Gazetteer of Upper Burma and the Shan States*, Vol. II, part. i, Rangoon, Government Printing, 1900, p. 134 (Henceforth: Scott and Hardiman, 1900)

<sup>7</sup> U Win Maung, "*Shae-khit Hlut-taw hnint Min-hmu-dan-mya*" (The *Hlut-taw* of Older Days and the Persons in the Service of the King), Vol. IX, part. iv, *The Department of Higher Education*, 1974, p. 115 (Henceforth: Win Maung, 1974)

<sup>8</sup> Tin, 1976, 140

<sup>9</sup> (a) Appointed by royal order means the king's servant called *Nar-Khan-taw* read the king's order to the appointed person at the *Hlut-taw*, and the person respectfully listened to it and accepted the Royal Order  
(b) Tin, U, *Myanmar-min Ok-chok-pon Sar-dan hnint Bodawphaya ei Ya-za-that Khaw A-meint-daw-dan-gyi* (Royal Administration of Myanmar and Royal Orders of King Bodaw Phaya), Vol.III, Yangon, Ministry of Culture, 1970, p. 181 (Henceforth: Tin, 1970)

<sup>10</sup> Tin, 1976, 1-2

<sup>11</sup> "*Myin-su-gyi-wun-khant Pyan-tan*" (The Royal Order for Appointing *Myin-su-gyi-wun*), Yangon, National Library Collection, *Parabaik* MS, No.622 (Henceforth: *Parabaik* MS, No.622, NLC)

<sup>12</sup> (a) The *A-thi*-civilian taxpayers living permanently in a certain locality; commoners; indigenous people  
(b) Tin, 1976, 4

<sup>13</sup> (a) The *A-lar*- persons born of *A-thi* and *Kap-pa*  
(b) Tin, 1976, 4

<sup>14</sup> (a) The *Kap-pa*- persons taken up residence in a locality which is not their native place. They were new comers to the locality and therefore strangers  
(b) Tin, 1976, 4-5

<sup>15</sup> Tin, 1976, 5

<sup>16</sup> "*A-thi-wun Khant-pyan-tan*" (The Royal Order for Appointing *A-thi-wun*), Yangon, NLC, *Parabaik* MS, No. 622

<sup>17</sup> (a) Gum of neem tree, plant fibred, the bark of laurus, beal fruit, molasses, swallow-wort charcoal, bud of toddy palm leaf (to be used for writing on), ripe tamarind fruit, oil, the gum of the In-pin or In-gyin pin. Silk cotton from the red silk cotton tree, Gum or glue made of dissolved buffalo hide

Among the person in the service of the king during the early Konbaung, *Wun-htauks*, who assisted the ministers, were in an important role, too. Their duty was to assist the ministers or *Wun-gyi*. They were officers appointed by royal decree of the King. *Wun-htauks* were to be honest and faithful. They must have the ability to help the *Wun-gyi* manage the *Hlut-taw* and other affairs. They had to decide which cases were to be put up.<sup>18</sup>

*Wun-htauks* had to put up reports, messages and applications to send from town and villages near and far before ministers. They had authority to judge the cases according to the procedures of the *Hlut-taw*. And they had the right to put up their views and opinions before the minister or the king.<sup>19</sup>

Besides the post of *Wun-htauks*, there were posts called *A-twin-wun* (Interior minister). He is a minister of second order in the Myanmar Kingdom whose duty was to transact business generally relating to the interior of the palace. Therefore they were also called *A-twin-thinn-hmu*.<sup>20</sup> Their duties were quite many.

They had to check the persons who were to serve by day and by night interior palace. They checked the palace guards whether they were dutiful or not and they punished the absentees. They also had to register the royal occasions and royal ceremonies. Thus they kept daily records, monthly records and yearly records<sup>21</sup>.

Among the capital royal servicemen of the king there was an officer called *Nar-khan-taw*, the royal listener; He was the person who connected *Hlut-taw* and *Bye-daik*, an outer building attached to the palace occupied by *A-twin-wun*. *Nar-khan-taw*, then he sent those cases to *Bye-daik*. The *Nar-khan-taw* was a person who listened to the decisions of *Wun-gyi* and then he recited them to the king. The traits of the *Nar-khan-taw*, the Royal listener, were

- to have efficient reading skill
- to possess clear voice
- to recite bravery at royal ceremonies
- to possess six qualifications of a royal writer<sup>22</sup>
- to have<sup>23</sup> six qualities required of a superior.<sup>24</sup>

<sup>17</sup> (b) Tin, 1976, 5-6

<sup>18</sup> Maung Maung Tin, 2005, 117

<sup>19</sup> Daw Mya Sein, *The Administration of Burma*, Yangon, Zabu Meitswe Press, 1938, p.21 (Henceforth: Mya Sein, 1938)

<sup>20</sup> Maung Maung Tin, 2005, 130

<sup>21</sup> Tin, 1976, 26

<sup>22</sup> (a) - to possess good memory.  
 - to be able to write quickly  
 - to be able to write neat and tidy  
 - to possess wit and wisdom  
 - to possess skills as an orator  
 - to be good at writing skill

(b) Tin, 2007, 188-189

<sup>23</sup> (a) 1. Patience 2. alertness 3. Industry 4. sound judgment 5. mercy 6. vision

(b) Tin, 2007, 109

<sup>24</sup> Tin, 1976, 7

*Nar-khan Sa-myaung-hmu* was a person who carried out both duties of the royal listener and the *Hlut-taw* officer.<sup>25</sup> *Nar-khan-taw Pyaw-gyi-hmu* also carried out both mentioned duties.<sup>26</sup>

*Wun-su-ya* (members of administrators of the *Hlut-taw*), were two types: the first type of *Wun-su-yas* was appointed by royal order of the king, and the second types were appointed by the order of *Hlut-taw*.<sup>27</sup> *Wun-su-yas* appointed by the Royal Order were higher in rank. They were *Sin-wun*, *Myin-wun*, *Phaung-wun*, *Wun* of royal treasury, *Kyi-wun* and *Khin-ma-min-wun*. The members of administrators, *Wun-su-ya*, appointed by *Hlut-taw* were *Nan-kan Kyawy Wun*, *Lamaing Wun*, *Thanchet Wun*, *A-khun Wun*, *A-kauk Wun*, *Yawn-Su Wun*, *Kaung-han Wun*, *Auk-mar Wun*, *A-mway Wun*, *Ta-saik Wun* and *A-yaut Wun*.

Besides *Wun-su-yas* (members of administrators of the king), there was one post of *Wun* called *A-nauk Wun*. He was responsible for the chief queen and queens called *A-nauk-yone* (western court or women's court). He had to inspect that no male without duty was to enter *A-nauk A-twin-taw* (chambers of the queens). Every male above seven was deterred from entering chambers of the queen. It was his duty to give medical treatment to the king and the queens with the help of *Thama-daws* (Physician), if they were ill. If the chambers of the queens needed to be repaired, he had to report the royal treasury for the money needed. Moreover, *A-nauk Wun* decided all the cases connected with *A-nauk-yone*.<sup>28</sup> During the reign of King Badon Taing-ta *Myo-za Thiri Dewa Kyaw Thu* and *Raza Htain-hmat* served as *A-nauk Wuns* (the chief Steward of the Queen).<sup>29</sup>

### Conclusion

To sum up, the interior service men of early Konbaung kings, *Wun-gyi* was the highest in rank. *Wun-gyis* had to back up and support the king's administration. Therefore the king chose only the persons who were reliable and faithful to him and efficient in administration as *Wun-gyis*. And among them there were *Wun-gyis* who were free or exempted from death sentence and were conferred on the title of "Thettaw Shae". Those who were not qualified enough for the post of *Wun-gyi*, were appointed as *Myin-su-gyi Wun*, officer in charge of the mounted militia. *Myin-su-gyi Wun* was not responsible for the civil administration. As it was a high ranking post, only the persons who were close relatives of the king and who were most reliable were appointed as *Myin-su-gyi Wuns*. *A-thi-wun*, the officer who was responsible for civilian tax-payers who permanently lived in a certain locality, had to administer all the affairs concerning with *A-this*, *A-lars* and *Kap-pas* (persons taken up residence in a locality which was most his native place). Among the capital royal servicemen, the *Wun-htauks* were to assist *Wun-gyis* and to report all the completed actions done according to the King's order to *Wun-gyis*. The *A-twin-wuns* were responsible not only the internal affairs of the palace but also to inform the matters concerning the Kingdom to the king. *Nar Khan-taw*

<sup>25</sup> Dr. Yi Yi, *Thu-tay-tha-na A-bi-dan-mya Hmat-su* (Notes and Dictionaries of Research), Vol.I, Yangon, Burma Research Society, 1974, p.323 (Henceforth: Yi Yi, 1974)

<sup>26</sup> Yi Yi, 1974, 328

<sup>27</sup> (a) The ministers appointed by order of senior minister and the ministers appointed by order of junior minister.

(b) Tin, 1970, 197-198

<sup>28</sup> Maung Maung Tin, 2005, 135-136

<sup>29</sup> "A-nauk-wun Khant-pyan-tan" (The Royal Order for Appointing *A-nauk-wun*), Yangon, NLC, *Prabaik MS*, No.622

was the person who connected the *Hlut-taw* and *Bye-taik*, Privy Council organized around the four junior councillors. *A-nauk-wun*, the Chief Steward of the Queen, was responsible for all the affairs of queens, princes and ladies in waiting and the ladies'safety.

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## A Study of the Social Responsibilities in Buddhist Literature

Khin Nu Swe<sup>\*</sup>

### Abstract

The aim and objective of this paper is to point out the important role of the social responsibilities in Myanmar. In many Buddhist Literature, we can trace five kind of responsibilities of offspring in *Singāla Sutta*. In the *Singāla Sutta*, the Buddha taught social responsibilities of son and daughter to take on the parents and vice versa. There are five responsibilities for the offsprings to serve then son and daughter, and their parents. A person who takes these five responsibilities is considered as a good offspring and preserve Myanmar cultural tradition in the modern period.

