

EDIBLE OIL INDUSTRY

1. INTRODUCTION

Oilseed crops are second to paddy in-term of sown area in Myanmar. The major oilseed crops are groundnut, sesame and sunflower covering 22%, 53.2 % and 19.4 % of sown area respectively. Niger and mustard are also important in some regions with 3.4 % and 2% of sown area.

Table 1 : Oilseed Crops Sown Area in 2000-2001

('000 acres)

No.	Crop	Sown area	% of total sown area	Remark
1	Groundnut	1,460	22	Major crop
2	Sesame	3,518	53	"
3	Sunflowe	1,280	19	"
4	Niger	226	3	Minor crop
5	Mustard	128	2	"
	Total	6,612	100	

Source: MAS.

Recently total requirement of edible oil for local consumption is 300,000 metric ton per year where 100,000 metric ton is imported. Demand for edible oil is on the increase due to excessive use of edible oil in Myanmar diet and increasing population. The remedies for increase edible oil production are area expansion and yield promotion using quality seed and better-improved agro-techniques. According to the population growth, 376,000 metric ton of edible oil will be needed in the year of 2002-03. Production of edible oil will be 490,000 metric ton which is more than enough.

2. BACKGROUND HISTORY

Groundnut is the second important oilseed crop in Myanmar. In the year 1885-86, Mr. W.A Hertz reported that groundnut was introduced from Shan State to Magway Division and had sown 2,700 acres. It spread out Pakokku and Myingyan District, then the whole Upper Myanmar.

Table 2 : Production of Edible Oil in Year 2002-2003

No.	Crop	Sown area (thousand acre)	Production (mt)	Edible Oil (mt)
1	Groundnut	1,476,424	738,760	216,000
2	Sesame	3,537,248	443,020	165,020
3	Sunflower	1,530,488	383,390	87,630
4	Niger	216,093	32,370	10,960
5	Mustard	140,693	30,970	9,940
	Total	6,900,946	1,635,050	489,550

Source: MAS.

Sesame is the oldest of the oilseed crops known to man. It has been under cultivation in Asia since in ancient times. According to the stone sculpture, sesame was cultivated in Bagan Dynasty and was recorded. In the government report on crop production in 1894-95, there were more than 400,000 acres of sesame cultivated.

Sunflower is the third important oilseed crop compare to sesame and groundnut. Until 1968 it was grown for snack food using local varieties with low oil content. In 1968, new varieties of sunflower were introduced from Russia with high oil content. The introduced varieties were open-pollinated and yield decrease year by year.

3. OILSEED CROPS PRODUCTION IN THE PAST

3.1. Colonial Era (1900 to 1948)

Groundnut and sesame cultivation data were recorded starting from 1901 but yield and production data were firstly found in 1914.

3.1.1. Groundnut

Local groundnut variety and introduced low-yield variety (big Japan and small Japan) were grown until 1929. Drought tolerant and suitable to grow in dry upper Myanmar, SP-121/070 from Argentina was introduced in 1930 and quickly spread in Upper Myanmar.

Until 1920, groundnut sown area was not more than 300,000 acres. Area

expansion was doubled in 1947 up to 727,778 acres with yield pound per acre ranging 425 to 996 (Table 3).

3.1.2. Sesame

Sesame cultivation was the earliest compared to groundnut and sunflower. But official record for cultivation was started from 1900-01 with sown area 828,512 acres. In 1947-48, sown area of sesame was 1,369,000 acres, which was not very much different in 1914-15 with the sown area 1,230,000 acres. Yield was decreased 214 lb/ac to 92lb/ac less than half of initial production because of long time production on the same land and world war (Table 4).

3.1.3. Sunflower

Sunflower was not popular for edible oil production in this era. Local sunflower varieties were used for snack food because of low oil content. The area of cultivation was not recorded.

3.2. Independent Era (1948-49 to 1973-74)

3.2.1. Groundnut

Groundnut cultivation was well adapted in Mandalay, Magway and Sagaing Division in this era. SP-121/070, an introduced groundnut variety was widely spread out and successful in the whole country. In dry area Kyaung Gon Pin Pyant, M30-38 was a well-known variety. Groundnut growing area jumped 705,000 acres to 1,638,000 acres with increased yield 469 lb/ac to 680 lb/ac (Table 5).

3.2.2. Sesame

Sesame growing area was increased gradually from 1948 to 1974 and it was nearly doubled in area increase. Yield was stable instead of increase. Farmers used local sesame varieties but a red sesame variety from Tatkon farm was released in 1962. This variety, Hnanni-25/160, was deep rooted and drought tolerant with high-yield (Table 6).

**Table 3 : Groundnut Sown Area, Yield and Production
(1902-03 to 1947-48)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1902-03	3,866			
1903-04	11,731			
1904-05	15,880			
1905-06	37,110			
1906-07	78,743			
1907-08	145,815			
1908-09	248,497			
1909-10	140,717			
1910-11	102,232			
1911-12	142,316			
1912-13	199,534			
1913-14	247,110			
1914-15	273,316	256,000	831	95,000
1915-16	261,764	245,000	896	98,000
1916-17	261,378	244,696	976	106,594
1917-18	249,358	237,453	996	105,568
1918-19	249,427	237,136	936	99,087
1919-20	280,296	260,650	704	81,957
1920-21	302,955			
1921-22	305,789	277,575	734	90,995
1922-23	332,477	291,047	721	93,740
1923-24	390,129	345,612	646	99,698
1924-25	461,856	432,734	818	158,041
1925-26	498,587	468,861	764	159,912
1926-27	523,118	490,176	688	150,469
1927-28	540,071	503,906	646	145,248
1928-29	598,872	555,687	600	148,692
1929-30	570,610	466,737	743	154,715
1930-31	564,523	456,259	725	147,664
1931-32	408,309	331,076	640	94,522
1932-33	521,850	411,152	682	125,235
1933-34	641,088	497,260	627	116,928
1934-35	624,558	497,845	508	112,914
1935-36	660,141	526,588	501	117,776
1936-37	764,600	574,499	443	113,616
1937-38	895,686	672,936	551	165,364
1938-39	839,501	639,500	538	153,606
1939-40	760,469	583,873	588	153,145
1940-41	780,604	594,613	603	160,083
1941-42				
1942-43	754,949			
1943-44				
1944-45				
1945-46	621,637	375,427	456	76,385
1946-47	572,020	317,638	425	60,277
1947-48	727,778	625,800	475	132,532

Source: MAS.

