ones with provision for irrigation, drainage and flood mitigation infrastructures, and provision for subsidy program to assist and develop smallholders' crop cultivation, inland and coastal fisheries and animal husbandry.

5.3 Future Rice Production Requirement for Self-sufficiency

Up to date, the States of Sabah and Sarawak have imported considerable amount of rice to meet their requirements as shown in Tables 8 and 15. In 1980, Sabah consumed 124,000 tons of rice comprising 60,000 tons of domestic wet paddy, 6,000 tons of domestic hill paddy and 58,000 tons of imported rice, while Sarawak spent 194,000 tons of rice consisting of 86,000 tons of domestic wet paddy, 28,000 tons of domestic hill paddy and 80,000 tons of imported rice. As 1980 population estimated is 1.11×10^6 for Sabah and 1.31×10^6 for Sarawak, present per capita consumption of rice becomes 112 kg/year for Sabah and 148 kg/year for Sarawak.

The future population which is projected in the socio-economic sector of the Study is to be 1.51×10^6 in 1990 and 2.08×10^6 in 2000 for Sabah, and 1.54×10^6 in 1990 and 2.48×10^6 in 2000 for Sarawak. As described in Sections 5.1 and 5.2, both the State Governments promote the self-sufficiency policy with regard to staple food production in each State. Based on the assumption of per capita milled rice consumption which is 120 kg/year as the national target, the total rice requirement is estimated to be 181,000 tons in 1990 and 250,000 tons in 2000 for Sabah, and 185,000 tons in 1990 and 298,000 tons in 2000 for Sarawak.

5.4 Future Cropping Pattern for Irrigated Paddy Cultivation and Anticipated Yield

Based on the annual isohyet, monthly distribution of rainfall and the location of irrigation areas, seven climatic zones for Sabah and six zones for Sarawak are established as shown in Fig. 2.

In selecting the growing seasons of rice for the above 13 zones, the following conditions are taken into consideration:

(a) most efficient use of rainfall to reduce irrigation water requirements,

(b) completion of transplanting works before the start of the heavy monsoon rainfalls to reduce the risk of crop damage caused by excess rain water and to reduce the drainage facilities required,

(c) separation of two growing seasons, main and off, to avoid the build-up of rice diseases and pests as well as to reduce farm labor requirements at peak time of farm operation, and

(d) undertaking of the harvest during the dry period to envisage the introduction of mechanized harvesting.

Following these concepts, the main season wet paddy should be grown between August/October and February/April, using varieties which require about 135 days on the main field after transplanting. The off-season wet paddy should be grown between March/May and July/September, using varieties which require around 105 days after transplanting to the main field. Future cropping patterns established for each climatic zone are as shown in Fig. 3.

Through provision for proper irrigation water supply system and improved agricultural supporting services, increase in paddy yield could be expected to large extent in both the existing and potential paddy cultivation areas of Sabah and Sarawak. Under the condition that various types of irrigation development will be implemented, paddy yield is anticipated to be 3.5 to 4.2 tons/ha for minor irrigation schemes and 3.8 to 4.6 tons/ha for major irrigation schemes in Sabah and 3.2 to 3.9 tons/ha for minor irrigation schemes and 3.2 to 4.4 tons/ha for major irrigation schemes in Sarawak as shown in Table 35.

5.5 Projection of Irrigated Paddy Area in Sabah

In Sabah, suitable land for development of new paddy field is limitedly distributed in the Residency of Sandakan. To increase paddy production in the existing paddy fields almost of which are concentrated into the Residencies of West Coast and Interior, it is necessary to provide new irrigation facilities for rainfed wet paddy field and to secure irrigation water resources during off-season for up-grading of irrigated wet paddy field from single crop to double crop.

As of 1980, there existed 9,460 ha of rainfed wet paddy field, 11,060 ha of irrigated wet paddy field with single crop and 9,720 ha of irrigated wet paddy field with double crop. Assumptions are made for anticipated paddy yield of 3.5 tons/ha on an average and for prospected improvement of milling rate from 60% to 65% for 1990 and 2000. From these, the annual rice production can be expected to be 138,000 tons in total in case that irrigated double cropping of paddy becomes possible in all the existing wet paddy field and to be 113,000 tons in total in case that all the existing irrigated paddy fields are graded up to double cropping areas and the existing rainfed paddy fields change to irrigated single cropping areas.

In due consideration of the results of hydrological study, irrigation potential is projected to be 16,100 ha with possibility of irrigated double cropping among 32,400 ha of possible irrigated paddy field in total other than large-scale paddy field development schemes. The paddy production expected from the above projected area is estimated to be 105,000 tons meeting 42% of the total rice requirement in 2000. The requirement for additional paddy field in 2000 is, therefore, at least 31,900 ha of double cropping area in order to meet the remaining rice requirement of 145,000 tons.

The Federal and State DIDs have already formulated two large-scale areas for new irrigation development as the long-term plan. These are Lower Labuk of 8,000 ha and Kinabatangan of 44,000 ha among which a part of the first scheme is under construction and the pre-feasibility study has just been completed for the last one.

In the Study, the priority is given to irrigation development of the Lower Labuk area. This scheme will be fully completed up to 2000. Due to the availability of natural stream flow discharge during the dry season, double cropping area is limited to be 4,000 ha for the scheme. The paddy yield under large-scale irrigation development scheme is anticipated to be 3.8 tons/ha for main season crop and 4.6 tons/ha for off-season crop. The total rice production expected at the full development stage is estimated to be 31,700 tons, being equivalent to 13% of the total demand in 2000.

According to the Pre-Feasibility Study on the Kinabatangan River Basin Development Project, 240,000 tons of rice can be expected to be produced at the full development stage under which 44,000 ha in net of paddy field will be grown with wet paddy twice a year under irrigated condition. It is obvious that irrigation development in the Kinabatangan Basin will play important role in boosting the self-sufficiency rate of rice in Sabah. However, more detailed engineering studies in various sectors are required for setting up of definite plan of operation in realizing the overall development of the Basin, because no accumulation of basic observation data, especially in the field of meteorology, hydrology and micro topography, has been made yet. In this Study, therefore, the Kinabatangan Basin was assumed to be developed after 2000 and its agricultural potential was not taken into consideration.

The result of projection for the future irrigated paddy field in the State of Sabah is summarized by Basin as shown in Table 36. The irrigated paddy field will increase from 20,780 ha in 1980 to 32,400 ha in 1990 and 39,520 ha in 2000 in Sabah.

5.6 Projection of Irrigated Paddy Area in Sarawak

The methodology in projecting future irrigated paddy field for Sarawak is almost the same as one described in the previous Section.

As of 1980, paddy field with the total area of 71,400 ha is in the form of rainfed area of 65,370 ha, control drainage area of 4,350 ha, irrigated single cropping area of 40 ha and irrigated double cropping area of 1,640 ha. The potential rice production areas when irrigated make double cropping possible in the whole wet paddy field which was estimated to be 32,000 tons.

According to the formulation of future irrigated paddy field made by the Federal and State DIDs, five large-scale irrigation development schemes such as Limbang, Binatang Barat, Batang Lupor, Sadong Krang and Samarahan are taken into consideration. The total area of these schemes is 32,600 ha including 11,600 ha of newly reclaimed paddy field and

6,000 ha of control drainage area. The expected rice production at the full development stage is estimated to be 95,800 tons based on the average anticipated paddy yield of 3.4 tons/ha for main season and 4.2 tons/ha for off-season and milling rate of 65%. This production is equivalent to 33% of the rice requirement in 2000.

A part of the existing rainfed paddy fields extends over coastal plains where river water is contaminated by sea water intrusion from tidal effects. From the point of view with regard to the availability of fresh water resources, it is projected that 24,200 ha of rainfed paddy field including the existing 4,350 ha could be provided with only control drainage system, producing 43,300 tons of rice with an anticipated paddy yield of 2.7 to 2.9 tons/ha at the full development stage. This production is equivalent to 15% of the rice requirement in 2000.

If the remaining rainfed paddy field of 30,520 ha, presently being cultivated by smallholders, is fully provided with irrigation facilities for double cropping, the total rice production is estimated to be 140,800 tons of milled rice at the full development stage. This production is equivalent to 49% of the rice requirement in 2000. Such full development will be realized and then rice production in the State could become independent of hill paddy grown in shifting cultivation areas to a large extent.

The development of irrigation potential above-mentioned up to 2000 is projected from the viewpoint of water resource availability in the State of Sarawak. The result of projection for the future irrigated paddy field is summarized as shown in Table 37. The irrigated paddy field will increase from 1,680 ha in 1980 to 17,200 ha in 1990 and 47,000 ha in 2000. The control drainage area will also raise from 4,350 ha in 1980 to 13,500 ha in 1990 and 24,200 ha in 2000 in Sarawak.

5.7 Paddy Production Expected by Proposed Irrigation Development

The paddy yield in proposed irrigation development areas will gradually increase from the yield level under the condition of without project and be attained to the anticipated yield with build-up period of five years. The paddy production will increase from the next crop season after the completion of construction works for irrigation facilities.

The total paddy production by irrigation scheme is estimated as shown in Table 38 for Sabah and in Table 39 for Sarawak. The estimated paddy production in Sabah is 126,200 tons being equivalent to 82,000 tons of rice in 1985, 151,600 tons being equivalent to 98,500 tons in 1990 and 165,100 tons being equivalent to 107,300 tons in 2000, respectively. In Sarawak, it is 137,500 tons equivalent to 89,400 tons of rice in 1985, 192,100 tons being equivalent to 124,900 tons of rice in 1990 and 349,500 tons being equivalent to 227,200 tons of rice in 2000, respectively. The above production prospected could meet 53% of the rice requirement in 1985, 54% in 1990 and 43% in 2000 in Sabah, and 74% in 1985, 68% in 1990 and 76% in 2000 in Sarawak, respectively.

5.8 Land Development Schemes in Sabah and Sarawak

By the end of 1980, SLDB in Sabah has planted 38,000 ha of commercial tree crops comprising 33,700 ha of oil palm, 1,000 ha of coconut, 1,100 ha of cocoa and 2,200 ha of rubber, and has settled a total of 3,020 families. Under 4MP, the target of new planting area is 16,500 ha including 12,300 ha of oil palm, 1,800 ha of coconut and 2,400 ha of cocoa. As of end 1980, SLDB in Sarawak has managed 21,600 ha of plantation consisting of 5,500 ha of rubber, 15,500 ha of oil palm, 600 ha of cocoa, and settled 1,175 families. Under 4MP, SLDB's efforts will be concentrated into oil palm planting in newly developed area during TMP period and another 8,100 ha will be opened up for oil palm and 2,800 ha for cocoa.

After 4MP, it is assumed in the Study that the increasing rate of oil palm plantation in both the Government and private sectors would be maintained. Based on the above assumption, the future planting area of oil palm in 1985, 1990, 1995 and 2000 is projected as shown in Table 40 for Sabah and in Table 41 for Sarawak, respectively.

In Sabah, oil palm planting area will increase 90,500 ha in 1980 to 108,500 ha in 1985, 124,750 ha in 1990 and 164,500 ha in 2000, respectively. This projection is compromised with that of the Sabah Regional Planning Study. In Sarawak, the planting area of oil palm will increase from 22,330 ha in 1980 to 32,890 ha in 1985, 59,390 ha in 1990 and 71,790 ha in 2000, respectively.

To provide basic data in estimating processing water requirement as a component of industrial water demand, future production of oil palm is also projected as shown in Table 43 for Sabah and in Table 44 for Sarawak, respectively, based on the anticipated yield as shown in Table 42.

The prospected production of oil palm in Sabah will raise from 1.26×10^6 tons of fresh fruit bunch in 1980 to 1.60×10^6 tons in 1985, 1.54×10^6 tons in 1990 and 2.24×10^6 tons in 2000, respectively. That in Sarawak will increase from 0.16×10^6 tons in 1980 to 0.39×10^6 tons in 1985, 0.57×10^6 tons in 1990 and 1.05×10^6 tons in 2000, respectively.

5.9 Future Processing Requirement of Oil Palm

According to the Annual Report of SLDBs in Sabah and Sarawak and statistics, the total processing capacity of the existing oil palm mills constructed by both SLDB and private sectors is 232 FFB tons/h in Sabah and 70.5 FFB tons/h in Sarawak, respectively. Assumption is made for daily operation hour of 16 hours and annual operation period of 300 days including 20% of contingency in the latter. From this assumption, the annual processing capacity presently facilitated is estimated to be 1.11×10^6 FFB tons in Sabah and 0.34×10^6 FFB tons in Sarawak, respectively.

To meet the processing requirement in the future, construction of several new mills other than planned mills of SLDB is proposed in the Study; three for Sabah and five for Sarawak. The total processing capacity is projected to be 491 FFB tons/h at 17 mills in Sabah and

150 FFB tons/h at nine mills in Sarawak. The processing requirement in oil palm mills is estimated by Basin as shown in Table 45.

The future processing requirement of rubber factories in Sabah and Sarawak is as shown in Table 46, being estimated taking into account the existing capacity of rubber factories.

6. AGRICULTURAL BENEFIT ATTRIBUTABLE TO WATER RESOURCES DEVELOPMENT AND MANAGEMENT

6.1 General

In this Study, the agricultural benefit arising from water resources development and management is composed of irrigation development benefit and flood control benefit.

The increase in the irrigation benefit is expected from the proposed irrigation schemes which will provide irrigation water to wet paddy field and be constructed during periods of 4MP to 7MP. The irrigation benefit is assumed to be realized with one year delay from the start of construction works for the proposed irrigation schemes. The build-up period of intensive cropping patterns for the proposed irrigation development schemes is also assumed to be five years.

The flood control benefit in the agricultural sector consists of the flood damage reduction benefit in flood prone areas. The flood damage is counted for paddy, mixed horticulture, rubber, oil palm, coconuts and cocoa. The land enhancement benefit is taken into consideration as a part of irrigation benefit for simplification of discussion in this Study.

6.2 Economic Price of Farm Input and Output

The economic farmgate prices of rice and other internationally marketable crops as well as chemical fertilizers are derived from a projection to 1990 at 1980 constant price level forecasted by IBRD (Ref. 28). The projected farmgate prices are M$640/ton for paddy, M$3,100/ton for dry rubber, M$1,164/ton for coconut as copra, M$211 for oil palm as fresh fruit bunch, M$3,580/ton for cocoa as dry beans, M$722/ton for urea, M$673/ton for triple superphosphate and M$405/ton for potash. The details for the above crops are as shown in Tables 47 to 51.

The economic farm labor wage including family labor is estimated to be M$6.5/d on the basis of MOA's information. Regarding the other farm inputs and products, annual average prices paid or received by farmers during 1980 are taken into account (Refs. 8, 9, 17, 18 & 29).

6.3 Economic Production Cost

The production costs estimated include seeds, fertilizer, agro-chemicals, materials and tools, fuel and oil, draft animal and machinery, employed and family labors, but these exclude taxes, water charges, land rent and repayment for initial investment.

The present and future labor requirements are as shown in Tables 52 and 53 for paddy cultivation and Table 54 for tree crops. The labor requirements for paddy cultivation vary according to the intensity of farming practices, which will increase from 64 to 84 man-days in total under present condition to 80 to 86 man-days under future condition with project for Sabah and from 54 to 82 man-days under present condition to 76 to 86 man-days under future condition with project for Sarawak.

The estimated production cost for paddy cultivation in Sabah and Sarawak varies from 495 to 829 M$/ha under present condition, 515 to 850 M$/ha under future condition without project and 712 to 867 M$/ha under future condition with project, as shown in Tables 55 and 56. The average annual economic production cost for tree crop plantation by grower is summarized as shown in Table 57.

6.4 Economic Production Value

The economic gross production value is obtained by multiplying the anticipated crop yield by the economic farmgate price. The economic net production value is then obtained by subtracting the economic production cost from the economic gross production value. The results of calculation are as shown in Table 58 for paddy cultivation in Sabah, Table 59 for paddy cultivation in Sarawak and Table 60 for tree crop plantation in Sabah and Sarawak.

The economic net production value of irrigated paddy for main season in Sabah will increase from M$1,030/ha in minor scheme areas under future condition without project to M$1,460/ha in minor scheme areas and M$1,630/ha in major scheme area under future condition with project. The value in Sarawak under the same condition will raise from M$950/ha in minor scheme areas to M$1,270/ha in minor scheme areas and to M$1,300/ha to M$1,500/ha in major scheme areas.

6.5 Irrigation Development Benefit

In estimating irrigation development benefit, the unit incremental benefit by type of irrigation development is estimated by deriving from the balance of net economic production values between the future conditions with and without project.

There exist five types of irrigation development for minor schemes, eight types for major schemes and one type of control drainage development for both minor and major schemes, as shown in Table 61. The increase in irrigated area by Basin by type of development in Sabah and Sarawak is as shown for each Malaysia Plan period in Tables 63 to 65 for minor schemes and Table 66 for major schemes.

The unit incremental net benefit arising from the respective types of irrigation development is as shown in Table 67. The total incremental net benefit by Basin can be obtained through multiplying the unit incremental benefit by the increased irrigation area. In this estimate, it is assumed that the incremental net benefit during the build-up period is

60% of the said benefit at the full development stage for the second year from the commencement of project implementation, 70% for the third, 80% for the fourth, 90% for the fifth, respectively. The total incremental net benefit, which is attributable to the irrigation development implemented during 20 years under 4MP to 7MP, is summarized by Basin by type of irrigation development as shown in Tables 68 to 70 for minor schemes and Table 71 for major schemes in Sabah and Sarawak.

For the economic evaluation of the respective irrigation schemes proposed in the Study, the annual equivalent economic cost and benefit is estimated by Basin under the condition that the present worth factor is 8% and the project life is 50 years from the commencement of proposed project construction works. The results of estimate are summarized by Basin as shown in Tables 68 to 70 for minor schemes and Table 71 for major schemes in Sabah and Sarawak.

The Benefit Cost Ratio (B/C Ratio) for the proposed irrigation projects is computed by Basin as shown in Tables 68 to 70 for minor development schemes and Table 71 for major development schemes.

