Ministry of Agriculture, Livestock and Irrigation

Department of Agriculture

Union Territory, Naypyitaw

Assessment of Sunflower Suitability for Pyinmana Township Depending on Rainfall and Temperature

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Contents

Introduction

- More than 60 different crops are grown based on the prevalence of different agro-ecological zones in Myanmar.
- These crops can be generally categorized into cereal crops, oilseed crops, pulses, industrial crops, culinary crops, vegetables and fruits (Aung Kyi 2005).
- Oilseed crops play an important role in Myanmar and are indeed the second most important crop after rice (Favre and Myint, 2009).
- Over 77% of the total oilseed crops production comes from Central Dry Zone of Myanmar: Sagaing, Magway and Mandalay Region (DOA, 2020).
- Oilseed crops are groundnut, sesame, sunflower, mustard, and niger (DOA, 2020).

Introduction

- To fulfill the domestic requirement of the country, different types of edible oil have been imported from foreign countries and the vast majority of imported oil is palm oil.

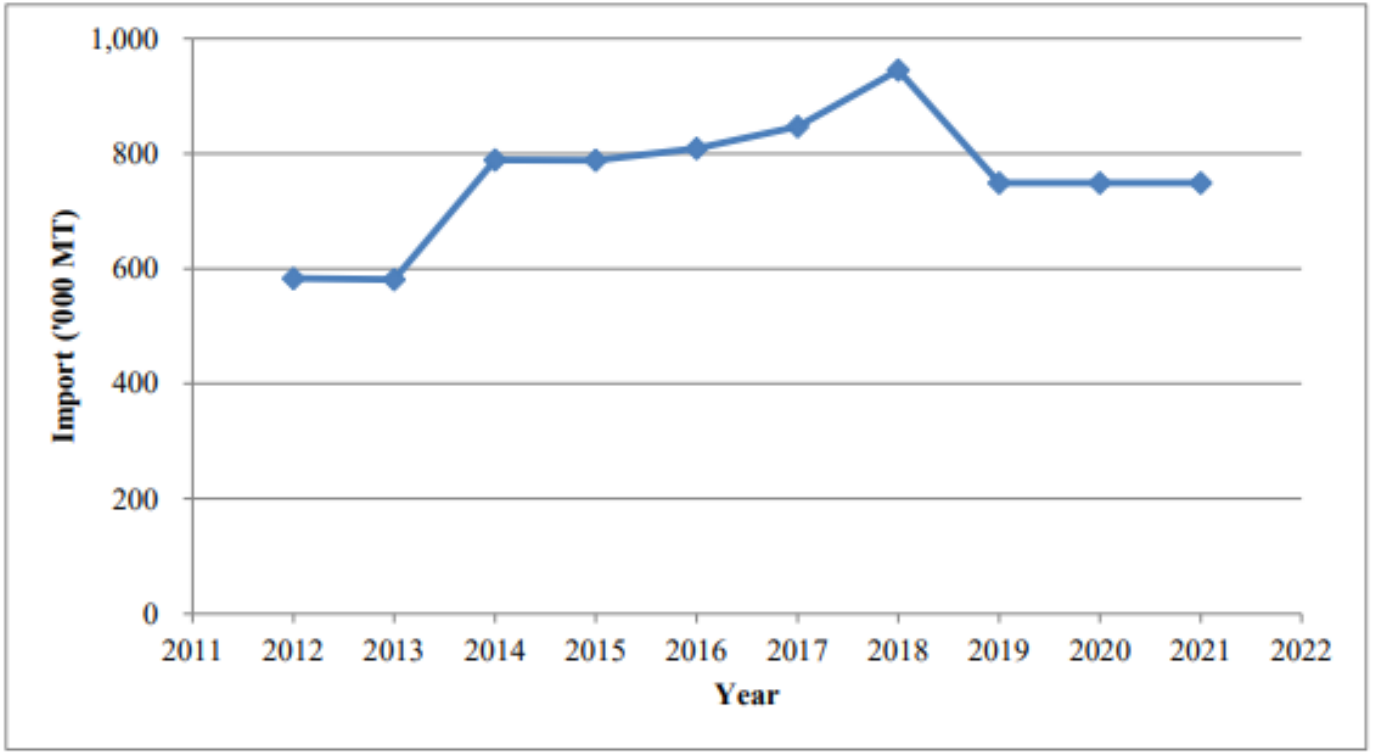

Figure 1. Import of palm oil to Myanmar (2012 to 2021)
Source: USDA, 2021

Introduction

