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GOVERNMENT OF INDONESIA MINISTRY OF TRANSMIGRATION DIRECTORATE GENERAL SETTLEMENT PREPARATION

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Transmigration Project Preparation

Proposal for World Bank Participation under Transmigration V Loan



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GOVERNMENT OF INDONESIA MINISTRY OF TRANSMIGRATION DIRECTORATE GENERAL SETTLEMENT PREPARATION

Transmigration Project Preparation

Proposal for World Bank Participation under Transmigration V Loan

NOVEMBER 1984

TRANS V PROJECT PREPARATION REPORT

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1. SUMMARY	l
2. BACKGROUND	
 2.1. Introduction 2.2. The transmigration programme 2.3. World Bank assistance 2.4. Related aid programmes 2.5. The agricultural sector 	3 4 5 6 9
3. PROJECT RATIONALE	
3.1. Repelita IV planning requirements 3.2. Planning study phases	12 13
3.2.1. Phase I 3.2.2. Phase II 3.2.3. Phase III 3.2.4. Constraints and proposals	13 15 15 16
3.3. Selection of settlement areas	18
3.3.1. Introduction 3.3.2. Prerequisites for Phase I studies 3.3.3. Methodology	18 19 21
3.4. Alternative mapping systems	24
3.4.1. Airborne radar topographic mapping system 3.4.2. Airborne laser profiling 3.4.3. Mapping pilot project	24 24 25
3.5. Agricultural Development	26
 3.5.1. Introduction 3.5.2. Factors affecting agricultural developmen 3.5.3. Planning implications 3.5.4. Alternative models 	26 t 27 30 31
3.6. Land allocation	32
<pre>3.6.1 Introduction 3.6.2 Forestry 3.6.3 Estate Development 3.6.4 Land Tenure 3.6.5 Other Land Availability Constraints 3.6.6 Conclusions</pre>	32 32 33 34 35 6/37/38

4. THE PROJECT AREAS

4.1. Introduction4.2. Site identification4.3. Description of areas4.4. Conclusions		39 40 42 46
5. THE PROJECT		
 5.1. Project description 5.2. The planning programm 5.3. Regional planning 5.4. Land resource studies 5.5. Remote sensing 5.6. Mapping 5.7. Pilot settlements 	ne S	48 49 51 53 57 6Ø 62
5.7.1. Introduction 5.7.2. Plans for Studies 5.7.3. The sago study	5	62 62 63
5.8. Special studies.		64
5.8.1. Marketing 5.8.2. Rural centre stud 5.8.3. Social and econom 5.8.4. Mid-term Repelita 5.8.5. Policy paper on s 5.8.6. Policy paper on l 5.8.7. Water Studies 5.8.8. Regional Studies	ies ic benefits IV review pontaneous transmigration and use for South East Irian Jaya	64 65 67 67 67 68 69
5.9. Programme support		7Ø
5.9.1. Technical Advisor 5.9.2. Ministry of Trans	y Group migration staff training	7Ø 75
6. COST ESTIMATES		
6.1. Introduction 6.2. Planning		8Ø 83
6.2.1. Remote sensing 6.2.2. Land resources 6.2.3. Regional Planni 6.2.4. Phase II studie 6.2.5. Phase IIIA stud 6.2.6. Phase IIIB stud	materials and mapping evaluation ng s ies ies	83 85 85 88 88
6.3. Pilot settlements 6.4. Special studies 6.5. Programme support		89 9Ø 92

6. 6.	5.1. Technical Advisory Group 5.2. Staff Training: Ministry of Tra	nsmigration	92 94
0.	5.5. Programme Support: Bakosurtanal		94
6.6.	Phasing of cost estimates		96
7. ORG2	ANISATION AND MANAGEMENT		97
7.1.	Institutional background		97
7.2.	Organisation		99
7.3.	Project phasing		101
8 FCOI	IOMIC AND COCIAL HIGHLBLCARTON		
U. LCUL	NOMIC AND SOCIAL JUSTIFICATION		103
8.1.	The transmigration programme		103
8.2.	Analysis of farm models		105
8.3.	The Trans V project		107
9. ENV	RONMENTAL ASPECTS		100
			TØQ
9.1.	Land and water		108
9.2.	Plant and animal communities		111
9.3.	Rural Institutions and Indigeneous Populations		112

APPENDICES

A. WPP centre design and implementation studies B. GOI position/policy paper on transmigration C. Agreement between Bina Program and Bakosurtanal for map production D. 11 = = 11 11 Forestry 11 Ε. 11 = 11 11 Agraria F. List and location of potential sites

MAPS

Project areas
 Location of sites studied under SFSE-80
 """ studied/under study in Trans III
 Areas covered by airphotography
 b. Areas for which radar mosaics are available

5. Location of sites to be studied under Trans V

List of Tables.

4.1. Populations, growth rates, and densities, by regions. 5.1. Transmigration planning targets for Repelita IV. 5.3. Schedule of Phase II studies under Trans V. 5.4. Availability of, and requirements for, working materials for comprehensive Phase I planning in Trans V. 6.1. Trans V project costs, estimated by IBRD project preparation mission (July 1984). 6.2. Trans V project: estimated costs. 6.3. Estimated costs of remote sensing materials.
6.4. "acquiring airphotographs.
6.5. "land resources evaluation. 6.6. Analysis of SFSE-82 Phase II study contract costs. 6.7. " " " " " IIIA " " Phase II and IIIA study costs. 6.8. Summary of 6.9. Estimated costs of airborne radar topo.mapping. 6.10. Analysis of costs of SFSE-82 Phase IIIB study contract costs.