Beneficial farm households by the proposed irrigation projects are estimated based on the assumed land holding size of 1.25 ha per one farm household on an average in the existing paddy cultivation area and 2.43 ha per one farm household migrated into the newly developed paddy cultivation area. The results are as shown in Tables 72 to 74 for minor schemes and Table 75 for major schemes. In Sabah, a total of 6,900 farm households will be benefited by implementation of the proposed major and minor irrigation projects. In Sarawak, the number of benefited farm households will be 47,600 during the period from 1981 to 2000.

6.6 Flood Damage Reduction Benefit

In this Study, benefits which will be born in the agricultural sector by undertaking the proposed flood control measures comprise flood losses of various crops to be directly reduced by providing with the said measures. Individual farmers and private estates in the existing flood prone areas could utilize their farm lands for more intensive cropping after frequency and duration of flooding will be considerably reduced by the proposed measures. Such benefit can be counted as land enhancement benefit. In order to simplify the discussion on the benefit estimate in this Study, the land enhancement benefit is included into irrigation development benefit.

The crop production values used in estimating flood damage of annual crops under the Study consist of net production value which is lost by flood and production cost which has already spent before occurrence of flooding. The annual average production values for wet paddy grown in flood prone areas in Sabah and Sarawak are as shown in Table 76.

The crop production values of perennial crops such as oil palm, coconut and cocoa are regarded as replanting cost of seedlings, because young tree crops with the age up to two years old are directly suffering

from flooded water. The replanting cost for the above-mentioned tree crops is as shown in Table 76. As for rubber and mixed horticulture, the production loss is taken into account for the calculation of flood damage. The value of production loss for rubber and mixed horticulture is also as shown in Table 76.

REFERENCES

1 THE PRESENT LAND USE OF SABAH 1970, No. 1 to 5, 1973, I. F. T. Fong

2 LAND RESOURCES STUDY 25, THE LAND CLASSIFICATION OF SABAH, Vol. 1 to 4, 1976, Land Resources Division, Ministry of Overseas Development, England.

3 LAND USE MAP SARAWAK, 1970, Land and Survey Department of Sarawak

4 LAND USE MAP SARAWAK, 1980, Land and Survey Department of Sarawak (Incomplete Set)

5 PLANIMETRIC MEASUREMENT OF LAND USE MAP SARAWAK, 1976, Land and Survey Department of Sarawak

6 AGRICULTURAL STATISTICS OF SABAH 1975, Department of Agriculture, Sabah

7 CROP AGREAGE SABAH 1979, Department of Agriculture, Sabah

8 AGRICULTURAL STATISTICS OF SARAWAK 1980, Department of Agriculture, Sarawak

9 LARGE SCALE PADI PRODUCTION IN SABAH, 1981, Sabah Padi Board

10 SABAH REGIONAL PLANNING STUDY, Vol. 1 to 4, 1978, Hunting Technical Services Limited

11 ANNUAL STATISTICAL BULLETIN SARAWAK, 1979, Department of Statistics Sarawak

12 SHIFTING CULTIVATION IN SARAWAK, 1978, T. Hatch and C. P. Lim

13 OIL PALM, COCONUT AND TEA STATISTICS, 1979, Federal Department of Statistics

14 RUBBER STATISTICS HANDBOOK, 1979, Federal Department of Statistics

15 SABAH'S DECADE OF PROGRESS 1970 - 1985, 1981, Sabah Land Development Board

16 A WRITE UP IN ITS FUNCTIONS, ACTIVITIES, ACHIEVEMENTS AND PROBLEMS, 1979, Sarawak Land Development Board

17 BULLETIN OF STATISTICS, FIRST QUARTER 1980 SARAWAK, 1980, Department of Statistics Sarawak

18 BULLETIN OF STATISTICS, SECOND QUARTER 1980 SARAWAK, 1980, Department of Statistics Sarawak

19 ANNUAL REPORT AND STATEMENT OF ACCOUNTS, 1979, Sabah Land Development Board

20 ANNUAL REPORT AND STATEMENT OF ACCOUNTS, 1980, Sabah Land Development Board

21 ANNUAL REPORT AND STATEMENT OF ACCOUNTS, 1980, Sarawak Land Development Board

22 DEVELOPMENT BRIEFING, 1980, Sabah Rubber Fund Board

23 REPORT ON THE POSSIBILITIES OF LARGE-SCALE PADI PRODUCTION IN SABAH, 1968, Department of Agriculture, Sabah

24 PADI AREA IDENTIFICATION REPORT, 1974, Technical Committee, Padi Production Unit, Sarawak

25 MASTER PLAN OF LAND DEVELOPMENT AREA, CREATING A MODERN, AGRARIAN MIDDLE CLASS SOCIETY, 1979, Datuk Harris Mohd. Salleh

26 PRE-FEASIBILITY STUDY ON THE KINABATANGAN RIVER BASIN DEVELOPMENT PROJECT (Final Report), 1982, Japan International Cooperation Agency

27 FOCUS ON SABAH 1981/1982, FOCUSASIA (M) Sdn. Ehd.

28 PRICE PROSPECTS FOR MAJOR PRIMARY COMMODITIES, 1980, IBRD

29 PARTAIL BUDGETS FOR SOME AGRICULTURAL CROPS OF SARAWAK, 1981, Clement K.K. Ngui, DOA, Sarawak

TABLES

Table 1 PRESENT LAND USE IN SABAH AND SARAWAK

Unit: km^2

Basin No.		Land Use Category							Total Area
		UA	CH	CP	CA	FD	FS	MS	
Sabah									
1	Pensiangan	1	5	9	694	4,841	1	420	5,971
2	Serudong	17	3	67	134	927	64	96	1,308
3	Kalabakan	21	4	86	150	923	81	106	1,371
4	Brantian	11	2	46	76	493	44	69	741
5	Umas Umas	9	2	72	50	347	34	39	553
6	Merutai Besar	9	2	35	55	381	34	42	558
7	Tawau	14	3	57	87	606	54	67	888
8	Kalumpang	17	6	179	282	1,888	173	247	2,792
9	Silabukan	2	3	69	298	2,050	92	200	2,714
10	Segama	4	6	115	626	4,134	261	412	5,558
11	Kinabatangan	5	12	80	1,721	11,818	1,544	1,401	16,581
12	Segaliud	10	25	203	171	1,166	482	278	2,335
13	Labuk	6	41	84	747	4,659	662	630	6,829
14	Sugut	3	12	34	348	2,117	299	281	3,094
15	Paitan	1	3	21	143	941	224	141	1,474
16	Bengkoka	1	21	150	237	1,058	174	302	1,943
17	Bongan	1	32	154	263	1,218	191	332	2,191
18	Kadamaian	1	52	47	188	679	57	362	1,386
19	Tuaran	3	37	295	141	504	71	168	1,219
20	Putatan	10	13	205	71	255	22	53	629
21	Papar	5	52	115	94	408	51	80	805
22	Kimanis	1	48	37	69	314	44	59	572
23	Membakut	1	15	119	55	198	259	89	736
24	Padas	11	75	536	1,001	6,266	393	898	9,180
25	Labuan	4	8	25	5	14	13	22	91
26	Lakutan	1	12	102	125	753	178	120	1,291
Total		169	494	2,942	7,831	48,958	5,502	6,914	72,810
Excluded Area		1	3	23	103	699	41	20	890
Whole of Sabah		170	497	2,965	7,934	49,657	5,543	6,934	73,700
Sarawak									
27	Lawas	1	7	10	106	857	67	22	1,070
28	Trusan	1	18	24	273	2,205	162	59	2,742
29	Limbang	3	48	50	534	3,135	79	129	3,978
30	Baram	2	23	282	2,227	17,225	2,119	447	22,325
31	Miri	20	8	39	109	404	182	26	788
32	Sibuti	1	9	44	153	454	239	35	935
33	Niah	1	13	66	224	681	308	52	1,345
34	Suai	1	14	71	236	732	331	55	1,440
35	Similajau	0	4	24	180	852	162	46	1,268
36	Kemana	3	7	47	879	4,140	538	220	5,834
37	Tatau	3	7	41	700	3,633	444	180	5,008
38	Balingian	1	19	31	509	845	923	129	2,457
39	Mukah	4	4	59	447	880	1,077	91	2,562
40	Oya	2	2	63	654	715	638	135	2,209
41	Rajang	36	80	845	7,645	36,991	4,098	1,620	51,315
42	Kerian	5	19	115	829	18	490	187	1,663
43	Saribas	5	42	93	835	38	674	178	1,865
44	Lupar	9	80	234	2,514	1,446	1,885	577	6,745
45	Sadong	5	45	288	987	755	1,327	281	3,688
46	Sarawak	46	40	534	1,094	753	664	267	3,398
47	Kayan	3	12	68	446	1,075	112	97	1,813
Total		152	501	3,028	21,581	77,834	16,519	4,833	124,448

Remarks; UA: Urban and associated lands
CH: Horticulture and garden crop area
CP: Perennial crop area
CA: Annual crop and shifting cultivation areas
FD: Hill forest
FS: Swamp forest including swamp
MS: Miscellaneous land

Source; Refs. 1 to 5

Table 2 HISTORICAL RECORD ON AGRICULTURAL LAND USE IN SABAH

Unit: 10^3 ha

Crop	1971	1975	1979
(1) Tree and Perennial Crops			
Rubber	105.0	103.8	106.9
Oil palm	43.1	59.4	86.7
Coconut	57.2	52.6	53.6
Cocoa	4.5	9.8	38.0
Citrus	1.5	1.5	1.4
Banana	3.0	4.2	4.7
Pineapple	0.4	0.9	1.1
Fruits	2.2	4.4	5.4
Coffee	1.2	1.5	2.4
Others	0.5	0.6	0.7
Sub-total	218.6	238.7	300.9
(2) Annual Crops			
Wet paddy	31.0	33.7	30.2
Hill paddy	9.8	9.5	11.9
Kendinga padi	1.0	0.6	0.8
Maize	4.6	7.5	6.7
Groundnut	0.5	0.9	0.9
Tapioca	3.7	4.9	5.4
Sweet potato	1.0	1.3	1.2
Ginger	0.4	0.4	0.4
Vegetable	1.1	1.1	1.1
Others	1.1	0.6	0.6
Sub-total	54.2	60.5	59.2
Total	272.8	299.2	360.1

Source; Refs. 6 & 7

Table 3 HISTORICAL RECORD ON AGRICULTURAL LAND USE IN SARAWAK

Unit: 10^3 ha

Crop	1975	1980
(1) Tree and Perennial Crops		
Rubber	193.1	199.9
Oil palm	15.6	22.9
Coconut	38.3	54.8
Cocoa	2.9	7.8
Sago	15.8	12.0
Pepper	23.6	12.2
Others	15.4	9.4
Sub-total	304.7	319.0
(2) Annual Crops		
Wet paddy	54.2	71.4
Hill paddy	64.2	74.2
Maize	1.3	1.3
Soya bean	0.4	0.1
Groundnut	0.3	0.2
Others	1.3	1.0
Sub-total	121.7	148.2
Total	426.4	467.2

Source; Refs. 5 & 8

Table 4 HISTORICAL RECORD ON RICE CULTIVATION AREA IN SABAH

Unit: ha

Year	Wet Paddy		Hill Paddy	Kendinga Paddy	Total
	Main Season	Off Season			
1968	28,740	1,630	10,450	1,130	41,950
1969	30,170	2,580	11,270	1,130	45,150
1970	30,500	1,840	9,740	1,200	43,280
1971	31,040	2,510	9,810	960	44,320
1972	32,750	4,580	9,790	920	48,040
1973	32,490	5,690	9,220	910	48,310
1974	32,800	3,450	11,880	1,070	49,200
1975	33,690	3,710	13,990	560	51,950
1976	29,100	2,070	17,380	520	49,070
1977	27,420	2,130	18,250	520	48,320
1978	27,340	1,340	13,700	870	43,250
1979	31,120	4,180	11,900	800	48,000
1980	31,650	3,500	12,140	810	48,100

Source; Ref. 9

Table 5 RICE CULTIVATION AREA BY DISTRICT IN SABAH AS OF 1979

Unit: ha

Residency/District	Wet paddy	Hill Paddy	Kendinga Paddy	Total
(1) Tawau Residency				
Tawau	101	-	-	101
Semporna	-	20	-	20
Lahad Datu	-	91	-	91
Sub-total	101	111	-	212
(2) Sandakan Residency				
Sandakan	20	41	-	61
Kinabatangan	45	1,295	-	1,340
Labuk/Sugut	348	2,266	-	2,614
Sub-total	413	3,602	-	4,015
(3) Kudat Residency				
Kudat	1,963	4,047	-	6,010
Pitas	81	73	364	518
Kota Marudu	2,153	318	-	2,471
Sub-total	4,197	4,438	364	8,999
(4) West Coast Residency				
Kota Belud	4,816	405	160	5,381
Ranau	1,764	890	-	2,654
Tuaran	3,047	385	24	3,456
Kota Kinabalu	735	81	-	816
Penampang	2,405	66	-	2,471
Papar	5,256	8	-	5,264
Sub-total	18,023	1,835	184	20,042
(5) Interior Residency				
Beaufort	789	34	-	823
Sipitang	809	136	-	945
Kuala Penyu	422	66	-	488
Tenom	666	296	142	1,104
Keningau	2,538	597	23	3,158
Tambunan	1,671	635	-	2,306
Pensiangan	78	128	85	291
Sub-total	6,973	1,892	250	9,115
(6) Labuan	538	20	-	558
State Total	30,245	11,898	798	42,941

Source; Ref. 7

Table 6 RICE CROPPING CALENDAR PREVAILING IN SABAH

Name of Area	Farming Practices				
	Land Preparation	Sowing	Trans-planting	Growing	Harvest
Kota Marudu	Sept.1 to Sept.25	Sept.26 to Oct.20	Oct.21 to Nov.15	Nov.16 to Jan.31	Feb.1 to Mar.15
Kota Belud	Jul.16 to Aug.20	Aug.21 to Sept.10	Sept.11 to Sept.30	Oct.1 to Nov.30	Dec.1 to Jan.15
Tuaran	Jul.1 to Aug.10	Aug.11 to Aug.31	Sept.1 to Sept.15	Sept.16 to Nov.30	Dec.1 to Jan.15
Penampang	Jun.16 to Jul.15	Jul.16 to Aug.10	Aug.11 to Aug.31	Sept.1 to Nov.15	Nov.16 to Jan.20
Papar	Aug.16 to Sept.15	Sept.16 to Oct.10	Oct.11 to Oct.31	Nov.1 to Dec.31	Jan.1 to Feb.15
Beaufort	Jun.16 to Jul.10	Jul.11 to Jul.25	Jul.26 to Aug.15	Aug.16 to Nov.15	Nov.16 to Dec.31
Sipitang	Aug.11 to Sept.10	Sept.11 to Sept.30	Oct.1 to Oct.20	Oct.21 to Dec.31	Jan.1 to Feb.20
Ranau	Jun.16 to Jul.15	Jul.16 to Aug.10	Aug.11 to Aug.31	Sept.1 to Nov.30	Dec.1 to Jan.15
Keningau	Jun.16 to Jul.15	Jul.16 to Aug.10	Aug.11 to Aug.31	Sept.1 to Nov.30	Dec.1 to Jan.15
Tenom	Jul.16 to Aug.15	Aug.16 to Sept.10	Sept.11 to Sept.30	Oct.1 to Nov.30	Dec.1 to Jan.20

Source; Ref. 10

Table 7 HISTORICAL RECORD ON PADDY YIELD AND PRODUCTION IN SABAH

Unit: Yield ton/ha
Production 10^3 ton

Year		Wet Paddy		Hill Paddy	Kendinga Paddy	Total Production
		Main Season	Off Season			
1968	Yield	2.5	2.1	0.7	1.8	
	Production	72.6	3.3	7.4	2.0	85.3
1969	Yield	2.4	2.5	0.7	1.8	
	Production	73.1	6.3	8.0	2.0	89.4
1970	Yield	2.6	2.5	0.7	1.8	
	Production	79.5	4.6	6.9	2.1	93.1
1971	Yield	2.9	2.9	0.7	1.8	
	Production	88.5	7.3	6.9	1.7	104.4
1972	Yield	2.8	3.0	0.7	1.8	
	Production	92.1	13.7	6.9	1.6	114.3
1973	Yield	2.6	2.6	0.7	1.8	
	Production	84.9	14.9	6.5	1.6	107.9
1974	Yield	3.0	3.0	0.7	1.8	
	Production	98.0	10.3	8.4	1.9	118.6
1975	Yield	3.3	3.3	0.7	1.8	
	Production	110.6	12.2	9.9	1.0	133.7
1976	Yield	2.6	2.6	0.7	1.8	
	Production	74.6	5.3	12.3	0.9	93.1
1977	Yield	2.8	2.8	0.7	1.8	
	Production	76.5	5.9	12.9	0.9	96.2
1978	Yield	2.9	2.9	0.7	1.8	
	Production	77.8	3.8	9.7	1.5	92.8
1979	Yield	2.8	3.1	0.7	1.8	
	Production	85.5	12.9	8.4	1.4	108.2
1980	Yield	2.8	3.7	0.7	1.8	
	Production	86.8	12.8	8.6	1.4	109.6

Source; Ref. 9

Table 8 HISTORICAL RECORD ON CONSUMPTION, PRODUCTION AND IMPORTS OF RICE IN SABAH

Unit: 10^3 tons

Year	Population /1 (10^3)	Rice Consumption /2	Rice Production	Rice Imports	Self-Sufficiency /3 Rate (%)
1968	606	72.8	51.2	26.1	70.3
1969	634	76.1	53.6	29.7	70.4
1970	669	80.2	55.9	35.7	69.7
1971	705	84.6	62.6	41.9	74.0
1972	758	91.0	68.6	44.1	75.4
1973	808	97.0	64.7	52.4	66.7
1974	850	102.0	71.2	42.3	69.8
1975	891	107.0	80.2	40.0	75.0
1976	942	113.1	55.8	38.1	49.3
1977	993	119.2	57.7	48.0	48.4
1978	1,046	125.5	55.7	64.5	44.4
1979	1,101	132.1	64.9	66.2	49.1
1980	1,153	138.3	65.8	68.3	47.6
(1980)	(1,098) /4	(131.8)	(65.8)	(68.3)	(49.9)

