Geographical Analysis on the subsistence efficiency of Paddy and Edible Oil in Myingyan Township

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Abstract

This research paper analyses the subsistence efficiency of paddy and edible oil in Myingyan Township. This analysis is based on crop cultivations, in the year of (2010-11). The major economic activity of the study area is agriculture and main cultivated crops are paddy, maize, groundnut, sesamum, sunflower, cotton, tobacco, pulses, onion and chilli. In order to assess the subsistence efficiency of the major crops within the study area, it is analysed by means of Subsistent Efficiency Index (SE). According to the analysis, it is found that the SEI index for paddy indicates that the study area cannot produce paddy sufficiently and SEI index for edible oil shows that it could produce surplus edible oil amounts within the study area. Therefore, Myingyan township is found to be a township in deficient rice and sufficient efficiency in edible oil.

Keywords : paddy, edible oil, Subsistence Efficiency Index(SEI), deficient, Myingyan Township

Introduction

Myanmar is an agro-based country. If the country's agricultural sector was succesfully developed, her economic sector would also be developed. The main economic activity of the study area is agriculture. The study area has an area of about 374.3 sq miles (239,544 arces). Of which, the net sown area has 167,393 acres which constitute about 69.87% of the total land area of Myingyan Township. The Ayeyarwady river and its pumping irrigration system are the most important role in agriculture. Generally, the types of land use can be categorized into four : cultivated land, forest land, other lands and waste land. The cultivated land can be classified into three types: '*Ya*' land, *'Le'* land and '*Kaing- Kyun'* land. '*Ya'* land occupies 124,757 acres of the cultivated land and it is the first rank. Among the cultivated crops, Major crops are paddy, groundnut, sesamum, sunflower, cotton, tobacco, onion, maize, pulses and chilli. In old days these were grown as subsistent crops but in today they are grown intensively as cash crops intensively. Therefore, these important crops cultivation are analyzed for the economic development of Myingyan Township. These resulting development levels of economic will help in future plans for the economic development of Myingyan Township.

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Aim and Objectives

The main aim of this research is the analysis on subsistence efficency of paddy and edible oil in Myingyan Township.

The objectives for this research are :

- to analyze the crop cultivation of the study area and
- to analyze the subsistence efficiency in production of paddy and edible oil seeds.

Materials and Methods

Both secondary and primary data are collected from the various reference books and Government Offices such as Land Records Department, Department of Agriculture. Primary data were collected from the field observation.Where as the production of those crops meets with local needs of them or not is examined by using subsistence efficiency index (SEI).

Geographical Background of Myingyan Township

The study area of Myingyan Township is one of the 36 townships in Mandalay Region. It lies in the western part of the Mandalay Region in Central Myanmar, located between latitudes 21°20' north and 21°46' 15" north and longitudes 95°15' 30" east and 95°37'30" east. It has an area of 374.3 square miles (239,544 acres) and takes the shape elongated in the north-south direction and relatively narrow in the east-west direction. (See Map.1)

Generally, the study area is a level plain with a height ranging from 200 feet to more than 1,500 feet above sea level, except a few high terrains.

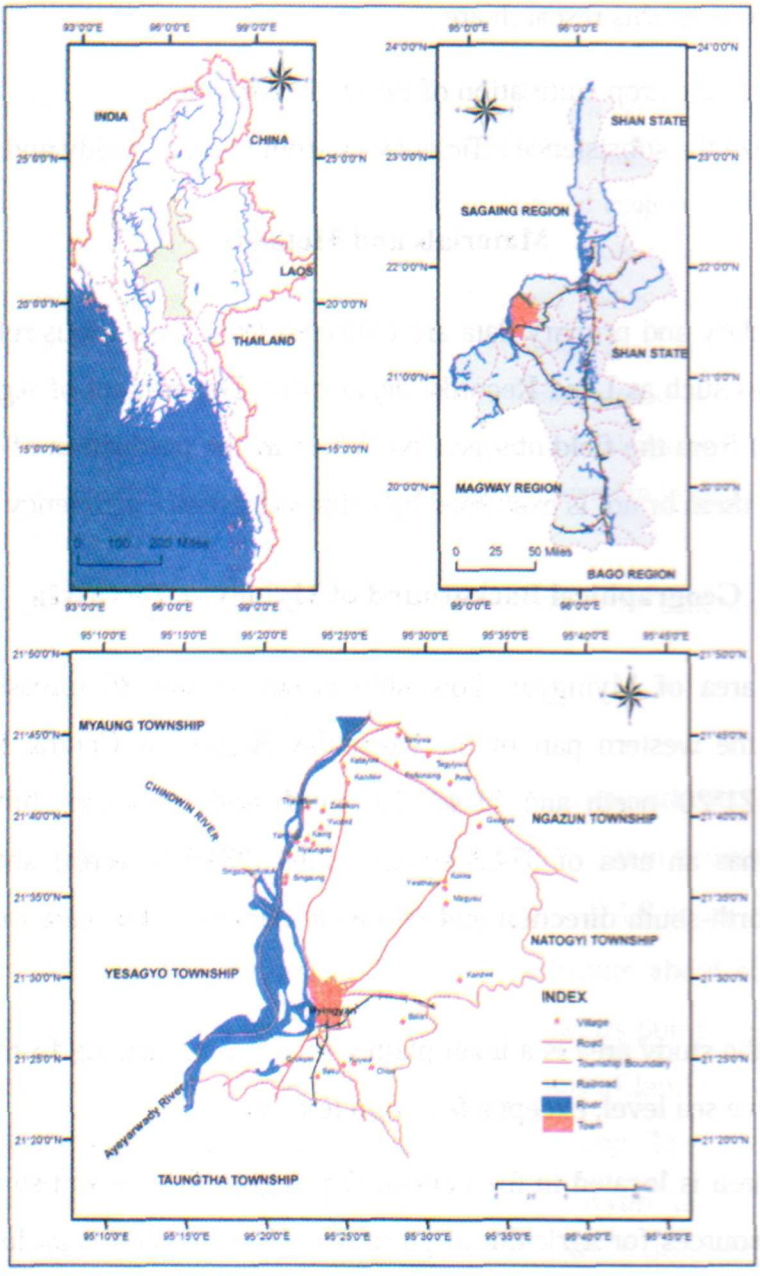
The study area is located in the Central Dry region. Rivers and streams are the most important water resources for agricultural purposes. The township is included in the hottest area of Mandalay Region.