List of Figures.

7.1. Organisation structure of Ministry of Transmigration.
7.2. "Directorate Bina Program.
7.3. Schedule of Trans V project activities.

GLOSSARY AND ABBREVIATIONS.

Adat (law) :	customary law
Alang-alang :	Imperata cylindrica (grass)
AGRARIA :	DG of Agraria (in Min.of Home Affairs)
	judicial aspects of land status
API :	air photo interpretation
APBN :	anggaran pendapatan belanja negara (annual
	government budget)
ARTMS :	airborne radar topographic mapping system
BAKOPTRANS :	Badan Koordinasi Penyelenggaraan Transmigrasi
	(coordinating body for executing
	transmigration)
BAKOSURTANAL:	Badan Koordinasi Survey dan Pemetaan National
BAPPEDAS :	provincial development planning agency
BAPPENAS :	Badan Perencanaan Pembangunan National
	(national development planning agency)
BINA MARGA :	DG Highways Development, Min.of Public Works
BINA PROGRAM:	Directorateof Programme Development, DG Settle-
	ment Planning (Transmigration)
CAG :	Central Advisory Group
CCT :	computer compatible tapes
CDC :	Commonwealth Development Corporation
CIDA :	Canadian International Dev. Agency
CIPTA KARYA :	DG of Housing, Building, Planning and Urban
	Development
CRIA :	Central Research Institute for Agriculture
CRIFC :	Central Research Institute for Food Crops
DG :	Directorate General
DITADA :	Direktorat Tata Kota dan Tata Daerah
	(Directorate of City and Regional Planning)
DPU :	Departemen Pekerjaan Umum
	(Public Works Department)
EEC :	European Economic Community
FAO :	Food and Agriculture Organisation of the United
	Nations
GDP :	gross domestic product
GOI :	Government of Indonesia
HBA :	Huszar Brammah and Associates
НРН :	Hak Pengusahaan Hutan
	(right to exploit forest)
HTS :	Hunting Technical Services Limited
HYV :	high yielding variety (of crop)
IBRD :	International Bank for Reconstruction and
	Development (World Bank)
IRJA :	Irian Jaya
IRR :	internal rate of return
ITB :	Institute of Technology Bandung
JOG :	Joint Operations Graphic
KANWIL :	provincial representative office of a dept.
KBLK :	Kelompok Besar Lahan Kering
	(Large Settlement Schemes Administration)
КК :	Kepala keluarga (family unit)

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KKLK	:	Kelompok Kecil Lahan Kering
	:	Small Settlement Schemes Administration)
LRDC	:	Land Resources Development Centre
MMP	:	Sir M. MacDonald and Partners
NES	:	Nucleus Estate/Smallholder (project)
ODA		Quarsaac Davalapment Administration
UDA	•	(The UK Aid Agency)
PSS		(The OK Ald Agency)
PTR		Perkehunan Inti Pakwat (domostically funded
1 1 1	•	tree crop programme limited to transmigrants
PLPT	•	Land Clearing Directorate Min of Trans
РМИ	:	Project Management Unit
PNP	:	Perusahaan Negara Perkebunan (state owned
	•	enterprise)
РТР	:	Perseroan Terbatas Perkebunan
		(state owned enterprise with limited lightlity)
RAAF	:	Roval Australian Air Force
RAG	:	Regional Advisory Group
RePPProT	:	Regional Planning Project for Transmigration
REPELITA	:	Rencana Pembangunan Lima Tahun (Five Year
		Development Plan)
RP	:	Rupiah
SAR	:	synthetic aperture radar
SATBIN	:	Provincial unit for transmigration promotion
SATDAL	:	Satuan Pengendali Transmigrasi (contro unit for
		transmigration)
SATLAP	:	Satuan Lapangan (Transmigration Field Unit)
SEKNEG	:	Sekretarian Negara (State Secretary)
SFSE	:	Screening (Phase II) Feasibility Studies and
		Detailed Engineering (Phase IIIA)
SIR	:	shuttle imageing radar
SLAR	:	side-looking airborne radar
SKP	:	Satuan Kawasan Pengembangan (Development Unit-
		1,000-2,000 families)
SP	:	Satuan Pemukiman (Settlement Unit,200-500
		families)
SRI	:	Stanford Research Institute (International)
SWP	:	Satuan Wilayah Pengembangan (Regional Develop-
		ment Unit)
TAD	:	Transmigration Area Development Project
		(West German Aid Project in East Kalimantan)
TAG	:	Technical Advisory Group (in Bina Program)
TOR	:	Terms of Reference
TRANS I-VI	:	IBRD loans for the Transmigration Programme
UNDP	:	United Nations Development Program
WAPCOS	:	Water and Power Consultancy Services (India)
WFP	:	World Food Programme
WPP	:	Wilayah Pengembangan Partial
		(Partial Development Region)

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INDONESIA



CHAPTER 1. SUMMARY.