Remarks: /1 : Estimated by Sabah DOS

/2 : Including some amount of stock carried over from the previous year

/3 : Self-sufficiency rate is obtained by dividing rice production by rice consumption in the same year

/4 : Based on the population estimated by the Study

Source: Ref. 9

Table 9 HISTORICAL RECORD ON RICE CULTIVATION AREA IN SARAWAK

Unit: ha

Year	Wet Paddy		Hill Paddy	Total
	Main Season	Off Season		
1970/71	61,570	-	73,270	134,840
1971/72	60,060	-	85,630	145,690
1972/73	48,180	-	62,500	110,680
1973/74	50,660	-	66,550	117,210
1974/75	54,180	-	64,200	118,380
1975/76	58,070	-	65,950	124,020
1976/77	67,790	170	63,550	131,340
1977/78	68,440	360	66,710	135,150
1978/79	70,610	750	73,110	143,720
1979/80	71,400	1,640	74,210	145,610

Source; Refs. 8 & 11

Table 10 TYPICAL RICE CROPPING CALENDER IN SARAWAK

Month	Wet Paddy	Hill Paddy
January	Weeding	-
February	-	Harvesting
March	Harvesting	Harvesting
April	Harvesting	-
May	-	-
June	-	Felling
July	-	Felling
August	Clearing	Burning
September	Clearing & Nursering	Burning
October	Planting	Sowing & Weeding
November	Planting & Weeding	Weeding
December	Weeding	-

Source; Ref. 8

Table 11 AREA, YIELD AND PRODUCTION OF WET PADDY BY DISTRICT IN SARAWAK AS OF 1979/80

Division/District	Planted Area (ha)	Harvested Area (ha)	Yield (kg/ha)	Total Production (ton)
(1) First Division				
Kuching	4,320	4,290	2,040	8,752
Bau	600	600	1,550	930
Serian	2,100	2,100	1,320	2,772
Lundu	1,420	1,420	2,090	2,968
Simunjan	3,870	3,870	2,350	9,095
Sub-total	12,310	12,280	1,996	24,517
(2) Second Division				
Batang Lupar	11,130	10,770	2,300	24,771
Lubok Antu	2,840	2,800	1,490	4,172
Saribas	3,870	3,840	1,820	6,989
Kalaka	5,570	5,520	1,830	10,102
Sub-total	23,410	22,930	2,009	46,034
(3) Third Division				
Sibu	4,250	4,250	2,510	10,668
Mukah	2,220	2,200	1,910	4,202
Dalat	1,230	1,140	2,150	2,451
Kanowit	1,700	1,660	1,200	1,992
Sub-total	9,400	9,250	2,088	19,313
(4) Fourth Division				
Miri	2,490	2,440	2,570	6,271
Baram	4,660	4,450	2,810	12,505
Bintulu	4,020	3,710	1,970	7,309
Sub-total	11,170	10,600	2,461	26,085
(5) Fifth Division				
Limbang	1,840	1,720	1,910	3,285
Lawas	2,710	2,590	2,090	5,413
Sub-total	4,550	4,310	2,020	8,698
(6) Sixth Division				
Sarikei	2,520	2,520	1,790	4,511
Binatang	3,790	3,790	1,490	5,647
Daro	3,540	3,520	1,970	6,934
Julau	180	140	1,020	143
Sub-total	10,030	9,970	1,731	17,235
(7) Seventh Division				
Kapit	460	450	1,150	518
Belaga	10	10	1,430	14
Song	60	60	900	54
Sub-total	530	520	1,128	586
State Total	71,400	69,860	2,040	142,468

Source; Ref. 8

Table 12 AREA, YIELD AND PRODUCTION OF HILL PADDY BY DISTRICT IN SARAWAK AS OF 1979/80

Division/District	Planted Area (ha)	Harvested Area (ha)	Yield (kg/ha)	Total Production (ton)
(1) First Division				
Kuching	2,390	2,390	600	1,434
Bau	1,550	1,550	760	1,178
Serian	1,280	1,280	840	1,075
Lundu	810	810	1,090	883
Simunjan	170	170	900	153
Sub-total	6,200	6,200	762	4,723
(2) Second Division				
Batang Lupar	4,810	3,490	450	1,571
Lubok Antu	3,900	3,600	600	2,160
Seribas	3,800	3,520	570	2,006
Kalaka	2,520	2,380	630	1,499
Sub-total	15,030	12,990	557	7,236
(3) Third Division				
Sibu	2,950	2,950	750	2,213
Mukan	970	960	980	941
Dalat	450	410	600	246
Kanowit	2,830	2,830	600	1,698
Sub-total	7,200	7,150	713	5,098
(4) Fourth Division				
Miri	3,250	3,210	1,430	4,590
Baram	6,070	5,260	1,010	5,313
Bintulu	5,520	5,010	600	3,006
Sub-total	14,840	13,480	958	12,909
(5) Fifth Division				
Limbang	1,880	1,760	960	1,690
Lawas	2,670	730	1,490	1,088
Sub-total	4,550	2,490	1,116	2,778
(6) Sixth Division				
Sarikei	2,830	2,830	420	1,189
Binatang	610	610	480	293
Daro	-	-	-	-
Julau	3,270	3,160	540	1,706
Sub-total	6,710	6,600	483	3,188
(7) Seventh Division				
Kapit	10,490	10,050	720	7,200
Belaga	3,240	3,200	720	2,304
Song	5,940	5,060	420	2,125
Sub-total	19,670	18,310	635	11,629
State Total	74,210	67,220	708	47,561

Source; Ref. 8

Table 13 SHIFTING CULTIVATION AND HILL PADDY GROWING AREAS BY DISTRICT IN SARAWAK

Unit: km^2

Division/District	Total Area	Shifting Cultivation Area	Shifting Cultivation Proportion (%)	Hill Paddy Growth Area	Hill Paddy Growth Proportion (%)
First Division					
Kuching	2,323	822	35.4	23.4	2.8
Bau	881	535	60.7	15.5	2.9
Serian	2,043	1,115	54.6	12.8	1.1
Lundu	1,783	531	29.8	8.1	1.5
Simunjan	1,602	353	22.0	1.7	0.5
Total	8,632	3,357	38.9	62.0	1.8
Second Division					
Batang Lupar	4,203	1,736	41.3	48.1	2.8
Lubok Antu	2,372	1,555	65.6	39.0	2.5
Saribas	1,803	994	55.1	38.0	3.8
Kalaka	1,598	988	61.8	25.2	2.6
Total	9,976	5,273	52.9	150.3	2.9
Third Division					
Sibu	3,400	1,190	35.0	29.5	2.5
Mukah	5,017	1,337	26.6	9.7	0.7
Dalat	2,200	908	41.3	4.5	0.5
Kanowit	2,231	1,367	61.3	28.3	2.1
Total	12,848	4,802	37.4	72.0	1.5
Fourth Division					
Miri	5,025	1,011	20.1	32.4	3.2
Baram	21,628	2,921	13.5	60.7	2.1
Bintulu	11,839	2,134	18.0	55.3	2.6
Total	38,492	6,066	15.8	148.4	2.4
Fifth Division					
Limbang	3,934	736	18.7	18.8	2.6
Lawas	3,799	450	11.8	26.7	5.9
Total	7,733	1,186	15.3	45.5	3.8
Sixth Division					
Sarikei	1,690	776	45.9	28.3	3.6
Binatang	1,067	444	41.6	6.1	1.4
Daro	1,261	300	23.8	-	-
Julau	2,625	1,762	67.1	32.7	1.9
Total	6,643	3,282	49.4	67.1	2.0
Seventh Division					
Kapit	15,594	2,236	14.3	104.9	4.7
Belaga	19,401	1,092	5.6	32.4	0.2
Song	3,934	1,235	31.4	59.5	1.5
Total	38,929	4,563	11.7	196.8	4.3
State Total	123,253	28,529	23.1	742.1	2.6

Remarks; Proportion of hill paddy growth indicates the ratio to shifting cultivation area.

Table 14 HISTORICAL RECORD ON PADDY YIELD AND PRODUCTION IN SAWARAK

Unit: Yield ton/ha
Production 10^3 tons

Year		Wet Paddy	Hill Paddy	Total Production
1970/71	Yield	1.6	0.8	1.2
	Production	97.5	60.0	157.5
1971/72	Yield	1.7	0.7	1.1
	Production	101.2	61.2	162.4
1972/73	Yield	1.8	0.7	1.2
	Production	85.7	44.2	129.9
1973/74	Yield	2.1	0.8	1.4
	Production	103.3	50.1	153.4
1974/75	Yield	1.9	0.8	1.3
	Production	97.0	47.2	144.2
1975/76	Yield	1.9	0.8	1.3
	Production	101.3	49.8	151.1
1976/77	Yield	2.0	0.7	1.4
	Production	127.4	44.8	172.2
1977/78	Yield	2.0	0.8	1.4
	Production	134.1	50.0	184.1
1978/79	Yield	2.0	0.8	1.4
	Production	139.7	52.8	192.5
1979/80	Yield	2.0	0.7	1.4
	Production	142.5	47.6	190.1

Source; Ref. 8

Table 15 HISTORICAL RECORD ON CONSUMPTION, PRODUCTION AND IMPORTS OF RICE IN SARAWAK

Unit: 10^3 tons

Year	Population /1 (10^3)	Rice Consumption /2	Rice Production	Rice Imports	Self-Sufficiency Rate (%) /3
1970	976.3	126.9	88.5		69.7
1971	1,004.6	130.6	91.3	60.2	69.9
1972	1,031.3	134.1	73.6	63.9	54.9
1973	1,059.0	137.7	87.0	70.3	63.2
1974	1,086.5	141.2	81.8	89.0	57.9
1975	1,114.2	144.8	85.7	36.9	59.2
1976	1,142.0	148.5	98.8	53.7	66.5
1977	1,170.1	152.1	105.5	78.0	69.4
1978	1,198.7	155.8	110.2	55.5	70.7
1979	1,228.6	159.7	109.3	62.9	68.4
(1980)	(1,244.8) /4	(193.9)	(114.0)	(79.9)	58.8

Remarks; /1 : Estimated by Sarawak DOS.

/2 : Including some amount of stock carried over from the previous year, based on DOA's statistics.

/3 : Self-sufficiency rate is obtained by dividing rice production by rice consumption in the same year.

/4 : Based on the population estimated by the Study.

Source; Refs. 8 & 11

Table 16 MAJOR TREE CROP CULTIVATION AREAS
BY DISTRICT IN SABAH AS OF 1979

Unit: ha

Residency/District	Rubber	Oil Palm	Coconut	Cocoa	Total
(1) Tawau Residency					
Tawau	11,350	20,900	5,590	15,720	53,560
Semporna	820	10,270	5,550	3,140	19,780
Lahad Datu	2,280	14,510	6,400	7,180	30,370
Sub-total	14,450	45,680	17,540	26,040	103,710
(2) Sandakan Residency					
Sandakan	6,070	18,410	3,680	3,870	32,030
Kinabatangan	560	5,040	910	440	6,950
Labuk/Sugut	1,480	10,280	390	540	12,690
Sub-total	8,110	33,730	4,980	4,850	51,670
(3) Kudat Residency					
Kudat	3,510	770	18,940	1,040	24,260
Pitas	780	1,250	1,250	350	3,630
Kota Marudu	2,010	2,050	5,500	1,500	11,060
Sub-total	6,300	4,070	25,690	2,890	38,950
(4) West Coast Residency					
Kota Belud	4,210	-	270	880	5,360
Ranau	1,370	0	90	360	1,820
Tuaran	8,500	-	120	160	8,780
Kota Kinabalu	5,780	-	50	-	5,830
Penampang	7,670	-	10	-	7,680
Papar	12,840	510	190	100	13,640
Sub-total	40,370	510	730	1,500	43,110
(5) Interior Residency					
Beaufort	11,800	2,490	700	200	15,190
Sipitang	3,490	-	80	70	3,640
Kuala Penyu	2,500	-	2,430	10	4,940
Tenom	9,850	20	110	1,560	11,540
Keningau	6,470	-	60	800	7,330
Tambunan	2,410	0	10	10	2,430
Pensiangan	10	-	20	30	60
Sub-total	36,530	2,510	3,410	2,680	45,130
(6) Labuan	1,090	0	1,220	0	2,310
State Total	106,850	86,500	53,570	37,960	284,880

Source; Refs. 7 & 13

Table 17 MAJOR TREE CROP CULTIVATION AREAS BY DISTRICT IN SARAWAK AS OF 1980

Unit: ha

Division/District	Rubber	Oil Palm	Coconut	Cocoa	Total
(1) First Division					
Kuching	15,580	-	12,840	3,120	31,540
Bau	10,710	-	320	30	11,060
Serian	9,620	-	220	30	9,870
Lundu	3,620	-	2,750	20	6,390
Simunjan	4,910	-	9,930	1,180	16,020
Sub-total	44,440	-	26,060	4,380	74,880
(2) Second Division					
Batang Lupar	9,950	-	5,180	400	15,530
Lubok Antu	4,360	2,380	20	140	6,900
Saribas	11,840	-	4,250	190	16,280
Kalaka	11,370	-	4,960	810	17,140
Sub-total	37,520	2,380	14,410	1,540	55,850
(3) Third Division					
Sibu	20,270	-	590	160	21,020
Mukah	9,540	3,730	1,500	90	14,860
Dalat	610	-	40	20	670
Kanowit	21,110	-	0	50	21,160
Sub-total	51,530	3,730	2,130	320	57,710
(4) Fourth Division					
Miri	6,490	15,950	710	260	23,410
Baram	8,950	-	350	50	9,350
Bintulu	10,390	-	1,860	460	12,710
Sub-total	25,830	15,950	2,920	770	45,470
(5) Fifth Division					
Limbang	7,960	270	1,480	50	9,760
Lawas	2,880	-	1,330	140	4,350
Sub-total	10,840	270	2,810	190	14,110
(6) Sixth Division					
Sarikei	8,400	-	3,230	370	12,000
Binatang	11,350	-	2,640	80	14,070
Daro	-	-	580	80	660
Julau	2,370	-	-	20	2,390
Sub-total	22,120	-	6,450	550	29,120
(7) Seventh Division					
Kapit	6,980	-	0	30	7,010
Belaga	170	-	-	20	190
Song	440	-	-	10	450
Sub-total	7,590	-	0	60	7,650
State Total	199,870	22,330	54,780	7,810	284,790

Source; Ref. 8

Table 18 PROPORTION OF MAJOR TREE CROPS' AREA TO TOTAL CROPPED AREA BY DISTRICT IN SABAH AS OF 1979

Unit: ha

Residency/District	Cropped Area			Major Tree Crops	
	Area	Perennial Crops	Annual Crops	Total Area	Proportion (%)
(1) Tawau Residency					
Tawau	55,140	54,730	410	53,560	97.1
Semporna	21,750	20,270	1,480	19,780	90.9
Lahad Datu	31,370	30,840	530	30,370	96.8
Sub-total	108,260	105,840	2,420	103,710	95.8
(2) Sandakan Residency					
Sandakan	34,360	33,540	820	32,030	93.2
Kinabatangan	9,560	7,390	2,170	6,950	72.7
Labuk/Sugut	16,730	13,070	3,660	12,690	75.9
Sub-total	60,650	54,000	6,650	51,670	85.2
(3) Kudat Residency					
Kudat	34,260	24,790	9,470	24,260	70.8
Pitas	6,360	3,770	2,590	3,630	57.1
Kota Marudu	15,080	11,270	3,810	11,060	73.3
Sub-total	55,700	39,830	15,870	38,950	69.9
(4) West Coast Residency					
Kota Belud	11,880	5,870	6,010	5,360	45.1
Ranau	5,630	2,370	3,260	1,820	32.3
Tuaran	14,150	10,300	3,850	8,780	62.0
Kota Kinabalu	7,220	6,260	960	5,830	80.7
Penampang	11,000	8,070	2,930	7,680	69.8
Papar	20,110	14,650	5,460	13,640	67.8
Sub-total	69,990	47,520	22,470	43,110	61.6
(5) Interior Residency					
Beaufort	17,320	16,310	1,010	15,190	87.7
Sipitang	5,710	4,680	1,030	3,640	63.7
Kuala Penyu	6,160	5,550	610	4,940	80.2
Tenom	14,570	12,570	2,000	11,540	79.2
Keningau	12,110	7,880	4,230	7,330	60.5
Tambunan	5,700	2,760	2,940	2,430	42.6
Pensiangan	760	290	470	60	7.9
Sub-total	62,330	50,040	12,290	45,130	72.4
(6) Labuan	3,210	2,540	670	2,310	72.0
State Total	360,140	299,770	60,370	284,880	79.1

Source; Ref. 7

Table 19 PROPORTION OF MAJOR TREE CROPS' AREA TO TOTAL CROPPED AREA BY DISTRICT IN SARAWAK AS OF 1980

Division/District	Cropped Area			Major Tree Crops	
	Total Area	Perennial Crops	Annual Crops /1	Total Area	Proportion (%)
(1) First Division					
Kuching	40,620	33,790	6,830	31,540	77.6
Bau	14,140	11,920	2,220	11,060	78.2
Serian	15,700	12,260	3,440	9,870	62.9
Lundu	9,350	7,080	2,270	6,390	68.3
Simunjan	20,490	16,430	4,060	16,020	78.2
Sub-total	100,300	81,480	18,820	74,880	74.7
(2) Second Division					
Batang Lupar	33,900	17,780	16,120	15,530	45.8
Lubok Antu	14,390	7,500	6,890	6,900	47.9
Saribas	26,230	18,400	7,830	16,280	62.1
Kalaka	26,850	18,660	8,190	17,140	63.8
Sub-total	101,370	62,340	39,030	55,850	55.1
(3) Third Division					
Sibu	31,170	23,850	7,320	21,020	67.4
Mukah	22,220	18,990	3,230	14,860	66.9
Dalat	5,720	4,020	1,700	670	11.7
Kanowit	26,180	21,530	4,650	21,160	80.8
Sub-total	85,290	68,390	16,900	57,710	67.7
(4) Fourth Division					
Miri	31,970	26,110	5,860	23,410	73.2
Baram	20,800	9,850	10,950	9,350	45.0
Bintulu	23,060	13,300	9,760	12,710	55.1
Sub-total	75,830	49,260	26,570	45,470	60.0
(5) Fifth Division					
Limbang	14,030	10,220	3,810	9,760	70.0
Lawas	10,140	4,650	5,490	4,350	42.9
Sub-total	24,170	14,870	9,300	14,110	58.4
(6) Sixth Division					
Sarikei	18,930	13,470	5,460	12,000	63.4
Binatang	20,700	16,270	4,430	14,070	68.0
Daro	4,800	1,240	3,560	660	13.7
Julau	6,440	2,870	3,570	2,390	37.1
Sub-total	50,870	33,850	17,020	29,120	57.2
(7) Seventh Division					
Kapit	18,630	7,290	11,340	7,010	37.6
Belaga	3,560	190	3,370	190	5.3
Song	6,980	730	6,250	450	6.4
Sub-total	29,170	8,210	20,960	7,650	26.2
State Total	467,000	318,400	148,600	284,790	61.0

Source; Ref. 8

Remarks; /1 : Annual crop areas exclude follow shifting cultivation area.