According to Koppen's classification of climates, based on the 27 year-meteorological data, Myingyan township has BSh (Tropical Steppe Climate) type of climate with average annual temperature of 82.31°F and 24.68 inches of average annual rainfall.

The soils occur in parallel belts from north to south. Myingyan Township receives low rainfall. Consequently, the soils have little moisture due to evaporation under intense

heat. The various kinds of soils can be found in Myingyan Township. These are red brown savanna soil, meadow alluvial soil, meadow valley gley soil and primitive crushed stone soil.

Map (1) Location Map of Myingyan Township



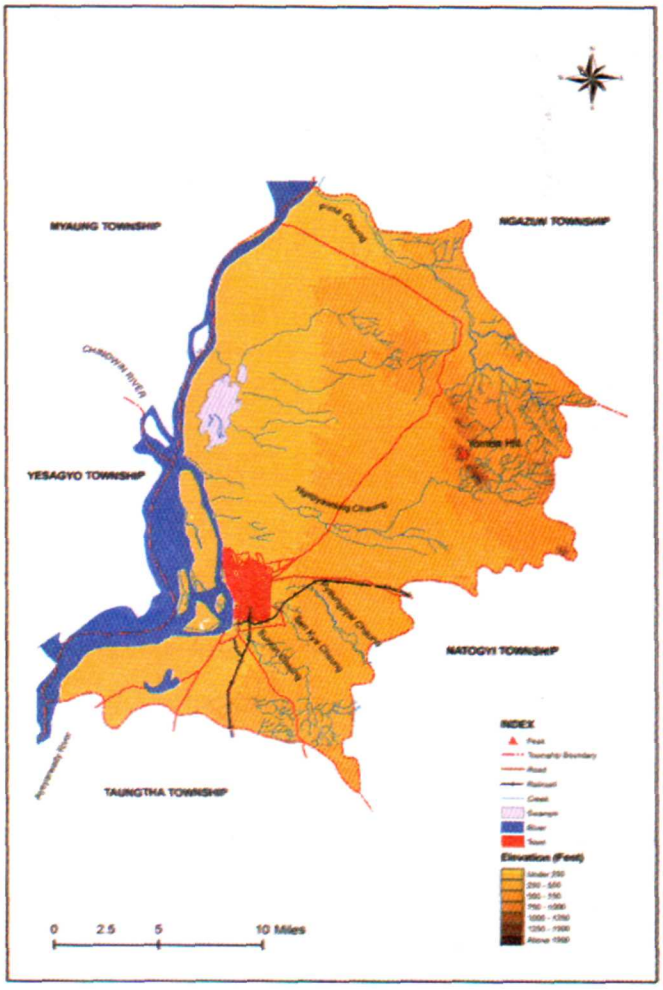
Source : Land Records Department, Myingyan, UTM Map, No. 2395-5,6,7,8, 10,11

Economic activities of the study area vary with distribution and density of population, and local physical features. People are densely distributed in the near township.

In 2010 the township had a population density of 1,228 persons per square mile. 156,915 persons or 34.14% of the total population are concentrated in the Myingyan town proper with a population density of 17,572 persons per square mile. Generally population is

dense in the village tracts, not far from the town of Myingyan, and lying along the Ayeyarwady River whereas it is thinly populated in the northern parts of the township.

