



# Country Report on the status of National Soil Resources in Myanmar

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# SOIL SCIENCE SECTION



- Myanmar is an ASEAN country located in South East Asia.
- It is located between latitudes  $09^{\circ} 32'N$  -  $28^{\circ} 31'N$  and longitudes  $92^{\circ} 10'E$  -  $101^{\circ} 11'E$ .
- It is bordered by China, Laos and Thailand, Bangladesh and India on the south by the Andaman Sea and the Bay of Bengal .



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## Climate of Myanmar

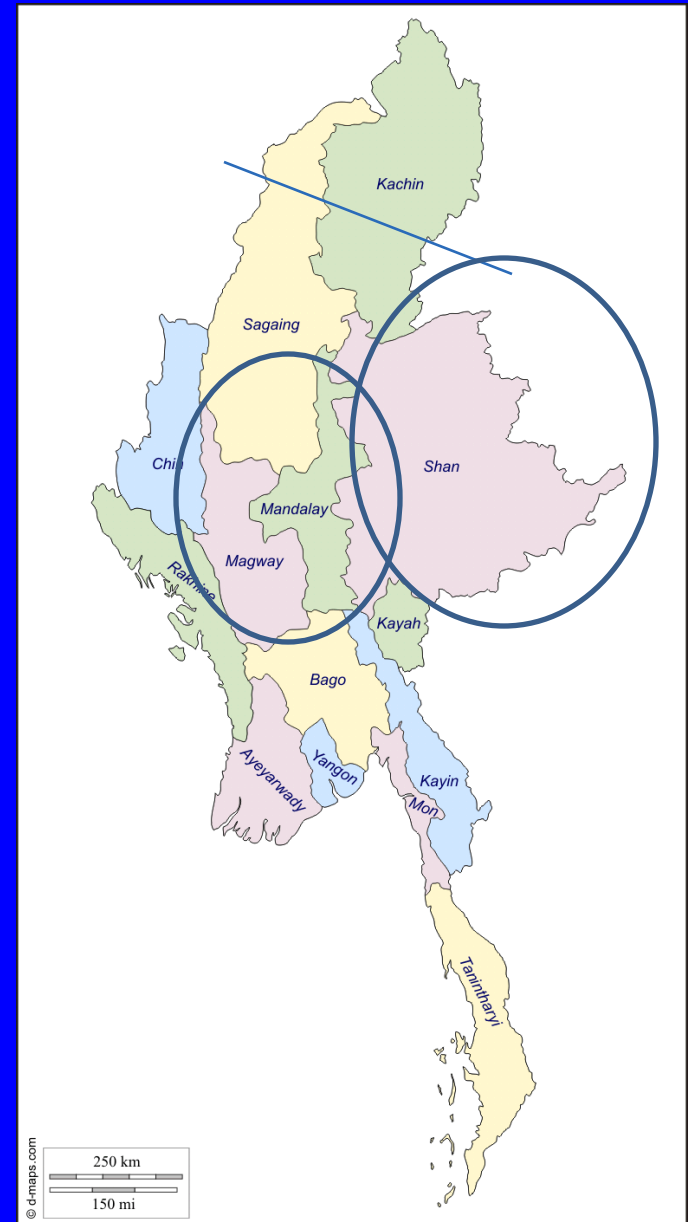
1. Summer (Dry season)
2. Rainy season (Wet season)
3. Winter season (Cold and dry season)

### Summer —

End of February to Beginning of May

with highest temperatures during March and April in Central Myanmar up to above 110°F (43.3°C) while in Northern

Myanmar it is about 97°F (36.1°C) and on the Shan Plateau between 85°F (29.4°C) and 95°F (35°C).