Table 20 LIST OF SLDB SCHEMES IN SABAH
AS OF 1980

Unit: ha

Regional Office	Name of Scheme	Type of Crop	Area
Tawau	Semporna	Oil Palm	1,070
	Lormalong	Oil Palm	308
		Cocoa	2
	Merotai Besar	Oil Palm	1,480
	Pegagau	Oil Palm	2,830
	Sg. Balung	Oil Palm	2,100
	Apas Balung	Oil Palm	2,970
	Sg. Wakuba	Oil Palm	1,530
	Sg. Kawa	Oil Palm	1,620
	Lihak Lihak	Coconut	170
		Cocoa	360
		Rubber	70
	Bergosong	Cocoa	90
		Rubber	280
	Tamang	Rubber	470
Sandakan	Sg. Manila	Oil Palm	3,970
	Suan Lamba	Oil Palm	3,350
	Nangoh	Oil Palm	1,110
	Silabukan	Oil Palm	3,240
	Ulu Dusun	Oil Palm	820
	Sungei Sungei	Coconut	60
	Rumidi/Perancangan	Cocoa	380
Kudat	Langkon	Oil Palm	2,440
		Coconut	100
		Cocoa	110
	Pitas	Oil Palm	1,250
	Pinawantai	Oil Palm	770
	Limauan	Coconut	320
	Lok Tohok	Coconut	370
	Sasapan	Cocoa	90
Beaufort	Klias	Oil Palm	1,300
	Menunuk	Oil Palm	240
	Mawao	Oil Palm	550
		Rubber	220
	Kimanis	Oil Palm	510
		Rubber	400
	Lumadan	Oil Palm	160
	Papar	Rubber	410

Source; Ref. 15

Table 21 LIST OF SLDB AND SALCRA SCHEMES IN SARAWAK AS OF 1980

Unit: ha

Executive Agency	Location	Name of Scheme	Type of Crop	Area
SLDB	First Division	Triboh	Rubber	340
	Second Division	Melugu	Rubber	980
		Skrang	Rubber	1,520
	Sixth Division	Meradon	Rubber	1,470
	Third Division	Sibintek	Rubber	880
		Nanga Sekuau	Pepper	240
		Mukah I/II	Oil Palm	1,990
		Mukah III	Oil Palm	970
		Mukah IV	Oil Palm	770
	Fourth Division	Suai I	Oil Palm	1,490
		Suai II	Oil Palm	380
		Subis I	Oil Palm	860
		Subis II	Oil Palm	1,660
		Subis III	Oil Palm	1,630
		Ladang Koko	Cocoa	810
		Ladang Tiga	Oil Palm	1,770
		Ladang Empat	Oil Palm	1,000
		Bukit Peninjau	Oil Palm	1,570
		Sungai Tangit	Oil Palm	1,410
		Lambir	Rubber	1,070
	Fifth Division	Lubai Tengah	Rubber	860
SALCRA	First Division	Lemanak	Oil Palm	1,760
	Second Division	Batang Ai	Oil Palm	1,210
		Pakit	Oil Palm	1,210

Source; Ref. 16

Table 22 EXPORTS OF MAJOR CROP PRODUCTION IN SABAH

Unit: Volume 10^3 tons
Value M10^6

Year	Rubber (DRC)	Palm Oil	Palm Kernel	Cocoa[1] Beans	Coconut Copra	Coconut Oil	Pepper Black	Pepper White
1970								
Volume	31.8	28.7	5.2	1,900	15.0	0.1		N.A.
Value	36.5	18.1	1.9	4.4	6.8	N.A.		N.A.
1975								
Volume	32.0	124.6	24.2	5,400	30.5	0.3		0.0
Value	40.0	131.0	8.9	17.0	14.4	N.A.		0.1
1976								
Volume	35.8	121.0	23.9	6,300	39.1	0.7		0.1
Value	62.0	108.5	11.2	25.6	19.9	N.A.		0.4
1977								
Volume	38.8	111.0	15.6	7,000	37.1	1.0		0.1
Value	69.5	136.2	9.4	54.2	30.7	N.A.		0.4
1978								
Volume	36.8	126.9	18.3	8,200	36.2	0.5		0.0
Value	73.5	156.0	11.8	62.8	31.2	N.A.		0.1
1979								
Volume	33.2	136.4	15.8	9,700	30.5	0.4	0.0	0.1
Value	79.8	183.3	13.0	64.8	34.5	0.7	0.0	0.2
1980								
Volume	30.8	143.6	22.9	12,400	43.2	0.4	0.0	0.0
Value	82.2	159.6	9.7	67.6	33.3	0.6	0.0	0.1

Source; Refs. 15 & 16

Table 23 EXPORTS OF MAJOR CROP PRODUCTION IN SARAWAK

Unit: Volume 10^3 tons
Value M$$10^6$

Year	Rubber (DRC)	Palm		Cocoa Beans	Coconut		Pepper	
		Oil	Kernel		Copra	Oil	Black	White
1970								
Volume	21.8	-	-	-	-	4.1	15.0	9.4
Value	24.0	-	-	-	-	3.4	31.1	25.1
1975								
Volume	29.0	3.6	0.7	-	-	3.8	20.6	9.8
Value	35.9	3.9	0.3	-	-	4.1	61.9	39.0
1976								
Volume	40.4	7.3	1.2	-	-	4.2	25.6	9.8
Value	64.3	7.7	0.6	-	-	4.8	83.1	41.3
1977								
Volume	37.7	12.5	1.8	-	-	2.2	19.4	7.4
Value	62.9	19.6	1.0	-	-	4.0	90.2	42.5
1978								
Volume	39.6	17.5	3.1	-	-	2.5	22.1	8.6
Value	74.0	26.4	1.9	-	-	4.7	82.4	49.4
1979								
Volume	38.6	18.8	4.2	0.7	-	5.2	25.5	10.6
Value	88.4	32.2	3.4	0.6	-	9.8	83.1	53.3
1980								
Volume	N.A.	N.A.	N.A.	N.A.	-	N.A.	N.A.	N.A.
Value /1	44.5	16.7	N.A.	N.A.	-	3.9	32.8	16.0

Source; Refs. 17 & 18

Remarks; /1 : Export values from January to June, 1980.

Table 24 HISTORICAL RECORD ON RUBBER PLANTED AREA BY PRODUCER IN SABAH AND SARAWAK

Unit: ha

	Year	Estates No.	Estates Area	Land Schemes No.	Land Schemes Area	Small Holding Area	Total Area
(1)	Sabah						
	1970	105	27,400	18	3,600	74,390	105,390
	1971	99	24,630	17	3,670	76,690	104,990
	1972	96	24,740	19	3,370	76,360	104,470
	1973	90	20,020	19	3,240	80,720	103,980
	1974	89	19,650	19	3,240	81,210	104,100
	1975	86	17,410	19	4,060	82,350	103,820
	1976	86	17,110	18	3,760	82,940	103,810
	1977	84	16,840	17	3,700	83,020	103,560
	1978	85	16,500	17	3,700	85,020	105,220
	1979	79	14,620	17	4,470	87,760	106,850
(2)	Sarawak						
	1970	16	3,040	7	5,770	181,370	190,180
	1971	16	2,990	7	5,770	184,150	192,910
	1972	15	2,980	7	5,810	184,110	192,910
	1973	13	2,850	7	5,540	184,520	192,910
	1974	12	2,810	7	5,540	184,560	192,910
	1975	11	2,690	7	5,540	184,680	192,910
	1976	11	2,670	7	5,540	184,700	192,910
	1977	12	2,810	7	5,540	184,560	192,910
	1978	11	2,850	7	5,540	184,520	192,910
	1979	11	2,900	7	5,540	184,520	192,960

Source; Ref. 14

Table 25 HISTORICAL RECORD ON PLANTED AREA OF HIGH YIELDING MATERIAL OF RUBBER IN SABAH AND SARAWAK

Unit: 10^3 ha

Year	Estates and Land Schemes			Small holders			Total		
	HYM	US	Total	HYM	US	Total	HYM	US	Total
(1) Sabah									
1971	17.4	10.9	28.3	51.1	25.6	76.7	68.5	36.5	105.0
1972	17.4	10.7	28.1	51.7	24.7	76.4	69.1	35.4	104.5
1973	13.5	9.8	23.3	52.5	28.2	80.7	66.0	38.0	104.0
1974	13.5	9.4	22.9	54.8	26.4	81.2	68.3	35.8	104.1
1975	12.7	8.7	21.4	57.1	25,3	82.4	69.8	34.0	103.8
1976	12.1	8.8	20.9	58.3	24.6	82.9	70.4	33.4	103.8
1977	12.1	8.5	20.6	60.4	22.6	83.0	72.5	31.1	103.6
1978	12.0	8.2	20.2	63.8	21.2	85.0	75.8	29.4	105.2
(2) Sarawak									
1971	7.7	1.0	8.7	75.5	108.7	184.2	83.2	109.7	192.9
1972	7.9	0.9	8.8	75.5	108.6	184.1	83.4	109.5	192.9
1973	7.6	0.8	8.4	75.8	108.7	184.5	83.4	109.5	192.9
1974	7.6	0.7	8.3	75.8	108.8	184.6	83.4	109.5	192.9
1975	7.6	0.6	8.2	75.8	108.9	184.7	83.4	109.5	192.9
1976	7.6	0.6	8.2	75,8	108,9	184.7	83.4	109.5	192.9
1977	7.7	0.6	8.3	75.7	108.9	184.6	83.4	109.5	192.9
1978	7.9	0.5	8.4	75.6	108.9	184.5	83.5	109.4	192.9

Source; Ref. 14

Remarks; HYM: High yielding material, and
US : Unselected seedlings

Table 26 HISTORICAL RECORD ON RUBBER YIELD AND PRODUCTION OF ESTATES IN SABAH AND SARAWAK

	Year	Exports			Production in Estate (ton)	Yield (kg/ha)	Estimated Tapped Area (ha)
		Total (ton)	Estates (ton)	Small-holders (ton)			
(1)	Sabah						
	1969	29,398	8,726	20,672	8,718	612	14,250
	1970	31,810	9,602	22,208	9,907	702	14,110
	1971	28,583	10,021	18,562	9,970	870	11,460
	1972	26,276	10,247	16,029	10,968	1,002	10,950
	1973	35,370	10,530	24,840	6,119	820	7,460
	1974	31,602	9,341	22,261	6,217	875	7,100
	1975	32,029	9,337	22,692	5,834	1,007	5,790
	1976	35,804	9,927	25,877	5,532	993	5,570
	1977	38,825	8,587	30,238	5,350	975	5,490
	1978	36,791	6,633	30,158	5,165	1,004	5,140
	1979	33,241	8,372	24,869	3,991	885	4,510
(2)	Sarawak						
	1969	39,351	504	38,847	504	542	930
	1970	21,804	420	21,384	420	503	830
	1971	19,588	397	19,191	397	528	750
	1972	19,938	433	19,505	433	569	760
	1973	42,000	501	41,499	501	600	840
	1974	32,707	567	32,140	567	671	850
	1975	29,036	562	28,474	562	708	790
	1976	40,404	574	39,830	574	658	870
	1977	37,665	579	37,086	579	625	930
	1978	39,609	511	39,098	511	624	820
	1979	38,583	456	38,127	456	597	760

Source; Ref. 14

Table 27 ESTIMATED RUBBER PRODUCTION IN SABAH AS OF 1980

Unit: Area ha
Production ton

Residency/District	Total Planted Area	Estimated Tapped Area			Estimated Rubber Production		
		Estates & Others	Small-holders	Total	Estates & Others	Small-holders	Total
(1) Tawau Residency							
Tawau	11,350	950	2,520	3,470	998	2,394	3,392
Semporna	820	20	290	310	21	276	297
Lahad Datu	2,280	200	470	670	210	447	657
Sub-total	14,450	1,170	3,280	4,450	1,229	3,117	4,346
(2) Sandakan Residency							
Sandakan	6,070	770	700	1,470	809	665	1,474
Kinabatangan	560	90	20	110	95	19	114
Labuk/Sugut	1,480	30	560	590	32	532	564
Sub-total	8,110	890	1,280	2,170	936	1,216	2,152
(3) Kudat Residency							
Kudat	3,510	190	1,030	1,220	200	979	1,179
Pitas	780	50	220	270	53	209	262
Kota Marudu	2,010	140	490	630	147	466	613
Sub-total	6,300	380	1,740	2,120	400	1,654	2,054
(4) West Coast Residency							
Kota Belud	4,210	220	1,230	1,450	231	1,169	1,400
Ranau	1,370	10	580	590	11	551	562
Tuaran	8,500	340	2,790	3,130	357	2,651	3,008
Kota Kinabalu	5,780	170	2,030	2,200	179	1,929	2,108
Penampang	7,670	260	2,620	2,880	273	2,489	2,762
Papar	12,840	930	3,210	4,140	977	3,050	4,027
Sub-total	40,370	1,930	12,460	14,390	2,028	11,839	13,867
(5) Interior Residency							
Beaufort	11,800	670	3,390	4,060	704	3,221	3,925
Sipitang	3,490	-	1,490	1,490	-	1,416	1,416
Kuala Penyu	2,500	10	1,030	1,040	11	979	990
Tenom	9,850	590	2,760	3,350	620	2,622	3,242
Keningau	6,470	60	2,600	2,660	63	2,470	2,533
Tambunan	2,410	-	1,020	1,020	-	969	969
Pensiangan	10	-	0	0	-	0	0
Sub-total	36,530	1,330	12,290	13,620	1,398	11,677	13,075
(6) Labuan	1,090	-	450	450	-	428	428
State Total	106,850	5,700	31,500	37,200	5,991	29,931	35,922

Table 28 ESTIMATED RUBBER PRODUCTION IN SARAWAK AS OF 1980

Unit: Area ha
Production ton

Division/District	Total Planted Area	Estimated Tapped Area			Estimated Rubber Production		
		Estates	Small-holders	Total	Estates	Small-holders	Total
(1) First Division							
Kuching	15,580	350	5,650	6,000	228	3,108	3,336
Bau	10,710	230	3,880	4,110	150	2,134	2,284
Serian	9,620	150	3,530	3,680	98	1,942	2,040
Lundu	3,620	-	1,360	1,360	-	748	748
Simunjan	4,910	-	1,850	1,850	-	1,018	1,018
Sub-total	44,440	730	16,270	17,000	476	8,950	9,426
(2) Second Division							
Batang Lupar	9,950	1,140	2,810	3,950	741	1,546	2,287
Lubok Antu	4,360	-	1,640	1,640	-	902	902
Saribas	11,840	-	4,510	4,510	-	2,481	2,481
Kalaka	11,370	-	4,330	4,330	-	2,382	2,382
Sub-total	37,520	1,140	13,290	14,430	741	7,311	8,052
(3) Third Division							
Sibu	20,270	400	7,430	7,830	260	4,087	4,347
Mukah	9,540	-	3,620	3,620	-	1,991	1,991
Dalat	610	-	240	240	-	132	132
Kanowit	21,110	-	8,100	8,100	-	4,455	4,455
Sub-total	51,530	400	19,390	19,790	260	10,665	10,925
(4) Fourth Division							
Miri	6,490	480	2,040	2,520	312	1,122	1,434
Baram	8,950	-	3,400	3,400	-	1,870	1,870
Bintulu	10,390	-	3,950	3,950	-	2,173	2,173
Sub-total	25,830	480	9,390	9,870	312	5,165	5,477
(5) Fifth Division							
Limbang	7,960	390	2,690	2,690	254	1,480	1,734
Lawas	2,880	-	1,100	1,100	-	605	605
Sub-total	10,840	390	3,790	3,790	254	2,085	2,085
(6) Sixth Division							
Serikei	8,400	-	3,170	3,170	-	1,744	1,744
Binatang	11,350	680	3,740	4,420	442	2,057	2,499
Daro	-	-	-	-	-	-	-
Julau	2,370	-	910	910	-	501	501
Sub-total	22,120	680	7,820	8,500	442	4,302	4,744
(7) Seventh Division							
Kapit	6,980	-	2,640	2,640	-	1,452	1,452
Belaga	170	-	60	60	-	33	33
Song	440	-	170	170	-	94	94
Sub-total	7,590	-	2,870	2,870	-	1,579	1,579
State Total	199,870	3,820	72,820	76,640	2,485	40,057	42,288

Table 29 HISTORICAL RECORD ON OIL PALM PLANTED AREA BY PRODUCER IN SABAH AND SARAWAK

Unit: ha

	Year	Estates No.	Estates Area	Land Schemes No.	Land Schemes Area	Small Holding Area	Total Area
(1)	Sabah						
	1969	59	19,390	19	8,540	1,390	34,590
	1970	56	20,200	22	11,860	1,450	38,430
	1971	56	21,710	22	13,500	2,890	43,060
	1972	54	23,140	20	14,770	5,020	49,980
	1973	57	28,490	21	17,570	5,060	51,890
	1974	56	29,660	22	19,490	4,700	54,810
	1975	62	30,560	27	23,940	3,520	59,140
	1976	59	34,150	30	31,250	3,180	69,710
	1977	65	36,360	33	33,320	2,380	73,300
	1978	59	37,750	33	34,620	3,880	78,210
	1979	59	41,680	33	36,920	6,440	86,690
(2)	Sarawak						
	1969	1	200	2	-	-	200
	1970	1	600	2	430	-	1,030
	1971	1	1,410	2	1,260	-	2,670
	1972	1	2,220	2	2,330	-	4,550
	1973	1	3,130	2	3,830	120	7,090
	1974	1	3,630	2	6,930	360	10,920
	1975	1	4,030	9	9,490	570	14,090
	1976	1	4,130	10	10,630	570	15,330
	1977	1	4,140	11	12,010	650	16,800
	1978	1	4,140	13	14,450	650	19,240
	1979	1	4,140	13	16,580	920	21,640

Source; Ref. SF 18

Ref.; For Sabah, the total area includes estates with other crops.