**Table 4 : Sesame Sown Area, Yield and Production
(1900-01 to 1947-48)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1900-01	828,512			
1901-02	82,588			
1902-03	968,505			
1903-04	993,679			
1904-05	1,036,678			
1905-06	929,122			
1906-07	959,973			
1907-08	988,323			
1908-09	1,038,723			
1909-10	1,130,500			
1910-11	937,840			
1911-12	1,069,941			
1912-13	1,208,683			
1913-14	1,230,556			
1914-15	1,210,741	981,000	274	94,000
1915-16	1,201,315	979,000	192	84,000
1916-17	1,216,756	1,025,530	185	84,500
1917-18	1,090,561	899,550	202	81,190
1918-19	1,267,195	1,070,621	171	81,541
1919-20	1,289,513	962,543	164	70,245
1920-21	1,098,354			
1921-22	1,033,674	722,855	137	44,029
1922-23	865,443	611,038	116	31,519
1923-24	1,015,355	669,875	104	31,025
1924-25	1,045,843	821,244	145	53,344
1925-26	1,132,862	862,315	105	40,268
1926-27	1,092,917	714,109	87	27,659
1927-28	1,071,325	855,688	116	44,064
1928-29	1,081,965	836,211	99	37,168
1929-30	1,225,026	909,724	114	46,603
1930-31	1,321,950	1,073,376	138	66,015
1931-32	1,308,463	624,437	91	25,357
1932-33	1,599,996	1,127,678	114	57,760
1933-34	1,609,408	1,166,619	119	61,788
1934-35	1,418,931	961,777	102	43,760
1935-36	1,503,608	903,403	73	29,554
1936-37	1,427,132	852,905	86	32,644
1937-38	1,371,933	933,900	102	42,568
1938-39	1,350,213	969,957	111	48,032
1939-40	1,437,557	958,382	107	46,004
1940-41	1,352,955	997,516	115	51,214

Table (4) Continued

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1941-42	1,022,423			
1942-43				
1943-44				
1944-45				
1945-46	1,218,818	802,852	90	32,059
1946-47	1,246,744	640,399	82	23,283
1947-48	1,380,413	896,181	97	38,824

Source: MAS.

**Table 5 : Groundnut Sown Area, Yield and Production
(1948-49 to 1973-74)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1948-49	705,142	604,250	469	126,381
1949-50	698,338	589,834	369	97,282
1950-51	692,499	593,550	482	127,672
1951-52	719,884	598,588	540	144,308
1952-53	736,065	634,095	507	143,498
1953-54	822,975	647,492	502	145,062
1954-55	788,504	611,201	416	113,601
1955-56	829,812	621,514	527	146,205
1956-57	856,018	620,461	450	124,727
1957-58	880,436	522,881	448	104,545
1958-59	971,860	581,088	464	120,225
1959-60	1,044,117	243,471	502	166,581
1960-61	1,887,797	1,159,217	707	365,790
1961-62	1,395,672	1,359,757	638	387,114
1962-63	1,535,559	1,497,965	631	425,007
1963-64	1,490,446	1,379,328	539	331,545
1964-65	1,331,624	1,307,211	579	337,587
1965-66	1,315,424	1,280,951	496	283,409
1966-67	1,132,300	1,109,841	552	273,251
1967-68	1,259,002	1,242,552	658	365,080
1968-69	1,509,266	1,476,011	595	392,176
1969-70	1,510,409	1,472,386	664	436,532
1970-71	1,734,715	1,712,545	682	521,088
1971-72	1,674,070	1,646,734	650	477,804
1972-73	1,563,666	1,507,031	562	377,761
1973-74	1,638,169	1,576,744	576	405,372

Source: MAS.

**Table 6 : Sesame Sown Area, Yield and Production
(1948-49 to 1973-74)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1948-49	1,369,619	871,159	97	37,678
1949-50	1,335,924	825,595	75	27,677
1950-51	1,320,748	877,941	93	36,687
1951-52	1,331,505	910,436	105	42,544
1952-53	1,310,423	940,729	115	48,412
1953-54	1,337,893	945,073	94	39,725
1954-55	1,386,048	798,699	91	32,341
1955-56	1,421,851	833,833	108	40,157
1956-57	1,449,957	943,668	128	53,834
1957-58	1,900,544	674,648	104	31,215
1958-59	1,399,936	851,252	126	48,024
1959-60	1,532,760	1,013,445	137	62,079
1960-61	1,467,484	1,014,834	138	62,263
1961-62	1,529,716	1,085,560	151	73,063
1962-63	1,575,735	1,148,458	163	83,567
1963-64	1,610,444	947,403	125	52,997
1964-65	1,960,384	1,737,425	127	98,813
1965-66	1,998,344	1,182,948	107	56,866
1966-67	1,909,623	1,180,876	106	55,717
1967-68	2,050,559	1,596,065	149	106,220
1968-69	2,037,274	1,387,984	132	81,804
1969-70	2,257,323	1,641,425	137	100,140
1970-71	2,509,872	1,960,125	149	130,022
1971-72	2,292,161	1,725,725	145	111,648
1972-73	2,256,484	1,227,316	127	69,594
1973-74	2,659,663	962,988	174	152,394

Source: MAS.

3.2.3. Sunflower

Sunflower grown area recorded was started from 1963. Until the last year of this era (i.e 1973-74) sunflower area was less than 9,000 acres with yield per acre ranging 370 lb/ac to 600 lb/ac (Table 7).

**Table 7 : Sunflower Sown Area, Yield and Production
(1963-64 to 1973-74)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1963-64	842	841		
1964-65	830	829	465	172
1965-66	1,932	1,932	378	326
1966-67	1,693	1,684	371	279
1967-68				
1968-69				
1969-70	2,401	2,376	-	-
1970-71	2,668	2,645	606	716
1971-72	3,730	3,718	518	860
1972-73	3,449	3,305	473	698
1973-74	8,349	6,119	469	1,281

Source: MAS.