The transmigration programme is one of the most important methods by which the Government of Indonesia (GOI) aims to improve the living standards of its people, and to achieve equitable population distribution and regional development. During the current Five Year Development Plan (Repelita IV), GOI aims to settle 750,000 families from Java, Bali, and Lombok, in the outer islands (mainly in Kalimantan and Irian Jaya). It is the largest voluntary re-settlement scheme in the world, demanding careful planning and execution.

Until recently, the emphasis of settlement planning has been on a "standard model" holding, consisting of a houseplot (0.25ha), an arable plot (1.0ha), and additional land intended for tree crops. The diminishing area of land suitable for arable cropping, and other constraints during implementation, have led to greater interest in alternative "non-standard" models, and in "second stage" development.

Since 1976, a series of IBRD loans have contributed to the cost of planning, and selected aspects of implementation. This Project Preparation Report sets out the GOI request for the next phase of IBRD funding, i.e. the Trans V project covering the 3.5 year period from October 1985 to March 1989. The report includes details of the project components and their estimated costs, totalling Rp 198,134 million (US\$198.1 million) in 1984 prices, and Rp 248,729 million (US\$248.7 million) at current prices.

The main aims and components of the project are:

a) Site selection and settlement planning for 300,000 transmigrant families, mainly in Kalimantan and Irian Jaya. The settlements will incorporate a variety of farm models, but the main emphasis will remain the standard arable/tree crop model. Remote sensing imagery will be acquired, and land resource evaluation studies continued. Consultants will be employed to carry out Phase II and III studies.

b) Implementation of pilot settlements to test alternatives to the standard arable/tree crop farm model, based on feasibility studies carried out under Trans III. The settlements will contain about 3,000 sponsored transmigrants, and 5,000 spontaneous transmigrants, and will include new village and urban centres. c) Special studies to guide the strategy of the transmigration programme, including: marketing, rural centres, social and economic benefits, mid-term Repelita IV review, spontaneous transmigration, and land use.

d) Programme support, including the Technical Advisory Group, and staff training for the agencies directly involved in planning.

Proposals are made for setting up a Steering Committee, consisting of Ministers directly involved in the transmigration programme, with a subsidiary Executive Committee consisting of Directors-General. These measures should improve coordination between the agencies, leading to more efficient planning and implementation.

The economic and social justification for the Trans V project is difficult to quantify, being a small, albeit important, component in a very large government programme. Nevertheless, the project, if successfully carried out, will improve the efficiency of planning for transmigration, thus preventing waste of resources and hardship for settlers, which might otherwise result from settlement in unsuitable areas and delayed implementation.

CHAPTER 2. BACKGROUND

2.1. Introduction

Indonesia has the fifth largest population in the world -147 million in the 1980 census, a growth rate of 2% a year, and thus a 1984 population of about 160 million. Nearly 100 million of these people live on the "inner islands" of Java, Bali, and Lombok, which have only 7.5% of Indonesia's land area. In contrast, the "outer islands", of which Sumatera, Kalimantan, Sulawesi, and Irian Jaya, are the largest, are relatively sparsely populated.

The average population density in Indonesia is about 78 per sq.km, but on Java it is about 690 per sq.km, rising to about 2,000 per sq.km in the irrigated areas.

The population of Java is growing at a slightly slower rate than the outer islands, but with such a large base the increase is nearly two million people a year.

It is becoming increasingly difficult to absorb additional workers into the agricultural and industrial sectors. GOI investments in natural resource based industries (refineries, petrochemicals, etc.) will generate relatively little employment. During the 1970s the growth of the services sector (from 24 to 32% of total employment) provided most of the new employment, but much of this was dependent on oil revenues which have been sharply curtailed in recent years.

It has long been the policy of Government to bring together under-employed and landless people of the inner islands the and the under-used land of the outer islands. The policy of "transmigration" earlier emphasised the relocation of people, mainly to Sumatera. However, during the Second and Third Five Year Development Plans (Repelitas II and III) covering the period 1974 to 1984, more emphasis was given to regional development, with the aim of increasing employment opportunities and incomes, encouraging equitable development throughout the country, promoting national unity, and increasing food production.

It is estimated that the Repelitas I and II transmigration programmes have increased the number of people in the outer islands by 650,000 people, with a further 2.5 million added during Repelita III. These numbers include the natural increase of the transmigrant populations, and make this the largest voluntary resettlement programme in the world. However, despite the scale of transmigration, the population of the inner islands is increasing.

2.2. The Transmigration Programme

Earlier schemes were based on irrigation development and swamp reclamation. Migrants received 0.7 ha plots, but plans did not provide land for the next generation. The concepts of free transport to the settlement, housing, input packages, and food supplies, became established.

In Repelita I (1969 - 1974) 46,300 families were moved, and in Repelita II (1974 - 1979) a further 82,800 families. The target for Repelita III (1979 - 1984) was increased to 500,000 families and was achieved, including some spontaneous transmigrants. For the current National Plan, Repelita IV (1984 - 1989), the target is 750,000 families.

During most of Repelita III the administrative responsibilty for transmigration was held by the Department of Manpower and Transmigration in the Ministry of Manpower and Transmigration. It has been estimated that seven Departments and 53 Directorates-General were involved in implementation, their activities coordinated by a Junior Minister for Transmigration. The increasing scale of the programme led to the creation of the Ministry of Transmigration in April 1983. Assistance is still provided by other departments, including aerial photography and mapping (Bakosurtanal) and land titles (Agraria).

