KEMENTERIAN PERTANIAN MALAYSIA

UPGRADING OF IRRIGATION & DRAINAGE SCHEMES IN BALIK PULAU AND SEBERANG PERAI PULAU PINANG

FINAL REPORT

VOLUME IV

ANNEXE C - SOILS
ANNEXE D - SOCIOLOGY
ANNEXE E - AGRICULTURE

1982

BINNIE DAN RAKAN (MALAYSIA)
KUALA LUMPUR
in association with
HUNTING TECHNICAL SERVICES LTD.
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SOILS

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Abbreviations used in this report

CHO	Constant head orifice
CSDS	Coconut Smallholders Development Scheme
DOA	Department of Agriculture (Jabatan Pertanian)
DID	Drainage & Irrigation Department (see JPT)
FAMA	Federal Agricultural Marketing Authority
FMP	Fourth Malaysia Plan
FSL	Full Supply Level
LADP	Integrated Agricultural Development Project
JKR	Jabatan Kerja Raya (Public Works Department)
JPBK	Jabatan Perancang Bandar & Kampong (State, Town & Country Planning Department)
JPT	Jabatan Parit dan Taliair (Drainage & Irrigation Department)
KGN	Koperasi Gabungan Negeri (Pulau Pinang)
LPN	Lembaga Padi Negara (National Padi Board)
LPP	Lembaga Pertubuhan Peladang (Farmers' Organisation Authority)
MADA	Muda Agricultural Development Authority (Kedah & Perlis)
MARDI	Malaysian Agricultural Research and Development Institute
MMS	Malaysian Meteorological Service
MOA	Ministry of Agriculture
MPPP	Majlis Perbandaran Pulau Pinang (Penang Island Municipal Council)
NEP	New Economic Policy
PBA	Pihak Berkuasa Air (Penang Water Authority)
RISDA	Rubber Industry Smallholders Development Authority
SPI	Seberang Padi Integrated Sdn Bhd
SEPU	State Economic Planning Unit
SERU	Socio-Economic Research Unit
TMP	Third Malaysia Plan
TOR	Terms of Reference
USDA	United States Department of Agriculture
JPN	Jabatanarah Permetaan Negara (Directorate of National Mapping).

Abbreviations used in this report

(continued)

Sg.	Sungai
Kg.	Kampong
ac	acres
ch	chains
ft	feet
gt	gantangs (1 gt = 5.6 lb of rice)
ha	hectares
in	inches
km	kilometres
kg	kilograms
L	Litres
lb	pounds
m	metres
mi	miles
m-m	man-month
s,sec	seconds
T	metric tonnes
CIF	Costs, Insurance and Freight
DBE	Dry Beans Equivalent
FFB	Fresh Fruit Bunches
FOB	Free on Board
IRR	Internal Rate of Return
NPV	Net Present Value
RSS	Ribbed Smoked Sheets

Metric Conversions

1 hectare (ha)	=	2.47 acres (ac)
1 T/ha	=	159 gt/ac
0.63 T/ha	=	100 gt/ac
1 m^3/day	=	220 gpd

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(3) McWalter A R (1956) — The soils of the Kedah/Perlis Coastal Plain. Proceedings of the 6th International Congress of Soil Science (Paris).

(4) Samy J & Joseph K T (1977) — Fertilizer studies in the Muda Scheme area. Proceedings of 3rd Asean Conference, Kuala Lumpur Ministry of Agriculture.

(5) Soo Swee Weng (1972) — Semi-detailed soil survey of the Kedah/Perlis Coastal Plain. West Malaysia Soil Survey Report No. 1, Ministry of Agriculture & Fisheries.

C1 INTRODUCTION

This Annexe presents the results of soils studies in all irrigation areas and comprises reports on two components of the study area - Balik Pulau and Seberang Perai. Soil studies in the tree-crop drainage areas of Seberang Perai are presented in Annexe J - Engineering, Agricultural and Economic Study of Drainage Areas in Seberang Perai.

The terms of reference require that all soils in the study area be checked with a view to assessing the soil capability and the formulation of cropping systems appropriate to each kind of soil (soil type) within the study area and to highlight limitations, if any, by way of toxicities, inordinate soil water losses through percolation, chronic soil deficiencies and other soil properties that might affect the scope for agricultural development in the study area.

The main soil textural types present in all the schemes have been identified and described. This also applies to the major soil series present. The soil fertility status and details of fertiliser requirements for specific areas and for specific crops have been provided.

The main irrigation schemes under study for upgrading are the Sg. Muda, Pinang Tunggal and the Sg. Kulim making up an area in the region of 12,000 ha, about 85% of the total land area of all the schemes under study. The soils in all these schemes are clays, highly suited to padi, and presenting no limitations whatsoever to the double cropping of padi under mechanisation.

The highlight of the soils report is that the soils are eminently suited to padi and offer no restrains whatsoever in nearly all areas. The main exception is in the Juru area of Seberang Perai, where acidity coupled with water shortage problems are limiting factors to improving padi yields.

C2 **BALIK PULAU**

C2.1 **Summary**

C2.1.1 The soils of the Balik Pulau Plain on the West Coast of Penang Island stretch for about 11 km N-S and 2 - 4 km E-W, and are low lying, level or nearly level with impeded drainage. The area under study consists of the padi areas of the Sg. Burong and Sg. Pinang schemes with a nominal total area of 1,127 ha (2,782 ac) plus an area of 200 ha (500 ac) at Pantai Acheh which consists of mangrove swamps, now partly reclaimed.

C2.1.2 The soils in the area comprise the following series:

- Kranji (class 4)
- Kuala Kedah/Tebangau Association (class 2)
- Rudua/Rusila Association
- Other colluvia/alluvia near the hillslopes

Soil samples were taken for the present study as shown on Figure C1, consisting of two sites in the Sg. Burong scheme and one site in the Sg. Pinang scheme. These sites are covered by the Kuala Kedah series and the Tebangau soil series. This soil association occurs throughout all the areas in which padi is cultivated now except for the isolated part in Mukim E nearest Balik Pulau town known as Pokok Kenanga, which is in the Rudua/Rusila association (see C2.2.5).

C2.1.3 Samples were also taken from three sites in the coastal mangrove forests of Pantai Acheh outside the new bund, and three sites on the Kranji soils of Kg. Enam. These site locations are all indicated in Figure C1.

C2.2 <u>Characteristics of soils in the padi areas</u>

C2.2.1 The Kuala Kedah and Tebangau series are both recent marine-derived clay soils with weak profile development. The soils are poorly drained and have a high water table. They are classified according to the soil taxonomy as Typic Hydraquent. On account of the high water table, flat terrain and heavy texture, these soils are best left for wet padi cultivation.

C2.2.2 Detailed description of these soils are provided in Appendix CIII. The Kuala Kedah and Tebangau series were originally described by McWalter (1956) in Kedah (Ref. 3) and more recently by Soo Swee Weng (1972) in the Report on the Semi-detailed Soil Survey of the Kedah/Perlis Coastal Plain published by the Ministry of Agriculture (Ref. 5). In the MADA area alone these soils occupy about 8,000 ha. Mechanised harvesting of padi has been carried out for many years in the MADA area and the soils in Balik Pulau would offer no problems for mechanisation as is now being proposed. Improvement of the infield drainage on these soils will result in improving the physical conditions, especially the soil bearing pressure.

C2.2.3 Figure C1 also shows locations of 52 samples taken by MARDI in the Kuala Kedah/Tebangau. The pH values obtained from these samples establish that this soil is not potentially acid sulphate. Test results for the samples taken in the present study are summarised in Tables C1, C3 and C4. The pH of the mangrove forest soils remains high after incubation, therefore it can be stated that acidity problems do not exist anywhere in the project scheme areas of Balik Pulau.

C2.2.4 The soil group boundaries shown on Figure C1 are taken from the unpublished semi-detailed survey by the DOA. The boundary between the Kranji and the Kuala Kedah/Tebangau was shown on the original map as lying along the line of the existing older JPT bunds, but in fact it is further inland at the south side of the project area.

C2.2.5 Soil examination of Pokok Kenanga would suggest that percolation losses are high in most areas in view of the high clay/silt content of the soil (See soil fractuation data in Table C6). Field auger examinations confirm the presence of a silty clay to silty clay loam texture in this area. Padi yields in this area are stated to be of the order of 3.1 T/ha (500 gantangs/acre). However the area is considered marginal for padi during the off-season.

C2.3 Coastal borderlands (Kampong Enam)

C2.3.1 The narrow strip between the coastal bund and the padi area of the Sg. Burong scheme, shown on Figure C1 as "Kampong Enam", contains Kranji soils from which three samples were taken. pH values are high, but soil conductivities are also very high. (Table C5). The leaching of salts from the pre-reclamation stage has not been very effective to date, but with the improved drainage arrangements proposed it is expected that the soil will be satisfactory for padi in a few year's time.

C2.3.2 The alternative to padi for its use could be aquaculture or coconuts; the latter would require further drainage both of surface water and a lowering of the water table. This would increase substantially the cost of the project.

C2.4 Fertiliser recommendation for padi

C2.4.1 Irrigation water analysis for Sg. Burong for potassium (2.4 ppm) would provide for adequate potassium nutrition of padi and for this reason potassium need not be applied in the fertiliser mixture.

C2.4.2 Fertiliser trials in the MADA area on Kuala Kedah and Tebangau series soil would suggest that the fertiliser compilation for Balik Pulau should be as follows:

Recommendation - 100 kg/ha nitrogen (as urea)
30 kg/ha P_2O_5 (as rock phosphate)

This recommendation is based on soil characteristics and the irrigation water analysis available for the double cropped areas.

C2.4.3 For the areas recommended for single cropping and alternative crop i.e. maize and vegetable crops as proposed by the agronomist, the padi phase for these schemes will require the same fertiliser schedule as recommended above. For maize following the padi phase the requirements will be as follows:

75 kg/ha nitrogen (as urea)
30 kg/ha P_2O_5 (as ground rock phosphate)
20 kg/ha K_2O (as muriate of potash).

For vegetable crops (okra, eggplant, chilli, non-leguminous crop, etc.) the fertilizer input should be as follows:

200 kg/ha N (as urea)

20 kg/ha P_2O_5 (as ground rock phosphate)

40 kg/ha K_2O (as muriate of potash.)

For leguminous crop, nitrogen content should be drastically reduced to a small starter dose of about 20 kg/ha N. The phosphate and potassium levels should be retained.

C2.4.4 In view of the heavy nature of the clays in the Kuala Kedah/ Tebangau association root crops are not recommended, neither is groundnut recommended on these soils as an alternative crop to padi, in those areas where water may not be adequate for double cropping of padi.

C.3 SEBERANG PERAI

3.1 Summary

C3.1.1 The soils of the study area in Seberang Perai are alluvial soils, derived either from marine or riverine alluvium. These soils have been identified, categorised and evaluated with respect to a soil capability assessment both for padi as well as for various short term annual crops considered appropriate in cropping systems in a rotational phase with padi.

C3.1.2 The terms of reference also require that the soils in the study area be checked to highlight limitations, such as nutrient deficiencies or toxicities, or large percolation losses of water that might affect the scope for agricultural development in the area. To this end it was noted that, except for the small schemes in the minor valleys of Cherok Tok Kun and Machang Bubok (where alternative dryland crops such as tobacco and vegetables might be considered) and in the Juru area of Seberang Perai (where acid sulphate conditions prevail), the soils in all the schemes have been supporting traditionally high crop yields of padi.

C3.1.3 The highlight of the soils report is that the soils are eminently suited to padi and offer no restraints whatsoever, except in the Juru area where acidity coupled with water shortage problems are limiting factors to improving padi yields.

C3.2 Characteristics of soils in the padi areas

C3.2.1 The main schemes under study for upgrading are the Sg. Muda, Pinang Tunggal and the Sg. Kulim making up an area in the region of 12,000 ha, about 85% of the total land area of all the schemes under study. The soils in all these schemes are clays, highly suited to padi, and presenting no limitations whatsoever to the double cropping of padi under mechanisation. Figure C2 shows the sample locations in the main schemes listed above as well as in the Jarak irrigation scheme and the smaller schemes, namely Tasek Gelugor, Jarak Tengah, Machang Bubok, Tasek Junjong, Alma, Cherok Tok Kun and Juru.

The Sg. Muda scheme

C3.2.2 This is the largest single scheme. The soils of the scheme are all clays (see Table C7) and comprise the following soil series, the characteristics of which are given in Appendix CIII. Kuala Kedah, Sedaka, Rantau, Sintok, Kundor and Tualang. They are all extremely fertile soils and are ideally suited to padi. An area where soft soils with low soil bearing pressures occur has been demarcated on Figure C2. Improved drainage here of surface water is essential. Soil physical conditions will automatically improve with drainage. Except for this area the soils can be regarded as dominated by Class I padi soils. Cation Exchange Capacity's (CEC) range from 17 - 32 meg/100 gm soil: average CEC is about 24.5 meg/100 gm.

The Pinang Tunggal scheme

C3.2.3 Soils here are also clays (see Table C7) and comprise the following soil series: Kundor, Tualang and Akob series. CEC's here are fairly consistent and the average value is about 17.5 meg/100 gm. The soils are highly suitable to padi and offer no limitations to padi culture.

Sg. Kulim scheme

C3.2.4 Here the soils are clays and clay loams and the average CEC's are about 14 meg/100 gm of soil. The soils here comprise the following series: Bakau, Kundor and Tualang. The area is highly suitable for padi and presents no problems to mechanisation.

C3.2.5 In the small schemes, minor valleys of Cherok Tok Kun and Machang Bubok, "clay + ½ silt" values are marginal to poor for padi. Here alternative dryland crops to padi may be considered. Tobacco, vegetables and groundnuts are crops which could be successfully grown in these schemes (see Table C8).

C .3 Soils and crop suitability

C3.3.1 In Table C8 it will be noted that double cropping of padi is recommended for areas where the soils are dominated by marine alluvia and those areas where the sediments have been described as "local alluvia-colluvia". It should be noted that the term "local alluvia" merely refers to riverine alluvia on restricted narrow zones (to distinguish from those riverine deposits on large flood plains) the availability of water and the relatively high "Clay + ½ Silt" values in these narrow restricted valleys would support double cropping of padi. There appears to be a relatively high proportion of colluvial material in the alluvial/colluvial deposits in the Cherok Tok Kun and Machang Bubok areas and for this reason, tobacco, groundnuts and a range of vegetable crops have been suggested.

C3.3.2 The marine alluvial soils are also characterised by 2:1 expanding type clay mineralogy. The dominance of montmorillonitic clays in the marine alluvia as against kaolinitic clays in the riverine alluvia is a feature of the soils of the study area (Ref.2). The yield potential of the riverine alluvia will not match that of the marine alluvial soils except where acid sulphate conditions develop from pyrite fairly close to the soil surface (see next section).

The Juru scheme

C3.3.3 This scheme covering about 244 ha is an acid sulphate area and ideally should be double cropped with padi, if water could be supplied throughout the area. Yields of padi are the lowest recorded in Seberang Perai. Due to the lack of water to irrigate the area throughout, it is suggested that double cropping should be practised in part of the area, preferably the parts furthest away from the coast; the remaining areas be converted for aquaculture. The presence of pyrite in the profile makes it mandatory that the soil here should be as far as possible continuously flooded. Soil pH and conductivity values obtained for 9 sample sites at 3 depth intervals (0-6, 6-12 and 12-18" from the surface) showed the presence of pyrite in most of the samples; conductivity values were higher closer to the sea (of the order of 2,700 micromhos/cm as against about 500 micromhos/cm further inland).

(Table C 9). An area for aquaculture nearer the sea would thus enable land not so suitable for padi to be utilised for aquaculture. This would decrease water requirements for irrigation thus enabling a scheme in which the remaining land could be double cropped. Adequate water for two crops of padi would also have the beneficial effect of keeping the pyrite under water for as long as possible, thus inhibiting oxidation which is the cause of the continuing release of acid. Locations near the coast gave pH values of 3.2, 2.7 and 2.6 for the 3 depth intervals 0"-6", 6"-12" and 12"-18" respectively. Further inland these values were less acid and corresponded to net values of 3.9, 3.8 and 3.7 respectively.

C3.4 Chemical evaluation of soils

C3.4.1 The best padi areas are reflected in the CEC values given in Table C10. The order is as given below:

Muda : Pinang Tunggal : Alma followed by the Sg. Kulim schemes.

C3.4.2 Cherok Tok Kun and Machang Bubok have the lowest CEC values with the others lying between these groups.

C3.5. Soil fertility and fertilisers

C3.5.1 The alluvial soils in the Sg. Muda, Pinang Tunggal and Sg. Kulim schemes are similar to the soils in the MADA irrigation area, and data obtained from fertiliser studies carried out by MARDI in the MADA area and in Seberang Perai are of immediate relevance to the present study. Water quality studies would indicate high levels of soluble potassium in the irrigation water and for this reason no potassium recommendations are being made for all the areas under double cropping and for the padi phase of cropping rotations. (This does not apply to non-padi crops, following the padi phase in any rotation).

C3.5.2 For marine-derived and mixed alluvial soils, the recommendation for padi is as follows:

100 kg/ha nitrogen (as urea)

20 kg/ha P_2O_5 (as rock phosphate)

C3.5.3 For the riverine derived soils and the sediments described as local alluvia/colluvia, the recommendation is as follows:

80 kg/ha nitrogen (as urea)
30 kg/ha P_2O_5 (as rock phosphate)

C3.5.4 For the Juru area where acid sulphate conditions prevail, in the proposed double cropped areas it is suggested that the recommendation is as follows:

60 kg/ha nitrogen (as urea)
45 kg/ha P_2O_5 (as rock phosphate)

C3.5.5 For the non-padi crops which have been recommended in Tasek Glugor, the Pinang Tunggal area, in Machang Bubok and in Cherok Tok Kun the following recommendations are made:

For tobacco (Cherok Tok Kun and Machang Bubok) the fertiliser recommendations for these are as follows:

35 kg/ha nitrogen (as urea)
30 kg/ha P_2O_5 (as rock phosphate)
30 kg/ha K_2O (as K_2SO_4)

For groundnut (Cherok Tok Kun and Machang Bubok)

40 kg/ha P_2O_5 (as rock phosphate)
20 kg/ha K_2O (as muriate of potash)

Nitrogen should not exceed 20 kg/ha if used as a starter dose. All groundnut seeds should be suitably innoculated.

C3.5.6 Vegetable crops are recommended for Pinang Tunggal, Tasek Glugor and could also be grown in Machang Bubok and Cherok Tok Kun. For vegetable crop like okra, eggplant and chilli the recommendations are as follows:

<u>Okra, eggplant, chilli</u>

200 kg/ha nitrogen (as urea)
70 kg/ha K_2O (as muriate of potash)
20 kg/ha P_2O_5 (as rock phosphate for Pinang Tunggal and Tasek Glugor).
30 kg/ha P_2O_5 (as rock phosphate for Cherok Tok Kun and Machang Bubok).

Maize

75 kg/ha nitrogen (as urea)

30 kg/ha P_2O_5 (as rock phosphate)

20 kg/ha K_2O (as muriate of potash for Pinang Tunggal and Tasek Glugor).

Not recommended for Cherok Tok Kun and Machang Bubok.

C3.6 Soil classification

C3.6.1 Table C11 gives the classification of soils in Seberang Perai. These soils are all present in the Kedah/Perlis coastal plain. The proposal by the consultants to have large scale mechanisation in the study area will not pose problems in so far as the soils are concerned. These soils will be able to support large machines such as the combine harvesters now operating in the MADA area on similar soils.

Table C.1

Chemical analysis of the Balik Pulau Soils

Surface soils

Sample No.	Location	pH	CEC (meq/ 100gm)	Total N (%)	Total P (mg/100 gm soil)	Total K (mg/100gm)	Organic carbon (%)
1	Sg. Burong	4.8	25.0	0.41	4.9	7.4	4.4
2	Sg. Burong	5.2	22.8	0.38	2.5	15.0	3.8
3	Sg. Pinang	4.5	18.6	0.22	4.0	7.6	3.0

Table C.2

Physical analysis of the Balik Pulau soils

Sample No.	Location	Clay	Silt	Sand	Clay + ½ Silt Index	Textural Type
1	Sg. Burong	63	27	10	76	Clay
2	Sg. Burong	67	32	2	83	Clay
3	Sg. Pinang	54	34	12	71	Clay

Samples at
6" - 12" depth

Table C.3

pH determinations in different locations of the mangrove forests near Pantai Acheh

Sample 4		Sample 5		Sample 6	
Fresh	After Incubation	Fresh	After Incubation	Fresh	After Incubation
(a) 7.4	7.3	(a) 6.9	6.7	(a) 7.9	7.7
(b) 7.3	7.1	(b) 7.1	6.7	(b) 7.9	7.9
(c) 7.8	7.6	(c) 7.2	6.4	(c) 7.8	7.7

(a), (b) and (c) refer to the 0-6, 6-12 and 12-18 in. fractions.

Table C.4

pH determinations on reclaimed coastal strip (Kg. Enam)

Kranji Series

Sample 7		Sample 8		Sample 9	
Fresh	After Incubation	Fresh	After Incubation	Fresh	After Incubation
(a) 6.6	6.6	6.4	6.5	6.6	6.3
(b) 6.4	6.3	6.5	6.5	6.3	6.4
(c) 6.5	6.6	6.4	6.6	6.6	6.5

(a), (b) and (c) refer to the 0-6, 6-12 and 12-18 in. fractions.

Conductivities on samples 7 and 8 surface soils gave values of 8,930 and 8,800 micromhos/cm respectively. These values are too high for padi cultivation.

Table C.5

Soil from Kg. Enam

	Sample 7	Sample 8
Conductivity, μ mhos/cm	8,930	8,800
Sulphate, %	0.12	0.11
Chloride, %	0.13	0.11
CEC, meq/100g	40.8	47.4
Exchangeable Na, meq/100g	14.39	14.42
Exchangeable Na % in Total Exchange Cations	35.27	30.44

Note: Soil to water in the ration of 1:5

Table C.6

Soil from Pokok Kenanga (2nd fraction)

Sample No.	Mechanical Analysis		
	Clay	Silt	Sand
10	79%	18%	3%
11	62%	34%	5%

Table C.7

Particle Size Fractionation of Typic Pedons (6" - 12" layer) - Seberang Perai

Scheme	Location*	Clay	Silt	Sand	Clay + ½ Silt	Textural Type
S. Muda	(A)	64	31	5	79	Clay
S. Muda	(B)	51	40	9	71	Clay/silty clay
S. Muda	(C)	65	30	5	80	Clay
S. Muda	(D)	84	13	4	90	Clay
S. Muda	(E)	66	28	6	80	Clay
S. Muda (Penaga)	(F)	60	33	8	76	Clay
S. Muda	(G)	59	38	3	78	Clay
P. Tunggal	(1)	76	22	2	87	Clay
P. Tunggal	(2)	70	29	1	85	Clay
P. Tunggal	(3)	74	25	2	86	Clay
P. Tunggal	(4)	77	21	2	87	Clay
S. Kulim	(1)	64	29	5	78	Clay
S. Kulim	(2)	43	32	26	59	Clay loam
S. Kulim	(3)	41	30	28	56	Clay loam
S. Kulim	(4)	36	30	30	51	Clay loam
S. Kulim	(5)	59	37	1	77	Clay
Jarak	(1)	54	37	9	72	Clay loam
Jarak	(2)	52	20	27	62	Sandy clay
Jarak	(3)	55	22	14	66	Clay

* Figure C 2 for Location of Sample Sites

Table C.7 (Contd.)

Particle Size Fractionation of Typic Pedons (6" - 12" layer) - Seberang Perai

Scheme	Clay	Silt	Sand	Clay + ½ Silt	Textural Type
Tasek Junjong (A)	50	16	34	58	Clay
Tasek Junjong (B)	36	16	48	44	Sandy clay loam
Jarak Tengah	42	15	43	50	Clay loam
Cherok Tok Kun	36	10	55	41	Sandy clay loam
Alma	39	10	52	44	Sandy clay
Tasek Gelugor	43	32	25	58	Clay
Machang Bubok*	16	8	77	20	Loamy sand

* Figure C.2 for Location of Sample Sites

All these soils are largely formed on colluvia/alluvia deposits, CEC values for Cherok Tok Kun, Machang Bubok, Tasek Junjong, Tasek Gelugor, Jarak Tengah are all about 10 meq/100 gm soil.

Table C.8

Showing Main Soils of Each Irrigation Scheme and Crop Suitability

	Irrigation Scheme	Soil Series Present	Nature of Sediment	Suitable crops
1.	Sg. Muda (7,115 ha)	Kundor Tualang Sintok Sedaka Rantau Kuala Kedah	Marine Riverine Mixed Marine Mixed Marine	Double cropping of padi as most of the soils are heavy clays of marine origin
2.	Sg. Kulim (3,663 ha)	Bakau Kundor Tualang	Marine Marine Riverine	Double cropping of padi as most soils are heavy clays of marine origin
3.	Pinang Tunggal (1,496 ha)	Akob Kundor Tualang	Riverine Marine Riverine	Double cropping of padi, or padi and alternate dry land crop (vegetables).
4.	Jarak (789 ha)	Akob	Riverine Local alluvia-colluvia	Double cropping of padi
5.	Juru (244 ha)	Linau Kranji	Marine Marine	Double cropping of padi and aquaculture
6.	Tasek Glugor (221 ha)	Akob	Riverine	Padi and alternate dry land crop-vegetables
7.	Tasek Junjong (195 ha)		Local alluvia-colluvia	Double cropping of padi
8.	Machang Bubok (136 ha)		Local alluvia-colluvia	One crop padi followed by dry land crop-vegetables or tobacco
9.	Alma (97 ha)	Briah	Mixed	Double cropping of padi of rice and alternate dry land crop (vegetables)
10.	Jarak Tengah (105 ha)		Local alluvia-colluvia	Double cropping of padi
11.	Cherok Tok Kun (106 ha)		Local alluvia-colluvia	Tobacco, groundnuts and vegetable crops
12.	Mengkuang Mat Sulong (24 ha)		Local alluvia-colluvia	Double cropping of padi
13.	Sg. Duri (20 ha)		Local alluvia-colluvia	Double cropping of padi
14.	Sg. Renjau (20 ha)		Local alluvia-colluvia	Double cropping of padi
15.	Kuala Tasek (18 ha)		Local alluvia-colluvia	Double cropping of padi

Table C9 - pH values (incubated) for the Juru Area

Sample No.	Incubated pH valves pH	(Juru) Conductivities umhos/cm
A_1	4.0	230
A_2	4.2	246
A_3	4.3	237
B_1	4.0	240
B_2	3.9	-
B_3	4.0	-
C_1	4.0	2680
C_2	3.9	2661
C_3	3.7	2679
D_1	4.1	320
D_2	3.9	340
D_3	4.0	337
E_1	3.9	2550
E_2	3.8	2610
E_3	3.7	2470
F_1	3.8	2010
F_2	3.7	2378
F_2	3.7	2290
G_1	4.0	893
G_2	3.9	870
G_3	3.8	-
H_1	4.0	470
H_2	4.1	486
H_3	4.2	-
I_1	4.0	-
I_2	4.3	-
I_3	4.2	-

Table C.10

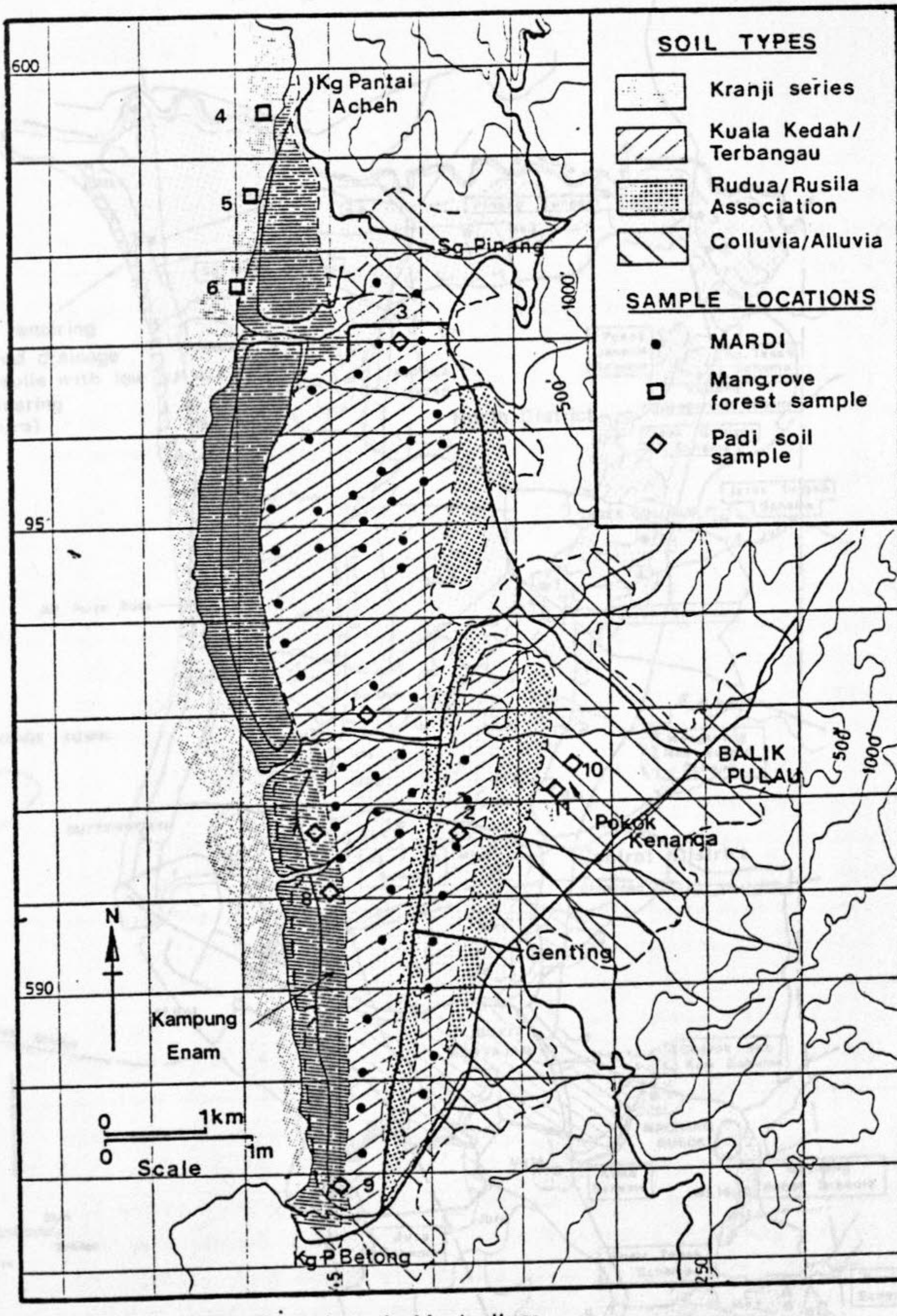
Chemical Analysis of Surface Soil of Seberang Perai
(0 - 6" fraction)

Schemes	pH	Nitrogen %	Organic Carbon %	CEC. MEG/100 gm Soil	Total P (ppm)	Total K (ppm)
1. Sg. Muda (Mean of 7 values)	4.6	0.42	3.1	24.5	214	1,375
2. Sg. Kulim (Mean of 5 values)	4.1	0.30	2.4	14.0	331	1,254
3. Pinang Tunggal (Mean of 4 values)	4.0	0.32	2.6	17.5	184	1,459
4. Jarak (Mean of 3 values)	4.1	0.22	1.5	10.0	95	915
5. Tasek Junjong (Mean of 2 values)	4.5	0.23	1.6	9.6	160	999
6. Alma	4.6	0.45	3.9	17.1	795	1,176
7. Jarak Tengah	4.3	0.21	1.2	8.9	135	882
8. Tasek Glugor	4.3	0.31	2.5	10.8	381	608
9. Cherok Tok Kun	4.4	0.20	1.0	7.5	64	229
10. Machang Bubok	4.0	0.16	0.9	6.4	63	495

Table C.11

Classification of Soils in Seberang Perai

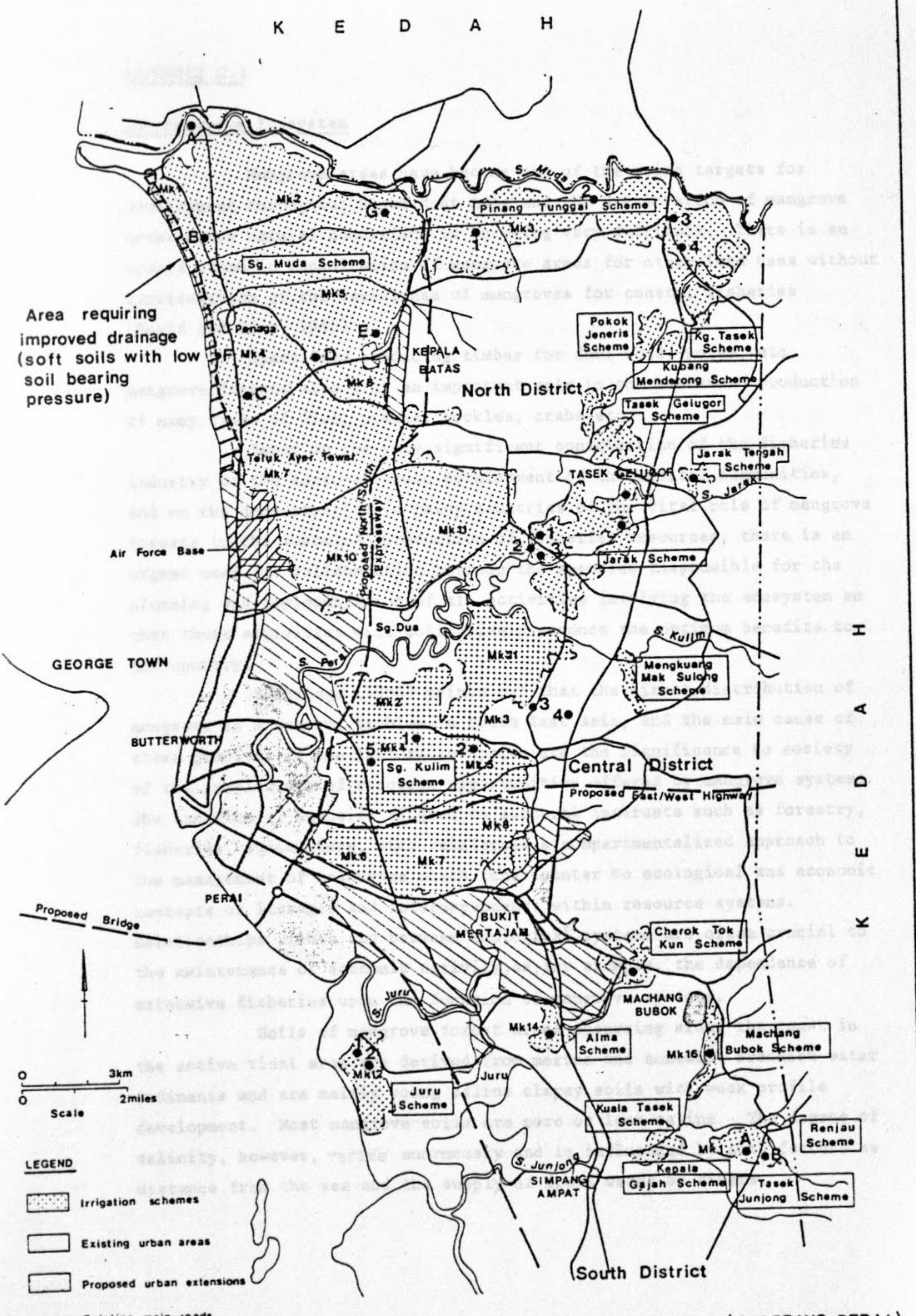
SOIL SERIES	SOIL TAXONOMY	FAO/UNESCO
Bakau	Typic Fluvaquent	Thionic Fluvisols
Kundur	Typic Fluvaquent	Thionic Fluvisols
Tualang	Typic Tropaquept	Dystric Fluvisols
Sintok	Typic Tropaquept	Dystric Fluvisols
Sedaka	Typic Tropaquept	Dystric Fluvisols
Rantau	Typic Tropaquept	Dystric Fluvisols
Kuala Kedah	Typic Hyraquent	Dystric Fluvisol
Akob	Typic Tropaquept	Dystric Fluvisol
Linau	Typic Sulfaquent	Thionic Fluvisol
Kranji	Typic Hydraquent	Thionic Fluvisol
Briah	Typic Tropaquept	Dystric Gleysol



Adapted from Department of Agriculture survey (Soo Swee Weng) & unpublished MARDI records

SOIL SAMPLE LOCATIONS (BALIK PULAU)

Figure C1



SOIL SAMPLE LOCATIONS (SEBERANG PERAI)

Figure C2

APPENDIX C.I

The Mangrove Ecosystem

Mangrove areas have become one of the prime targets for development throughout South East Asia and the preservation of mangrove areas under natural conditions is becoming very difficult. There is an upward trend in exploitation of mangrove areas for other land uses without consideration of the usefulness of mangroves for coastal fisheries (Heald and Odum, 1968).

Apart from producing timber for fuel wood, poles, etc mangrove forests also play an important role in the sustained production of many types of fish, prawns, cockles, crabs etc.

Based on the very significant contribution of the fisheries industry to the socio-economic development of the coastal communities, and on the demonstration in rainy countries of the vital role of mangrove forests to the sustained production of fisheries resources, there is an urgent need for collaboration between the agencies responsible for the planning and implementation of all activities involving the ecosystem so that these activities will collectively produce the optimum benefits to the country.

Burbridge (1980) points out that the direct distribution of mangrove is a serious problem in South East Asia, and the main cause of these problems is the failure to appreciate the significance to society of the complex web of resource opportunities offered by mangrove systems. The creation of agencies aligned to sectoral interests such as forestry, fisheries, agriculture, etc: reinforces a compartmentalized approach to the management of resources which runs counter to ecological and economic concepts of linkages and interdependence within resource systems. Relationships within and between ecological systems are often crucial to the maintenance of economic activity,as,for example, the dependence of extensive fisheries upon the function of mangrove systems.

Soils of mangrove forest areas occurring along the coast in the active tidal area are derived from marine and somewhat brackish water sediments and are mainly young saline clayey soils with weak profile development. Most mangrove soils are more or less saline. The degree of salinity, however, varies enormously and is influenced by such factors as distance from the sea and the supply of fresh water by rivers.

Some mangrove soils developed from marine and/or brackish sediments contain sulfides such as pyrites (FeS_2). If the soil is drained, the sulphates are oxidised and sulphuric acid is formed. Some sampling was carried out in the Pantai Acheh area and incubation pH values were determined. About a dozen pH recordings were made. There were no indications of the presence of pyrite. However it should be pointed out that the sampling intensity was extremely low because of the difficulties in field sampling. In view of the need for systematic detailed sampling, the statement regarding the absence of the potential acid sulphate soils should be treated with caution. In any case, the author strongly believes that the mangrove areas in the Balik Pulau area should be preserved at all costs and that the conversion of these areas to padi is to be strongly resisted.

There is considerable evidence that mangrove forests are very important habitats of several commercially important species of fish, crustaceans and molluscs. They also serve as nursery areas for many of the above species. In recent year increasing areas of mangrove forests have been disturbed and areas have been totally cleared and reclaimed for various purposes such as housing, agriculture, aquaculture, industries etc. The decline of coastal fisheries in recent years would suggest that both overfishing and increased disturbance of the mangrove forest has contributed significantly to the decline of the coastal fisheries which are dependent on mangrove forests.

K.T. Joseph

References:

1) Heald, E.J. and Odum WE (1968)
The contribution of mangrove swamps to Florida fisheries. In Proceeding of the Gulf and Carribean Fisheries Institute San Juan, Puerto Rico.

2) **Burbridge, P.R (1980)**
The Management and Planning of Mangrove Resources in Asia. In Asian Symposium on Mangrove Environment - Kuala Lumpur

3) **Chan Sang and Smith I.R. (1980)**
Compatability of Alternative Uses of Mangroves and Estuarine Resources.
In Asian Symposium on Mangrove Environment Kuala Lumpur

APPENDIX C.II

*SOIL SAMPLES FROM BALIK PULAU

SAMPLE NO.	pH (1:1)	µmho/cm.
Point No. 1		
0 - 6	5.0	50
6 - 12	4.7	110
12 - 18	4.5	150
18 - 24	3.9	300
Point No. 2		
0 - 6	5.8	140
6 - 12	6.3	190
12 - 18	6.4	200
18 - 24	6.2	310
Point No. 3		
0 - 6	6.8	62
6 - 12	6.8	95
12 - 18	6.7	240
18 - 24	5.9	240
Point No. 4		
0 - 6	6.6	130
6 - 12	6.5	180
12 - 18	6.8	200
18 - 24	6.7	300
Point No. 5		
0 - 6	5.1	90
6 - 12	5.4	40
12 - 18	5.0	50
18 - 24	5.4	60
Point No. 6		
0 - 6	6.2	140
6 - 12	6.7	190
12 - 18	6.8	200
18 - 24	7.1	310

* Data from Mardi Files, unreported previously. These values, (somewhat on the high side) do however clearly indicate the absence of acid problems in the bulk of the padi soils of Balik Pulau.