**Key words:** Buddhist literature, social responsibilities, preserve,

### Introduction

There are many Buddhist literature, we may study social duties in *Singāla Sutta*. In the *Singāla Sutta*, Buddha taught the social duties to be fulfilled by offspring to the parents, by the pupils to the teachers, by a husband to his wife, by a householder to his friend and kinsmen, by an employer to his employee, and by a householder to Sangha (monk) for the affection benefit or service which the former receives from the latter. Filial responsibility is the responsibility for offspring to support their parents with reverence and love. There are two means to fulfil filial responsibility physical service and mental service. Of all responsibilities the most prominent is the responsibilities of offspring towards one's parents because of the most important relation between parents and offspring.

Filial responsibilities which are based on gratitude is the most fundamental virtue. As virtue means good traits of characters, habits of human character which men admire and value it is the habits of human character that runs to the welfare of the individual or the group. Being filial can runs to the welfare of individual and the society. The very source of one's grateful mind is from family. So, a filial person can fulfil his or her social responsibilities by virtuous character. Therefore, the aim and objective of this paper is to study the duties in Myanmar society.

### Social Responsibilities in *Singāla Sutta*

Society is like a building. A building has six directions such as the roof, floor, eastern wall, western wall, southern wall and northern wall. The Buddha discoursed in the *Singāla Sutta* that people who live in the house will be happy if the six directions are covered securely. On the contrary, the people who live in the house would not be happy if the roofs crumble, the floors decay, and the doors break. Similarly, the world will be peaceful if the duties of the six great persons looked upon as six directions are performed. The six directions are as follow.

1. The mother and the father are the East.
2. The teachers are the South.

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3. Spouse and children are the West.
4. Friends and associations are the North.
5. Servants and employees are the Nadir.
6. The good men and samanas and brahmanas are the Zenith.

The responsibilities which should be served in return between the teacher and the pupil, the husband and wife, parents and children, the householder and his friends and associations each other, the employer and the employee, lay people and samanas and brahmanas are based on loving-kindness and support in turn. If loving-kindness is based on, various benefits will be achieved for not only the family but also the society.

### **Five filial responsibilities of offspring**

There are five responsibilities which the children should take upon their parents. They are: (1) supporting the parents in turn (2) managing affairs on the parents' behalf (3) behaving as worth offspring for inheritance (4) offspring as alms on behalf of the departed parents and (5) maintaining the honor of traditions of the family.

#### **Supporting the Parents in Turn**

Parents feed, clothe and educate their offspring till they grown up. So, Myanmar people believe that one should support the parents in turn. Then one should fulfil the material needs for the parents and nurture the old-age parents. Moreover, one should try to sympathize with old-age parents, by remembering their gratitude. In other words, Myanmar people honor and appreciate the person who has a grateful mind, and accept that one should serve, support and nurture the parents in turn with respect and love.

#### **Managing Affairs on the Parent's Behalf**

Managing all the affairs of the parents is a filial responsibility to be fulfilled for the filial son and daughter. In Myanmar society, one should not fail and neglect to manage ones parents' affairs. Particularly, one should upgrade the status of the economy of one's parents. One should manage affairs for the parents successfully. Furthermore after the death of one's parents, one should continue to do their unfinished affairs. Finally managing all the affairs of the parents means serving all the affairs of them and creating the situations for them to get benefits.

#### **Behaving as Worthy Offspring for Inheritance**

Behaving oneself as worthy of the inheritance is one of the responsibilities of the filial offspring. One who does not obey the teaching of the parents is not worthy of inheritance. To be as a worthy of inheritance son one should obey what the parents taught. Parents teach their offspring with good will and good experience, and their offspring will get the benefits. However one should not obey blindly because parents may have knowledge more or less and they cannot be free from greed, anger, ignorance. So, their decisions may be wrong. So, one should obey and accept what the parents taught only after careful thinking. One should examine the words of the others, even if they are parents or teacher, whether their words are wise or not.

This does not mean to pay disrespect to the parents. It is the guideline not to accept anything without reasoning. It means that if the parents have wrong way one should point out what is right and what is wrong. These are the responsibilities of the filial son.

### **Offspring Alms on Behalf of the Departed Parents**

Buddhists believe the law of kamma and the round of rebirth. There are thirty-one planes of existence in Buddhism on to logical thought. According to the idea of samsarā, one can be reborn in such and such place after one's death, by his kamma-deeds, words and thought. Then, one dies again and again and one will be reborn in another life. Such is called samsarā.

One can be peta or a hungry ghost in accordance with his past activities after his death. If one will be peta, there is only one way to save him free from such unhappy or woeful state. That is offering alms on behalf of him or her in this world of beings. However, in which places a person will be reborn is unknown. So, Myanmar Buddhists believe that one should offer alms on behalf of the departed parents, with the hope for them to be free from such woeful state. So, it is the duty to be done by a filial son or daughter.

### **Maintaining the Honor of Traditions of the Family**

Maintaining the honor of traditions of the family is one of the responsibilities of a filial offspring. Most Myanmar people follow moral rules. So, Myanmar people believe that one should maintain the honor of family traditions without immoral deeds. Furthermore, in Myanmar there is no caste system like in Hinduism. In Hinduism there are four caste systems. (1) Brahmin-priest class (2) Kshatriyas-warrior class (3) Vaishyas-merchant and peasant class (4) Shudras-labor class. The highest and noble class is Brahmin and the lowest class is Shudras. The highest and noble class is Brahmin and the lowest class is Shudras. In that society there is no freedom, if one is born in the lower family, one will be regarded as un-noble person till one's death. On the other hand, in Myanmar, the nobilities of a man and a family is determined by one's own conduct, personalities and morality. It can be said that maintaining the honor of the traditions depends upon one's conduct and morality.

### **Responsibilities of offspring in Theravada Buddhist Literature**

Filial responsibilities are based on the gratitude of parents to their children for what the parents feel or do for them. The quality of parents is defined as follows;

By comparing with the quality of the parents else, the earth which has two hundred and forty thousand volume is nothing.. Its size is as small as a bamboo leave. By comparing with the quality of the parents, the most expansive universe is as wide as the eye of a needle. By comparing with the quality of the parents, Mount Meru which is eighty four thousand yojanas high is as high a honrofanox. By comparing with the quality of the parents, the water in the great sea which is eighty-four thousand yojanas deep is a small as a raindrop. It is said that the benevolence of the parents is infinite because it cannot be compared with may amount, size and height.

The offspring ought to feed and take care of their parents in turn and manage affairs on the parents behalf, make worthy of the inheritance, only these who feed and take care of the parents who manage the parent's affairs, and who listen to the parents is worthy of the inheritance. Those who do not listen to the parents and who forsake the parents is not worthy of inheritance. They also should share their good deeds to the departed parents and maintain the honour and traditions of the family. That is, the farm, the gold and the silver which were inheritance should be maintained not to be extinct. And after that the merits having performed by the parents should be kept doing. That is

why they will be the children who maintain the tribe. That is to say, they should maintain not only material things but also the clan, religion and culture.

The offspring should lead the parents who do not have faith, morality, generous and wisdom, not to believe in wrong view, to refrain from taking life, not to take what is not given, not to indulge in sexual misconduct and to avoid taking intoxicating drinks. And after that the offspring should tell the parents not to give up giving charity, to offer alms food regularly, to pay respect to the three gems, to live with soft mind, to observe the morality. According to the Buddhist, if one does like this, the debts he owed his parents will be devoid. These are the filial responsibilities in the repayment of the debt of gratitude, benevolence, affection and services which one received from one's parents.

Parents are the greatest benefactors, so one ought to know and repay one's debt of gratitude for the benefits received from them. The gratitude of parents is immense. One cannot repay the debt of gratitude to one's parents by only serving and paying the physical needs for the parents.

Buddha himself repaid the debt of gratitude to his parents, after he has attained enlightenment. Because of his father's invitation he came to his father and he went round the city for food, his father do not want to see him to go round for food and felt uncomfortable. By considering the gratitude of his father the Buddha preached verses to his father explaining the action of the former Buddha.

The father of the Buddha attained Sotapatti Fruition after the end of the discourse. Similarly the Buddha went to Tāvātinsā in order to pay the debt of gratitude to his mother. There he expounded the Abhidhamma for three months. The *eravāda* Buddhists believe that those who do not make obeisance to the parents and who do not serve the parents could hardly possess wealth and glory. Although they possess them, long-live, they could hardly possess the property. One who realizes the gratitude of parents will never meet with troubles. However, those who do not realize it and are ungrateful to the parents will fall into trouble.

In the *Bimbisāra Jataka*, *Ajātasatthu* was born as the son of king *Bimbisāra*. He was very much loved by his father king. However, when he grows up, he killed his father in order to take the throne. *Ajātasatthu* was reborn in the hell because of his being ungrateful to parents and the act of killing his father. So, filial son should not do ungrateful deeds to parents.

### Conclusion

In the social teachings of Buddha especially *Singāla Sutta*, the Buddha distributes relation between parent and child, teacher and pupil, husband and wife, householders and friends and relatives, employer and employee, and laymen and Monks. There are mutual responsibilities between those who are particularly related to each other and advices that one should with thankful mind repay benefit which one receives from others who stand in various relations with one under different circumstances.

Although there are many different forms of responsibilities they are grounded upon the Buddha literature. Although the conduct of showing reverence in ancient time is changed, the essence of filial piety-sense of gratitude and repaying gratitude to parents is still alive in eastern societies.

Human society is a form of eco-system. Eco-system is formed by organic and inorganic matters which include all the living beings, non-living beings animals, plants



and all the natural resources etc. All of these are interdependent to each others. If any part of them is damaged, the whole system will also be damaged.

In human society human beings are also interdependent to each other. One's social responsibilities are to benefit the others' and vice versa. There is no one who does not owe the gratitude to other and who does not get the gratitude from the others. All are related with one another directly or indirectly. So, if each and every one fulfils respective responsibilities with grateful mind then the society will progress. As filial offspring never fail to fulfil their respective responsibilities, it can be said that filial responsibilities are the fundamental responsibilities in Buddhist culture and they play an important role in Myanmar Buddhist society.