Table 30 DISTRIBUTION OF SOIL UNIT BY BASIN IN SABAH AND SARAWAK

Unit: km^2

Basin No.	Name of Basin	Soil Unit AC	AR	AF	AT	SR	SH	SM	Total
(1)	Sabah								
201	Pensiangan	-	-	41	61	-	-	5,869	5,971
202	Serudong	305	-	90	-	-	-	913	1,308
203	Kalabakan	79	-	99	-	-	-	1,193	1,371
204	Brantian	37	-	93	-	-	-	611	741
205	Umas Umas	59	-	99	-	-	-	395	553
206	Merutai Besar	62	-	93	-	62	-	341	558
207	Tawau	109	18	290	-	72	-	399	888
208	Kalumpang	198	108	306	-	90	558	1,532	2,792
209	Silabukan	212	233	64	106	276	21	1,802	2,714
210	Segama	391	535	21	-	206	185	4,220	5,558
211	Kinabatangan	756	1,209	173	302	302	864	12,975	16,581
212	Segalid	545	39	39	-	311	700	701	2,335
213	Labuk	773	301	301	-	193	301	4,960	6,829
214	Sugut	42	191	127	-	-	-	2,734	3,094
215	Paitan	295	-	369	-	-	-	810	1,474
216	Bengkoka	410	43	324	-	-	-	1,166	1,943
217	Bongan	113	132	76	-	-	38	1,832	2,191
218	Kadamaian	103	145	21	-	-	-	1,117	1,386
219	Tuaran	100	20	-	-	-	-	1,099	1,219
220	Putatan	-	84	-	-	-	-	545	629
221	Papar	22	109	-	-	-	-	674	805
222	Kimanis	42	106	-	-	-	-	424	572
223	Membakut	82	300	55	-	-	-	299	736
224	Padas	265	611	570	204	-	-	7,530	9,180
225	Labuan	-	-	-	-	-	-	91	91
226	Lakutan	58	116	39	-	-	-	1,078	1,291
	State Total	5,058	4,300	3,290	673	1,512	2,667	55,310	72,810
(2)	Sarawak								
227	Lawas	67	67	67	-	-	201	668	1,070
228	Trusan	64	129	107	-	-	536	1,906	2,742
229	Limbang	86	130	216	-	-	454	3,092	3,978
230	Baram	21	1,910	1,443	21	-	2,356	16,574	22,325
231	Miri	40	364	81	81	-	182	40	788
232	Sibuti	83	138	165	-	-	521	28	935
233	Niah	21	149	107	-	-	790	278	1,345
234	Suai	21	188	125	21	-	835	250	1,440
235	Similajau	37	110	18	92	-	827	184	1,268
236	Kemana	-	869	434	83	-	2,572	1,696	5,834
237	Tatau	-	442	253	-	-	1,957	2,356	5,008
238	Balingian	-	1,144	94	-	-	431	788	2,457
239	Mukah	23	862	113	159	45	567	793	2,562
240	Oya	21	821	105	21	21	547	673	2,209
241	Rajang	1,573	4,315	744	21	-	3,699	40,963	51,315
242	Kerian	166	312	270	-	-	624	291	1,663
243	Saribas	42	650	314	-	-	251	608	1,865
244	Lupar	63	2,087	274	84	148	1,497	2,592	6,745
245	Sadong	129	1,402	302	22	43	1,229	561	3,688
246	Sarawak	629	357	231	126	-	1,468	587	3,398
247	Kayan	432	35	86	121	414	449	276	1,813
	State Total	3,518	16,481	5,549	852	671	22,173	75,204	124,448

Source; Refs. 12 & 13

Remarks; AC: Alluvial soils on coastal plains, AR: Alluvial soils on coastal plains and/or riverine, AF: Alluvial soils on riverine, flood plains and/or low riverine terrace, AT: Alluvial soils on intermediate and high terraces, SR: Sedentary soils on undulating plains to rolling land, SH: Sedentary soils on rolling and low hilly land and SM: Sedentary soils on hills and mountains.

Table 31 ANALYSIS OF LAND WITH HIGH AND MODERATE AGRICULTURAL POTENTIALS BY PRESENT LAND USE AND BY RESIDENCY IN SABAH

Unit: ha

Present Land Use Category	Tawau	Sandakan	Interior & Labuan	West Coast & Kudat	Total
(1) Class II (High Agricultural Potential)					
Urban	1,020	590	150	190	1,950
Horticulture	850	2,720	1,200	3,930	8,700
Tree crops	15,790	14,980	9,510	9,980	50,260
Shifting area	310	190	1,160	5,360	9,020
Pasture	0	0	0	100	100
Ggassland	4,470	8,570	2,670	10,810	26,520
Forest	107,940	242,180	3,900	8,530	362,550
Scrub forest	13,110	72,610	4,600	18,620	108,940
Swamp	2,960	33,860	570	2,020	39,410
Unused land	920	4,610	220	290	6,040
Total	147,370	382,310	23,980	59,830	613,490
(2) Class III (Moderate Agricultural Potential)					
Urban	970	570	1,110	730	3,380
Horticulture	1,460	1,410	5,460	5,710	14,040
Tree crops	20,610	7,830	22,230	25,000	75,670
Shifting area	370	2,850	12,220	22,350	37,790
Pasture	40	0	70	20	130
Grassland	5,090	8,520	11,810	18,120	43,540
Forest	265,420	623,510	75,930	45,830	1,010,690
Scrub forest	34,370	120,390	22,810	44,270	221,840
Swamp	9,200	96,310	6,210	6,860	118,580
Unused land	2,570	2,570	1,430	940	7,510
Total	340,100	863,960	159,280	169,830	1,533,170

Source; Refs. 2 & 10

Table 32 IDENTIFIED AREAS WITH POTENTIAL OF LARGE SCALE PADDY CULTIVATION IN SABAH

Unit: ha

Residency	Identified Area	Location	Area		
			Class II Land	Class III Land	Total
Tawau	Segama valley	Middle Segama valley North of Lahad Datu	-	8,500	8,500
		Lower Silabukan valley	-	2,000	2,000
		Kuala Kawang	-	800	800
	Semporna lowlands	Lower Tingkayu valley	-	2,400	2,400
		Upper Tingkayu valley	-	1,600	1,600
	Dent hills	Middle Sabahan valley	-	2,800	2,800
	Kalabakan valley	Lower Brantian valley	-	800	800
		Lower Kalabakan valley	-	800	800
	Scattered small areas		5,300	-	5,300
Sandakan	Kinabatangan lowlands	Kinabatangan valley	6,500	72,500	79,000
		Kretam valley	3,200	5,700	8,900
	Lubuk highland and delta	Labuk valley	4,000	-	4,000
		Klegan	-	2,400	2,400
	Kaindangan Pepeplain & Sugut delta	Sugut valley	4,000	4,000	8,000
		Kaindangan valley	800	-	800
		Paitan valley	800	1,200	2,000
	Segama valley	Tomanggong	3,200	25,900	29,000
	Eastern deltas	Ganduman	-	9,700	9,700
		Lumerace	-	7,700	7,700
	Lonkan pepeplain	Samawang	-	1,600	1,600
		Segaliud	-	800	800

Source; Ref. 10

Remarks; Class II & Class III soils are alluvial reverine plain soils.

Table 33 STATUS OF POTENTIAL LANDS IDENTIFIED FOR MECHANIZED RICE PRODUCTION

Unit: ha

Site	Gross Area	Land Availability/Suitability
Pitas	600	15% cultivated, remainder under customary rights
Sugut	16,000	Committed to other applicants
Tagas Tagas	1,200	800 ha alienated, 400 ha subject to application
Trusan Sapi	8,500	Available
Dusun	400	All alienated
Tingkeyu	6,000	All alienated
Wakuba	1,000	50% alienated, balance committed
Kalabakan	800	Very remote, logged over and too small an area
Kretam Forest Reserve	15,400	Available but partly soils unsutable
Dent peninsular	14,000	Allocated to FELDA

Source; Ref. 11

Table 34 POTENTIAL AREA FOR LARGE SCALE DEVELOPMENT OF IRRIGATED PADDY FIELD AND PROPOSED AREA

Unit: ha

State	Potential Scheme	Potential Area	DID Proposed Area
Sabah	Klias plain	22,700	-
	Bandau plain	23,100	-
	Lower Labuk	27,100	8,100
	Segama valley	82,200	-
	Tabin-Lumerau plain	26,700	-
	Semporna peninsular	66,000	-
	Kinabatangan valley	132,700	12,200
	Total	380,500	20,300
Sarawak	Limbang valley & middle Limbang	26,900	10,100
	Bakong/Bakas	6,300	-
	Bungai Mumoon	400	-
	Sibu	2,200	-
	Batang Oya	3,700	-
	Batang Igan	2,500	-
	Sarikei/Binatang	22,000	4,000
	Daro	1,400	-
	Saratok	3,700	-
	Roban	2,300	-
	Batang Ai/Batang Lupar	4,500	4,000
	Sadong/Krag	11,500	4,000
	Sadong/Krong	11,500	4,000
	Samarakan	7,200	12,100
	Total	94,600	34,200

Table 35 ANTICIPATED PADDY YIELD IN SABAH AND SARAWAK

Unit: ton/ha

Scheme	Season	Sabah			Sarawak		
		Present	Without Project	With Project	Present	Without Project	With Project
Minor							
Irrigated	Main	2.7	2.8	3.5	2.6	2.7	3.2
	Off	3.1	3.2	4.2	3.0	3.1	3.9
Control drainage	Main	-	-	-	2.4	2.5	2.7
Rainfed	Main	1.8	2.0	-	1.5	1.7	-
Major							
-Lower Labuk							
Irrigated	Main	2.7	2.8	3.8	-	-	-
	Off	3.1	3.2	4.6	-	-	-
-Limbang							
Irrigated	Main	-	-	-	-	-	3.2
	Off	-	-	-	-	-	4.0
-Binatang Baret							
Irrigated	Main	-	-	-	-	-	3.6
	Off	-	-	-	-	-	4.4
Rainfed	Main	-	-	-	1.5	1.7	-
-Batang Lupor and Sadong Krang							
Irrigated	Main	-	-	-	-	-	3.4
	Off	-	-	-	-	-	4.2
Rainfed	Main	-	-	-	1.5	1.7	-
-Samarahang							
Irrigated	Main	-	-	-	-	-	3.4
	Off	-	-	-	-	-	4.2
Control drainage	Main	-	-	-	2.4	2.5	2.9
Rainfed	Main	-	-	-	1.5	1.7	-

Table 36 ESTIMATED AREA OF IRRIGATED PADDY FIELD IN SABAH

Unit: ha

Basin No.	Basin Name	Scheme	1980 Main Season	1980 Off Season	1990 Main Season	1990 Off Season	2000 Main Season	2000 Off Season
201-212	Tawau+	-	-	-	-	-	-	-
213	Labuk	Major/1	-	-	-	-	6000	3000
		Minor	2172	642	2510	690	730	120
214	Sugut	Minor	1068	324	1068	324	1068	324
215	Paitan	-	-	-	-	-	-	-
216	Bengkoka	Minor	238	199	766	617	1256	617
217	Bongan	Minor	1337	568	3406	2219	3406	2219
218	Kadamaian	Minor	5442	2423	6115	3108	6370	3581
219	Tuaran	Minor	1984	1206	1984	1206	1984	1206
220	Putatan	Minor	1419	628	1822	871	1822	871
221	Papar	Minor	2739	2055	3223	2539	3223	2539
222	Kimanis	Minor	60	60	2410	1610	2410	1610
223	Membakut	Minor	145	81	1319	667	1319	667
224	Padas	Minor	2962	1086	6563	2061	8718	2298
225	Labuan	-	-	-	-	-	-	-
226	Lakutan	Minor	1214	648	1214	648	1214	648
	Total		20780	9920	32400	16560	39520	19700

Remarks; /1: Lower Labuk Project. The Trusan Sapi Scheme of 1,780 ha will be incorporated into this project by 2000.

Table 37 ESTIMATED AREA OF IRRIGATED PADDY FIELD IN SARAWAK

Unit: ha

Basin No.	Basin Name	Scheme	1980 Positive Main	1980 Positive Off	1980 C/D	1990 Positive Main	1990 Positive Off	1990 C/D	2000 Positive Main	2000 Positive Off	2000 C/D
227	Lawas	Minor	-	-	-	408	408	-	408	408	-
228	Trusan	Minor	-	-	-	540	540	-	1429	1429	189
229	Limbang	Major/1	-	-	-	3100	3100	-	8600	8600	-
		Minor	219	219	-	323	323	-	323	323	-
230	Basam	Minor	162	162	-	1414	1414	-	3883	3883	-
231	Miri	Minor	-	-	128	108	108	128	108	108	128
232	Sibuti	Minor	546	546	202	546	546	394	546	546	778
233	Niah	Minor	-	-	-	-	-	-	-	-	-
234	Buai	Minor	-	-	-	-	-	-	-	-	-
235	Similajau	Minor	-	-	-	-	-	-	-	-	-
236	Kemena	Minor	-	-	109	962	962	109	2666	2666	328
237	Tatau	Minor	-	-	-	182	182	-	182	182	-
238	Balingian	Minor	-	-	-	-	-	-	257	257	-
239	Mukah	Minor	-	-	-	418	418	-	418	418	728
240	Oya	Minor	-	-	-	266	266	-	532	532	304
241	Rajang	Major/2	-	-	-	-	-	-	4000	2000	-
		Minor	150	150	1379	970	970	5189	1641	1641	6150
242	Kerian	Minor	-	-	231	-	-	2069	-	-	3032
243	Saribas	Minor	-	-	304	126	126	817	126	126	2096
244	Lupar	Major/3	-	-	-	-	-	-	4000	2000	-
		Minor	349	349	1441	1321	1221	2738	3240	3140	3911
245	Sadong	Major/4	-	-	-	1800	1000	-	4000	2000	-
		Minor	60	20	297	518	518	297	1432	1432	297
246	Sarawak	Major/5	-	-	-	3000	1600	1500	6000	1600	6000
		Minor	-	-	259	707	707	259	2123	2123	259
247	Kayan	Minor	194	194	-	491	491	-	1086	1086	-
	Total		1680	1640	4350	17200	14900	13500	47000	36500	24200

Remarks; Positive : Positive irrigation scheme (Gravity or Pumping)

C/D : Control drainage scheme

/1 : Limbang Valley Project

/2 : Binatang Barat Project

/3 : Batang Lupor Project

/4 : Sadong Krang Project

/5 : Samarahan River Basin Development Project

Table 38 PROSPECTED PADDY PRODUCTION IN SABAH

Unit: 10^3 tons

Schemes	1980 EX	1980 PR	1985 EX	1985 PR	1990 EX	1990 PR	2000 EX	2000 PR
Major Schemes								
- Irrigated	-	-	-	-	-	18.0	-	31.7
Minor Schemes								
- Irrigated	86.9	-	89.9	22.2	89.9	58.4	84.3	80.8
- Rainfed	19.5	-	14.1	-	3.3	-	-	-
Sub-total	106.4	-	104.0	22.2	93.2	58.4	84.3	80.8
Annual Production								
- Paddy	106.4	-	104.0	22.2	93.2	76.4	84.3	112.5
	106.4		126.2		151.6		165.1	
(Milling rate)	(60%)		(65%)		(65%)		(65%)	
- Rice	63.8		82.0		98.5		107.3	

Remarks; EX: Existing schemes
PR: Proposed schemes

Table 39 PROSPECTED PADDY PRODUCTION IN SARAWAK

Unit: 10^3 tons

Schemes	1980 EX	1980 PR	1985 EX	1985 PR	1990 EX	1990 PR	2000 EX	2000 PR
Major Schemes								
- Irrigated	-	-	-	8.3	-	37.8	-	140.1
- C. Drainage	-	-	-	-	-	3.5	-	15.9
Minor Schemes								
- Irrigated	9.3	-	9.6	6.3	9.5	44.1	9.5	124.5
- C. Drainaged	10.5	-	10.9	10.5	10.9	19.4	10.9	36.1
- Rainfed	91.2	-	91.9	-	66.9	-	12.5	-
Annual Production								
- Paddy	111.0	-	112.4	25.1	87.3	104.8	32.9	316.6
	111.0		137.5		192.1		349.5	
(Milling rate)	(60%)		(65%)		(65%)		(65%)	
- Rice	66.6		89.4		124.9		227.2	

Remarks; EX: Existing schemes
PR: Proposed schemes

Table 40 PROJECTED PLANTING AREA OF OIL PALM BY DISTRICT IN SABAH

Unit: ha

Residency & District	1980	1985	1990	1995	2000
Tawau					
Tawau	21,995	23,000	23,000	23,000	23,000
Semporna	10,300	12,600	13,000	13,000	13,000
Lahad Datu	14,511	17,500	23,000	30,800	37,000
Sub-total	46,806	53,100	59,000	66,800	73,000
Sandakan					
Sandakan	19,000	23,000	22,400	22,100	23,000
Kinabatangan	6,000	8,500	12,700	16,100	20,500
Labuk/Sugut	11,006	13,700	16,600	22,900	30,000
Sub-total	36,006	45,200	51,600	61,100	73,500
Kudat					
Kudat	769	769	769	769	769
Pitas	1,251	1,324	3,824	4,824	4,824
Kota Marudu	2,437	2,907	2,907	2,907	2,907
Sub-total	4,457	5,000	7,500	8,500	8,500
West Coast & Labuan					
Papar	509	1,000	1,000	1,000	1,000
Other Districts	2	-	-	-	-
Sub-total	511	1,000	1,000	1,000	1,000
Interior					
Beaufort	2,700	4,200	5,650	7,500	8,500
Other Districts	20	-	-	-	-
Sub-total	2,720	4,200	5,650	7,500	8,500
State Total	90,500	108,500	124,750	144,900	164,500