Map (2) Topography and Drainage of Myingyan Township



Source : DEM derived from ASTER G Grid N21E095

Geographical Analysis on Crop Cultivation of Myingyan Township

Agricultural activity plays a vital role in economic activities because Myingyan is a township mainly relying on agriculture. Depending upon the physical factors, land use types of the township differ from place to place. The types of land use can be categorized into four: cultivated land, forest land, other lands, and waste land. Cultivated land comprises "*Le*' land, "Ya" land, and "*Kaing-Kyun "land. Out* of the township's total area, the largest area is occupied by cultivated land accounting for 167,393 acres or 69.87%, of which '*Ya'* land occupies 124,757 acres, '*Le'* land 24,443 acres, and '*Kaing-kyun' land 18,193* acres. In the '*Le'* land are included 767 acres under dam irrigation, 762 acres under irrigation from river,

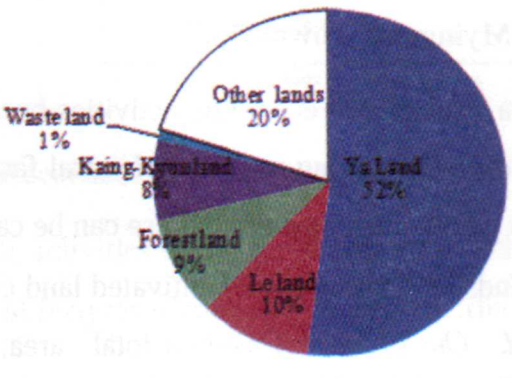
and 3153 acres of rain-fed land. As other land use, there are 21,415 acres (8.94%) of forest land, 2,746 acres (1.15%) of waste land, and 47,991 acres (20.03%) of land used in various ways; use as urban land, roads, dam, pond, reservoir, and stream or river beds under water.

Table (1) General Land Use of Myingyan Township in 2011

Sr.	Types of Land Use	Area (in acres)	% of the township
1	*Le* land	24,443	10.2
	Paddy-cultivated land	4,682	1.95
	Other crop land	19,761	8.25
2	*Ya* Land	124,757	52.08
	Cultivated land	123,729	51.65
	Uncultivable land	1,027	0.43
3	*Kaing-Kyun* land	18,193	7.59
4	Forest land	21,415	8.94
5	Other lands	47,990	20.03
6	Waste land	2,746	1.15
	Total	239,544	100

Source: Township Land Records Department,Myingyan Township.

Figure (3.1)General land Use of Myingyan Township in 2011



Source: Based on Table 1.

1. Cereal Crops

Cereal crops grown commonly in the township are paddy (rice), corn (maize), and wheat.

Paddy (Rice)

Paddy is cultivated on yearly average of 15,053 acres, mostly in rainy season and some in summer season. In 2010-11, it occupied 16,561 acres or 9.89% of the total net sown acreage. Monsoon paddy is usually grown on irrigated "*le* "land in July and August and harvested in November and December. The summer paddy is usually cultivated in April and harvested in July or August. The most commonly sown paddy varieties are *Midon, Sintheingi, Manawthukha, Shwetasoke, Ngasein,* and *Ayeyarmin.*

Regarding per-acre-yield rate, it increased from 66.61 baskets in 1982-83 to 89.77 baskets in 2003-04, and then fell to 70.46 baskets in 2007-08. Since 2007-08, it has again increased to 78.35 baskets in 2010-11.This increase was due to the effect of irrigation from North Pinle reservoir, Pyokan reservoir, and of river pumping irrigation at Semekhone No.1, No.2, No.2 extension, and Seiknyan. In irrigated paddy-fields it yields 94.39 baskets per acre in average but about 75 baskets per acre in rain-fed area.

As paddy-production of the entire township, it has increased by 862,991 baskets from 277,393 baskets in 1999-2000 to 1,140,384 baskets in 2010-2011. Between these two years, accordingly with increase in per-acre yield, the total production has also increased. For the entire township, it needs 6,433,952 baskets of paddy for consumption, 27,306 baskets for pure seeds, and 40,960 baskets for waste, totalling 6,502,218 baskets. If the paddy production of the township is compared to the total needs of paddy, 5,361,834 baskets are still needed. Subsistent efficiency on paddy of the township is 17.54% in 2011. Therefore, Myingyan township can be assumed to be a township in deficient rice.

Maize (Corn)

The township had an average maize-sown area of 17,373 acres, but a total maize-sown acreage of 16,105 in 2010-11. It accounts for 10.38% of the total cultivated land. Cob corn is usually cultivated on '*Ya*' land in monsoon season and pre-monsoon season and harvested in 3 months later.The sown acreage of corn accounted for more than 22,000 acres

during the 2003-2007 years. After 2007, it was less than 20,000 acres. However it has increased gradually from 10735 acres in 2007-08 to 16,105 acres in 2010-11.

When grown in irrigated area, an acre is fed one bag each of T-super and Pale fertilizer to the soil. In 2010-11, per-acre yield averages 10 baskets in seed-corn and 18,500 cobs in consumption maize. In 2010-11 the township could produce 161,855 baskets of maize in total. Mostly all of the production is used up in the township.

Wheat

Wheat is grown on an annual average area of 616 acres, particularly on *Ya* land as a mono crop. It is sown in October and harvested in January. In 2010-11, 535 acres were under wheat cultivation and was less than the average sown acreage of wheat. It is grown for local use, by pumping irrigation from the Ayeyarwady River, mostly in the village tracts of Talokemyo, Sinchaung, Kataw, Tawbu, Singuit, Nyaungto, Gintge, Kaing, Lintgyi, Zidaw, Kalarywa, Kaingtaung, Yantapo, and Semekhone. The largest production was found in 2005-06 with 35,695 baskets and the smallest in 1999-00 with 5,100 baskets. In 2010-11, the township could produce 9,240 baskets of wheat.