**Table 8 : Mustard Sown Area, Yield and Production
(1962-63 to 1973-74)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1962-63	10,031			
1963-64	8,624	8,504		
1964-65	12,714	12,685	267	1511
1965-66	11,775	11,537	327	1685
1966-67	12,341	12,271	365	1997
1967-68	12,899	12,370	357	1970
1968-69	11,953	11,675	383	1997
1969-70	13,357	13,192	475	2795
1970-71	16,622	16,164	431	3110
1971-72	17,175	16,056	377	2703
1972-73	17,931	16,025	388	2779
1973-74	19,510	17,116	388	2966

Source: MAS.

3.2.4. Niger

Niger is suitable to grow in hilly region where the weather is cold. In 1972-73 and 1973-74, niger was grown 11,750 and 18,450 only and yield was not recorded until at that time.

3.2.5. Mustard

Mustard is a oil producing crop, but characteristic smell of oil is used to only some tribes. In 1962-63, the sown area acre was 10,031 but 1973-74, it was 19,510 acres. Production was also doubled (Table 8).

3.3. Socialist Era (1974-75 to 1987-88)

3.3.1. Groundnut

Improvement of variety was carried out in Magway Central Farm and Agricultural Research Institute, Yezin. Six varieties in Magway and three varieties in Yezin were released and successful cultivation. The whole township intensive cultivation program was carried out and yield per acre was increased more than 50 %. Special projects such as Maize and Oilseed Production Project and Burma Agricultural Production Projects were sources to increased production (Table 9).

**Table 9 : Groundnut Sown Area, Yield and Production
(1974-75 to 1987-88)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1974-75	1,666,020	1,631,478	631	459,363
1975-76	1,696,337	1,633,769	555	404,364
1976-77	1,507,304	1,410,357	661	416,175
1977-78	1,481,263	1,391,822	736	456,990
1978-79	1,377,715	1,290,866	666	383,998
1979-80	1,200,379	1,126,123	670	336,799
1980-81	1,271,131	1,209,940	797	430,703
1981-82	1,477,687	1,372,283	921	563,981
1982-83	1,411,695	1,334,716	909	541,273
1983-84	1,384,603	1,294,238	906	523,199
1984-85	1,597,466	1,532,185	957	656,096
1985-86	1,470,473	1,355,975	911	551,286
1986-87	1,394,006	1,291,284	929	535,382
1987-88	1,327,322	1,248,342	918	511,271

Source: MAS.

3.3.2. Sesame

Sesame production was increased as irrigated sesame cultivated result better yield. Four sesame varieties were released for better yield and production (Table 10).

**Table 10 : Sesame Sown Area, Yield and Production
(1974-75 to 1987-88)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1974-75	2,609,410	1,619,842	130	93,642
1975-76	2,464,623	1,641,347	180	132,223
1976-77	2,630,504	1,478,480	138	91,060
1977-78	2,696,095	1,496,651	164	109,347
1978-79	3,086,408	2,366,609	195	206,247
1979-80	2,563,013	1,558,520	156	108,204
1980-81	3,230,821	1,761,810	197	154,675
1981-82	3,385,471	1,909,184	207	176,951
1982-83	3,402,276	2,311,822	189	194,966
1983-84	3,308,366	1,901,801	240	203,504
1984-85	3,708,321	2,485,018	224	248,833
1985-86	3,488,610	2,473,786	221	244,306
1986-87	2,845,023	1,972,228	222	195,702
1987-88	2,932,792	1,552,470	241	167,226

Source: MAS.

3.3.3. Sunflower

Sunflower sown area was increased by nearly 7 times and yield was doubled. Introduced varieties from Russia were high oil content with high yield. Five black sunflower varieties were introduced and sunflower production was encouraged through special project. As a special assignment, research for breeding and agro-techniques were carried out (Table 11).

3.3.4. Niger

In this era niger production was increased as sown area was increased. Niger researches were carried out at Agricultural Research Institute, Yezin on only production technology (Table 12).

**Table 11 : Sunflower Sown Area, Yield and Production
(1974-75 to 1987-88)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1974-75	9,142	7,987	463	1,652
1975-76	9,711	8,684	471	1,827
1976-77	25,138	20,993	476	4,463
1977-78	89,105	84,295	509	19,171
1978-79	136,158	122,183	410	22,357
1979-80	83,474	54,656	532	12,992
1980-81	142,740	121,163	598	32,376
1981-82	257,930	229,175	679	69,519
1982-83	271,293	226,762	687	69,519
1983-84	347,135	315,537	794	111,841
1984-85	398,908	358,003	872	139,395
1985-86	575,287	517,135	919	212,268
1986-87	614,546	574,637	969	248,579
1987-88	645,486	563,536	863	217,063

Source: MAS.

**Table 12 : Niger Sown Area, Yield and Production
(1974-75 to 1987-88)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1974-75	23,932	19,641		
1975-76	23,398	20,289		
1976-77	47,433	42,633		
1977-78	44,299	40,438		
1978-79	59,084	42,472	520	9,860
1979-80	49,142	23,100	221	2,280
1980-81	36,621	27,708	217	2,679
1981-82	58,312	51,899	241	5,582
1982-83	79,092	70,501	314	9,875
1983-84	81,890	69,213	273	8,430
1984-85	103,651	92,735	275	11,393
1985-86	124,582	113,998	268	13,568
1986-87	112,779	95,618	282	12,050
1987-88	93,612	84,122	267	10,017

Source: MAS.

3.3.5. Mustard

Mustard sown area was doubled but yield was not different. As a research program observation on mustard crop was done in Agricultural Research Institute but not intensively (Table 13).