- The study of the Department of Agricultural Economics of the Yezin Agricultural University (YAU) research team found that the annual edible oil consumption per capita of Myanmar was **14.39 kg** which has increased by nearly 64% in the last two decades (May Thet Htar et al., 2022).
- Therefore, plans have been drawn up for the production of oil crops and in 2022-2023, **1.5 million acres of sunflowers** will be planted in the regions and states of Myanmar to ensure self-sufficiency in domestic consumption.
- According to the water, land and seasonal conditions of Naypyitaw Region **2489 acres** have been targeted for sunflower cultivation and production.
- However, **8586 acres** have been planted for Naypyitaw Region.

Objectives

- To estimate the sowing time of the sunflower in Pyinmana Township
- To evaluate the variation of rainfall and tempertaure
- To study the growing cycle of the sunflower
- To increase the farmers's income

Problem Statement

- Due to the high consumption of edible oil in the country, edible oil is imported from abroad every year.
- In order to expand the cultivation and production of sunflower oil crops to achieve self-sufficiency in oil for domestic consumption.
- Per capita edible oil consumption per year of sample consumers was about **17.75 kg per year** in Nay Pyi Taw Council (Theingi Myint on 28 January 2022).

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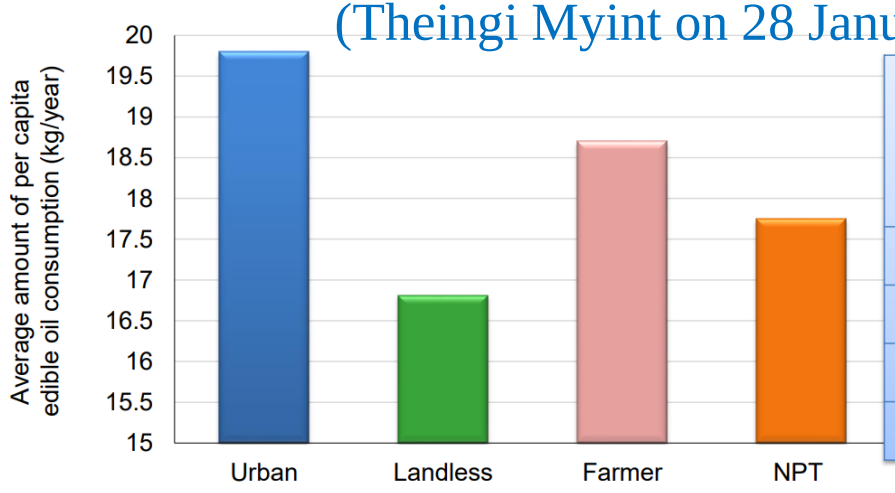
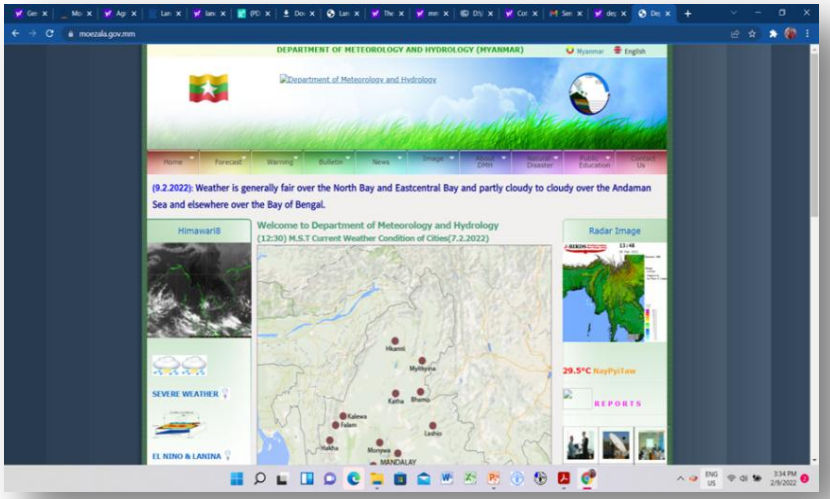


