



# Mapping Distribution of Medicinal Plants Commonly used in Myanmar Traditional Medicine Formulations

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# Introduction

- ❖ Traditional Medicine Formulations (TMFs) originated from **natural plant resources a significant role** in the Traditional Medicine pharmaceutical market
- ❖ Most of the medicinal plants - **therapeutic agents**
- ❖ The **demand for herbal product - increasing day by day** in both developing and developed countries for community health care.
- ❖ But there is **a wider gap** between this **demand and their availability** from wild resources.
- ❖ Plant collection, identification, cultivation and conservation are the significant processes **for quality assurance and effective herbal product.**<sup>1</sup>

- ❖ Myanmar is essentially tropical monsoon country and rich in plant diversity.
- ❖ Kress *et al.* (2003) - 273 families, 2371 genera and over **11,800 species** in Myanmar.<sup>4</sup>
- ❖ Need to implement measures - genetic resources (medicinal plants and associated Myanmar Traditional Medicine knowledge) -legally acquired in Myanmar according to Nagoya Protocol.
- ❖ But very few countries - implemented a transparent access system that welcomes and encourages research.<sup>5</sup>


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- ❖ Selected 15 raw plant materials commonly used in Mandalay and Yangon Traditional Medicine Factories (2013 - 2017)
  - ❖ Profitable by cultivating these medicinal plants commonly used in Myanmar TMFs

Table 1. Demand of selected raw materials in Mandalay and Yangon Traditional Medicine Factories (2013 to 2017)

SN	Crude Plant	Mandalay TM Factory (Viss)	Yangon TM Factory (Viss)	Total Weight (Viss)
1	နွယ်ခို	3848	2081	5929
2	ဆေးပုလဲ	1476	1048	2524
3	ပိတ်ချင်း	1092	808	1900
4	ဆူးကောက်နက်	1073	748	1821
5	သက်ရင်းကြီး	1099	666	1765
6	နံ့သာဖြူ	871	532	1403

Cont. from Table -1

7	ကံ့ကော်	842	540	1382
8	ပန်းနု	869	427	1296
9	စမုံနက်	630	406	1035
10	မက်လင်ချဉ်	581	357	938
11	ပဲနံ့သာ	618	191	809
12	ကန့်ဘလူဥ	502	141	643
13	ဆောင်မေခါး	343	238	581
14	ကန့်ချုပ်ဖြူ	247	169	416
15	ဆေးမခန်း	67	71	138

# Objectives

- To list the **high demand crude drugs** among who sale markets, Traditional Medicine Practitioners and two government factories,
- To identify the **need of crude drugs supply** by **conserving and plantation** of the commonly used medicinal plants in TMFs
- To identify **sites for naturally occurring and plantation** of selected medicinal plants
- To find out **a practical way to cultivate rare medicinal plants** with a particular concern to biodiversity-rich in Myanmar.

# Methods

- ❖ **Design:** Cross sectional descriptive survey
- ❖ **Study Period:** 6 months (Oct 2017- March 2018)
- ❖ **Study sites:**

## **Marketing Survey (4 days)**

- Mandalay (15) and Yangon (15) Crude Drug Markets

## **Plant Collection Survey (30 days)**

- Mandalay, Sagaing and Magway Regions,
- Southern Shan and Kayah States



- ❖ **Data Collection Tools:** questionnaires, interview, observation, mapping and photograph recording.
- ❖ **Information:** the present situation of their **habitat** (wild or cultivated species), **database** in the local regions and the **cultivation methods** and **amount of products**
- ❖ **Education:** to local farmers about the economic advantages of these raw plant materials.
- ❖ commonly used, edible and cultivated materials eg.  $\text{ချင်း၊}$   
 $\text{နွမ်း}$  were excluded
- ❖ Private sectors selection - Industries zone - 5  
- Both TMFs seller & TMPs - 5





Sagaing



Magway

Mandalay

**Three regions for plant survey**





Kayah

Southern Shan

Two states for plant survey



# Results

Table 2. Marketing survey on 15 kinds of crude plant materials in Mandalay and Yangon Crude Drug Markets