Point No. 7		
0 - 6	4.8	62
6 - 12	4.7	95
12 - 18	4.3	240
18 - 24	4.2	240
Point No. 8		
0 - 6	5.6	80
6 - 12	6.3	120
12 - 18	6.5	125
18 - 24	6.7	130
Point No. 9		
0 - 6	6.3	210
6 - 12	6.7	260
12 - 18	6.7	320
18 - 24	6.9	350
Point No. 10		
0 - 6	6.0	60
6 - 12	5.1	55
12 - 18	4.8	50
18 - 24	4.6	40
Point No. 11		
0 - 6	6.1	150
6 - 12	6.6	140
12 - 18	6.7	150
18 - 24	6.6	155
Point No. 12		
0 - 6	5.1	60
6 - 12	4.8	45
12 - 18	4.5	50
18 - 24	4.2	45
Point No. 13		
0 - 6	6.3	180
6 - 12	6.7	190
12 - 18	7.1	195
18 - 24	7.1	240

Point No. 14		
0 - 6	4.8	60
6 - 12	4.6	45
12 - 18	4.7	65
18 - 24	4.9	20
Point No. 15		
0 - 6	5.7	110
6 - 12	6.4	280
12 - 18	6.6	290
18 - 24	6.7	350
Point No. 16		
0 - 6	5.5	70
6 - 12	5.6	23
12 - 18	5.8	38
18 - 24	5.6	32
Point No. 17		
0 - 6	6.6	450
6 - 12	6.8	670
12 - 18	6.9	725
18 - 24	6.9	650
Point No. 18		
0 - 6	6.0	100
6 - 12	6.6	170
12 - 18	7.2	160
18 - 24	7.1	150
Point No. 19		
0 - 6	6.3	2,000
6 - 12	6.6	2,350
12 - 18	6.5	3,100
18 - 24	7.2	2,750
Point No. 20		
0 - 6	6.7	1,600
6 - 12	6.8	1,700
12 - 18	6.9	2,000
18 - 24	6.6	2,200

Point No. 21		
0 - 6	6.2	1,900
6 - 12	6.2	1,700
12 - 18	6.4	2,300
18 - 24	6.1	2,500
Point No. 22		
0 - 6	5.8	2,900
6 - 12	6.1	3,200
12 - 18	5.9	4,000
18 - 24	6.6	3,700
Point No. 23		
0 - 6	5.2	130
6 - 12	5.0	160
12 - 18	5.1	170
18 - 24	5.5	170
Point No. 24		
0 - 6	5.2	260
6 - 12	5.7	340
12 - 18	6.2	390
18 - 24	6.5	530
Point No. 25		
0 - 6	5.5	60
6 - 12	5.6	590
12 - 18	5.3	270
18 - 24	4.6	720
Point No. 26		
0 - 6	4.7	130
6 - 12	4.9	160
12 - 18	5.0	180
18 - 24	4.6	230
Point No. 27		
0 - 6	5.2	140
6 - 12	5.1	140
12 - 18	5.2	230
18 - 24	5.3	360

Point No. 28		
0 - 6	5.1	180
6 - 12	5.4	200
12 - 18	5.9	250
18 - 24	5.9	260
Point No. 29		
0 - 6	5.1	290
6 - 12	5.5	520
12 - 18	6.1	700
18 - 24	6.3	800
Point No. 30		
0 - 6	5.4	340
6 - 12	6.1	680
12 - 18	6.2	660
18 - 24	6.2	800
Point No. 31		
0 - 6	5.4	320
6 - 12	6.4	450
12 - 18	6.6	530
18 - 24	6.7	680
Point No. 32		
0 - 6	6.4	500
6 - 12	6.7	1,000
12 - 18	6.8	1,100
18 - 24	7.0	1,200
Point No. 33		
0 - 6	6.9	730
6 - 12	6.9	750
12 - 18	7.0	780
18 - 24	7.3	940
Point No. 34		
0 - 6	6.6	170
6 - 12	7.5	720
12 - 18	7.2	400
18 - 24	6.9	330

Point No. 35		
0 - 6	6.8	255
6 - 12	7.0	350
12 - 18	7.1	600
18 - 24	6.9	730
Point No. 36		
0 - 6	6.4	160
6 - 12	6.7	350
12 - 18	7.1	390
18 - 24	7.2	450
Point No. 37		
0 - 6	7.2	200
6 - 12	7.3	300
12 - 18	7.9	520
18 - 24	8.1	530
Point No. 38		
0 - 6	7.1	140
6 - 12	7.1	160
12 - 18	7.2	170
18 - 24	7.6	170
Point No. 39		
0 - 6	6.2	100
6 - 12	6.6	220
12 - 18	7.0	270
18 - 24	7.1	280
Point No. 40		
0 - 6	6.6	90
6 - 12	6.6	150
12 - 18	6.7	160
18 - 24	6.7	190
Point No. 41		
0 - 6	7.3	180
6 - 12	7.9	230
12 - 18	7.6	475
18 - 24	7.8	510

Point No. 42		
0 - 6	5.6	69
6 - 12	6.5	150
12 - 18	6.8	150
18 - 24	7.1	130
Point No. 43		
0 - 6	6.6	355
6 - 12	7.3	590
12 - 18	6.9	575
18 - 24	7.1	560
Point No. 44		
0 - 6	6.7	180
6 - 12	7.2	340
12 - 18	6.9	330
18 - 24	7.2	400
Point No. 45		
0 - 6	6.2	210
6 - 12	6.9	370
12 - 18	7.3	410
18 - 24	7.4	420
Point No. 46		
0 - 6	6.9	395
6 - 12	7.1	440
12 - 18	7.2	420
18 - 24	7.2	420
Point No. 47		
0 - 6	5.9	170
6 - 12	5.9	360
12 - 18	5.9	360
18 - 24	5.9	450
Point No. 48		
0 - 6	6.0	270
6 - 12	6.9	395
12 - 18	7.3	540
18 - 24	7.4	900

Point No. 49		
0 - 6	6.9	150
6 - 12	7.1	180
12 - 18	7.4	425
18 - 24	7.4	400
Point No. 50		
0 - 6	6.9	240
6 - 12	7.3	380
12 - 18	7.5	900
18 - 24	7.7	600
Point No. 51		
0 - 6	7.0	430
6 - 12	7.4	670
12 - 18	7.0	750
18 - 24	6.8	1,000
Point No. 52		
0 - 6	7.2	450
6 - 12	7.3	650
12 - 18	6.9	680
18 - 24	7.6	690

SOIL SERIES DESCRIPTIONS

Soil Series	- Akob Series
Location	- Kampung Lahar Tiang, Seberang Perai
Map & Grid Reference	- Sheet 2I/6 - 160885
Landform	- River terrace
Vegetation	- Paddy
Parent Material	- Riverine alluvium
Drainage	- Moderately well drained

Profile Description

Ahp 0 - 15 cm

Greyish brown (2.5Y 5/2) silty; firm; weakly to moderately well developed medium subangular blocky structure; abundant pores, few fine faint yellowish brown (10YR 5/8) mottles; may roots; boundary distinct.

Ahps 0 - 15 cm

Grey (10YR 5/1) silty clay; firm; massive structure; few pores, many fine distinct strong brown (7.5YR 5/6) mottles; few roots, boundary indistinct.

AB 15 - 36 cm

Light brownish grey (2.5Y 6/2) clay; firm to friable; moderately well developed to strongly developed medium angular blocky structure; almost continuous clay-skins, few pores, abundant medium distinct string brown (7.5YR 5/6) mottles; few roots, boundary indistinct.

Bg 36 - 71 cm

Light grey (2.5Y 7/1) clay; friable; strongly developed coarse angular blocky structure; discontinuous clayskins; abundant medium distinct brownish yellow (10YR 6/8) and many medium distinct red (2.5YR 5/8) mottles; boundary diffuse.

BCg 71 + cm

Light grey (2.5Y 7/1) clay; friable; moderately well developed coarse angular blocky structure; discontinuous clayskins; few coarse distinct red (2.5YR 4/8) mottles.

Soil Series - Bakau Series

Location - Sungai Bakau, Seberang Perai

Map & Grid Reference - 21/14 - 066364

Landform - Coastal Plain

Vegetation - Paddy

Parent Material - Marine alluvium

Drainage - Poorly drained

Profile Description

Ah 0 - 3 cm

Dark grey (10YR 4/1) clay; friable; weakly developed medium crumb structure; many pores; many fine distinct strong brown (7.5YR 5/6) mottles along former root channels; many fine roots; boundary sharp.

Bg 3 - 13 cm

Greenish grey (5GY 6/1) clay; slightly sticky; moderately well developed coarse to very coarse blocky structure; patchy clayskins; many pores; many medium to coarse, distinct to prominent reddish brown (5YR 4/4 to 5/4) mottles along former root channels; few roots and many channels; boundary indistinct.

Bgcn(mn) 13 - 51 cm

Greenish grey (5GY 5/1) clay; sticky; weakly developed coarse to very coarse blocky structure; patchy clayskins and few pores; many medium distinct olive brown (2.5Y 4/4) mottles on structure faces; many dark brown small manganese concretions; boundary diffuse.

Cr 51 - 102 cm

Greenish grey(5BG 5/1) clay; sticky; massive structure.

Soil Series - Kuala Kedah
Location - -
Map & Grid Reference - -
Landform - Flat depression
Vegetation - Paddy
Parent Material - Marine alluvium
Drainage - Very poorly drained

Profile Description

Apl 0 - 17 cm

Dark grey (10YR 4/1) clay, dark grey (10YR 3/1) when moist; abundant coarse prominent red (2.5YR 4/6) iron deposits on pad faces and root channels; massive; very hard (dry); some fine sand; many fine roots and root mat; clear and wavy boundary to.

CIC 17 - 40 cm

Greenish grey (5G 5/1) wet clay; many fine distinct strong brown (7.5YR 5/6) iron deposite on former root channels in upper part of horizon; massive; sticky and slightly plastic (wet); very few fine roots, clear boundary to.

C2G 40 - 74 cm

Greenish grey(580 6/1) wet clay; many medium distinct olive (5Y 5/4) deposits; weakly developed coarse prismatic and angular blocky; sticky and slightly plastic (wet) diffuse boundary to.

C3G 74 - 96 cm

Greenish grey(5G 6/1) wet clay; many medium distinct olive (5Y 5/4) deposits along former root traces; massive; very sticky and plastic (wet) diffuse boundary to.

C4G 96 cm +

Greenish grey (5G 5/1) wet clay; many gritty greyish green(5G 5/2) deposits; massive; very sticky and plastic (wet).

The soil cracks only in the Ap in extremely dry periods, 2 cm wide.

Soil Series - Kundor Series

Location - Butterworth - Bukit Merah Road, Seberang Perai

Map & Grid Reference - Sheet 28 - 105710

Landform - Marine Terrace

Vegetation - Paddy

Parent Material - Marine alluvium

Drainage - Imperfectly drained

<u>Profile Description</u>

<u>Ahp 0 - 13 cm</u>

Dark grey (10YR 4/1) silty clay; friable; moderately well developed fine to medium subangular blocky structure; abundant pores; many fine distinct dark brown (7.5YR 4/4) mottles along former root channels; some mica flakes; many roots and channels; boundary distinct.

<u>Ahps 13 - 20 cm</u>

Dark grey (10YR 4/1) silty clay; sticky; massive structure; few pores; few medium distinct strong brown (7.5YR 5/6) mottles along former root channels; many roots and few channels, boundary distinct.

<u>Bgj 20 - 33 cm</u>

Grey (5Y 5/1) clay; friable; moderately well developed coarse angular blocky structure and weakly developed medium prismatic structure; patchy clayskins and few pores; many coarse distinct yellowish red (5YR 4/8) mottles along former root channels; few roots; boundary diffuse.

<u>Bg 33 - 71 cm</u>

Grey (10YR 5/1) clay; friable; weakly to moderately well developed medium prismatic and moderately well developed medium to coarse angular blocky structures; almost continuous clayskins; many pores; abundant coarse distinct yellowish red (5YR 4/8) mottles along former root channels and structure faces, many channels.

Soil Series	-	Rantau Series
Location	-	Between 46 and 45 3/4 milestone Tikam Batu, Kota Kuala Muda Road, South Kedah
Map & Grid Reference	-	Sheet 16 - 692174
Landform	-	Terrace
Vegetation	-	Paddy
Parent Material	-	Mixed riverine and marine alluvium
Drainage	-	Imperfectly drained

Profile Description

Ahp 0 - 10 cm

Grey (10YR 5/1) clay; firm; massive structure; many pores; many medium distinct dark brown (10YR 4/3) and few medium distinct red (2.5YR 5/8) mottles; many fine roots and channels; boundary distinct.

Ahps 10 - 23 cm

Dark grey (10YR 4/1) clay; very firm; massive structure; few pores; abundant fine faint to distinct reddish yellow (7.5YR 7/8) and many fine distinct strong brown (7.5YR 5/6) mottles; few fine roots; micaceous; boundary distinct.

Bg 23 - 58 cm

Light grey (5Y 7/1) clay; friable to slightly sticky; moderately well developed medium columnar structure, breaking into moderately well developed medium angular blocky; discontinous clayskins and many pores; many medium distinct red (10R 5/8) and yellow (10YR 7/8) mottles along former root channels; few fine roots and channels; micaceous; boundary indistinct.

Bcg 58 - 91 cm

Light grey (5Y 7/1) clay; slightly sticky; weakly developed medium angular blocky structure; discontinuous clayskins and few pores; pockets of fine sand; many medium distinct light olive brown (2.5Y 5/6) and yellowish brown (10YR 5/6) mottles.

Soil Series - Sedaka Series
Location - -
Map & Grid Reference - -
Landform - Almost flat coastal plain
Vegetation - Paddy
Parent Material - Marine aluuvium
Drainage - Poorly drained

Profile Description

Ap 0 - 27 cm

Very dark grey (10YR 3/1) moist to dark grey (10YR 4/1) dry silty clay many fine distinct brownish yellow (10YR 6/8) dry mottles on root traces; massive; dry, extremely hard; many fine roots ; abrupt smooth boundary.

B2g 27 - 68 cm

Light olive grey (5Y 6/2) moist clay; many medium distinct yellow (10YR 7/8) mottles on ped faces; strongly developed coarse angular blocky; firm (moist); slightly sticky and slightly plastic (wet); many slickensides; diffuse wavy boundary.

B3G 68 - 100 cm

Greenish grey (5G 6/1) wet clay; many medium distinct olive (5Y 5/4) mottles, weakly developed very coarse angular blocky; slightly sticky and slightly plastic; occasional slickensides; diffuse wavy boundary.

CG 100 - 150 cm

Greenish grey (5BG 5/1) wet clay; many medium distinct pale green (5G 6/2) mottles; many fine distinct reddish brown (5YR 5/4) iron deposits along root traces; massive; sticky and plastic.

Soil Series - Sintok Series

Location - Kampung Permatang Kuang, Seberang Perai

Map & Grid Reference - 21/6 - 065843

Landform - Marine terrace

Vegetation - Paddy

Parent Material - Mixed riverine and marine alluvium

Drainage - Poorly drained

Profile Description

Ahp 0 - 18 cm

Dark grey (10YR 4/1) clay; friable; moderately well developed medium subangular blocky tructure; abundant pores; few medium distinct olive brown (2.5Y 4/4) mottles; many roots and many channels; boundary distinct.

Ahps 18 - 25 cm

Grey (5Y 5/1) clay; firm; massive structure; few pores; few fine faint dark grey (2.5Y 4/1) mottles; few roots; boundary distinct.

Bg 25 - 48 cm

Light greenish grey (5BG 7/1) sandy clay; slightly sticky; weakly developed coarse angular blocky structure;almost continuous clayskins and many pores; many coarse distinct strong brown (7.5YR 5/6) mottles along former root channels; few roots; boundary indistinct.

Bcg 48 - 69 cm

Light bluish grey (5B 7/1) sandy clay loam; slightly sticky; weakly developed coarse angular blocky structure; many pores; many fine distinct strong brown (7.5YR 5/8) mottles.

Soil Series - Tualang Series

Location - -

Map & Grid Reference - -

Landform - Flat coastal plain

Vegetation - -

Parent Material - Riverine alluvium overlying marine alluvium

Drainage - Poorly to imperfectly drained

Profile Description

Apl 0 - 7 cm

Light brownish grey (10YR 6/2) clay loam, light brownish grey (10YR 5/2) when moist; few distinct brownish yellow (10YR 6/8) iron depends on root channels; massive; soft to slightly hard (dry); many fine rooots; diffuse boundary to.

Ap2 - 7 - 18 cm

Grey (10YR 5/1) clay, grey (10YR 4/1) when moist; many medium distinct brownish yellow (10YR 6/8) mottles on pad faces; massive; very hard (dry) abrupt boundary to.

Bl 18 - 38 cm

Grey(10YR 5/1) moist clay; abundant medium distinct brownish yellow (10YR 6/8) and few medium distinct red (10YR 4/8) mottles on pad faces; strongly developed coarse angular blocky breaking into fine and medium subangular blocky; firm (moist); diffuse boundary to.

(B)2g 38 - 84 cm

Grey to light grey (10YR 6/1) moist clay; many to abundant coarse distinct brownish yellow (10YR 6/8) and few medium distinct red (10YR 5/8) mottles on pad faces, the latter tending to form soft concretions; weakly developed coarse angular blocky breaking into medium and fine angular blocky; friable (moist) diffuse boundary to.

83g 84 - 130 cm

Grey (10YR 5/1) moist clay; many medium distinct yellow (10YR 7/8) mottles on ped faces; weakly developed coarse angular blocky breaking into medium angular blocky; slightly friable (moist); occasional organic stains on old root traces.

Cracks (lees than 1 cm side) occur only in the Apl and Ap2.

SOCIOLOGY

ANNEXE D

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ANNEXE D

SOCIO-ECONOMIC STUDIES

D1. SUMMARY OF CONCLUSIONS

D1.1 It was evident from our study that education had been mainly instrumental in creating a changing pattern in the farming population. The family size is generally small and the children have much better education than the parents. Both factors have interacted to give rise to the labour scarcity on the farm: the small family implies low man-power availability; better education means better job opportunities outside padi cultivation. Given existing farming conditions, it is therefore unlikely that the majority of the younger generation will return to follow the life-style of their parents. However, the possibility of the younger generation returning to the land should not be completely ruled out if improved farming methods requiring less labour and more material inputs, such as machinery and chemicals, are introduced.

D1.2 The household income in the study area is generally below the national poverty line despite the economic boom in the neighbouring towns of Butterworth and Bukit Mertajam in the case of Seberang Perai Tengah and Bayan Baru in the case of Balik Pulau.

D1.3 The majority of the respondents were willing to support the co-operative farm concept, either by being shareholders, workers or both. We therefore recommend that a better organisation of the farm land and mechanised farming be immediately instituted. All groups interviewed were agreeable to mechanised farming as long as they could still remain on their kampung land.

D1.4 Although many respondents were no longer farming in Seberang Perai Tengah, they still retained emotional ties with padi double-cropping and favoured it. Any attempt to permanently convert padi land in the area to other crops would likely be met with some opposition from the local people judging from their emotional ties with padi. The present farmers (head of households) in Balik Pulau also seemed to prefer rice cultivation, especially if there was better control of the rice land.

D1.5 It appears that, in general, landlords were willing to rent their land to a co-operative farm venture if there was one. The landlords were in favour of agriculture, but they would prefer that the land they own be better organised and managed: implying that they preferred group or co-operative farming. Their preference for rice coincided with that of the farmers.

D1.6 Mixed answers were received with regards to alternative farming systems. The farmers were not against the idea of introducing off-season crops if double-cropping of rice was not possible. However, if there was better management, the farmers still preferred to plant rice because it was connected with their sense of security and relationship to the earth.

D1.7 However, the key to the problem in the study area was not so much on the choice of crops but in the management of the land. A uniform planting date for all farmers, for example, was seen by many farmers as a positive step to combat the pest problem in padi cultivation: implying the need for irrigation upgrading as the first step. We would recommend therefore that a single authority be set up to manage the land for agricultural purposes.

D1.8 Our interviews with the landowners, the most crucial group of people who must agree to lease their land, revealed that most would co-operate with such an authority established to manage the lands.

D1.9 There would be potential labour if farming was organised as a 'corporate' venture with permanent wages paid to workers throughout the year. There would also be a good prospect for a sizeable number of the younger generation returning to the land for a similar reason.

D2. BALIK PULAU SOCIO-ECONOMIC REPORT

D2.1 Introduction

The problem

D2.1.1 Nearly half the population of Balik Pulau are engaged in agriculture. Crops grown include padi (1197 ha), coconut (2000 ha), rubber (3376 ha) and orchards (1189 ha). However, all is not well with the farmers of Balik Pulau, especially the smallholders who are engaged in padi cultivation. The acreage operated is small, tenancy is widespread and, of late, much of the padi land has been abandoned. At the same time there is great pressure on the demand for land for urban purposes, especially housing. Labour for padi cultivation has dwindled over the years having been drawn into the urban sectors; factories and airport in the south and the hotel industry in the north. Thus unless the padi land is rehabilitated and new agricultural institutions introduced, the future of Balik Pulau padi farmers looks rather bleak. However, programmes instituted in the area must be acceptable to the farmers for they are the owners of the two major resources in the study area, namely labour and land.

Objectives

D2.1.2 The general objective of the survey is to assess the socio-economic viability of the area for agriculture, especially in view of the fact that Balik Pulau is situated in between two development areas in the north (tourism) and in the south (manufacturing industries).

D2.1.3 Specifically, the objectives of the study are to:

(i) Determine socio-economic characteristics of the padi farming population, including age structure, educational attainments of family members, their occupations, etc.

(ii) Determine problems faced by the padi farmers in relation to the abandonment of land.

(iii) Determine farmers' preference for alternative crops after land rehabilitation and preferred organisation to undertake farming.

D2.2 Methodology

D2.2.1 Data for the study came from personal interviews with 270 farmers and ex-farmers in Sungai Burung and Sungai Pinang. Lists of respondents were obtained from the Lembaga Pertubuhan Paladang's office in Balik Pulau. For the purpose of this study, Sungai Burung was divided into two sub-areas using the Jalan Baru as an arbitrary dividing line. Thus we have Sungai Burung East, Sungai Burung West and Sungai Pinang as our study areas (see Figure D2.1).

D2.2.2 From the lists supplied by the LPP, we extracted simple random samples from each of the 3 areas - 158 from Sungai Burung East, 48 from Sungai Burung West and 64 from Sungai Pinang.

D2.2.3 Besides the main respondent, we also interviewed young working adults from the same selected households. However, a maximum of one young adult only was interviewed from any household. Our main interest with the younger generation is to assess the potential agricultural labour force in the area after the rehabilitation efforts. A total of 190 young working adults were interviewed.

D2.2.4 Since re-organisation of agriculture would also affect the landowners, we believe that the landlords should also be interviewed in order to get their views about the future of agriculture in the area. Lists of landlords were prepared by asking the aid of kampung headmen in the respective areas. A total of 55 landlords were interviewed.

D2.2.5 The sampling appears to be biased towards the 'active' farmers as 90% of the sample consisted of people still actively engaged in padi cultivation. Former farmers working on lands now abandoned appear to be under-represented, comprising only 10% of the sample. However, in this study we are more interested in learning about general socio-economic characteristics of the farm population, which we believe are not connected with the incidence of tanah rang.

D2.3 Farmers Sample

Household Characteristics

D2.3.1 Over 55% of the informants were over 50 years old, compared with only 45% for the Seberang Perai Tengah study areas (see Table D2.1). Thus the farmers of Balik Pulau are generally older than those of Seberang Perai Tengah. It is rather difficult to find young farmers as indicated by the fact only one out of a sample of 270 farmers was under 31 years old. The conclusion is clear, namely, the young has almost entirely left agriculture for non-farming occupations. In Seberang Perai Tengah study area, the situation is slightly better with 5% of the farmers below 30 years of age, although it is still not encouraging compared with MADA.

D2.3.2 The proportion of the farmers in the 41 - 60 age group is somewhat of the same order of magnitude with that for Seberang Perai Tengah, i.e. approximately two-thirds (see Table D2.1).

D2.3.3 Most families (34%) in Balik Pulau consist of 5 to 6 people (see Table D2.3), very much similar to the case of Seberang Perai Tengah, where 39% of the households were in this size category. However, while in Seberang Perai Tengah the second most important category (24%) was 7 - 8, for the Balik Pulau it was 3 - 4 (27%). Thus the mean household size for Balik Pulau is smaller than for Seberang Perai Tengah, which suggests a more acute labour shortage in Balik Pulau than Seberang Perai Tengah.

D2.3.4 A vast majority (94%) of the respondents had attended primary school (see Table D2.2). Only 6% reported not having attended any school. These statistics are not too far off in comparison with Seberang Perai Tengah where 9% reported no schooling. However, not even one respondent ever went beyond secondary school in the case of Balik Pulau sample.

D2.3.5 The fact that only a mere 0.4% of the sample reached secondary education is astonishing since it is widely known that Penang was one of the earlier states to provide education in Bahasa Malaysia.

D2.3.6 As expected, other members of the family (mainly children of respondents) were better educated than the head of household (see Table D2.4). Over 72% of the respondents reported that some one in the family have had at least Form III education (74% in the case of Seberang Perai Tengah); 37% reached Form V. The results in general indicate that the majority of the children have gone to school and obtained a good education - a passport to other better income jobs elsewhere. However, it also means a reduction in the farm labour force since the younger generation is better equipped to take up non-farm jobs with much better prospects. This provides a changing pattern in the local situation. It is also significant that 4% go to Form IV, 3.5% go to college, while 3% reach the university level. It is noteworthy that the better educational opportunities brought a change not only to the family structure but also to the community as a whole. The children had the qualifications to enable them to work in the factories in the south or the hotels in the north, adversely thus affecting the labour force available for local agriculture. The higher the education, the further it takes the younger generation away from the kampung and the padi fields. It is not surprising therefore to find the old folk earning only meagre income from the rice fields while the young adults bring in a larger income from the outside.

D2.3.7 It should be mentioned that the survey was biased towards the active farmers, which explains why a large percentage (73%) gave farming as the main occupation while other occupations account for the remaining minority. Here we are more interested in the structure of the farmer's family, since we are dealing with their future more than anything else. Those who are recorded as not working were actually former farmers, now depending on their children for income. The children are employed in various non-farm occupations outside the villages.

D2.3.8 Rice and other farming activities are seldom a full-time occupation, although they can remain the major occupation of the people (see Table D2.5). It is significant that 17% of the respondents said that their part-time occupation was farming, (see Table D2.6), while nearly half the sample (48%) said that they had no part-time work. The other category included carpentry, roof-thatching, chicken rearing and other activities which come under 'kerja kampung' (or odd jobs). They are listed under part-time work because the informants spent less time on these activities but yet received some kind of remuneration from these jobs. It is also interesting to note that fishing is regarded only as part-time occupation. The incidence of 10% is not high, but it is significant as a supplementary income for the farmers. It should be regarded as an odd job (kerja kampung) too, although it requires some capital outlay. Thus Tables D2.5 and D2.6 should be considered together. We regard this as important because, together they provide a more or less complete picture concerning sources of income.

Tenure Status

D2.3.9 The survey also bears out earlier reports that the majority of the farmers were tenant farmers, especially in Sungai Pinang, where the incidence of tenancy is particilarly high (62%). Only about a quarter of those interviewed operated their own land (see Table D2.7). We note that in Sungai Burung East, some people had been tenants for as long as 60 years, although the majority had been tenants for the past 30 years or so (see Table D2.11). Such a high stability of tenure augers well for a co-operative farm approach which requires land to be rented in by the co-operative from the landowners for reasonably long periods.

D2.3.10 Over a third of the tenants rented their land from relatives, residing mainly in the same village (see Table D3.12). However, nearly two-thirds of these tenants rented from non-relatives, and nearly 60% of these rented from people who reside outside their own villages. The latter appears to indicate absentee landlordism in Balik Pulau.

D2.3.11 Over 80% of the tenants reported to be paying a third of their crop to the landlords as rental fee (see Table D2.13). Such variable rental is not conducive to productivity improvements since, being dependent on gross output, the system tends to act as disincentive to greater effort. To our knowledge, the government had recommended that this pawah system be abolished to be replaced with a fixed cash rental fee (1967 Padi Land Tenure Act). A fixed rental fee payable in advance may provide the inducement to landowners to agree to rent their land to a co-operative venture. The rate should be negotiated between the co-operative's management and landowners' representatives, presumably the local Farmers' Organisations.

Income

D2.3.12 It is most difficult to estimate the income of the family as their income originates from many sources. The income of the average farm family is not only seasonal but also unstable. It is also difficult for the respondent to estimate his income from padi or other crops as no records were ever kept.

D2.3.13 Dividing income into $100 intervals, it was found that the income interval with the highest frequency was the class of $101 - $200 a month; closely followed by income interval of $1 - $100 (see Table D2.38). Many respondents (23%) also reported as having no income at all. Only a few had income between $200 and $300 or between $300 or $400 (see Table D2.38).

D2.3.14 Taking $400 a month per family as the poverty line as suggested in the Fourth Malaysia Plan, the study revealed that over 62% of the households were below the poverty level. Although the situation looks slightly better than the Seberang Perai Tengah case, where 74% were below the poverty level, the difference may not be significant since the Balik Pulau sample may be less representative. It could have been more representative if more people who have abandoned land were included.

Present land use

D2.3.15 As regards to present land use, single-cropping accounts for 60%, double-cropping covers 29%, while only 10% of the respondents said that they did not plant padi anymore (see Table D2.8). This appears to be an overstatement because well below 30% double-cropped in the last four years. It is encouraging that 81% would be willing to double-crop in future (see Table D2.9).

D2.3.16 When asked what was the major problem they faced in padi cultivation, 56% considered the pests (rats) infestation to be their major problem (see Table D2.15). Many farmers realised that the probelm could be reduced if everybody planted at the same time. However, since such a practice is contingent upon water being made available at the same time, which is not likely at present, the rat problem will continue until rehabilitation is completed.

D2.3.17 Over a quarter of the sample perceived labour shortage to be the main problem. Perhaps when the rats 'took over' the padi fields, many young people were discouraged from padi farming and left, thereby creating labour shortage. Only 10% considered water supply to be their main problem.

D2.3.18 From interviews we had with the Ketua Kampung, prior to the survey, we learned that padi planting had been a traditional occupation which goes back to the distant past and that padi culture had greatly influenced the life of the people. It should be noted that padi is not the main source of income for many farmers. The crop is grown only as a supplementary source of income although it plays a very important part in their lives.

D2.3.19 Very few farmers planted other off-season crops. However, on the coastal plain we found that coconuts had been planted by some. There was also maize planted on the bunds in the padi fields but the condition of the crop indicated that it was a half-hearted way of supplementing income. Income also came from the rubber and dusun planted on the hill-sides. However, commercialised planting of spices like nutmeg and cloves on the hill land was not practised by Malay padi farmers.

<u>Projection for the future</u>

D2.3.20 The survey showed that the majority (98%) of the farmers were in favour of rehabilitating the land (see Table D2.16). A vast majority agreed that double-cropping would improve their livelihood. They also agreed that a co-operative system or group farming could solve their problem. It appears that the concept translated as 'group farming' is not popular, whereas a co-operative is. The majority have some experience with co-operative farming before, and to them, joining co-operatives means that a certain amount of control would be in their hands. Group farming would have elements of co-operative but control will be entirely in the hands of those in charge. However, it should have no bearing on the acceptability of group farms as defined in Annexe E, Chapter D6, which would, as explained there, include co-operatives. Nevertheless it is clearly desirable in future to avoid use of the term '<u>secara berkelompok</u>' which, being somewhat ambiguous, has produced this negative reaction.

D2.3.21 Of different crops suggested for future cultivation in co-operative units on large scale, padi emerged with a clear lead, followed by coconut and vegetables. Enterprises which have been considered and rejected in our general assessment, namely poultry, beef, papaya and bananas, all received very low votes in each case.

D2.4 <u>Landowners' and Children's Samples</u>

D2.4.1 Of the landlords surveyed, the majority (74%) acquired their land by inheritance (see Table D2.1B). This is not surprising since, in this area, land is bequeathed in ever smaller parcle according to Islamic law of inheritance.

D2.4.2 To the question why some of the land was not worked by the landowners, the majority were unwilling to provide the information (65%). Of the remainder, 11% each said that they were too old to work, or they had other jobs to be considered (see Table D2.2B).

D2.4.3 To the question whether or not they agreed to double-cropping, the great majority agreed. To another question whether they were willing to change from padi land to other crops, only 38% agreed (see Tables D2.3B and D2.4B).

D2.4.4 They were also asked whether they would be willing to rent their land to the co-operative. The majority answered in the affirmative. In fact the majority agreed to become shareholders in such venture. (see Tables D2.7B and D2.8B).

D2.4.5 It must be borne in mind that the respondents in this section are the grown-up children not engaged in farm work. Their reactions to the possibility of future work in agriculture were very encouraging (see Tables D2.5C and D2.7C).

SOCIO ECONOMIC SURVEY TABLES - BALIK PULAU

Table D2.1 - 40 refer to main respondent (Head of household)

1 - SBE = Sungai Burung East
2 - SBW = Sungai Burung West
3 - SP = Sungai Pinang

Table D2.1 : Age Distribution of Household Heads by Regions in Balik Pulau.

Age Group	SBE 1	SBW 2	SP 3	Total No.	Total %
Less 30	0	0	1	1	0.4
31 - 40	16	7	8	31	11.5
41 - 50	57	13	19	89	33.0
51 - 60	54	16	21	91	33.7
61 +	31	12	15	58	21.4
Total	158	48	64	270	100

Minimum Age 23 yrs old
Max 81
Average 52.8

Age of Respondent

Minimum Age of respondent is 23 yrs old, and the max. is 81 yrs. old. The average is 52.8 yrs old. Majority of the respondents: 41 yrs. above (88.2%)

Age structure of the population:

Age		No	%
1 -	3.9 yrs	68	(4.13%) out of 1648
4 -	5.9	38	(2.30)
6 -	12.9	203	(12.32)
13 -	15.9	141	(8.56)
16 -	19.9	209	(12.68)
20 -	25.9	256	(15.53)
26 -	30.9	134	(8.13)
31 -	40.9	188	(11.41)
41 -	50.9	199	(12.08)
51 yrs. above		212	(12.86)

The labour force at the age of 26-40.9 = 322 (19.5%)

Table D2.2 : Education of Respondent

level of education	SBE	SBW	SP.	Total No.	%
No School	11 (7.0)	3 (6.3)	2 (3.1)	16	5.9
Primary	147 (93.0)	45 (93.8)	61 (95.3)	253	93.7
Secondary	0	0	1 (0.6)	1	0.4
Total	158	48	64	270	100

Table D2.3 : Size of Household

Member of household	SBE	SBW	SP.	Total No	%
1 - 2	12	3	3	18	6.6
3 - 4	43	12	17	72	26.6
5 - 6	53	16	22	91	33.7
7 - 8	34	14	11	59	21.9
9 - 10	15	2	9	26	9.6
11 - 12	1	1	2	4	1.4
Total	158	48	64	270	100

Min. 1 member
Max. 12
average 5/6 members of household.

Table D2. 4 : Highest Education received by any Member of the Family

level of education received	1	2	3	Total No.	Total %
No information	3	2	0	5	1.9
Std. 6	46	15	9	70	25.9
Form 3	48	13	10	71	26.3
Form 5	49	14	36	99	36.7
Form 6	4	0	6	10	3.7
College	4	3	1	8	3.0
University	4	1	2	7	2.6
Total	158	48	64	270	100

Table D2. 5 : Main Occupation

Occupation	1	2	3	Total No	Total %
Not Working	3	1	1	47	1.9
Farmer	118	32	47	197	73.0
Fishermen	5	3	5	13	4.8
Business	1	1	1	3	1.1
White Collar	19	4	5	28	10.4
Others	11	7	5	23	8.5
Total	158	48	64	270	100

Not working - formerly farmers, now depending on working children

Table D2.6 : Part - time work

Occupation	1	2	3	Total No.	Total %
No part time work	82	16	32	130	48.1
Farmer	28	9	8	45	16.7
Fishing	10	11	8	29	10.7
Business	3	0	1	4	1.5
Others/	35	12	15	62	23.0
Total	158	48	64	270	100

Others: includes: Tukang/artisen
buat atap
menebas/hired labour
jaga
naik kelapa, cari ketam, menternak ayam/lembu.

Table D2.7 : Tenure Status

Tenure Status	1	2	3	Total No.	Total %
Landowner/Landlord	1	2	3	6	2.2
Owner operator & renting out	5	1	1	7	2.6
Owner operator	43	7	18	68	25.2
Owner operator + tenant	7	3	4	14	5.2
Tenant	97	34	37	168	62.2
Not any now	5	1	1	7	2.6
Total	158	48	64	270	100

Table D2.8 : Cropping intensity

Cropping pattern	1	2	3	Total No	Total %
No crop now	17	3 (6.3)	7 (10.9)	27	10.0
Single	77 (48.7)	31 (64.6)	56 (87.5)	164	60.7
Double	64 (40.5)	14	1	79	29.3
Total	158	48	64	270	100

Not working now - this people formerly farmers.

Table D2.9 : Willingness to double crop

	1	2	3	Total No	Total %
No	21	9	22	52	19.3
Yes	137	39	42	218	80.7
Total	158	48	64	270	100

Table D2.10 : Types of Cropping preferred most

	1	2	3	Total No.	Total %
Not Willing	4	4	6	14	5.2
Single Cropping	43	5	15	63	23.3
Double Cropping	111	39	43	193	71.5
Total	158	48	64	270	100

Table D2.11 Length of time being tenants

tenancy in yrs	1	2	3	Total No	Total %
Not involved	54	11	23	88	32.6
1 - 5	19	7	7	33	12.1
6 - 10	11	6	11	28	10.4
11 - 15	16	7	2	25	9.2
16 - 20	10	3	4	17	6.4
21 - 25	8	3	3	14	5.2
26 - 30	9	5	6	20	7.4
31 - 35	7	0	3	10	3.7
36 - 40	6	1	2	9	3.4
41 - 45	1	0	2	3	1.1
46 - 60	3	0	0	3	1.7
No information	14	5	1	20	7.4
Total	158	48	64	270	± 100

Table D2.12 : From whom lands were rented

	1	2	3	Total No	Total %
Relative in Kampung	22	14	19	55	20.4
Relative outside Kampung	5	3	5	13	4.8
Non relative in Kampung	32	6	10	48	17.8
People outside Kampung	44	15	7	66	24.4
Not tenant	55	10	23	88	32.6
Total	158	48	64	270	100

Table D2.13 : Tenancy system

	1	2	3	Total No.	Total %
Fixed rent (fixed)	5	2	1	8	3.0
Half of crop	3	0	4	7	2.6
One third of crop	87	26	34	147	54.4
Others	8	10	2	20	7.4
Not involved	55	10	23	88	32.6
Total	158	48	64	270	100

Table D2.14 : How tenant paid rent

System	1	2	3	Total No.	Total %
Cash	14	10	2	26	9.6
Kind	76	14	37	127	47.0
Both cash & kind	13	14	2	29	10.7
Not involved	55	10	23	88	32.6
Total	158	48	64	270	100

Table D2.15 : Main problem in padi cultivation

Problems	1	2	3	Total No	Total %
Lack of labour	42	24	7	73	27.1
Pests	94	13	43	150	55.6
Soil not fertile	0	0	1	1	0.4
Water	14	4	9	27	10.0
Tractor	1	0	0	1	0.4
Others	7	7	4	18	6.7
Total	158	48	64	270	100

D2.16: Whether rehabilitation was a good idea

	1	2	3	Total No.	Total %
No	2	3	1	6	2.2
Yes	156	45	63	264	97.8
Total	158	48	64	270	100

Table D2.17 : Whether you could depend on two padi crops per year for livelihood

	1	2	3	Total No.	Total %
No	40	12	24	76	28.1
Yes	118	36	40	194	71.9
Total	158	48	64	270	100

Table D2.18 : Willingness to grow off-season crops

	1	2	3	Total No.	Total %
No	42	22	21	85	31.5
Yes	116	26	43	185	68.5
Total	158	48	64	270	100

Table D2.19 : Types of off-season crop preferred

Types of crop	1	2	3	Total No.	Total %
Maize	37	21	34	92	34.1
Vegetables	79	4	9	92	34.1
Other	0	1	0	1	0.4
No./Crop	42	22	21	85	31.4
Total	158	48	64	270	100

Table D2.20 : Use of Tractors

	1	2	3	Total No.	%
No	105	45	64	214	79.3
Yes	53	3	0	56	20.7
Total	158	48	64	270	100

Note: None 214(79.3)
Two-wheel 56 (20.7%)

Table D2.21 : Ownership of Tractors

	1	2	3	Total No.	%
Not used	105	45	64	214	79.2
Self-owned	1	0	0	1	0.4
Other farmers/ Cooperatives/LPP	52	3	0	55	20.4
Total	158	48	64	270	100

Table D2.22 : Willingness to increase farm size

	1	2	3	Total No.	%
No	96	21	37	154	57.0
Yes	62	27	27	116	43.0
Total	158	48	64	270	100

Table D2.23 : Opinion about Government Land Rehabilitation Scheme

Opinion	1	2	3	Total No.	%
Very good	104	27	61	192	71.1
Good	53	19	1	73	27.0
Don't know	0	1	0	1	0.4
No answer	1	1	2	4	1.5
Total	158	48	64	270	100

N.B. No one said it was a 'bad' idea.