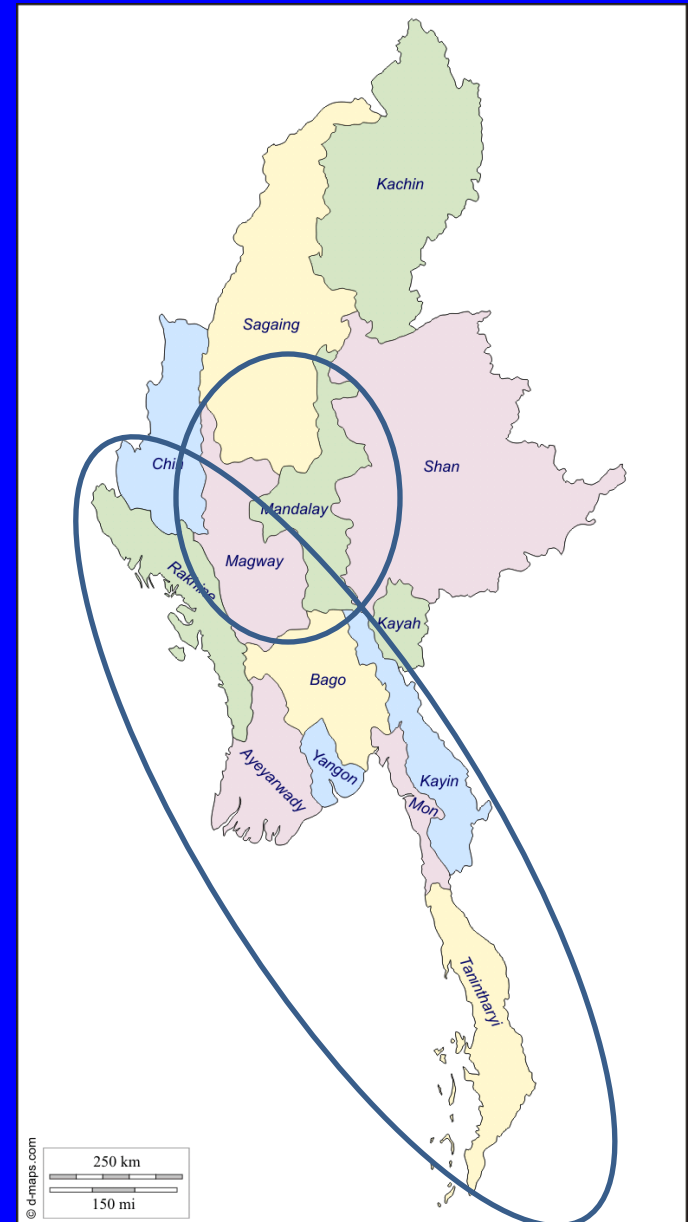
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## Climate of Myanmar

**Rainy Season**- from mid May to the end of October,  
with annual rain fall of less than 40 inches in Central Myanmar while the coastal regions of Rakhine and Tanintharyi get about 200 inches.

**Winter** - from November and lasts to the end of February  
with temperature in hilly areas of over 3000 feet drops below 32F (0C).  
Average Temperature across the country – 10 to 18°C





## 11. Agro-Ecological Zones

$R_3 S_1, R_3 S_3, R_3 S_6, R_4 S_1, R_4 S_3, R_4 S_5,$   
 $R_4 S_6, R_5 S_1, R_5 S_4, R_5 S_6, R_5 S_5$

### 5. soil groups

$S_1$  Fluvisols/ Gleysols

$S_3$  Lithosols/ Cambisols  
/ Andosols

$S_4$  Vertisols

$S_5$  Luvisols (Alfisols)/ Nitosols

$S_6$  Acrisols/ Ferrasols

### 3. Rainfall Groups

$R_3$  > 100 inches

$R_4$  40 – 100 inches

$R_5$  < 40 inches

UNION OF MYANMAR  
DISTRIBUTION OF THE  
AGRO-ECOLOGICAL ZONE

MILES 0 50 100 MILES

INDIA

CHINA

BAHAGLADISH

THAILAND

LAO

#### FIVE SOIL GROUPS

- $S_1$  FLUVISOLS / GLEYSOLS
- $S_3$  LITHOSOLS / CAMBISOLS / ANDOSOLS
- $S_4$  VERTISOLS
- $S_5$  LUVISOLS / NITOSOLS
- $S_6$  ACRISOLS / FERRALSOLS

#### THREE RAINFALL GROUPS

- $R_3$  ABOVE 100 INCHES
- $R_4$  40 TO 100 INCHES
- $R_5$  UNDER 40 INCHES

LAND USE DIVISION (M.S.) THU YA 3/AMU/1995



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## 3. Rainfall Groups

### **$R_3 > 100$ inches**

- This rainfall pattern can be found in Rakhine, Mon, Northern part of Kachin State, Ayeyarwady and Tanintharyi Regions where there rainfall is more than 100 inches. In this pattern there is no dry spell during rainy season.

### **$R_4 40 - 100$ inches**

- In Chin, some parts of Kachin, Kayah, Shan state and Bago Yoma hill receive 40-100 inches rainfall during rainy season and that amount of rain fall is sufficient for crop production. But sometimes excessive rainfall or dry spell may occur.

### **$R_5 < 40$ inches**

- We can see this rainfall pattern in Central Dry Zone of Myanmar including Mandalay, Magway, and southern part of Sagaing Regions.