Sr.	Name of Plants	Part used	Available Region	Storage	Annual sale (Viss)
1	<i>Glycyrrhiza glabra</i> L. (နွယ်ချို)	Root	India, Afganistam	Polythene bag	4,300
2	<i>Croton crassifolius</i> Geisel. (ရှမ်းဆေးပုလဲ)	Root	Southern Shan,	Polythene bag	3,670
3	<i>Piper longum</i> L. (ပိတ်ချင်း)	Fruit	Kayah, Shan, Mon, Taninthayi, Bago, India	Polythene bag	3,450
4	<i>Capparis sepiaria</i> L. (ဆူးကောက်နက်)	Bark	Mandalay, Magway, Sagaing	Polythene bag	4,150
5	<i>Croton roxburghii</i> N.P. Balaker. (သက်ရင်းကြီး)	Root	Mandalay, Magway, Sagaing, Shan, Kayah	Polythene bag	4,375

## Cont. from Table -2

6	<i>Santalum album</i> L.	Wood	Mandalay, Sagaing, Southern Shan,	Polythene bag	3550
7	<i>Mesua ferrea</i> L. (uHhaumf)	Stamen	Mandalay, Sagaing, Southern Shan, Mon	Polythene bag	1825
8	<i>Saussurea affinis</i> Spreng. (ဝန်နီ)	Root	Imported from India & China	Polythene bag	3150
9	<i>Nigella sativa</i> L. (ဝဲနဲနဲ)	Seed	Mandalay, Sagaing	Polythene bag	3300
10	<i>Garcinia pendunculata</i> Roxb. (မက်လင်ချဉ်)	Fruit	Sagaing, Shan, Kachin	Polythene bag	3975
11	<i>Trigonella foenum- graecum</i> L. (ဝဲနဲသ)	Seed	Mandalay, Magway, Shan,	Polythene bag	2725

## Cont. from Table -2

12	<i>Cnidium officinale</i> Makino. (ကန့်ဘလူဥ)	Tuber	Southern Shan	Polythene bag	3750
13	<i>Picrorhiza kurroa</i> Royle. (ဆောင်မေခါး)	Root	Southern Shan, Imported from India	Polythene bag	2730
14	<i>Plumbago rosea</i> L. (ကန့်ချုပ်နီ)	Stem, Root	Sagaing, Mandalay, Shan, Ayayarwadi	Polythene bag	3000
15	<i>Jatropha multifida</i> L. (ဆေးမခန်း)	Root	Southern Shan, Yangon	Polythene bag	2225



Table 3. Total annual demand on 15 plant materials in 2 Government and 10 Private Sectors produced by Traditional medicine Practitioners

SN	Name of Plants	Demand of 2 Gov. Factories	Demand of 10 Private Sectors	Total Annual Demand
1	<i>Glycyrrhiza glabra</i> L.	1166	8115	<b>9281</b>
2	<i>Croton crassifolius</i> Geisel.	504	2663	3167
3	<i>Piper longum</i> L.	280	1530	1810
4	<i>Capparis sepiaria</i> L.	369	168874	<b>169243</b>
5	<i>Croton roxburghii</i> N.P. Balaker.	353	1028	1381
6	<i>Santalum album</i> L.	281	1078	1359
15	<i>Jatropha multifida</i> L.	28	132	160

## Cont. from Table -3

7	<i>Mesua ferrea</i> L.	276	685	961
8	<i>Saussurea affinis</i> Spreng.	256	695	951
9	<i>Nigella sativa</i> L.	1035	1368	2403
10	<i>Garcinia pendunculata</i> Roxb.	188	5520	<b>5708</b>
11	<i>Trigonella foenum-graecum</i> L.	162	854	1016
12	<i>Cnidium officinale</i> Makino.	129	5400	<b>5529</b>
13	<i>Picrorhiza kurroa</i> Royle.	116	366	482
14	<i>Plumbago rosea</i> L.	83	1393	1476