	Edible oil consumption (kg/yr)
Urban	19.8
Landless	16.81
Farmer	18.7
NPT	17.75

Materials & Methods

Data Collection

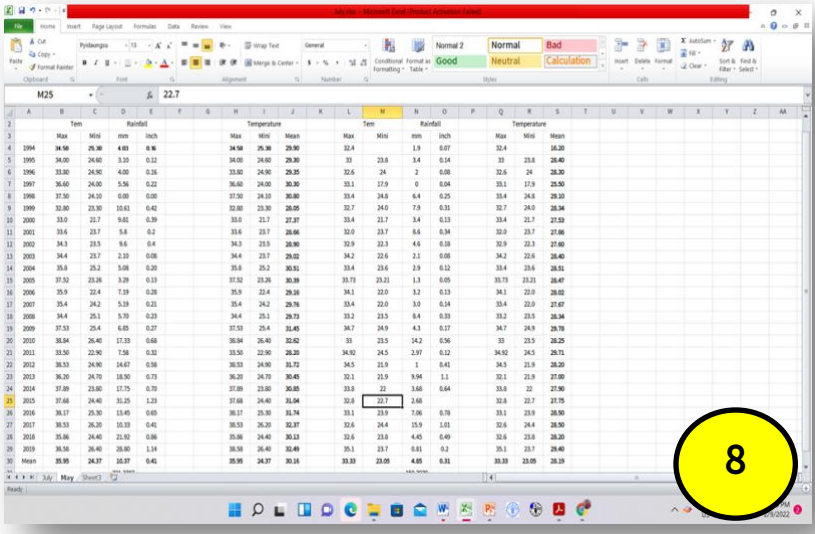
1. Minimum temperature (°C) and
2. Maximum temperature (°C)
3. Daily rainfall (mm)
4. From 1996 to 2021 (25 years)



Source: Department of Meteorology and Hydrology

Data Analysis

- The collected data were calculated by Excel.



Weather condition(mean) (1996-2021) Pyinmana (25 Years)

No.	Month	Minimum °C	Maximum °C	Mean Temp °C	Precipitation mm
1	January	14.5	31.65	23.07	42.3
2	February	16.59	34.12	25.36	13.2
3	March	21.15	38.03	29.59	5.16
4	April	23.72	37.60	30.66	53.77
5	May	24.37	35.95	30.16	321.37
6	June	24.9	32.79	23.44	228
7	July	23.83	31.55	27.69	281.17
8	August	24.41	32.8	28.6	307.52
9	September	24.71	34.06	29.38	261.6
10	October	23.05	33.33	28.19	150.39
11	November	20.77	34.32	27.54	163.06
12	December	16.67	32.34	24.5	28.21

Source: Department of Meteorology and Hydrology

Suitability Classes

S1 L0	No limitations; very suitable; optimal yield
S1 L1	Slight limitations; suitable; almost optimal yield
S2	Moderate limitations; moderately suitable; acceptable yield
S3	Severe limitations; marginally suitable; low yield
N1	Very severe limitations; not recommended, but potentially suitable.
N2	Very severe limitations; not recommended; potentially not suitable; not acceptable yield

Land Evaluation. Part III: crop requirements. Agricultural Publications n° 7, G.A.D.C., Brussels, Belgium, 1993, 191 p.