Physical planning is based on the assumption that transmigrants will be settled in locations with good access, and on land with the capability of initially achieving a subsistence standard of living with agricultural inputs provided, and will subsequently progress to production of surplus crops for sale. The standard houseplot is 0.25 ha, and the arable holding 1.0 ha. An additional 2.25 ha is provided (but not cleared) for eventual tree crops.

Standard infrastructure under Repelita III is at a much higher level than in earlier programmes, and includes access roads, bridges, schools, and clinics. In 1981/82, 67% of transmigration costs were for infrastructure, including housing. Whereas only 5% of costs were for farm inputs and less than 1% for physical planning.

Although the proportion of total land area in the outer islands allocated to transmigrants has been very small (0.2%), the effect on land development has been considerable in relation to land already developed for agriculture by indigenous farmers, reaching over 10% in some provinces. Similarly, the impact of new infrastructure has been considerable in the recipient provinces. The impact of the transmigration programme on food production is difficult to assess because of the lack of comparative data. However, it has been estimated to be in the order of 1.0 to 1.5% for the whole of Indonesia, which is significant in keeping pace with population growth of 2%. Virtually all of the incremental production has come from food crops.

2.3. World Bank Assistance

The cost of the transmigration programme was estimated to be \$625/family in 1972/73, and has since increased to over \$6,000/family, in real terms a three-fold increase, due mainly to additional inputs and services for the transmigrants, and improvements in planning. The World Bank has provided the GOI with a series of loans to assist with specific aspects of the programme.

The first loan (Trans I) was for the development of settlements in South Sumatera. The second (Trans II) was for the development of settlement sites in Jambi Province along the Trans-Sumatera highway, and for site identification and planning studies, referred to as the Screening, Feasibility, and Detailed Engineering Programme (SFSE 80).

The third loan (Trans III), which is currently in operation, is for further site identification and planning studies, with the aim of providing settlement plans for Repelita IV transmigration. The fourth loan (Trans IV) is to provide part of the funds required to settle transmigrant families in East Kalimantan (see below). INDONESIA



SUMATERA

Location of sites





IRIAN JAYA

Location sites studied / under study during Trans III.

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132⁰

2.4. Related aid projects.

2.4.1. Nucleus estates and smallholders (NES) projects.

At the beginning of Repelita III, GOI started an accelerated tree crop development plan, recognising the potential of tree crops to improve smallholder incomes, as well as non-oil exports. The targets for Repelitas III and IV were 2.4 million ha of new planting, and 2.8 million ha of replanting and rehabilitation, with the main emphasis on coconuts, rubber, and oil palm. Since 1976, GOI has increasingly used the technical and managerial resources of the public sector tree crop estates to implement the NES projects.

Since November 1977, IBRD has helped to finance seven NES projects. At full development, these projects will settle (or re-settle) 17,350 families in the outer islands. The average cost (in 1983 prices) was estimated to be about US\$17,000 per family.

NES projects have included the following components:

-improved planning, coordination, and monitoring of PTP activities;

-strengthening DG Estates;

-strengthening Team Khusus, which is the special team in DG Estates, set up to coordinate and supervise preparation of foreign-aided tree crop development projects;

-increasing the supply of trained manpower;

-improving tree crop marketing.

2.4.2. World Food Programme, Economic and Social Development Project.

The World Food Programme (WFP) has been associated with the GOI's transmigration programme since 1972. It has concluded that provision of food aid has had a significant impact on agricultural development, resulting in: a higher rate of land clearing, maintaining health of the transmigrant families, and helping the families' meagre cash resources by releasing some produced food crops for sale.

In July 1984, GOI requested a food aid programme from WFP with the emphasis on "food for work" used for the following components:

- -implementation by transmigrants of essential infrastructure;
- -family rations for cooperative managers, and public health instructors;
- -food for attending agricultural courses and instruction in public health matters;
- -family rations to enable settlers to clear and develop their already established holdings.

The project would be concentrated in Aceh, South Sumatera, and West, Central, and South Kalimantan, covering roughly 70,000 families.

The total cost of the project would be US\$ 21.8 million over three years, of which \$3.5 million would be for storage, offices, and warehouse equipment, and \$9.3 million for unloading, clearing, and transporting food.

2.4.3. Smallholder cattle development project.

This project, which receives financial assistance from IFAD, aims to increase food crop production and improve farm family incomes by providing draught cattle. In the first three years to October 1983, 13,200 head of cattle were procured, mainly from S.Sulawesi, Timor, and E.Java, and were distributed to smallholders mainly in S.Sumatera, Riau, Bengkulu, and Lampung. By the end of the first phase, it was intended that 80,000 families would have received draught animals.

The IFAD mid-term review of Phase I of the project concluded that the economic IRR was 27%, with benefits from increased crop production, and growth and offtake from the cattle. The estimated total cost was Rp 25,833 million, of which 60% was for cattle procurement, IFAD providing roughly two thirds of the finance.

A proposal to extend the project into a second phase was made in February 1984, and it is understood that the proposal will be appraised by IFAD in October 1984. Phase II aims to distribute cattle to 120,000 families, also in Sumatera, over a six year period. The cost of the proposed extension is US\$60 million, of which IFAD would provide 83%.