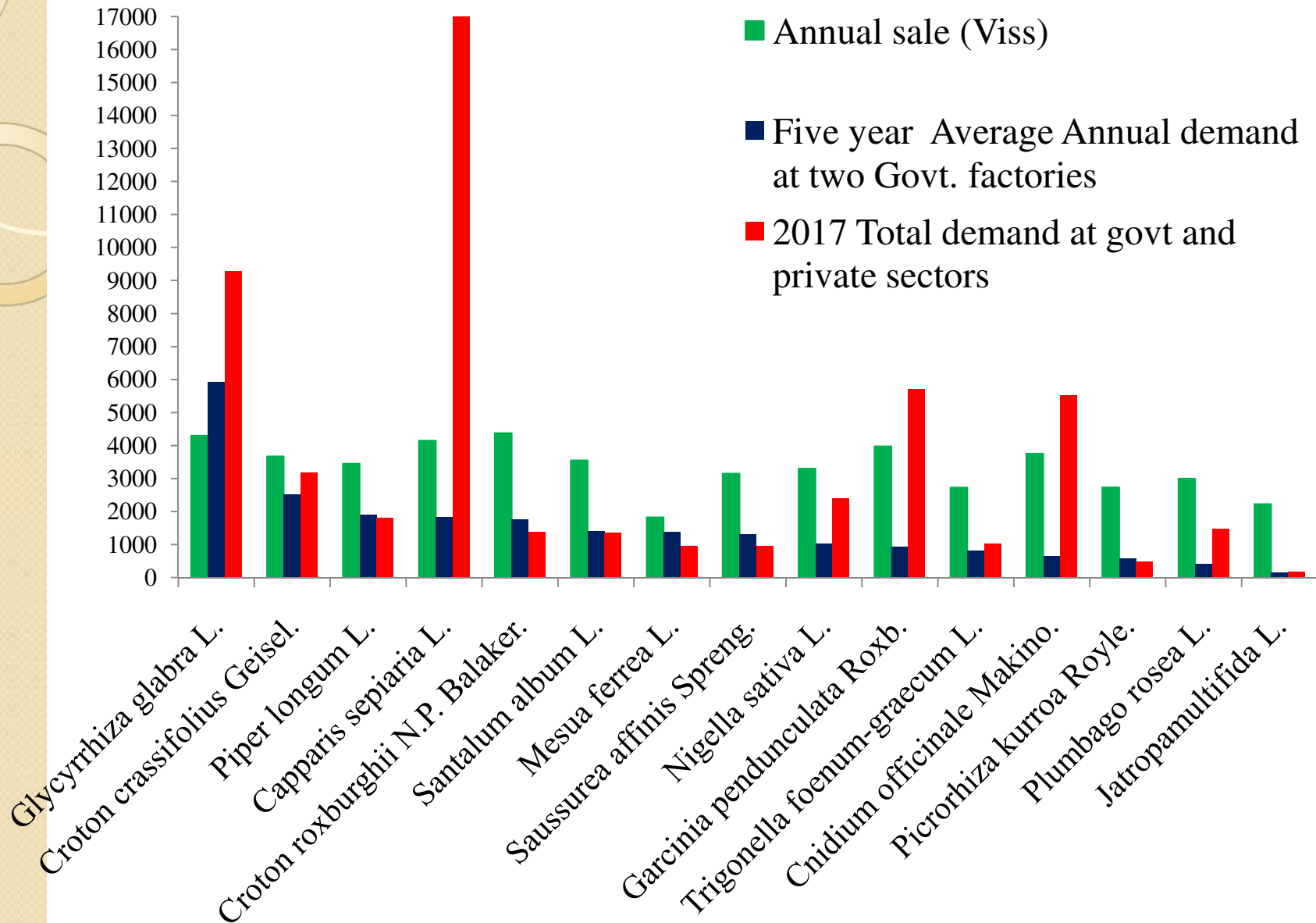


Figure 1. Comparison of annual sale and demand of 15 medicinal plants

Table 4. Wild Distribution of selected medicinal plants found in study areas

SN	Name of Plants	MDY	MG	SG	SS	K	Cultivated/ Wild
1	<i>Croton crassifolius</i> Geisel.	F	F	F	A	A	Wild
2	<i>Capparis sepiaria</i> L.	D	D	D	F	F	Wild
3	<i>Croton roxburghii</i> N.P. Balaker.	A	D	A	A	A	Wild
4	<i>Garcinia pendumculata</i> Roxb.	F	F	B	E	F	Wild
5	<i>Picrorhiza kurroa</i> Royle.	F	F	F	C	F	Wild
6	<i>Plumbago rosea</i> L.	D	E	E	E	E	Wild

Table 5. Cultivated selected medicinal plants in study areas

SN	Name of Plants	MDY	MG	SG	SS	K	Cultivated/ Wild
1	<i>Piper longum</i> L.	D	E	C	E	B	Cultivated
2	<i>Santalum album</i> L.	B	A	D	E	E	Cultivated
3	<i>Mesua ferrea</i> L.	B	D	A	E	F	Cultivated
4	<i>Nigella sativa</i> L.	D	B	B	F	F	Cultivated
5	<i>Trigonella foenum-graecum</i> L.	E	A	A	F	F	Cultivated
6	<i>Jatropha multifida</i> L.	B	E	E	E	E	Wild/Culti