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- ဉာဏိဿရ၊ အရှင်၊ (၁၉၈၂)၊ “*သင်္ဂါယနသုတ္တန်တရားတော်*”၊ ရန်ကုန်မြို့၊ ရဲအောင်စာပေ။
- ညောင်ကန်ဆရာတော်ဘုရားကြီး၊ (၁၉၂၇) “*ပဉ္စကနိပါတ်စာတ်ဝတ္ထု*”၊ ရန်ကုန်မြို့၊ သုဓမ္မဝတီစာပေ။
- နန်းညွန့်ဆွေ (၁၉၆၀)၊ “*ဟံသာဝတီဆုံးမစာပေါင်းချုပ်*”၊ ရန်ကုန်မြို့၊ ဟံသာဝတီပုံနှိပ်တိုက်။

## DETERMINATION OF SUGAR CONTENT IN MYANMAR WINES

Khin Ei Ei Thein \*

### Abstract

In the present work, the different grape wines were produced from commercial brown grapes by fermentation process with and without dry yeast (*Saccharomyces cerevisiae*). All fermentation processes were carried out at ambient temperature ( $30\pm 2^{\circ}\text{C}$ ), and the duration of the fermentation process was extended from a few days to two weeks. The fermentation process was carried out in anaerobic condition (no oxygen is present). The resultant wines were also pasteurized at  $50-60^{\circ}\text{C}$ . Some physicochemical properties such as color, pH, sugar content, alcohol content, volatile acid of the grape wines was determined. Especially sugar content of grape juice before and after fermentation were also determined. In addition to physicochemical properties, it was also determined whether the toxic substances are present or not in there for drinking purpose. But there were no toxic substances in all of grape wines. The comparative studies of properties and quality of the grape wines and three brands commercial grape wines (Summer and Victoria from Pyin Oo Lwin) and (Red Mountain Estate from Taunggyi) were done. The present work reveals that three brands and the grape wines have met all the requirements specified for wine.

**Key words:** grapes, fermentation, yeast, anaerobic

### Introduction

Myanmar country lies in the tropical zone. So producers faced many challenges and obstacles. Finally, wine was able to be produced. In Myanmar, wines are produced from damson, grape, pineapple, sticky rice, honey, passion fruit and strawberry etc. Taunggyi and Pyin Oo Lwin are on the map of wine-producing places. Grape and damson wines are the most popular wine in Myanmar. Grape wine is the quality wine in Taunggyi in Myanmar. Damson wine is the quality wine in Pyin Oo Lwin. Now, Myanmar is definitely on a member of the family of wine-producing countries in the world.

Wine is an alcoholic beverage obtained from the fermentation of juice from freshly gathered grapes. Fermentation is the process by which sugar is converted to alcohol by yeasts. As grapes mature, the wine yeast, *Saccharomyces ellipsoideus* naturally accumulates on the skins. When the crushed grapes or filtered juice is placed at a temperature of about  $27^{\circ}\text{C}$ , the juice proceeds to ferment, yielding essentially equal molar quantities of ethyl alcohol and  $\text{CO}_2$  and traces of flavor compounds.

In commercial operation, special strains of *S. ellipsoideus* are used to supplement the natural inoculum and better control fermentation. Wine yeast is relatively resistant to  $\text{SO}_2$  and so this agent commonly is added to the grapes or must to help control undesirable microorganisms, particularly bacteria. Fermentation under conditions of limited exposure to air may continue until the sugar is entirely consumed, when it stops naturally, or fermentation may be interrupted prior to this point. At around  $27^{\circ}\text{C}$ , fermentation may last for some 4-10 days depending on wine type. The varieties and names given to wines are region and reflect their region of origin, varieties of grape used in their manufacture, and certain properties such as degree sweetness, color,

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alcohol content, and effervescence. Wines can be grouped into five classes; appetizer wines, red wines, white wines, sweet dessert wines, and sparkling wines (Srilakshmi, 2007).

### **Materials and Methods**

All chemicals and reagents used in this research were analytical grade and purchased from Dagon Township, Yangon Region.

#### **Source of Sample**

All the grapes were purchased from Hledan Market, Kamayut Township, Yangon Region, Myanmar.

#### **Sample Preparation**

Healthy, ripe, undamaged grapes were selected. And then, the grapes were removed from stems (stems made the wine taste bitter). The rotten or unripe grapes were discarded. The selected grapes were washed well in cleaned water to remove dust. The selected and cleaned grapes were placed in plastic basket.

#### **Sterilisation of the Apparatus**

Three tablespoons of sodium metabisulphite were added to 4.5 liters of water and mixed well, a solution of sodium metabisulphite was used to clean the fermentation vessels and the bottles for storage. The bottles were rinsed well with boiled water to remove any residual sulphite.

#### **Analysis of Grape Must**

Firstly, sterilization process and raw material preparation were carried out. After being prepared, the crushed grapes plus skins were transferred into a large fermentation vessel, such as plastic basket with a lid and placed in a room temperature (25- 30 °C). The sugar content and pH of grape must were determined. The results are shown in Table 3.1.

#### **Production of Natural Grape Wine**

Firstly, sterilization process and raw material preparation were carried out. After being prepared, the crushed grapes plus skins were transferred into a large fermentation vessel, such as plastic basket with a lid and placed in a room temperature (25- 30 °C) to proceed initial fermentation for one week. The must (juice) were tested with a hydrometer and titration kit. Controlling the acidity of the must is critical to produce a good quality wine. The filtrate from the partially fermented wine was removed by using cotton cloth. Secondary fermentation was allowed to proceed to develop the aroma and flavour of wine for about one week. After that, grape wine was filtered from sediment. The produced grape wine was pasteurized at 50 – 60 °C to kill the pathogens. Finally, grape wines were bottled and stored in clean bottles.

#### **Determination of the Yield Percent of Produced Natural Grape Wine**

The yield percent of natural grape wine was determined and calculated. The results are shown in Table 3.2.

#### **Determination of Physicochemical Properties of Produced Grape Wines and Some Commercial Grape Wines**

The physicochemical properties such as pH, color, sugar content, alcohol content, volatile acid was determined by various conventional and modern instrumental techniques. The results are shown in Table 3.3, 3.4, 3.5, 3.6.

### Qualitative Analysis of Produced Grape Wines and Some Commercial Grape Wines

The qualities analyses such as methanol test, cyanide test, and fusel oil test of samples were investigated. The results are shown in Table 3.7.

### Results and Discussion

#### Sugar Content and pH of Grape Juice

In this research, two kinds of grapes: small grape (I) and big grape (II) were used. It was found that grape juice (I) contained 11.95 % of sugar and grape juice (II) contained 14.20 % of sugar. The pH was observed to be 3.00 and 3.07 respectively.

**Table 3.1 Sugar Content and pH of Grape Juice**

Name	Sugar Content (%)	pH
Grape Juice I	11.95	3.00
Grape Juice II	14.20	3.07

Grape Juice I → Small grapes were used

Grape Juice II → Big grapes were used

#### Yield Percent of Different Grape Wines

There are different kinds of grape. In this work, commercial grapes were purchased from Hledan Market. The quality of raw materials is fundamentally important in the production and marketing of a successful product. Yield (%) of grape wines are also depending on the quality of grapes. The yield (%) of grape wines are shown in Table 3.2. From these results, natural grape wine II (big grape) fermented without yeast was obtained as the best yield (%) in wine production.

**Table 3.2 Yield (%) of Produced Grape Wines**

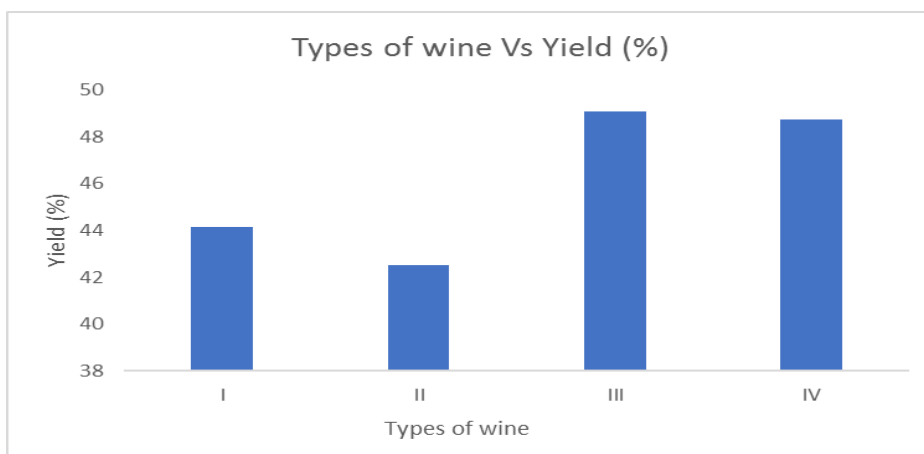
Types of wines	Wt. of grape (g)	Wt. of yeast (g)	Wt. of pulp and seed (g)	Wt. of stem (g)	Wt. of produced grape wine (g)	Yield (% w/w)
I	1000	-	345	213	441.56	44.15
II	1000	-	290	219	490.50	49.05
III	1000	20	340	254	425.60	42.3
IV	1000	20	295	237	487.31	48.73

I → Small grapes fermented without yeast

II → Big grapes fermented without yeast

III → Small grapes fermented with yeast

IV → Big grapes fermented with yeast



I → Small grapes fermented without yeast

II → Big grapes fermented without yeast

III → Small grapes fermented with yeast

IV → Big grapes fermented with yeast

**Figure 3.1 Types of wines with different yield (%)**

### **Physicochemical Properties of Produced Grape Wines and Some Commercial Grape Wines**

#### **pH of Grape Wines**

In this present work, commercial brown grapes were used. The pH of produced grape wines and some locally produced grape wine in Myanmar were determined by using pH meter. The values of pH of various wines were found to be in the range of 3.0 – 4.0 comparatively shown in Table 3.3.