Table D2.24 : Willingness to be farmer even though better offer in other sector

	1	2	3	Total No	Total %
No	23(14.6)	13(27.1)	8(12.5)	44	16.3
Yes	135(85.4)	35(72.9)	56(87.5)	226	83.7
Total	158	48	64	270	100

Table D2.25 : Willingness to co-operate with the Government to improve padi land

	1	2	3	Total No	Total %
No	3 (1.9)	6 (12.5)	6(9.4)	15	5.6
Yes	155 (98.1)	42 (87.5)	58(90.6)	255	94.4
Total	158	48	64	270	100

Table D2.26 : Reaction to Conversion of Padi Land to other Crops

	1	2	3	Total	
				No	%
Strongly agree	18	20	15	53	19.6
Agree	35	10	6	51	18.9
Neutral	21	3	1	25	9.3
Disagree	40	5	5	50	18.5
Strongly disagree	34	5	35	74	27.4
Don't know	10	5	2	17	6.3
Total	158	48	64	270	100

Table D 2.27 : Participation in Local Co-operative Movement

Partici-pation	1	2	3	Total	
				No	%
No	89(56.3)	15(31.3)	18(28.1)	122	(45.4)
As Ordinary member	66(41.8)	31(64.6)	43(67.2)	140	51.9
As Exco	3(1.9)	2(4.2)	3(4.7)	8	3.0
Total	158	48	64	270	100

Table D2.28 : Opinion of the Co-operative

Opinion	1	2	3	Total No	Total %
No answer/ no opinion	76	11	8	95	35.2
Very good	31	8	41	80	29.6
Good	33	14	4	51	18.9
Bring no change	10	5	7	22	8.1
No good	8	10	4	22	8.1
Total	158	48	64	270	100

Table D2.29 : Willingness to Participate in Co-operative System

	1	2	3	Total No	Total %
As shareholder	50	18	37	105	38.9
As worker	30	13	1	44	16.3
As shareholder & worker	66	12	22	100	37.0
Don't want	6	1	1	8	3.0
No answer	6	4	3	13	4.8
Total	158	48	64	270	100

N.B. This is a projection for a large co-operative system in farming which is to be managed by a 'Lembaga'.

Table D2.30 : If not to the above (Table D2.29) give reason

Reasons	1	2	3	Total No.	Total %
Sufficient income	1	0	0	1	0.4
Owned no land	5	0	1	6	2.2
Padi as tradition	0	0	0	0	0.0
Others	0	1	0	1	0.4
Not involved	152	47	63	262	97.0
Total	158	48	64	270	100

Table D2.31 : Farming System - Alternative crops preferred

Alternative	1	2	3	Total No.	Total %
Double crop	77	21	28	126	46.6
Single crop + off season	63	7	21	91	33.7
Change to other crop,coconut etc	18	20	15	53	19.7
Total	158	48	64	270	100

Table D2.32 : Farming System - Alternative organisation preferred

Alternative prefer	1	2	3	Total No	%
Individual farming	45(28.5)	10(20.8)	36 (56.3)	91	(33.7)
Group farming	21(13.3)	2(4.2)	4 (6.3)	27	(10.0)
Large scale co-op system	90(57.0)	36(75)	22 (34.4)	148	(54.8)
No answer	2(1.3)	0	2 (3.1)	4	1.5
Total	158	48	64	270	100

Table D2.33 : Alternative Crops for Individual Farming

Alternative crop	1	2	3	Total No	%
Padi	44	8	35	87	32.2
Vegetables	1	2	0	3	1.1
Banana	0	0	1	1	0.4
No answer/not involved	113	38	28	179	66.3
Total	158	48	64	270	100

Table D2.34 : Alternative Crop preferred in Group Farming and other Activities

	No	Yes
Padi	242(89.6)	28(10.4)
Coconut	257(93.0)	19(7.0)
Banana	252(93.3)	18(6.7)
Papaya	254(94.1)	16(5.9)
Poultry	257(93.0)	19(7.0)
Beef	254(94.1)	16(5.9)
Vegetables	251(93.0)	19(7.0)

Table D2.35 : Willingness to Participate in Group Farming

	No	Yes
As ordinary Worker	247 (91.5)	23 (8.5)
Shareholder	266 (98.5)	4 (1.5)

Table D2.36 : Alternative Crop preferred for large scale Co-operative System

	No	Yes
Padi	124(45.9)	146(54)
Coconut	231(85.6)	39(14.4)
Banana	264(97.8)	6(2.2)
Papaya	267(98.9)	3(1.1)
Poultry	260(96.3)	10(3.7)
Beef	268(99.3)	2(0.7)
Vegetables	233(86.3)	37(13.7)
Others	255(98.1)	5(1.9)

Table D2.37: Monthly Household Income

Income ($)	Household	%	Cumulative %
Less 100	49	18.1	18.1
101 - 200	42	15.6	33.7
201 - 300	46	17.0	50.7
301 - 400	32	11.9	62.6
401 - 500	22	8.1	70.7
501 - 600	19	7.0	77.7
601 - 700	13	4.9	82.6
701 - 800	18	6.7	89.3
801 - 900	8	2.9	92.2
901 - 1000	8	2.9	95.1
1001 above	13	4.9	100.0
Total	270	100	

Table D2.38: Monthly major income of the Respondent

Income ($)	Respondent	%	Cumulative %
0	63	23.4	23.4
1 - 100	64	23.7	47.1
101 - 200	77	28.5	75.6
201 - 300	35	12.9	88.5
301 - 400	23	8.5	97.0
401 - 500	6	2.2	99.2
501 - 600	-	-	99.2
601 - 700	-	-	99.2
701 - 800	1	0.4	99.6
801 - 900	1	0.4	100.0
Total	270	100	

Table D2.39: Monthly part-time Income of the Respondent

Income ($)	Respondent	%
0	155	57.4
1 - 100	77	28.5
101 - 200	30	11.1
201 - 300	5	1.9
301 - 400	2	0.7
401 - 500	1	0.4
Total	270	100

Table D2.40: Best Organization of farming in Balik Pulau

	No information %	Individual operation %	Group farming %	Large Scale Co-ops %	Total
SBE	1.3	28.5	13.3	57.0	158
SBW	-	20.8	4.2	75.0	48
S.P	3.1	56.3	6.3	34.4	64
ALL	1.5	33.7	10.0	54.8	270

Crops Preferred by farmers

	No. reporting
A. Individually operated (33.7%)	
Padi	89
Vegetables	3
Banana	1
B. Group farming (10%)	
Padi	23
Coconut	19
Bananas	18
Poultry	19
Papaya	16
Beef	16
Vegetables	19
C. Cooperative Farming (54.8%)	
Padi	146
Coconut	39
Vegetables	37
Poultry	10
Bananas	6
Papaya	3

Table D2.1B - 10B refer to Respondent: Landowner/Landlord

Table D2.1B: Information on how land was owned

	1	2	3	Total No	Total %
No information	2 (5.6)	0	1 (9.1)	3	(5.5)
Inheritance	26 (72.2)	6 (75.0)	9 (81.8)	41	(74.5)
Purchase	6 (16.7)	2 (25.0)	0	8	(14.5)
Other ways	2 (5.6)	0	1 (9.1)	3	(5.5)
Total	36 (65.5)	8 (14.5)	11 (20.0)	55	(100)

Table D2.2B: Reasons for not cultivating the land

Reasons	1	2	3	Total No.	Total %
No information	26 (72.2)	6 (75.0)	4 (36.4)	36	(65.5)
Divorcee/widow	1 (2.8)	0	1 (911)	2	(3.6)
Old age	1 (2.8)	1 (12.5)	4 (36.4)	6	(10.9)
Have no time	1 (2.8)	0	0	1	(1.8)
Have other job	4 (11.1)	0	2 (18.2)	6	(10.9)
Others	3 (8.3)	1 (12.5)	0	4	(7.3)
Total	36 (65.5)	8 (14.5)	11 (20.0)	55	(100)

Table D2.5B: Willingness to cultivate your land

Willingness	1	2	3	Total No.	Total %
Likely yes	26 (72.2)	4 (50.0)	5 (45.5)	35	(63.6)
Yes	4 (11.1)	1 (12.5)	1 (9.1)	6	(10.9)
Not sure	2 (5.6)	2 (25.0)	2 (18.2)	6	(10.9)
Not willing	2 (5.6)	1 (12.5)	0	3	(5.5)
Not willing at any cost	1 (2.8)	0	3 (27.3)	4	(7.3)
No information	1 (2.8)	0	0	1	(1.8)
Total	36 (65.5)	8 (14.5)	11 (20.0)	35	(100)

Table D2.6B: If not willing to above (Table D2.5B), give reasons

Reasons	1	2	3	Total No.	Total %
Old age/divorcee/ widower	2 (5.6)	1 (12.5)	4 (36.4)	7	(12.7)
Have other permanent occupation	2 (5.6)	0	1 (9.1)	3	(5.5)
Waiting to sell the land	0	0	0	0	0
Others	1 (2.8)	0	0	1	(1.8)
No information	31 (86.1)	7 (87.5)	6 (54.5)	44	(80.0)
Total	36 (65.5)	8 (14.5)	11 (20.0)	55	(100)

Table D2.7B : Willingness to rent out padi land to large Co-operative System

Willingness	1	2	3	Total No.	%
No	12 (33.3)	3 (37.5)	3 (27.3)	18	(32.7)
Yes (1 - 3 yrs.)	13 (36.1)	5 (62.5)	8 (72.7)	26	(47.3)
Yes (3.1 - 6 yrs.)	4 (11.1)	0	0	4	(7.3)
Yes (6.1 -10 yrs.)	1 (2.8)	0	0	1	(1.8)
Yes (10 yrs.)	6 (16.7)	0	0	6	(10.9)
Total	36 (65.5)	8 (14.5)	11 (20.0)	55	(100)

Table D2.8B: Willingness to participate in large Co-operative System

	1	2	3	Total
As shareholder only	24 (66.7)	7 (87.5)	9 (81.8)	40 (72.7)
As shaholder & worker	7 (19.4)	0	0	7 (12.7)
Not willing to participate	4 (11.1)	1 (12.5)	2 (18.2)	7 (12.7)
No information	1 (2.8)	0	0	1 (1.8)
Total	36 (65.5)	8 (14.5)	11 (20.0)	55 (100)

D2.9B: Preference in land rental

	1	2	3	Total No.	Total %
Relative	18 (50.0)	4 (50.0)	3 (27.3)	25	(45.5)
Friends in the kampung	1 (2.8)	0	0	1	(1.8)
Anyone willing to rent	15 (41.7)	4 (50.0)	8 (72.7)	27	(49.1)
No information	2 (5.6)	0	0	2	(3.6)
Total	36 (65.5)	8 (14.5)	11 (20.0)	55	(100)

Table D2.10B: Any offer for land purchase in the last one year

	1	2	3	Total
Yes, (genuine buyer)	1 (2.8)	0	0	1 (1.8)
Yes, (broker)	0	0	1 (9.1)	1 (1.8)
No	34 (94.4)	8 (100)	10 (90.9)	52 (94.5)
No information	1 (2.8)	0	0	1 (1.8)
Total	36 (65.5)	8 (14.5)	11 (20.0)	55 (100)

Table D2.1C - 9C refer to Off-farm worker among the family member of a farmer's household - younger generation - particularly the children of Respondent.

Table D2.1C: Age of Respondent

	1	2	3	Total No	Total %
Less 18	17 (16.5)	1 (2.9)	11 (21.2)	29	(15.7)
18 - 21	53 (51.5)	16 (45.7)	22 (42.3)	91	(47.9)
22 - 25	21 (20.4)	14 (40.0)	14 (26.9)	49	(25.8)
26 - 29	6 (5.8)	4 (11.4)	2 (3.8)	12	(6.2)
30 - 33	3 (2.9)	0	2 (3.8)	5	(2.6)
Above 34	3 (2.9)	0	1 (1.9)	4	(2.1)
Total	103 (54.2)	35 (18.4)	52 (27.4)	190	(100)

Table D2.2C : Occupation

Types of occupation	1	2	3	Total No	Total %
Factory worker	77 (74.8)	21 (60.0)	45 (86.5)	143	(75.3)
Govt. labour	12 (11.7)	7 (20.0)	3 (5.8)	22	(11.6)
Clerical (Govt./ private)	3 (2.9)	2 (5.7)	0	5	(2.6)
Police/Security Officer	3 (2.9)	2 (5.7)	0	5	(2.6)
Teacher	1 (1.0)	0	0	1	(0.5)
Officer (Govt./ Private	1 (1.0)	1 (2.9)	0	2	(1.1)
Others	4 (3.9)	2 (5.7)	3 (5.8)	9	(4.7)
No specific job	2 (1.9)	0	1 (1.9)	3	(1.6)
Total	103 (54.2)	35 (18.4)	52 (27.4)	190	(100)

Table D2.3C: Attitude towards padi/agriculture

Attitudes	1	2	3	Total No	Total %
a) Low income	32 (31.1)	14 (40.0)	11 (21.2)	57	(30.0)
b) Working condition - tiring	44 (42.7)	15 (42.9)	32 (61.5)	91	(47.9)
c) No experience	26 (25.2)	3 (8.6)	6 (11.5)	35	(18.4)
d) Others	1 (1.0)	3 (8.6)	2 (3.8)	6	(3.2)
e) No information	0	0	1 (1.9)	1	(0.5)
Total	103 (54.2)	35 (18.4)	52 (27.4)	190	(100)

Table D2.4C: Assistance to parents working in the farm

	1	2	3	Total No	Total %
No	13 (12.6)	11 (31.4)	12 (23.1)	36	(18.9)
When asked	25 (24.3)	13 (37.1)	27 (51.9)	65	(34.3)
When necessary	23 (22.3)	2 (5.7)	2 (3.8)	27	(14.2)
Free time	42 (40.8)	9 (25.7)	11 (21.2)	62	(32.6)
Total	103 (18.4)	35 (18.4)	52 (27.4)	199	(100)

Table D2.5C: Willingness to participate in agriculture when improvement was made by the Government

Willingness	1	2	3	Total No.	Total %
Full time	9 (8.7)	3 (8.6)	10 (19.2)	22	(11.6)
Part-time	73 (70.9)	22 (62.9)	25 (48.1)	120	(63.2)
Not at all	18 (17.5)	8 (22.9)	16 (30.8)	42	(22.1)
No information	3 (2.9)	2 (5.7)	1 (1.9)	6	(3.2)
Total	103 (54.2)	35 (18.4)	52 (27.4)	190	(100)

Table D2.6C: What the respondents would do to their parent's padi land

	1	2	3	Total No.	Total %
I will improve & cultivate it	47 (45.6)	10 (28.6)	12 (23.1)	69	(36.3)
Rent out to other people	43 (41.7)	22 (62.9)	37 (71.2)	102	(53.7)
Advice my parent to sell it	0	1 (2.9)	0	1	(0.5)
Others	4 (3.9)	1 (2.9)	3 (5.8)	8	(4.2)
No land	9 (8.9)	1 (2.9)	0	10	(5.3)
Total	103 (54.2)	35 (18.4)	52 (27.4)	190	(100)

Table D2.7C: Willingness to participate in large scale cooperative system

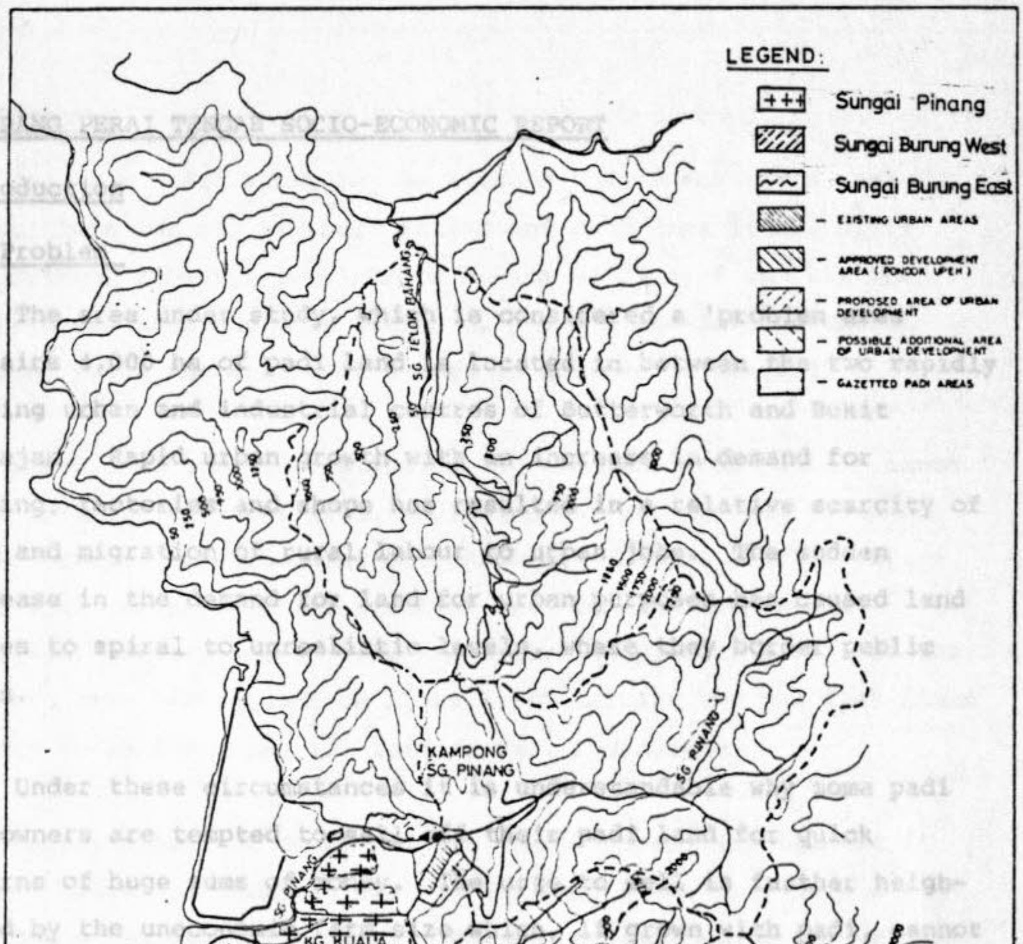
	1	2	3	Total No.	Total %
As shareholder only	37	3	32	72	(37.9)
As worker only	13	23	4	40	(21.1)
As shareholder & worker	40	5	12	57	(30.0)
As managerial only	0	0	0	0	-
Do not want to take part	13	4	4	21	(11.1)
Total	103	35	52	190	

Table D2.8C: Willingness to participate in cooperative with high pay or as much as they get in the factories

	1	2	3	Total No.	Total %
No	32 (31.1)	6 (17.1)	27 (51.9)	65	(34.2)
Yes	71 (68.9)	29 (82.9)	25 (48.1)	125	(65.8)
Total	103	35	52	190	100

Table D2.9C: Sex ratio of the respondent

Age of the respondent	Male	Female	% total
Less than 17	19	9	14.7
18 - 21	60	31	47.9
22 - 25	18	31	25.8
26 - 29	4	8	6.3
30 - 34	3	2	2.6
35 & above	0	4	2.1
	105(55.3)	85(44.7)	



LOCATION PLAN
BALIK PULAU SOCIO – ECONOMIC SURVEY
Figure D2.1

D3. SEBERANG PERAI TENGAH SOCIO-ECONOMIC REPORT

D3.1 Introduction

The Problem

D3.1.1 The area under study, which is considered a 'problem area' contains 4,000 ha of padi land is located in between the two rapidly growing urban and industrial centres of Butterworth and Bukit Mertajam. Rapid urban growth with an increase in demand for housing, factories and shops has resulted in a relative scarcity of land and migration of rural labour to urban jobs. The sudden increase in the demand for land for urban purposes has caused land values to spiral to unrealistic levels, where they border public roads.

D3.1.2 Under these circumstances it is understandable why some padi landowners are tempted to sell off their padi land for quick returns of huge sums of money. The urge to sell is further heightened by the uneconomic farm size which, if grown with padi, cannot provide a decent income to support a farm family. One reason why farmers in the area have abandoned their padi land may well be that they are waiting for the opportune time to sell off their plots, although the lack of labour and inadequacy of water and drainage may have also contributed to the tanah rang problem. In 1974, about 120 ha of padi land in the area has been abandoned and this increased to 2176 ha in 1980, which is about 18 times the area in 1974.

Objectives

D3.1.3 The objectives of this study are to:

- Describe the socio-economic characteristics of the farmers and ex-farmers of the areas.
- Determine present levels of income of the family in the area.
- Determine current practices with respect to padi cultivation.
- Determine attitudes of the farm population towards tanah rang rehabilitation, including crops preferred.

D3.2 Methodology

D3.2.1 The area under study may be divided into 3 sub-areas, namely the northern mukims, southern mukims and Juru (see Figure D3.1). The northern sub-area consists of mukims 2, 3, 4, 5 and 21; the southern sub-area includes mukims 6, 7 and 8 and part of Cherok Tok Kun, while the area called Juru is located in mukim 12.

D3.2.2 The DOA at one time estimated the northern area to have about 4,000 farmers; southern area, including Cherok Tok Kun, to have 3,020 farmers and Juru about 200 farmers. The LPP in 1978 registered 1,411 farmers in the northern area for the Government fertiliser subsidy and in 1980 the figure deopped to 800. For the southern area LPP registered about 1,500 farmers for the fertiliser subsidy while for Juru, 177 farmers were registered.

D3.2.3 Unfortunately we could not use the LPP registers because it did not contain a complete list of the padi farmers. The DOA did not keep a register of farmers. We had no alternative but to prepare a fresh listing of the farmers by going from house to house or to contact the ketua kampung to give us names of padi farmers under his administration. In most cases these ketua-ketua know their fellow residents personlally. Having obtained a list in this way we compared it with those supplied by the LPPlocal offices at Cherok Tok Kun and Padang Ibu. The following table gives the number of farmers listed and sampled by simple random sampling from each sub-area.

Sub-Area	Number of farmers		% Listed
	Listed	Sampled	
Northern	609	200	33
Southern	680	258	38
Juru	177	43	24
Total	1,466	501	34

D3.2.4 We are not completely satisfied with our sampling frame from which to draw our sample, but at the same time we feel that we have done everything possible within the resource limitations, especially time, to ensure representative areas. One way was to take a large enough sample in order to reduce sampling errors.

D3.2.5 A list of landowners was prepared by asking the local farmers and kampung headmen to give us names and addresses of landowenrs they were familiar with. A total of 121 such people were listed and we interviewed all of them using our Schedule B.

D3.2.5 We did not prepare a list of the working children of the respondents; we simply asked the respondent-farmer if he had any living-in working children and relatives and if so how many. On receiving an affirmative answer, our enumerators then administered Schedule C (questionnaire) to all these young adults. A total of 406 of such people were interviewed from the 501 farm households.

D3.2.7 Thus in summary, we interviewed three groups of people, namely, 501 households heads, 406 young adults living with the household heads and working off-farms; and 121 landowners. Three different sets of questionnnaires were used, one for each group. Each set of questionnaire was pre-corded for computer analysis which was done with the SPSS Package available at the University of Malaya Computer Centre. The completed questionnaires were edited as soon as they were submitted by the enumerators in the field, and upon verification by the sociology field assistant, were sent for key-punching at a private firm.

D3.3 Farmers

D3.3.1 Socio-Economic Characteristics

Age of Respondents

D3.3.1.1 The sample data showed that over two-thirds of the respondents were over 40 years old (see Table D3.3). This result is in marked contrast with that of a study of MADA farmers (Ayob, 1980, p.160) in which only over half of the sampled farmers were over 40. To give another comparison, while only 27% of MADA farmers were over 50, our Seberang Perai Tengah Socio-economic survey showed that over 45% were over 50 years in age. The results tend to show that, Seberang Perai Tengah farmers are generally of the older generation and therefore do not have as much energy as their counter-parts in MADA. Hence, age may well explain part of the tanah rang phenomenon.

D3.3.1.2 It is interesting to note that only 5% of the respondents here are below 30, whereas in the MADA study 19% were below thay age. The difference is understandable since the area of the present study is near two urban centres, which therefore provide more job opportunities for the younger generation than does an area such as the MADA scheme. In other words, the majority of those below 30 years must have found employment in the urban centres of Butterworth and Bukit Mertajam.

Size of Household

D3.3.1.3 Almost two-thirds of the sampled households (65%) reported having no more than 6 people in the household (see Table D3.4). The model class is between 5 and 6 people. Thus it appears that the people in the study area are also moving along with the urban trend of having small 'nuclear' families, unlike in the past when 'extended' families were the order of the day in the rural areas. This has an important implication on labour availability on the farm, since obviously, if there are fewer persons in the household chances are that there will be fewer adults available to attend to the smallholdings.

D3.3.1.4 Although nearly 75% of the respondents reported having from 3 to 6 children, hence seemingly indicating large families (see Table D3.5), many of these children would now be working adults and living outside the respondents' households. Our question did not specifically ask for the number of children living in the same house, but all children alive on the day of the interview.

Education of Respondents

D3.3.1.5 Only 9% of the respondents reported not having attended any school, although it cannot be inferred that they were illiterate. The remainder of the sample reported that they had at least attended primary school (see Table D3.7). Less than 3% of the respondents have a secondary education or better. This is in marked contrast with the education received by other members of the family, i.e.

children of respondents. In the children's case, nearly everyone had attended school, with the vast majority having reached at least Form III (64%, see Table D3.8). These results did not come as a surprise knowing the location of the study area.

D3.3.1.6 The implication for agricultural development is quite clear. With better education it is unlikely that the younger generation will return to inherit the life-style of their parents by working on small uneconomic holdings and never be assured of a steady monthly income. Education changes people's attitudes, widens their opportunities and sharpens their perception of life in general. Unless agriculture can provide equivalent income and fringe benefits, even those genuinely interested in the mundane and practical aspects of farming will look for other vocations before they consider going to farming.

<u>Occupation of respondents</u>

D3.3.1.7 Although the main interest of this survey was on 'full-time' farmers, our sample showed that only 54% of the respondents considered themselves full-time farmers (Table D3.10). The remainder was made up of small-time businessmen, wage earners, blue collar workers and fishermen. When asked about their part-time occupation gave 'farming' as their part-time occupation (see Table D3.11).

D3.3.1.7 These results are interesting for a number of reasons. The figure of 54% regarding themselves as full-time farmers is low, even though still a majority. It can be expected that this majority will continue to dwindle in the years to come as heads of households are replaced by the younger generation.

D3.3.1.8 Another interesting feature of the results is that, even though Table D3.10 and Table D3.11 jointly revealed at least 95% of the respondents as having something to do with farming, we know from Table D3.18 that only 28% cultivated padi land in the latest season. The majority have either abandoned the land and lived off their working children's contribution, for the elderly group (see Table D3.15), have gone into non-farming occupations such as fishing (for Juru) or the factory work, white collar jobs, etc.

D3.3.1.9 A third interesting aspect of the finding is that, even though many of the respondents were not actually farming, they appeared to retain such emotional ties with farming as to regard themselves as 'farmers'. However, it should be noted that farming could well include attending to non-padi crops such as coconut, vegetables, etc. or even working as hired workers for other padi farmers.

D3.3.1.10 The implication for future agricultural development is clear: manpower to manage individual uneconomic plots will continue to be in short supply as the older generation ages to be replaced by the younger set. Radical adjustments have to be made in padi cultivation, perhpas in the form of group farms, which will be largely mechanised and adapted with labour-saving technologies (e.g. direct seeding, chemical weed control, etc). This kind of institutional innovation is urgently needed if the Government's intention is to bring back idle padi land into production.

Income

D3.3.1.11 One of our major interests in the survey was to assess household income in the study area and determine the extent of poverty of these households vis-a-vis the national average. We must warn, however, about the accuracy of the figures given by the respondents as income is a rather 'private and confidential' matter.

D3.3.1.12 The household income includes income from the main occupation, part-time occupation and other sources, especially contributions from working children. The respondent was asked to give his best estimate of his household monthly income.

D3.3.1.13 Taking $400 per month as the nation's poverty line, as defined in the Fourth Malaysia Plan, our survey showed that 73% of the households could in fact be classified as being below the poverty line (see Table D3.12).

D3.3.1.14 Dividing income into $100 intervals, we find that the class with the highest frequency was the $100 - $200. The distribution of household income was highly skewed to the left, meaning that there is a heavy concentration of the households at the bottom of the income ladder. We found the mean household income to be around $150 per month. Even though income figures collected during surveys are invariably biased downwards, meaning that real income is always understated by respondents, we strongly feel that income reported in the study area should be viewed with great concern by the Government. They should act as warning signals that all was not well in the study area despite booming economic growth next-door. As 97% of the households in the sample area were Bumiputras early redress of the area would be a positive contribution to the achievement of the Government's New Economic Policy.

Padi Farm Size

D3.3.1.15 Our data showed that only 141 respondents cultivated padi land in the latest season. As data on acreage planted were given to the nearest acre, the intervals 0 - 1 acre had the highest frequency (45% of this sub-sample of 141 informants). The results in general show the preponderance of small uneconomic farm holdings, with 74% of the active farmers cultivating no more than 2 acres (see Table D3.18). Without non-padi sources of income it is inconceivable how the average family in this area can survive with only 2 acres of padi land - which suggests a strong dependence on off-farm jobs for a large proportion of these households.

D3.3.1.15 We also found from our statistical analysis that 56% of the land area owned by the respondents had been abandoned in the study areas. The percentage will be much higher if one includes land operated by tenants which have been abandoned.

Tenure Status of Respondents

D3.3.1.16 Since only 28% of the informants actually cultivated padi at the time of interview it would be pointless to ask the non-cultivators to state the tenure category of the land they operated. We nevertheless went ahead with the question after clarifying that we were also interested to learn about their former tenure status while they were active farmers.

D3.3.1.17 The results were not out of line with our expectations. A clear majority of 54% were tenant farmers; 34% were either owner-operators or operators-cum-landlords and 11% were of the mixed tenure category (see Table D3.24). The remainder was made up of absentee landlords, hired labour and 'non-response'.

D3.3.1.8 The mixed tenure category consists of farmers who operated their own land but augmented their holdings with some rented land. In the MADA area this is an important category, showing more entrepreneurial skills than the 'pure tenants' and 'pure owners'.

D3.3.1.19 A question now arises: who are the landlords or where do they come from? Our sample showed that about 27% of the tenants rented from non-relatives residing outside their own villages (see Table D3.25). If we include the 9% renting land from relatives living outside the village, we have more than one third of the tenants renting their land from absentee landlords. Even though we grant that some absentee landlords were also farmers who could not cultivate their far-away plots, a good majority of them must be non-farmers who have no interest in the development of their land for agriculture. With the abandonment of this land by tenants, the urge to sell of such land must be great indeed. Without immediate land rehabilitation, we foresee the forces of the market to work against the interest of the New Economic Policy as these landowners start to dispose of their land for immediate short-term monetary gains.

Rental Payment

D3.3.1.20 The majority of tentants paid their rent in kind, either on the basis of bagi dua or bagi tiga. In the former system, the tenant and landlord share the harvest equally; whereas in the second system, one-third of the crop goes to the landlord as rent. One advantage of this mode of payment from the tenant's point of view is that, should there be a crop failure, no rent is paid out. However, the disadvantage is that, since the bigger the harvest the bigger is the quantity going to the landlord, it may act as a disincentive to produce more. In such a system, rent becomes a variable cost. On the other hand, a fixed rental becomes a fixed cost. The tenant who has to pay a fixed rental to the landlord has the incentive to produce more by using more variable inputs such as fertilizer and weeding labour.

We found a very negligible number of tenants paying fixed rentals, however. Under a new farming system, we recommend the share-cropping system to be abolished and replaced by a fixed cash rental. If land is to be managed under the group farm concept, landlords have to be paid in advance of each cropping season; this procedure may act on inducement to landlords to agree to rent out their land to the new management.

D3.3.2 Problems Faced by Respondents

D3.3.2.1 One of our objectives of conducting the survey was to ascertain the nature of the problems faced by farmers that could have led to the tanah rang syndrome. We asked all 501 of them about the main problem in padi cultivation as perceived by them.

D3.3.2.2 We must warn the reader that the problems are not independent of each other, but they may have cause-and-effect relationship. For instance, pests may be a problem, but it may have been aggravated by poor water management and neighbouring farmers abandoning their lands first.

D3.3.2.3 Well over three-quarters of the informants agreed that pests were a leading problem in padi farming (see Table D3.28). Only 10% perceived labour shortage to be a problem, which is rather unexpected as our familiarity with the area tends to point towards labour as a major bottle-neck in padi cultivation in Seberang Perai. Our discussions with a group of retired farmers in a village coffee-shop (Kg. Pertama, Permatang Pauh, on 29th May 1981) tends to corroborate our view.

D3.3.2.4 When we asked those who have abandoned or stopped cultivating padi why they followed this course of action, 45% blamed it on the neighbours who had also abandoned their land, and 43% again blamed it on pests. Obviously the two problems are inter-dependent - abandoned land harbours numerous pests (notably rats) which can reduce yield of padi on isolated plots to almost nothing. One experience is enough to force the active farmer to follow suit and abandon his land also.

D3.3.2.5 This leads to our conclusion that abandonment of padi land is contagious and no one farmer can fight the pest problem single-handedly. Nor do we believe that informal voluntary group action can overcome the problem because the phenomenon has also to do with faulty infrastructure which requires upgrading.

D3.3.2.6 Only 2% of the informants said they abandoned their land because it was not profitable to continue (see Table D3.32). This should not be construed to mean that the 98% were not profit-motivated, but that perhaps they realised the low profitability might be the result of the low yield brought about by pest infestations. Other reasons given include incapacity, availability of other jobs, capital limitation, lack of labour, etc. Again, labour shortage did not immediately enter the minds of these people.

D3.3.2.7 We asked the informants the year and season of their last planting of padi. A large proportion (16%) stopped planting (retired or abandoned land) beginning in 1978 (see Table D3.48). In 1979 another 24% followed suit, increasing to 25% in 1980.

D3.3.2.8 Over half (52%) of the informants said that they will abandon their land if the Government has no plan to improve the irrigation system in the area - and this they surely have done! over one-quarter (27%) pledge that they would try to cultivate the land themselves (see Table D3.47). It is highly likely that a good majority of the latter group belongs to the 141 still cultivating.

D3.3.3 Future Land Utilization

D3.3.3.1 The informants were asked if they would be willing to double-crop with padi if water and other aids were provided. The majority (94%) gave affirmative answers although we know that only 54% of the sampled informants considered themselves full-time farmers (see Table D3.26). We have to be cautious about the result as it does not necessarily mean that the majority of the respondents would readily march back into the padi fields to cultivate the land. It merely means that they would support any Government moves to have the land rehabilitated for double-cropping (see Table D3.35). Those who own land in the area will benefit from rental; the hardpressed tenants would likely return to the land in full force if they can be assured of a reasonable income. Those who are employed as white collar workers or even blue collar workers on steady incomes are not likely to come back to till their father's small, uneconomic holdings with uncertainty of a steady income. Notwithstanding these cautionary remarks, the answers may be taken to indicate the people choice of padi double-cropping as the most appropriate way to utilise the land in the area. Only 4% (see Table D3.27) favoured single-cropping.

D3.3.3.2 We then asked the respondents whether they would plant other off-season crops if the land was rehabilitated to allow for a single crop of padi only. It is interesting to note that 71% were not in favour of such a cropping pattern and implicitly refused to grow other than padi. Only 29% indicated that they would be willing to grow off-season crops (see Table D3.29). The result does seem to indicate that respondents were reluctant to try new crops with which many of them had no experience, except on a backyard scale only, perhaps.

D3.3.3.3 Of those who said they would plant off-season non-padi crops, 68% favoured maize, 25% favoured vegetables (see Table D3.30). These vegetables in order of preference are: long beans, lady's finger (okra), chilli and brinjals (egg plant) (see Tables D3.31(a) and (b)). Note that these vegetables are relatively of low perishability.

D3.3.3.4 When asked for their opinions about the Government idle land rehabilitation scheme, almost all (98%) said it was a good idea (see Table D3.35) - as we have expected. To another question (somewhat hypothetical), 74% said they would remain in farming even if other occupations could give them higher incomes (see Table D3.36). Obviously one can question the sincerity of such an answer. The remaining 26% said they would definitely leave padi cultivation aside if there were better opportunities elsewhere. It is most likely that those giving the latter answer were already out of padi farming.

D3.3.3.5 To another hypothetical question, 58% of the informants were not in favour of coverting padi land in the area to other crops, 16% were in favour (3% strongly so), and 13% were indifferent (see Table D3.37). The remaining either did not know how to answer or did not give any answer. Vegetables and sugarcane were suggested as possible crops to be grown by a good number of those in favour of permanent conversions of the lands (see Table D3.38).

D3.3.3.6 We may conclude from the above results that any attempt to permanently convert the padi land in the area to other crops will be met with some resistance by the rural folks, judging from their emotional attachment to padi. In any case, such a conversion would be extremely costly to the Government.

D3.3.4 <u>Organisation</u>

D3.3.4.1 Another major interest in the survey was to study farmers' involvement in the co-operative movement, attitude towards the movement and their preference for a form of organisation of farming after rehabilitation.

D3.3.4.2 Only 48% of the respondents were members of co-operatives with 4% involved as committee members (see Table D3.39). The figures are almost similar to those found in the case of MADA farmers. Except for 18% of the members the majority thought that the movement was good and very beneficial, the 18% said the movement did not bring any change to them (see Table D3.40).

D3.3.4.3 When asked if they would participate in co-operative farms after land rehabilitation, only 16% either answered in the negative or did not know (see Table D3.41). The majority were willing to participate as shareholders (34%), as workers (16%) or as both (34%). Presumably those who would participate as shareholders only were landowners or they had permanent jobs elsewhere; we can also expect those who wanted to be workers only were tenants. These results auger well for the future of the group farm concept.

D3.3.4.4 Those who did not want to participate in co-operative farms either said they had other jobs, already had a good income, did not have land, etc (see Table D3.42).

D3.3.4.5 When asked for the most preferred farming system after land rehabilitation, 39% preferred individually operated farms, while 60% were in favour of some kind of group effort (see Table D3.44). Of the latter category, those in favour of co-op farming and in favour of simple group farming (ladang berkelompok) were about equal in strength. There is therefore a strong indication that the majority of the informants were willing to adopt a new system in farm organisation and therefore, with intensive campaign programmes, it would not be too difficult to change the minds of the 39% who preferred individual operation. The major advantages to be stressed of group action are economies of scale (lower cost to produce a unit of output), more effective pest control, better management of scarce labour, better co-ordination in planting and and better planning of input supplies, etc.

D3.3.4.6 Informants were asked to suggest steps which the Government could take to improve local agriculture. Over half (55%) suggested more input subsidies to farmers, 28% wanted the Government to require all farmers in the area to adhere to common planting dates, perhaps as an effective way to combat the rat problem; and only 10% suggested an upgrading of irrigation (see Table D3.45). The fact that 90% of the informants did not perceive irrigation upgrading as the immediate solution was probably because they took for granted that it will be done anyway, as it was explained by the enumerators on arrival at the farmer's house.

D3.3.4.7 Increased input subsidies were seen as a way to redress local agriculture because the farmers are too aware of the rising costs in padi cultivation in comparison with the price they receive for padi. Many used the increase in the price of sugar (a basic necessity) as a sort of index for the rise in the cost of living - one farmer in Permatang Pauh told us that when the price of padi was $12.00 a pikul, the price of sugar was only 25 cents a kati, now when the price of padi is $28, the price of sugar is $1.05!

D3.3.4.8 It is gratifying to note that the informants realise the importance of common planting dates (see Table D3.4). Although these were already gazetted and made known to farmers on the bill boards, many farmers could not or did not adhere to such dates.

There is a lot of room for improvement in this matter, both by the authorities and the farmers. Again, we believe the group farm idea will have a better chance of overcoming the problem than the existing form of organisation.

D3.3.4.9 Over 90% of the informants agreed that, on their part, they have to work a lot harder if they want to improve their lot. Such a pledge was of course to be expected in a survey of this kind (see Table D3.46)

D3.4 <u>Landlords</u>

D3.4.1 As future development of the area will definitely affect landlords of padi land, we also interviewed this group of people. Our sample included 121 of them.