Cont. from Table -5

7	<i>Cnidium officinale</i> Makino.	F	F	F	A	F	Cultivated
8	<i>Glycyrrhiza glabra</i> L.	E	-	-	-	-	Cultivated

**Notes:** MDY = Mandalay,  
SS= Southern Shan,

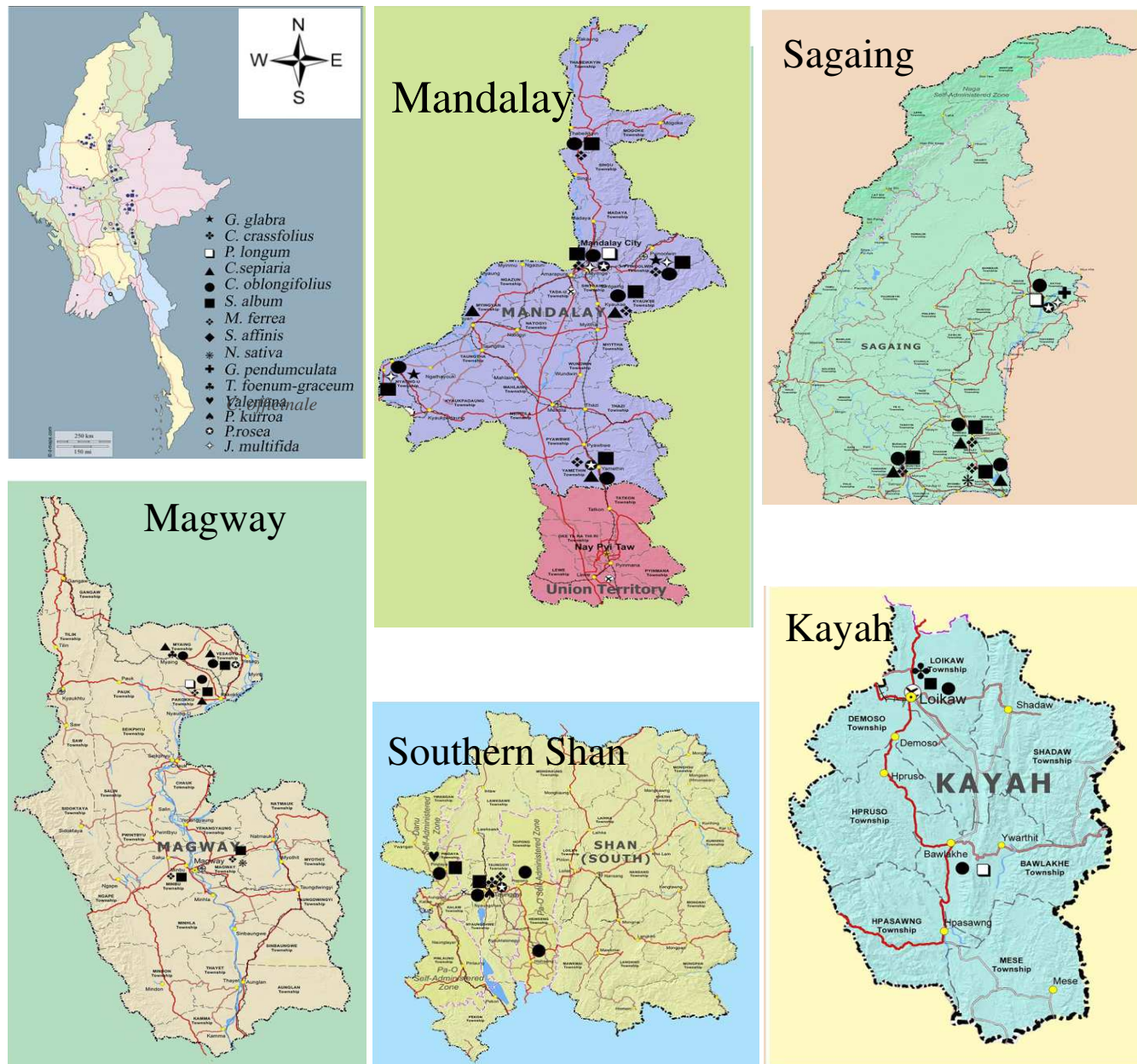
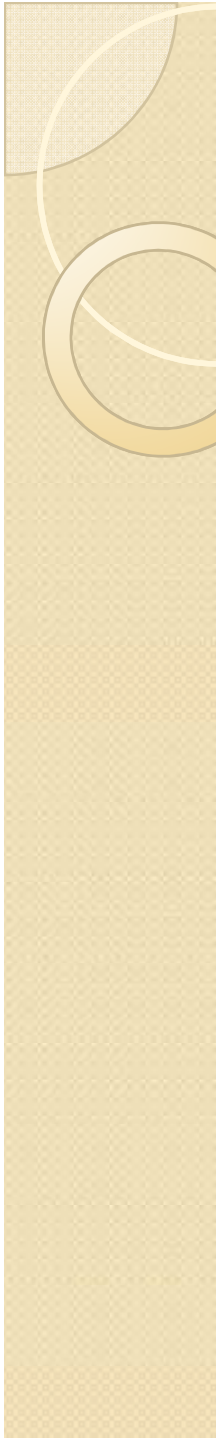
MG = Magway,  
K = Kayah.