#### **Colour of Grape Wines**

There are many varieties of grape used for making wine. The color ranges from a light red to a deep dark red depending on the grape variety and the length of fermentation and maturation. The skins of the grape are included in the production of red wine. Red wines result when the crushed grape skins, pulp, and seeds of purple or red varieties are allowed to remain with the juice during the fermentation period. The ethanol produced during this initial fermentation helps with the extraction of pigment from the skins. The longer the fermentation, the darker the wine.

In this present work, produced grape wines are also made from brown varieties of crushed grapes with skins, pulps, and seeds. The length of fermentation period was about two weeks. Final wine color is determined by Tintometer. The colors of produced grape wines and some commercial grape wines were observed to be red.

**Table 3.3 pH of Produced Grape Wines and Some Commercial Grape Wines**

No.	Types of Wine	pH
1	Natural grape wine I	3.1
2	Natural grape wine II	3.4
3	Grape wine I	3.5
4	Grape wine II	4.0
5	Summer	3.5
6	Victoria	4.0
7	Red Mountain Estate	4.0

Natural grape wine I	→	Small grapes were fermented without yeast
Natural grape wine II	→	Big grapes were fermented without yeast
Grape wine I	→	Small grapes were fermented with yeast
Grape wine II	→	Big grapes were fermented with yeast
Summer	→	Commercial Myanmar wine
Victoria	→	Commercial Myanmar wine
Red Mountain Estate	→	Commercial Myanmar wine

**Table 3.4 Colors of Produced Grape Wines and Some Commercial Grape Wines**

No.	Types of Wine	Observed Color
1	Natural grape wine I	Red (Red 30)
2	Natural grape wine II	Red (Red 32)
3	Grape wine I	Light red (Red 20)
4	Grape wine II	Light red (Red 22)
5	Summer	Deep dark red (Yellow 9.9, Red 9.3)
6	Victoria	Deep dark red (Yellow 9.9, Red 5)
7	Red Mountain Estate	Deep dark red (yellow 20, Red 30, Blue 7)

Natural grape wine I	→	Small grapes were fermented without yeast
Natural grape wine II	→	Big grapes were fermented without yeast
Grape wine I	→	Small grapes were fermented with yeast
Grape wine II	→	Big grapes were fermented with yeast
Summer	→	Commercial Myanmar wine
Victoria	→	Commercial Myanmar wine
Red Mountain Estate	→	Commercial Myanmar wine

**Sugar Content and Alcohol Content of Grape Wines**

The major sugars of fruits which are normally used for making wine are glucose, fructose, and sucrose. The two reducing sugars predominate in grapes and occur in approximately equal amounts, and sugar content is one of the most important measures of grape majority. Sugars also will influence sweetness in wines. The degree of sweetness (sweet to wine) is an essential sensory property of wines. The wine industry demonstrates the value of sweetness by controlling the sugar content in their wines.

In this work, grape wines were produced with and without dry yeast (*Saccharomyces Cerevisiae*). The fermentation period was two weeks. Sugar content and alcohol content were determined after fermentation. From the results, the sugar content of grape wines I and II (with yeast) is higher than natural grape wines I and II. The sugar content (%) of produced grape wines are between 9 and 12. Therefore produced grape wines may be classified as table wine and sparkling wine.

**Table 3.5 Sugar Contents and Alcohol Contents of Produced Grape Wines and Some Commercial Grape Wines**

No	Types of Wine	Sugar Content (%)	Alcohol Content (%)
1	Natural grape wine I	3	9.2
2	Natural grape wine II	5	10
3	Grape wine I	3.5	11
4	Grape wine II	6	11.9
5	Summer	9.4	13
6	Victoria	5.3	13
7	Red Mountain Estate	5.8	13

Natural grape wine I → Small grapes were fermented without yeast

Natural grape wine II → Big grapes were fermented without yeast

Grape wine I → Small grapes were fermented with yeast

Grape wine II → Big grapes were fermented with yeast

Summer → Commercial Myanmar wine

Victoria → Commercial Myanmar wine

Red Mountain Estate → Commercial Myanmar wine

### **Volatile Acid of Grape Wines**

Fermentation of grape juice or other fruit juices, they contain various types organic substances:

- (i) Volatile organic substance (acetic acid, propionic acid and butyric acid etc.)
- (ii) Non- volatile organic substances (Tartaric acid, malic acid, and citric acid etc.)
- (iii) Inorganic compound (potassium sulphate, manganese salts and phosphate etc.)

Although their amounts are low in wines, organic acid are important constituents which affect the properties of wines, particularly tartness. Wines tartness are also related to pH. The major organic acids of grapes are tartaric and malic acid. Red wine with high acidity (low pH) had more brightness than low-acid wines. In addition, the color of pink wines is generally improved by selecting low pH grapes.

In the United States the legal limit for volatile acid content is 0.14 gramper 100 mL, expressed as acetic acid, for red wine and 0.12 gram for white wine. A high content of volatile acid in wines is an indication of a faulty fermentation.

In this work, the content of volatile acid, of produced different grape wines and some locally produced grape wines were also determined. According to the results, the contents of volatile acid in all produced grape wines and some locally produced grape wines were less than the legal limit. So, there is no faulty fermentation in this work within two weeks.

**Table 3.6 Volatile Acid Content of Produced Grape Wines and Some Commercial Grape Wines**

No.	Types of Wines	Volatile Acid Content (g/mL)
1	Natural grape wine I	0.0085
2	Natural grape wine II	0.0092
3	Grape wine I	0.0077
4	Grape wine II	0.0088
5	Summer	0.0112
6	Victoria	0.0107
7	Red Mountain Estate	0.0115

Natural grape wine I → Small grapes were fermented without yeast  
 Natural grape wine II → Big grapes were fermented without yeast  
 Grape wine I → Small grapes were fermented with yeast  
 Grape wine II → Big grapes were fermented with yeast  
 Summer → Commercial Myanmar wine  
 Victoria → Commercial Myanmar wine  
 Red Mountain Estate → Commercial Myanmar wine

### **Qualitative Analysis of Produced Grape Wines and Some Commercial Grape Wines**

The qualities analyses such as methanol test, cyanide test and fusel oil test of produced grape wines and some commercial grape wines namely Victoria, Summer, Red Mountain Estate, were investigated. Analyses were carried out by appropriate assay methods. Methanol, cyanide and fusel oil are toxic substances. The harmful substances were not detected in the different grape wines. The results are shown in Table 3.7.

**Table 3.7 Qualitative Analysis of Produced Grape Wines and Some Commercial Grape Wines**

No.	Types of wine	Methanol test	Cyanide test	Fusel test
1	Natural grape wine I	—	—	—
2	Natural grape wine II	—	—	—
3	Grape wine I	—	—	—
4	Grape wine II	—	—	—
5	Summer	—	—	—
6	Victoria	—	—	—
7	Red Mountain Estate	—	—	—



Natural grape wine I	→	Small grapes were fermented without yeast
Natural grape wine II	→	Big grapes were fermented without yeast
Grape wine I	→	Small grapes were fermented with yeast
Grape wine II	→	Big grapes were fermented with yeast
Summer	→	Commercial Myanmar wine
Victoria	→	Commercial Myanmar wine
Red Mountain Estate	→	Commercial Myanmar wine
(-)	→	Absent

### Conclusion

This investigation has shown that it is feasible to prepare natural grape wine by using commercial brown grape fruits as the raw materials. The different grape wines namely, natural grape wine I, natural grape wine II, grape wine I, grape wine II were produced. Wine fermentation was completed by using yeast (*Saccharomyce Cerevisiae*).

The condition for preparing different grape wines were found to be grape sugar (naturally occur in grape fruit), 20 g of dry yeast, 1000 g of brown grape fruits as raw materials, fermenting time of two weeks and fermenting temperature of  $30 \pm 2$  °C.

It was found that maximum yield (about 49 %) was obtained from naturally grape wine II.

The physicochemical properties such as color, pH, alcohol content, sugar content, volatile acid content was also determined. The pH of all grape wines was found to be in the range of 3.0 – 4.0.

The color of produced grape wines was found that the color ranges from a light red to a deep dark red. The sweetness and alcohol content of wines are interrelated because fermentation converts the grape sugars to ethanol. The sugar content (%) of produced grape wine were ranged between 3 -6 and the alcohol content (%) were observed in the range of 9 – 12. Besides, it was also determined whether the toxic substance (methanol, cyanide, fusel oil) are present or not there for drinking purpose. But, there was no toxic substances in all of wines.

Protection from direct sunlight, removal from sediment, aging, storing in air-tight bottles and subsequent steps are all benefit to wine making of good flavor and aroma in practice.

Since wine making is still very much an art rather than science, there are many sectors to be studied as further research work.

### Acknowledgements

I would like to express my deepest gratitude to Dr Aung Kyaw Thin. Rector and Dr Aye Aye Han, Pro-rector of Banmaw University, for their interest and encouragement on this research work. I also wish to express my thanks to Dr Nilar (Retired), Professor and Head Department of Chemistry , University of Yangon and Dr Myint Myint Sein , Professor and Head, Dr Khin Su Su, Professor, Department of Chemistry, Banmaw University for their kind help and invaluable guidance for this research work.

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## ANTIOXIDANT SCAVENGING ACTIVITY ASSAYS OF KASSOD TREE PLANT

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### ABSTRACT

In this research work, three parts of Kassod Tree plant were selected for the study. The leaf, bark and root of Kassod Tree were collected from Namphar Quarter, Banmaw Township, Kachin State. The collected samples were tested by phytochemical screening. The crude extracts of samples were investigated by two antioxidant activity scavenging methods (metal chelating activity assay and DPPH radical scavenging activity assay) with China 752 N UV-VIS spectrophotometer. The obtained data were compared with respective standard values. The  $IC_{50}$  values of three samples were determined by linear regressive excel programme.