Table 41 PROJECTED PLANTING AREA OF OIL PALM BY DISTRICT IN SARAWAK

Unit: ha

Division & District	1980	1985	1990	1995	2000
First					
Lundu	-	-	1,600	1,600	1,600
Bau	-	-	2,400	2,400	2,400
Serian	-	-	2,000	6,000	6,000
Sub-total	-	-	6,000	10,000	10,000
Second					
Sri Aman	-	800	1,100	1,700	1,700
Lubok Antu	2,380	3,200	3,200	3,200	3,200
Sub-total	2,380	4,000	4,300	4,900	4,900
Third					
Mukah	3,730	6,470	9,670	9,670	9,670
Sub-total	3,730	6,470	9,670	9,670	9,670
Fourth					
Miri	15,950	20,420	22,420	24,420	24,420
Baram	-	-	7,000	7,000	7,000
Bintulu	-	2,000	4,000	6,500	8,000
Sub-total	15,950	22,420	33,420	37,920	39,420
Fifth					
Limbang	270	-	-	-	-
Sub-total	270	-	-	-	-
Sixth					
Julau	-	-	6,000	8,000	8,000
Sub-total	-	-	6,000	8,000	8,000
State Total	22,330	32,890	59,390	70,490	71,790

Table 42 OIL PALM YIELD ESTIMATED FOR PRESENT CONDITION AND ANTICIPATED FOR FUTURE CONDITION

Unit: FFB ton/ha

Year	Present Yield			Future Yield		
	Small Holder	FELDA	Estate	Small Holder	FELDA	Estate
1	15.1	18.1	22.0	15.1	18.1	22.0
2	15.1	18.1	22.0	15.1	18.1	22.0
3	15.1	18.1	22.0	15.1	18.1	22.0
4	15.1	18.1	22.0	15.1	18.1	22.0
5	15.1	18.1	22.0	15.1	18.1	22.0
6	15.1	18.1	22.0	15.1	18.1	22.0
7	15.1	18.1	22.0	15.8	18.7	22.5
8	15.4	18.5	22.4	16.5	19.2	23.1
9	15.9	19.1	23.1	17.5	20.4	24.5
10	16.4	19.7	23.9	18.5	21.6	25.5
11	16.4	19.7	23.9	18.5	21.6	25.5
12	16.1	19.3	23.4	18.5	21.6	25.5
13	16.1	19.3	23.4	18.3	21.3	25.2
14	15.9	19.1	23.1	18.3	21.3	25.2
15	15.6	18.7	22.7	18.0	21.0	24.9
16	15.6	18.7	22.7	18.0	21.0	24.9
17	15.6	18.7	22.7	17.5	20.4	24.5
18	15.4	18.5	22.4	17.3	20.2	24.2
19	15.4	18.5	22.4	17.0	19.8	23.8
20	15.1	18.1	22.0	16.8	19.6	23.5
21	14.9	17.9	21.7	16.8	19.6	23.5
22	14.9	17.9	21.7	16.8	19.6	23.5
23	14.6	17.5	21.2	16.5	19.2	23.1
24	14.6	17.5	21.2	16.5	19.2	23.1
25	14.6	17.5	21.2	16.5	19.2	23.1
Annual average yield	15.4	18.4	22.4	16.8	19.7	23.6

Table 43 PROJECTED PRODUCTION OF OIL PALM BY DISTRICT IN SABAH

Unit: 10^3 FFB ton

Residency & District	1980	1985	1990	1995	2000
Tawau					
Tawau	279	339	281	339	396
Semporna	125	176	171	152	143
Lahad Datu	181	245	232	321	459
Sub-total	585	760	684	812	998
Sandakan					
Sandakan	392	457	384	319	436
Kinabatangan	64	100	133	184	250
Labuk/Sugut	153	135	161	261	364
Sub-total	609	692	678	764	1,050
Kudat					
Kudat	6	15	13	9	2
Pitas	13	24	26	59	59
Kota Marudu	15	47	52	39	16
Sub-total	34	86	91	107	77
West Coast & Labuan					
Papar	0	10	19	16	7
Other Districts	0	-	-	-	-
Sub-total	0	10	19	16	7
Interior					
Beaufort	29	47	64	85	109
Other Districts	0	-	-	-	-
Sub-total	29	47	64	85	109
State Total	1,257	1,595	1,536	1,784	2,241

Table 44 PROJECTED PRODUCTION OF OIL PALM BY DISTRICT IN SARAWAK

Unit: 10^3 FFB ton

Division & District	1980	1985	1990	1995	2000
First					
Lundu	-	-	3	29	30
Bau	-	-	5	44	44
Serian	-	-	-	41	117
Sub-total	-	-	8	114	191
Second					
Sri Aman	-	0	15	21	29
Lubok Antu	-	23	62	55	35
Sub-total	-	23	77	76	64
Third					
Mukah	1	71	117	160	112
Sub-total	1	71	117	160	112
Fourth					
Miri	154	294	313	197	286
Barem	-	-	17	130	128
Bintulu	-	-	32	76	111
Sub-total	154	294	362	403	525
Fifth					
Limbang	2	2	1	-	-
Sub-total	2	2	1	-	-
Sixth					
Julau	-	-	-	105	158
Sub-total	-	-	-	105	158
State Total	157	390	565	848	1,050

Table 45 ESTIMATED PROCESSING REQUIREMENT OF OIL PALM BY BASIN IN SABAH AND SARAWAK

Unit: 10^3 FFB tons

Basin No.	Name of Basin	No. of Mills	Annual Processing Requirement 1980	1985	1990	1995	2000
(1) Sabah							
206	Merutai Besar	1	-	-	-	60	120
207	Tawau	2	335	420	420	420	420
208	Kalumpang	3	87	148	148	148	148
209	Silabukan	2	49	73	120	259	420
210	Segama	1	65	150	150	150	150
212	Segaliud	3	180	180	240	240	240
213	Labuk	3	210	210	243	286	359
217	Bongan	1	-	60	91	125	125
223	Membakut	1	63	83	120	120	120
	Total	17	989	1,324	1,532	1,808	2,102
(2) Sarawak							
229	Limbang	1	2	2	2	-	-
232	Sibuti	1	66	73	64	69	80
233	Niah	1	90	222	240	240	240
234	Suai	1	-	-	110	120	120
237	Tatau	1	-	-	32	77	80
239	Mukah	1	1	71	117	160	160
241	Rajang	1	-	-	-	105	160
244	Lupar	1	-	23	77	80	80
245	Sadong	1	-	-	-	41	118
246	Sarawak	1	-	-	9	73	80
	Total	10	159	391	651	965	1,118

Table 46 ESTIMATED PROCESSING REQUIREMENT OF RUBBER BY BASIN IN SABAH AND SARAWAK

Unit: 10^3 DRL ton

Basin No.	Name of Basin	Name of Factories	Annual Processing Requirement 1980	1985	1990	1995	2000
(1) Sabah							
207	Tawau	1	3.1	3.3	3.3	7.5	7.5
217	Bongan	1	-	-	-	2.5	7.5
219	Tuaran	1	-	5.0	10.0	10.0	10.0
220	Putatan	1	5.2	-	-	-	-
224	Padas	1	0.8	3.0	7.5	10.0	15.0
	Total	5	9.1	11.3	20.8	30.0	40.0
(2) Sarawak							
229	Limbang	1	0.2	0.3	0.3	0.3	0.9
231	Miri	1	0.5	0.5	0.5	0.5	0.5
241	Rajang	1	0.6	0.7	0.7	0.7	0.7
244	Lupar	1	1.0	1.0	1.0	1.0	1.0
246	Sarawak	1	0.5	0.5	0.5	0.5	0.5
	Total	5	2.8	3.0	3.0	3.0	3.6

Table 47 DERIVATION OF ECONOMIC FARMGATE PRICE OF RICE (1980 CONSTANT VALUE)

	1980	1981 and thereafter
In US$/ton		
Export price Thai 5% broken, F.O.B. Bangkok	464	551
10% discount for quality	418	496
Freight, Bangkok to K. Kinabalu and Kuching	50	50
Insurance	2	2
C.I.F. K. Kinabalu and Kuching	470	548
In M$/ton		
C.I.F. K. Kinabalu and Kuching	1,034	1,206
Port handling charge	21	21
Transport to Godown	9	9
Value at Godown	1,064	1,236
Average haulage to Godown	50	
Loading	2	
Gunny sack cost	9	
Milling cost including millers' profit	98	
Less value of by-products	- 53	
Net cost to Godown	106	
Rice price (ready to mill)	958	1,130
Paddy price (65% milling rate)	623	735
Drying cost	13	
10% weight loss	53	
Handling (into driers and off-trucks)	11	
Transport from purchasing center to mill	8	
Commission for buying agents	8	
Net delivery cost from buying center to mill	93	
Price delivered at buying center	530	642
Transport farm to buying center	2	2
Economic farmgate price of paddy	528	640

Table 48 DERIVATION OF ECONOMIC FARMGATE PRICE OF RUBBER (1980 CONSTANT VALUE)

	1980	1981 and thereafter
In US$/kg		
RRSI rubber spot, New York	1.44	1.67
Ocean freight and insurance	0.07	0.07
F.O.B. K.Kinabalu and Kuching	1.43	1.60
In M$/kg		
F.O.B. K.Kinabalu and Kuching	3.15	3.52
Handling charges, K.Kinabalu and Kuching	0.02	0.02
Transport to K.Kinabalu and Kuching	0.05	0.05
Processing cost	0.26	0.26
Processing losses	0.09	0.09
Economic dry rubber price ex-farmgate	2.73	3.10

Table 49 DERIVATION OF ECONOMIC FARMGATE PRICE OF COPRA (1980 CONSTANT VALUE)

	1980	1981 and thereafter
In US$/ton		
Copra C.I.F. Europe	594	616
Ocean freight and insurance	33	33
F.O.B. K.Kinabalu and Kuching	561	583
In M$/ton		
F.O.B. K.Kinabalau and Kuching	1,234	1,283
Handling charges, K.Kinabalu and Kuching	13	13
Transport to K.Kinabalu and Kuching	50	50
Drying and sacking cost at drying unit	40	40
Transport from farm to drying unit	5	5
Commission to buying agent	11	11
Economic farmgate price	1,115	1,164

Table 50 DERIVATION OF ECONOMIC FARMGATE PRICE OF PALM OIL, PALM KERNEL AND FRUIT BUNCH OF OIL PALM (1980 CONSTANT VALUE)

	1980	1981 and thereafter
(1) PALM OIL		
In US$/ton		
Malaysian palm oil C.I.F. Europe	611	594
Ocean freight and insurance	32	32
F.O.B. K.Kinabal	579	562
In M$/ton		
F.O.B. K.Kinabalu and Kuching	1,274	1,236
Handling charge, K.Kinabalu and Kuching	13	13
Transport to K.Kinabalu and Kuching	50	50
Economic price ex-mill	1,211	1,173
(2) PALM KERNEL		
In US$/ton		
Nigerian palm kernels C.I.F. Europe	462	454
Ocean freight and insurance	50	50
F.O.B. K.Kinabalu and Kuching	412	404
In M$/ton		
F.O.B. K.Kinabalu and Kuching	906	889
Handling charge, K.Kinabalu and Kuching	16	16
Transport to K.Kinabalu and Kuching	50	50
Economic price ex-mill	840	823
(3) FRESH FRUIT BUNCH		
In M$/ton		
18.5% of oil plus 3.5% of kernel	253	246
Processing costs and margins	35	35
Economic price ex-mill	218	211

Table 51 DERIVATION OF ECONOMIC FARMGATE PRICE OF COCOA (1980 CONSTANT VALUE)

	1980	1981 and thereafter
In US$/kg		
Cocoa beans C.I.F. New York	3.52	1.83
5% discount for lower quality	3.34	1.74
Ocean freight and insurance	0.07	0.07
F.O.B. K.Kinabalu and Kuching	3.27	1.67
In M$/kg		
F.O.B. K.Kinabalu and Kuching	7.19	3.67
Handling charges, K.Kinabalu and Kuching	0.02	0.02
Transport to K.Kinabalu and Kuching	0.05	0.05
Fermenting, drying cost and transport from farm to buying center	0.12	0.12
Economic farmgate price of dry beans	7.00	3.58

Table 52 FARM LABOUR REQUIREMENT FOR PADDY CULTIVATION IN SABAH

Unit: man-day/ha

	Land Preparation	Trans-planting	Miscel-laneous	Harvest-ing	Total
(1) Present Condition					
- Minor Scheme					
Irrigated Main	20	18	6	34	78
Irrigated Off	20	18	6	40	84
Rainfed Main	16	16	6	26	64
(2) Future Condition/Without Project					
- Minor Scheme					
Irrigated Main	20	18	6	34	78
Irrigated Off	20	18	6	40	84
Rainfed Main	16	16	6	26	64
(3) Future Condition/With Project					
- Minor Scheme					
Irrigated Main	20	18	6	36	80
Irrigated Off	20	18	6	40	84
- Major Scheme (Lower Labuk)					
Irrigated Main	20	18	6	38	82
Irrigated Off	20	18	6	42	86

Table 53 FARM LABOUR REQUIREMENT FOR PADDY CULTIVATION IN SARAWAK

Unit: man-day/ha

		Land preparation	Trans-planting	Miscel-laneous	Harvest-ing	Total
(1) Present Condition						
- Minor Scheme						
Irrigated	Main	20	18	6	36	80
Irrigated	Off	20	18	6	38	82
C. Drainage	Main	18	18	6	34	76
Rainfed	Main	12	16	6	20	54
(2) Future Condition/Without Project						
- Minor Scheme						
Irrigated	Main	20	18	6	36	80
Irrigated	Off	20	18	6	38	82
C. Drainage	Main	18	18	6	34	76
Rainfed	Main	12	16	6	20	54
(3) Future Condition/With Project						
- Minor Scheme						
Irrigated	Main	20	18	6	36	80
Irrigated	Off	20	18	6	38	84
C. Drainage	Main	18	18	6	34	76
- Major Scheme (Limbang)						
Irrigated	Main	20	18	6	36	80
Irrigated	Off	20	18	6	42	86
- Major Scheme (Binatang Barat)						
Irrigated	Main	20	18	6	38	82
Irrigated	Off	20	18	6	40	84
- Major Scheme (Batan Lupor, Sadong Krang & Samarahan)						
Irrigated	Main	20	18	6	38	82
Irrigated	Off	20	18	6	40	84
C. Drainage	Main	20	18	8	38	84

Remarks; C. Drainage: Control drainage

Table 54 FARM LABOUR REQUIREMENT FOR TREE CROP PLANTATION

Unit: man-day/ha

Year from Planting	Rubber			Oil Palm			Coconut		Cocoa		
	SM	FL	ES	SM	FL	ES	SM	ES	SM	ESS	ESI
(1) Present Condition											
1	72	74	116	100	136	186	140	162	86	130	58
2	48	50	90	40	60	88	56	72	54	82	26
3	28	30	68	30	48	74	50	66	54	82	26
4	22	24	62	40	60	88	40	56	54	82	26
5 - 6	14	16	50	76	106	150	42	58	50	76	22
7 - 8	66	84	128	90	122	166	46	62	56	84	28
9 - 10	56	68	110	90	122	166	50	66	56	84	28
11 - 15	60	74	116	80	112	150	56	72	56	84	26
16 - 20	60	74	116	72	102	138	50	66	54	82	26
21 - 25	58	72	114	60	84	120	50	66	54	82	26
26 - 30	46	60	102	-	-	-	50	66	54	82	26
31 - 50	-	-	-	-	-	-	46	62	-	-	-
(2) Future Condition											
1	74	76	116	106	142	190	148	170	86	130	58
2	50	50	88	42	62	88	64	82	54	82	26
3	30	30	62	32	50	72	58	74	56	84	28
4	24	24	56	42	62	88	46	62	58	88	30
5 - 6	16	20	44	82	112	152	48	64	52	78	24
7 - 8	68	88	128	94	128	170	50	66	62	94	34
9 - 10	58	70	110	94	128	170	54	70	62	94	34
11 - 15	62	76	116	86	118	152	58	74	62	94	32
16 - 20	62	76	116	76	106	142	54	70	58	88	30
21 - 25	60	74	114	64	90	122	54	70	58	88	30
26 - 30	48	62	110	-	-	-	54	70	58	88	30
31 - 50	-	-	-	-	-	-	50	66	-	-	-

Remarks; SM: Smallholder, FL: FELDA, ESS: Estate solo crop, and ESI: Estate intercrop

Table 55 ECONOMIC PRODUCTION COST FOR PADDY CULTIVATION IN SABAH

Unit: M$/ha/season

Item	Irrigated		Control Drainage	Rainfed
	Main	Off	Main	Main
(1) Present Condition				
- Minor				
Materials	237	283	-	172
Labour	507	546	-	416
Total	744	829	-	588
(2) Future Condition Without Project				
- Minor				
Materials	257	332	-	193
Labour	507	546	-	416
Total	764	878	-	609
(3) Future Condition With Project				
- Minor				
Materials	262	293	-	-
Labour	520	546	-	-
Total	782	839	-	-
- Major (Lower Labuk)				
Materials	274	308	-	-
Labour	533	559	-	-
Total	807	867	-	-