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## 5. soil groups

### **S<sub>1</sub> Fluvisols/ Gleysols**

- Fluvisol is an alluvial soil and it is rich with silt.
- It can be found in any region of our country and it is important for agriculture.
- It is developed from recent deposits of the river plains and it is young and rich in plant nutrients.
- It is suitable for rice, maize, legumes, sugarcane, vegetables and plantation crops.



## 5. soil groups

### **S<sub>3</sub> Lithosols/ Cambisols / Andosols**

- These soils occupy at the high elevation (from 4000 feet to 10000 feet above sea level).
- We can find such kind of soils in Myitkyina and some parts of Shan Plateau.
- Many of the area are covered with forest.
- In the rainy season, land sliding can happen in such areas.
- Therefore, undertaking of soil conservation is essentially needed.



## 5. soil groups

### **S<sub>4</sub> Vertisols**

- Vertisols is the dark compact soils.
- It can be found in Mandalay, Magway and Sagaing Regions.
- They are also important for agriculture.
- These soils are mainly composed of clay.
- At the time of dry season, we can see the deeply crack onto the ground and at rainy season, it becomes sticky and very difficult to cultivation.
- Therefore, mechanization is important in those areas.
- Under the irrigated area, farmers grow rice and majority of cropping patterns are upland crops based cropping patterns.



## 5. soil groups

### **S<sub>5</sub> Luvisols (Alfisols)/ Nitosols**

- These soils cover across the dry zone area especially in Nyaung U district in Mandalay region.
- Soil rich in sand and pH ranges from 7.0 to 8.0.
- Although Ca and Mg content is said to be high, other plant nutrients are low and soil organic matter is very low under the high temperature.
- That area is major area for oil seed crops such as groundnut and sesame.
- The problem in that area is wind erosion.
- In that area, pigeon pea is included in the cropping pattern of farmers as wind break.
- Water saving technology is also important in that soil with uneven rainfall.



## 5. soil groups

### **S<sub>6</sub> Acrisols/ Ferrasols**

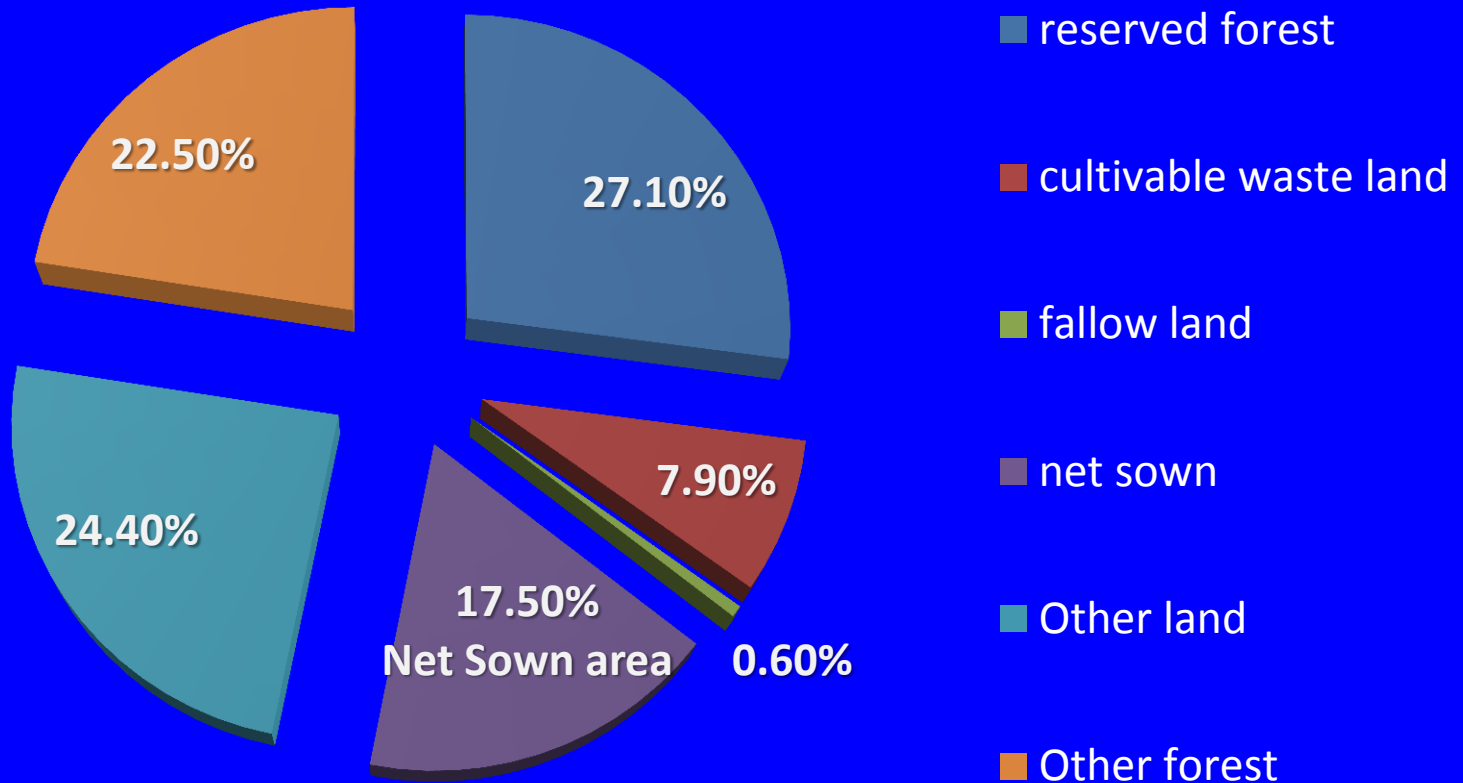
- It is red earth soils mostly dominant in Shan State.
- Soil texture varies from sandy to silty clay loam.
- The soil reaction is slightly acid to neutral.
- Iron (Fe) content can be rated as high.
- However, Nitrogen and Phosphorus is deficient.
- In that area we can see the plantation of gardens, flowers, and forests.