D3.4.2 The majority of the landlords (70%) are 51 years old or more, another 15% were between 41 and 50 years in age (see Table D3.18).

D3.4.3 The results are to be expected since ownership of land may be acquired either through purchase or inheritance - both of which are associated with economic status and/or age. However, over 82% of the landlords owned no more than 3 acres of padi land (see Table D3.2B). Nearly 40% of the landlords owned more than 1 acre. In general, we may say that these people are far from being big-time landlords, as only 11% reported having more than 5 acres of padi land.

D3.4.4 The implication of this result is that it might not be difficult to get the landlords to rent out their land to a group farm management since the plots they own are small and 65% of them have rented out their land for at least 5 years (see Table D3.4B). Such stability in tenure augers well for a group farm as this new institution needs to rent the land from owners for relatively long periods.

D3.4.5 About 70% of the landlords have stopped farming for at least 2 years; 39% have stopped for as much as 8 years. However, it is not known to what extent the land was being cultivated by tenants. Our feeling is that most of it was already tanah rang. Table D3.6B shows the distribution of tanah rang acreage for the landlords; 44% of the landlords reported at least 1 acre of tanah rang.

D3.4.6 When asked why they did not cultivate the land (see Table D3.8B) 32% said they were already employed elsewhere, 28% because of old age, 20% because they were either widows or divorcees, mostly women; 40% of these landowners were women (see Table D3.7B).

D3.4.7 When asked whether they would cultivate the land after rehabilitation, only 14% said they would (see Table D3.9B). The majority were either non-committal or simply did not know how to answer. However, 58% said they would be willing to rent out their land to any one at all (see Table D3.10B); 25% prefer to rent out to relatives and 17% will rent to friends in the village.

D3.4.8 We then asked these landowners whether they would rent out their land to a co-operative society which will manage all padi land as a commercial venture. Nearly a third (31%) said 'no'. Of those who said 'yes' (84 in all), 30 were willing to rent out land for 1 - 3 years (see Table D3.11B), representing a quarter of those interviewed. It is interesting to note that as high as 41% of all landowners interviewed were willing to lease their land for 6 years or more.

D3.4.9 The results are again encouraging for the group farm concept; it should not be a difficult task to convince the minority of 31% why it is to their advantage to join the co-operative farming system.

D3.4.10 On the question of participating in the co-operative, 58% said they would participate (see Table D3.12B) either as shareholders (48%) or as shareholders-cum-workers (10%). As high as 40% did not want to participate, although this did not necessarily mean that they would not lease their land to the co-op. 'Participation' is defined as 'being a shareholder or a worker or both' but not a landlord to the co-op.

D3.4.11 Only 10% wanted to work for the co-op, which is understandable because of their present employment, their having other sources of income or because of old age, etc.

D3.4.12 Would the landowners object if their padi land was converted to cater for non-padi crops after rehabilitation? The majority (59%) objected to this possibility - 21% strongly do. Only 18% agreed to the suggestion while 17% did not care one way or the other. These results generally are in unison with feelings expressed by the farmers as we mentioned earlier. The inference to be made is that the vast majority of the people in the study area still prefer padi double-cropping (see Table D3.13B), with a major change in the form of organisation and institutional arrangements.

D3.4.13 One of the things that interested us before the survey was to see whether landowners have received offers from potential buyers or brokers to buy their land. To our surprise only 8% said they had been approached (see Table D3.15B). The vast majority (86%) had not been approached. When asked if they were willing to sell off their land, only 3% said 'yes' (see Tables D3.16B and D3.17B). But of course if the price is right, no one can be sure that the 97% will keep their word.

D3.5 Working Children

D3.5.1 A third group of people interviewed in this exercise consisted of 406 working children of the 501 heads of households. The purpose of interviewing this group was to determine their social characteristics, their views and attitudes regarding agriculture and the possibility of them coming back to work on the land under new management.

D3.5.2 The majority (55%) of these young people were between 18 and 25 years old (see Table D3.1C) and 71% were male (see Table D3.2C).

D3.5.3 A majority of them were employed in factories (56%) (see Table D3.3C) and another 12% were working as Government labourers. Thus we have 68% of these youngsters engaged as 'blue collar'workers. Only 15% would qualify as white collar workers - including clerks, police and army personnel, teacher and Government and private executives.

D3.5.4 Nearly half (47%) were earning between $100 to $200 per month, which is what a factory gets (see Table D3.4C). Nearly a third (30%) earned between $200 and $300 a month. It is not likely that those currently earning $200 or more can be attracted to return to the land to work as farm workers. Many may not have the experience or liking for agriculture.

D3.5.5 When asked if they had helped their parents (or household head) in padi cultivation in the past 12 months, more than half (52%) replied in the negative; 24% said they would help whenever they were asked to (see Table D3.5C). It is clear that the majority of these young people did not display a great liking for farming as only 12% would readily volunteer during free time to help their parents in padi cultivation. The majority associated agriculture with either low income or sheer drudgery (76%) (see Table D3.6C).

D3.5.6 These attitudes are not very encouraging and need to be changed if agriculture is to be commercialised and modernised. While these attitudes are understandable, coming from the young, they can be changed by demonstrating that a new form of agricultural management can provide them with a steady income throughout the year.

D3.5.7 At the moment only 7% would like to participate in farming after rehabilitation as full-time workers, although 50% would work on part-time basis (see Table D3.7). However, 43% would not have anything to do with agriculture. The question presumes individually operated farms. However, when we specifically mentioned large scale co-operative system, 58% said they would participate, either as shareholders, workers shareholder-cum-worker or manager only (see Table D3.9C). Half of this group would be willing to go down to the field as workers (or 27% of entire sample of 406 persons).

D3.5.8 This finding speaks well for the co-operative system, even though only slightly over a quarter of the sample said they would be willing to provide the labour. This small proportion, however, should not be a set-back as the new system will require much less labour but more machines and other labour-saving technologies.

D3.5.9 It is interesting to note that, if the new agricultural management system (co-op) could guarantee an income equivalent to or higher than the factory wage rate, over a third (37%) of the sample said they would be willing to work in the co-op (see Table D3.10C). The majority of 63%, perhaps comprising the higher income earners (white collar workers), said they would not go back into farming even if there was such a guarantee.

D3.5.10 As expected, as high as 91% were positively in favour of Government rehabilitation of padi land; 3% were indifferent, another 3% were pessimistic about the programme and only 1% favoured housing as an alternative (see Table D3.11C). Asked to make a choice between double-cropping of padi and single-cropping plus an off-season non-padi crop, the choice of double-cropping was almost unanimous (95%) (see also Table D3.12C).

D3.5.11 When asked to state their preference for the type of organisation to manage padi land after land rehabilitation, only 27% preferred individually operated farms (see Table D3.14C). Of the remaining group who favoured some kind of group action, 63% were in favour of a co-operative system; group farming (ladang berkelompok) was favoured by the rest. We believe that these results are in harmony with, and reflections of, the feeling of the farmers in the study area in general, and only serve to corroborate the views expressed by the farmers.

Socio-Economic Survey of Seberang Perai Tengah

1 = Northern Part
2 = Southern Part
3 = Juru area

Table D3.1
Ethnic by Region

Ethnic/Region	1	2	3	Total No.	Total %
Malay	187	256	43	486	97.0
Chinese	13	0	0	13	2.6
Indian	0	1	0	1	0.2
Other	0	1	0	1	0.2
Total	200	258	43	501	100

Table D3.2
Sex by region

Sex/region	1	2	3	Total No	Total %
Male	192	225	42	459	91.6
Female	8	33	1	42	8.4
Total	200	258	43	501	100

Table D3.3
Age of Respondent

Age/Region	1	2	3	Total No	Total %
Less than 30	10	13	3	26	5.2
31 - 40	24	50	5	79	15.8
41 - 50	78	77	14	169	33.7
51 - 60	71	81	20	172	34.3
61 and above	17	37	1	55	11.0
Total	200	258	43	501	100

Table D3.4
Size of Household

Size/Region	1	2	3	Total No	Total %
Less than 2	17	22	5	44	8.9
3 - 4	32	45	10	87	17.4
5 - 6	77	101	15	193	38.5
7 - 8	49	65	8	122	24.4
9 - 10	16	20	4	40	7.9
11 and above	9	5	1	15	2.9
Total	200	258	43	501	100

Table D3.5

Size of Children

Size/Region	1	2	3	Total No	Total %
Less than 2	20	39	6	65	12.97
3 - 4	94	92	22	208	41.5
5 - 6	66	85	12	163	32.5
7 - 8	12	33	3	48	9.6
9 and above	8	10	0	18	3.6
Total	200	258	43	501	100

Table D3.6

Children Working and Living outside the Mukim.

Number/Region	1	2	3	Total No	Total %
Less than 2	132	144	35	311	62.1
3 - 4	47	351	5	103	20.5
5 - 6	11	50	3	64	12.8
7 and above	10	13	0	23	4.6
Total	200	258	43	501	100

Table D3.7

Education of the Respondents

Level of Education/region	1	2	3	Total No	Total %
a) No school	16	27	2	45	9.0
b) Primary school	179	222	40	441	88.0
c) Secondary school	5	7	0	12	2.4
d) Higher instituti- on	0	0	1	1	0.2
e) Other	0	2	0	2	0.4
Total	200	258	43	501	100

Table D3.8

Highest education received by any member of the family

Level of education/region	1	2	3	Total No	Total %
a) Primary	45	71	16	132	26.3
b) Form III	43	54	8	105	21.0
c) Form V	74	73	2	149	29.7
d) Form VI	6	25	12	43	8.6
e) Colleges	10	5	1	16	3.2
f) University	8	0	1	9	1.8
g) Other	11	7	0	18	3.6
h) No answer	3	23	3	29	5.8
Total	200	258	43	501	100

Table D3.9

Age distribution of member of household by region

Age/region	1	2	3	Total No	Total %
0 - 3.9 yr	48	73	12	133	7.16
4 - 5.9 yr	34	63	4	101	5.44
6 -12.9 yr	85	134	19	238	12.8
13 -15.9 yr	91	105	13	209	11.3
16 -19.9 yr	-	-	-	-	-
20 -25.9 yr	107	131	20	258	13.9
26 -30.9 yr	52	87	16	155	8.3
31 -40.9 yr	94	137	21	253	13.6
41 -50.9 yr	99	135	12	246	13.2
51 and above	102	138	25	265	14.3
Total	712	1003	142	1857	100

Table D3.10

Main Occupation

Occupation/region	1	2	3	Total No	Total %
a) Farmer	129	122	17	268	53.5
b) Fisherman	1	1	14	16	3.2
c) Business	10	11	3	24	4.8
d) Wage earner-white collar (private/ government)	5	57	3	65	13.0
e) Blue collar/ labourer	12	15	0	27	5.3
f) Other	40	48	6	94	18.8
g) Not working	3	4	0	7	1.4
Total	200	258	43	501	100

Table D3.11

Part-time work

Occupation/region	1	2	3	Total No	Total %
a) Farmer	65	117	26	208	41.5
b) Fisherman	0	3	0	3	0.6
c) Business	5	4	0	9	1.8
d) Wage earner white collar (private/ government)	0	2	0	2	0.4
e) Blue collar/labo- labourer	3	5	0	8	1.6
f) Other	61	42	2	105	21.0
g) No part-time work	66	85	15	166	33.1
Total	200	258	43	501	100

Table D3.12

Mounthly Household Income

$/region	1	2	3	Total No	Total %	accumative
Less than200	69	68	2	139	27.7	
201 -400	35	16	1	52	10.4	38.1
401 -600	24	25	0	49	9.8	47.9
601 -800	18	32	3	52	10.4	58.3
801 -1000	12	13	10	35	6.9	65.2
1001 -1200	10	21	22	53	10.6	75.8
1201 -1400	12	30	2	44	8.8	84.6
1401 -1600	8	24	1	33	6.6	91.2
1601 & above	12	30	2	44	8.8	100
Total	200	258	43	501	100	

Table D3.13

Monthly Income from Major Occupation

$/region	1	2	3	Total No	Total %	accumative
Unemployed	3	4	0	7	1.4	
Less than 100	67	14	2	83	16.6	18
101 - 200	57	25	4	86	17.1	35.1
201 - 300	19	80	14	113	22.5	57.6
301 - 400	20	71	5	96	19.2	76.8
401 - 500	21	42	9	72	14.4	91.2
501 & above	13	22	9	44	8.8	100
Total	200	258	43	501	100	100

Table D3.14

Monthly Part-time Income

$/region	1	2	3	Total No	Total %
Less than 100	57	85	10	152	30.3
101 - 200	54	107	81	169	33.7
201 - 300	17	31	8	56	11.2
301 & above	6	28	2	46	9.2
No part-time work	66	7	15	88	17.6
Total	200	258	43	501	100

Table D3.15

Monthly other income of Respondents (from working children)

$/region	1	2	3	Total No	Total %
Less than 100	114	38	22	174	34.7
101 - 200	71	201	21	293	58.5
200 & above	6	10	0	16	3.2
Not involved	9	9	0	18	3.6
Total	200	258	43	501	100

Table D3.16

Size of Padi land owned

acreage/region	1	2	3	Total No	Total %
Less than 1	68	75	13	156	31.1
1.1 - 3	13	20	5	38	7.6
3.1 - 5	5	13	2	20	4.0
5.1 - 7	2	2	2	6	1.2
7.1 & above	3	3	0	6	1.2
Not involved/ tenant farmer	109	145	21	275	54.9
Total	200	258	43	501	100

Table D3.17

Size of other type of land owned

Acreage/region	1	2	3	Total No	Total %
Less than 1	98	81	10	189	37.7
1.1 - 2	11	12	5	28	5.6
2.1 - 3	0	14	2	16	3.2
3.1 & above	0	5	2	7	1.4
Not owned	91	146	24	261	52.1
Total	200	258	43	501	100

Table D3.18

Size of padi land cultivated

acreage/region	1	2	3	Total No.	Total %
Less than 1	19	31	14	64	12.8
1.1 - 2	22	14	4	40	8.0
2.1 - 3	10	5	4	19	3.7
3.1 - 4	4	3	2	9	1.8
4.1 - 5	1	4	0	5	1.0
5.1 & above	3	1	0	4	0.8
Not anymore	141	200	19	360	71.9
Total	200	258	43	501	100

Table D3.19

Size of Padi land Renting

Acreage/region	1	2	3	Total No	%
Less than 1	29	31	11	71	50.3
1.1 - 2	8	18	10	36	25.5
2.1 - 3	11	7	2	20	14.3
3.1 - 4	8	1	1	10	7.1
4.1 above	3	1	0	4	2.8
Total	59	58	24	141	100

Table D3.20

Size of Padi land Rented out

Acreage /region	1	2	3	Total No	%
Less than 1	3	8	0	11	2.1
1.1 - 3	2	2	0	4	0.7
3.1 - 5	1	1	0	2	0.3
5.1 & above	0	0	0	0	0
Not involved	194	247	43	484	96.9
Total	200	258	43	501	100

Table D3.21

Length of Time being Tenant for Respondent, farmers and exfarmers

Yrs/region	1	2	3	Total No	%
Less than 1	29	24	4	57	11.4
5.1 - 10	69	84	4	157	31.3
10.1 - 15	14	38	10	62	12.4
15.1 & above	25	21	3	49	9.8
No answer	1	3	1	5	1.0
Not involved	62	88	21	171	34.1
Total	200	258	43	501	100

Table D3.22

Size of abandoned padi land

Acreage/region	1	2	3	Total No	%
Less than 1	96	124	10	230	45.9
1.1 - 3	32	39	5	76	15.2
3.1 - 5	6	19	1	26	5.2
5.1 - 7	4	15	3	22	4.4
7.1 & above	3	3	0	6	1.2
Not involved	59	58	24	141	28.1
Total	200	258	43	501	100

Table D3.23

Length of time land been abandoned

Yrs/region	1	2	3	Total No	Total %
Less than 1	54	59	18	131	26.1
2.1 - 4	52	70	0	121	23.3
4.1 - 6	18	62	1	81	16.1
6.1 - 8	6	8	0	14	2.8
No answer	11	1	0	12	2.3
Not involved	59	58	24	141	28.1
Total	200	258	43	501	100

Table D3.24

Tenure Status

Tenure/region	1	2	3	Total No.	Total %
a) Landowner & rent out	2	1	0	3	0.7
b) Owner operator & rent out	4	10	0	14	2.8
c) Owner operator	56	78	21	155	30.8
d) Owner operator + tenant	29	24	1	54	10.8
e) Tenant	108	141	20	269	53.7
f) Hired labour	0	1	0	1	0.2
g) No answer	1	3	1	5	1.0
Total	200	258	43	501	100

Table D3.25

From whom do you rent land

	1	2	3	Total No.	Total %
a) Relative in the village	28	29	8	65	13.0
b) Relative out-side village	19	21	3	43	8.6
c) Other people in the village	45	31	4	80	16.0
d) Other people outside village	45	84	7	136	27.1
e) Not tenant	63	93	21	177	35.3
Total	200	258	43	501	100

Table D3.26

Willingness to double crop

Willingness/region	1	2	3	Total No.	Total %
Yes	185	244	42	471	94.0
No	15	14	1	30	6.0
Total	200	258	43	501	100

Table D3.27

Cropping intensity prefered most

Intensity/region	1	2	3	Total No.	Total %
a) Don't want to cultivate anymore	5	5	0	10	2.0
b) Single cropping	7	6	7	20	4.0
c) Double cropping	188	247	36	471	94.0
Other	200	258	43	501	100

Table D3.28
Main Problem in Padi cultivation

Problem/region	1	2	3	Total No.	Total %
a) Lack of labour	43	5	3	51	10.2
b) Pests	148	229	7	384	76.6
c) Land is not fertile	0	0	1	1	0.2
d) Water problem	3	15	27	45	9.0
e) Credit	0	1	0	1	0.2
f) Tractor	1	0	2	3	0.6
g) Marketing	1	0	2	3	0.6
h) Salt water	-	-	-	-	-
i) Drainage	1	1	0	2	0.4
j) Small size landholding	-	-	-	-	-
k) Other	1	1	1	3	0.6
l) Don't know	3	6	2	11	2.2
Total	200	258	43	501	100

Table D3.29
Willingness to grow off-season crops if land here is rehabilitated, to enable single crop padi

Willingness/region	1	2	3	Total No.	Total %
Yes	60	66	20	146	29.1
No	140	192	23	355	70.9
Total	200	258	43	501	100

Table D3.30

Types of off-season crop preferred

Types/region	1	2	3	Total No.	Total %
a) Maize	37	57	14	108	21.6
b) Vegetables	12	5	2	19	3.8
c) Ground nut	-	-	-	-	-
d) Tabacco	2	0	0	2	0.4
e) Chillies	2	0	2	4	0.8
f) Other	7	4	2	13	2.6
g) No crop	140	192	23	355	70.9
Total	200	258	43	501	100

Table D3.31

Types of vegatables preferred most

a) First choice

Types/region	1	2	3	Total No	Total %
a) Cabbage	2	0	0	2	0.4
b) Long bean	8	3	2	13	2.6
c) Lady's fingers	3	10	0	13	2.6
d) Brinjals	1	1	0	2	0.4
e) Chillies	3	0	0	3	0.6
f) Leafy vegetables	1	0	0	1	0.2
g) Others	0	1	1	2	0.4
h) No crop and no answer	182	243	40	465	92.8
Total	200	258	43	501	100

Table D3.31

Second and Third Choice

b)

Vegetables/region	1		2		3		Total No.		%	
	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(3)
a) Long bean	1,	2	8,	0	0,	0	9,	2	1.8	0.4
b) Lady's fingers	5,	0	1,	1	1,	1	7,	2	1.4	0.4
c) Brinjals	3,	4	3,	3	0,	1	6,	8	1.2	1.6
d) Petola	1,	1	0,	0	0,	0	1,	1	0.0	0.2
e) French bean	1,	2	0,	0	0,	0	1,	2	0.2	0.4
f) Chillies	7,	6	1,	1	2,	0	10,	7	2.0	1.4
g) Leafy vegetables	0,	0	1,	8	0,	1	1,	9	0.2,	1.8
h) No crop and no answer	182,	185	244,	245	43,	40	466,	470	93.0	93.8
Total	200		258		43		501		100	

Table D3.32

Why did you abandon land?

Reason/region	1	2	3	Total No.	%
a) Other people also does not work	40	116	1	157	31.3
b) Not able to work/old/sick	3	1	0	4	0.8
c) Having other job	2	0	0	2	0.4
d) Pests	85	55	0	140	27.9
e) Not profitable	7	3	0	10	2.0
f) Capital problem	4	0	1	5	1.0
g) Lack of labour	5	0	0	5	1.0
h) Other	1	0	0	1	0.2
i) No answer/not involved	53	83	41	177	35.3
Total	200	258	43	501	100

Table D3.33

Number of members in the family who could work full-time in:

a) Land preparation - above 17 yrs old. Male (Female)

Number member of the family	1	2	3	Total No.	Total %
1	93(51)	115(107)	36(28)	244(186)	48.7(37.1)
2	1(2)	8(4)	4(1)	13(7)	2.6(1.4)
3	0(0)	2(0)	0(1)	2(1)	0.4(0.2)
None	106(147)	133(147)	3(13)	242(307)	48.3(61.3)
Total	200	258	43	501	100

b) Land preparation - below 17 years. Male (Female)

Number member of the family	1	2	3	Total No.	Total %
1	1	6	1	8	(1.6)
2	1	0	0	1	(0.2)
3	0	1	0	1	(0.2)
None	198	251	42	491	(98.0)
Total	200	258	43	501	100

c) Planting: male (female) & children.

Number member of the family	1	2	3	No.	Total %
	M F C	M F C	M F C	M F C	M F C
1	68(59)3	47(52)5	36(29)1	151(140)9	30.1(27.9)(1.8)
2	4(4)-	8(5)-	4(1)-	16(10) -	3.2(2.0) -
3	0(0)-	1(0)-	0(1)-	1(1) -	0.2(0.2) -
None	128(137)197	202(201)253	3(12)42	333(350)492	66.5(69.9)98.2
Total	200	258	43	501	100

d) Harvesting - male (female) children

Number member of the family	1	2	3	No.	Total %
	M F C	M F C	M F C	M F C	M F C
1	67(55) 1	49(51) 0	37(28) 1	153(134) 2	10.5(26.7)(0.4)
2	5(5) -	8(4) -	4(1) -	17(10) -	3.4(2.0) -
3	0(1) -	2(0) -	0(1) -	2(2) -	0.4(0.4) -
None	128(139)199	199(203)258	2(13) 42	329(355)499	65.7(70.9)99.6
Total	200	258	43	501	100

Table D3.34

If you were cultivating your land last season do you intend to increase your padi land

Intensive/region	1	2	3	Total No.	Total %
Yes	46	20	11	77	15.4
No/not involved	154	238	32	424	84.6
Total	200	258	43	501	100

Table D3.35

Opinion about government land rehabilitation scheme

Opinion/region	1	2	3	Total No	Total %	
a) Very good	126	186	43	355	70.9	98
b) Good	70	66	0	136	27.1	
c) Not agree	1	0	0	1	0.2	
d) Don't know	1	0	0	1	0.2	
e) No answer	2	6	0	8	1.6	
Total	200	258	43	501	100	

Table D3.36

Willingness to be farmer even though better off in other sector when the improvement was made by the government

Willingness/region	1	2	3	Total No	Total %
Yes	151	185	32	368	73.5
No	48	72	11	131	26.1
No answer	1	1	0	2	0.4
Total	200	258	43	501	100

Table D3.37

Reaction to conversion of padi land in Seberang Perai into a different crop; what would be your reaction to that?

Reaction/region	1	2	3	Total No	Total %
a) Strongly agree	5	10	1	16	3.2
b) Agree	23	32	8	63	12.6
c) Don't care	11	48	3	62	12.4
d) Likely not agree	91	96	5	192	38.3
e) Not agree at all	38	44	18	100	20.0
f) Don't know	14	14	8	36	7.2
g) No answer	18	14	0	32	6.4
Total	200	258	43	501	100

Table D3.38 If you agree to the above what type of crops would you prefer most

Types/region	1	2	3	Total No.	%
a) Coconut	3	2	0	5	1.0
b) Banana	-	-	-	-	-
c) Vegetables	3	6	6	15	3.0
d) Sugarcane	8	6	1	15	3.0
e) Poultry	4	1	1	6	1.2
f) Orchard	-	-	-	-	-
g) Beef	4	0	0	4	0.8
h) Fish pond	3	1	0	4	0.8
i) Other	4	11	1	16	3.2
j) Not agreed/no answer	171	231	34	436	87.0
Total	200	258	43	501	100

Table D3.39 Participation on local co-operative movement

	1	2	3	Total No	%
Yes, ordinary member	94	93	34	221	44.0
Yes, committee member	10	8	1	19	3.9
Not involved	96	157	8	261	52.1
Total	200	258	43	501	100

Table D3.40

Opinion of the Co-operative

Opinion/region	1	2	3	Total No	Total %
a) Very good & beneficial	73	44	2	119	23.7
b) Good	21	49	8	78	15.6
c) Bring no change	10	8	24	42	8.4
d) Not beneficial	-	-	-	-	-
f) No answer/not a member	96	157	9	262	52.3
Total	200	258	43	501	100

Table D3.41

Willingness to participate in cooperative system

Willingness/region	1	2	3	Total No	Total %
a) As shareholder only	58	87	24	169	33.7
b) As worker only	28	53	1	82	16.4
c) As shareholder & worker	86	68	18	172	34.3
d) Don't want to participate	27	41	0	68	13.6
e) No answer/don't know	1	9	0	10	2.0
Total	200	258	43	501	100

Table D3.42

If not willing to participate as above give reason

Reason/region	1	2	3	Total No.	Total %
a) Waiting to sell land	1	0	0	1	0.2
b) Already having good income	1	4	0	5	1.0
c) Having other job	4	14	0	18	3.6
d) Don't have land	10	3	0	13	2.6
e) Padi as tradition	7	2	0	9	1.8
f) Other	2	26	0	28	5.6
g) No answer/don't know/don't want to participate	175	209	43	427	85.2
Total	200	258	43	501	100

Table D3.43

Farming system - alternative prefered

Alternative/region	1	2	3	Total No	Total %
a) Padi double cropping	183	241	37	461	92.0
b) Single cropping with off-season crops	11	0	4	15	3.0
c) Convert to other crops	0	1	0	1	0.2
d) No answer/don't know	6	16	2	24	4.8
Total	200	258	43	501	100

Table D3.44

Farming system - alternative prefered

Alternative/region	1	2	3	Total No.	%
a) Individual farming	80	104	11	195	39.0
b) Group farming	85	34	30	149	29.7
c) Large Co-operative system	34	115	1	150	29.9
d) No answer/don't know	1	5	1	7	1.4
Total	200	258	43	501	100

Table D3.45

Your opinion what should the government do to improve agriculture here*

Opinion/region	1	2	3	Total No.	%
1. Ask farmers to plant at the sametime	15	123	3	141	28.1
2. Improve in of material subsidising	156	108	10	274	54.7
3. Upgrading Irrigation	18	2	30	50	10.0
4. Increase the income	3	0	0	3	0.6
5. Don't know	1	2	0	3	0.6
No answer	7	23	0	30	6.0
Total	200	258	43	501	100

* open ended question.

Table D3.46

What should you do in response to above suggestion•

Opinion/region	1	2	3	Total No.	Total %
a) Try very had/work hard to cultivate it	185	229	43	457	91.2
b) Ask govt. to sponser it	1	2	0	3	0.6
c) Can't work anymore	3	0	0	3	0.6
d) Don't want to cultivate it anymore	1	0	0	1	0.2
e) No answer/don't know	10	27	0	37	7.4
Total	200	258	43	501	100

Table D3.47

If the Government would not improved your padi land what should you do to your land•

Opinion /region	1	2	3	Total No	Total %
1. Wait and see to the majority	21	3	0	24	4.8
2. Abandoned it	82	173	4	259	51.7
3. Convert to coconut	9	12	4	25	5.0
4. Try hard to cultivate myself	63	39	34	136	27.1
5. Converted to housing lot	3	0	0	3	0.6
6. Sell it	0	0	1	1	0.2
7. No answer/ don't know	22	31	0	53	10.6
Total	200	258	43	501	100

• this is open ended question.

Table D3.48

Season of your last planting

Yr/region	1	2	3	Total No.	Total %
1975	2	1	0	3	0.6
1976	2	2	0	4	0.8
1977	2	5	0	7	1.4
1978	18	62	1	81	16.2
1979	52	70	0	122	24.4
1980	54	59	18	131	26.1
1981	59	58	24	141	28.1
No answer	11	1	0	12	2.4
Total	200	258	43	501	100

Landowner/Landlord.

Region: 1 - Northern part 69 (57%)
2 - Southern 39 (32.2)
3 - Juru (Mukim 12) 13(10.7%)

Table D3.1B
Age

Age/region	1	2	3	Total No.	Total %
Less 30	4	3	0	7	5.8
31 - 40	8	3	0	11	9.1
41 - 50	8	5	5	18	14.9
51 - above	49	28	8	85	70.2
Total	69	39	13	121	100

Average 54 yrs
Maximum 86 yrs.

Table D3.2B
Landholding: Size of Padi land

Size/region	1	2	3	Total No.	Total %
a) Less 1	19	15	5	39	32.2
b) 1.1 - 2	29	11	7	47	38.8
c) 2.1 - 3	8	4	1	13	10.7
d) 3.1 - 4	5	1	0	6	5.0
e) 4.1 - 5	1	2	0	3	2.5
f) above 5.1	7	6	0	13	10.7
Total	69	39	13	121	100

Average 3.1 acre
Max 8

Table D3.6B

Size of abandoned padi land

Size/region	1	2	3	Total No.	Total %
Less 1	38	19	11	68	56.2
1.1 - 2	11	8	2	21	17.4
2.1 - 3	8	4	0	12	9.9
3.1 - 4	4	0	0	4	3.3
4.1 - 5	1	2	0	3	2.5
above 5.1	7	6	0	13	10.7
Total	69	39	13	121	100

Average 2.5 acres
Max 7.5 acres

Table D3.3B

Size of padiland rented out

Size/region	1	2	3	Total No.		Total %
Less 1	32	19	6	57	-	47.1
1.1 - 2	18	9	6	33	-	27.3
2.1 - 3	7	3	1	11	-	9.1
3.1 - 4	4	1	0	5	-	4.1
4.1 - above	8	7	0	15	-	12.4
Total	69	39	13	121		100

Averege 2.6 acres
Max 7.5

Harga tanah padi yang ditawarkan = averege $7107/- /ekar
Max 80,000/ekar.

Table D3.4B

Rental Period

Yrs/region	1	2	3	Total No.	Total %
Less 5	23	11	11	45	37.2
5.1 - 10	35	16	2	53	43.8
10.1 - 15	1	3	0	4	3.3
15.1 - and above	10	9	0	19	15.7
Total	69	39	13	121	100

Average 9.4 yr
Max 40yr.

Table D3.5B

Period the land was abandoned

Yrs/region	1	2	3	Total No.	Total %
Less 2	16	13	6	35	28.9
2.1 - 4	4	8	1	13	10.8
4.1 - 6	14	3	4	21	17.4
6.1 - 8	2	3	0	5	4.1
8.1 and above	33	12	2	47	38.8
Total	69	39	13	121	100

Average 9 yr
Max. 70yr.

Table D3.7B

Sex

Sex/region	1	2	3	Total No.	Total %
Male	40	21	12	73	60.3
Female	29	18	1	48	39.7
Total	69	39	13	121	100

Table D3.8B

Reasons for not cultivating the land

Reasons/region	1	2	3	Total No.	Total %
Divorcee/widow	16	7	1	24	19.8
Old age	16	12	6	34	28.2
Have no time	7	1	0	8	6.6
Having other job	19	15	5	39	32.2
Others	11	4	1	16	13.2
Total	69	39	13	121	100

Table D3.9B

Willingness to improve/cultivate your land if the upgrading irrigation system in this area was implemented by Govt.

Willingness/region	1	2	3	Total NO.	%
Strongly yes	5	2	2	9	7.4
Yes	4	2	2	8	6.6
Not sure	26	3	3	32	26.4
Dont know	24	22	4	50	41.3
Not at all	10	8	2	20	16.5
No answer	0	2	0	2	1.7
Total	69	39	13	121	100

Table D3.10B

Preference to rent out the land

Prefer/region	1	2	3	Total No.	%
Relative	16	7	7	30	24.8
Friends in the village	13	8	0	21	17.4
Anyone at all	40	24	6	70	57.8
Total	69	39	13	121	100

Table D3.11B

Willingness to rent out your padi land to large co-operative system

Willingness/region	1	2	3	Total No.	Total %
No	26	10	1	37	30.6
Yes, for 1 - 3 yrs	7	16	7	30	24.8
Yes, for 3.1- 6 yrs	3	1	0	4	3.3
Yes, for 6.1-10 yrs	13	2	1	16	13.2
Yes, for more than 10 yrs.	20	10	4	34	28.1
Total	69	39	13	121	100

Table D3. 12B

Willingness to participate in Large Co-operative system

Willingness/Region	1	2	3	Total No	Total %
As shareholder only	36	14	8	58	47.9
As shareholder & worker	10	0	2	12	9.9
Don't want to participate	23	22	3	48	39.7
Don't know	0	3	0	3	2.5
Total	69	39	13	121	100

Table D3.13B

Willingness to change padi land to other crops

Willingness/region	1	2	3	Total No	Total %
Strongly agree	3	4	0	7	5.8
Agree	8	6	1	15	12.4
Do not care	10	9	2	21	17.
Not likely to agree	34	9	3	46	38.0
Not agree at all	11	7	7	25	20.7
Don't know	3	4	0	7	5.8
Total	69	39	13	121	100

Table D3.14B

Willingness to improve land for double cropping

Willingness/region	1	2	3	Total No	Total %
Strongly agree	42	28	3	73	60.3
Agree	25	10	7	42	34.7
Don't care	0	0	0	0	0
Not likely agree	0	0	0	0	0
Not agree at all	1	0	2	3	2.5
Don't know	1	1	1	3	2.5
Total	69	39	13	121	100

Table D3.15B

Offer to buy your land in the last one year

	1	2	3	Total No.	Total %
Yes, genuine buyer	0	3	0	3	2.5
Yes, broker	1	5	0	6	5.0
No	66	27	11	104	85.9
No answer	2	4	2	8	6.6
Total	69	39	13	121	100

Table D3.16B

Whether agreeing to sell your land

	1	2	3	Total No.	Total %
No	67	38	13	118	97.5
Yes	2	1	0	3	2.5
Total	69	39	13	121	100

Table D3.17B

Proportion of land to be sold

	1	2	3	Total No	Total %
No	67	38	13	118	97.5
Partly	1	1	0	2	1.7
Yes, all	1	0	0	1	0.8
Total	69	39	13	121	100

The Working Dependents of the Respondent

Region: 1 - Northern part 158 (38.9)
2 - Southern part 219 (53.9%)
3 - Juru (mukim 12) 29 (7.1%)

Table D3.1C
Age

Age/Regions	1	2	3	Total No.	Total %
Less 18	22(38.6)	30(52.2)	5 (8.8)	57	14.0
18 - 25	103(45.8)	104(46.2)	18 (8.0)	225	55.4
25 - 32	25(27.8)	60(66.7)	5 (5.6)	90	22.2
32 above	8(23.5)	25(73.5)	1 (2.9)	34	8.4
Total	158	219	29	406	100

Average 23 yrs.
Max 53 yrs.

Table D3.2C
Sex

Sex by Region	1	2	3	Total No.	Total %
male	119(75.3)	149(68.0)	22(75.9)	290	71.4
famale	39(24.7)	70(32.0)	7(24.1)	116	28.6
Total	158	219	29	406	100

Table D3.3C

Occupation

Occupation/region	1	2	3	Total No	Total %
Factory labour	81	130	17	228	56.2
Govt. labour	18	22	7	47	11.6
Clerical (Govt/ private)	10	18	3	31	7.6
Police/armed/forces	5	9	0	14	3.4
Teacher	4	5	0	9	2.2
Officer (private/ Govt.	1	4	1	6	1.5
Others	39	31	1	71	17.5
Total	158	219	29	406	100

Table D3.4C

Income

Income group/region	1	2	3	Total No.	Total %
Less 100	12	14	1	27	6.6
10 - 200	78	97	15	190	46.8
201 - 300	43	67	10	120	29.6
301 - 400	17	22	2	41	10.1
401 and above	8	19	1	28	6.9
Total	158	219	29	406	100

Table D3.5C

Any help given to parents or household head in the past 12 months in Agriculture/Padi Farming

	1	2	3	Total No.	%
No	76	132	5	213	52.5
When asked for	37	50	9	96	23.7
When necessary	25	18	1	44	10.8
Yes, any free time	19	15	14	48	11.8
Others.	1	4	0	5	1.2
Total	158	219	29	406	100

Table D3.6C

Opinion towards padi/agriculture

Opinion/region	1	2	3	Total No	%
a) Low income	65	127	7	199	49.0
b) Hard labour	55	41	13	109	26.9
c) No experience	29	42	6	77	19.0
d) Others	9	9	3	29	7.1
Total	158	219	29	408	100

Table D3.3B

Size of padiland rented out

Size/region	1	2	3	Total No.	Total %
Less 1	32	19	6	57 -	47.1
1.1 - 2	18	9	6	33 -	27.3
2.1 - 3	7	3	1	11 -	9.1
3.1 - 4	4	1	0	5 -	4.1
4.1 - above	8	7	0	15 -	12.4
Total	69	39	13	121	100

Averegd 2.6 acres
Max 7.5

Harga tanah padi yang ditawarkan = averege $7107/- /ekar
Max 80,000/ekar.

Table D3.4B

Rental Period

Yrs/region	1	2	3	Total No.	Total %
Less 5	23	11	11	45	37.2
5.1 - 10	35	16	2	53	43.8
10.1 - 15	1	3	0	4	3.3
15.1 - and above	10	9	0	19	15.7
Total	69	39	13	121	100

Average 9.4 yr
Max 40yr.

Table D3.5B

Period the land was abandoned

Yrs/region	1	2	3	Total No.	Total %
Less 2	16	13	6	35	28.9
2.1 - 4	4	8	1	13	10.8
4.1 - 6	14	3	4	21	17.4
6.1 - 8	2	3	0	5	4.1
8.1 and above	33	12	2	47	38.8
Total	69	39	13	121	100

Average 9 yr
Max. 70yr.

Table D3.6B

Size of abandoned padi land

Size/region	1	2	3	Total No.	Total %
Less 1	38	19	11	68	56.2
1.1 - 2	11	8	2	21	17.4
2.1 - 3	8	4	0	12	9.9
3.1 - 4	4	0	0	4	3.3
4.1 - 5	1	2	0	3	2.5
above 5.1	7	6	0	13	10.7
Total	69	39	13	121	100

Average 2.5 acres
Max 7.5 acres

Table D3.7C

Willingness to participate in agriculture when improvement is made by the Government

Willingness/region	1	2	3	Total No	Total %
Full-time	8	19	0	27	6.7
Part-time	94	84	27	105	50.5
Not at all	56	116	2	174	42.8
Total	158	219	29	406	100

Table D3.8C

What the Respondents will do to their parent's padi land

Opinion/region	1	2	3	Total No.	Total %
Will improve it	24	26	10	60	14.8
Rent it out	73	101	8	182	44.8
Advise to sell it	0	2	0	2	0.5
Others	23	9	0	32	7.9
Not involved	38	81	11	130	32.0
Total	158	219	29	406	100

Table D3.9C

Willingness to participate in large scale Co-operative System in operating agriculture

Willingness/region	1	2	3	Total No.	%
As shareholder only	54	45	16	115	28.3
As worker only	14	44	1	59	14.5
As shareholder & worker	29	17	5	51	12.6
As maneger only	1	10	0	11	2.7
Don't want to get involved	44	101	0	145	35.7
Don't know	16	2	7	25	6.2
Total	158	219	29	406	100

Table D3.10C

Willingness to participate in cooperative with high pay or as much as they get in the factories.