https://biblio.ugent.be/publication/233235
https://www.researchgate.net/publication/324330469_Land_Evaluation_Part_3_Crop_Requirements

Results and Discussion

Climate Requirement – Sunflower (growing cycle 85-90 days)

Climatic Characteristics	Climate class, degree of Limitation and rating											
	S1		S2	S3	N1	N2	Pre-Rainy Season		Rainy Season		Late Rainy Season	
	0	1	2	3	4		Feb. to March		May. to June		Sept. to Oct.	
	100 95	85	60	40	25	0	Result	Class	Result	Class	Result	Class
Precipitation of growing cycle (mm)	650-800 650-500	800-900 500-400	900-1300 400-300	> 1300 300 -250	- -	- < 250	380	S2	831	S1 L1	342	S2
Precipitation of (1st - month) (mm)	105 - 135 105 - 75	135 - 215 75 - 60	> 215 < 60	- -	- -	- -	2	S2	321	S2	150	S1 L1

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Precipitation of (2nd month) (mm)	250- 315 250 -190	315 -450 190-140	450 - 750 140 - 120	> 750 120 - 80	- -	- < 80	54	N2	228	S1 L0	163	S1 L1
Precipitation of (3rd month) (mm)	100- 120 100 -75	120- 150 < 75	> 150 -	- -	- -	- -	321	S2	281	S2	28	S1 L1
Mean temp. of growing cycle (°C)	22- 20 22 -24	20- 18 24 -26	28- 16 26 -28	16- 13 28 -30	-	< 13 > 30	30	N2	27	S2	27	S2

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Conclusion & Recommendation

Climate Requirement – Sunflower (growing cycle 85-90 days)

If the sunflower will plant by farmers in Pyinmana Region,

- Sowing Time Feb. - March = S2, S2, N2, S2, N2
- Sowing Time May - June = S1 L1, S2, S1 L0, S2, S2
- Sowing Time Sept. - Oct. = S2, S1 L1, S1 L1, S1 L1, S2

S1 L0	No limitations; very suitable; optimal yield
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Conclusion & Recommendation

Climate Requirement – Sunflower (growing cycle 85-90 days)

If the sunflower will plant by farmers in Pyinmana Region,

- Sowing Time Feb. - March = S2, S2, N2, S2, N2

Precipitation of growing cycle (Rainfall) = Very High Irrigation

Mean temp. of growing cycle(Very High) = Moisture and Flowering Time

- Sowing Time May - June = S1 L1, S2, S1 L0, S2, S2

Precipitation of (1st - month) (Heavy Rainfall) = Drainage, Seed Treatment

Precipitation of (3rd month) (Heavy Rainfall) = Low Yield, Harvesting Limit

- Sowing Time Sept. - Oct. = S2, S1 L1, S1 L1, S1 L1, S2

Precipitation of growing cycle (A Few Rainfall Needed)

Future Plan

Information and Communication Technology (ICT)

- ICT – includes – any communication device, television, cell phones, computer, Satellite systems and so on Ozdamli, Fezile; Ozdal, Hasan (May-2015)
- This method will be selected and used in future.