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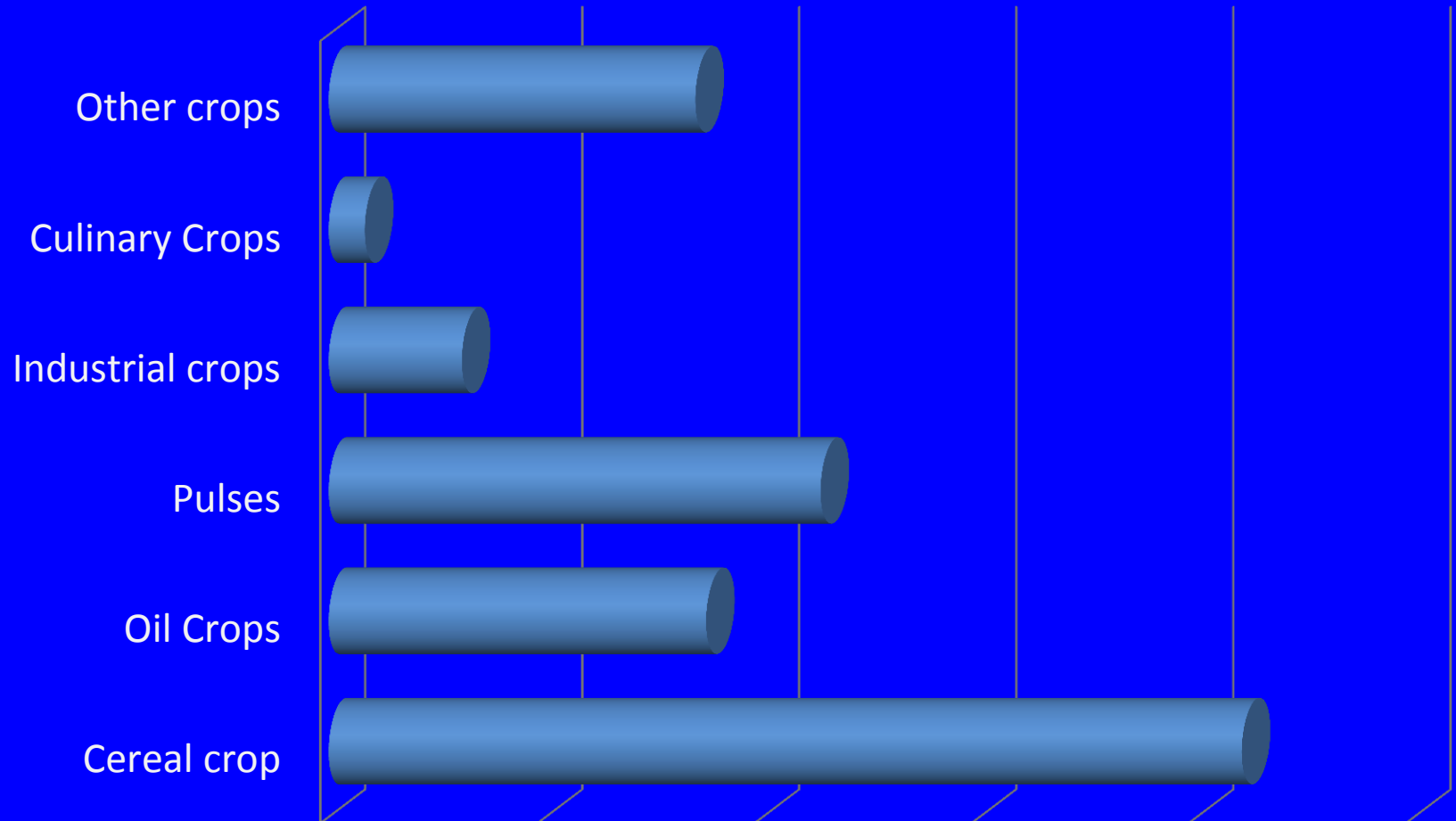
## Land utilization in 2013-2014