Willingness/region	1	2	3	Total No	%
Yes	57	76	17	150	36.9
No	101	143	12	256	63.1
Total	158	219	29	406	100

Table D3.11C

Opinion about Govt, land rehabilitation scheme

Opinion/region	1	2	3	Total No.	Total %
1) Strongly agree	87	164	22	273	67.3
2) Agree	47	47	4	98	24.1
3) Don't care	6	4	1	11	2.7
4) Will not bring improvement	11	0	0	11	2.7
5) Should develop as housing and industrial area	5	0	0	5	1.2
6) Don't know	2	4	2	8	2.0
Total	158	219	29	406	100

Table D3.12C

Opinion towards the best padi farming system prefered

Opinion/region	1	2	3	Total No.	Total %
a) Double cropping	143	219	25	387	95.3
b) Single cropping and with off-season crops	15	0	4	19	4.7
c) Others	0	0	0	0	0
Total	158	219	29	406	100

Table D3.13C

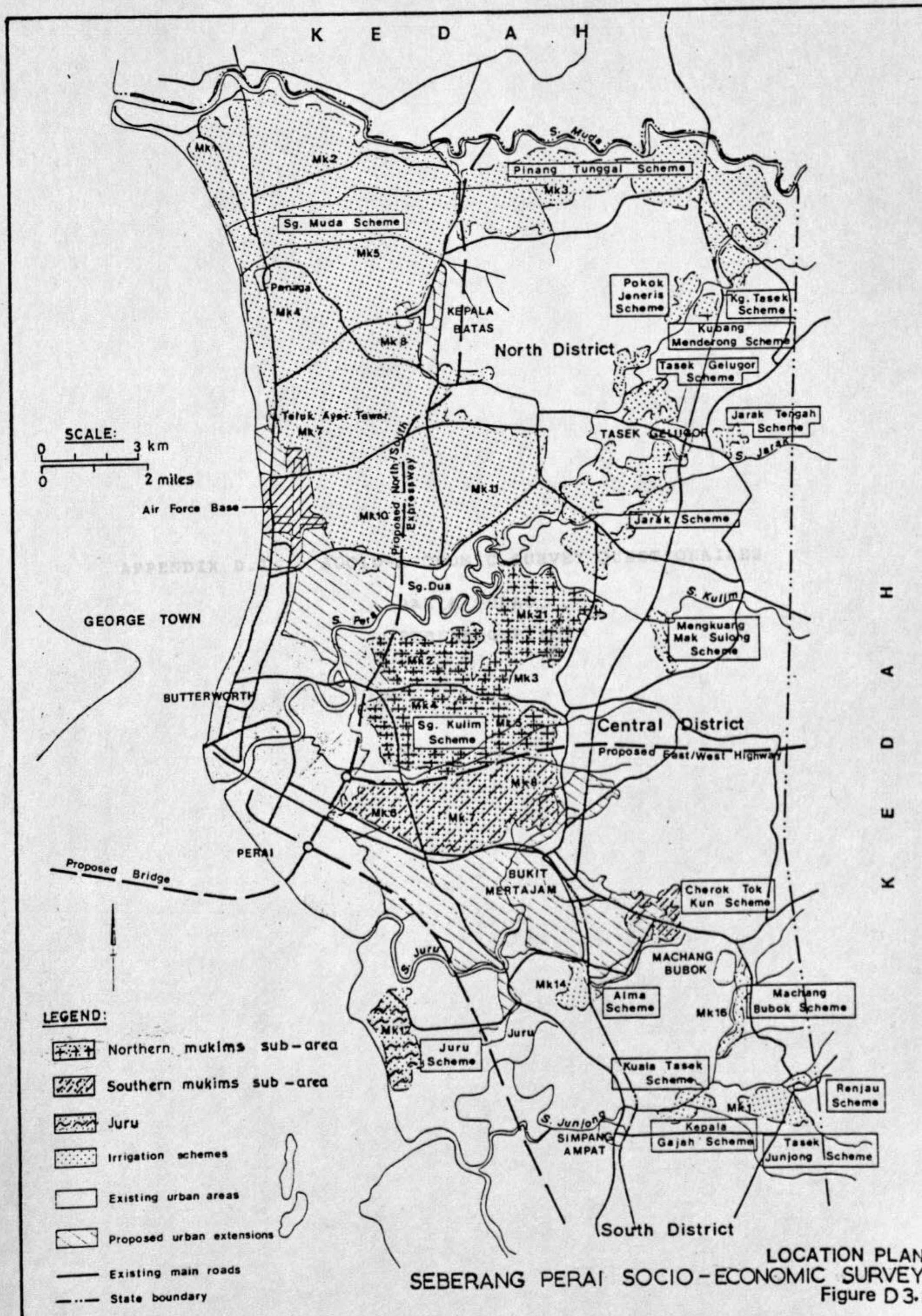
Farming System: Alternative preferred

Alternative/region	1	2	3	Total No.	Total %
a) Padi	145	206	26	377	92.9
b) Other commercial crops	10	3	1	14	3.4
c) Any crop at all	3	3	2	8	2.0
d) Don't know	0	7	0	7	1.7
Total	158	219	29	406	100

Table D3.14C

Type of Organisation preferred to manage padi after land rehabilitation

Opinion/region	1	2	3	Total No	Total %
a) Individual farming	37	69	5	111	27.3
b) Group farming	70	19	21	110	27.1
c) Cooperative system	51	131	3	185	45.6
Total	158	219	29	406	100



LOCATION PLAN
SEBERANG PERAI SOCIO-ECONOMIC SURVEY
Figure D3.

APPENDIX D.1 SOCIO-ECONOMIC SURVEY QUESTIONAIRES

BALIK PULAU

SEBERANG PERAI

KAD 1

Upgrading of Irrigation Schemes in
Balik Pulau, Pulau Pinang

	1	2	3	4	5	6
NO. PENGENALAN						1

No. Kampung ←

No. Mukim ←

No. Petani ←

No. Kad ←

Maklumat Responden

Nama : ____________________

Kampung : ____________________

Mukim : ____________________

Pembantu Penyelidik

Nama : ____________________

Tarikh temuduga : ____________________

BINNIE DAN RAKAN
KUALA LUMPUR
1981

A. Responden: Ketua Rumahtangga

I. Latarbelakang Responden dan Keluarga

1. Jantina:
Lelaki = 1
Perempuan = 2

7 SEX

2. Berapakah umur Sdr.?

_________ tahun

8 9 UMUR

3. (i) Pendidikan: persekolahan paling tinggi,

(a) Tidak bersekolah = 0

(b) Sekolah rendah = 1

(c) Sekolah Menengah = 2

(d) Maktab/Pengajian tinggi = 3

10 EDUC

(ii) Berapa tahun Sdr. bersekolah:

_________ tahun

11 12 SEKOLAH

4. (i) Bilangan isi rumahtangga sekarang:

_________ orang

13 14 ISI

(ii) Bilangan anak

_________ orang

15 16 ANAK

Isi-rumahtangga dan anak-anak (termasuk anak-anak yang telah berpindah dan tinggal berasingan)

Bil	Nama	Umur	Hubungan dengan Responden	Taraf Persekolahan	Pekerjaan	Pendapatan sebulan	Tempat tinggal sekarang bagi anak-anak

(iii) Bilangan anak yang tinggal bersama (termasuk anak-anak yang masih bersekolah dan tinggal di asrama atau rumah sewa)

_______________ orang

17 18 SAMA

5. (i) Berapa orang bilangan anak Sdr. yang sudah bekerja dan tinggal di tempat lain?

19 20 KERJA

(ii) Di mana tinggal

(a) Di Balik Pulau ini,

_______________ orang

21 BP

(b) Tempat lain di Pulau Pinang

_______________ orang

22 XBP

(c) Di luar Pulau Pinang

_______________ orang

23 XBP

II. Ringkasan Data Isi-rumah

6. Jumlah bilangan yang dilaporkan:

_______________ orang

24 25 ISIR

7. Taraf pelajaran yang paling tinggi dicapai oleh mana-mana ahli keluarga (sama ada berpindah atau tidak)

a) Tamat darjah 6 = 1

b) Tamat Tingkatan III = 2

c) Tamat Tingkatan V = 3

26 EDF

d) Tamat Tingkatan VI = 4

e) Tamat Maktab Perguruan /ITM/ Dip. Pertanian, dll. = 5

f) Tamat Universiti = 6

g) lain

8. Anggaran jumlah pendapatan anggota isirumah yang <u>tinggal bersama-sama</u> responden:

$ ____________

27 28 29 30 31 [| | | |–] FLYING

Age Structure

9. Bilangan anggota isirumah yang berumur:

(a) 0 - 3.9 tahun ______

(b) 4 - 5.9 " ______

(c) 6 - 12.9 " ______

(d) 13 - 15.9 " ______

(e) 16 - 19. 9 " ______

32 33 34 35 36 [| | | |] A B C D E

(f) 20 - 25.9 " ______

(g) 26 - 30.9 " ______

(h) 31 - 40.9 " ______

(i) 41 - 50.9 " ______

(j) 51 - ke atas " ______

37 38 39 40 41 [| | | |] F G H I J

III. Kegiatan Ekonomi

10. Jenis pekerjaan:

		Kod
Petani	=	1
Nelayan	=	2
Berniaga	=	3
Makan gaji (white Collar)	=	4
Buruh Kilang	=	5
Lain-lain ______	=	6

Gunakan Kod-Kod di atas untuk menjawab (i) & (ii):

(i) Apakah pekerjaan utama Sdr.? ______ 42 [ ] PEKU

(ii) Apakah pekerjaan sambilan Sdr.? ______ 43 [ ] PEKS

11. Sudah berapa lama Sdr. membuat bendang?

______ tahun 44 45 [|] MABB

12. Anggaran Pendapatan wang tunai sebulan:

(i) Dari pekerjaan utama $ ______ 46 47 48 [| |] UTAMA

(ii) Pekerjaan sambilan $ ______ 49 50 51 [| |] SAMBIL

(iii) Bantuan dari anak-anak: $ ________ 52 53 54 DARI

(iv) lain-lain ____________ $ ________ 55 56 57 LPUNCA

IV Pengerjaan Tanah

13. Tentukan kedudukan Sdr. dalam pengerjaan tanah.

(a) Tuan tanah semata & disewakan = 1

(b) Pemilik Pengusaha dan beri sewa = 2

(c) Pemilik - Pengusaha = 3

(d) Pemilik - Pengusaha dan penyewa = 4

(e) Penyewa semata-mata = 5

58 PEKT

Pemilik - Pengusaha = owner - operator

14. Pemilikan tanah:

(i) Tanah padi

______ ekar

59 60 61 62

PADI

(ii) tanah kelapa/kebun/kampung dan tapak rumah

______ ekar

63 64 65 66

DARAT

15. Jika Sdr. <u>tidak mempunyai</u> tanah, terangkan bagaimana <u>tanah</u> <u>tapak</u> rumah Sdr. ini diperolehi:

a) Menumpang = 1

b) Menyewa = 2

c) Lain-lain = 3

67

TARAK

16. Jika Sdr. tidak mempunyai tanah terangkan sama ada:

a) dari dulu tidak bertanah = 0

b) tanah milik telah dijual = 1

c) lain-lain ( ) = 2

68

Kad 2

NO. PENGENALAN

1	2	3	4	5	6
					2

No. Kampung

No. Mukim

No. Petani

No. Kad

17\. (i) Berapa luas Sdr. mengerjakan tanah padi pada musim yang lepas?

_____________ ekar

7	8	9	10

LUTAPA

(ii) Berapa luas tanah itu Sdr. miliki sendiri?

_____________ ekar

11	12	13	14

LUTMIS

(iii) Berapa luas pula yang Sdr. sewa/pajak?

_____________ ekar

15	16	17	18

LUTSE

(iv) Berapa luas yang Sdr. dan isirumah Sdr. mampu mengerjakan tanah padi?

_____________ ekar

19	20

LUMAK

18. (i) Berapa kali Sdr. usahakan padi dalam setahun?

a) Tidak mengusahakan lagi = 0

b) Sekali setahun = 1

c) Dua kali setahun = 2

21 KAPA

(ii) Jika didapati kemudahan air & bantuan lain sanggupkah Sdr. mengerjakan padi dua kali setahun.

Ya = 1

Tidak = 0

22 PADU

(iii) Jika (Kerajaan) Memperbaiki pertanian di sini, cara penanaman padi manakah yang Sdr. paling sukai

a) Tidak mahu tanam padi lagi = 0

Padi { b) sekali setahun = 1

c) dua kali setahun = 2 }

23 PASU

18) Jika penyewa;

(i) sudah berapa lama Sdr. menyewa tanah itu?

24 25 MSETA

(ii) Dari siapa Sdr. menyewa tanah itu:

a) kaum kerabat sekampung = 1

b) kaum kerabat luar kampung = 2

c) orang lain dalam kampung = 3

d) orang luar kampung = 4

26 SISE

(iii) Apakah cara penyewaannya?

a) Sewa tetap = 1

b) Pawah bagi dua = 2

c) Pawah bagi tiga = 3
(1 bah = pemilik,
2 bah = penyewa)

c) Lain-lain _______ = 4

23 PASU

(iv) Bagaimana Sdr. membuat bayaran pawah sewa itu?

a) dalam bentuk wang tunai = 1

b) dalam bentuk hasil padi = 2

c) campuran kedua-duanya = 3

28 BASE

20. Apakah pada pendapat Sdr., masalah yang paling utama dalam usaha penanaman padi ini?

a) Kurang tenaga pekerja = 1

b) Musuh padi = 2

c) Tanah tidak subur = 3

d) Masalah air = 4

e) Kredit = 5

f) Traktor = 6

g) Pemasaran = 7

h) Lain-lain __________ = 8

29 MAUT

21. (i) Jika ada rancangan untuk memulihkan tanah padi terbiar di sini adakah Sdr. bersetuju?

    Setuju = 1

    Tidak = 0

30 RANP

(ii) Jika usaha tanaman padi dapat dilakukan secara dua kali setahun dapatkah Sdr. bergantung hidup dengan padi sahaja?

    Ya = 1

    Tidak = 0

31 PADUH

22. (i) Jika usaha pemulihan dilakukan untuk tanaman padi <u>sekali setahun,</u> sanggupkah Sdr. mengusahakan tanaman selain dari padi di luar musim di atas tanah itu?

    Ya = 1

    Tidak = 0

32 PASE

(ii) Jika ya, apakah tanaman luar musim yang Sdr. akan tanam?

    (a) Jagung = 1

    (b) Sayur-sayuran = 2

    (c) Kacang tanah = 3

    (d) Lain-lain ____ = 4

33 TALUM

23. (i) Purata hasil padi setahun ________ gantang | 34 35 36

(ii) Hasil padi untuk bayaran sewa ________ gantang. | 37 38 39

(iii) Hasil padi untuk bayaran zakat ________ gantang. | 40 41 42

24. Jumlah perbelanjaan upah mengupah mengerjakan tanah dalam setahun $ ________ | 43 44 45 PERUP

25. (i) Berapa banyak padi yang digunakan sendiri setahun ________ gantang. | 46 47 48 PAGUS

(ii) Berapa banyak padi yang dapat Sdr. pasarkan setahun ________ gantang. | 49 50 51 PAPAR

26. (i) Adakah Sdr. menggunakan jentera membajak? | 52 GUJE

Ya = 1

Tidak= 0

(ii) Jika ya, apakah jenis traktor yang lazim digunakan: | 53 JETR

a) 4-roda = 1

b) 2-roda = 2

(iii) Kepunyaan siapa?

a) Sendiri = 1

b) Petani lain = 2

c) Kontrak luar = 3

d) LPP/Jab. Pertanian = 4

e) Lain-lain

54 JESI

27. Berapakah kadar bayaran upah atau perbelanjaan se ekar?

(a) Menyiapkan tanah

________ ekar

55 56 BESIT

(b) Mencabut semai dan menanam

$ ________

57 58 BESEM

(c) Mengerat

$ ________

59 60 BEKE

(d) Memukul

$ ________

61 62 BEME

(e) Baja

$ ________

63 64 BA

Basal _________ kampit

Urea _________ kampit

Ammpphos _______ kampit

(f) Racun

65 66 BERA

28. Kenalkah Sdr. pegawai pertanian kawasan ini?

Tak kenal langsung = 0

Kenal tapi tak tahu nama = 1

Kenal dan tahu nama = 2

67 PEPER

29. Dalam tempoh tiga bulan yang lepas, berapa kali pegawai pertanian melawat ke kampung Sdr.? _________
(Tak tahu = 99)

68 69 PEPED

30. (i) Dalam tempoh tiga bulan yang lepas, adakah pejabat pertanian atau Persatuan Peladang (LPP) mengadakan tunjuk ajar atau demostradi pertanian

Ya = 1

Tidak = 0

70 PEPETU

(ii) Kalau ya, ada berapa kali? _________

71 72 PETUK

(iii) Kalau ya, berapa kali yang Sdr. hadir diperjumpaan seumpama itu dalam tempoh 3 bulan yang lepas? ___________

73 74 PEPER

KAD 2

31. Adakah Sdr. bercadang meluaskan lagi pengerjaan tanah sawah

Ya = 1

Tidak = 0

75 CAME

32. Apakah pendapat Sdr. tentang rancangan kerajaan untuk perbaiki pertanian di tempat ini?

a) Baik sekali = 1

b) Baik = 2

c) Tidak setuju = 3

d) Tak tahu = 4

76 RAMEP

38. Adakah Sdr. akan kekal dengan bertani jika ada peluang mendapat pendapatan yang lebih baik dalam lapangan lain?

Ya, kekal dalam pertanian = 1

Tidak, akan tinggalkan pertanian. = 0

77 PEKEL

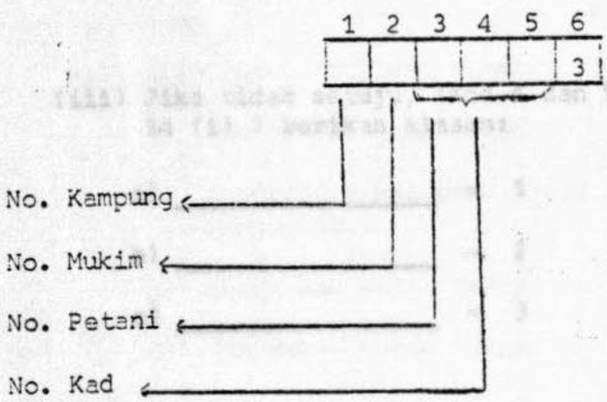
34. Jika dilancarkan rancangan memperbaiki pertanian di sini, adakah Sdr. ingin turut serta memperbaiki cara pertanian Sdr.?

Ya = 1

Tidak = 0

78 PETUR

Kad 3



35. (i) Jika ada usaha bagi menukar tanah padi di Balik Pulau ini kepada jenis tanaman lain, adakah Sdr. bersetuju:

a) Sangat setuju = 1

b) Setuju = 2

c) Tak ambil kesah = 3

d) Tidak berapa setuju = 4

e) Sekali-kali tidak setuju = 5

f) Tak tahu = 6

7
TUTUP

(ii) Jika setuju, apakah jenis tanaman yang Sdr. fikirkan paling baik:

a) Kelapa = 1

b) Pisang = 2

c) Sayur-sayuran = 3

d) Tebu = 4

e) Ternak ayam/itik = 5

f) Orkid = 6

g) Ternak lembu = 7

h) Lain-lain = 8

8 TUTA

(iii) Jika tidak setuju, (Kod 4 dan 5 bagi 34 (i)) berikan alasan:

a) ________________ = 1

b) ________________ = 2

c) ________________ = 3

9 TUTI

36. (i) Adakah Sdr. menganggotai sesuatu Syarikat Kerjasama (Kooperasi) di kawasan Sdr.?

a) Ya, ahli biasa = 1

b) Ya, ahli JKK = 2

c) Tidak = 0

10 ANSY

(ii) Jika ya, apakah pandangan Sdr. tentang Syarikat Kerjasama itu?

a) Sangat baik dan berfaedah = 1

b) Baik = 2

c) Tidak ada apa-apa perubahan = 3

d) Tidak berfaedah = 4

11 SYFA

37. (i) Jika ada sebuah Syarikat Kerjasama anjuran Kerajaan mengusahakan pertanian secara besar-besaran di-kawasan ini, mahukah saudara menyertainya?

a) Sebagai pemegang saham sahaja = 1

b) Sebagai pekerja sahaja = 2

c) Sebagai pemegang saham pekerja = 3

d) Tidak mahu menyertai = 4

12 SYMEN

(ii) Jika tidak, berikan alasan:

a) Tunggu nak jual tanah = 1

b) Pendapatan keluarga sudah mencukupi. = 2

c) Sudah ada kerja tetap = 3

d) Tak punya tanah langsung = 4

e) Tanaman padi turun temurun = 5

f) Lain-lain ______________ = 6

13 SYTIM

38. Di bawah ini terdapat beberapa alternatif dalam usaha pertanian. Pada pandangan Sdr., alternatif manakah yang paling sesuai bagi Sdr.?

a) Tanaman padi dua kali setahun = 1

b) Tanaman padi sekali setahun, diikuti tanaman luar musim seperti sayur-sayuran atau tanaman jangka pendek yang lain. = 2

c) Mengubah tanaman padi kepada tanaman lain, seperti kelapa, pisang, tebu, dll. = 3

14 ALPER

39. Pada pendapat Sdr. yang mana satu paling baik:

a) Masing-masing mengerjakan tanah pertanian secara bersendirian macam sekarang = 1

b) Mengerjakan tanah secara berkelompok (group farming) = 2

c0 Mengerjakan tanah secara kooperasi dengan besar-besaran = 3

15 ALPAB

40. (i) Kepada yang menjawab "Secara bersendirian":
Apakah perusahaan yang paling sesuai?

a) Padi = 1

b) Kelapa = 2

c) Sayuran = 3

d) Pisang = 4

e) Ternak ayam = 5

f) Ternak ikan air tawar = 6

g) Lain-lain ________ = 7

16 ☐ ALBER

(ii) Kepada yang menjawab "Secara Kelompok"

a) Berapa buah keluarga yang paling sesuai bagi suatu kelompok? ________

17 18 ☐☐ ALBEK

b) Berapa luas tanah yang patut diusahakan oleh suatu "kelompok"? ________ ekar

19 20 21 ☐☐☐ ALLUT

c) Adakah tanaman/ternakan berikut patut diusahakan oleh sesuatu kelompok setelah tanah di sini dibaiki semula:

i) Padi - Ya=1/ Tidak=0 22 ☐

ii) Kelapa - Ya=1/ Tidak=0 23 ☐

iii) Pisang - Ya=1/ Tidak=0 24 ☐

iv) Betek - Ya=1/ Tidak=0 25 ☐

v) Ternak ayam - Ya=1/ Tidak=0 26 ☐

vi) Lembu daging -Ya=1 / Tidak=0 | 27 [ ]

vii) Sayuran -Ya=1 / Tidak=0 | 28 [ ]

d) Adakah Sdr. sanggup menyertai perusahaan secara kelompok ini?

i) Sebagai pekerja - Ya=1 / Tidak=0 | 29 [ ]

ii) Sebagai pengurus - Ya=1 / Tidak=0 | 30 [ ]

iii) Sebagai pemegang saham - Ya=1 / Tidak=0 | 31 [ ]

(iii) Kepada yang menjawab "secara keperasi dengan besar-besaran"

a) Sila sebutkan tanaman/ternakan yang sesuai diusahakan setelah tanah di sini dipulih semula:

i) Padi - Ya=1 / Tidak=0 | 32 [ ]

ii) Kelapa - Ya=1 / Tidak=0 | 33 [ ]

iii) Pisang - Ya=1 / Tidak=0 | 34 [ ]

iv) Betek - Ya=1 / Tidak=0 | 35 [ ]

v) Ternakan ayam - Ya=1 / Tidak=0 | 36 [ ]

vi) Lembu daging - Ya=1 / Tidak=0 | 37 [ ]

vii) Sayuran - Ya=1 / Tidak=0 | 38

viii) Lain-lain - Ya=1 / Tidak=0 | 39

b) Adakah sesiapa (orang dewasa) dalam isirumah Sdr. yang boleh bekerja sepenuh masa di "ladang koperasi" itu kelak jika gaji dibayar serupa dengan kilang?

- Wanita berapa orang? ________ | 40

- Lelaki berapa orang? ________ | 41

c) Yang sanggup bekerja separuh masa?

- Wanita berapa orang? ________ | 42

- Lelaki berapa orang? ________ | 43

41. (Kepada semua responden)

Mengikut apa yang Sdr. tahu, berapakah gaji yang lazim dibayar kepada seorang pekerja kilang sehari?

a. Wanita

i) Baru kerja (rendah) $ ________ | 44 45

ii) 3 - 5 tahun kerja (sederhana) $ ________ | 46 47

(iii) 6 - 10 tahun kerja (tertinggi) 48 49

$____________

b. **Lelaki**

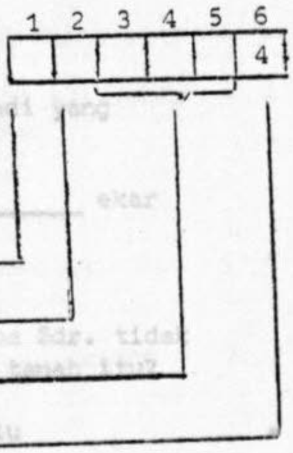
(i) Baru kerja (3 tahun) 50 51

(ii) 3 - 5 tahun bekerja 52 53

(iii) 6 - 10 tahun bekerja 54 55

KAD 4

B. <u>Soalan Tambahan Untuk Tuan Tanah</u>



Bil. Kampung

Bil. Mukim

Bil. Petani

Bil. Kad

1. Jantina: 7

   Lelaki = 1

   Perempuan = 2

2. Umur ______ tahun 8 9

3. Berapa luas tanah padi Sdr. miliki

_____________ ekar

10 11 12 13

4. Berapa luas tanah padi yang Sdr. beri sewa? _____________ ekar

14 15 16 17

5. Berapa luas tanah padi yang tidak dikerjakan?

_____________ ekar

18 19 20 21

6. Berikan sebab mengapa Sdr. tidak mengerjakan sendiri tanah itu?

(a) Janda/balu = 1

(b) Sudah tua = 2

(c) Tidak ada masa = 3

(d) Mempunyai kerja lain = 4

(e) Lain-lain _____________ = 5

22

7. Sudah berapa lama Sdr. berhenti daripada mengerjakan tanah itu?

_____________ tahun.

23 24

8. Bagaimana Sdr. memperolehi tanah itu?

Pesaka = 1

Belian = 2

Lain-lain = ______ = 3

25 [ ]

9. Kalau nak menyewa tanah kepada siapa tanah itu nak disewakan?

a) Kaum kerabat sendiri = 1

b) Jiran-jiran dalam kampung = 2

c) Kepada siapa saja yang ingin menyewa = 3

26 [ ]

10. Sudah berapa lama tanah itu disewakan?

______ tahun

27 28 [ ][ ]

11. Berapa banyak hasil pendapatan dari sewaan tanah itu setahun

$ ______

29 30 31 32 [ ][ ][ ][ ]

12. Adakah kemungkinan Sdr. akan mengerjakan sendiri tanah itu jika kerajaan memperbaiki sistem pertanian di kawasan ini?

Besar kemungkinan = 1

Mungkin = 2

Belum pasti = 3

Tak mungkin = 4

Sekali-kali tidak = 5

33 [ ]

13. Jika tidak apakah sebabnya?

a) Sudah tua/janda = 1

b) Ada kerja tetap yang lain = 2

c) Tunggu nak jual tanah = 3

d) Lain-lain = 4

34

14. i) Apakah pendapat Sdr., jika terdapat satu Syarikat Kerjasama (Kooperasi) peladang secara besar-besaran, mahukah Sdr. menyewakan tanah Sdr. kepada syarikat seperti ini?

a) Tidak = 0

b) Ya, untuk 1-3 tahun = 1

c) Ya, untuk 3.1-6 tahun = 2

d) Ya, untuk 6.1-10 tahun = 3

e) Ya, untuk 10 tahun lebih = 4

35

(ii) Dan mahukah Sdr. menyertai syarikat seperti itu:

a) Sebagai pemegang saham sahaja = 1

b) Sebagai pemegang saham & pekerja bergaji = 2

c) Tidak mahu menyertai apa-apa pun. = 3

36

15. Adakah Sdr. bersetuju jika tanah padi itu diubah kepada tanah pertanian jenis lain?

a) Sangat setuju = 1

b) Setuju = 2

c) Tak ambil kesah = 3

d) Tidak berapa setuju = 4

e) Sekali-kali tidak = 5

f) Tak tahu = 6

37 ☐

16. Adakah Sdr. bersetuju tanah padi itu dimajukan untuk ditanam dengan padi dua kali setahun?

a) Sangat setuju = 1

b) Setuju = 2

c) Tak ambil kesah = 3

d) Tidak berapa setuju = 4

e) Sekali-kali tidak = 5

f) Tak tahu = 6

38 ☐

17. (i) Dalam masa <u>setahun</u> yang lepas, adakah sesiapa datang menawar hendak membeli tanah bendang Sdr.?

a) Ya, pembeli tulen = 1

b) Ya, broker tanah = 2

c) Tidak = 3

39 ☐

Isi-rumahtangga dan anak-anak (termasuk anak-anak yang telah berpindah dan tinggal berasingan)

Bil	Nama	Umur	Hubungan dengan Responden	Taraf Persekolahan	Pekerjaan	Pendapatan sebulan	Tempat tinggal sekarang bagi anak-anak

1	2	3	4	5	6
					5

Bil. Kampung

Bil. Mukim

Bil. Petani

Bil. Kod.

c. Soalan-soalan untuk anggota-anggota rumahtangga yang bekerja di luar pertanian.

1. Umur Sdr. ____________ tahun

7 8 AGE

2. Jantina: Lelaki = 1

   Perempuan = 0

9 SEX

3. Pekerjaan Sdr.

   a) Buruh kilang = 1

   b) Buruh kerajaan = 2

   c) Perkeranian (Kerajaan/Swasta = 3

   d) Polis/Peg. Keselamatan = 4

   e) Guru = 5

   f) Pegawai (swasta/kerajaan = 6

   g) Lain-lain ____________ = 7

10

4. Pendapatan Sdr. sebulan

   $ ____________ | 11 | 12 | 13 | 14 |

5. Apakah pendapat Sdr. mengenai usaha menanam padi:

   a) Pendapatan rendah = 1

   b) Kerjanya lebih penat berbanding dengan kerja lain. = 2

   c) Tidak ada pengalaman = 3

   d) Lain-lain = 4

   15

6. Adakah Sdr. menolong ibu-bapa Sdr. dalam kerja-kerja pertanian?

   a) Tidak = 0

   b) Apabila diminta bantuan = 1

   c) Apabila kerja kelihatan perlu = 2

   d) Setiap waktu lapang saya = 3

   e) Lain ____________ = 4

   16
   TOLONG

7. (i) Jika usaha memperbaiki sistem penanaman padi dilakukan, adakah Sdr. ingin turut serta dalam kerja-kerja ini?

   a) Sepenuh masa = 1

   b) Sambilan = 2

   c) Tidak sekali-kali = 3

   17

8. Jika orang tua Sdr. mempunyai tanah padi, apakah yang Sdr. lakukan pada tanah padi itu jika orang tua Sdr. tidak terdaya mengerjakannya lagi?

a) Saya sendiri akan mengerjakan = 1

b) Memberi sewa pada orang lain = 2

c) Menasihatkan orang tua menjualkannya = 3

d) Lain-lain ____________ = 4

18 ☐ LAKPA

9. (i) Jika terdapat sebuah kooperasi mengerjakan tanah pertanian itu/secara besar-besaran adakah Sdr. akan ikut serta menjadi anggota?

a) Sebagai pemegang saham sahaja = 1

b) Sebagai pekerja bergaji sahaja = 2

c) Sebagai pemegang saham & pekerja sekali = 3

d) Sebagai pengurus sahaja = 4

e) Tidak mahu menyertai langsung = 5

19 ☐ PARTIC

(ii) Jika kooperasi ini kelak dapat menawar gaji setinggi gaji Sdr. sekarang,dan syarat-syarat perkhidmatan yang sama, adakah Sdr. sanggup pulang bekerja di-Ko-op. ini?

Ya = 1

Tidak = 0

20 ☐

10. Komen penyelidik tentang temubual:

a) Very favourable = 5

b) Favourable = 4

c) Fair/neutral = 3

d) Unfavourable = 2

e) Very unfavourable = 1

21 ☐

Upgrading of Irrigation Schemes in

Seberang Perai (Seberang Perai Tengah Survey)

NO. PENGENALAN

1	2	3	4	5	6
					1

No. Kampung ________

No. Mukim ________

No. Petani ________

No. Kad ________

Maklumat Responden

Nama : ________

Kampung : ________

Mukim : ________

Pembantu Penyelidik

Nama : ________

Tarikh temuduga : ________

BINNIE DAN RAKAN
KUALA LUMPUR
1981

a. Responden: Ketua Rumahtangga

I. Latarbelakang Responden dan Keluarga

1. Jantina

Lelaki = 1

Perempuan = 2

7 SEX

2. Berapakah umur Sdr.?

_________ tahun

8 9 UMUR

3. Pendidikan: persekolahan paling tinggi.

(a) Tidak bersekolah = 0

(b) Sekolah rendah = 1

(c) Sekolah menengah = 2

(d) Maktab/Pengajian tinggi = 3

10 EDUC

4. (i) Bilangan isi rumahtangga sekarang: (termasuk Sdr.)

_________ orang

11 12 ISI

(ii) Bilangan anak

_________ orang

13 14 ANAK

5. Bilangan anak Sdr. yang sudah bekerja dan tinggal di tempat lain?

_______ orang

15 16
KERJA

6. Taraf pelajaran yang <u>paling</u> <u>tinggi</u> dicapai oleh mana-mana ahli keluarga (sama ada berpindah atau tidak):

a) Tamat darjah 6 = 1

b) Tamat Tingkatan III = 2

c) Tamat Tingkatan V = 3

d) Tamat Tingkatan VI = 4

e) Tamat Maktab Perguruan/ITM/Dip. Pertanian, dll. = 5

f) Tamat Universiti = 6

17
EDF

7. Anggaran jumlah pendapatan anggota isirumah yang tinggal <u>bersama-sama</u> responden:

$ _______

18 19 20 21 22
FLYIN

8. Bilangan anggota isirumah yang berumur:

a) 0 - 3.9 tahun _______

b) 4 - 5.9 " _______

c) 6 - 12.9 " _______

d) 13 - 15.9 " _______

e) 16 - 19.9 " _______

23 24 25 26 27
A B C D E

f) 20 - 25.9 tahun ________

g) 26 - 30.9 " ________

h) 31 - 40.9 " ________

i) 41 - 50.9 " ________

j) 51 ke atas " ________

28	29	30	31	32
F	G	H	I	J

II. Kegiatan Ekonomi

9. Jenis pekerjaan | Kod

Jenis pekerjaan		Kod
Petani	=	1
Nelayan	=	2
Berniaga	=	3
Makan gaji (White Collar)	=	4
Buruh Kilang	=	5
Lain-lain ________	=	6

Gunakan Kod-Kod di atas untuk menjawab (i) & (ii):

(i) Apakah pekerjaan utama Sdr.?

________ 33 PEKU

(ii) Apakah pekerjaan sambilan Sdr.?

________ 34 PEKS

10. Anggaran pendapatan wang tunai sebelum:

(i) Dari pekerjaan utama $ ________

35 36 37 UTAMA

13. (i) Berapa luas Sdr. mengerjakan tanah padi pada musim yang lepas?

______ ekar

53 54 55 56 LUTAPA

(ii) Berapa luas tanah itu Sdr. miliki sendiri?

______ ekar

57 58 59 60 LUTMIS

(iii) Berapa luas pula yang Sdr. sewa/pajak?

______ ekar

61 62 63 64 LUTSE

14. (i) Jika didapati kemudahan air & bantuan lain sanggupkah Sdr. mengerjakan padi dua kali setahun?

Ya = 1

Tidak = 0

65 PADU

(ii) Jika kerajaan memperbaiki pertanian di sini, cara penanaman padi manakah yang Sdr. paling sukai

a) Tidak mahu tanam padi lagi = 0

Padi { b) Sekali setahun = 1

c) Dua kali setahun = 2 }

66 PASU

15. Jika penyewa;

i) Sudah berapa lama Sdr. menyewa tanah itu? — 67 68 MESTA

_____________ tahun

ii) Dari siapa Sdr. Menyewa tanah itu:

a) kaum kerabat sekampung = 1

b) kaum kerabat luar kampung = 2

c) orang lain dalam kampung = 3 — 69 SISE

d) orang luar kampung = 4

16. Apakah pada pendapat Sdr., masalah yang paling utama dalam usaha penanaman padi itu?

a) Kurang tenaga pekerjaan = 1

b) Musuh padi = 2

c) Tanah tidak subur = 3

d) Masalah air = 4

e) Kredit = 5

f) Traktor tak boleh masuk = 6

g) Pemasaran = 7 — 70 MAUT

h) Lain-lain = 8

17. (i) Jika usaha pemulihan dilakukan untuk tanaman padi sekali setahun, sanggupkah Sdr. mengusahakan tanaman selain dari padi di luar musim di atas tanah itu?

Ya = 1

Tidak = 0

71 PASE

(ii) Jika ya, apakah tanaman luar musim paling utama yang Sdr. akan tanam?

a) Jagung = 1

b) Sayur-sayuran = 2

c) Kacang tanah = 3

d) Tembakau = 4

e) Lain-lain = 5

72 TALUM

(iii) Jika sayur-sayuran, nyatakan sayuran jenis mana Sdr. gemar menanam:

Pilihan pertama * ________ 73 PSATU

Pilihan kedua * ________ 74 PDUA

Pilihan ketiga * ________ 75 PTIGA

* Gunakan kod-kod di bawah:

Kobis = 1, Kacang panjang = 2, Bender = 3
Keladi = 4, Terung = 5, Perola = 6, Kacang buncis = 7
Sawi, lobak, kanghong (jenis daun) = 8, lain ________ = 9

18. (i) Jika Sdr. memiliki 'tanah terbiar', nyatakan keluasannya _______ ekar

76 77 TABIA

(ii) Sudah berapa lama tanah itu tidak dikerjakan __________ tahun

78 79 TABIAT

(iii) Mengapa Sdr. tinggalkan tanah itu terbiar:

a) Orang lain juga tidak mengerjakan = 1

b) Tidak terdaya/sakit/tua = 2

c) Mempunyai pekerjaan lain = 3

d) Musuh padi dan masalah air = 4

e) Lain-lain ___________

80 TABIAS

Kad 2

NO. PENGENALAN	1	2	3	4	5	6
						2

No. Kampung

No. Mukim

No. Petani

No. Kad

19. i) Jika membuat bendang musim lepas purata hasil padi setahun ________ gantang

7 8 9 10 HAPAG

ii) Hasil padi untuk bayaran sewa ________ gantang

11 12 13 HAPAS

iii) Hasil padi untuk bayaran zakat ________ gantang.

14 15 16 HAPAZ

20. Jumlah perbelanjaan upah mengupah mengerjakan tanah dalam setahun $ ________

17 18 19 10 PERUP

21. i) Berapa banyak padi yang digunakan sendiri setahun ________ gantang

21 22 23 24 PAGUS

ii) Berapa banyak padi yang dapat Sdr. pasarkan setahun ________ gantang.