2. Oil Seed Crops

Among the edible oil seed crops, commonly grown in Myingyan township are included sesamum, groundnut, sunflower, and niger seed. The edible oil seed crops occupy the largest sown acreage among the crops and have an average sown area of 68,940 acres every year. In 2010-11 the oil seed crops occupy 86,238 acres. It represents 51.52% of the total cultivated land.

Sesamum

Among the oil seed crops, sesamum occupies the largest sown acreage. It is grown mostly on '*Ya*' land, and about 50,000 acres every year. Its sown acreage varies with oscillation period of early rain and early or late retreat of monsoon rain. Of two types of sesamum, pre-monsoon sesamum locally known as *hnanlyin* is mostly grown and post-monsoon sesamum locally known as *hnangyi* is grown in a few acres. *Hnangyi* can be grown in places of other cash crops whose sowing season is late. The smallest and the largest sown acreages as well as in production are found in 2001-02 and 2008-2009, respectively. Yield per acre ranges from 2 to 5 baskets depending upon the rain.

The largest production of sesamum was found in 2002-03 with a total output of 594,749 baskets and the smallest production in 2006-07 with 59,213 baskets. In 2010-11, the township could produce 248,496 baskets of sesamum. In other words edible oil could be produced about 1,366,728 viss in that year.

Sunflower

In Myingyan township sunflower occupies 9.59 % of the total cultivated land and its yearly sown acreage ranged from 2,200 to 5,300 acres before 2005-06, and from 10,000 acres to 17,000 acres in recent years. Formerly it was cultivated as a mixed crop but today commonly grown on *Ya* land as mono crop separately, for local consumption and as a commercial crop. During the 1999-00 years, the smallest sunflower-sown acreage occurred in 2004-05 with 2,622 acres and the largest sown acreage in 2008-09 with 17,086 acres.

The village tract that grows sunflower in the largest sown acreage is Gyokepin with 743 acres and the village tract with the smallest sown acreage of sunflower is Shadaw with 27 acres. In the township there is no village tract which does not grow sunflower.

The largest production of sunflower was found in 2008-09 with a total output of 434,285 baskets and the smallest production in 2000-01 with 51,353 baskets. Yearly production has increased from 106,400 baskets in 1999-00 to more than 400,000 baskets after 2006-07. In 2010-11, the township could produce 409,419 baskets of sunflower, i.e. in that year edible oil could be produced about 941,664 viss from sunflower.

Groundnut

Groundnut occupies the third largest sown acreage among the oil seed crops and is grown on "*Ya*" land and '*Kaing-kyun*' to get edible oil. It is cultivated as mono crop. It is sown in October or November and harvested in January or February. During the observed years the township grew it about 7,628 ~ 14,522 acres per year. Before 2005-06 yearly sown acreage was less than 10,000 acres but after 2004-05 it has increased to more than 10,000 acres for examples 11,986 acres in 2005-06, 12,484 acres in 2007-08, 14,474 acres in 2009-10, and 14,522 acres in 2010-11. It (that of 2010-11) represents 8.68% of the total cultivated land. Generally its yearly sown acreages have increased by a few hundreds in recent years, depending on the annual rainfall. It is grown in rows in a traditional style, by using pure seeds chosen from the local produce.

In Myingyan township, except Aingma, shadaw, and Chaungdaung village tracts, all of the village tracts grown groundnut on a few acres or a few hundreds of acres. The largest groundnut-sown acreage occurred in Balon village tracts with 957 acres, and the smallest acreage in Pyokan village tract with 7 acres.

In accordance with increasing growing acre of groundnut, yearly production has also increased by 426,834 baskets from 292,441 baskets in 1999-00 to 719,275 baskets in 2010-11. Starting from 2008-09, yearly production of groundnut has exceeded 700,000 baskets with an average yield of about 49 baskets per acre. In 2010-11, Myingyan township could produce the edible oil about 1,158,038 viss.

As the production of edible oil from the above-mentioned three crops, the township could produce a total of 3,466,430 viss in the year 2010-11. Local consumption of edible oil for the entire township is estimated about 2,757,408 viss for the total population of 459,568 persons. If estimated local comsumption is subtracted from the production, 709,022 viss will come out as the surplus. Therefore, subsistence efficiency of edible oil of Myingyan township in 2010-11 is 125.71%. Some of subsistence efficiency are found to be 107.08% in 2006-07, 131.55% in 2007-08, 138.66% in 2008-09, and 137.38% in 2009-10. Therefore, Myingyan township can be assumed to be a township having a sufficient efficiency in edible oil production.