It has been further proposed (see Section 5.7.) that an additional 40,000 head of cattle be provided to transmigrant families in Kalimantan and Irian Jaya, with quarantine stations to support these movements.

2.4.4. Trans IV.

This project provides financial assistance from IBRD for four years of a ten year programme to settle about 14,000 families in E.Kalimantan. Components include: land clearing, access roads, wharf and storage facilities, housing, sanitation, and water supplies, village community facilities, 500 ha of coconut estate, and 8,000 ha of transmigrant coconuts, and technical assistance. The total project cost at appraisal (April 1983) was US\$ 121 million (53% foreign costs).

2.4.5. Trans VI : Second stage development.

This project, currently being formulated, aims to assist the Ministry of Transmigration to demonstrate methods of raising settler incomes in "problem" and "non-problem" sites, by planning and implementing additional development measures "second stage development". These measures would i.e. include: up-grading the basic infrastructure, particularly access roads; strengthening extension, research, and credit services; and introducing processing and marketing facilities.

About 70 settlements have already been identified as needing rehabilitation to raise transmigrant incomes above subsistence levels. It is intended that about 10 - 12 sites will be planned and implemented each year for five years. In addition, about 200 sites will be planned for second stage development in the future.

A mission from FAO/IBRD Cooperative Programme visited Indonesia in February 1984, to study the issue in Sumatera and W.Kalimantan. The mission suggested that the DG Mobilisation and Development should set up working parties to study organisation arrangements and site-specific development plans, in anticipation of a project preparation mission from FAO/IBRD/CP.

2.5. The agricultural sector

2.5.1. Aims and contributions

The main aims of GOI for this sector are:

- -productive employment to raise the incomes of the rural poor,
- -increased domestic food supplies to keep pace with rising demand,
- -expanded agricultural exports, particularly smallholder tree crops, and
- -productive, sustainable use of the country's natural resources.

Despite production growth of 3 to 4% a year, agriculture's share of GDP has declined from 45% in 1971 to 25% in 1981, and its share of exports from 45% to 33%, mainly due to the increase in oil production. Nevertheless, agriculture is a vital sector because 80% of the population live in rural areas and obtain most of their income from farming. It is now the largest source of new employment, mainly through transmigration activities, land reclamation, and irrigation development and rehabilitation.

2.5.2. Food crops

Through the series of five year development plans, GOI has consistently tried to make Indonesia indedpendent of food imports. It has invested heavily in irrigation, subsidised fertiliser distribution, credit, and price supports. It can now be concluded that Indonesia is self-sufficient. In the case of rice, the preferred staple food of the majority of Indonesians, substantial deficits and surpluses may happen in any year because of the random effects of weather and pests.

Production increased rapidly (4.5% a year) from 1968 to 1974, mainly due to irrigation rehabilitation and provision of inputs (HYV seed, fertilisers, and credit), but later slowed with reduced fertiliser use, poor rainfall, and unprecedented pest and disease attacks. By 1982, 23.2 million tonnes were produced, about 150 kg for each person in the country.

Over the last decade, output of secondary food crops (maize, cassava, soyabeans, groundnuts, and sweet potatoes) grew at 1.6% a year, comprising a decrease of 1.1% a year in area (much of this land shifting to irrigated rice) and a 2.7% a year increase in yield. Growth in demand for secondary food crops is slow and easily satisfied by domestic production. Production techniques have not changed much, and these crops are usually grown under inferior agronomic conditions compared to rice.

2.5.3. Perennial crops

Perennial crops occupy about 8 million ha (45% of total cropped area), and account for about 43% of total non-oil export revenue. Smallholders cultivate 80% of the rubber and virtually all the coconut, coffee, cloves, and pepper. Cocoa, tea, and oil palm are grown mainly on estates.

Since 1976, GOI has given increased emphasis to smallholder tree crop production through Nucleus Estate and Smallholder (NES) Projects, which have received World Bank finance. Government-owned estates plant and maintain tree crops for smallholders on previously undeveloped land, using settlers employees until the trees start to as produce. thereafter providing them with inputs, extension, and processing GOI has also initiated national programmes facilities. to assist smallholders to replant rubber or coconut themselves, with support from Project Management Units (PMUs).

Expansion of smallholder tree crops is a high priority, given the great area of over-aged and low yielding rubber and coconut, good market prospects, and employment potential. The outer islands have comparative advantages for the production of these crops.

2.5.4. Land use

Cultivable land in Java is almost all being used, and in some higher watersheds cultivation already exceeds ecologically safe limits. Erosion, downstream flooding, and siltation of dams, irrigation canals, and harbours, has reached serious proportions. GOI is preparing watershed and integrated development projects to deal with this problem.

Traditional settlement on the outer islands has been on the levees of major rivers which have the most fertile soils due to regular flooding. Shifting cultivation has spread outwards and the pace has grown with population increases and the construction of many new roads, including those used for logging.