25 26 27 28 PAPAR

22. (i) Jika buat bendung musim lepas, adakah Sdr. bercadang meluaskan lagi pengerjaan tanah sawah? 29 CAME

Ya = 1

Tidak = 0

(ii) Jika ya, berapa jumlah keluasannya kelak? 30 31 32 33

_______ ekar

23. Apakah pendapat Sdr. tentang rancangan kerajaan untuk perbaiki pertanian di tempat ini?

a) Baik sekali = 1

b) Baik = 2

c) Tidak setuju = 3

d) Tak tahu = 4 34 RAMEP

24. Adakah Sdr. akan kekal dengan bertani jika ada peluang pendapatan yang lebih baik dalam lapangan lain?

Ya = 1

Tidak, akan tinggalkan pertanian. = 0 35 PEKEL

25. i) Jika ada usaha bagi menukar tanah padi di seberang Perai ini kepada jenis tanaman lain, adakah Sdr. bersetuju.

a) Sangat setuju = 1

b) Setuju = 2

c) Tak ambil kesah = 3

d) Tidak berapa setuju = 4

e) Sekali-kali tidak setuju = 5

f) Tak tahu = 6

36 TUTAP

(ii) Jika setuju, apakah jenis tanaman yang Sdr. fikiran paling baik:

a) Kelapa = 1

b) Pisang = 2

c) Sayur-sayuran = 3

d) Tebu = 4

e) Ternak ayam/itik = 5

f) Orkid = 6

g) Ternak lembu = 7

h) Lain-lain = 8

37 TUTA

26. i) Adakah Sdr. menganggotai sesuatu syarikat Kerjasama (Kooperasi) di kawasan Sdr.?

a) Ya, ahli biasa = 1

b) Ya, ahli JKK = 2

c) Tidak = 0

38 ANSY

ii) Jika ya, apakah pandangan Sdr. tentang Syarikat Kerjasama itu:

a) Sangat baik dan berfaedah = 1

b) Baik = 2

c) Tidak ada apa-apa perubahan - 3

d) Tidak berfaedah = 4

39 SIFA

27. (i) Jika ada sebuah Syarikat Kerjasama anjuran Kerajaan mengusahakan pertanian secara besar-besaran dikawasan ini, mahukah saudara menyertainya?

a) Sebagai pemegang saham sahaja = 1

b) Sebagai pekerja sahaja = 2

c) Sebagai pemegang saham dan pekerja = 3

d) Tidak mahu menyertai = 4

40 SYMEN

(ii) Jika tidak, berikan alasan:

a) Tunggu nak jual tanah = 1

b) Pendapatan keluarga sudah mencukupi = 2

c) Sudah ada kerja tetap = 3

d) Tak punya tanah langsung = 4

e) Tanaman padi turun temurun = 5

f) Lain-lain ________ = 6

41 SYTIM

28. Di bawah ini terdapat beberapa alternatif dalam usaha pertanian. Pada pandangan Sdr., alternatif manakah yang paling sesuai bagi Sdr.?

a) Tanaman padi dua kali setahun = 1

b) Tanaman padi sekali setahun seperti sayur-sayuran atau tanaman jangka pendek yang lain. = 2

c) Mengubah tanaman padi kepada tanaman lain, seperti kelapa, pisang, tebu, dll. = 3

42 ALPER

29. Pada pendapat Sdr. yang mana satu paling baik:

a) Masing-masing mengerjakan tanah pertanian secara bersendirian macam sekarang = 1

b) Mengerjakan tanah secara berkelompok (group farming) = 2

c) Mengerjakan tanah secara kooperasi dengan besar-besaran = 3

43 ☐ ALPAB

30. Komen penyelidikan tentang temubual:

a) Very favourable = 5

b) Favourable = 4

c) Fair/neutral = 3

d) Unfavourable = 2

e) Very unfavourable = 1

44 ☐ KOMEN

1	2	3	4	5	6
					3

Bil. Kampung (1)

Bil. Mukim (2)

Bil. Petani (3–4)

Bil. Kad (6)

1. Jantina:

   Lelaki = 1

   Perempuan = 0

7 — SEX

2. Umur ________ tahun

8 9 — AGE

3. Berapa luas tanah padi Sdr. miliki?

   ________ ekar

10 11 12 13 — LUPA

4. Berapa luas tanah padi yang Sdr. beri sewa? ________ ekar

14 15 16 17 — LUPAS

5. Berapa luas tanah padi yang tidak dikerjakan? ________ ekar

18 19 20 21
LUPAT

6. Berikan sebab mengapa Sdr. tidak mengerjakan sendiri tanah itu?

a) Janda/balu = 1

b) Sudah tua = 2

c) Tidak ada masa = 3

d) Mempunyai kerja lain = 4

e) Lain-lain ________ = 5

22
TIKES

7. Sudah berapa lama Sdr. berhenti daripada mengerjakan tanah itu?

________ tahun

23 24
HATAK

8. Kalau nak menyewakan tanah, kepada siapa tanah itu nak disewakan:

a) Kaum kerabat sendiri = 1

b) Jiran-jiran dalam kampung = 2

c) Kepada siapa saja yang ingin menyewa = 3

25
SETA

9. Sudah berapa lama tanah itu disewakan?

________ tahun

26 27
MSETA

10. Adakah kemungkinan Sdr. akan mengerjakan sendiri tanah itu jika Kerajaan memperbaiki sistem pertanian di kawasan ini?

Besar kemungkinan = 1

Mungkin = 2

Belum pasti = 3

Tak mungkin = 4

Sekali-kali tidak = 5

28 KESEN

11. Jika tidak apa sebabnya?

a) Sudah tua/janda = 1

b) Ada kerja tetap yang lain = 2

c) Tunggu nak jual tanah = 3

d) Lain-lain ________ = 4

29 SETAK

12. (i) Apakah pendapat Sdr., jika terdapat satu Syarikat Kerjasama (kooperasi) peladang secara besar-besaran, mahukah Sdr. menyewakan tanah Sdr. kepada syarikat seperti ini?

a) Tidak = 0

b) Ya, untuk 1-3 tahun = 1

c) Ya, untuk 3.1-10 tahun = 2

d) Ya, untuk 6.1-10 tahun = 3

e) Ya, untuk 10 tahun lebih = 4

30 SYKE

(ii) Dan mahukah Sdr. menyertai syarikat seperti itu:

a) Sebagai pemegang saham sahaja = 1

b) Sebagai pemegang saham & pekerja bergaji = 2

c) Tidak mahu menyertai apa-apa pun ________ = 3

31 SYKEM

13. Adakah Sdr. bersetuju jika tanah padi itu diubah kepada tanah pertanian jenis lain?

a) Sangat setuju = 1

b) Setuju = 2

c) Tak ambil kesah = 3

d) Tidak berapa setuju = 4

e) Sekali-kali tidak = 5

f) Tak tahu = 6

32 [ ] TAPAU

14. Apakah Sdr. bersetuju tanah padi itu dimajukan untuk ditanam dengan padi dua kali setahun:

a) Sangat setuju = 1

b) Setuju = 2

c) Tak ambil kesah = 3

d) Tidak berapa setuju = 4

e) Sekali-kali tidak = 5

f) Tak tahu = 6

33 [ ] TAPAM

15. (i) Dalam masa setahun yang lepas, adakah siapa datang menawar hendak membeli tanah bendang Sdr.?

a) Ya, pembeli tulen = 1

b) Ya, broker tanah = 2

c) Tidak = 3

34 [ ] JUAL

(ii) Berapakah harga yang ditawarkan?

__________ ekar

35	36	37	38	39	40

HARTAW

(iii) Adakah Sdr. telah bersetuju menjualnya?

Ya = 1

Tidak = 0

41 SETUJU

(iv) Kalau "tidak) kepada Soalan 15(i) adakah Sdr. bercadang hendak menjual sebahagian atau semua bendang kepunyaan Sdr. dalam masa setahun akan datang ini?

Tidak = 0

Ya, sebahagian = 1

Ya, semua = 2

42 CADANG.

(v) Berapa ekar nak dijual?

________ ekar

43 44 XEKAR

(vi) Berapa harga yang dipersetujui

________ ekar

45 46 47 48 49 50 HARTASE

C. Soalan-soalan untuk anggota-anggota rumahtangga yang bekerja di luar pertanian

1	2	3	4	5	6
					4

Bil. Kampung (1)

Bil. Mukim (2)

Bil. Petani (3–5)

Bil. Kod. (6)

1. Umur Sdr. ________ tahun — 7 8 AGE

2. Jantina: Lelaki = 1
   Perempuan = 0 — 9 SEX

3. Pekerjaan Sdr.

   a) Buruh kilang = 1

   b) Buruh Kerajaan = 2

   c) Perkeranian (Kerajaan/Swasta) = 3

   d) Polis/Peg. Keselamatan = 4

   e) Guru = 5

   f) Pegawai (swasta/ kerajaan) = 6 — 10 KERJA

   g) Lain-lain ________ = 7

4. Pendapatan Sdr. Sebulan dari kerja ini?

   $ ______________

11	12	13	14

PEND

5. Apakah pendapat Sdr. mengenai usaha menanam padi:

   a) Pendapatan rendah = 1

   b) Kerjanya lebih penat berbanding dengan kerja lain = 2

   c) Tidak ada pengalaman = 3

   d) Lain-lain ______________ = 4

15 ☐ USAPA

6. Dalam tempoh 12 bulan yang lepas, adakah Sdr. menolong ibu-bapa Sdr. dalam kerja-kerja pertanian:

   a) Tidak = 0

   b) Apabila diminta bantuan = 1

   c) Apabila kerja kelihatan perlu = 2

   d) Setiap waktu lapang = 3

   e) Lain ______________ = 4

16 ☐ TOLONG

7. i) Jika usaha memperbaiki sistem penanaman padi lakukan, adakah Sdr. ingin turut serta dalam kerja-kerja ini?

   a) Sepenuh masa = 1

   b) Sambilan = 2

   c) Tidak sekali-kali = 3

17 ☐ TURUT

8. Jika orang tua Sdr. mempunyai tanah padi, apakah yang Sdr. lakukan pada tanah padi itu jika orang tua Sdr. tidak terdaya mengerjakannya lagi:

a) Saya sendiri akan mengerjakan = 1

b) Memberi sewa pada orang lain = 2

c) Menasihatkan orang tua menjualkannya = 3

d) Lain-lain ____________ = 4

18 [ ] TAPAOT

9. i) Jika terdapat sebuah kooperasi mengerjakan tanah pertanian itu, secara besar-besaran dengan pekerja-pekerja sepenuh masa adakah Sdr. akan turut ikut serta menjadi anggota.

a) Sebagai pemegang saham sahaja = 1

b) Sebagai pekerja bergaji sahaja = 2

c) Sebagai pemegang saham & pekerja sekali = 3

d) Sebagai pengurus sahaja = 4

e) Tidak mahu menyertai langsung = 5

19 [ ] PARTIC

ii) Jika kooperasi ini kelak dapat menawarkan gaji setinggi gaji Sdr. sekarang, dan syarat-syarat perkhidmatan yang sama, adakah Sdr. sanggup pulang bekerja di Ko-op ini?

Ya = 1

Tidak = 0

20 [ ] KOGAJ

AGRICULTURE

◂ Manual transplanting

▴ Harvesting (by combined harvester)

Direct sowing by drill ▸

'The farming system would be based on mechanised rice monocropping with two or more crops being grown each year.'

ANNEXE E

AGRICULTURE

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2. Tanah Rang di Negeri Pulau Pinang - Taklimat Pengarah Pertanian Pulau Pinang, 2hb Februari, 1981.

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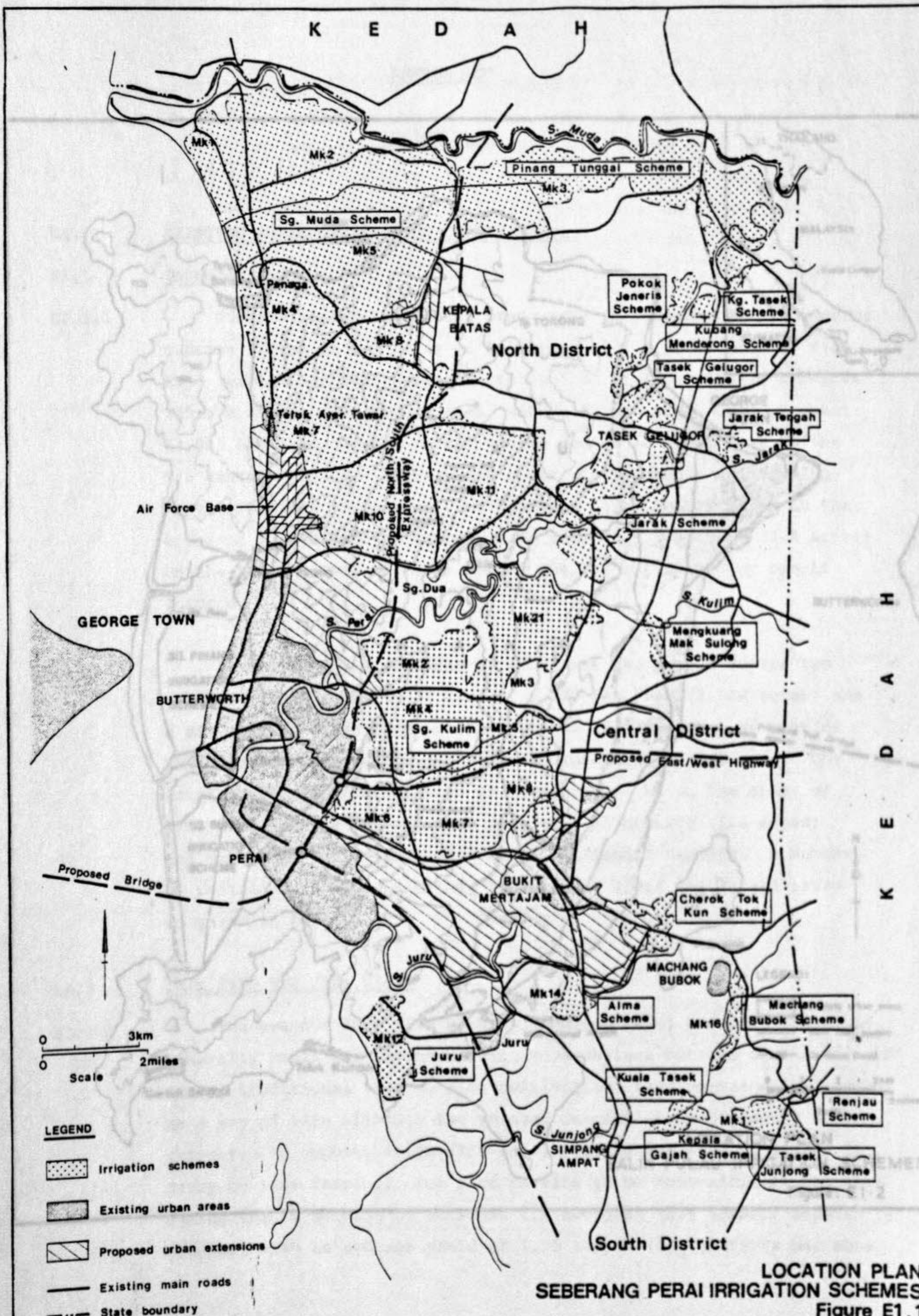
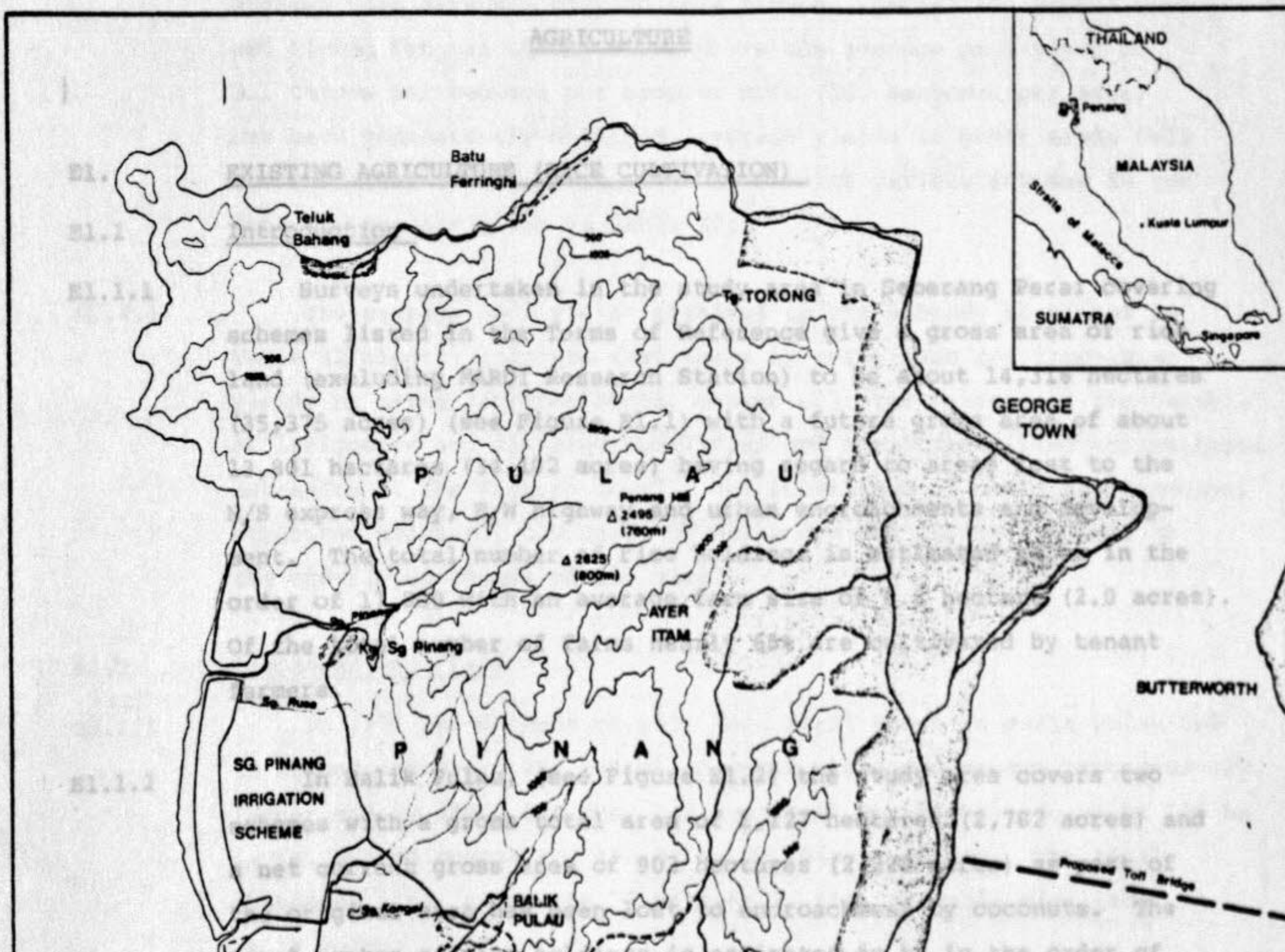


LOCATION PLAN
SEBERANG PERAI IRRIGATION SCHEMES
Figure E1.1



LOCATION PLAN
BALIK PULAU IRRIGATION SCHEMES
Figure: E1·2

ANNEXE 'E'

AGRICULTURE

E1. EXISTING AGRICULTURE (RICE CULTIVATION)

E1.1 Introduction

E1.1.1 Surveys undertaken in the study area in Seberang Perai covering schemes listed in the Terms of Reference give a gross area of rice land (excluding MARDI Research Station) to be about 14,316 hectares (35,375 acres) (see Figure E1.1) with a future gross area of about 13,801 hectares (34,102 acres) having regard to areas lost to the N/S express way, E/W highway and urban encroachments and development. The total number of rice holdings is estimated to be in the order of 17,800 with an average farm size of 0.8 hectare (2.0 acres). Of the total number of farms nearly 65% are cultivated by tenant farmers.

E1.1.2 In Balik Pulau, (see Figure E1.2) the study area covers two schemes with a gross total area of 1,127 hectares (2,782 acres) and a net current gross area of 902 hectares (2,228 acres) as part of the original area has been lost to encroachment by coconuts. The total number of rice holdings is estimated to be in the order of 1400 with a gross average farm size of 0.65 hectare (1.6 acres) and more than 60% of the cultivators are tenant farmers. A summary of individual schemes showing the existing gross and future areas is given in Table E1.

E1.2 Farm Size and Padi Yield

E1.2.1 The average farm size both in Seberang Perai and Balik Pulau is generally small and uneconomical. Nevertheless because of the farmers' strong traditional ties to rice cultivation, they continue the pursuit as a way of life although the younger generation is presently more attracted to opportunities elsewhere, leaving the kampong elders to carry on rice farming. For rice farming to be economical it has been stated that a holding of at least 2.4 hectares (5.9 acres), double-cropped, with an average yield of 1.25 tonnes (500 gantangs per acre per crop is required (Ref. 1). No holding in the study area has an average size anywhere near to this figure. Except for Sungai Muda and Pinang Tunggal scheme areas where the average padi yield of 3.1 tonnes per hectare per crop or more (500 gantangs per acre) has been consistently obtained, average yields in other areas fall short of that level. Average yield for the various schemes in the last 5 years are given in Table E2.

E1.2.2 The average padi yields obtained in the schemes mentioned in Table E2 clearly indicate that there is still room for increasing yields by using improved seeds, better cultural practices, improvement of irrigation and drainage facilities and more intensified agricultural extension at the farmers level. The prevalence of pests and diseases, staggered planting, low level of husbandry and inputs are some of the underlying causes of low yield.

E1.3 Abandoned Padi Land

E1.3.1 In 1974 abandonment of padi land first began in Balik Pulau and in subsequent years the extent of areas abandoned became progressively larger and by 1981, the area had increased to 648 ha made up of 283 ha in Sg. Burong scheme and 365 ha in Sg. Pinang scheme. The total abandoned area represents 72 percent of the irrigable rice lands in Balik Pulau.

E1.3.2 In Seberang Perai, abandonment was reported to have started in 1978 with 30 ha in S.P. Utara and 530 ha in S.P. Tengah. By early 1981 the extent of areas abandoned had increased to 800 ha in S.P. Utara and 2,200 ha in S.P. Tengah (Ref.2). The total abandoned not cultivated in the main season 1980/81 give figures of 2,000 ha in S.P. Utara and 2,800 ha in S.P. Tengah. The total abandoned area represents 35 percent of the total irrigable rice lands in Seberang Perai. Taken together with areas abandoned in Balik Pulau, it is estimated that a total area of 5,488 ha or 37 percent of the total irrigable rice lands in the study area have now been abandoned. (See Table E3)

Reasons for Abandonment

E1.3.3 Interviews with farmers and officials of Government departments and agencies gave the following to be some of the main reasons for the abandonment of padi land:

(i) Shortage of labour brought about by urban and industrial development.

(ii) Staggered planting.

(iii) Deficiencies in irrigation infrastructures.

(iv) Absentee landlords.

(v) Land speculations.

(vi) Lack of enforcement of laws relating to padi cultivation.

E1.3.4 Labour Shortage: In the last decade there was rapid industrial and urban development in the State and consequently, many young and able-bodied rural people were attracted to work in the newly created construction and manufacturing industries. The shift of labour from agriculture to the various industries resulted in severe shortage of farm hands including those who would otherwise be engaged in padi planting.

E1.3.5 Staggered Planting: Staggered planting first started when there occurred continuous outbreaks of pests and diseases for several consecutive seasons, rat damage being the most serious. This resulted in one farmer wanting to plant later than his neighbour to avoid attacks and planting at different times started. With such a practice there was a continuous supply of food for rats favouring rapid multiplication of the pest. As a result many farmers lost their entire crop or obtained unsatisfactorily low yields and suffered loss in income. Many gave up planting padi to look for off-farm jobs.

E1.3.6 Deficiencies in Irrigation Infrastructures: Although Penang was the first State in Malaysia to practice double-cropping of padi, the irrigation system and infrastructures have become out-dated to cater for the demand as areas under double-cropping grew in size from its inception in the fifties when irrigation systems were designed to service a limited area only. As a result, there were problems on the part of DID to cope with water demand and these were further aggravated by demands for water for other uses.

E1.3.7 Absentee Landlord: The State of Penang has limited lands for development and because of pressure on the limited land resources prices have risen to almost unrealistic levels, so much so that cheaper padi lands and kampong lands are being sought after by purchasers for housing and small industries. Attracted by the high prices offered, many padi lands have changed hands and such lands have been left uncultivated thus contributing to the increase in size of "tanah rang".

E1.3.8 Land Speculation: Land speculation is another contributing cause to the increase in areas under "tanah rang". This is particularly true in the Central District and the S.W. District in Penang Island. Such speculators have little interest in renting out the lands for padi cultivation and less so in cultivating the lands themselves. Their main aim is to wait for an opportune time to dispose of the lands for maximum profits.

E1.3.9 Lack of Enforcement of Laws Relating to Padi Cultivation: Chapter 145, Ordinance No. 39 of 1934 cited as the Rice Cultivation Ordinance was promulgated "to control the time and method of the preparation and cultivation of land for the growth of rice". Under the Ordinance, rules may be made and gazetted for compliance by padi planters failing which they can be brought before a Police Court and penalised. It is assumed that the Ordinance has not been enforced as the amount of penalty provided for non-compliance is too small to have any deterrent effect on the offenders. Laws relating to padi cultivation are out of date, requiring close studies and revision.

E1.3.10 Attempts have been made by DOA in 1975 and 1979 to rehabilitate abandoned padi lands under a crash programme under which assistance to farmers was given in the form of land preparation. The programme met with only limited success as the farmers were reported to be rather indifferent to the programme. A similar programme in three parts of the Project Area is currently being organised by the LPP.

E1.3.11 Organisation in the rehabilitation of abandoned lands is proposed at Section E6 of this Annexe.

E1.4 Production Constraints

Soil

E1.4.1 Constraints to high padi yield due to soil texture, acidity, toxicity etc. in the study area are confined to a few and small localised areas only. In Seberang Perai, 85 percent of all the padi lands fall within the 3 schemes namely, Sg. Muda, Pinang Tunggal and Sg. Kulim whose soils are found to be eminently suited to padi having in nearly all cases "clay + ½ silt" indices exceeding 70. In the two schemes, Sg. Burong and Sg. Pinang in Balik Pulau, most of the soils examined have "clay + ½ silt" indices well exceeding 70 and together, soils of the schemes cover more than 90% of the total padi lands of Balik Pulau. On the whole, it may be said that soil does not constitute a major constraint to padi production in the study area. Exceptions are (i) the Juru scheme (244 ha) in Seberang Perai Tengah where low pH or high acidity constitutes the most serious constraint to padi production (ii) the marginally low "clay + ½ silt" indices of soils which occur in Cherok Tok Kun (106 ha), Machang Bubuk (136 ha) and some parts of Tasek Junjong and Alma Schemes. The Cherok Tok Kun Scheme area has since been abandoned, partly also because of shortage of water.

Water Availability

E1.4.2 Water availability constitutes another production constraint to padi production in the study area. This is especially relevant in padi double cropping areas where water is most needed for presaturation and field preparation for off-season padi during the time of minimum river flows in late February and early March. Where supply depends on pumping, difficulties have been encountered on account of breakdown of pump/s resulting in a reduced area cropped for that season.

Irrigation Infrastructure

E1.4.3 Some inadequacies in the distribution system at the farm level coupled with weed infestation in distributaries and field channels have been indentified as further production constraints. Distribution of water is generally effected by flooding, and the speed and effectiveness of distribution depend to a large extent on the free flow of water within the fields. Fields distant from source of supplies depend largely on water which flows from field to field by gravity. Interruptions and delays are often encountered and sowing and planting can be put back by several weeks, so much so that harvesting coincides with unfavourable weather conditions. Furthermore, when supplies are shut off to effect drying of fields with earlier planted rice nearest the offtakes, late planted rice in the more distant fields is affected by premature drying at a time when water is still needed.

Other Constraints

E1.4.4 There is apparently some difficulty in obtaining the service of contractors for land preparation particularly during the busy season. Many full time ploughing contractors have moved out to more lucrative opportunities in the construction industries and elsewhere where payments are more assured and prompt. A further constraint is the severe shortage of farm labour resulting from the movement of young people from farm to construction and manufacturing industries which offer more secure income and cleaner working conditions. This has brought about a residual population of elderly people remaining on the land with little incentive to farm and improve productivity. High cost of inputs especially labour for transplanting and harvesting and difficulty in securing input credit are additional constraints identified.

E1.4.5 Other constraints of a more general nature but which hinder production and productivity are:-

(a) the small size of farms;
(b) the farmers' attitudes, values and practices - these are not in keeping with present standards;
(c) insecurity of tenure among tenant farmers and high rental for land;
(d) different times of planting giving rise to pests and diseases problem;
(e) slow transfer of technologies from research to field.

E1.5 Cropping Intensity

E1.5.1 Based on available data for most of the schemes in the study area, the cropping intensity indices for the base year 1976 and five years later 1980 have been determined and these are shown in Table E4.

Table E4. Cropping Intensity Indices 1976 and 1980

Scheme	1976 Intensity Index	1980 Intensity Index	Decline Index
Seberang Perai:			
Sungai Muda	2.0	1.8	-0.2
Pinang Tunggal	2.0	1.9	-0.1
Jarak	2.0	0.9	-1.1
Tasek Glugor	2.0	1.6	-0.4
Sungai Kulim	1.9	0.4	-1.5
Alma	2.0	2.0	0.0
Jarak Tengah	2.0	1.4	-0.6
Juru	0.5	0.5	0.0
Machang Bubok	2.0	1.3	-0.7
Sg. Renjau	2.0	2.0	0.0
Tasek Junjong	2.0	1.7	-0.3
Sg. Duri	2.0	2.0	0.0
Cherok Tok Kun	0.0	0.0	0.0
Kuala Tasek	0.0	0.0	0.0
Balik Pulau:			
Sungai Pinang	1.0	0.6	-0.4
Sungai Burong	1.4	0.5	-0.9

E1.5.2 From the indices given in Table E4 above, it will be seen that cropping intensity has generally declined both in Seberang Perai and in Balik Pulau notably in Sg. Kulim, Jarak, Sungai Burong, Machang Bubok, Jarak Tengah, Tasek Glugor, Sg. Pinang and Tasek Junjong in the order given. There has been little decline in cropping intensity in Sungai Muda, Pinang Tunggal, Alma, Sg. Renjau and Sg. Duri scheme areas. The decline has been mainly attributed to abandonment of padi lands of which the most serious are in the Sg. Kulim, Jarak and Sg. Burong schemes. Cherok Tok Kun and Kuala Tasek had been completely abandoned although a fresh attempt has been made to rehabilitate the Kuala Tasek scheme in the 1981 off-season.

E1.6 Cropping practices (padi)

Double-cropping

E1.6.1 Double-cropping of padi is practised in areas where there is an assured supply of irrigation water for the cultivation of two crops, the main and the off-season crop in a calendar year. In the main season which coincides with the high rainfall period, the problem of water shortage does not arise. In the off-season, however, water becomes the main constraint and where irrigation water is obtained by pumping or gravity intake from an adjacent river, off-season padi growing becomes uncertain and areas under cultivation each off-season are determined by the quantity of supply. In a dry year, water supply combined with the existing inadequate tertiary distribution systems may limit the extent of area to be cultivated. Insufficient supply during the critical stage of growth of the crop, may result in crop failure. In less severe cases, yields are often seriously affected.

E1.6.2 In the State of Penang, the natural short wet season usually begins about mid-March when supply of irrigation water for field presaturation begins to allow for sowing of seeds to commence in early April and transplanting to complete before the end of April and harvesting to finish by mid-August. Late sowing beyond mid-April is highly undesirable as the crop may subsequently run into a wet harvest with serious consequences.

E1.6.3 Padi varieties cultivated in the off-season are as a rule varieties with low photo period sensitivities (period fixed) and of short maturations varying between 120 - 135 days. Most of the popular varieties now grown in double-cropping areas belong to this group and these are also grown in single cropping areas.

Single-cropping

E1.6.4 Single cropping of padi is practised in rainfed areas which are mainly dependent on direct rainfall when there is a period of uninterrupted supply of water necessary for field preparation, sowing of seeds and growth of the crop from transplanting to flowering. In Penang, the period falls between September and November which is followed by a gradual decline in rainfall with the onset of the dry season from December to February, traditionally the harvesting season of the main season crop.

E1.6.5 In the years before the introduction of short maturation (period-fixed) varieties, only long maturation season-fixed varieties were used. Some of the varieties were Seraup 50, Siam 29, Serendah Kuning, Radin Ebos, Nachin, etc. These varieties have maturation periods of 5 - 6 months and are tall and highly prone to lodging with poor response to fertilisers.

E1.6.6 These have now been replaced by varieties developed by the Department of Agriculture (DOA) and the Malaysian Agricultural Research and Development Institute (MARDI) and are of short maturation, short to medium in height, resistant to lodging and highly responsive to fertilisers and therefore have potentials for high yield. Some of the varieties are Mahsuri, Bahagia, Sri Malaysia, Jaya, Setanjung and Sekincang.

E1.6.7 Nursery preparation: The wet nursery method is common throughout. Seeds are normally soaked in water for a day and are then removed and spread out and covered with a wet gunny sack for a further period of 48 hours to hasten germination before broadcasting onto a prepared nursery bed or onto a well puddled plot. Although the recommended sowing rate is one gantang of seed for every 500 sq. ft. of nursery, farmers generally sow at a higher seed rate of up to 1½ - 2 gantangs seeds for the same area using up to 8 gantangs of seeds for each acre of field padi. The seed bed is usually fertilised with subsidised fertiliser Ammophos 11:48 at the rate of 2.2 lb per 500 sq. ft. of nursery as recommended by the Department of Agriculture. After sowing of the pre-germinated seeds, the seed bed is covered with a layer of mulch or banana leaves for a period of 2 - 3 days as a precaution against birds. Water level is gradually increased as the seedlings grow in height.

E1.6.8 Land preparation: Land preparation is commonly done by contractors using a four-wheeled tractor with a rotovator attachment or by a power tiller. The contract rate has risen to $80 - $100/ac for two rotovation rounds and payment is cash after work. For single rotovation, the rate is $45 - $55/ac. On exceptionally deep areas, land preparation is done manually at a cost of $170/ac.

- In Seberang Perai Utara, it is estimated that 65% of the field preparation is done by four-wheeled tractors, 30% by power tillers and only 5% by hand.
- In Seberang Perai Tengah, the corresponding ratio is 40:40:20.
- In Seberang Perai Selatan and Balik Pulau, most of the work is done by hand because of the prevalence of deep land unsuitable for mechanised cultivation. Hand preparation consists of slashing, heaping and spreading of the partially decomposed weeds under flooded condition.

E1.6.9 In recent years, farmers who rely on contractors to prepare their fields are experiencing difficulties in obtaining their services due to the fall in tractor population. Because of the increasing areas of abandoned padi land, contractors were said to have insufficient work and have moved out to other contract jobs in the urban and industrial sectors. Another contributing factor is said to be poor payment which has discouraged contractors to continue providing services to farmers.

E1.6.10 Transplanting: Most rice in the project areas are transplanted either by contract or by mutual help (gotong-royong). Seedlings used vary from 25 - 40 days but 30 day old seedlings are commonly used. Spacing used is generally 30 cm x 30 cm (12" x 12") irrespective of varieties and because of the traditional use of the "kuku kambing", planting tends to be generally deeper than desirable. The number of seedlings per hill also tends to be higher than recommended. Whereas 3 - 4 seedlings per hill are adequate, twice the number are used, hence the high seed rate used by farmers in most cases.

Observations tend to suggest that although spacing of 30 cm x 30 cm (12" x 12") is intended, in actual practice the spacing always tends to be higher resulting in a planting density of only 9 to 10 hills per square metre. Better yield can be obtained if a higher planting density is adopted - 16 hills/m^2.

E1.6.11 Weed control: The traditional practice of weed control is hand weeding during the period 30 - 60 days after transplanting. The number of weeding rounds depends on the degree of weed infestation but one round is common and is done usually before topdressing of fertilisers. Because of high labour cost, two weeding rounds are rare. The use of herbicides for weed control is not yet widely practised. From reports gathered from Koperasi Peladang Managers, it would appear that farmers are beginning to switch over to the use of chemicals for the control of weeds. Rumputox (butylester of 2, 4-D) and Esteron 45P (butylester of 2, 4-D) are two popular brands of herbicides used. They are mixed together with fertilisers and applied about 14 days after transplanting.

E1.6.12 Fertiliser applications: Fertilisers for padi planting are fully subsidised by Government under the Padi Fertilisers Subsidy Scheme launched in 1979. Every padi farmer under this Scheme is entitled to receive 1 x 4 kg bag of Ammophos 11:48 for the nursery, 2 x 20 kg of urea and 4 x 20 kg bags of NPK basal mixture 23:11:11 for every acre of padi to be planted up to a maximum of seven (7) acres per planter. LPP handles the distribution through its area Koperasi Peladang.

Official recommendations for fertiliser applications are as follows (Ref.3):

Levels of Nutrient	Total N	Total P (lb/ac)	Total K
Off-season/Main Season :	80	20	20
For padi Mahsuri o/s and m/s :	60	20	20

Time of Application

Application	Time	Rate
First topdressing	14 days after transplanting	Half the nitrogen and all the phosphorus and potassium
Second topdressing	At panicle initiation stage	Balance half of the nitrogen

E1.6.13 It is reasonable to assume that all subsidised fertilisers received are being used. Little is known if there are malpractices such as fertilisers being sold in exchange for cash. As regard time of application, farmers do not as a rule adhere strictly to the recommendations and maximum benefits of the Scheme are thus not obtained. Extension efforts of the Department of Agriculture under its 2L System should help to correct any shortcomings in proper technology of fertiliser use.

E1.6.14 It is further observed that in the project areas, planting of rice is carried out at all times of the year. The full benefit and effects of the nutrients supplied in the fertilisers will not be realised in crops which do not receive sufficient sunshine during their reproductive phase of growth i.e. the last 45 - 50 days of the life of the plant. Hence it is important that the planting seasons be strictly regulated and all padi planting activities be re-scheduled i.e. late March/early April sowing for o/s padi and September sowing for m/s padi.

E1.6.15 <u>Padi varieties</u>: No less than 10 different varieties of padi are grown in the various scheme areas (see Table E5). The most popular variety is Katek (syn. Seribu Gantang) which is a short-strawed, erect and high yielding variety with a maturation period of 135 - 138 days. It is not an officially released variety but nevertheless popular among farmers. Improved Mahsuri (syn. Anak Dara) is also another popular variety. It is short-strawed, erect and high yielding with a maturation period of 125 - 128 days. Other popular varieties are Mat Candu, Bahagia, Mahsuri. Two varieties released in 1979 viz. Setanjung and Sekencang and officially recommended for planting in the project areas of Seberang Perai are now being encouraged by the Department of Agriculture but their full endorsement by farmers have yet to be seen.

E1.6.16 Field visits and observations have clearly shown that there is an urgent need for a full scale seed renewal exercise. A very high proportion of fields are carrying crops of mixed varieties thus necessitating more than one round of harvesting because of uneven ripeness which affect quality of padi for sale. The extension service of the Department of Agriculture can help to rectify this unhealthy situation.

E1.6.17 Millers do not as a rule welcome too many varieties of padi as they entail extra time to adjust their machines in accordance with the padi to be milled. It is suggested that extension effort should also be directed towards reducing the varieties grown by farmers to 2 or 3 of the top varieties only, having regard to their maturation period, suitability, yield, quality of milled rice and market price.

E1.7 Cropping Practices (vegetables)

Vegetable production in the study area is largely concentrated in Pinang Tunggal in Seberang Perai Utara. Small scattered plots are found in Machang Bubok and in the northern periphery of the Sg. Muda scheme but these are quite insignificant. The Pinang Tunggal vegetable area is by far the most important, covering an aggregate area of approximately 200 ha (495 ac) made up of lots of varying sizes and on different land levels. Where supply of water is difficult on high ground, vegetables are grown throughout the year but where water is available, the general cropping pattern is a rice crop in the main season and vegetables in the off season. Vegetables in the off season may consist of two very short term varieties in quick succession or a single longer maturation variety.

The current production system is based upon a labour intensive technology with land preparation being the only operation completely mechanised.

Among the varieties of vegetables grown, fruit vegetables such as okra (lady's fingers), cucumber, brinjal, chilli and long beans are high on the popularity rating. Leafy vegetables are the least popular. The preference for fruit vegetables is largely determined by factors such as perishability, distance to market and relative return to labour input.

Table E1 Existing Gross and Future Gross Areas - Rice in Seberang Perai and Balik Pulau

	Name of Scheme	Existing Gross Area		Future Gross Area
		Acres	Hectares	Hectares
	Seberang Perai			
1.	Sg. Muda	17,606	7,125	6,950
2.	Pinang Tunggal	3,956	1,601	1,585
3.	Jarak	1,952	790	778
4.	Tasek Glugor	647	262	262
5.	Kulim	9,054	3,664	3,369
6.	Alma	245	99	82
7.	Jarak Tengah	242	98	98
8.	Juru	603	244	244
9.	Machang Bubok	336	136	136
10.	Renjau	50	20	20
11.	Kuala Tasek	59	24	24
12.	Tasek Junjong	412	167	167
13.	Kg. Kepala Gajah	163	66	66
14.	Sungai Duri	50	20	20
		35,375	14,316	13,801
	Balik Pulau			
1.	Sungai Burong	1,296	525	1,084
2.	Sungai Pinang	1,486	601	
		2,782	1,126	
	Total (S. Perai and B. Pulau)	38,157	15,442	14,885

Table E2 Average Padi Yield:- Main Season 1976/77 - 1980/81 and off season 1976 - 1980

Scheme	Av. Padi Yield Main Season 1976/77 - 1980/81		Av. Padi Yield off season 1976-80	
	Ton/ac	Gtg/ac	Ton/ac	Gtg/ha
1. Sg. Muda	1.25	500	1.25	500
2. Pinang Tunggal	1.43	570	1.35	537
3. Sg. Jarak	1.00	399	1.03	413
4. Tasek Glugor	1.03	413	1.06	424
5. Kulim	1.14	457	1.05	420
6. Jarak Tengah	1.00	400	1.00	400
7. Juru	0.81	323	0.73	293
8. M. Bubok	1.04	417	0.93	370
9. Sg. Renjau	0.98	390	0.75	300
10. Kuala Tasek	1.00	400	0.86	345
11. Tasek Junjong	0.93	370	-	-
12. Sg. Pinang	1.05	420	0.68	273
13. Sg. Burong	1.00	403		
Average (S. Perai & Balik Pulau)	1.05	420	0.96	385

Table E3 Acreages of Padi Land under "TANAH RANG" in Various Districts, Seberang Perai and Balik Pulau

District / Year	Seberang Perai Utara		Seberang Perai Tengah		Pulau Pinang Balik Pulau		Total Whole State		Percentage of Gross Area
	ha	(ac)	ha	(ac)	ha	(ac)	ha	(ac)	%
1974	-	-	-	-	121	(300)	121	(300)	0.8
1975	-	-	-	-	186	(460)	186	(460)	1.2
1976	-	-	-	-	202	(500)	202	(500)	1.3
1977	-	-	-	-	61	(150)	61	(150)	-
1978	30	(80)	530	(1300)	486	(1200)	1044	(2580)	7
1979	140	(350)	660	(1630)	486	(1200)	1287	(3180)	8
1980	400	(1000)	1300	(3200)	648	(1600)	2347	(5800)	15
1981	800	(2000)	2200	(5375)	688	(1700)	3673	(9075)	24

Source: Department of Agriculture, Pulau Pinang.