Analysis on Subsistence Efficiency in Production of Paddy and Edible Oil Seed Crops

Myingyan can be assumed to be an agricultural township. In accord with being the agricultural township, cultivation of crops is done adaptably to its physical environment such as climate, soil, relief and drainage. Particularly, paddy is grown as first priority where irrigation is possible. Where irrigation is impossible, edible oil crops are cultivated as first priority and pulses and beans as second priority. Therefore, cultivation of paddy and edible oil seed crops, which are staple foods, plays an important role in agriculture of economic activity. Based on these, whether the production of those crops meets with local needs of them or not is examined by using Subsistence Efficiency Index (SEI) as shown below.

$$\text{Subsistence Efficiency Index} = (\Sigma Pt \div \Sigma Ln) \times 100$$

Where, Σ Pt is the total production of a selected crop in an area, and Σ Ln is the total local need of the crop in the same area, within a year. According to the formula, if the result is 100, it means "efficiency", if less than 100, it refers to "inefficiency", if more than 100, it reveals

"more than enough" or "surplus". In this analysis SEI 150% means that 100% refers to accurate amount enough for local need and another 50% to the surplus amount; and also SEI 250% means 100% to accurate amount enough for local need and another 150% to the surplus amount. In other words SEI 250% means the amount 2.5 times the local need 100%.

The efficiency of two major crops, paddy and oil seed crop, are analyzed for the entire township from the year 2006-2007 to 2010-2011. In calculation of local needs, essential need of paddy per person is assumed to be 14 baskets a year, and edible oil per head per year to be 6 viss (according to field observation). With this assumption, SEIs of paddy and edible oil seed crops for the entire township are calculated, and the results are described in tables.

Regarding efficiency of paddy, the SEIs 41.51 in 2006-2007,41.82% in 2007-2008, 28.44% in 2008-2009, 16.74% in 2009-2010, and 29.70% in 2010-2011 all show that Myingyan township can produce paddy about 16.74% ~ 41.82% of the local need. Within the past 3 years, not more than 30% of the local need of the entire township could be produced. The reason appears that those years were the drought years and thus small local reservoirs and ponds could not irrigate paddy fields adequately. Therefore, Myingyan can be assumed to be a township area as the deficience with in self-sufficient production of paddy.

Table (2) Subsistence-Effiency Index of Paddy in Myingyan Township

Year	(Σ Pt)	(Σ Ln)	SEI
2006-2007	2,606,357	6,278,865	41.51
2007-2008	2,372,670	5,673,529	41.82
2008-2009	1,489,835	5,238,520	28.44
2009-2010	873,711	5,219,301	16.74
2010-2011	1,140,384	3,839,458	29.70

Note: Pt=Township Production, Ln=Local need

Table (3) Subsistence Efficiency Index by Village Tracts for Paddy (2010-11)

Sr.	Village Tract	Σ Pv	Σ Ln (Paddy)	SEI
1	Singuit	83,599	15,092	553.9
2	Sakyui	21,703	15,596	139.2
3	Petaw	21,468	21,980	97.7
4	Nabuaing	40,899	47,362	86.4
5	Tawpu	35,963	44,884	80.1

Sr.	Village Tract	Σ Pv	Σ Ln (Paddy)	SEI
6	Htanaungkhone	15,905	25,942	61.3
7	Htanaungtaing	58,449	96,488	60.6
8	Zidaw	9,950	19,390	51.3
9	Yontoe	24,053	47,460	50.7
10	Nyaungwun	3,682	7,434	49.5
11	Pyokan	6,581	13,650	48.2
12	Gyokepin	20,606	67,998	30.3
13	Pinle	13,555	45,892	29.5
14	Balon	32,437	116,592	27.8
15	Kaingtaung	4,153	16,772	24.8
16	Mepauk	11,439	46,872	24.4
17	Semekhone	31,653	148,218	21.4
18	Nganan	23,505	118,146	19.9
19	Sakhar	4,388	22,358	19.6
20	Yetaing	4,858	26,096	18.6
21	Thapaung	29,930	212,562	14.1
22	Zeepinkan	5,406	44,436	12.2
23	Kuywa	7,600	64,932	11.7
24	Lintgyi	14,338	141,610	10.1
25	Kanswe	1,880	22,568	8.3
26	Kanchaw	7,992	112,056	7.1
27	Kalarywa	2,115	29,974	7.1
28	Tatywa	1,410	21,868	6.4
29	Thepyuwa	5,406	108,024	5.0
30	Talokemyo	8,775	224,616	3.9
31	Ayeywa	627	17,626	3.6
32	Daungthit	4,623	142,478	3.2
33	Ywatharyar	1,097	39,172	2.8
34	Pyawbwe	2,351	124,278	1.9
35	Pyar	705	42,574	1.7
36	Pyaw	392	24,780	1.6