In Sumatera the forest margins have been cleared for dryland cropping (ladang) and instead of being left to regenerate are planted with seedling rubber. The shifting cultivator thus establishes some permanent rights to the land, although he may tap the rubber only when market conditions are favourable. Forest rubber now covers huge areas and is a major factor affecting land availability. Superimposed have been government development schemes, private concessions, and earlier transmigration settlements. In Kalimantan, population density is lower and rubber cultivation is less than in Sumatera. The same pattern of shifting cultivation can be observed, spreading out from the main rivers. In West Kalimantan, shifting cultivation has deforested much of the non-swampy lowlands, and is still encroaching into the remotest hills and up to the Sarawak border. Thus huge areas lie under grassland or secondary forest, and although cultivated only once every 7 to 15 years the local population have some customary (adat) rights of tenure.

In the forest areas of all the outer islands the local people have traditional rights to forest products, not only for domestic use but also for sale, e.g. ulin (ironwood), rottan, jelutong and damar gums. In parts of Central Kalimantan, rottan is planted as a forest crop. In many parts of Irian Jaya the local population are hunter-gatherers, dependent on forest products such as sago and game for their existence.

CHAPTER 3. PROJECT RATIONALE

3.1. Repelita IV planning requirements.

During Repelita IV (1984-1989), GOI aims to settle 750,000 families in the outer islands.

The planning requirements for each year of Repelita IV have been given as:

1984/85	190,000	KK
1985/86	200,000	KK
1986/87	210,000	KK
1987/88	220,000	KK
1988/89	230,000	KK
	1,050,000	KK

Details of the planning programme are given in Chapter 5.

3.2. Planning study phases

During Repelita III, planning for transmigration has followed three distinct phases:

- Phase I: National Regional Planning, long term (20 years), medium term (5 years, e.g. Repelitas III, IV, and V).
- Phase II: Screening and structure planning of development areas.
- Phase III: Detailed planning of settlement units.

For Repelita IV, the Phase I medium-term plans prepared for the previous 5 year period require complete revision, taking into account:

-the results of Phase II and Phase III studies already undertaken;

-better knowledge about land suitability;

-known development plans of other agencies and provincial authorities, which might affect site availability and accessibility.

3.2.1. Phase I

Phase I is divided into two stages. In Phase IA, GOI makes long term plans for transmigration, taking into account national development objectives. These plans are then used by Bina Program in the Ministry of Transmigration for Phase IB planning, in which the aim is to ensure that regional plans can be implemented within the natural resources constraints such as availability of suitable land and environmental factors.

Before the start of Trans III the initial selection of sites at Phase I was coordinated by the Directorate of City and Regional Planning (DITADA), DG Cipta Karya, Min. of Public Works. The process of selection was a combination of defining priority regions, as expressed by inter-departmental consultative meetings, and the identification within these regions sites (SKPs) believed to be potentially suitable of for settlement. The determining factors were, therefore, a mixture of political-economical and social-physical considerations. Unfortunately, because the data on which the site selection was finally made were generally lacking or inadequate, or not fully used, a large number of sites were rejected in subsequent planning phases. Using SFSE-80 data, has been calculated that only 12% of sites initially it selected have so far been successfully taken through to detailed settlement planning (Phase III).

To improve the ratio between selected and successfully settled sites, it is now accepted that the key is to ensure that the initial screening is as good as possible. Logically, if areas are correctly chosen at this stage, the chances of success after Phase II and Phase III field investigations are greatly enhanced.

With the availability of recent remote sensing imagery and new medium- and small-scale airphotography covering large areas of the country, such an improvement to Phase I planning is realistic. Consequently, under the Trans III programme, an agreement was reached between GOI, the UK Government, and IBRD, through a Memorandum of Understanding, that the Land Resources Development Centre (LRDC), a branch of the UK Overseas Development Administration, would be assigned the task of improving Phase I physical planning. Funding was to be partly through the IBRD Trans III loan and partly a UK grant. Fundamental to the arrangement was that GOI would supply the necessary imagery and local staff to ensure that the fast rate of study for all the contemplated regions could be maintained throughout the planned 18 month study period.

The LRDC team mobilised in May 1984, and became operational one month later when office and working facilities were made available. Four full time resource specialists and one shortterm remote sensing specialist are each complemented by counterpart staff. Ten cartographic staff were to be supplied to process the output from image interpretation into 'final map form.

The Technical Advisory Group assists in correlating the land capability mapping with known constraints to transmigration settlement caused by designation of land for forestry, current development programmes of other agencies, and plans of provincial BAPPEDAS.

of the scale and widespread distribution Because of transmigration settlement under Repelita III, Phase IB regional planning for Repelita IV must be also concerned with consolidating development in selected regions, as much as with identifying entirely new areas for settlement. Regional should also select sites for planning "second stage" development, sites for non-standard (in some cases, nonagricultural) models, and urban settlement development related to establishing processing facilities and marketing networks. These sites must all be tied into established or planned regional structures.

The process of selecting settlement areas in Phase IB is described in Section 3.3 (below).

3.2.2. Phase II

Phase II is a rapid reconnaissance of areas identified for transmigration in Phase IB. The objective is to assess the suitability of the area for development, and to decide whether it would be worth carrying out more detailed surveys. Investigations are made into the natural resources, present land use, and potential for agricultural development in general and transmigration settlements in particular. In areas found to be suitable, a structure plan for development is prepared.

The main activities in Phase II, as indicated in the terms of reference for consultants, are:

-preliminary air photo interpretation (API), -base map preparation (1:50,000 scale), -land unit investigation, -climate and hydrology investigation, -present land use and forest status investigation, -socio-economic and agricultural studies, -definition of land suitability, -agricultural development options and proposals, and -structure planning.