No land is reported abandoned in Seberang Perai Selatan.

Recent estimates of land not cultivated in the Main Season 1980/81 give:

Seberang Perai Utara : 2,000 ha (5,000 acres)
Seberang Perai Tengah : 2,800 ha (6,900 acres)

giving an overall percentage of 36% of land uncultivated.

Definition: The definition of "TANAH RANG" or abandoned padi land in so far as it applies to the State of Penang is "padi land which has not been cultivated for four(4) consecutive seasons (double cropping areas) or two(2) consecutive seasons (single cropping areas)". This definition has been accepted by the Jawatan Kuasa Penyelarasan Kementerian Pertanian Negeri Pulau Pinang on 7.3.79.

TABLE E5

Varieties of Padi Cultivated in the Scheme Areas

Variety	Parentage	Maturation (days)		Height cm	Grain	Lodging resist-ance	Blast resist-ance	Threshing quality	Yield potential gantangs/acre
		Main season	Off season						
Setanjung (MR 1)	IR 22 x Pazudofusu	135	140	110-120	Long	High	Medium	Easy	1001
Sekencang (MR 7)	Jaya x Tadukan	120	125	97-120	Long	High	Medium	Easy	1166
Mahsuri	Mayang Ebos 80 x Taichu 65	134	138	110-115	Short	Medium	Low	Easy	760
Bahagia	Peta x Tangkai Rotan	137	145	100-115	Long	Medium	Medium	Easy	900
Improved Mahsuri (Anak Dara)	IR 8 x Mahsuri	125	128	85	Medium	High	Low	Easy	1000
Katek (Seribu Gantang) (farmer's selection)	(Engkatek x Sacupak) x IR 8 (?)	135	138	80	Medium	High	Medium	Easy	1000
Mat Candu (farmer's selection)	Peta x BPI 76 (?)	150	155	120	Long	Medium	Low	Easy	600

Source: Dept. of Agriculture, Pulau Pinang
MARDI, Bumbong Lima

E2. AGRICULTURAL SERVICES

E2.1 Department of Agriculture (DOA)

E2.1.1 The State Department of Agriculture (DOA) provides a variety of supporting services which are mainly directed towards increasing output and production of essential food for the growing population as well as basic raw materials for agro-based industries and for export. It is primarily concerned with the extension of improved agricultural technologies to the farmers. With the launching of the National Extension Project in 1978, a Training and Visit System (syn. 2L System) was introduced in the State and under this System, farmers are organised into informal groups and regularly visited and trained by specially assigned extension workers (agricultural technicians) supported by Subject Matter Specialists (SMS) from the Federal Department of Agriculture. Supplementary training is also provided at regional centres in Relau and Cherok Tok Kun on specially selected subjects for farm youths and women.

E2.1.2 Besides training, other support services provided include the production and distribution of high quality seeds and planting materials, demonstrations on new seeds, fertiliser use, pesticides etc., provision of agricultural inputs under the Agricultural Input Subsidy and Development Programme (AID) with a view to increase production and income of farmers and encouraging the cultivation of specified crops suitable to the State. Other services DOA provide also include matters relating to crop protection such as surveillance of crop diseases and pest infestations and assisting farmers in their control through group action. Services are also provided on matters relating to soil, soil analysis, land use and management and generally all other matters related to agriculture in the State.

E2.1.3 The total number of farming families in the State is estimated at 51,695 (Ref. 4). The number of agricultural extension workers (all levels) servicing farming families in the various districts are given as follows:-

Table E6. Existing Number of Farming Families and Extension Workers according to Districts

District	No. of Families	No. of Extension Workers	Ratio
S. P. Utara	17,078	13	1:1,314
S. P. Tengah	10,569	10	1:1,055
S. P. Selatan	15,469	11	1:1,406
Barat Daya	6,560	7	1:937
Timor Laut	2,019	5	1:404
Training Centres	-	3	-
Supervisory Officers	-	7	-
Total	51,695	56	1:923

E2.1.4 The ratio of extension workers to farming families as set out under the National Extension Project is 1:600. To achieve the target for more effective extension, the following additional staff are deemed necessary:-

Table E7 Existing Number of Extension Workers and Additional Number required according to Districts

District	Existing	Additional	Total to achieve ratio 1:600
S.P.U. (AT)	13	15	28
S.P.T. (AT)	10	8	18
S.P.S. (AT)	11	15	26
Barat Daya (AT)	7	4	11
Timor Laut (AT)	5	-	4
Training Centres (AT)	3	1	4
Supervisors (AA)	7	2	9
Total	56	45	101

AT = Agricultural Technician - Certificate Level
AA = Agricultural Assistant - Diploma Level

E2.2 Farmers' Organisation Authority (LPP)

E2.2.1 The Farmers' Organisation Authority (LPP) in its early years of establishment in 1973 was concerned with the re-organisation of kampong farmers' associations and agro-based co-operative societies into area farmers co-operatives (koperasi peladang kawasan). Resulting from the re-organisation exercise, there are now eight(8) koperasi peladang kawasan (KPK) in the State and these are given in Table E8 below:-

Table E8 Details of State Farmers' Organisations

Name of KPK	District	Mukim	No. of Farming Families	No. of Members	Percent Members
1. Kawasan 1, Penaga	SPU	1-5	3,045	1,742	57.2
2. Kawasan 2, Lahar Bubu	SPU	7-10	3,007	1,321	43.9
3. Kawasan 3, Pokok Sena	SPU	6,11-13,16	2,460	1,383	56.2
4. Kawasan Utara, Kg. Pelet	SPT	2,5,18-21	4,785	1,111	23.2
5. Kawasan Bukit Mertajam	SPT	1,6-17	4,365	1,045	23.9
6. Kawasan 1, Sg. Acheh	SPS	7-10	1,662	891	53.6
7. Kawasan 2, Tasek	SPS	1,6-15	1,900	263	13.8
8. Kawasan Sri Pulau	B. Daya	B. Daya	3,370	914	27.1
			24,594	8,670	37.3

Source: Lapuran Tahunan 1979, LPP Negeri Pulau Pinang(Ref.5).

E2.2.2 It is suggested that a concerted effort be made to increase the membership to a target of at least 70% to make the KPK more effective in servicing the farmers within their organic areas of control. The supporting services provided by LPP through the KPK include the distribution of padi fertilisers under the Padi Fertilisers Subsidy Scheme, the provision of mechanisation services, the provision of transport services, the provision of seasonal and medium term loans, warehousing and marketing. KPK are also engaged in consumer trading and sale of various agricultural inputs on the use of which technical guidance is also provided. They also provide services to farmers in group farming projects which are generally encouraged. A revolving fund by LPP is provided to each KPK to facilitate farmers to obtain agricultural inputs at reduced cost and this is further supplemented by KPK's own fund.

E2.2.3 In order to encourage mechanisation and tractor ownership, LPP also provide loans whereby farmers may obtain loans on a small down payment and the balance to be paid in six(6) instalments on a reduced interest rate of only 4% per annum. In 1979, 89 farmers were provided with loans under the scheme made up of 79 farmers in S.P. Utara and 10 farmers in S.P. Tengah. All tractors purchased were power tillers made up of 60 SUZUE, 16 KUBOTA, 5 YANMAR and 8 DAIDONG with an average cost of $4,762 each. In addition to the loan scheme, LPP is presently in the course of establishing a centralised farm mechanisation centre at Pokok Sena, SPU. The centre will provide repair services to all KPK machines which are used on farmers' fields.

LPP "Tanah Rang" Schemes

E2.2.4 Under the first phase of the rehabilitation of "tanah rang" (abandoned land) exercise, 6,475 acres have been targetted constituting 4,675 acres in Seberang Perai Tengah (SPT) and 1,800 acres in Seberang Perai Utara (SPU). Necessary funds have been allocated to LPP to carry out the exercise and are to cover the cost of spraying and land preparation up to the stage ready for transplanting. The cost of transplanting and subsequent operations is the responsibility of individual farmers. Fertilisers are free under the Padi Fertilisers Subsidy Scheme.

E2.3 Malaysian Agricultural Research and Development Institute (MARDI)

E2.3.1 MARDI is primarily concerned with the provision of research support and under the Fourth Malaysian Plan (FMP), MARDI's research will be more location specific so that the technologies developed can be readily transferred for immediate adoption by farmers. MARDI research emphasis will initially be directed towards annual crops as these crops are more likely to exert the greatest impact over a shorter period of time.

(i) conduct production and adaptive research to identify and overcome constraints to crop production of the area. This entails the assessment of varieties, fertiliser application, planting system, water management, cultural practices necessary for the proper and successful management of crops in a particular area;

(ii) conduct developmental research in order to bridge the gap between research stations and farmers' fields. Research station's newly developed technologies and successful adaptive research findings will be verified for their economic and agronomic feasibility through active farmers participation. Proven successful technologies will be passed on to extension agencies for adoption by farmers.

(iii) to conduct sociological studies and study the impact of newly developed technologies on the farming community.

MARDI has identified the following crops for further research:-

<u>Group I</u>: Crops where some existing technologies are available and these include padi, maize, cabbage and other leafy vegetables;

<u>Group II</u>: Crops where component technologies are required to be ascertained prior to testing in different sites and these include groundnut, mungbean, soyabean, chilli, cucumber and fruit vegetables(vines) and pineapple.

<u>Group III</u>: Crops where technology is limiting and these include shallot and papaya.

<u>Group IV</u>: Crops where suitable areas will have to be identified initially prior to testing and these includes cocoa, durian, rambutan and mango.

E2.3.2 Of particular relevance to the Study Area, it is gratifying to note that MARDI has made most useful contributions. Through its efforts in the breeding of rice, MARDI has in 1979 released two high yielding varieties namely Setanjung (MR1) and Sekencang (MR7) which are gaining acceptance in the double cropping areas. An earlier variety, Improved Mahsuri (Anak Dara) developed by MARDI is also popularly grown. Other varieties such as Katek (Seribu Gantang) and Mat Candu, although not officially released but widely grown, also originated from MARDI Rice Research Station in Bumbong Lima. On fertilisers for rice, MARDI's recommendations have found adoption in fertiliser mixture used under the Padi Fertilisers Subsidy Scheme and application rates and methods are being extended to farmers by extension staff of DOA.

E2.4 <u>Bank Pertanian Malaysia (BPM)</u>

E2.4.1 Bank Pertanian Malaysia's (BPM) supporting role in the study area is primarily concerned with the provision of credit to eligible farmers who undertake agricultural and agriculturally related projects. The Bank's credit programme started in 1972 and is now serviced by its Kepala Batas Branch in Seberang Perai Utara. BPM credit/loan programmes include:-

(a) Short-term padi production credit to assist padi planters with funds for the purchase of material, labour and other inputs;

(b) Short-term loans for the production of all agricultural crops other than padi;

(c) Loans for land purchase and development and for redeeming agricultural land;

(d) Loans for purchase of agricultural equipment;

(e) Loans for poultry, livestock and fishery projects;

(f) Educational loans;

(g) Loans for estate development and agribusiness.

E2.4.2 Besides providing credit/loan services to the agricultural sector BPM also provides savings and other banking facilities, though its role is generally geared more towards the development of agriculture especially rice. Its credit/loan facilities are open to individual farmers, group of farmers, companies and co-operatives.

E2.5 Federal Agricultural Marketing Authority (FAMA)

E2.5.1 The marketing of agricultural produce in the State of Penang is mainly in the hands of the private sector. To assist primary producers to secure the best return for their effort, Government has set up various agencies with a view to reduce the primary producers over-dependence on middlemen in the marketing of their produce. FAMA is one of the many agencies set up by Government with the object of ensuring that farmers obtain reasonable prices for their produce. FAMA assists in finding markets and providing transport if necessary, and in price negotiations with buyers. FAMA itself is involved in its own marketing activities although the volume is rather small. Besides assisting farmers with direct marketing, FAMA also assists by providing market information regarding market prices and demand for various agricultural produce.

E2.5.2 Plans are in hand to enhance the supporting role of FAMA by providing more basic facilities such as cold rooms for storage of perishable farm produce, centres for grading of cocoa beans and additional transport backup to move produce from farms to markets.

E2.6 Lembaga Padi dan Beras Negara (LPN)

E2.6.1. LPN support service, in so far as padi planters in the study area are concerned, is mainly connected with the operation of the Padi Price Subsidy Scheme. Under the scheme, all padi planters are entitled to a price subsidy of $10.00 for every pikul of padi (irrespective of the class of grain) sold to any of the 44 appointed agents of LPN. 7 of the agents are area Farmers' Organisations(Koperasi Peladang Kawasan, KPK) and the rest are private ricemillers or ricemilling co-operatives. Price paid for good, clean and dry padi (14% moisture content) delivered at mill door is $30.00 per pikul for long grain and $28.00 per pikul for medium or short grain padi. Where subsidies to individuals are less than $150.00 payment is made by cash, but where subsidies exceed $150.00 payment is made by cash or cheque at the LPN office at Butterworth or at the Koperasi Kawasan Peladang (KPK) at Penaga.

E2.6.2 Besides the support service of LPN described in the foregoing, LPN is involved in rice importing, stock piling, distributing of rice, licensing of rice dealers and millers and other regulatory and enforcement functions.

E3 CROP PRODUCTION AND IMPROVEMENT

E3.1 Padi

E3.1.1 Padi production in the project areas is low when compared with production in the Muda Irrigation Project (MADA) in Kedah/ Perlis. Yield trials carried out on farmers' fields by MARDI using Sri Malaysia 2 and Sekencang (MR7) have clearly demonstrated that very high yield exceeding 6000 kg/ha (950 gt/ac) is possible. Comparing yield performances in Seberang Perai and Balik Pulau with that achieved in MADA, there appears to be immense scope for improvement of padi yield provided that all recommended practices are adopted. The relative production efficiencies and crop yields for the different areas viz. MADA, Seberang Perai Utara (SPU), Seberang Perai Tengah (SPT) and for Peninsula Malaysia are shown in Table E9.

E3.1.2 The following are general recommendations for the improvement of padi yield in the study area:

E3.1.3 Varieties:

Use only high yielding varieties (HYV) recommended by DOA. For the off-season, short maturation varieties of 120 - 125 days are preferred. For the main season, longer maturation varieties of up to 140 days may be used. In all cases, it is important that only pure seeds be used which may be obtained by purchase or exchange from the DOA.

E3.1.4 Nursery Management:

A high standard of management in the nursery is necessary to produce healthy and robust seedlings. Sowing rate at 1 gantang seed/500 sg. ft. of nursery; nursery to be well fertilised with Ammophos 11:48 at the rate of 1 kg/500 sg. ft. with supplementary topdressing of urea at the rate of ½ kg/500 sg. ft. at 15 days after sowing, if necessary. At the 6-leaf stage (25-30 days after sowing), seedlings should be used for transplanting. Use of older seedlings is not recommended.

E3.1.5 Transplanting:

Planting density of 16 hills/m^2 (25 cm x 25 cm) is recommended. 3-4 seedlings/hill are quite adequate for most varieties. Depth of planting varies between 5 cm to 15 cm (2-6 in) depending on age of seedlings and field condition. Deep planting >15 cm (6 in) should be avoided.

E3.1.6 Fertilisers:

Use fertilisers as recommended by DOA. For most HYV, the recommended levels are 90 kg/ha N (80 lb/ac), 22.5 kg/ha P (20 lb/ac) and 22.5 kg/ha K (20 lb/ac) for both the main and off-season padi. It is also recommended that half the total quantity of N be applied at 14 days after transplanting together with all the P and K. The balance of N should be applied at about panicle initiation stage which is 6-7 weeks after transplanting or about 30 days before heading. N should be applied as Urea.

E3.1.7 Weed Control:

Because of the high cost of manual weeding, more use of herbicides is suggested. Grass weeds can be reasonably controlled by early inundation. For the control of broadleaved weeds, it is recommended that 2,4-D butylester be used and applied at the rate of 2.25 kg/ha (2 lb/ac) at 3 weeks after transplanting. However, in order to save cost of applying fertilisers and herbicides separately, both may be mixed and applied in a single operation.

E3.1.8 Pests and Diseases Control:

The assistance of DOA should be sought in case of outbreaks which should be reported without delay. In the case of rats, control requires community action and total involvement of the village or kampong people and so a smooth and functional organisation should be created and maintained.

E3.1.9 Irrigation Water Management:

Water in the field should be drained 7-10 days before harvesting to hasten maturity of late tillers and improve harvesting conditions. Too early draining especially in lighter soil, should be avoided as it may give rise to poorly developed grains and ultimately lower yield.

E3.2 Direct Seeding of Padi

E3.2.1 In view of the labour shortage and the possible introduction of large scale mechanised padi farming as an answer to the problem, direct seeding which eliminates the laborious task of transplanting has considerable attractions. We assume that direct seeding will be necessary for the group farms we are putting forward. Brief notes on the method as it affects agricultural inputs and engineering criteria follow.

Land Preparation and Irrigation Control

E.3.2.2 Land must be as level as possible as not to allow any part of the field to be exposed when flooded. Weeds are normally found in areas not covered by water. Land can be prepared dry or wet but the dry method is preferred for large scale mechanisation to obtain a fine seed bed for drilling. Positive control of water is essential as it is desirable to be able to control irrigation, drainage and maintain water level as and when required for management of the rice plant in the early stages of growth and to effectively control the growth of weeds.

Rice Variety

E3.2.3 Not all varieties are suitable for direct sowing. Suitable varieties are those which are stiff-strawed and resistant to lodging. Varieties such as Setanjung (MR1), Sekencang (MR7) and Jaya are all suitable.

Rates of Application

E3.2.4 Sowing rate depends on the tillering rate of the variety used. Higher seed rate is used for low tillering variety and vice versa. Seeds of lower germination require a higher seed rate. It is however advisable to use seeds with a high germination percentage and as far as possible, use of seeds with germination of less than 80% should be avoided. Normal seed rate used in other countries is of the order of

80 - 100 kg/ha (70 - 90 lb/ac). However much lower rates are being tried in experiments under way in the State.

Method of Direct Sowing

E3.2.5 There are several methods, namely:

(a) Drilling in dry soil;
(b) Broadcast on mud;
(c) Broadcast in water;
(d) Drill on mud.

E3.2.6 Drilling in dry soil is the standard method used and is also the method now practised in Tanjung Karang where approximately 5,000 acres of padi are directly seeded. The seeds are drilled in 1 - 1.5 cm below the soil surface spaced at approximately 25 cm or 10 in. between rows and covered. After drilling, water is admitted just enough to wet the soil. As the seedlings grow, the depth of the water is gradually increased in the same way as seedlings in wet nurseries are managed. The other three methods (b) - (d) require the use of pre-germinated seeds.

E3.2.7 Direct seeding has two advantages and these are:-

(a) It cuts down labour cost by eliminating seed bed preparation, care of seedlings in the seed bed, pulling and transporting seedlings and transplanting.
(b) Directly seeded rice matures 7 - 10 days earlier than transplanted rice.

As far as yeild is concerned, there are no fundamental difference in yield between direct seeding and transplanted rice if good management is used with each method. Good yields are understood to be obtained in both the Tanjung Karang and MADA areas.

E3.3 Maize

E3.3.1 Maize has been identified as one of the crops suitable for cultivation as an off-season crop. It has not been grown on a

E3.4.3 Varieties:

Several varieties are capable of giving good yields and these are Dobbs, 655N, E178 and Cosor. Ultimate choice of varieties will depend on results of local trial planting. An average yield of 4.0 tonnes/ha (3,600 lb/ac) for most of the above varieties is attainable under average management.

E3.4.4 Planting and Planting Distances:

Seeds are normally sown in drills 60 cm (24 in) apart. Sowing can be mechanised by the use of seed drillers. For uniform distribution of seeds, it is advocated that one part of seeds be mixed with five parts of river sand before sowing. When seedlings in the row have attained a height of 8 - 10 cm (3 - 4 in), thinning out of the seedlings to 8 cm (3 in) apart should be done.

E3.4.5 Seed Rate:

11.0 - 12.0 kg/ha (10 lb/ac)

E3.4.6 Fertilisers:

Same rate of application as for maize.

E3.4.7 Weed Control:

Same as for maize.

E3.4.8 Pests and Diseases Control:

Same as for maize.

AVERAGE CROP YIELDS AND PRODUCTION EFFICIENCY

Yield Potential	a) Variety Sri Malaysia 2 [a/]	=	6,496 kg/ha
	b) Variety Sekencang (MR 7)	=	6,000 kg/ha

Production/ areas — Crops	Pen. Malaysia [b/]	MADA [b/]	SPU [c/]	SPT [c/]
Main season	2,492 kg/ha	3,418 kg/ha	2,905 kg/ha	2,245 kg/ha
Off-season	2,862 kg/ha	4,227 kg/ha	2,875 kg/ha	2,271 kg/ha
Production efficiency	%	%	%	%
Main season a)	38.3	52.6	44.7	34.6
b)	41.5	60.0	48.4	34.9
Off-season a)	44.1	65.1	44.3	37.4
b)	47.7	70.4	47.9	37.8
Average production efficiency (% of Sekencang)	45.0	64.0	48.0	37.6

a/ MARDI Report No. 54, 1977, ref. 6

b/ Padi Production Survey, DOA 1978, ref. 7

c/ JPT Pulau Pinang (unpublished data) ref. 8

E4 ALTERNATIVE CROPS

E4.1 General

E4.1.1 The present cropping system in the study area is essentially rice-based where at least one main season rice crop is taken. Off-season cropping is largely determined by the availability of water. Where a supply is available, a second rice crop is grown but where water supply is uncertain or inadequate for rice, fields are left to fallow or some short-term upland vegetables, maize and other crops are substituted, but only grown on a very much reduced scale. Varieties of vegetables and other crops cultivated are to a large extent determined by factors such as soil, market, crop duration, perishability, availability of manpower and other inputs, and the individual skill and experience of the operator.

E4.1.2 The established system of rice double-cropping should be continued because of the farmers' long experience and association with rice farming. On the other hand, in areas where inadequate water supply does not permit the cultivation of off-season rice but is adequate for the cultivation of upland short-term crops, a main season rice and off-season upland cropping system is to be recommended. Soil texture is the determining factor in the suitability of crops in any given scheme/area. Suffice it to say, root crops are not recommended for heavy textured soils. Light soils are best suited for all crops including root crops.

E4.1.3 A list of all possible alternative crops is prepared for consideration and these are subjected to further screening and assessment as to their suitability to each of the scheme areas. The following criteria eliminate many of the considered crops:-

a) the crops are unsuitable to the soil;
b) the field duration of the crops exceed 20 weeks and therefore cannot be fitted into the cropping system;
c) the crops give a low return to labour;
d) the farmers are unfamiliar with the cultivation of the crops;
e) the crops cannot find a ready market;
f) the crops can only be grown on a limited scale.

E4.1.4 Further study resulted in the elimination of the following crops for the reasons given:-

i) Ginger:

This crop has a field duration of 34 weeks which is too long as an off-season crop. Since most soils in the study area are heavy textured, it is an unsuitable crop. Its cultivation would displace the main season padi.

ii) Yam:

This crop is elimated on the ground that it has a very long field duration of 44 weeks. Its cultivation during the off-seaaon would displace the main season padi.

iii) Sugar Cane:

This crop has a field duration of 50 weeks and is therefore eliminated. In schemes which are totally abandoned, this crop may be considered.

iv) Tapioca:

This crop has a field duration of 25 - 50 weeks depending on varieties. It cannot be considered as an off-season crop as its cultivation would displace the main season padi. Gross return is low.

v) Tomato:

Although its field duration is 15 weeks and its cultivation can be fitted into the off-season, it has limited consumer market. It is not a crop to grow on an extensive field scale. Technology is limited.

vi) Groundnut, Sweet Potato & Shallot:

Although these crops have field durations of less than 20 weeks and therefore are suitable as crops during the off-season, these are eliminated because they are unsuited to the heavy textured padi soils. They could however be profitably grown in schemes with lighter soils e.g. in Alma, Tasek Junjong, Kuala Tasek, Cherok Tok Kun, Machang Bubok and in the Pokok Kenanga padi area in Sungai Burong.

vii) Tobacco:

Although a promising crop, its scope for large scale planting is limited by soil factor. Most soils are too 'rich' for good quality Virginian tobacco production. Besides, it is labour intensive and labour is already a problem in the study area.

E4.1.5 We have considered bananas and papayas which are semi-perennial crops for large scale cultivation in the two scheme areas of Balik Pulau, in order to satisfy the State's deficits in these two popular fruits. Their cultivation is possible if the rice areas are drained ; however, stringent water requirements for drainage and the uncertainty over the time required to lower the water table sufficiently for their cultivation have led us to exclude these crops.

E4.1.6 Considerations were also given to the conversion of rice land for the cultivation of tree crops. We are not satisfied that such a step is wise as this will lead to haphazard development of individual holdings and a change to a static form of agriculture. If all the rice holdings could be consolidated into one large unit and developed into an estate, there might be justification for such a change. However, this is not socially desirable.

E4.1.7 Our recommendation for vegetable cultivation, which is limited to the Balik Pulau schemes and Pinang Tunggal, is for a mixture in the following proportions:-

Okra(Lady's Fingers)	65%
Brinjal	10%
Long bean	10%
Cucumber	10%
Chilli	5%

Brinjals and chillies have a growth period of 32 weeks which is slightly too long for the crop programme shown in the main reports. However, extra time can be derived either by using a shorter growth period rice variety in the main season, or by starting the vegetables in seed beds and transplanting them after six weeks. Careful timing also will be needed for okra, which should be directly sown in the fields. The market potential for okra locally is limited but it is a less perishable crop which can be packed and shipped to to other States.

Crop Recommendations for Schemes

E4.1.8 Based on the foregoing discussion, our cropping system and crop recommendations for each scheme area are shown in Table E10. In our cropping recommendations, we are conscious of the Government's policy in regard to achieving self-sufficiency in rice and that Government's agricultural and other services presently provided through its various departments, institutions and agencies are particularly geared towards rice. Hence, a rice-based cropping system constitutes the main feature in our crop recommendations for all scheme areas. Where soils are ideal and irrigation water supply presents no limitations as in the case of Sg. Muda, Pinang Tunggal, Sg. Kulim and a few of the smaller schemes, there is no good reason to recommend any major alternative to rice monoculture and rice double-cropping is therefore strongly recommended. Where soils and especially water supply in the off-season are less favourable for total rice double-cropping as in schemes such as Alma, Juru, Machang Bubok, Kuala Tasek, Tasek Junjong and Balik Pulau, the cropping system should be based on a main season rice crop followed by limited rice with alternative upland short term crops in the off-season.

Table E10 Crop Recommendations for Schemes in Seberang Perai and Balik Pulau

Scheme	Future Gross Area (ha)	Soil Textural Type	Main Season Crop	Off-season Crop	Remarks
Seberang Perai					
1. Sg. Muda	6,950	Clay	Padi	Padi	Soils most ideal and water available for double cropping of rice.
2. Pinang Tunggal	1,585	Clay	Padi	Padi and Vegetables	Soils most ideal and water available for double cropping of rice. Present vegetable areas should be retained and expanded if necessary.
3. Sg. Jarak	778	Clay and clay loam	Padi	Padi	Soils most ideal and water available for double cropping of rice.
4. Tasek Glugor	262	Clay	Padi	Padi	" " "
5. Sg. Kulim	3,369	Clay and clay loam	Padi	Padi	" " "
6. Alma	82	Sandy clay	Padi	Padi, Maize & Vegetables including root crops	Limited double cropping of rice subject to availability of water;balance of area may be devoted to all types of vegetables including root crops.
7. Jarak Tengah	98	Clay and clay loam	Padi	Padi	Soils most ideal and water available for double cropping of rice.
8. Juru	244	Clay	Padi	Padi	Acidity problems for upland crops in the off-season. Padi preferred in off-season subject to availability of water. Area nearer the sea may be developed for aquaculture to enable part of area to be double cropped.
9. Machang Bubok	136	Loamy sand	Padi	Padi & Maize Vegetables including root crops.	Soils marginally suited for padi requiring high rate of fertilisation. Limited double cropping of rice due to shortage of water; balance of area may be devoted to vegetables including root crops.
10. Renjau	20	Clay and clay loam	Padi	Padi	Good padi soil and traditionally double cropped with rice. Rice double cropping recommended.
11. Kuala Tasek	24	Loam and fine sandy loam	Padi	Padi & Maize & all vegetables including root crops	Ideally suited for vegetables and maize and root crops in the off-season. Preference over padi due to water problem in the off-season.
12. Tasek Junjong (incl. Kepala Gajah)	233	Clay and loam	Padi	Padi & all vegetables	Padi to be confined to heavier textured soils in the off-season and limited vegetables; maize and root crops on the lighter soils.
13. Sungei Duri	20	Clay loam	Padi	Padi	Traditionally double cropped with rice. System may be continued.
Balik Pulau					
14. Sg. Burong	1,084	Clay	Padi	Padi, maize & vegetables	32 hectares in Pokok Kenanga is marginal for padi due to high water percolation losses in the off-season and should preferably be devoted to vegetables and root crops only. Maximum rice double cropping over 300 ha., vegetables 150 ha. and balance to fully mechanised off-season maize. Sorghum could replace maize in exceptionally dry year.
15. Sg. Pinang		Clay	Padi	Padi, maize & vegetables	

E5 FARM MECHANISATION

E5.1 Introduction

E5.1.1 The choice of crop for the proposed agricultural enterprise is largely governed by soil and agronomic conditions whereas the choice of system under which the crop will be grown must take account of the combination of factors which have contributed to the decline in cropped areas. If the abandoned areas are to be reclaimed and the returns from presently cropped areas increased, priority will need to be given to cultivation and harvesting systems which will provide those participating in them with incomes and working conditions that are competitive with those offered in other industries.

E5.1.2 Efforts towards higher production have been hampered by the following:

- poor irrigation and drainage
- problems with pests, especially rodents
- inability to expand farm size due to problems of land tenure
- lack of knowledge of, and ability to apply, technological improvements
- unavailability of farm machines

These problems can only be solved using a multidisciplinary approach in which mechanisation should play a major role.

E5.1.3 There are, however, a number of constraints to mechanisation which include:

- the small size of some holdings which makes individual mechanisation uneconomic
- poor credit-worthiness resulting from present low incomes
- the unwillingness of tenants to commit themselves to long term credit
- poor infrastructure, in some areas, to maintain a small farm equipment industry.

It is felt that many of these problems can be alleviated if groups of smallholders form joint mechanisation schemes which in turn would be the vehicle for the introduction of improved techniques.

E5.2 The Present Situation

E5.2.1 The farming system is based on individually operated smallholdings with casual labour being hired to cope with operations such as transplanting and harvesting. Rice is the major crop. Double rice cropping is possible throughout the majority of the Seberang Perai Schemes whilst it is limited, because of water shortage, to a maximum of about 30 per cent of Balik Pulau. Nowhere, however, is double cropping practised to the maximum extent possible. Mechanised techniques are currently employed in land preparation and, to a limited extent, in harvesting. All other operations are carried out by hand.

Land Preparation

E5.2.2 Land preparation is mechanised throughout the Seberang Perai Schemes but is not yet widespread on Balik Pulau. Hired labour using hand tools is the main means of land preparation in the latter. Mechanised cultivation is generally carried out in flooded conditions using pedestrian power tillers or four wheeled medium powered tractors and mounted rotavators. The majority of the cultivations are carried out by private contractors or by the Farmers Organisation Authority (LPP) with charges being determined by the number of operations required. Charges range from M$100 - M$175 for two rotavations by the LPP to M$225 per ha for similar work by a private contractor.

E5.2.3 Where land has been abandoned and rehabilitation is being attempted under the present LPP Schemes (Section E2.2.4) the land is treated with herbicides and the dead foliage burnt before cultivation is attempted.

Harvesting

E5.2.4 The use of combine harvesters, now widespread in the MADA area to the north, has recently started to encroach on the northern Seberang Perai Schemes. Combine harvesters were introduced by the Muda Agricultural Development Authority in the early seventies, and now a thriving private contracting industry has developed. It is the private contractors, in search of expansion of their business, who are making the main thrust towards mechanisation of harvesting in Seberang Perai. The machines used are self-propelled and are adapted for handling rice.

E5.3 Alternative Systems of Mechanisation

E5.3.1 The main areas of peak labour demand and where mechanised techniques are possible are:

- land preparation
- crop establishment (sowing/transplanting)
- harvesting and threshing

Alternative systems for reducing these labour peaks are discussed in this section in terms of smallholders and group farms.

Land Preparation

E5.3.2 Alternative methods considered for reducing labour inputs of land preparation are:

- dry land cultivation
- use of oxen
- power tilling
- tractor mounted rotavating

Dry land cultivation, using tractor mounted disc harrows, is more suited to the off season crop where sowing is carried out at the beginning of the second rains. Wet land cultivation can be carried out using oxen, power tillers or tractor mounted equipment. Typical work rates for puddling are shown in Table E.11.

TABLE E.11

WORK RATES AND WORK POTENTIAL OF VARIOUS POWER SOURCES

PLOUGHING AND LEVELLING

Power Source	Power (kW)	Speed (m/s)	Daily Work Hours	Pull (N)	Work Rate ha/8 hr day
Oxen	0.5	1	5	500	0.13 ***
Power Tiller	4.5*	1	8**	2250	1.0 - 1.5**
Tractor	45.0*	2.5	8+	9000	7+

* Rated engine power
** 2 operators at 4 hrs/day
*** Typical field capacity over 8hr day
kW = kilowatt
N = Newton
Watt = N.m/s

E5.3.3 Draught oxen were rarely observed in the field. Limitations in output, both in terms of power and length of working day, together with the labour requirements for them and the inevitable loss in productive land to fodder production, make it unlikely that draught animals will be a major power source in this area.

E5.3.4 Power tillers and two wheel tractors are already popular within the project area and it is expected that their numbers will increase in areas where wet cultivation techniques are used. It should be noted however that operating power tillers for long periods is very tiring and to maximise daily output, two operators are required.

E5.3.5 Four wheel, two wheel drive tractors fitted with power take-off (PTO) driven rotary cultivators (Rotavators) are also used in the project area for wet cultivation. This technique has the added advantage that the rotavator has a positive draught effect, that is to say that it has a tendency to push the tractor forward when operating, an important factor when working in flooded conditions. Tractors from 35 - 55 kW are generally adequate for these operations if fitted with cage wheels to reduce ground pressure and thus increase flotation and traction.

Crop Establishment

E5.3.6 The present system of crop establishment is manual transplanting, a highly labour-intensive method. Transplanting can be mechanised but the machines are complex and output is generally low - no higher than can be obtained by hand broadcasting. (See Table E.12). Two techniques of direct sowing are considered as alternatives to transplanting, namely:

- dry sowing
- wet sowing

The dry method of direct sowing is more suited to the 'off season' crop and is carried out by drilling dry, un-germinated seed into a dry, finely tilthed seedbed. The seeds are drilled 10 - 15 mm deep and if a mechanical combined seed and fertiliser drill is used, fertiliser can be applied at the same time.

E5.3.7 If soil moisture is insufficient to allow seed germination, the land has to be carefully irrigated, and drained quickly to ensure that no standing water remains. Three to four weeks after seeding, the crop is flooded with shallow water until it matures. Direct sowing of pre-germinated seeds is applicable to both cropping seasons and can be carried out either by broadcasting or drilling. With the broadcast method the soil must be well puddled and levelled. After draining the seedbed, pre-germinated seeds are broadcast onto the wet soil. Broadcasting can be by:

- hand
- hand operated centrifugal distributor
- tractor mounted centrifugal distributor
- aerial seeding

Hand broadcasting needs skill to ensure even distribution. The swath width should be assessed in the field and is usually around 2.5 m. The manually operated centrifugal distributor produces a wider, more even swath width if used correctly and can also be used to broadcast fertilisers.

E5.3.8 Tractor mounted centrifugal distributors have high outputs (See Table E.12) with swath widths in excess of 10 m. However, traction problems in puddled soil can cause uneven distribution. This, plus the loss of crop growth in wheel tracks unless a levelling board is fitted between the back wheels and the distributor, makes this method unsuitable for the small field sizes in the project. Aerial seeding is high in work rate and low in labour requirement. Costs, however, are relatively high and the method is only suitable where field sizes are large or adjacent fields are to be sown.

E5.3.9 The International Rice Research Institute (IRRI) in Manila have developed 6 and 8 row machines capable of row drilling pre-germinated seeds. Output is considerably faster (up to 15 times) than hand transplanting techniques but is still about half the rate of hand broadcasting. Drilling however, would have the advantage of facilitating mechanical weeding.

TABLE E.12

OUTPUTS OF VARIOUS METHODS OF CROP ESTABLISHMENT

Method	Hectares per man-day (8 hours)
Hand Transplanting	0.05 to 0.07
Machine Transplanting (Manual)	0.2 to 0.3
Machine Transplanting (3kW engine)	1.5 to 2.0
Wet Drilling (Manual)	1
Dry Drilling (power tiller and 1m drill)	1+
Dry Drilling (tractor and 2m drill)	4+
Hand Broadcasting	2
Manually Operated Distributor	2
Tractor Mounted Distributor	8+
Aerial Seeding**	32+

** Assumes 4 hours flying/day

Harvest

E5.3.10 Labour requirements at harvest are higher in terms of total man hours than at transplanting. Alternatives to hand harvesting and threshing are considered as follows:

- intermediate mechanisation of one or more operation(s)
- full mechanisation using combine harvesters

The sequence of harvesting operations is cutting, gathering, threshing and winnowing. Each of these operations can be mechanised individually or in groups of operations.

E5.3.11 Cutting attachments are available for two wheel tractors, some of which have attachments to bind the crop into sheaves. This facilitates collection and threshing. A typical output for this operation is 0.2 ha /hr. Similar attachments are available for four wheel tractors but their manoevrability is limited in small fields.

E5.3.12 Collection of sheaves would be by hand for threshing. Machines are available for threshing and/or winnowing and can be driven by any of the following means:

- hand/foot operated
- small petrol/diesel engine
- two wheel tractor or power tiller engine
- four wheel tractor PTO
- electric motor

Typical rates of work for threshing are 80 - 100 kg/hr for manual threshing, 200 kg/hr for a treadle (foot) thresher and up to 1000 kg/hr for a stationary thresher with engine. This machine also winnows the crop and requires 5 operators, three feeding the crop (sheaves) into the machine, one collecting the grain and one removing the straw.

E5.3.13 Full mechanisation combining all the harvesting operations with one machine can be carried out using combine harvesters. This machine can be built around a conventional four wheel tractor, trailed PTO driven or self-propelled. Of course, the self-propelled is most suited to the harvesting of paddy rice, especially if fitted with a track-laying under-carriage, in place of regular drive wheel equipment, to overcome traction problems. Alternatively, if traction problems are not too severe, dual wheels, wide flotation tyres and rear wheel drive attachements may be fitted. Also, a peg-toothed drum and concave is required for efficient threshing of paddy rice. Rates of work are high (see Table E.13) and labour requirements low. Some assistance is required for handling the grain after harvest.

TABLE E.13

RATES OF WORK OF VARIOUS HARVESTING METHODS

Method	Rate (ha/man-day)
Hand cut and gather	0.04 - 0.05
One Row Motorised reaper/binder	0.4 - 0.7
Two Row Motorised reaper/binder	0.5 - 0.8
Combine Harvester (4.2m cut)	4.8 - 6

E5.4 Recommendations

Land Preparation

Smallholders

E5.4.1 With the introduction of mechanisation to the surrounding areas, it is likely that smallholder farming systems will gradually adopt various levels of mechanisation. Land preparation should continue to be carried out using contractor operated power tillers and/or four-wheeled medium powered tractors and rotavators.

Group Farmers

E5.4.2 Land preparation should be by use of medium powered four-wheeled tractors, using disc harrows for dry land preparation or rotavators for wet land preparation. These operations could be carried out using machinery provided by Machinery Service Centres

E5.5.5 The Working Group has recommended the establishment of Farm Mechanisation Service Centres to speed up the supply of these skills. This idea should be encouraged and these centres should form the basis of a structured programme of mechanic and technician training.

Equipment Selection and Testing

E5.5.6 Much of the equipment available from large international manufacturers is designed for temperate agricultural conditions and may not be entirely suited for tropical agricultural use. It is important therefore that such equipment is carefully selected and its suitability to local conditions proved before recommending its use in the project area. The International Rice Research Institute has involved itself with the development of suitable equipment and can supply working drawings, fsee of charge, of implements such as power tillers, rice transplanters, rice seeders, threshing equipment and grain driers to facilitate local manufacture. This system has the advantage that local modifications can easily be built in if required.