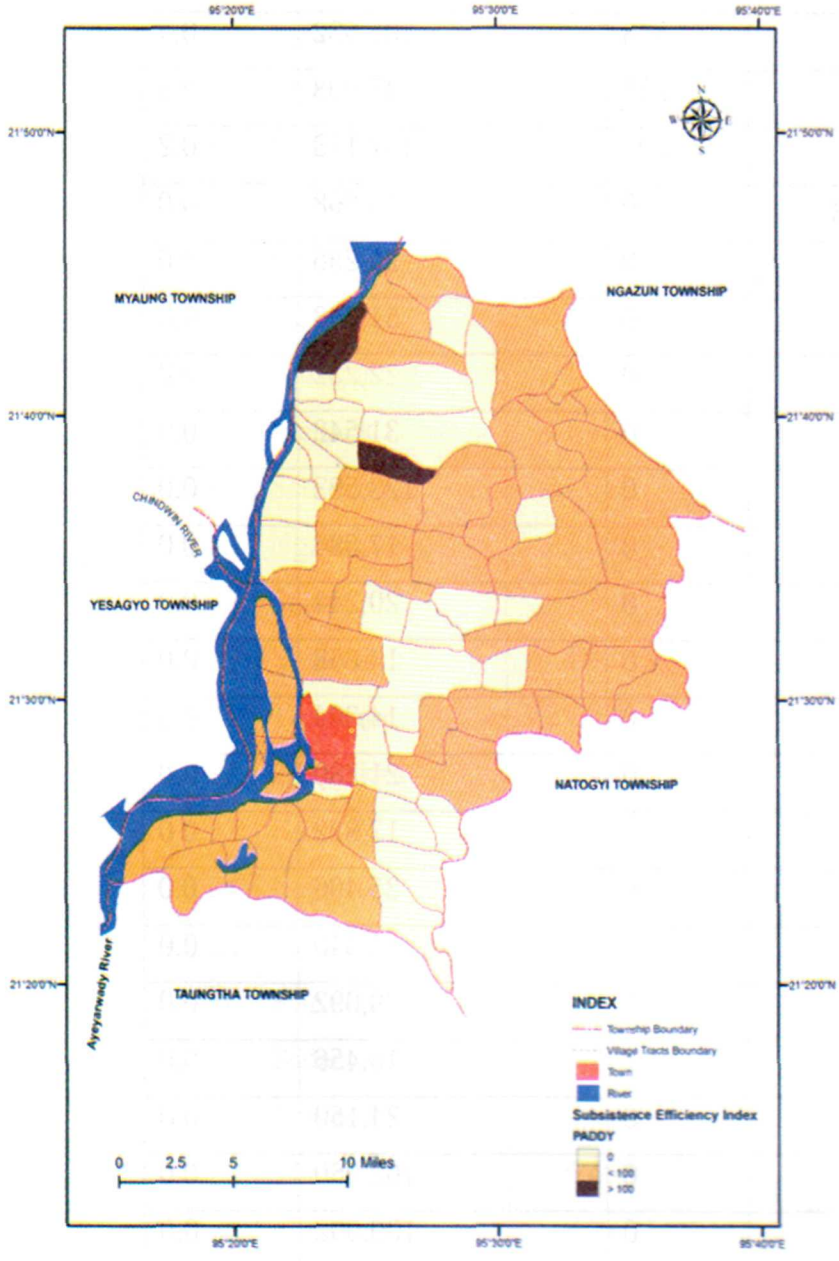
Sr.	Village Tract	Σ Pv	Σ Ln (Paddy)	SEI
37	Thinpyun	1,254	138,348	0.9
38	Layaingtan	1,332	150,752	0.9
39	Yatha	705	110,418	0.6
40	Ywasi	548	105,532	0.5
41	Taywinbo	235	47,908	0.5
42	Gaunggwe	392	167,118	0.2
43	Phatpinaing	0	115,668	0.0
44	Kanni	0	25,256	0.0
45	Kataw	0	51,758	0.0
46	Kyiywa	0	22,232	0.0
47	Kantaw	0	31,542	0.0
48	Kyataing	0	123,592	0.0
49	Gintge	0	17,584	0.0
50	Kaing	0	20,244	0.0
51	Yantapo	0	14,658	0.0
52	Nyaungto	0	14,364	0.0
53	Sinchaung	0	21,280	0.0
54	Aingma	0	17,822	0.0
55	Thityon	0	35,406	0.0
56	Kokeke	0	25,340	0.0
57	HHteinpan	0	29,092	0.0
58	Nathtar	0	15,456	0.0
59	Kyipinkan	0	24,150	0.0
60	Lethit	0	162,960	0.0
61	Shadaw	0	100,002	0.0
62	Kwunseik	0	90,692	0.0
63	Chaungdaung	0	76,734	0.0
64	Kansin	0	65,884	0.0
65	Chaysay	0	18,312	0.0
66	Gwepinyo	0	59,262	0.0
67	Myoma/Sunlun	0	2,196,810	0.0

Note: Pv= Production by village tract, Ln=Local need

Source: Complied by the researcher based on the data from Land Record Department

Map (3) Subsistence Efficiency Index for Village Tracts for Paddy

(2010-11)



Source: Township Land Records Department, Myingyan, Based on table (3)

In efficiency of edible oil, production of sesamum, sunflower, and groundnut crops are considered here. According to the average common production of oil per basket, it is noted that if one basket is pressed 5.5 viss is obtained from sesamum, 2.3 viss from sunflower, and 1.6 viss from groundnut. By using these rates, oil production from each of edible oil crops is calculated for the entire township, and then they are summed as the total

production of edible oil **(Σ Pt).** In calculation of local need (Ln), individual consumption of edible oil is assumed to be 6 viss per year and then that 6 viss is multiplied by the total population of the township in order to get the total local need or consumption of edible oil for the entire township. Then Subsistence Efficiency Index (SEI) of edible oil is calculated by dividing the total production of edible oil **(Σ Pt)** by the total local need of oil **(Σ Ln).** Production of edible oil from sesamum (Sm), sunflower (Sf), groundnut (Gnt), the total production of edible oil from the three for the entire township, yearly needs of local consumption, and the resulting SEIs are described in table.