3.2.3. Phase III

Phase III studies are made only for those areas found in Phase II to be suitable for settlement. In the earlier Trans II programme, Phase III studies were made before land clearing and site development. During the Trans III programme, Phase III studies have been divided into two stages.

In Phase IIIA, the aim is to confirm that an area is suitable for transmigration settlement, and to prepare preliminary plans. Topographic surveys are carried out, and maps at 1:20,000 scale are produced. Areas for land clearing are defined. The main planning activities are:

- -reconnaissance slope surveys,
- -soil survey at semi-detailed level,
- -present land use survey,
- -forestry investigation, including estimates of marketable timber and proposals for extraction,
- -water resource investigations, including flood protection and drainage, and potable water,
- -land suitability map (1:20,000 scale),

-agricultural development proposals,

-preparation of preliminary structure plans (1:20,000 scale) showing blocks of land within which more detailed surveys for houseplots and arable land should be made,

-cost estimates for settlement development,

-preparation of tender documents,

-study of regional and environmental setting,

-a feasibility study of a representative area.

In Phase IIIB, the aim is to prepare detailed plans in areas of cleared land, and to confirm the allocation of holdings. The main activities are:

-preparation of a topo map (1:5,000 scale) of cleared areas,

-preparation of plans for the cleared area, showing houseplots and arable holdings, together with the location of public facilities and the alignments of roads (on a scale of 1:50,000),

-preparation of plans for the uncleared area, showing blocks of land corresponding to specific groups (on l:20,000 scale).

3.2.4. Constraints and proposals for Trans V planning studies.

Under previous IBRD funded planning programmes (SFSE-80 and SFSE-82), international consultants, in association with local (Indonesian) consultants, were engaged to carry out a specific number of Phase II and III (latterly IIIA) studies. These consultant "packages" met with varying degrees of success. On several occasions, due to the lack of suitable airphotos, or to insufficient suitable sites on which to start Phase II screening studies early in the contract period, consultants soon fell behind in their work programmes. Some consultants did not have the managerial capabilities to properly organise and supervise the amount of logistical support required to supply a large team of technical and administrative staff, often professional, working in remote areas.

It is proposed that under Trans V revisions should be made in the procedures for awarding, implementing, and supervising consultants' contracts for Phase II and Phase IIIA studies.

The first priority when awarding a contract is that the consultant should have a good "track record" in carrying out similar assignments. Too often in the past, consultants who inexperienced in carrying out planning studies in remote are have failed to work competently, areas resulting in presentation of sub-standard reports, plans, and recommendations.

Under previous planning programmes, most studies and plans have largely been based on the standard rainfed arable/tree crop model. It is anticipated that studies during Trans V will be concerned with a wider range of models. It is unlikely that at the start of any one consultant's contract the exact number of studies relating to each of the various models will be known with any certainty. Therefore, it is proposed that consultants' contracts should be more flexible than in the past, to allow specialist inputs to be used when needed.

To avoid delays in consultants' contracts, it is proposed under Trans V they should be awarded only when that sufficient Phase II sites are available (with the necessary airphotos or maps) for the consultant to mobilise and carry out his work efficiently. Because of the uncertainty about the number of Phase IIIA studies generated by a specific number of Phase II studies, it may be considered more appropriate to award the first contracts only for Phase II studies. As the results of these studies become available, contracts for Phase IIIA studies could be awarded once the Phase II proposals are accepted and the area has been designated for transmigration settlement.

3.3. Selection of settlement areas.

3.3.1. Introduction.

It is customary in developing and developed countries when attempting to assess whether a form or forms of development can be successfully introduced, to firstly define the resource requirements of the model and then establish whether and where the development form can be most appropriately located. In the case of agriculturally-based development, and transmigration is such a case, an essential pre-requisite is knowledge of the land resources - where are suitable soils, topography, water for crops and domestic use, or conversely where are the areas to avoid - the mountains and steep hills, peat swamps, erodible and infertile soils, land already used, etc..

In Indonesia, while the general land resource distribution is known in broad terms, there is insufficient knowledge in most provinces to plan confidently for agriculturally-based development, except in the most accessible areas. There remain vast areas of inland Kalimantan, Irian Jaya, and even Sulawesi and Sumatera, about which there is only sketchy resource information available.

The LRDC input to Phase I planning through RePPProT will give a firmer basis on which transmigration settlement areas are selected. The aim is to provide physical resource information mainly in the form of two map series covering virtually all of Indonesia, at a compromise scale of 1:250,000; small enough to keep the total number of map sheets to a minimum (about 220), and large enough to facilitate regional structural planning.

The two themes are:

-the physical resource base (land systems): this shows where different transmigration development models could be located on different types of land, together with the main physical limitations to the models;

-land availability: this will be indicated by mapping present land use with land status - defined as land that has already been allocated or designated (e.g. for forestry, conservation, estate agriculture).

It should be noted that there would be substantial benefits for other planning agencies from these maps. 3.3.2. Prerequisites for Phase I studies.

a) Base maps.

Land resource information is best displayed in map form, but suitable topographic base maps at medium and small scale on which to plot the data are not yet available for most of Kalimantan, and Irian Jaya in particular.