**Table 13 : Mustard Sown Area, Yield and Production
(1974-1975 to 1987-88)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1974-75	20,240	18,869	374	3,151
1975-76	22,119	21,022	391	3,669
1976-77	24,775	23,487	404	4,234
1977-78	25,065	24,298	415	4,508
1978-79	26,230	25,531	407	4,642
1979-80	31,611	29,975	409	5,473
1980-81	33,273	30,581	425	5,806
1981-82	37,349	35,114	410	6,423
1982-83	41,699	39,410	431	7,582
1983-84	55,185	53,035	456	10,782
1984-85	58,066	55,988	449	11,225
1985-86	53,182	50,549	420	9,490
1986-87	49,330	46,888	452	9,465
1987-88	44,872	42,316	446	8,436

Source: MAS.

4. CURRENT SITUATION ON OIL SEED CROPPRODUCTION (1989-90 TO 1999-2000)

4.1. Groundnut

Groundnut growing area was not very much changed but yield per acre increased 759 lb/ac to 1,010 lb/ac. To achieve self-sufficiency in edible oil, special plans and projects on oilseed crops were laid out. Four groundnut varieties were released in coordination with ICRISAT. High yielding varieties seeds were increased and demonstration plots were carried out to transfer information to farmers. Yield was increased by using of new groundnut varieties (Table 14).

4.2. Sesame

To achieve self-sufficiency in edible oil, many projects including irrigated sesame and intensive sesame cultivation zones were carried out. Exportable black and white sesame productions were emphasized. One white sesame variety (Sinyadanar-4) and one black sesame variety (Sinyadanar-3) were released from Central Agricultural Research Insti-

**Table 14 : Groundnut Sown Area, Yield and Production
(1988-89 to 1999-2000)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1988-89	1,355,211	1,272,642	759	431,262
1989-90	1,379,677	1,294,378	781	451,267
1990-91	1,369,162	1,307,642	796	464,595
1991-92	1,260,823	1,156,975	721	372,376
1992-93	1,219,709	1,197,343	797	425,812
1993-94	1,203,756	1,152,187	825	424,541
1994-95	1,252,429	1,227,163	900	492,779
1995-96	1,302,712	1,272,417	1,027	583,411
1996-97	1,183,796	1,181,680	1,044	550,494
1997-98	1,111,118	1,101,758	1,080	531,348
1998-99	1,241,853	1,211,870	1,022	552,902
1999-00	1,400,140	1,383,501	1,010	623,789

Source: MAS.

**Table 15 : Sesame Sown Area, Yield and Production
(1988-89 to 1999-2000)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1988-89	2,994,372	1,591,559	201	142,552
1989-90	3,157,804	2,284,554	200	203,566
1990-91	3,271,267	2,454,175	194	212,344
1991-92	3,184,483	1,983,895	190	167,829
1992-93	3,379,123	2,451,253	213	233,363
1993-94	3,211,251	2,337,854	211	219,800
1994-95	3,287,607	2,796,504	240	299,359
1995-96	3,152,968	2,233,967	300	298,803
1996-97	2,829,148	2,508,659	302	338,669
1997-98	2,556,519	1,913,046	341	391,398
1998-99	2,962,588	1,740,956	266	209,175
1999-00	3,352,087	2,554,964	255	290,845

Source: MAS.

tute (CARI), Yezin. Area expansion and use of high yielding varieties made a better production (Table 15).

4.3. Sunflower

Sunflower research programs were carried out with special care in hybrid sunflower and high yielding sunflower. Varieties were released for better yield and production. Area expansion reached up to 1.2 million acre from 523,562 acres in 1988 (Table 16).

**Table 16 : Sunflower Sown Area, Yield and Production
(1988-1989 to 1999-2000)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1988-89	523,562	436,437	651	126,741
1989-90	393,660	331,023	595	87,842
1990-91	404,042	358,802	590	94,470
1991-92	361,185	327,607	585	85,504
1992-93	385,033	355,736	595	94,491
1993-94	297,706	274,841	667	81,809
1994-95	492,388	443,493	582	115,204
1995-96	545,739	553,449	677	161,193
1996-97	308,483	300,681	677	90,934
1997-98	296,468	283,225	701	88,733
1998-99	848,080	789,090	529	186,439
1999-00	1,203,548	1,113,599	316	157,340

Source: MAS.

4.4. Niger

Yield of niger could not improved but niger sown area was increased and production also. Research on varietal improvement can carry out in this era. A cold tolerant variety was tested against local varieties (Table 17).

**Table 17 : Niger Sown Area, Yield and Production
(1988-1989 to 1999-2000)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1988-89	95,837	84,850	216	8,191
1989-90	81,244	75,546	224	7,535
1990-91	80,062	76,710	230	7,878
1991-92	79,547	75,718	224	7,581
1992-93	92,284	88,226	228	8,997
1993-94	108,361	106,671	220	10,459
1994-95	111,809	109,792	276	13,557
1995-96	114,572	114,480	268	13,717
1996-97	115,715	115,380	249	12,811
1997-98	122,158	122,117	270	14,719
1998-99	139,648	138,976	279	17,307
1999-00	202,308	199,051	296	26,339

Source: MAS.

4.5. Mustard

Sown area yield and production of mustard was not improved. No research work on mustard was done. Mustard can grow only in cold weather and CARI can not do research work in Yezin (Table 18).

**Table 18 : Mustard Sown Area, Yield and Production
(1988-89 to 1999-2000)**

Year	Sown acre	Harvested acre	Yield (lb/acre)	Production (mt)
1988-89	43,194	40,239	460	8,268
1989-90	40,421	38,810	469	8,121
1990-91	41,038	39,418	463	8,136
1991-92	34,091	32,923	411	6,045
1992-93	33,120	32,385	407	5,875
1993-94	34,621	34,521	423	6,526
1994-95	38,753	38,735	413	7,139
1995-96	44,321	44,312	415	8,208
1996-97	44,426	44,426	410	8,124
1997-98	50,067	50,046	428	9,561
1998-99	74,261	71,459	414	13,194
1999-00	100,723	100,723	467	20,980

Source: MAS.

5. UTILIZATION

There are many ways of oilseed utilization, mainly for edible oil and some for various kind of snack food.

5.1. Edible Oil

Oilseed crops are mainly used for edible oil extraction. Myanmar people love groundnut oil and sesame oil because of their characteristic smell. Oil content for groundnut is 50 %, sesame 46 % and sunflower 47 % respectively (Table 19).