Source: 2014 Myanmar Agriculture at a Glance, DAP, MOAI.



## Sown area of crop groups in 2013-2014



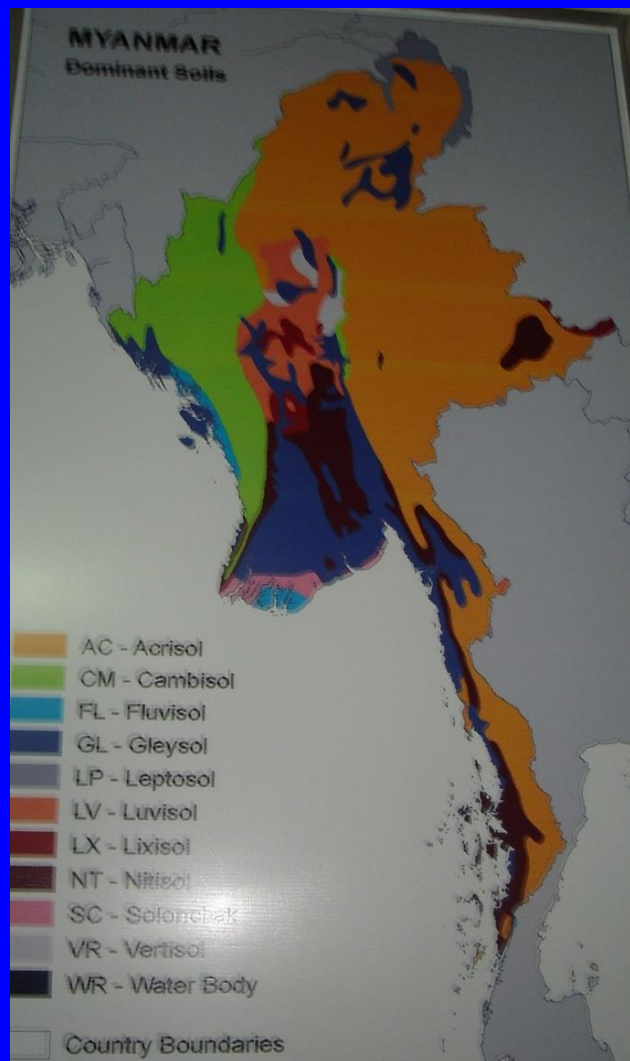
Source: 2014 Myanmar Agriculture at a Glance, DAP, MOAI.



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**Nutrients related problem across the country for crop production are;**

- Low in soil organic matter
- Deficient in S
- N and K are dynamic
- Deficient in P
- Deficient in Zn
- Soil B level in Myanmar especially in dry zone is low.





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## Blanket fertilizer application rate for major crops

Sr.No.	Crop	N kg/ha	P kg/ha	K kg/ha
1	Hybrid rice	114	24	61
2	HYV rice	85	24	31
3	Hybrid Maize	142	24	61
4	Sesame	85	24	31
5	Groundnut	28	24	31
6	Sunflower	114	24	31
7	Food legume	14	24	31
8	Safflower	28	5	15
9	Jute	85	24	31
10	Cotton	85	24	61
11	Sugarcane	85	24	61
12	Vegetables	57	28	31

**+ 8 kg S/ha and 0.05% late foliar fertilizer application of B and ZnSO<sub>4</sub> is suggested at 3 kg/ha if the soil analysis showed <1 mg/kg of DTPA (Diethylene Triamine Penta Acetic Acid) extractable Zn.**



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## Sustainable management for soil organic matter

- Farm Yard Manure application at the rate of 3 to 5 ton/ha
- Rice stubble incorporation into the soil after harvest of rice
- Rice-legume-rice cropping pattern in irrigated area an incorporation of biomass of legume crop is advisable.
- As per research findings of our soil science section, Glyricidia is a promising green manure for both lowland and upland area.





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## Glyricidia





THANK  
YOU  
VERY  
MUCH