**Key words:** Kassod Tree, antioxidant scavenging activity, metal chelating method, DPPH assay,  $IC_{50}$

### Introduction

Medicinal plants are of historic use in therapy and form a part of traditional medicine. Plants are source of natural products and studies have shown that many plants have chemical components and biological activities that produce definite physiological actions in the body and could be used to treat ailments. One of the most important of these bioactive constituents of plants is antioxidant (P.Shobba Rani et. al, 2015). Many of these plants have antioxidant activities and investigations revealed that antioxidant potential of plants might be due to their phenolic components.

In the recent years, there is an increasing interest in finding antioxidant phytochemicals, because they can inhibit the propagation of free radical reactions and protect human body from diseases. It is a current trend in different domains to replace synthetic with natural products especially rich in flavonoids (or) antioxidants to prevent effect of oxidative stress (P.Shobba Rani et. al, 2015).

Kassod Tree is a small to medium sized tree, up to 15-20 m tall, with a short bole and low branching high crown. Leaves pinnate, alternate, rachis are 25-30 cm long, with a marked furrow, 8-13 pairs of leaflets of different size. Flower yellow, up to 3.5 cm long, in dense racemes at the end of the shoots, and in their axils. Racemes are 15-30 cm long. Glabrous, brown, slightly curved pods in the dense clusters, up to 25 cm long with ca. 20 seeds in each. It originates in India, Burma, Sri Lanka, Indonesia and Malaysia. Today, it is grown at the regions of pantropical in semi-arid and subhumid tropics (Orwa et al., 2009).

Kassod Tree leaf, bark, and seeds have been used as folk medicine to relieve ailments such as intestinal worms. In addition, many traditional claims are reported as medicinal treatments on various diseases like constipation, malaria and associated diseases such as fevers and jaundice. Almost all its parts possess medicinal value and have been used for thousands of years in herbal medicine in India. Kassod Tree is available in health food stores in the form of capsules and tablets, loose tea and tea bags, and liquid extracts (Article, 13 Amazing Benefits, 2017).

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This wonderful herb can be really beneficial for the skin. Exposure to radiation, environmental pollutants and harsh chemicals adversely affect our skin health, leading to several skin ailments. Kassod Tree can be used for healthy hair and treatment of hair problems.

Being a laxative, it is effective in relieving constipation. It has been approved by the US FAD as a non-prescription drug to treat constipation. Kassod Tree stimulates the muscles of the colon to push fecal matter through more quickly. Kassod Tree leaf acts on the intestinal walls to cause contractions that lead to bowel movements. It can effectively cure even the most severe cases of constipation.

Kassod Tree leaf is used in traditional Chinese medicine to clear away the heat accumulated in the large intestine, helping the body get rid of the stagnant food accumulated in the stomach. Today, it is widely used in cleansing the colon before colonoscopy and other types of colon surgery (Article, 13 Amazing Benefits, 2017). Kassod Tree has been found to be effective in the treatment of anal lacerations and hemorrhoids as it helps reduce swelling and facilitates quick healing. It also helps relieve occasional constipation which often occurs in low fiber weight loss diets.

The essential oils, tannins and other compounds in Kassod Tree possess anti-bacterial properties. These can inhibit the growth and proliferation of microorganisms such as bacteria, fungi and parasites. Chewing Kassod Tree leaf like tobacco can cure mouth infections and gingivitis. It also possesses mild inflammatory properties, which can soothe internal and external swelling. Kassod Tree has been found to be effective in providing relief from heartburn, nausea, gas, bloating and belching associated with dyspepsia (Article, 13 Amazing Benefits, 2017).

So, the possible antioxidant potentials of different parts of Kassod Tree have been explored in the present study using in vitro experiments.



**Figure .1 Plant and three parts of Kassod Tree**

<b>Family name</b>	-	Caesalpiniaceae
<b>Botanical name</b>	-	<i>Cassia siamea</i> Lam.
<b>English name</b>	-	Kassod Tree
<b>Myanmar name</b>	-	Mezali
<b>Part used</b>	-	Leaf, Stem bark and Root
<b>Medicinal uses</b>	-	Several illness, malaria, liver disorders, laxative, colon cleanser, against diabetes, skin and hair problems

### **Material and Methods**

The three parts of Kassod Tree were collected from Namphar Quarter, Banmaw Township, Kachin State. The samples were cut, washed with distilled water, air dried and ground into powders at room temperature. The sample powders were stored in air tight bottle. The samples were extracted by using solvent ethanol.

#### **Phytochemical Screening of the three samples of Kassod Tree**

Phytochemical analysis of three samples of Kassod Tree for alkaloid, glycoside, carbohydrate, phenolic, reducing sugar, tannin, saponin, lipophenol, polyphenol, flavonoid, steroid and terpene were carried out (Tin Oo Kyi, 2017).

#### **Determination of Metal Chelating Activity Assay for Three Sample Extracts**

To know metal chelating activity assay of samples required four materials. They are  $\text{FeCl}_2$  (0.2 mM), ferrozine (5mM), EDTA and 95% ethanol.

##### **Preparation of three sample solutions**

The 0.01g of sample was dissolved in 50 ml of 95% ethanol to get stock solution 200  $\mu\text{g/mL}$ . This stock solution was prepared to various concentrations (180,160,140, 120, 100, 80, 60, 40 and 20 $\mu\text{g/mL}$ ) by serial dilution method.

##### **Preparation of standard solution**

The 0.01 g of EDTA was dissolved in 50 ml of 95% ethanol and then it was made to get various concentrations.

#### **Determination of maximum wavelength of control solution for metal chelating activity assay**

In this experiment, 0.3 ml 95% ethanol, 1.5 ml  $\text{FeCl}_2$  and 0.6 ml ferrozine were used to obtain maximum wavelength of control solution for metal chelating activity by using China 752 N UV-VIS spectrophotometer.

##### **Procedure of metal chelating activity assay**

The ferrous chloride solution 1.5 ml and 0.6 ml ferrozine were added to 0.3ml sample solution. The reaction mixture was made with voltex shaker and then they were incubated at room temperature for 10 minutes. It was measured at 536 nm to obtain absorbance value. EDTA was used as a standard above the same procedure. The rate chelating (or) % inhibition was calculated by the following equation.

$$\text{Rate chelation (or) \% inhibition} = (\text{Control} - \text{Test}/\text{Control}) \times 100$$

Control = Without sample, Test= Sample and reagents

#### **Determination of DPPH Radical Scavenging Activity Assay for Three Sample Extracts**

To determine DPPH radical scavenging activity assay, two chemicals are required. They are DPPH (0.1mM) and 95% ethanol.

##### **Preparation of three sample solutions**

The 0.01g of sample was dissolved in 10 ml of 95% ethanol to get stock solution 1000  $\mu\text{g/mL}$ . This stock solution was prepared to various concentrations (500, 250, 125, 62.5, 31.25, 15.63, 7.8, 3.91 and 1.95 $\mu\text{g/mL}$ ) by two-fold dilution method.

##### **Preparation of standard solution**

The 0.01 g of ascorbic acid was dissolved in 10 ml of 95% ethanol and then it was made to get various concentrations.

### Determination of maximum wavelength of control solution for DPPH radical scavenging activity assay

In this experiment, 1.5 ml of 95% ethanol and 1.5 ml DPPH solution were used to obtain maximum wavelength of control solution for DPPH radical scavenging activity by using China 752 N UV-VIS spectrophotometer.

### Procedure of DPPH radical scavenging activity assay

The equal amounts (each 1.5 ml) of sample solution and DPPH solution were made the reaction mixture by vortex shaker. They are incubated at dark room for 10 minutes and measured at 520 nm to obtain absorbance value. Ascorbic acid was used as a standard above the same procedure. The % radical scavenging activity (RSA) was calculated by the following equation.

$$\% \text{ RSA} = (\text{Control-Sample} / \text{Control}) \times 100$$

Control= Without sample, Test= Sample and reagents

## Results and Discussion

### Determination of Phytochemical Screening of Three Samples of Kassod Tree

Leaf, bark and root of Kassod Tree were tested by phytochemical screening and those results were shown in Table (1).

**Table (1) Results of Phytochemical Test for Three Parts Kassod Tree**

No	Constituents	Reagents	Observation	Leaf	Bark	Root
1	Alkaloid	Wagner's reagent	Brown ppt	+	+	+
2	Glycoside	H <sub>2</sub> O, 10 % lead acetate	White ppt	+	+	+
3	Carbohydrate	Fehling (A) + (B) , ethanol + sample	Red ppt	—	—	—
4	Phenolic Compounds	H <sub>2</sub> O, 10 % FeCl <sub>3</sub>	Brown color solution	+	+	+
5	Reducing Sugar	H <sub>2</sub> O, Benedict's solution	Orange ppt	+	+	—
6	Tannin	H <sub>2</sub> O, 10 % FeCl <sub>3</sub> , dil: H <sub>2</sub> SO <sub>4</sub>	Yellow brown ppt	+	+	+
7	Saponin	H <sub>2</sub> O, vigorously shaken (3 mins)	Froth	+	+	+
8	Lipophenol	H <sub>2</sub> O, 0.5 M KOH + 4 drops of NaOH	Deep color solution	+	+	+
9	Polyphenol	Ethanol, 3 drops of 1 % FeCl <sub>3</sub> and 1 % K <sub>3</sub> [Fe (CN) <sub>6</sub> ]	Greenish blue color solution	+	+	+
10	Flavonoid	Ethanol, conc : HCL, Mg turnings	Red color solution	+	—	—
11	Steroid	Ethanol, 1 ml of acetic anhydride, conc : H <sub>2</sub> SO <sub>4</sub> , CHCl <sub>3</sub>	Deep blue color solution	—	—	—
12	Terpene	Ethanol, CHCl <sub>3</sub> , conc : H <sub>2</sub> SO <sub>4</sub>	Pink color solution	+	—	—

(+) = presence, (-) = absence

According to this table, most of tested phytochemical constituents were present in three parts of Kassod Tree except carbohydrate and steroid.