Table 56 ECONOMIC PRODUCTION COST FOR PADDY CULTIVATION IN SARAWAK

Unit: M$/ha/season

Item	Irrigated Main	Irrigated Off	Control Drainage Main	Rainfed Main
(1) Present Condition				
- Minor				
Materials	236	260	211	144
Labour	520	533	494	351
Total	756	793	705	495
(2) Future Condition Without Project				
- Minor				
Materials	255	279	229	164
Labour	520	533	494	351
Total	775	812	723	515
(3) Future Condition With Project				
- Minor				
Materials	260	271	218	-
Labour	520	533	494	-
Total	780	804	712	-
- Major (Limbang)				
Materials	229	298	-	-
Labour	520	559	-	-
Total	749	857	-	-
- Major (Binatang Barat)				
Materials	277	290	-	-
Labour	533	546	-	-
Total	810	836	-	-
- Major (Batan Lupor, Sadong Krang & Samarahan)				
Materials	268	282	294	-
Labour	533	546	546	-
Total	801	828	840	-

Table 57 ECONOMIC AVERAGE ANNUAL PRODUCTION COST FOR TREE CROP PLANTATION IN SABAH AND SARAWAK

Unit: M$/ha/y

	Crop/Item	Private Estate		FELDA & FELCRA	Small-holders
		Solo crop	Intercrop		
(1)	Rubber				
	Materials	199	-	128	101
	Labour	690	-	415	338
	Total	889	-	543	439
(2)	Oil Palm				
	Materials	501	-	443	408
	Labour	894	-	648	463
	Total	1,395	-	1,095	871
(3)	Coconut				
	Materials	515	-	-	290
	Labour	431	-	-	327
	Total	946	-	-	617
(4)	Cocoa				
	Materials	1,267	724	1,267	844
	Labour	545	176	545	360
	Total	1,812	900	1,812	1,204

Table 58 ECONOMIC NET PRODUCTION VALUE OF PADDY IN SABAH

Unit: M$/ha/season

Scheme	Season	Yield (ton/ha)	Price (M$/ton)	Gross Value	Production Cost	Net Value
(1) Present Condition						
- Minor						
Rainfed	Main	1.8	528	950	588	362
Irrigated	Main	2.7	528	1,426	744	682
Irrigated	Off	3.1	528	1,637	829	808
(2) Future Condition Without Project						
- Minor						
Rainfed	Main	2.0	640	1,280	609	671
Irrigated	Main	2.8	640	1,798	764	1,034
Irrigated	Off	3.2	640	2,048	878	1,170
(3) Future Condition With Project						
- Minor						
Irrigated	Main	3.5	640	2,240	782	1,458
Irrigated	Off	4.2	640	2,688	839	1,849
- Major (Lower Labuk)						
Irrigated	Main	3.8	640	2,432	807	1,625
Irrigated	Off	4.6	640	2,944	867	2,077

Table 59 ECONOMIC NET PRODUCTION VALUE OF PADDY IN SARAWAK

Scheme	Season	Yield (ton/ha)	Price (M$/ton)	Gross Value	Production Cost	Net Value
(1) Present Condition						
- Minor						
Rainfed	Main	1.5	528	792	495	297
C. Drainage	Main	2.4	528	1,267	705	562
Irrigated	Main	2.6	528	1,373	756	617
Irrigated	Off	3.0	528	1,584	793	791
(2) Future Condition Without Project						
- Minor						
Rainfed	Main	1.7	640	1,088	515	573
C. Drainage	Main	2.5	640	1,600	723	877
Irrigated	Main	2.7	640	1,728	775	953
Irrigated	Off	3.1	640	1,984	812	1,172
(3) Future Condition With Project						
- Minor						
C. Drainage	Main	2.7	640	1,728	712	1,016
Irrigated	Main	3.2	640	2,048	780	1,268
Irrigated	Off	3.9	640	2,496	804	1,692
- Major (Limbang)						
Irrigated	Main	3.2	640	2,048	749	1,299
Irrigated	Off	4.0	640	2,560	857	1,703
- Major (Binatang Barat)						
Irrigated	Main	3.6	640	2,304	810	1,494
Irrigated	Off	4.4	640	2,816	836	1,980
- Major (Batan Lupor, Sadong Krang & Samarahan)						
C. Drainage	Main	2.9	640	1,856	840	1,016
Irrigated	Main	3.4	640	2,176	801	1,375
Irrigated	Off	4.2	640	2,688	828	1,860

Remarks; C. Drainage: Control drainage

Table 60 AVERAGE ANNUAL NET PRODUCTION VALUE OF TREE CROPS

Unit: M$/ha

Crop	Farm Type	Yield (kg)	Gross Income	Production Cost	Net Income
(1) Present Condition					
Rubber	Smallholder	635	1,734	439	1,295
	FELDA	900	2,457	543	1,914
	Estate	1,135	3,099	889	2,210
Oil Palm	Smallholder	15,400	3,357	871	2,486
	FELDA	18,400	4,011	1,095	2,916
	Estate	22,400	4,883	1,395	3,488
Coconut	Smallholder	900	1,004	617	387
	Estate	1,400	1,561	946	615
Cocoa	Smallholder	550	3,850	1,204	2,646
	Estate Solo	1,200	8,400	1,812	6,588
	Estate Intercrop	1,170	8,190	900	7,290
(2) Future Condition					
Rubber	Smallholder	670	2,077	467	1,610
	FELDA	965	2,992	572	2,420
	Estate	1,170	3,627	867	2,760
Oil Palm	Smallholder	16,800	3,545	945	2,600
	FELDA	19,700	4,157	1,178	2,979
	Estate	23,600	4,980	1,467	3,513
Coconut	Smallholder	1,000	1,164	671	493
	Estate	1,550	1,804	1,001	803
Cocoa	Smallholder	620	2,220	1,252	968
	Estate Solo	1,310	4,690	1,883	2,807
	Estate Intercrop	1,275	4,565	840	3,725

Table 61 AVERAGE ANNUAL NET PRODUCTION VALUE OF ORCHARD

Unit: M$/ha

Kind	Net Return	Weighted Ratio	Weighted Value
Banana	1,670	0.35	585
Orange	1,900	0.05	95
Pomelo	5,670	0.02	115
Rambutan	930	0.26	240
Chempedak	130	0.03	5
Duku Langsat	460	0.04	20
Durian	1,130	0.24	270
Papaya	290	0.01	5
Total			1,335

Remarks; Weighted ratio is based on the proportion of planting area.

Table 62 TYPE OF IRRIGATION DEVELOPMENT FOR PADDY CULTIVATION

Type	Without Development	With Development
(1)	Minor Irrigation Development Scheme	
A	Rainfed single cropping	Irrigated single cropping
B	Rainfed single cropping	Irrigated double cropping
C	Irrigated single cropping	Irrigated double cropping
D	Newly reclaimed land	Irrigated single cropping
E	Newly reclaimed land	Irrigated double cropping
O	Rainfed single cropping	Control drainage single cropping
(2)	Major Irrigation Development Scheme	
F	Rainfed single cropping	Irrigated single cropping
G	Rainfed single cropping	Irrigated double cropping
H	Irrigated single cropping	Irrigated double cropping
I	Newly reclaimed land	Irrigated single cropping
J	Newly reclaimed land	Irrigated double cropping
K	Irrigated single cropping of minor schemes	Irrigated double cropping
L	Irrigated double cropping of minor schemes	Irrigated double cropping
N	Irrigated double cropping	Irrigated double cropping on tertiary developed field
O	Rainfed single cropping	Control drainage single cropping

Table 63 INCREASE IN IRRIGATION AREA UNDER MINOR SCHEMES BY BASIN BY TYPE OF IRRIGATION DEVELOPMENT IN SABAH

Unit: ha

State	Basin No.	Type of Scheme	Development Area 4MP	5MP	6MP	7MP	Total
Sabah	213	D	-	290	-	-	290
		E	-	48	-	-	48
	Sub-total		-	338	-	-	338
	216	A	-	110	-	-	110
		B	192	-	-	-	192
		D	-	-	240	250	490
		E	-	226	-	-	226
	Sub-total		192	336	240	250	1,018
	217	A	218	200	-	-	418
		B	851	800	-	-	1,651
	Sub-total		1,069	1,000	-	-	2,069
	218	B	376	-	-	-	376
		C	-	12	218	-	230
		E	-	297	255	-	552
	Sub-total		376	309	473	-	1,158
	220	A	80	80	-	-	160
		B	122	121	-	-	243
	Sub-total		202	201	-	-	403
	221	B	242	242	-	-	484
	222	B	621	622	-	-	1,243
		D	-	800	-	-	800
		E	-	307	-	-	307
	Sub-total		621	1,729	-	-	2,350
	223	A	107	-	-	-	107
		B	-	586	-	-	586
		D	-	481	-	-	481
	Sub-total		107	1,067	-	-	1,174
	224	A	-	2,626	-	-	2,626
		B	975	-	-	-	975
		D	-	-	959	959	1,918
		E	-	-	237	-	237
	Sub-total		975	2,626	1,196	959	5,756
Total for Sabah			3,784	7,848	1,909	1,209	14,750

Table 64 INCREASE IN IRRIGATION AREA UNDER MINOR SCHEMES BY BASIN BY TYPE OF IRRIGATION DEVELOPMENT IN SARAWAK (1/2)

Unit: ha

State	Basin No.	Type of Scheme	Development Area 4MP	5MP	6MP	7MP	Total
Sarawak	227	B	288	-	-	-	288
		E	20	100	-	-	120
	Sub-total		308	100	-	-	408
	228	B	-	540	349	540	1,429
		O	-	-	189	-	189
	Sub-total		-	540	538	540	1,618
	229	B	-	104	-	-	104
	230	B	-	1,252	1,250	1,219	3,721
	231	B	-	108	-	-	108
	232	O	-	192	192	192	576
	236	B	-	962	962	742	2,666
		O	-	-	-	219	219
	Sub-total		-	962	962	961	2,885
	237	B	-	182	-	-	182
	238	B	-	-	128	129	257
	239	B	-	418	-	-	418
		O	-	-	364	364	728
	Sub-total		-	418	364	364	1,146
	240	B	-	266	266	-	532
		O	-	-	-	304	304
	Sub-total		-	266	266	304	836
	241	B	820	-	335	336	1,491
		O	2,478	1,332	481	480	4,771
	Sub-total		3,298	1,332	816	816	6,262
	242	O	1,356	482	482	481	2,801
	243	B	-	126	-	-	126
		O	-	513	639	640	1,792
	Sub-total		-	639	639	640	1,918

Table 65 INCREASE IN IRRIGATION AREA UNDER MINOR SCHEMES BY BASIN BY TYPE OF IRRIGATION DEVELOPMENT IN SARAWAK (2/2)

Unit: ha

State	Basin No.	Type of Scheme	Development Area 4MP	5MP	6MP	7MP	Total
Sarawak	244	A	-	100	-	-	100
		B	-	872	960	959	2,791
		O	739	558	586	587	2,470
	Sub-total		739	1,530	1,546	1,546	5,361
	245	B	-	458	-	-	458
		C	-	40	457	457	954
	Sub-total		-	498	457	457	1,412
	246	B	-	707	707	709	2,123
	247	B	-	297	297	298	892
Total for Sarawak			5,701	9,609	8,644	8,656	32,610

Table 66 INCREASE IN IRRIGATION AREA UNDER MAJOR SCHEMES BY BASIN BY TYPE OF IRRIGATION DEVELOPMENT IN SABAH AND SARAWAK

Unit: ha

Name of Scheme	Basin No.	Type of Scheme	Development Area 4MP	5MP	6MP	7MP	Total
Lower Labuk	213	I	-	-	1,410	1,420	2,830
		J	-	-	610	610	1,220
		K	-	-	1,210	-	1,210
		L	-	-	570	-	570
	Sub-total		-	-	3,800	2,030	5,830
Limbang	229	J	400	2,700	2,750	2,750	8,600
Binatang Barat	241	F	-	-	1,000	1,000	2,000
		G	-	-	1,000	1,000	2,000
	Sub-total		-	-	2,000	2,000	4,000
Batang Lupur	244	F	-	-	1,000	1,000	2,000
		G	-	-	1,000	1,000	2,000
	Sub-total		-	-	2,000	2,000	4,000
Sadong Krang	245	F	-	800	600	600	2,000
		G	514	486	500	500	2,000
	Sub-total		514	1,286	1,100	1,100	4,000
Samarahan	246	F	-	1,400	-	-	1,400
		G	600	1,000	-	-	1,600
		I	-	-	1,500	1,500	3,000
		O	-	1,500	2,000	2,500	6,000
	Sub-total		600	3,900	3,500	4,000	12,000
Total for Sabah and Sarawak			1,514	7,886	15,150	13,880	38,430

Table 67 UNIT INCREMENTAL NET BENEFIT BY TYPE OF IRRIGATION DEVELOPMENT IN SABAH AND SARAWAK

Unit: M$/ha/y

	Sabah		Sarawak					
	Minor	LL	Minor	LV	BB	BL	SK	SM
A	787	-	695	-	-	-	-	-
B	2,636	-	2,387	-	-	-	-	-
C	1,849	-	1,692	-	-	-	-	-
D	1,458	-	1,268	-	-	-	-	-
E	3,307	-	2,960	-	-	-	-	-
F	-	-	-	-	921	802	802	802
G	-	-	-	-	2,901	2,662	2,662	2,662
H	-	-	-	-	-	-	-	-
I	-	1,625	-	-	-	-	-	1,375
J	-	3,702	-	3,002	-	-	-	-
K	-	2,244	-	-	-	-	-	-
L	-	395	-	-	-	-	-	-
N	-	-	-	-	-	-	-	-
O	-	-	443	-	-	-	-	443

Remarks; LL: Lower Labuk, LV: Limbang, BB: Binatang Barat, BL: Batan Lupor, SK: Sadong Krang, and SM: Samarahan

Table 68 RESULTS OF ECONOMIC BENEFIT AND COST ESTIMATE FOR PROPOSED MINOR IRRIGATION SCHEMES IN SABAH

Unit: 10^6M$

State	Basin No.	Type of Scheme	Total Incremental Benefit	Annual Equivalent Benefit	Annual Equivalent Cost	B/C Ratio
Sabah	213	D	0.42			
		E	0.16			
	Sub-total		0.58	0.31	0.23	1.35
	216	A	0.09			
		B	0.51			
		D	0.71			
		E	0.75			
	Sub-total		2.06	1.06	0.58	1.83
	217	A	0.33			
		B	4.35			
	Sub-total		4.68	3.14	1.60	1.96
	218	B	0.99			
		C	0.42			
		E	1.82			
	Sub-total		3.23	1.77	0.72	2.46
	220	A	0.12			
		B	0.64			
	Sub-total		0.76	0.51	0.31	1.65
	221	B	1.28	0.85	0.37	2.30
	222	B	3.28			
		D	1.17			
		E	1.02			
	Sub-total		5.47	3.36	1.70	1.98
	223	A	0.08			
		B	1.54			
		D	0.70			
	Sub-total		2.32	1.26	0.79	1.59
	224	A	2.07			
		B	2.57			
		D	2.80			
		E	0.78			
	Sub-total		8.22	4.26	3.36	1.27
Total for Sabah			28.60	16.52	9.66	1.71

Table 69 RESULTS OF ECONOMIC BENEFIT AND COST ESTIMATE FOR PROPOSED MINOR IRRIGATION SCHEMES IN SARAWAK (1/2)

Unit: 10^6M$

State	Basin No.	Type of Scheme	Total Incremental Benefit	Annual Equivalent Benefit	Annual Equivalent Cost	B/C Ratio
Sarawak	227	B	0.69			
		E	0.36			
	Sub-total		1.05	0.76	0.35	2.17
	228	B	3.41			
		O	0.08			
	Sub-total		3.49	1.32	0.66	2.00
	229	B	0.25	0.13	0.06	2.17
	230	B	8.88	3.35	1.65	2.03
	231	B	0.26	0.14	0.04	3.50
	232	O	0.27	0.10	0.07	1.43
	236	B	6.37			
		O	0.10			
	Sub-total		6.47	2.49	1.23	2.02
	237	B	0.43	0.23	0.03	7.7
	238	B	0.62	0.18	0.09	2.0
	239	B	1.00			
		O	0.32			
	Sub-total		1.32	0.63	0.33	1.91
	240	B	1.26			
		O	0.13			
	Sub-total		1.39	0.59	0.40	1.48
	241	B	3.56			
		O	2.11			
	Sub-total		5.67	5.45	1.91	2.85
	242	O	1.23	0.71	0.50	1.42
	243	B	0.30			
		O	0.79			
	Sub-total		1.09	0.45	0.29	1.55

Table 70 RESULTS OF ECONOMIC BENEFIT AND COST ESTIMATE FOR PROPOSED MINOR IRRIGATION SCHEMES IN SARAWAK (2/2)

Unit: 10^6M$

State	Basin No.	Type of Scheme	Total Incremental Benefit	Annual Equivalent Benefit	Annual Equivalent Cost	B/C Ratio
Sarawak	244	A	0.07			
		B	6.66			
		O	1.10			
	Sub-total		7.83	3.06	1.67	1.83
	245	B	1.09			
		C	1.61			
	Sub-total		2.70	1.08	0.48	2.25
	246	B	5.07	1.90	0.94	2.02
	247	B	2.13	0.80	0.39	2.05
Total for Sarawak			50.15	23.37	10.99	2.13

Table 71 RESULTS OF ECONOMIC BENEFIT AND COST ESTIMTE FOR PROPOSED MAJOR IRRIGATION SCHEMES IN SABAH AND SARAWAK

Unit: 10^6M$

Name of Scheme	Basin No.	Type of Scheme	Total Incremental Benefit	Annual Equivalent Benefit	Annual Equivalent Cost	B/C Ratio
Lower Labuk	213	I	4.60			
		J	4.52			
		K	2.72			
		L	0.23			
	Sub-total		12.07	3.75	1.83	2.05
Limbang	229	J	25.30	9.97	11.00	0.91
Binatang Barat	241	F	1.84			
		G	5.80			
	Sub-total		7.64	2.26	1.42	1.59
Batang Lupur	244	F	1.60			
		G	5.32			
	Sub-total		6.92	2.05	1.42	1.44
Sadong Krang	245	F	1.60			
		G	5.32			
	Sub-total		6.92	3.20	2.05	1.56
Samarahan	246	F	1.12			
		G	4.26			
		I	4.12			
		O	2.66			
	Sub-total		12.16	5.45	3.86	1.41