5.2. Snack Food

Raw seed: Sesame, sunflower and mustard seed can eat raw. It is useful for medicine.

Table 19 : Oil Content in Different Oilseed and Edible Oil Production

Crop	Oil content (%)	Yield (lb/acre)	Edible Oil (lb/acre)	Edible Oil (lb/acre)
Groundnut	50	1,040	7.2	7,488
Sesame	46	302	21.6	6,523
Sunflower	47	672	9.0	6,048
Niger	44	297	19.8	5,880
Mustard	42	288	18.0	5,184

Source: MAS.

Boiled: Groundnut pod is boiled in hot water about half an hour and mixed with a little salt for snack food.

Roasted: Groundnut seed, sesame seed and sunflower seed are roasted and eat as a snack food.

Brittle: Groundnut and sesame seed are roasted and mixed with sweet and made brittle separately. Sometime mixed groundnut and sesame seed are made brittle.

5.3. Fermented Cake

Groundnut and sesame cake can be used as a side dish after using fermentation method. In village this fermented cake is daily food for poor farmer.

Table 20 : Utilization of Oilseed in Different Ways

Seed	Seed for growing(%)	Snack food (%)	Others (%)	Edible Oil (%)	Total (%)
Groundnut	14	5	5	76	100
Sesame	2	5	2	91	100
Sunflower	2	5	2	91	100
Niger	2	5	2	91	100
Mustard	3	5	2	90	100

Source: MAS.

6. OIL MILL

In Myanmar every day diet, edible oil is used in different ways such as cooking oil, dressing oil, medicine etc. In the year of 2002-03, 376,00 metric tons of edible oil will be needed by calculation. According to the report more than 480,000 metric tons of edible oil can be produced.

Edible oil is extracted raw mostly at the local oil extraction mill without refining. There are both private and cooperative oil mills in upper Myanmar. Those oil mills are not refineries of de-waxing. According to the survey there are 2,014 oil crushing mills (private) in three major oil-seed growing area, Sagaing, Mandalay and Magway Division (Table 21).

Table 21 : Lists of Oil Crushing Mills and Their Location

No.	Location (Division/District)	Size of the Mill			Total
		Large	Medium	Small	
	Sagaing Division	17	79	596	692
1	Sagaing	6	5	101	112
2	Shwebo	4	31	81	116
3	Monwya	6	23	153	182
4	Katha	-	9	90	99
5	Kalay	1	7	67	75
6	Tamu	-	-	5	5
7	Mawlite	-	1	25	26
8	Kanti	-	3	74	77
	Magway Division	12	92	433	537
1	Pakokku	5	52	121	178
2	Magway	3	25	109	137
3	Minbu	-	7	113	120
4	Thayat	4	8	53	65
5	Gangaw	-	-	37	37
	Mandalay Division	21	98	666	785
1	Mandalay	5	20	153	178
2	Pyin OO Lwin	-	-	4	4
3	Kyaukse	3	12	83	98
4	Meiktila	1	6	45	52
5	Myingyan	7	28	219	254
6	Nyaung Oo	-	1	11	12
7	Yamethin	5	31	157	187
	Total	50	269	1695	2014

Source: Ministry of Industry (1).

Remark: Large= >50 hp, Medium = 25-50 hp, Small = <25 hp

7. MARKETING POLICY AND SYSTEM

Government has not any plan to purchase oilseed. Growers have free choice to sell to private traders at local market. Agriculture inputs such as variety seed, chemical fertilizers, pesticides and farm machineries are distributed by both government agency and private companies. Oilseed can be crushed at any oil mill and marketing of edible oil is done by grower's choice.

Price of oilseed varies from time to time. In early harvest time dealers pay higher price and then become lower. After they have bought enough at late harvest time, the price goes up. Another things of price changes is dependent upon import of vegetable oil.

If the amount of palm oil imported is high, then the price of edible oil is low and the price of oilseed goes down. Cost of cultivation is a factor for high price. If the input price is high, then the price of seed and oil is high. In brief, the price relies on the amount of imported palm oil, cost of cultivation, time of marketing and weather condition. Recently palm oil is not imported and price of oilseed and price of edible oil are high.

Table 22 : Cost and Benefits on Oilseed Crops Cultivation

(Kyats)

Crop	Cost of cultivation		Price per basket	Benefits per basket
	per acre	per basket		
Groundnut	71,000	1,970	4,000	2,030
Sesame	38,700	5,160	12,000	6,840
Sunflower	36,200	2,130	4,000	1,870
Niger	27,300	4,550	6,000	1,450

Source: MAS.

Sesame is the only seed that was exported every year. In Japan market black sesame gets better price and it is used not only for edible oil but also for medicinal purpose. For white sesame, it is used in snack and food decoration. The price for black sesame is US\$ 750-800 for one metric ton when white sesame is only US\$ 550-600. China bought

Table 23 : Import and Export Volume of Oilseed Crops and Their Products

Item / Year	Export (mt)	Import (mt)
Sesame seed		
1996-97	52.5	
1997-98	51.7	
1998-99	42.2	
1999-00	79.5	
2000-01	34.4	
2001-02	13.2	
2002-03	0.3	
Oil cake		
1991-92	16.0	
1992-93	25.0	
1993-94	35.0	
1994-95	14.0	
1995-96	37.0	
1996-97	7.0	
Edible Oil		
1991-92		123.0
1992-93		125.0
1993-94		155.0
1994-95		205.0
1995-96		218.0
1996-97		72.0
1997-98		154.0

Source: Ministry of Commerce.

Myanmar sesame and processed and sold to Japan with higher price. Oil cake is another exportable oilseed product used as animal feed because of high protein content. Because edible oil in local production is not met to sufficiency, palm oil is imported every year. But palm oil is not good for health because of the high cholesterol content.

8. RESEARCH AND HUMAN RESOURCE DEVELOPMENT

Central Agriculture Research Institute (CARI) has been carried out academic or basic research on the fields of plant breeding, agronomy and plant protection. The satellite stations under CARI work crop varietal improvement and agronomic practices. There are 16 farms under CARI and 34 farms under Seed Division. The seed farms produced quality seeds for seed growers.