Table (4) Subsistence Effiency Index of Edible Oil in Myingyan Township

Year	Sm (Σ Pv)	Sf (Σ Pv)	Gnt (Σ Pv)	(Σ Pt) Oil	(Σ Ln) Oil	SEI
2006-2007	1,331,919	607,497	894,037	2,833,453	2,690,940	105.3
2007-2008	1201,547	991,792	994,686	3,188,025	2,431,512	131.1
2008-2009	889,394	998,856	1,139,896	3,028,146	2,245,080	134.9
2009-2010	1,258,389	983,772	1,156,531	3,398,692	2,236,842	151.9
2010-2011	1,366,728	941,664	1,150,840	3,459,232	1,645,482	210.2

Note: Sm=Sesamum, Sf=Sunflower, Gnt=Groundnut, Pt=Township

Production

According to the result, it is found that Myingyan township could yearly produce edible oil ranging from 1,645,482 viss to 2,690,940 viss during the 2006-2011 years. The SEI value of 105.3% shows the township could produce just sufficient amount of edible oil in 2006-2007. After that year, it is found that yearly SEI has increased year after year till more than 130% and it reached to 210.2% in 2010-2011 year. SEI 210.2% in 2011 indicates that the production was 2.1 times the local need. The increase was due to increase of sesamum growing acreage while it was decreasing in paddy-cultivated area. As a whole, the result indicates that Myingyan is a township that can produce edible oil more than the amount of local need.

Table (5) **Subsistence Efficiency Index by Village Tracts for Edible Oil (2010-11)**

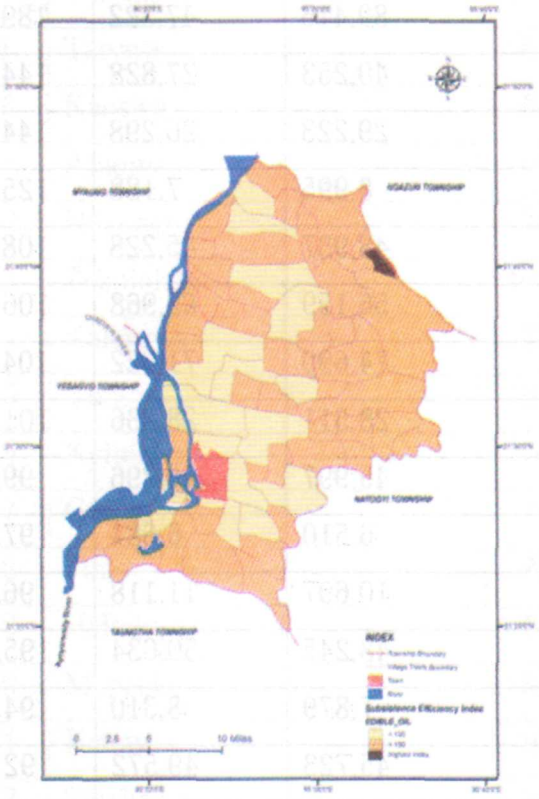
Sr.	Village Tract	Σ Pv Oil (Gdt+Sm+Sf)	Σ Ln (Oil)	SEI
1	Pyokan	71,815	5,850	1,227.6
2	Nyaungwun	30,608	3,186	960.7
3	Thityon	115,838	15,174	763.7
4	Nathtar	49,543	6,624	747.9
5	Sakhar	69,961	9,582	730.1
6	Singuit	44,101	6,468	681.8
7	Yetaing	76,199	11,184	681.3
8	Ywatharyar	113,331	16,788	675.1
9	Tatywa	61,451	9,372	655.7
10	Kanswe	63,168	9,672	653.1
11	Aingma	47,815	7,638	626.0
12	Nyaungto	38,167	6,156	620.0
13	Zeepinkan	105,002	19,044	551.4
14	Kalarywa	70,276	12,846	547.1
15	Yontoe	101,242	20,340	497.7
16	Kyipinkan	50,089	10,350	484.0
17	Gintge	35,158	7,536	466.5
18	Pinle	89,462	19,668	454.9
19	HHteinpan	54,826	12,468	439.7
20	Mepauk	85,919	20,088	427.7
21	Kataw	92,710	22,182	418.0
22	Sinchaung	35,926	9,120	393.9
23	Taywinbo	80,808	20,532	393.6
24	Ayeywa	29,379	7,554	388.9
25	Kanni	41,509	10,824	383.5
26	Kokeke	40,092	10,860	369.2
27	Petaw	32,360	9,420	343.5
28	Chaysay	26,750	7,848	340.9
29	Pyaw	35,839	10,620	337.5