SG= Sagaing,

A = Above 40 Acres,  
D = 10 - 20 Acres,

B = 30 - 40 Acres,  
E = Below 10 Acres,

C = 20 to - 30 Acres,  
F = Remote Area



**Figure 2. Distribution of 14 kinds of medicinal plants commonly used in Myanmar Traditional Medicine Formulations in study areas**





နွယ်ချို



ဆေးပုလဲ



ပိတ်ချင်း



ဆူးကောက်နက်



သက်ရင်းကြီး



နံသာဖြူ





ကံ့ကော်



စမုံနက်



မက်လင်ချဉ်



ကန့်ဘလူဥ



ပဲနံ့သာ



ဆောင်မေခါး



**Figure 3. Photos of 14 selected medicinal plants**



## Discussion

- ❖ 15 Selected plant materials – in commonly used in TMFs.<sup>7</sup>
- ❖ 12 plants – available in local except  
*Saussurea affinis* Spreng,  
*Glycyrrhiza glabra* L.  
*Picrorhiza kurroa* Royle
- ❖ *Cnidium officinale* **Makino.** - cultivated 6000 ft. above sea level in Pindaya township
- ❖ Should be cultivated in other places like this geographical conditions

❖ **In conservational point of view,**

- *Glycyrrhiza glabra* L . is endangered species<sup>8</sup>

- *Picrorhiza kurroa* Royle. - thread  
(International Union for Conservation of Nature)<sup>9</sup>.

- *Garcinia pendunculata* Roxb. - endemic to the south-eastern regions of Asia such as parts of Myanmar and north-eastern parts of India<sup>10</sup>

❖ The conservation of these medicinal plants - vitally important

❖ Systematically cultivated and harvested

## Advantages and disadvantages<sup>2</sup>

	Advantages	Disadvantages
<b>Wild Species</b>	<ul style="list-style-type: none"><li>■ Free from pesticides</li></ul>	<ul style="list-style-type: none"><li>■ Becoming scarce and threatened by over-harvesting,</li><li>■ Existing a risk of adulterations and resource exhaustion,</li><li>■ Extinction of ecotype and species due to uncontrolled harvesting,</li><li>■ a lack of resource inventories and related management practices.</li></ul>

## Cultivated Species

### Advantages

- Harvesting pressure on rare and threatened species,
- Keeping genotypes being standardized
- Improved continuing supply of raw medicinal materials,

### Disadvantages

- Requirements of substantial investment before and during production,
- Narrow genetic diversity in gene pool of wild populations,
- Causing genetic pollution of wild resource for reintroduced plants,


## Cultivated Species

### Advantages

- Economic prospects - increasing market opportunity,
- Achieving optimal quality
- Economic returns & Securing economic growth
- Social stability

### Disadvantages

- Negative impacts on ecosystems a lack of successful cultivation techniques for some species.

- 
- ❖ The medicinal plants - **important genetics resources for food security, public health, biodiversity conservations<sup>5</sup>.**
  - ❖ The correct identification and quality assurance of the plant materials - an essential **to ensure reproducible quality, safety and efficacy.**

# Conclusion


## Information and experiences

- **Real situation** of 15 selected medicinal plants
- **Potential threat** of some species in near future.
- **Assist to conserve and cultivate** medicinal plant for raw plant materials with **reliable quality** and a **sustainable supply** to meet market demands.
- To **reduce a gap** between high demand and scarcity of naturally available plants for further mass production
- **Protect the wild resources** of medicinal plants commonly used in Myanmar TMFs

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**Thank You**

**For**

**Your Attention**