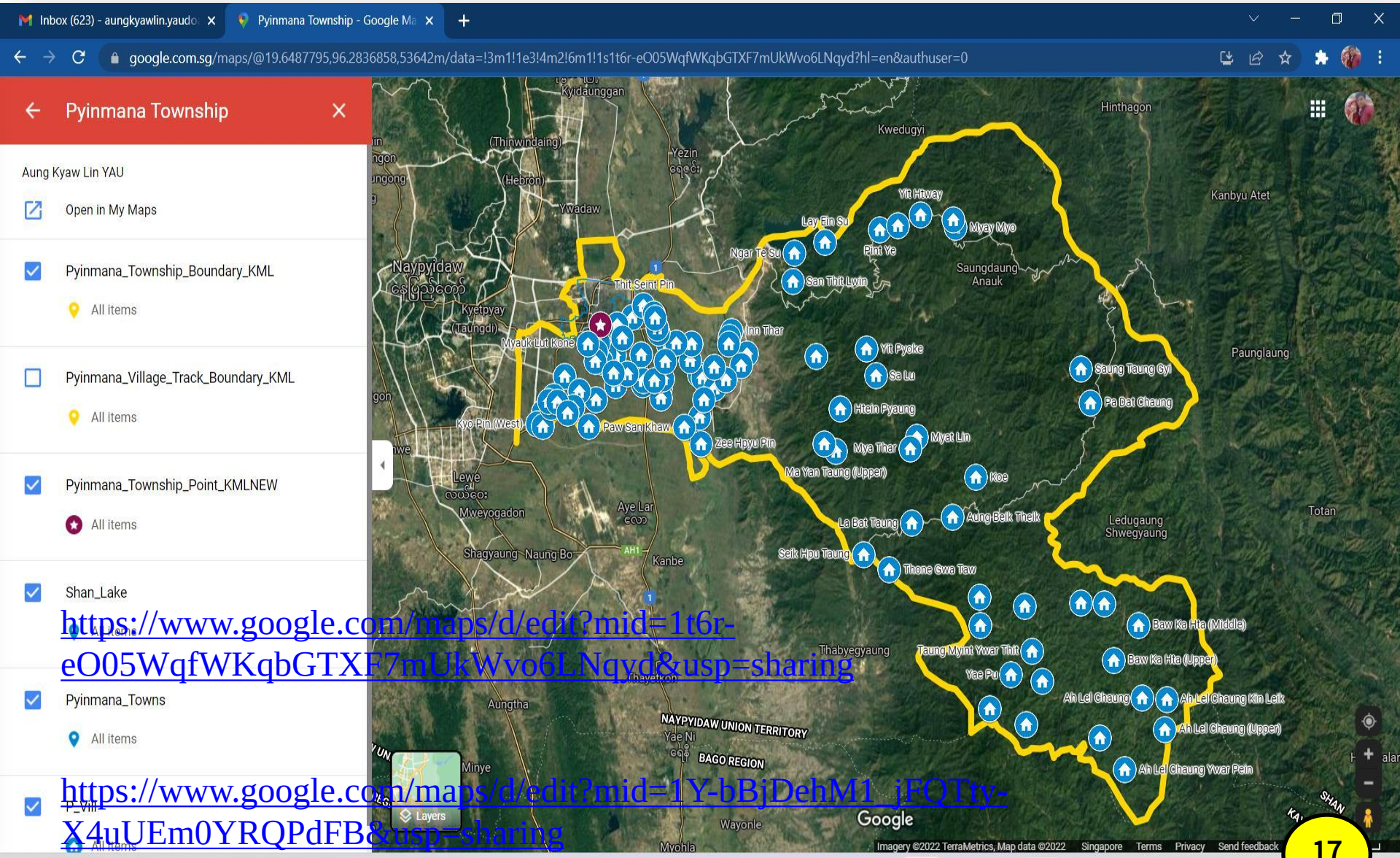
  By using this method,

  ✓ sunflower growers can get high benefit from sunflower production.

  ✓ Domestic oil self-sufficiency

  ✓ Increasing the income of farmers and Food safety.
- Moreover, other townships other than Pyinmana Township, I will continue to work on the suitability of crops for districts and regions. **(If I got the required data of temperature and rainfall, other crops can be calculated by this way).**

Future Plan



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https://www.google.com/maps/d/edit?mid=1Y-bBjDehM1_jFQTty-X4uUEm0YRQPdFB&usp=sharing

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- **May Thet Htar, Theingi Myint, Thi Thi Soe, Moh Moh, Yin Nyein Aye, Chue Htet Hnin, Htet Marlar Aye (2022)** "Analysis of edible oil consumption in Myanmar; per capita consumption, oil types and regional differences" FFTC Agricultural Policy Platform, Publication in progress.

Thank You for your attention