Oilseed crops research has been start in 1924 in Magway Farm. Main objective of research is to release new varieties and to know better agronomic practices. Under oilseed crops research in CARI and Magway, there are five different crops involved but number of staffs is short compared to other countries. Only 30 staffs are working on oilseed research.

Table 24 : List of Staffs

Qualification	Groundnut	Sesame	Sunflower	Total
Dip.Ag	7	5	2	14
B.Ag	6	6	1	13
M.Sc	1	2	-	3
Total	14	13	3	30

Source: MAS.

As a research achievement, improved new oilseed crop varieties had been released and widely spread in farmer field. Recently three groundnut varieties and three sesame varieties, one sunflower variety and one hybrid sunflower variety were released.

Table 25 : Released Oilseed Crops Varieties

Variety	Life Period (days)	Yield (lb/ac)
Sinpadatha-5	115-125	1050
Sinpadatha-6+A31	90-95	875
Sinpadatha-7	105-115	1250
Sinyadanar-3	95-100	540-810
Sinyadanar-4	80-90	500-800
Sinyadanar-5	65-70	370-540
Sinshwekyar-2	80-85	640-800
Sin Hybrid-1	80-90	960-1120

Source: MAS.

In near future research on hybrid seed will be emphasized. Drought resistant and short-lived with good quality crops will be released. Fertil-

izer use efficiency, weed control and appropriate plant population are desirable traits in research. More staffs will be appointed in research station and institute. Training for both post-graduated and short-term course will be sent.

9. CONSTRAINTS

Oilseed crops prefer fertile soil to poor soil. Normally farmers grow groundnut on fertile soil and grow sesame on poor soil. Yield potential of sesame is 1,350 lb/ac with sufficient input, but the average yield is only 297 lb/ac.

Table 26 : Utilization of Fertilizers on Oilseed Crops (mt)

Year	Groundnut	Sesame	Sunflower
1987-88	8,536	8293	7461
1988-89	4,112	2632	3609
1989-90	2,596	4835	5322
1990-91	2,970	2753	2808
1991-92	2,700	4953	2328
1992-93	888	3697	158
1993-94	-	861	477
1994-95	-	1031	862
1995-96	6,000	7300	5300
1996-97	4,528	7605	5820
Average	4,041	4396	3415

Source: MAS.

Average utilization of fertilizers per year in groundnut was 4,041 metric tons, in sesame 4,396 metric tons and in sunflower 3,415 metric tons. It is very low fertilizer rate for oilseed crops compared to their requirement.

Pulses, an exportable crop is substituted in groundnut area and sesame area. For irrigated sesame, cotton, summer rice and vegetables are competitive crops. Expansion of area for groundnut and sesame is difficult

Table 27 : Fertilizer Requirement for Unit Acre of Oilseed Crops and Actual Used

Crop	Average Sown acre per year(000)	Fertilizer Requirement (lb/ac)	Actual Fertilizer Used(lb/ac)	Shortage (lb/ac)
Groundnut	1,375	196	6.58	189.42
Sesame	3,059	280	3.22	276.78
Sunflower	352	252	21.73	230.27

Source: MAS.

in lower Myanmar because of the heavy rain in monsoon. To grow in post monsoon, groundnut seed should be under good storage not to decrease seed germination.

Especially for groundnut, seed to seed ratio is very narrow, only 1:7 when sesame 1:50, sunflower 1:80, niger 1:40 and mustard 1:30. This means expansion of groundnut area is slow in practical. The most important thing in growing groundnut is to *reach the correct or optimum plant population*. Seed is very expensive and farmers use lower seed rate and causes low yield. 70 % of the total population is farmers who are not well educated. Son of a farmer becomes farmer and they don't know exactly in cultivation. Most of the crop production hand-book are published in English which they can not read.

10. RECOMMENDATION

Instead of the grain, seed should be used for better crop production. To get enough seed for the whole growing area, seed farm should be established. Fertilizer is the major factor to grow successful oilseed crop in cooperating with farm-yard-manure or humus. Training for farmers has to be done every season for every crop. Farmers need regular meeting with extension personal to know better crop production including seeds, efficient use of fertilizers and agro-techniques. Small library and information centers are effective in village. Farmer should learn about production, marketing and food processing. Short-term and long-term training and post-graduate degree training are needed. There should be big library in Institute for agriculture to get easy reference.

11. OIL PALM DEVELOPMENT

11.1. Background

Oil palm grows well in West Africa from where it spread over to the equatorial climate area of Latin America and South East Asia. In 1848 and 1870, first seeds received in Indonesia and in Malaysia respectively, where commercial plantation started in 1917. Myanmar received the seeds through Malaysia in 1921 and tried to plant this crops. Some area of Central Farm under Agriculture Department, Hmawbi, Mudon, Myaungmya and Sittwe this new crop was tried to plant. At present, the area established in 1916 at Egani, near Dawei, was the only area left.

Area extension was implemented by the Agriculture Corporation. At Dawei area, in 1972, Kyaikto and Thandwe in 1978, Longlon and Tanintharyi in 1979 and Kawthaung in 1980 respectively. The Prison Department also carried out the oil palm planting in Kawthaung area in 1982. For oil palm development, one project granted by EEC and Swiss was implemented during the period of 1981-82 to 1992-93. Total project cost was USD 12.88 million and Government of Myanmar contributed kyat 61.98 millions.

When the market oriented economic system was introduced, most of the oil palm area 16,287 acres was leased to local private companies for 10 years period with the aim of organizing the private participation and investment to reduce the edible oil deficit.

11.2. Present Situation

Oil Palm grows well in equatorial climate area. Tanintharyi Division in the southern part of Myanmar where more rainy days are observed. Most of the area planted in Tanintharyi Division. Planted area, harvested area and FFB production are shown in the Table 28.