### Determination of Metal Chelating Activity Assay for Extracts of Three Samples

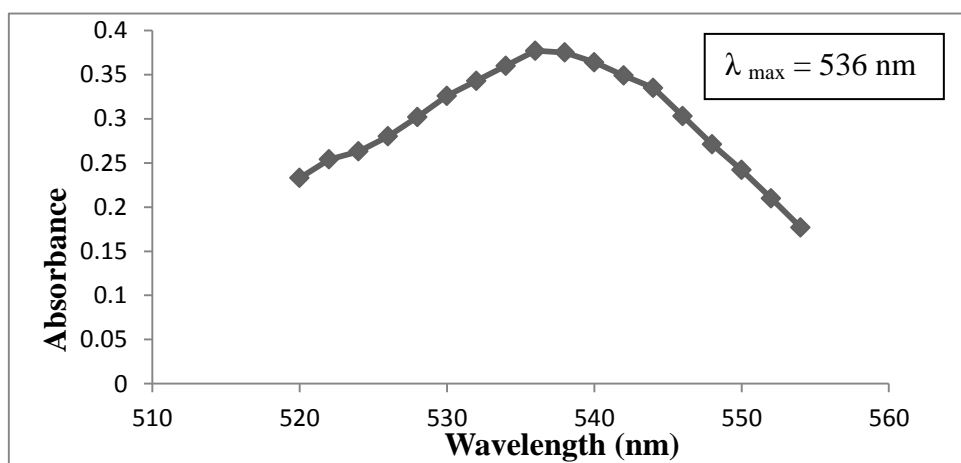
To determine metal chelating activities of three samples require their maximum wavelength that provides optimum results.

#### Determination of maximum wavelength for metal chelating activity assay

A maximum wavelength of metal chelating activity was found to be at 536 nm and the value of absorbance is 0.377. It was shown in Table (2) and figure (2).

**Table (2) Maximum Wavelength for Metal Chelating Activity Assay**

No.	Wavelength(nm)	Absorbance	No.	Wavelength(nm)	Absorbance
1	520	0.233	10	538	0.375
2	522	0.254	11	540	0.364
3	524	0.263	12	542	0.349
4	526	0.280	13	544	0.335
5	528	0.302	14	546	0.303
6	530	0.326	15	548	0.271
7	532	0.343	16	550	0.242
8	534	0.360	17	552	0.210
9	<b>536</b>	<b>0.377</b>	18	554	0.177



**Figure (2) A plot of absorbance and wavelength for control solution**

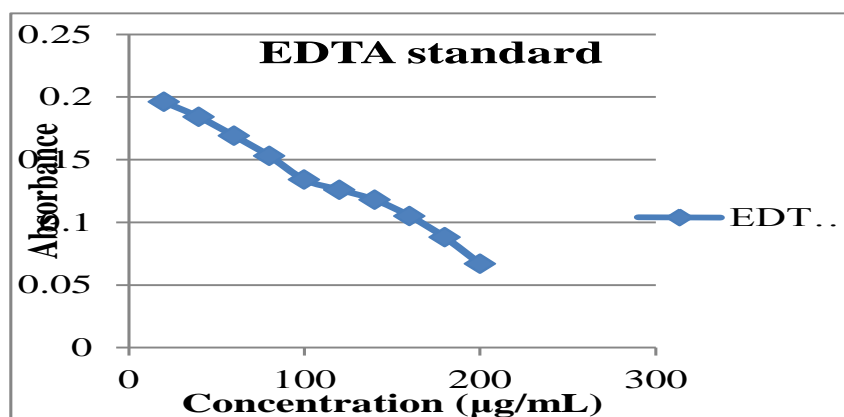
### Determination of EDTA standard for metal chelating activity at 536 nm

To know the antioxidant scavenging activities of three samples need a standard. EDTA was used as a standard to compare scavenging potentials. The percent inhibition and  $IC_{50}$  value of EDTA were shown in Table (3) and figure (4).

**Table (3) Percent Inhibition of Metal Chelating Activity for EDTA Standard**

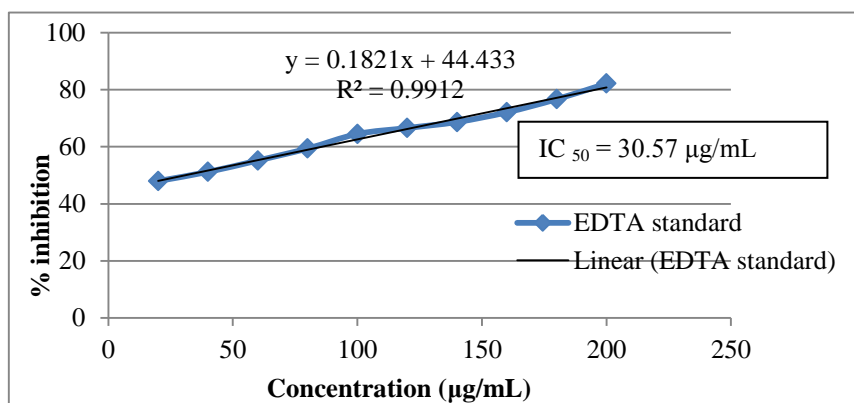
No.	Concentration ( $\mu\text{g/mL}$ )	Absorbance	% inhibition
1	200	0.067	82.2
2	180	0.088	76.7
3	160	0.105	72.1
4	140	0.118	68.7
5	120	0.126	66.6
6	100	0.134	64.5
7	80	0.153	59.4
8	60	0.169	55.2
9	40	0.184	51.2
10	20	0.196	48.0

According to table, the higher concentration 200  $\mu\text{g/mL}$  has the higher percent inhibition 82.2 %. It was observed that the concentration and % inhibition values are inversely proportional to their absorbance values. The  $IC_{50}$  value of EDTA is 30.57  $\mu\text{g/mL}$ .



**Figure (3) A standard curve of EDTA by absorbance and concentration**





**Figure (4) Metal chelating activity of EDTA standard**

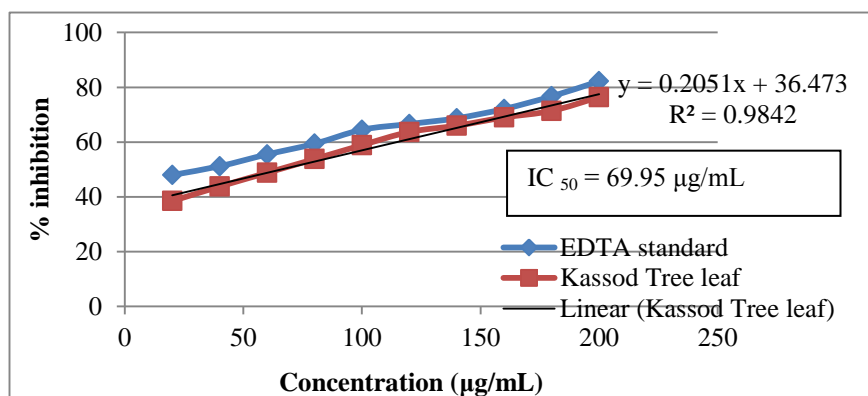
#### **Determination of metal chelating activity for extract of Kassod Tree leaf at 536 nm**

To know the antioxidant scavenging activities of ethanolic extract of Kassod Tree leaf was determined by various concentrations.

**Table (4) Percent Inhibition of Metal Chelating Activity for Extract of Kassod Tree Leaf**

No.	Concentration (µg/mL)	Absorbance	% inhibition
1	200	0.890	76.4
2	180	0.108	71.4
3	160	0.117	69.0
4	140	0.128	66.0
5	120	0.137	63.7
6	100	0.155	58.9
7	80	0.174	53.8
8	60	0.193	48.8
9	40	0.212	43.8
10	20	0.232	38.5

The higher concentration, the higher percent inhibition of Kassod Tree leaf extract was shown in Table (4) and IC<sub>50</sub> value of Kassod Tree leaf (69.95µg/mL) was compared with IC<sub>50</sub> of EDTA standard.



**Figure (5) Comparison of metal chelating activity of Kassod Tree leaf extract with EDTA**

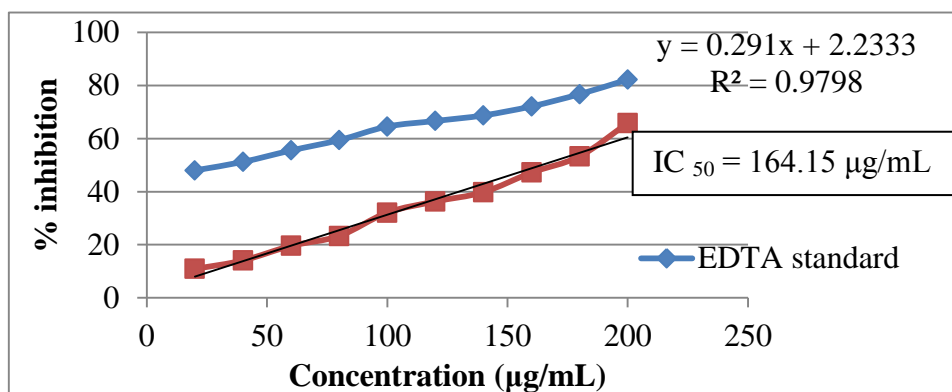
#### **Determination of metal chelating activity for extracts of Kassod Tree bark at 536nm**

To get the antioxidant scavenging activities of ethanolic extract of Kassod Tree bark was determined by various concentrations.

**Table (5) Percent Inhibition of Metal Chelating Activity for Extracts of Kassod Tree Bark**

No.	Concentration (µg/mL)	Absorbance	% inhibition
1	200	0.129	65.8
2	180	0.176	53.3
3	160	0.199	47.2
4	140	0.227	39.8
5	120	0.240	36.3
6	100	0.256	32.1
7	80	0.289	23.3
8	60	0.303	19.6
9	40	0.324	14.1
10	20	0.336	10.9

The higher concentration, the higher percent inhibition of Kassod Tree bark extract was shown in Table (5) and  $IC_{50}$  value of Kassod Tree bark (164.15 µg/mL) was found in figure (6) that compared with their  $IC_{50}$  value of standard EDTA.