E6. ORGANISATION IN THE REHABILITATION OF TANAH RANG AND OTHER AGRICULTURAL LANDS IN PULAU PINANG

E6.1 Background

Traditionally the irrigation schemes of Seberang Perai and Balik Pulau have been almost entirely devoted to rice monoculture with two crops per year being grown throughout the majority of the area. A small area of diversified cropping, about 200 hectares of rice and vegetables, is practised in part of the Pinang Tunggal scheme, where topography and land levels have precluded double rice cropping. Double rice cropping has come under increasing pressure in recent years and padi land has been abandoned at an alarming rate. The extent of areas abandoned is covered in detail at paragraph E1.3 of this Annexe.

E6.1.2 The existence of highly competitive alternative employment opportunities has been a major factor in causing a severe shortage of farm workers. Some of the reasons for the abandonment of padi land are as follows and described in detail at paragraph E1.3:

- Small size holdings
- Staggered planting
- Deficiencies in irrigation and drainage infrastructures
- Absentee landlords and land speculation
- Land speculation
- Lack of enforcement of laws relating to padi cultivation.

The labour shortage is a direct consequence of Penang's outstanding growth in non-agricultural sectors and must be accepted. Staggered planting and damage by pests, mainly rodents, are now in a vicious circle requiring new standards of farming co-operation. Staggered planting first started when there occurred continuous outbreaks of pests and diseases for several consecutive seasons, rat damage being the most serious. This resulted in one farmer wanting to plant later than his neighbour to avoid attacks and planting at different times started. With such a practice there was a continuous supply of food for rates favouring rapid multiplication of the pest. As a result many farmers lost their entire crop or obtained unsatisfactorily low yields and suffered loss in income. Many gave up planting padi to look for off-farm jobs.

E6.1.3 The aim has therefore been to retain those areas presently being cultivated and to bring abandoned land back into cultivation. Thus, priority has been attached to identifying systems of cultivation which are practically feasible and which will provide those participating in them with incomes and working conditions that are competitive with those offered in other industries. This has meant that the introduction of more intensively mechanised operations has received considerable attention and that economic criteria such as returns to farmers' labour have assumed great importance.

E6.1.4 The most important requirement for successful future agriculture is to persuade the farming community that, with the various forms of assistance due to be provided, there is a future in agriculture in the State and that it can and will provide a proper standard of living. However, the farmers will have to accept that in order to realise this aim their farming practices will have to change, and above all that farm working in large units must be adopted in all areas where the independent farm operator is failing to maintain either his agriculture output or his living standards.

E6.1.5 The most appropriate organisation to persuade the farming community to participate in farming in large units will be the Statutory Body proposed at section E6.6.2. However, before this Statutory Body is formed, it would be the responsibility of the State Government, through its agencies and also possibly the KGN, (see Section E6.3.2) to publicise and get the farmers to accept large scale farming practice.

E6.1.6 A mechanised farming system based on groups of farmers is therefore proposed for abandoned land and areas where farmers themselves wish to form groups and operate on a larger scale.

E6.2 Rehabilitation Scope

E6.2.1 Rehabilitation is intended to mean the upgrading of irrigation of padi land in the State of Pulau Pinang, and subsequent organisation of an agency to be responsible for implementing policies designed to bring padi land back into production. An appropriate form of organisation will be proposed for adoption in efforts to bring idle padi land back into production in Seberang Perai and Balik Pulau, given the socio-economic and political setting in the State.

E6.2.2 The proposal is based on the following premises:

- The over-riding objective of padi land rehabilitation is to put padi land back into production with the use of minimum direct labour since labour is widely known to be in short supply. (Indirectly,the rehabilitation of padi land will also reduce rice imports, save foreign exchange and contribute towards the self-sufficiency goal of the Government).
- The rehabilitation of padi land will not be accompanied by comprehensive land reforms involving land transfers, expropriation, etc. In other words, rehabilitation is not designed to disturb present ownership patterns or the average holding size.
- After rehabilitation, a smaller number of people will be necessary to cultivate padi land, as machines will be more extensively used and new labour-saving technologies introduced.

E6.3 Present Rehabilitation Efforts

E6.3.1 Farmers' Organisation Authority (LPP)

E6.3.1.1 The supporting services provided by LPP through the Koperasi Peladang Kawasan (KPK) include the distribution of padi fertilisers under the Padi Fertilisers Subsidy Scheme, the provision of mechanisation services, the provision of the seasonal and medium term loans, warhousing and marketing. KPK are also engaged in consumer trading and sales of various agricultural inputs on the use of which technical guidance is also provided. They also provide services to farmers in co-operating projects which are generally encouraged. A revolving fund by LPP is provided to each KPK to facilitate farmers to obtain agricultural inputs at reduced cost and this is further supplemented by KPK's own fund.

E6.3.1.2 LPP is presently in the course of establishing a centralised farm mechanisation centre at Pokok Sena, SPU. The centre will provide repair services to all KPK machines which are used on farmers' fields. A second centre is proposed in the report of the working group on padi and other crops.

E6.3.1.3 Under the tanah rang (abandoned land) exercise, 2,600 ha have been targetted, of which three quarters are in Seberang Perai Tengah (SPT) and the remainder in Seberang Perai Utara (SPU). Details are given at paragraph E2.2 of this Annexe.

E6.3.2 Role of Koperasi Gabungan Negeri (KGN)

E6.3.2.1 The State of Pulau Pinang had established a Co-operative Society, called Koperasi Gabungan Negeri, with a long run goal of bringing bumiputras in the State into the nation's economic mainstream, as envisaged in the New Economic Policy. One of the proposed activities of KGN is to gradually take over the cultivation of abandoned padi land in the State through one of its solely-owned subsidiaries, namely, Seberang Padi Integrated Sdn Bhd (SPI). We have learnt that the KGN has been placed under the wings of the Prime Minister's department at the Federal level, and that a Minister-without-portfolio in the department, who is from Penang, has been charged to look after its affairs. The Koperasi, we gather, has been allocated a launching grant of $3 million by the Prime Minister's department. We note that in future SPI plans to venture into rice millings, rice straw processing, and other agro-based activities, although initially it will only concern itself with idle land rehabilitation.

E6.3.2.2 Our meeting with a member of the KGN Board of Directors (Encik Mohd Farid Ariffin, September 17th, 1981) gave the impression that, at this point at least, the KGN has not yet worked out a detailed organisational set-up within the solely-owned subsidiary SPI, which will undertake padi land rehabilitation. We learn however, that SPI is presently conducting a pilot project involving 150 ha of abandoned padi land in Mukim 12, SPU, with the assistance of the State DOA. The pilot project is modelled somewhat on the Asam Jawa scheme with minor modifications. For example, instead of paying rental in kind, SPI proposes to pay a fixed cash rental to land owners. The implemenation of this pilot project rests with SPI which will be advised by a Technical Committee comprising representatives from Government Agencies, namely LPP, DOA, MARDI, FAMA, JPT, etc. The committee will be strictly advisory. Apparently SPI is keen to avoid inter-departmental frictions brought about by a 'multiple-line' organisational structure - which is inevitable if the project were to be run by a committee of agency officials, as in the recent past.

E6.4 Group Farm Concept

E6.4.1 Introduction

The present difficulties cannot be solved by farmers working their small individual holdings; a larger area must be farmed as one unit. An experiment in Seberang Perai Utara in co-operative group farming, proposed by KGN, is promising but its modus operandi has not yet been fully worked out.

In some areas smallholders with larger holdings are expected to remain outside the group farming scheme. However, we consider that group farming is the answer to the problem of very small holdings and labour shortage and when its success has been demonstrated smallholders remaining outside may wish to join also.

E6.4.2 LPP Rehabilitation Schemes

Two rehabilitation schemes for tanah rang in Seberang Perai have been implemented by LPP. They are in Mukims 1 and 4 (400 ha) and in Mukim 8 (175 ha) of Seberang Perai Utara. Necessary funds have been allocated to the LPP to carry out the exercise and are to cover the cost of spraying and land preparation up to the stage ready for transplanting. The cost of transplanting and subsequent operations including harvesting, is the responsibility of individual farmers. Hence, these schemes are based on the principle that the land is handed back to individual farmers after the first land preparation; we therefore do not consider them as complete group farm ventures and should remain indistinguishable from other smallholder areas not yet abandoned.

E6.4.3 KGN Rehabilitation Schemes

The KGN has designated areas for a form of co-operative or group farming by its subsidiary company, SPI. The areas of abandoned land for which the farmers' agreement to co-operative farming has been obtained are firstly in the area of Kg. Pokok Tampang and Padang Songson (150 ha) in the Sg. Jarak scheme area. A second area for co-operative farming by SPI has been selected in Mukim 7 near Telok Ayer Tawar (about 400 ha).

The KGN, we believe, will operate the project as a commercial venture and pay landowners fixed cash rental. A committee comprising representatives from government agencies namely LPP, DOA, MARDI, FAMA, JPT, etc. will be available to advise the KGN. As stated earlier, the KGN has not yet worked out a detailed organisational set-up within the SPI to date.

E6.4.4 Estate Management Concept

An estate management concept of group farming may not be suitable in rice cultivation where the enterprise is run entirely as a commercial venture with farmers only as employees. Farmers' participation in group farming is vital and desirable for the venture to be efficient and successful. An estate management concept in which profit motive is not allowed to operate to the benefit of farmers may eventually result in dismal performances attributable mainly to lack of staying power of the farmers pulled to more attractive jobs elsewhere.

E6.4.5 Consultants Proposals

E6.4.5.1 Overall Structure

The consultants propose a group farm concept which is clearly operated on a two-tier system: the overall mamangement of all group farms on a state-wide basis by a Managing Body and the implementation of group farming at 'grass root' level by individual group farms responsible to the Managing Body as shown in Figures E6.1 and E6.2. The Managing Body could be a government agency such as the LPP or a statutory body created on the lines of MADA or a co-operative organisation like KGN. Justification for this proposal will be set out in Section E6.5.

E6.4.5.2 Group Farms Set-Up

E6.4.5.2.1 The group farm would comprise all the holdings within a tertiary irrigation unit and thus would vary in size both in terms of number of members and overall area depending upon the size of the tertiary unit. The group farms would range between 50 and 80 ha comprising 65 to 160 members. The members would include owner-operators, tenant farmers who were still actively farming the areas, and possibly landowners. The objective should be that, in the long term, the group or a larger unit formed of one or two groups, should have its own elected decision-making committee or board. The committee would be responsible for determining and implementing policies on behalf of its members and for hiring or appointing whatever managerial and supervisory staff were considered necessary. (See Figure E6.2).

E6.4.5.2.2 Should it prove impossible to interest groups of farmers in all areas in returning to cultivate abandoned land, the large scale system of cultivation proposed could equally well interest individual entrepreneurs or even small partnerships. These should not be discouraged since they will contribute to achieving the aim of returning abandoned land to cultivation. Also, individual entrepreneurs can often bring a valuable innovative flair to production systems. A case of reactivation of abandoned land in the off season of 1981 known to us was an area of about 40 ha operated by one such entrepreneur in a part of Balik Pulau.

E6.4.5.2.3 Initially, group farming should be implemented in abandoned padi areas, once the irrigation upgrading is completed. However, farmers in non-abandoned areas should also be encouraged to form groups, and this task should be easy as soon as farmers see the benefits accruing to successful groups in the vicinity.

E6.4.5.2.4 For administrative purposes, we recommended that 2 or 3 tertiary irrigation blocks, depending on the size of a tertiary block, be 'merged' into one 'administrative unit' and placed under one 'unit manager'. The area envisaged to be under the charge of one unit manager is between 150 and 200 ha. Each group farm is to be run by 2 supervisors, chosen from among the more progressive members of the group (landowners and previous tenants), and employ 7 - 10 permanent workers (inclusive of supervisors) depending on the size of the block.

E6.4.5.2.5 We recommend that a farm group be made up of all landowners owning land bounded by a tertiary irrigation block, which varies between 50 and 100 ha. We also recommend that tenants who have since abandoned their holdings be given the opportunity to work as padi workers and given the opportunity to be shareholders in the administrative unit formed by 2 or 3 tertiary irrigation blocks mentioned above. But if these farmer tenants prefer to be workers only, they have no production expenses to worry about. On the contrary, they receive a clean income in the form of wages. There is no loss of income to the previous tenants in abandoned padi land since even without rehabilitation, they have not been cultivating the land anyway. For tenants who are still farming, in largely abandoned areas, the group farm concept ensures that he be given priority in employment in the group farm block.

E6.4.5.2.6 We recommend that each farm administration unit be treated as a profit-loss centre in its own right - meaning that profits made (or loss incurred) by a group should benefit that group alone (larger bonus), thereby ensuring a profit-motive, competitive, element in an otherwise co-operative environment. A central office levy to sustain loss-making areas may be unavoidable at the start, however.

E6.5 The Managing Body

E6.5.1 We have studied possible forms of organisation for the Managing Body to manage rehabilitation of abandoned areas and related tasks. The first issue is whether or not this body should be a government agency. In favour of a government agency are the points that it would be able:

- to acquire land where necessary, given the statutory powers;
- to be responsible and accountable to Government, and to act as a channel for receipt of Government finance;
- to employ on secondment Government officers from existing departments who possessed needed technical skills.

On the other hand it must be accepted that farmers' direct interests in the venture are not identical with interests of officials of a government agency managing the farms: farming should be an enterprise in which the profit motive is allowed to operate.

E6.5.2 The experience of the LPP, LPN and FAMA in having to act as channels of Government technical administration as well as the body for assisting farmers to organise themselves does not seem to us one to be recommended or repeated. We feel that fragmentation (and to some extent, duplication) of functions at the regional level makes it difficult for anyone to co-ordinate the activities of these agencies and to implement programmes in accordance with a coherent policy. Integrated development calls for an integrated approach in implementing plans; such an approach is possible only if there is proper co-ordination of various aspects of the programme - irrigation/drainage operation and maintenance, extension, marketing, credit, machinery and input supply, etc. Proper co-ordination can be better achieved if a single regional managing body is given the power to implement all aspects of agricultural development - from production to marketing. Parcelling out the programme to different agencies has shown to be counter-productive. In the interest of efficiency it is desirable to consolidate all work on projects which cut across the jurisdiction of several government departments and agencies.

E6.5.3 We also feel that Committee arrangement is bound to be weak because there is no formal mechanism by which to co-ordinate the various agencies/departments - only ad hoc procedures in the nature of technical committees, advisory committees and steering committees which have very restricted authority, if any, over each of the agencies.

E6.5.4 We suggest it may be possible to combine the advantage of having a government agency operating with the farmers collectively managing their own farms by the following arrangements:

- A statutory body on the lines of MADA, though smaller both in size and breadth of functions, is set up. For reference this is termed 'Penang Agricultural Development Authority', PADA.
- PADA would manage the group farms but it would allow group farms, or neighbouring clusters of group farms (blocks), as much independence as they wished in managing their own accounts, consistent with efficient agriculture.

E6.5.5 PADA would be managed by seconded officers from government departments or agencies.

- DOA extension functions would be absorbed by PADA
- LPP functions as operators of machinery service centres would be absorbed, or controlled by PADA.
- JPT functions, initially, would not be transferred. We consider the operating difficulties of having part of the State JPT inside and a part of it outside PADA would lead to inefficiency. Furthermore drainage and irrigation infrastructure works represent by far the largest contribution needed from Government funds, and it is thought that an existing agency (at Federal and State levels) would be a suitable body to administer contracts for the large sums involved.

E6.6 The Statutory Body (PADA)

E6.6.1 Objectives of the Statutory Body

We believe the following to be the over-riding objectives of the Statutory Authority.

- In general, to be responsible for all agricultural lands and to plan and implement agricultural development programmes in the State of Pulau Pinang.
- Specifically, to act as a vehicle to be directly responsible for the rehabilitation of idle padi land in the State.
- Additionally, to engage in agro-based undertakings either on its own or in joint ventures.

E6.6.2 Roles of the Statutory Body

- Undertake to rehabilitate idle padi land through the group farm concept.
- Organise farmers into groups to cultivate padi land in other areas.
- Decide on present and future use of all agricultural lands.

- Be responsible for the operation and maintenance of the irrigation system, and other civil engineering structures and physical plants which are in the nature of public investments in the affected areas.
- Be responsible for the secondment of officers from all agriculturally-related agencies in the area.
- Conduct technical evaluation and socio-economic research so that the progress of the project is continually monitored.
- Enlist the services of all existing agencies related with agriculture so that services already available are not duplicated.

E6.6.3 Justification of Statutory Body

We see three major justifications, mostly legal in nature, for establishing a statutory body.

E6.6.3.1 As we have mentioned, there is a need to temporarily transfer some experienced government officers to work in the system. As secondment of civil servants to statutory authorities is a common practice, we thus see no difficulties in direct secondment of government officers to PADA.

E6.6.3.2 A Statutory Body is entitled to receive government funding on a yearly basis and is accountable to Parliament, unlike a private company or a co-operative. Government funding is necessary in order to meet most of the personnel emoluments of the seconded government officers, who will have to be paid anyway even if they remain in government services. Funds are also needed to meet operation and maintenance as well as future development expenditures of the project. Thus PADA forms the vehicle for channelling government funds to the rehabilitated areas. Also, since PADA would be accountable to Parliament chances of misuse of funds will be reduced.

E6.6.3.3 A body such as the proposed PADA will be far more effective in implementing development plans since it will be based in the affected areas, rather than in the Federal Capital, 400 km away. The Chief Executive of the proposed body will have all his problems at his door-step and should be able to take decisive actions immediately.

E6.6.4 Organisation of Statutory Body

We recommend that the Statutory Body be organised, initially into 3 divisions (See Figure E6.1) as follows:

- Engineering
- Agribusiness
- Administration.

The heads of the divisions are designated as Directors, reporting directly to the General Manager of the authority.

It is important that the organisation does not set out with the thought of becoming a permanent body with prestigious offices and so on. There seems no reason why it should need to continue at high level staffing when once the group farm system has been implemented and has surmounted its initial difficulties. Nevertheless it is impossible to predict the number of years that such an organisation would be necessary, and so in order to avoid the risk of under-estimating project costs our economic analysis has allowed for its continuation throughout the project life.

E6.6.5 Section of Authority

E6.6.5.1 Engineering

The Engineering Division will be responsible for the operation and maintenance of all engineering structures and facilities throughout the project areas, as in the MADA scheme.

JPT functions tentatively would not be transferred, but we recommend that eventually the JPT relinquish its role in the gazetted project areas as far as irrigation and drainage of padi land are concerned. We recommend that the staffing of this division be effected by secondment of JPT professionals, who should be given the option of joining the authority.

E6.6.5.2 Agribusiness

The Agribusiness Division will be responsible for manpower training, organising farmers into working group and agribusiness development.

Manpower training. This section under the Agribusiness Division will be responsible for training the needed skilled personnel, in particular unit managers of the group farms and machine operators (tractor, combined harvester, etc). It will also perform repairs for farm equipment and maintain the division's motor pool.

Group farms. This section will be concerned with the organisation of farmers into groups and maintaining a register of all group farms and group members. It will also be responsible for publicity campaigns, with the help of the Agricultural Information Services; to explain to farmers the group farm concept; to get their consent to rent their land to PADA; to have agreements signed, etc.

Agribusiness development. Among other things, this section will be charged with:

- Planning and managing field demonstrations to disseminate information on improved cultural practices, new materials and recommended methods of plant protection to farmers (non-group) and 'unit managers'.
- Co-ordinating credit programmes with BPM
- Co-ordinating marketing programmes with FAMA, LPN.
- Identifying potential business activities and recommending their findings to the Board.

E6.6.5.3 Administration

This Division will be responsible generally for the administration of the whole authority and in particular personnel affairs.

Two important sections will be under this Division:

- Finance: which will be responsible for budgeting, control of expenditure and financing.
- Planning, evaluation and agricultural information services: which serves as the centre for records on progress, evaluation and planning of development programmes and also for the preparation of distribution of educational and other important agricultural information to farmers.

E6.7 The Role of Farmers Organisation Authority (LPP)

E6.7.1 LPP may play one or more of the following roles in the proposed Group Farm concept:

- Each local Farmers Organisation (FO) could represent the farm workers and landowners (the owners of two major resources in padi production) in their dealings with the PADA management.
- The local FO could also enter into direct business dealings with PADA, e.g. supply of inputs, marketing on behalf of PADA, etc.
- Help organise the tertiary group farms.

E6.8 Group Farm Organisation

E6.8.1 We recommend that, group farms should be organised as a self-contained business concern, with its full complement of technical departments. The main technical departments to be set up should be:

- Agronomy/soil
- Agricultural inputs/crop protection
- Mechanisation/work schedulling
- Marketing/credit.

The Deputy Director, Crop Production and Group Farms will be responsible to the Director, Agribusiness Division in the implementation of schemes (See Figure E6.1).

E6.8.2 All Regional Managers and department heads will report to the Deputy Director, Crop Production and Group Farms.

E6.8.3 The PADA headquarters should be based in Seberang Perai with a branch in Balik Pulau. The four main technical departments as mentioned in E6.8.1 shall each be headed by an experienced professional officer. These posts of department heads would only be filled as and when the extent of operations justified them. Most department heads should be seconded from the Government department concerned.

E6.8.4 If and when the organisation had the need to cover the whole area of <u>tanah rang</u> which we estimate as requiring group farms (6,900 ha) at a detailed level of supervision, then an intermediate level of regional offices and regional managers could become necessary. We have budgeted for seven such offices, with the eighth in Balik Pulau, the areas for which could conveniently be based on the present LPP sub-division of the State. In the early stages such an enlargement of management is not necessary, but we recommend that from the start the group farms be joined into units or blocks of two or three, so as to form management units of between 150 to 200 ha.

E6.8.5 There would be full-time unit managers for which posts experienced agricultural technicians from DOA would be very suitable (see Figure E6.3). The unit manager would require a small office and clerical assistance, and would supervise the work in the fields through two elected working farmers in each group, who would act as supervisors and also as the channel with the technical department representatives. Machinery for the group farming operation: land preparation, harvesting and, in due course, direct sowing would be provided by machinery service centres run eventually by PADA. The direct costs of machinery hire and included in the group farm budgets. Administrative overheads of the centres are treated separately from PADA costs.

Some of these tertiary irrigation blocks if desirable could also be managed by co-operative bodies like KGN/SPI or by private individuals.

E6.9 Implications of the New Organisation: Manpower Needs

E6.9.1 It should be mentioned that with the setting up of the Statutory Body many existing government agencies will experience reduced workloads. But since many of these officials will be deployed to man the new proposed authority, the reduced workload will not be tantamount to retrenchment of personnel. It merely means re-channelling of efforts through a new integrated authority. The officers should work as a new team under a new leadership. The skeletal staff that remain in the old agencies should carry on with their regulatory and/or advisory functions and leave implementation aspects to the proposed body.

E6.10 Secondment of Officers

E6.10.1 It is recommended that officers from relevant agencies be seconded to take up appointments, say for an initial period of 3 years, in PADA at the 3 levels: Director, Deputy-Director (see Figure E6.1) and the 4 department heads (see Figure E6.2). We consider this more prudent because of the following factors:

- The responsibility to rehabilitate padi land is now to be transferred from the Committee made up of government agencies which plays only an advisory role to PADA which is to be vested with decision-making (executive) powers.
- We consider it immaterial as to who undertakes idle land rehabilitation as long as the work gets done efficiently in line with the ultimate goal of putting idle padi land back into active production.
- There is no additional cost to the government by the secondment of some of its agency personnel since, with or without PADA, expenditure on agricultural development through extension, research, subsidies, drainage, etc, has to be incurred, anyway. The temporary transfer of these officials from the agencies merely means that their emoluments will be channelled through PADA the proposed Statutory Body, which has a legitimate right to receive and disburse public funds.

- There might be better rapport between PADA and the relevant government agencies concerned as they have their own men seconded in the PADA. We believe such an arrangement augurs well for the future of the rehabilitation programme, which requires the co-operation of all agencies.

E6.11 <u>The Recommended Manpower Planning for Crop Production and Group Farms</u>

The manpower requirements of PADA in as far as Group Farms are concerned are as follows:

E6.11.1 <u>Director</u> (Agribusiness Division) - The Director should be an experienced agriculture officer to be nominated by the DOA and, seconded to PADA for an initial period of 2 years. The candidate should be well versed with all aspects of padi production, farm management economics and agribusiness and should have at least 7 years of working experience. A candidate who is less than 35 years old is not likely to possess the maturity required to tackle the challenges of the job.

E6.11.2 <u>Deputy Director</u> (Crop Production and Group Farms) - The Deputy Director of the project should also be an agriculturally trained man, perhaps with a Diploma in Agriculture and a working experience of not less than 10 years as an extension man. A degree in agricultural science with a working experience of at least 5 years may also be considered suitable for the post. He too should be seconded from one of the agriculturally-based agencies such as the DOA or LPP, and have had a specific training in agricultural science, at least at the Diploma level.

E6.11.3 <u>Heads of Technical Departments</u> - These technical departments should be organised in such a way that they provide support services to PADA besides working closely with existing government agencies, such as DOA, LPP, JPT, FAMA, etc. We recommend that these department heads should be at least diploma holders in agriculture with at least 7 years experience in one of the government agencies connected with agriculture or irrigation. The head of Agronomy must have extensive experience in machines and likewise for the other heads. In addition, all heads of departments should have some experience in personnel management and in dealing with people at different levels.

We recommend that officers from DOA, MARDI, JPT and LPP be seconded to serve in PADA for a period of say three years or longer, to head these departments. Details of the work responsibilities of, and organisation within, these departments would require a different exercise at this point in time.

E6.11.4 Regional Managers - These individuals should be people who have had some basic training in agriculture. Ideally they should possess a diploma in agriculture and have at least 7 years working experience. We estimate, that ultimately 7 regional offices will be required.

E6.11.5 Unit Manager - We recommend that Agricultural Technicians now serving the DOA be deployed to PADA as Unit Managers since most of them would be redundant in their present position once padi land rehabilitation is placed under the PADA. It would appear reasonable to say that these AT's would be able to perform more effectively once they are put in charge of a well-defined area made up of 2 or 3 tertiary irrigation blocks.

Alternatively, unit managers could be recruited from retired army personnel who have followed an agriculture course during their prior-to-retirement adaptation programmes.

These administrative unit managers will be responsible for the day-to-day management of his unit, including planning of operations, submission of request for field operations, reporting of outbreaks of diseases, etc, record-keeping and labour management in the field. He will be assisted by 4 - 6 farmer supervisors in labour managements (2 supervisors per tertiary irrigation block).

E6.11.6 Farmer Supervisors - They should be appointed or elected from among the more progressive and dynamic members of the group within each tertiary block. Their salaries are counted in the farm labour force with an element of bonus in return for extra effort.

E6.11.7 Workers - Anyone who does not mind doing manual work and has muscle for it should be encouraged to work. They may be landowners or tentants. The salaries are counted in the farm labour force.

E6.12 Management Costs

E6.12.1 As previously discussed at Section E6.9, the successful establishment of the type of farming organisation suggested above will reduce to a major extent the current work load and responsibilities of the present government agencies involved; DOA, LPP, MARDI and BPM. We therefore consider that the salaries and incidental costs of senior seconded officers should continue to be borne by the Government. For unit managers and below, allowance has been made for their salaries and costs as a charge on the group farm expenses and included in the farm budgets (See Annexe G Volume V). However only a supplementary salary of $200 per month is allowed for the two farmer-supervisors, since these men are also counted in the farm labour force.

E6.12.2 The costs of administering group farms have been estimated for purposes of the economic analyses. Obviously such costs are provisional since the detailed management structure has yet to be worked out. The costs have been spread over the whole 6,900 ha of abandoned lands and it is therefore important that during the build-up period the headquarters does not grow faster than the area served. Excluding four department heads, and without provision for much more than direct payroll costs, the costs are as shown below:

	M$
(a) Administering group farms (6,874 ha)	375,000
(b) 7 regional offices at $43,000	301,000
	676,000
÷ 6,874, equal to $98.34 per ha	
(c) 150 ha management block expenses	31,250
equal to $208.33 per ha	

Total charge to group farm areas of all schemes is $306.67 per ha, of which $208.33 is accounted for within group farm budgets.

E6.12.3 Costs of extension service as conventionally done by DOA, and operation and maintenance of their systems by JPT, are charged in the scheme level analyses only insofar as increases to the present level of work are necessary. These costs are excluded from the group farm budgets since no charge for them is made to farmers at present.

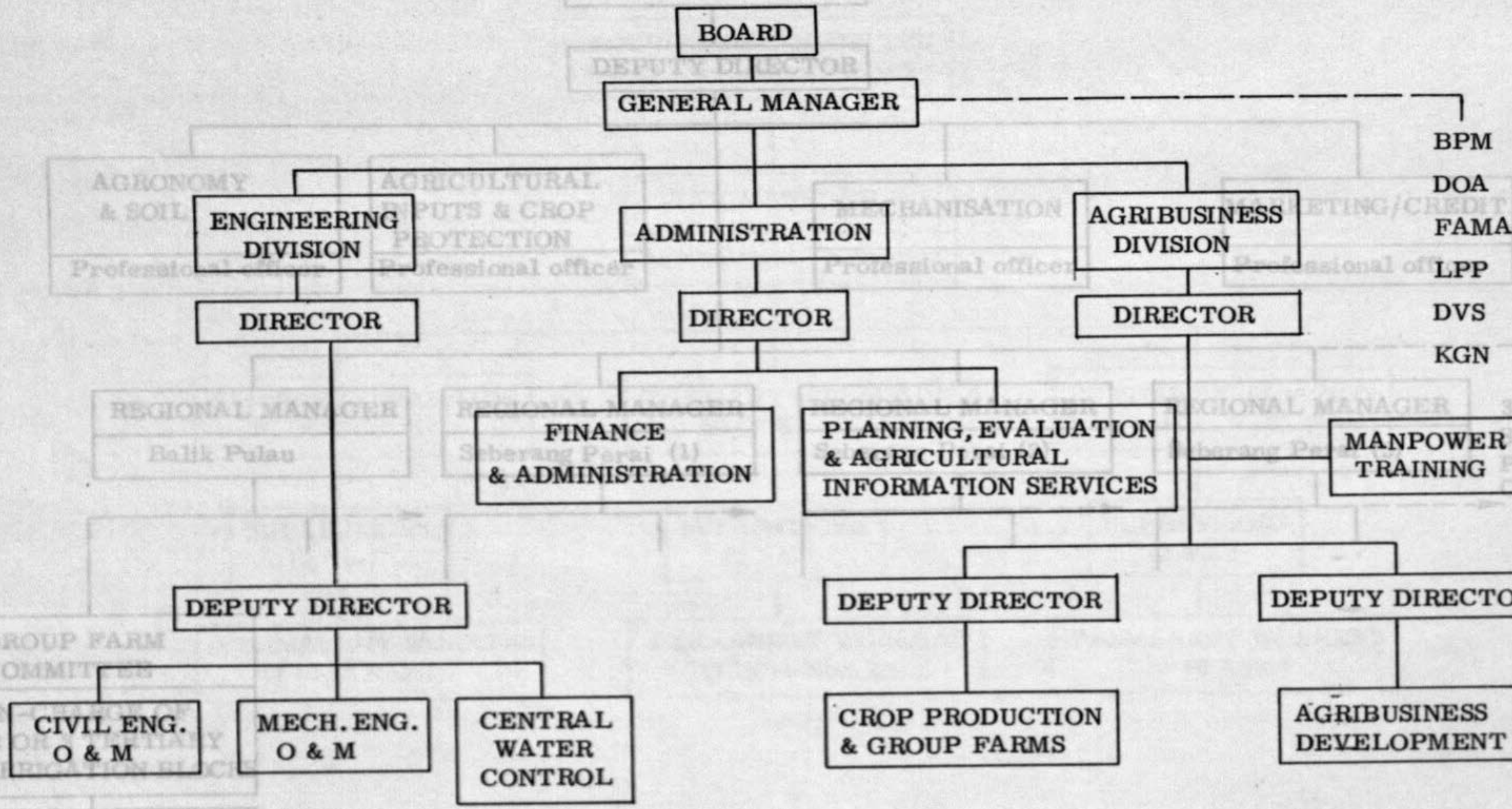
Division of profits

E6.12.4 PADA may itself grow into a large body, managing many thousands of hectares of padi land. We doubt whether merely belonging to a very large co-operative, will be sufficiently attractive to farmers who are accustomed to make a profit. Even those who have given up the struggle to farm independently and are content to become paid labourers, with or without co-operative shares, would probably work harder and much more productively if extra efforts which they made were to become visible in the shape of extra money returned to them.

E6.12.5 We consider the way this should be done is to treat the operating accounts of each farm, or possibly each 150 ha block, as a separate profit-and-loss centre. A central office levy to sustain loss-making areas may be unavoidable at the start, and a share of the profits may have to be awarded to landlords in return for their agreeing to a take-over of their holdings, but a very susbstantial part of the block profits should be allocated to the permanent workers (30 to 40 on each block) irrespective of whether they own land there or not. not

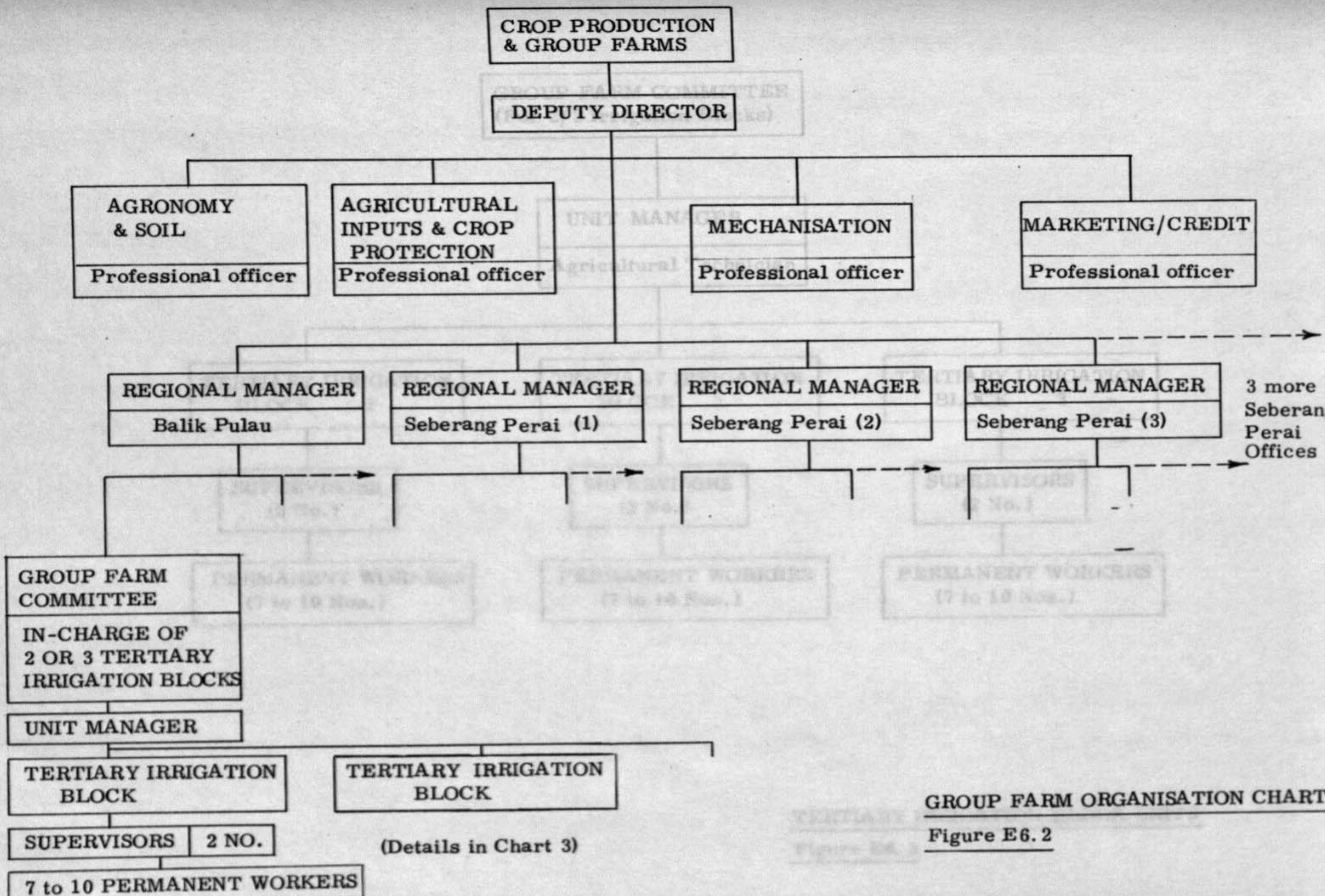
Smallholders

E6.12.6 The socio-economic survey results indicate that (at least in the short term) a proportion of the existing smallholders would wish to maintain their individual status and to continue farming as smallholders. Providing that these farmers represented a majority within their particular tertiary irrigation unit, there is no overriding reason why they should be perusaded to participate in any formal grouping or association. It is inevitable however, that they will have to accept a degree of co-operation if innovations such as mechanisation of field operations are eventually to be introduced. If the advantages of formal grouping are clearly evident, it is quite likely that farmers may voluntarily decide to join in a formal group at a later stage. If this occurs it should be encouraged.



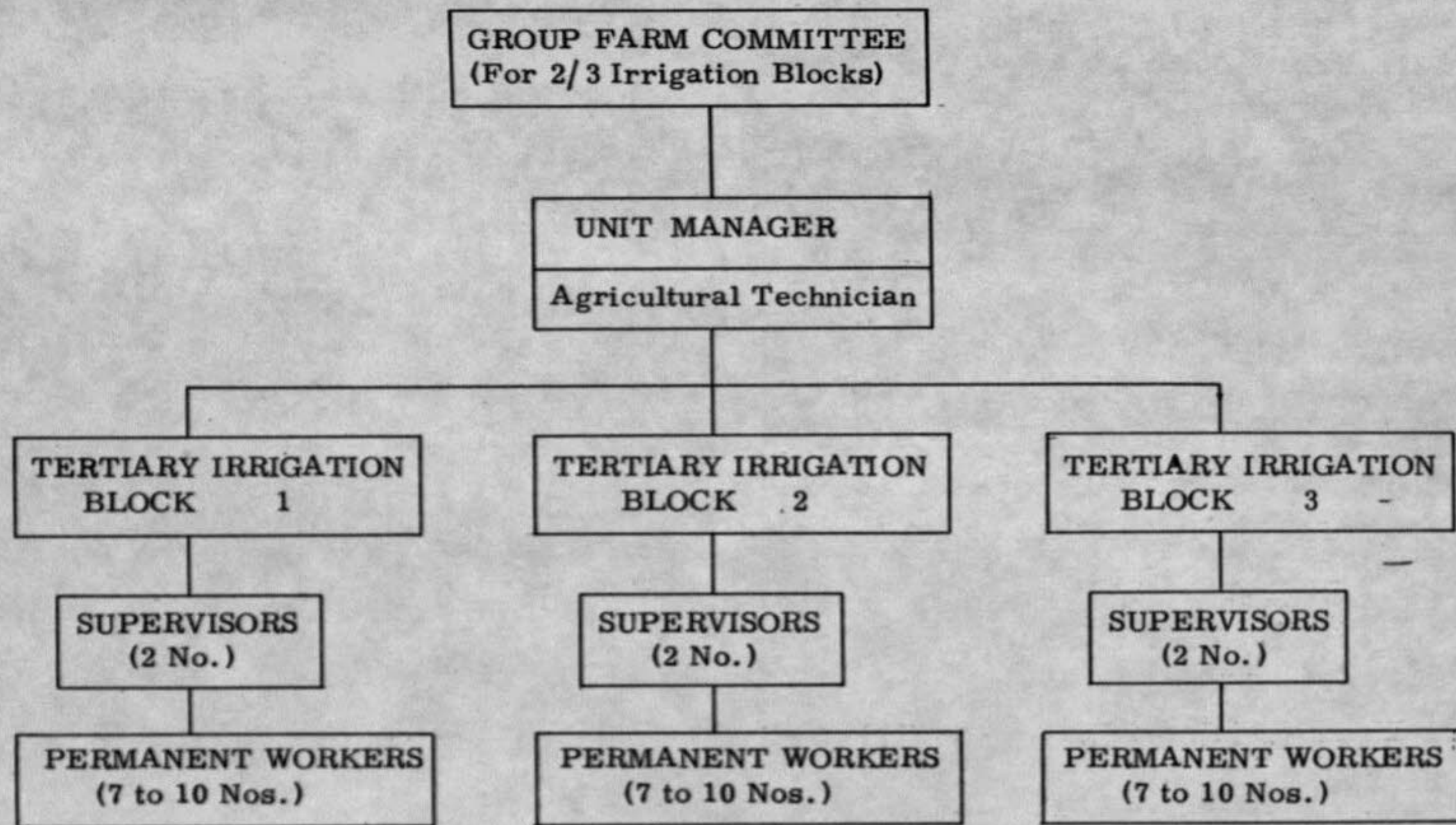
PADA ORGANISATIONAL CHART

Figure E6.1



GROUP FARM ORGANISATION CHART

Figure E6.2



TERTIARY IRRIGATION BLOCK UNITS

Figure E6.3