11.3. Oil Palm Project

Edible oil import stands around 0.15 to 0.2 million tons annually. To

Table 28 : Planted Area, Harvested Area and Production Area

Year	Planted (ac)	Harvested (ac)	Yield (Ton/ac)	Production (FFB Ton)	CPO (Ton)
1996-97	20,514	11,051	1.54	17,063	3,179
1997-98	22,261	11,296	1.63	18,363	3,076
1998-99	24,894	17,220	3.29	56,729	3,369
1999-00	27,956	17,209	2.83	48,766	6,549
2000-01	47,199	19,530	3.62	70,789	8,102

Source: MPCE.

reduce the palm oil import it is estimated to grow 0.5 million acre of oil palm with the assumption of 0.5 ton edible oil will be extracted from the yield of 5.0 ton/acre basis to produce 0.2 million ton locally. Altogether 20 local private companies are engaged in this project. From the start of project, 55,172 acres of plantation were established and can be summarized as the following.

Table 29 : Oil Palm Planted Area from 1999 to 2002

Year	Planted acre
1999-00	2,924
2000-01	27,935
2001-02	24,313
Total	55,172

Source: MPCE.

Although the plantation industry has momentum but the crushing or extraction of fruits is growing very slow due to the heavy investment.

11.4. Palm Oil Mill

There are two types of mill to produce edible palm oil, crude palm oil mill (CPO) which crush the fruits to get crude oil, and refinery mill which refines the CPO to get edible oil. There are altogether eight CPO mills and two refineries which can be summarized as the following.

Table 30 : CPO Mill and Refineries

Mill	Location	Capacity (FFB ton/hr)	Owned by	Remarks
<u>CPO</u>				
Pagawzun	Yebyu	7.5	MPCE	Imported
Longlon	Longlon	1.5	MPCE	Imported
Ingabo	Kyaikto	1.5	MPCE	Local-made
Padonmar	Kawthaung	1.5	Private	Local-made
Tet Nay	Kawthaung	1.5	Private	Local-made
Tet Nay	Kawthaung	1.5	Private	Local-made
CKB	Nyaung bin kwin	1.0	Private	Local-made
Aungzinmar	Bokepyin	1.0	Private	Local-made
<u>Refinery</u>				
Thingangyun	Thingangyun	6 t/hr	MPCE	
O-3	Insein	40 t/hr	MAPT	

Source: MPCE.

Based upon the present area established, fruits production will be increased drastically and crushing mills requirement is found to be major concerned.

In year 2000-01, FFB production was 70,800 tons and crude palm oil produced by the mills was only 8,100 ton. The average extraction rate was only 11.4% where it should be 20% if the proper mills were established. Even though, because of the high content of FFA value less than 50% of CPO was refined to get edible oil. The balance was used in soap making factories.

According to the calculation, total planted area of the project would be 68,851 acre in 2001-02, from which FFB yield would be around 357,100 tons. At the end of the five year project, total planted area would be 345,425 acres, from where FFB production would be about 1.895 million ton. Thus, there is an urgent need for the CPO mills respectively. Based upon the estimated FFB production of up to 2001-02 planting, total requirement of CPO mills and their capacities are shown in the following table.

Table 31 : CPO Mill Requirement

Region	Capacity		
	3.0 t	7.5 t	15.0 t
Dawei	2.0	3.0	-
Myeik	1.0	2.0	-
Kawthaung	2.0	4.0	3.0
Total	5.0	9.0	3.0

Source: MPCE.

11.5. Constraints and Issues

A number of constraints that need to be resolved in order to oil palm development are Policy and Strategy, Infrastructure, Communication, Transportation, Power supply, Technology, Finance and Investment, and Migration. According to existing land use policy the growers are allowed to plant oil palm up to thirty years. There is no right of lease or mortgage the land the growers allowed. The project area is actually a remote area and infrastructure is poor condition (Table 32). The growers have to develop with high investment. Transportation and communication are also less developed in this area; there is no power supply and the growers have to use their own generator where diesel prices are high. Technology of planting, using suitable variety and field upkeep are to be conducted. There is no experience of CPO mill or refinery. Most of the southern part of Myanmar is remote and labour force is in shortage because the local people are engaged in fishery, mining and timber business. So some workers from upper Myanmar are highly welcomed. Investment in plantation is also high compared to other part of Myanmar. The growers have to invest the plant upto maturity and also to invest for establishing crushing mills. Financial assistance should be provided.

11.6. Measures

To overcome the above mentioned problems efficient policy reforms and implementation procedure, arrangements for the easy or convenient access to the financial sources, acquisition of loans and other supportive practice would be essential.

Table 32 : Land Allotment and Plantable Area

Sr. No	Company	Township	Allotted Acre	Plantable Acre
1	Steel Stone	Ye-phyu	10,000	8,000
2	Sky Link	Ye-phyu	50,000	36,000
3	Sky Link	Tanintharyi	70,000	25,000
4	Annawar Soe Moe	Thayatchaung	5,000	3,564
5	Shwe Kanbawza	Tanintharyi	35,000	30,699
6	Myan Naing Myint	Tanintharyi	11,800	9,142
7	Myan Naing Myint	Myeik	1,800	300
8	Asia World	Myeik	3,810	1,700
9	Asia World	Tanintharyi	17,400	12,000
10	Po Kaung	Boke-pyin	26,800	7,000
11	Po Kaung	Ye-phyu	2,000	-
12	Dagon Timber	Kaw-thaung	23,690	1,200
13	Yuzana	Kaw-thaung	31,310	11,000
14	Annawar Tun	Kaw-thaung	15,000	5,000
15	Super One	Kaw-thaung	17,304	6,000
16	SI	Kaw-thaung	11,639	8,560
17	South Dagon	Boke-pyin	20,000	12,000
18	Tet Nay	Kaw-thaung	1,000	428
19	Aung Zin Mar	Boke-pyin	5,000	750
20	Myanmar Economic Holding	Kaw-thaung	158,000	103,767
21	Bugar	Boke-pyin	44,084	31,000
	Total		560,645	323,910

Source: MPCE.

12. CONCLUSION

Oilseed crop production is second to paddy in-term of sown area in Myanmar. Self-sufficiency of edible oil is the second of three objectives laid down by the Ministry of Agriculture and Irrigation. Recently because of insufficient production of oilseed crops large amount of edible oil is imported for local consumption. Therefore area expansion and promotion of yield are the ways to self-sufficiency of edible oil.