**Figure (6) Comparison of metal chelating activity of Kassod Tree bark extract with EDTA**

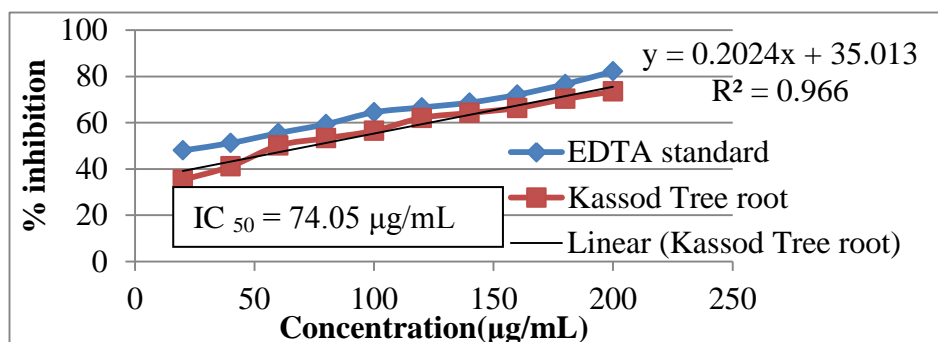
#### **Determination of metal chelating activity for extracts of Kassod Tree root at 536 nm**

To obtain the antioxidant scavenging activities of ethanolic extract of Kassod Tree root was determined by various concentrations.

**Table (6) Percent Inhibition of Metal Chelating Activity for Extracts of Kassod Tree Root**

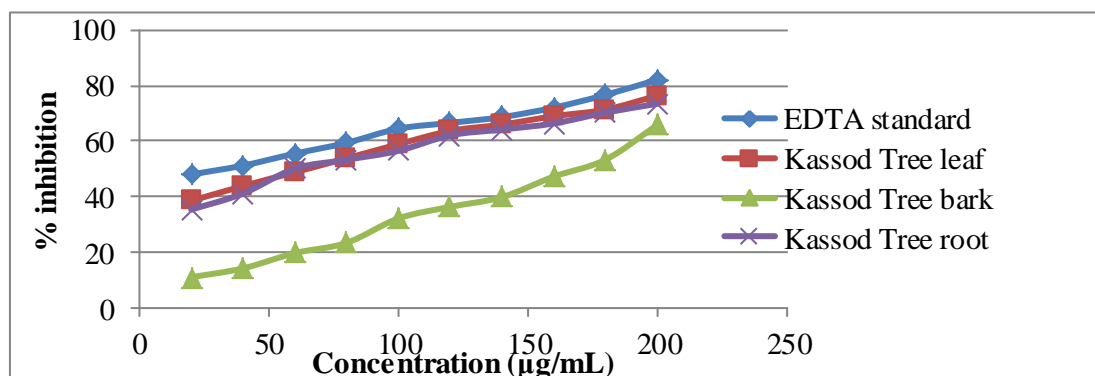
No.	Concentration (µg/mL)	Absorbance	% inhibition
1	200	0.100	73.5
2	180	0.112	70.3
3	160	0.127	66.4
4	140	0.135	64.2
5	120	0.143	62.1
6	100	0.164	56.5
7	80	0.176	53.3
8	60	0.188	50.1
9	40	0.222	41.1
10	20	0.244	35.3

According to table (6), the higher percent inhibition of Kassod Tree root extract was observed in the concentration 200 µg/mL and IC<sub>50</sub> value of Kassod Tree root (74.05 µg/mL) was found in figure (7) that compared with their IC<sub>50</sub> value of standard EDTA.



**Figure (7) Comparison of metal chelating activity of Kassod Tree root extract with EDTA**

The  $IC_{50}$  values of three different extracts of Kassod Tree were compared with their  $IC_{50}$  value of standard EDTA. In this comparison, Kassod Tree leaf extract has more significant antioxidant scavenging activity than other two samples. It was shown in the following figure (8).



**Figure (8) Metal chelating activity of Kassod Tree extracts with EDTA**

### Determination of DPPH Radical Scavenging Activity Assay for Extracts of Three Samples

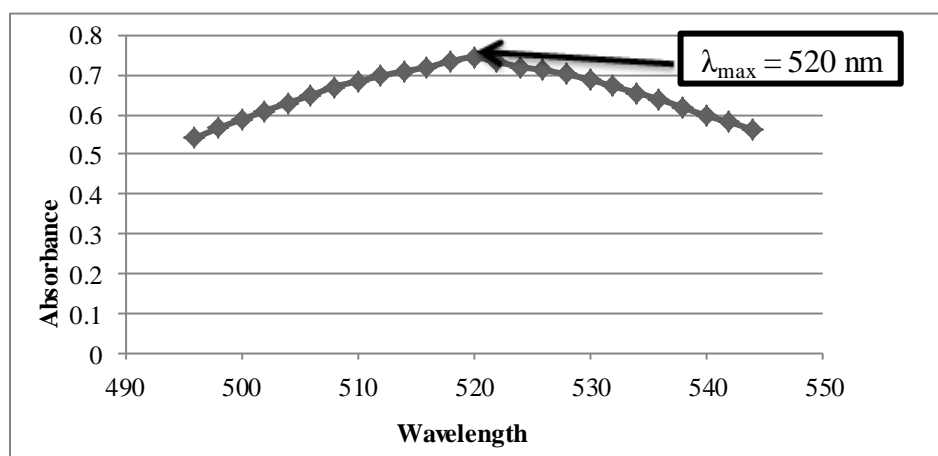
To determine DPPH assays of three samples require their maximum wavelength that provides optimum results.

### Determination of maximum wavelength for DPPH radical scavenging activity assay

A maximum wavelength of DPPH assay was observed to be at 520 nm and the value of absorbance is 0.745. It was shown in Table (7) and figure (9).

**Table (7) Maximum Wavelength for DPPH Assay**

No.	Wavelength(nm)	Absorbance	No.	Wavelength(nm)	Absorbance
1	496	0.541	13	<b>520</b>	<b>0.745</b>
2	498	0.566	14	522	0.734
3	500	0.588	15	524	0.721
4	502	0.609	16	526	0.713
5	504	0.630	17	528	0.702
6	506	0.649	18	530	0.689
7	508	0.671	19	532	0.672
8	510	0.684	20	534	0.656
9	512	0.698	21	536	0.639
10	514	0.710	22	538	0.619
11	516	0.720	23	540	0.598
12	518	0.735	24	542	0.582

**Figure (9) A plot of absorbance and wavelength for control solution**

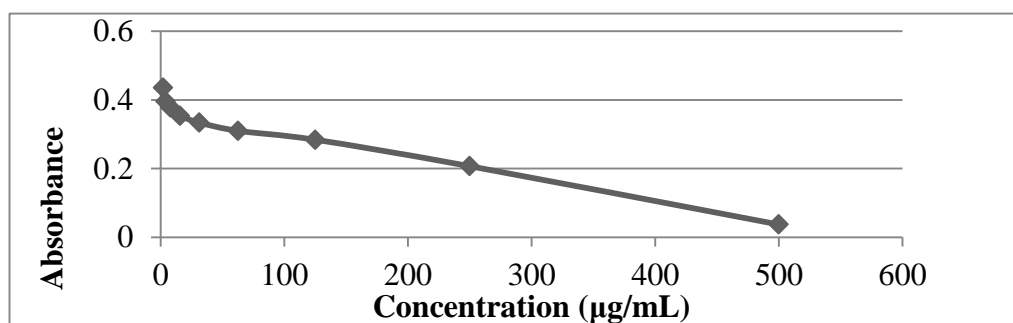
### Determination of standard ascorbic acid for DPPH radical scavenging activity assay at 520 nm

To compare the antioxidant scavenging activities of three samples need a standard. Ascorbic acid was used as a standard.

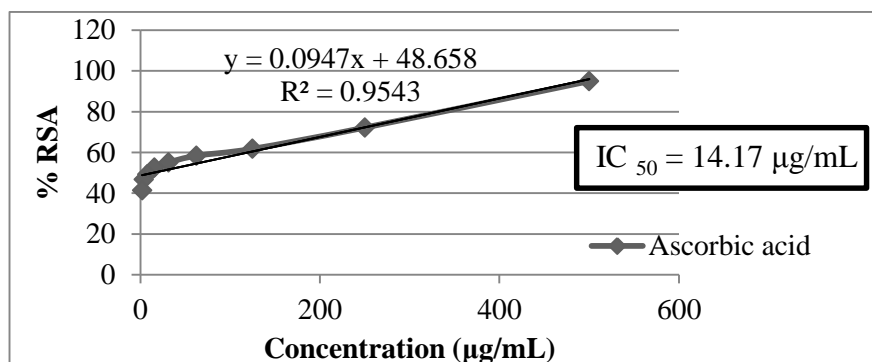
**Table (8) Percent Inhibition of DPPH Radical Scavenging Activity Assay for Standard Ascorbic Acid**

No.	Concentration ( $\mu\text{g/mL}$ )	Absorbance	% inhibition
1	500	0.037	95.0
2	250	0.207	72.2
3	125	0.284	61.8
4	62.5	0.310	58.4
5	31.25	0.334	55.1
6	15.63	0.354	52.5
7	7.8	0.378	49.2
8	3.95	0.396	46.8
9	1.95	0.436	41.4

According to table (8), the higher concentration 500  $\mu\text{g/mL}$  has the higher percent inhibition 95.0%. The  $\text{IC}_{50}$  value of standard ascorbic acid is 14.17  $\mu\text{g/mL}$  as shown in figure (11).