Table 72 NUMBER OF FARM HOUSEHOLDS BENEFITED BY MINOR IRRIGATION DEVELOPMENT (1/3)

Unit: No. of households

State	Basin No.	Type of Scheme	Period of Scheme Completed 4MP	5MP	6MP	7MP	Total
Sabah	213	D	-	119	-	-	119
		E	-	20	-	-	20
	Sub-total		-	139	-	-	139
	216	A	-	88	-	-	88
		B	154	-	-	-	154
		D	-	-	99	103	202
		E	-	93	-	-	93
	Sub-total		154	181	99	103	537
	217	A	174	160	-	-	334
		B	681	640	-	-	1,321
	Sub-total		855	800	-	-	1,655
	218	B	301	-	-	-	301
		C	-	10	174	-	184
		E	-	122	105	-	227
	Sub-total		301	132	279	-	712
	220	A	64	64	-	-	128
		B	98	97	-	-	195
	Sub-total		162	161	-	-	323
	221	B	194	194	-	-	388
	222	B	497	498	-	-	995
		D	-	329	-	-	329
		E	-	126	-	-	126
	Sub-total		497	953	-	-	1,450
	223	A	86	-	-	-	86
		B	-	469	-	-	469
		D	-	198	-	-	198
	Sub-total		86	667	-	-	753
	224	A	-	2,101	-	-	2,101
		B	780	-	-	-	780
		D	-	-	395	395	790
		E	-	-	98	-	98
	Sub-total		780	2,101	493	395	3,769
Total for Sabah			3,029	5,328	871	498	9,726

Table 73 NUMBER OF FARM HOUSEHOLDS BENEFITED BY MINOR IRRIGATION DEVELOPMENT (2/3)

Unit: No. of households

State	Basin No.	Type of Scheme	Period of Scheme Completed 4MP	5MP	6MP	7MP	Total
Sarawak	227	B	230	-	-	-	230
		E	8	41	-	-	49
	Sub-total		238	41	-	-	279
	228	B	-	432	279	432	1,143
		O	-	-	151	-	151
	Sub-total		-	432	430	432	1,294
	229	B	-	83	-	-	83
	230	B	-	1,002	1,000	975	2,977
	231	B	-	86	-	-	86
	232	O	-	154	154	154	462
	236	B	-	770	770	594	2,134
		O	-	-	-	175	175
	Sub-total		-	770	770	769	2,309
	237	B	-	146	-	-	146
	238	B	-	-	102	103	205
	239	B	-	334	-	-	334
		O	-	-	291	291	582
	Sub-total		-	334	291	291	916
	240	B	-	213	213	-	426
		O	-	-	-	243	243
	Sub-total		-	213	213	243	669
	241	B	656	-	268	269	1,193
		O	1,982	1,066	385	384	3,817
	Sub-total		2,638	1,066	653	653	5,010
	242	O	1,085	386	386	385	2,242
	243	B	-	101	-	-	101
		O	-	410	511	512	1,433
	Sub-total		-	511	511	512	1,534

Table 74 NUMBER OF FARM HOUSEHOLDS BENEFITED BY MINOR IRRIGATION DEVELOPMENT (3/3)

Unit: No. of households

State	Basin No.	Type of Scheme	Period of Scheme Completed 4MP	5MP	6MP	7MP	Total
Sarawak	244	A	-	80	-	-	80
		B	-	698	768	767	2,233
		O	591	446	469	470	1,976
	Sub-total		591	1,224	1,237	1,237	4,289
	245	B	-	366	-	-	366
		C	-	32	366	366	764
	Sub-total		-	398	366	366	1,130
	246	B	-	566	566	567	1,699
	247	B	-	238	238	238	714
Total for Sarawak			4,552	7,650	6,917	6,925	26,044
Total for Sabah & Sarawak			7,581	12,978	7,788	7,423	35,770

Table 75 NUMBER OF FARM HOUSEHOLDS BENEFITED BY MAJOR IRRIGATION DEVELOPMENT

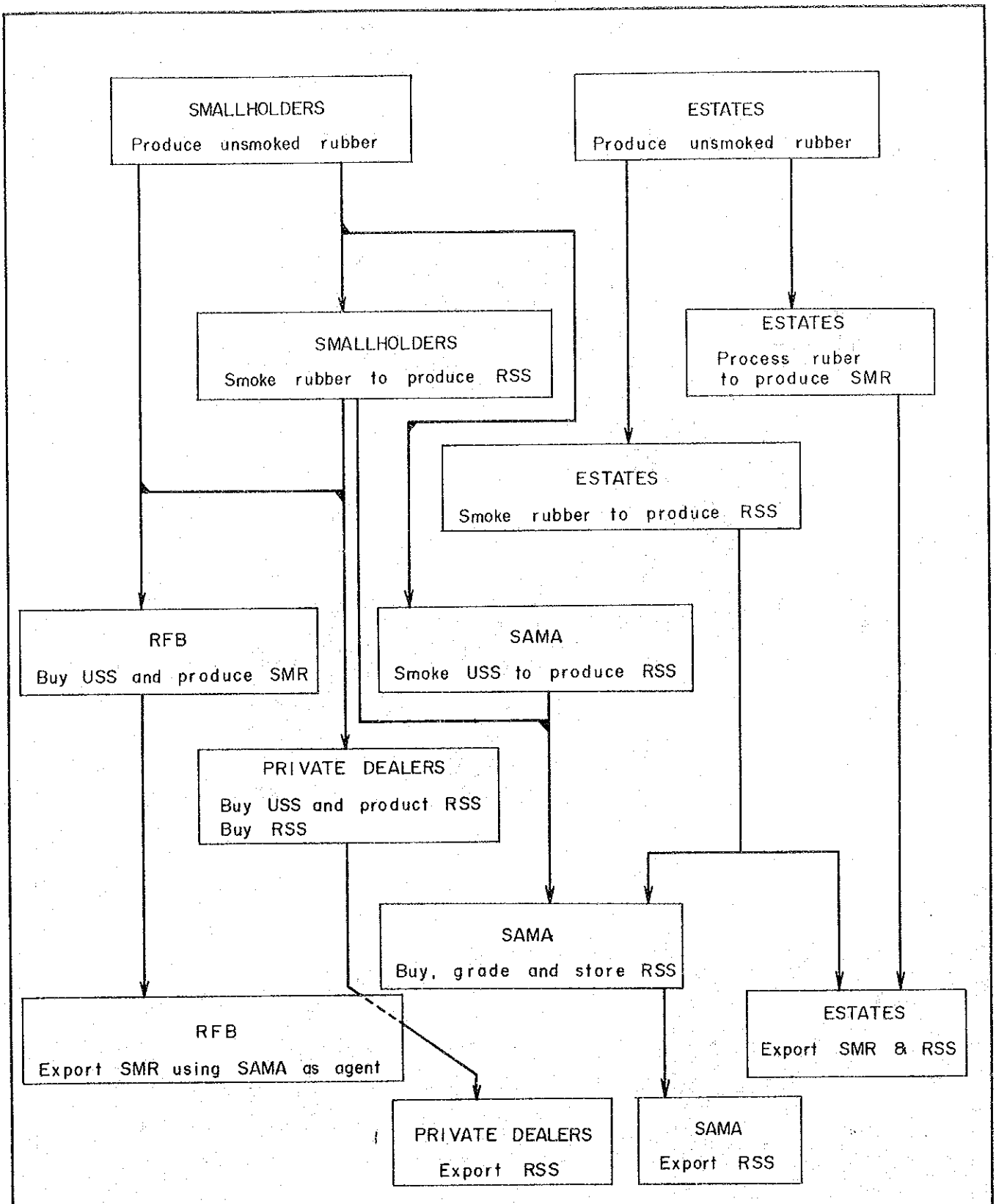
Unit: No. of households

Name of Scheme	Basin No.	Type of Scheme	Period of Scheme Completed 4MP	5MP	6MP	7MP	Total
Lower Labuk	213	I	-	-	580	584	1,164
		J	-	-	251	251	502
		K	-	-	968	-	968
		L	-	-	456	-	456
	Sub-total		-	-	2,255	835	3,090
Limbang	229	J	165	1,111	1,132	1,132	3,540
Binatang Barat	241	F	-	-	800	800	1,600
		G	-	-	800	800	1,600
	Sub-total		-	-	1,600	1,600	3,200
Batang Lupur	244	F	-	-	800	800	1,600
		G	-	-	800	800	1,600
	Sub-total		-	-	1,600	1,600	3,200
Sadong Krang	245	F	-	640	480	480	1,600
		G	411	389	400	400	1,600
	Sub-total		411	1,029	880	880	3,200
Samarahan	246	F	-	1,120	-	-	1,120
		G	480	800	-	-	1,280
		I	-	-	617	617	1,234
		O	-	1,200	1,600	2,000	4,800
	Sub-total		480	3,120	2,217	2,617	8,434
Total for Sabah and Sarawak			1,056	5,260	9,684	8,664	24,664

Table 76 CROP PRODUCTION VALUES FOR ESTIMATE OF FLOOD DAMAGE IN SABAH AND SARAWAK

Crop	Value	Remarks
Paddy		
- Irrigated	M$1,130/ha M$1,060/ha	Sabah Sarawak
- Control drainage	M$950/ha	Sarawak
- Rainfed	M$730/ha M$620/ha	Sabah Sarawak
Rubber	M$2.73/kg	Production loss as dry rubber
Oil Palm	M$1,930/ha	Replanting cost
Coconut	M$3,440/ha	Replanting cost
Other crops	M$3,540/ha	Replanting cost of coconut and cocoa
Mixed Horticulture	M$2,900/ha	Replanting cost of coconut and production loss of orchard

FIGURES



Remarks;

USS : Unsmoked sheets
RSS : Ribbed smoked sheets
SMR : Standard Malaysian rubber
RFB : Rubber Fund Board
SAMA: Sabah Marketing Corporation

Fig. 1 Rubber Marketing Channels in Sabah

GOVERNMENT OF MALAYSIA
NATIONAL WATER RESOURCES STUDY MALAYSIA
JAPAN INTERNATIONAL COOPERATION AGENCY

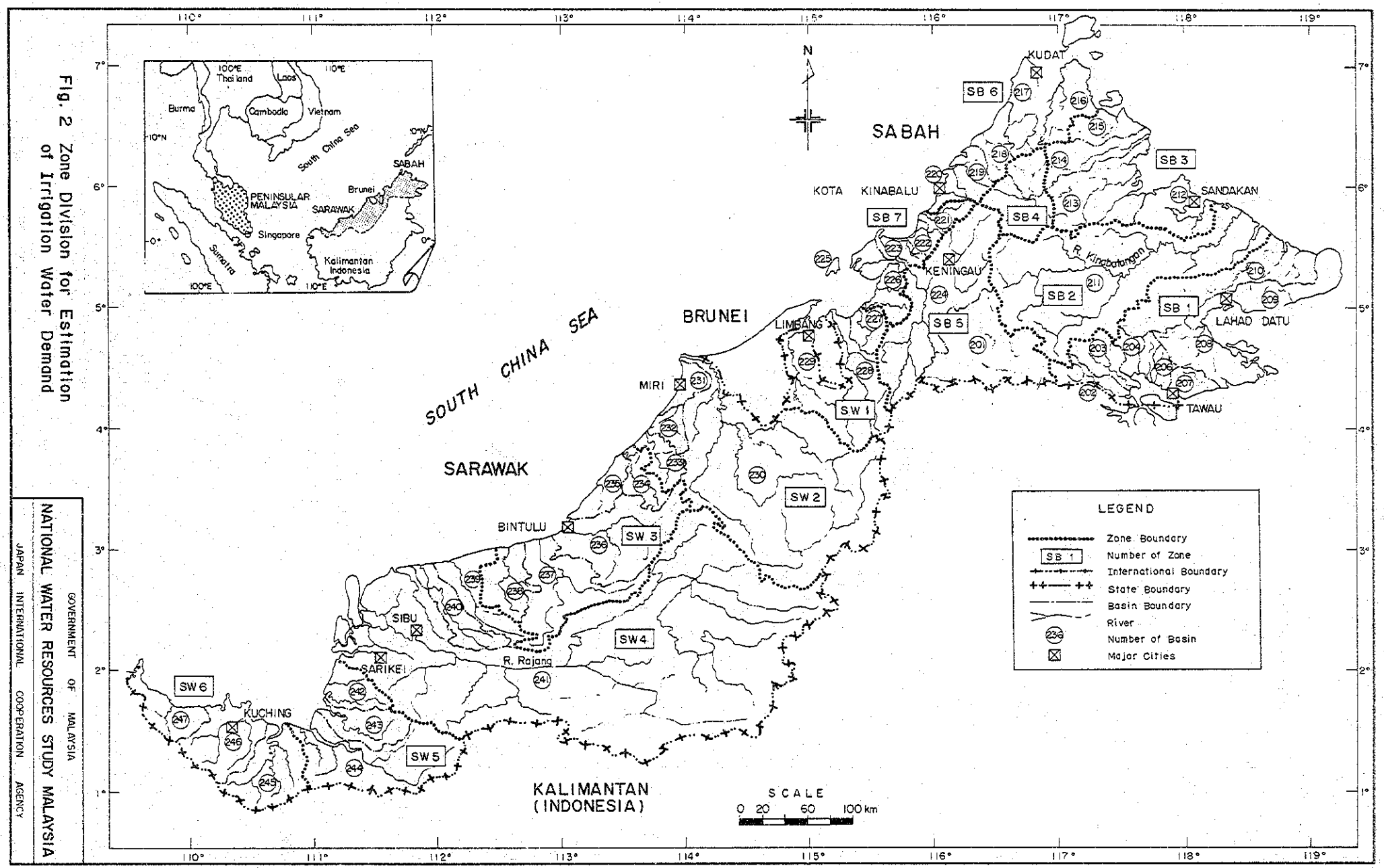
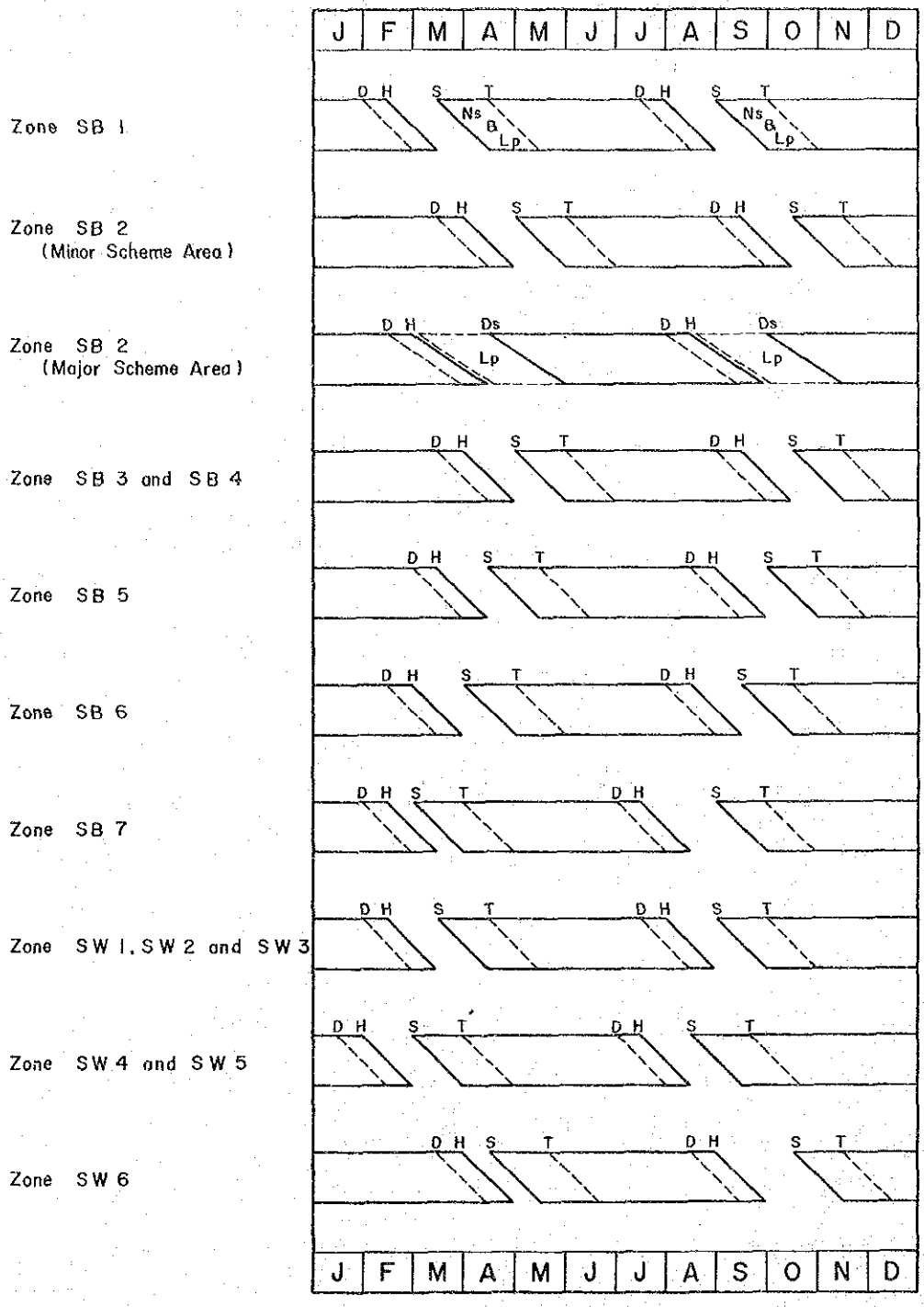


Fig. 2 Zone Division for Estimation of Irrigation Water Demand

NATIONAL WATER RESOURCES STUDY MALAYSIA

GOVERNMENT OF MALAYSIA

JAPAN INTERNATIONAL COOPERATION AGENCY



LEGEND

S	Sowing
Ds	Direct sowing
Ns	Nursery
Lp	Land preparation
D	Drainage
H	Harvest

Fig. 3 Assumed Cropping Pattern for Paddy by Climatic Zone

GOVERNMENT OF MALAYSIA
NATIONAL WATER RESOURCES STUDY MALAYSIA
JAPAN INTERNATIONAL COOPERATION AGENCY