Table 33 :CPO Mill Requirement

Sr. No	Oil Mill Group	FFB/yr (ton)	Calculation	Capacity of Mill needed (ton/hr)	Mill to be built (ton/yr)	Remarks
1	Group (1)	15,000	FFB x 30%	9.00	7.50	Yield of FFB/Yr x FFB% in Peak month ÷ (Milling Hr x Milling Day)
(1)	Sky Link	15,000	÷ (20 x 25)			
2	Group (2)	606	"	0.36		
(1)	Steel Stone	606				
3	Group (3)	5,280	"	3.17	3.00	
(1)	Shwe Padonmar	900				
(2)	Habitats (Dawci)	3,546				
(3)	Ta-line-ya	834				
4	Group (4)	18,231	"	10.94	7.50	
(1)	Po-kaung	6,006				
(2)	Pu-gaw-zun	12,225				
5	Group (5)	4,689	"	2.81	3.00	
(1)	Laung-lon	4,689				
6	Group (6)	10,281	"	6.17	7.50	
(1)	Annawar Soe Moe	9,591				
(2)	Habitats (Thayat chaung)	660				
(3)	Model Plantation	30				
7	Group (7)	1,890	"	1.13	-	
(1)	Ventage	1,890				
8	Group (8)	28,956	FFB x 18%	10.42	7.50	
(1)	Shwe kanbawza	28,956	÷ (20 x 25)			
9	Group (9)	29,778	"	10.72	7.50	
(1)	Myan Naing Myint	12,948				
(2)	Nyaung Pin Kwin	16,830				
10	Group (10)	6,600	"	2.38	3.00	
(1)	Asia World	6,600				
11	Group (11)	15,618	"	5.62	7.50	
(1)	Dagon Timber	15,618				
12	Group (12)	96,192	"	34.63	15 x (2)	
(1)	Yuzana+Annawar Tun	94,932				
(2)	Habitats (Kaw-thaung)	1,260				
14	Group (14)	34,470	FFB x 18%	12.41	15.00	
(1)	Tet-Nay	2,232	÷ (20 x 25)			
(2)	Aaw-gyi	9,780				
(3)	Hard Stand	10,668				
(4)	Ye-ta-gun	11,790				
15	Group (15)	8,964	"	3.32	3.00	
(1)	Ma-li-wun	6,384				
(2)	Ban-ka-chun	2,580				
16	Group (16)	18,642	"	6.71	7.50	
(1)	Po Kaung	18,642				
17	Group (17)	24,102	"	8.68	7.50	
(1)	South Dagon	23,178				
(2)	Habitats (Boke-pyin)	864				
18	Group (18)	25,500	"	9.18	7.50	
(1)	Aung Zin Mar	25,500				
	Total	357,129				

Source: MPCE.

Editor's Note: Group (13) is missing.

Table 34 : Yield of FFB After 5-Years Project Planting

Sr. No	Company / Estate	(2001-2002)		After 5-years Project		Remarks
		Estimate Acre	Yield of FFB	Estimate Acre	Yield of FFB	
A	Dawei District	18,029	54,087	54,830	164,490	
1	Sky Link	5,000	15,000	30,000	90,000	3 ton/ac
2	Steel Stone	202	606	10,000	30,000	"
3	Shwe Padonmar	300	900	500	1,500	"
4	Habitats (Dawei)	1,182	3,546	1,182	3,546	"
5	Ta-line-yar	278	834	278	834	"
6	Po Kaung	2,002	6,006	2,002	6,006	"
7	Pu-gaw-zun	4,075	12,225	4,075	12,225	"
8	Laung-lon	1,563	4,689	1,563	4,689	"
9	Annawar Soe Moe	3,197	9,591	5,000	15,000	"
10	Habitats (Thatyat chaung)	220	660	220	660	"
11	Model Plantation	10	30	10	30	"
B	Myeik District	11,519	67,224	42,014	239,184	
1	Ventage	630	1,890	4,300	12,900	3 ton/ac
2	Shwe Kanbawza	4,826	28,956	20,001	120,006	6 ton/ac
3	Myan Naing Myint	2,158	12,948	10,808	64,848	"
4	Nyaung Pin Kwin	2,805	16,830	2,805	16,830	"
5	Asia World	1,100	6,600	4,100	24,600	"
C	Kaw-thaung District	39,303	235,818	248,581	1,491,486	
1	Dagon Timber	2,603	15,618	14,000	84,000	6 ton/ac
2	Yuzana + Annawar Tun	15,822	94,932	46,310	277,860	"
3	Habitats (Kaw-thaung)	210	1,260	210	1,260	"
4	Super One	1,300	7,800	6,000	36,000	"
5	S.I	755	4,530	8,000	48,000	"
6	Tet Nay	372	2,232	1,000	6,000	"
7	Aaw-gyi	1,630	9,780	1,630	9,780	"
8	Hard Stand	1,778	10,668	1,778	10,668	"
9	Yc-ta-gun	1,965	11,790	1,965	11,790	"
10	Ma-li-wun	1,064	6,384	1,064	6,384	"
11	Ban-ka-chun	430	2,580	430	2,580	"
12	Po Kaung	3,107	18,642	7,000	42,000	"
13	South Dagon	3,863	23,178	8,040	48,240	"
14	Habitats(Boke-pyin)	144	864	144	864	"
15	Model Plantation	10	60	10	60	"
16	Aung Zin Mar	4,250	25,500	20,000	120,000	"
17	Myanmar Economic Holding	-	-	100,000	600,000	"
18	Bugar	-	-	31,000	186,000	"
Total		68,851	357,129	345,425	1,895,160	

Source: MPCE.

For long-term program to sufficiency of edible oil, oil palm and other oil producing trees and plants research should be started widely including oil processing.

Better seed and better agro-techniques are the main factors to achieve better yield. Variation of oilseed crop price is very high. That should be corrected by promotion of high production. Another way is substitution of palm oil which production will be enough in future in Myanmar.

Most of the oil mills are owned by the private sector and those are very old with very low oil outturn. New modern oil factory should substitute them.

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