Sr.	Village Tract	Σ Pv Oil (Gdt+Sm+Sf)	Σ Ln (Oil)	SEI
30	Balon	164,753	49,968	329.7
31	Yantapo	20,401	6,282	324.8
32	Kaing	26,312	8,676	303.3
33	Kantaw	40,054	13,518	296.3
34	Gyokepin	84,857	29,142	291.2
35	Pyar	52,424	18,246	287.3
36	Kyiywa	25,878	9,528	271.6
37	Tawpu	46,711	19,236	242.8
38	Kanchaw	116,226	48,024	242.0
39	Thinpyun	125,406	59,292	211.5
40	Yatha	89,416	47,322	189.0
41	Kuywa	40,253	27,828	144.7
42	Nabuaing	29,223	20,298	144.0
43	Kaingtaung	8,995	7,188	125.1
44	Ywasi	48,937	45,228	108.2
45	Kyataing	56,159	52,968	106.0
46	Gaunggwe	74,690	71,622	104.3
47	Kansin	28,511	28,236	101.0
48	Thepyuwa	45,997	46,296	99.4
49	Sakyui	6,510	6,684	97.4
50	Htanaungkhone	10,697	11,118	96.2
51	Nganan	48,245	50,634	95.3
52	Zidaw	7,879	8,310	94.8
53	Phatpinaing	45,723	49,572	92.2
54	Gwepinyo	23,126	25,398	91.1
55	Lethit	63,111	69,840	90.4
56	Layaingtan	57,666	64,608	89.3
57	Semekhone	50,024	63,522	78.8
58	Daungthit	46,999	61,062	77.0
59	Talokemyo	73,811	96,264	76.7
60	Htanaungtaing	31,307	41,352	75.7
61	Thapaung	67,106	91,098	73.7

Sr.	Village Tract	Σ Pv Oil (Gdt+Sm+Sf)	Σ Ln (Oil)	SEI
62	Kwunseik	26,455	38,868	68.1
63	Pyawbwe	34,762	53,262	65.3
64	Chaungdaung	15,616	32,886	47.5
65	Lintgyi	23,787	60,690	39.2
66	Shadaw	2,160	42,858	5.0
67	Myoma/Sunlun	37,736	941,490	4.0

Source: Complied by the researcher based on the data from Land Record Department

Map (4) Subsistence Efficiency Index for Village Tracts for Edible Oil



Source: Township Land Records Department, Myingyan, Based on table (5)

Results and Discussions

According to the analysis, out of 67 village tracts in Myingyan township, there are 42 village tracts that produce paddy and 25 village tracts that cannot produce paddy. The result shows that there are only 2 village tracts that could produce paddy more than local needs in Myingyan township, namely Singuit and Sakyui. 47 village tracts have sufficient production of edible oil. The increase was due to increase of sesamum growing acreage while it was

decreasing in paddy-cultivated area. As a whole, the result indicates that Myingyan is a township that can produce edible oil more than the amount of local needs.

Conclusion

The study area is located in the western part of the Mandalay Region in central Myanmar with low rainfall. The general topographic features of the study area is a level plain except few high terrains. The most important water resources for agricultural purposes in rivers and streams. Agricultural activity plays a vital role in economic activities because Myingyan is a township mainly relying on agriculture. Common crops are paddy, maize, groundmut, sesamum, sunflower, cotton, tobacco, pulses and beans, onion and chilli.

Paddy is cultivated on yearly average of 15,053 acres, mostly in rainy season. Regarding subsistence efficiency on paddy of the township is 29.70% in 2011. The paddy production of the township is compared to the total needs of paddy are still needed. Therefore, Myingyan township can be assunned to be a township in deficient rice. Edible oil production is calculated for the entire township. The SEI value of 105.3% shows the township could produce just sufficient amount of edible oil in 2006-2007 and 210.2% in 2011 The result indicates that Myingyan township can be assumed to be a township having a sufficient efficiency in edible oil production.

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မြန်မာကျမ်းကိုးစာရင်း

၁။ မြန်မာ့စိုက်ပျိုးရေးလုပ်ငန်း၊ လယ်ယာစိုက်ပျိုးရေးနှင့်ဆည်မြောင်းဝန်ကြီးဌာန၊ နှစ်အလိုက် သီးနှံစိုက်ပျိုးထုတ်လုပ်မှု နှစ်ချုပ်အစီရင်ခံစာ များ (၁၉၉၉-၂၀၀၀မှ ၂၀၁၁ -၂၀၁၂ထိ) မြို့နယ် စိုက်ပျိုးရေး ရုံး၊ မြင်းခြံ မြို့။

၂။ မြို့နယ်၏ကျေးရွာအုပ်စုအလိုက် စိုက်ပျိုးထုတ်လုပ်မှု အစီရင်ခံစာများ၊ အရေးကြီးသီးနှံများ (၁၉၉၉ မှ၂၀၁၀) မြို့နယ်စိုက်ပျိုးရေးရုံး၊ မြင်းခြံမြို့။

၃။ မြင်းခြံမြို့နယ် အုပ်ချုပ်ရေးမှူးရုံး၊ ကျေးရွာအုပ်စုအလိုက် ဒေသဆိုင်ရာ အချက်အလက်များ မြင်းခြံမြို့။