**Figure (10) A standard curve of ascorbic acid by absorbance and concentration**



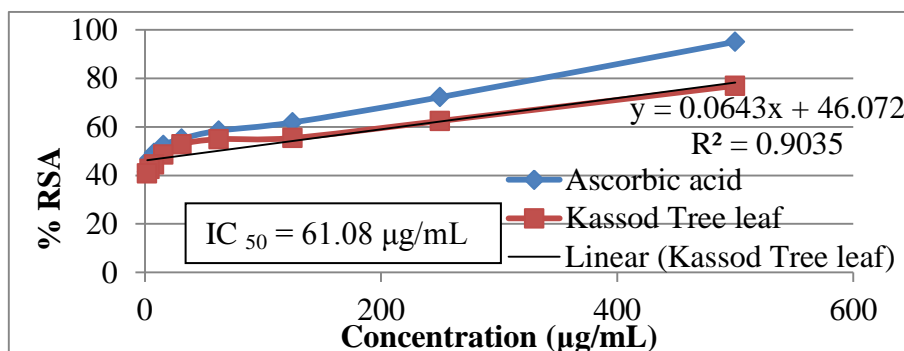
**Figure (11) DPPH radical scavenging activity of standard ascorbic acid**

**Determination of DPPH radical scavenging activity assay for extract of Kassod****Tree leaf at 520 nm**

To know the antioxidant scavenging activity of Kassod Tree leaf extract was determined by various concentrations such as 500, 250, 125  $\mu\text{g/mL}$ , and so on.

**Table (9) Percent Inhibition of DPPH Radical Scavenging Activity Assay for Kassod Tree Leaf**

No.	Concentration ( $\mu\text{g/mL}$ )	Absorbance	% inhibition
1	500	0.172	76.9
2	250	0.280	62.4
3	125	0.332	55.4
4	62.5	0.336	54.9
5	31.25	0.352	52.8
6	15.63	0.384	48.5
7	7.8	0.413	44.5
8	3.95	0.428	42.6
9	1.95	0.441	40.8



**Figure (12) Comparison of DPPH radical scavenging activity assay of Kassod Tree leaf extract with ascorbic acid**

According to obtaining results, the concentration 500  $\mu\text{g/mL}$  of Kassod Tree leaf extract gave the highest percent inhibition as shown in table (9). The  $\text{IC}_{50}$  value of Kassod Tree leaf obtained 61.08  $\mu\text{g/mL}$  in figure (12).

### Determination of DPPH radical scavenging activity assay for extract of Kassod

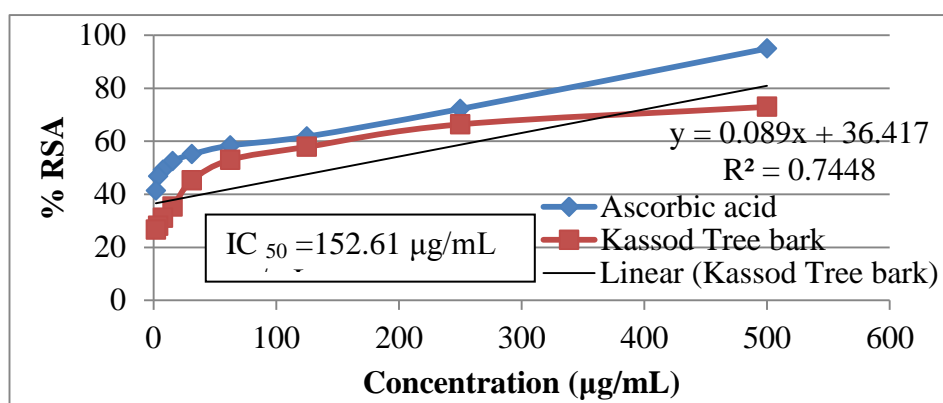
#### Tree bark at 520 nm

To observe the antioxidant scavenging activity of Kassod Tree bark extract was determined by various concentrations such as 500, 250, 125 $\mu$ g/mL, and so on.

**Table (10) Percent Inhibition of DPPH Radical Scavenging Activity Assay for Kassod Tree Bark**

No.	Concentration ( $\mu$ g/mL)	Absorbance	% inhibition
1	500	0.201	73.0
2	250	0.250	66.4
3	125	0.314	57.9
4	62.5	0.350	53.0
5	31.25	0.408	45.2
6	15.63	0.482	35.3
7	7.8	0.513	31.1
8	3.95	0.536	28.1
9	1.95	0.547	26.6

In this table (10), it was observed that the higher concentration of Kassod Tree bark extract gave the higher percent inhibition to determine the antioxidant power. The  $IC_{50}$  value is 152.61 $\mu$ g/mL and then this value was compared with a standard ascorbic acid value 14.17 $\mu$ g/mL as shown in the following figure (13).



**Figure (13) Comparison of DPPH radical scavenging activity assay of Kassod Tree bark extract with ascorbic acid**



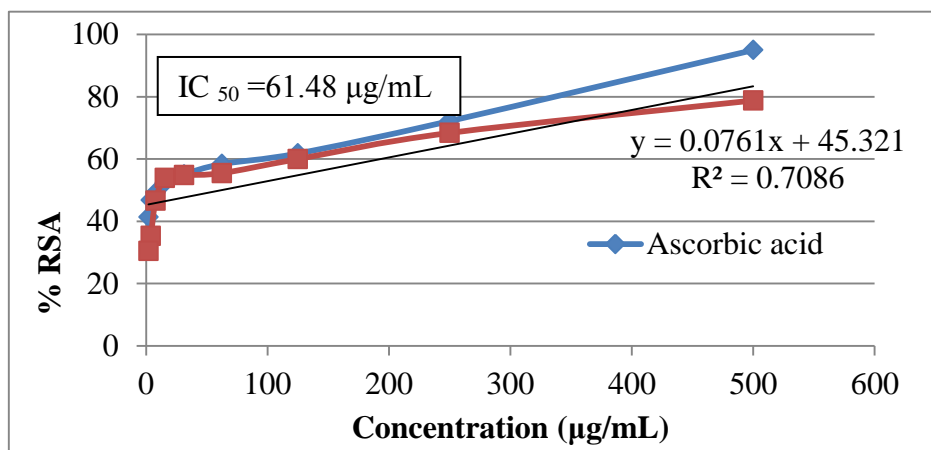
### Determination of DPPH radical scavenging activity assay for extract of Kassod Tree root at 520 nm

To obtain the antioxidant scavenging activity of Kassod Tree root extract was determined by various concentrations such as 500, 250, 125  $\mu\text{g/mL}$ , and so on.

**Table (11) Percent Inhibition of DPPH Radical Scavenging Activity Assay for Kassod Tree Root**

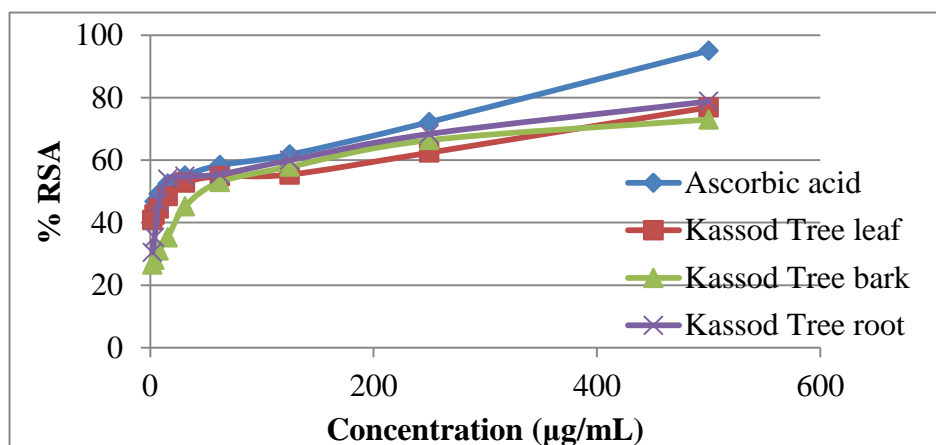
No.	Concentration ( $\mu\text{g/mL}$ )	Absorbance	% inhibition
1	500	0.158	78.8
2	250	0.235	68.4
3	125	0.298	60.0
4	62.5	0.331	55.5
5	31.25	0.337	54.8
6	15.63	0.343	53.9
7	7.8	0.398	46.6
8	3.95	0.482	35.3
9	1.95	0.518	30.5

In this table (11), it was found that the higher concentration of Kassod Tree root extract provides the higher percent inhibition to observe the antioxidant power. The  $\text{IC}_{50}$  value is 61.48  $\mu\text{g/mL}$  and then this value was compared with a standard ascorbic acid value 14.17  $\mu\text{g/mL}$  as shown in the following figure (14).



**Figure (14) Comparison of DPPH radical scavenging activity assay of Kassod Tree root extract with ascorbic acid**

The  $\text{IC}_{50}$  value of three different kinds of Kassod Tree extracts were compared with their standard ascorbic acid value 14.17  $\mu\text{g/mL}$ . In this comparison, Kassod Tree leaf (61.08  $\mu\text{g/mL}$ ) has more antioxidant scavenging activity than other two Kassod Tree extracts (KB 152.61  $\mu\text{g/mL}$  and KR 61.48  $\mu\text{g/mL}$ ). It was shown in the following figure (15).



**Figure (15) DPPH radical scavenging activity assay of Kassod Tree extracts with ascorbic acid**

### Conclusion

In the present work, the antioxidant activities of leaf, bark and root extracts of Kassod Tree were determined by two selected vitro methods. In metal chelating activity assay, the  $IC_{50}$  values of Kassod Tree extracts were compared with standard EDTA (30.57 µg/mL). It was observed that the increasing order of  $IC_{50}$  is KL 69.95µg/mL < KR 74.05µg/mL < KB 164.15µg/mL, respectively. Therefore, KL has more antioxidant scavenging potential.

In DPPH assay, the antioxidant activities of three samples were also compared with their standard ascorbic acid ( $IC_{50}$  = 14.17 µg/mL). In the three extracts of Kassod Tree,  $IC_{50}$  value of KL (61.08 µg/mL) is the lowest value. Therefore, KL has the highest antioxidant activity. When  $IC_{50}$  values of the other two samples KB (152.61 µg/mL) and KR (61.48µg/mL) have very fewer antioxidant activities.

In all two selected vitro methods, the extracts of Kassod Tree leaf (KL) have more significant free radical scavenging activities than the other two samples.

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