A prime requirement, therefore, for regional or national resource survey mapping is reliable topographic mapping at scales from 1: 50,000 to 1: 250,000. It is of no use acquiring, for example, soil or vegetation information at great expense if it cannot be plotted accurately on a map. Furthermore, there are considerable problems, both for planners who define study areas and consultants who are contracted to survey them, when neither party is certain of the area's map location.

Imagery analysis data has to be translated to a reproducible master map for each of the two themes. In Central Kalimantan, the top priority area studied first, the LRDC team has found that the Joint Operations Graphic (JOG) topographic maps at 1: 250,000 scale, which were planned as the final base map, could not be used in many areas. Although considered to be the best map series available at that scale, and satisfactory for general purposes, the horizontal accuracy and height information diminishes rapidly with distance from the coast or major rivers, making the accurate plotting of imagery analysis impossible.

A very satisfactory solution has been found where airphotography exists. This is to produce semi-controlled photo mosaics at 1:100,000 scale, onto which airphoto interpretation (API) can be readily plotted. A tracing of the information is then reduced to 1: 250,000 scale ready for final drawing. In other provinces where published topographic maps exist (Sumatera, part of W.Kalimantan, and W. Irian Jaya) the API will be transferred to these sheets and reduced, in preference to producing new photomosaics.

A Cooperation Agreement, funded by IBRD, was signed in May 1984 between Bina Program and Bakosurtanal for the production of semi-controlled photomosaics, for both the requirement described above and to provide substitute interim topographic data, especially river networks where only JOG sheets exist. This is to be done in three stages according to the Phase I priority programme. The first priority, for a set of 21 sheets covering part of C. Kalimantan, has been provided on time, and enabled the plotting of the API to be completed. The remaining 58 sheets under the second priority have been held up due to administrative difficulties: thus plotting of API for a large part of C. Kalimantan has been stopped.

b) Airphotographs.

Conventional, panchromatic airphotographs at 1: 50,000 to 1: scale are the most useful for resource surveys, 100,000 because full stereoscopic analysis is possible. For Central airphotography exists for about Kalimantan 90% of the province, and 95% of this has now been obtained. For other provinces no photography has yet been obtained except for about 50% of West Kalimantan. The time required to obtain security clearance, order and receive the photos can be three months or more.

Photo quality is disappointing for RAAF and CIDA prints held in Indonesia. Storage and handling of negatives, and lack of quality control in processing and printing, appear to be the main reasons. The photo quality directly affects the ease and accuracy of interpretation. Efforts to purchase a new set of photos at 1: 100,000 scale for Irian Jaya direct from Australia have not yet been successful.

Project requirements for airphotos and other remote sensing materials are described in Section 5.3.

c) Radar imagery.

Mosaics of SLAR and SAR radar imagery (the techniques are described in Section 5.3.) dating from the mid-1970s are available, covering large blocks in many of the islands. They are obtainable as "client area" mosaics through Pertamina, or "speculative area" mosaics held by as the commissioned company. The former are relatively cheap and easily obtained. The latter are relatively expensive and so far have not been purchased. The mosaics are particularly important to obtain for areas where airphotos do not exist: horizontal scale distortion is slight, and drainage and landform analysis is readily achieved in spite of the lack of stereoscopy. The imagery is unaffected by haze and cloud. Satellite (SIR) radar swathes have been obtained covering parts of Kalimantan and Irian Jaya.

d) Landsat imagery.

Several useful prints covering parts of Kalimantan have been obtained. These are mostly of Band 7. Some tapes have also been purchased of parts of Kalimantan but these have not yet been processed at Bakosurtanal. Landsat imagery is usually affected by cloud to some degree but is particularly useful for land use analysis where airphotography is poor or does not exist. The new receiving station at Jakarta (LAPAN) is now operational and this should increase the chances of obtaining cloud-free scenes at some cost saving compared to ordering from the USA or Bangkok. Orders will be made from Canberra for Irian Jaya, because LAPAN cannot receive data for that province.

3.3.3. Methodology.

a) Introduction.

The RePPProT methodology used relies heavily on interpretation of conventional airphotography, supported by analysis of Landsat imagery for land use, and radar mosaics for topographic patterns where photography is not yet available or is of poor quality. For "ground truth", existing ground surveys have to be used because time available for fieldwork is severely restricted. Fortunately, there are now many Phase II and III studies readily accessible to the team, which provide valuable information.

Following the interpretation stage, data is transferred to photomosaics or base maps, reduced to final mapping scale of 1:250,000 and re-drawn. Land system and land use interpretative data are stored on computer file in a form that can be interrogated for matching against development models.

b) Interpretation.

The aim is to identify the recurring landscape patterns termed land systems. The principle is that wherever the land system is found, the same combination and proportions of soil, land form, drainage pattern, natural vegetation, etc., will occur.

Having mapped the land system distribution on airphotos, radar mosaics, or Landsat images, they are then characterised by measuring or estimating parameters, especially those directly affecting the defined transmigration models. For the many proposed "non-standard" models, which remain to be defined and officially approved, it is possible to guess the key limiting factors, such as soil fertility and slope, but not the class limits between suitable and unsuitable.

Experience with SFSE-80 has shown that the following are the most important factors that limit settlement planning based on an arable component:

i) Land availability.

Land already intensively used or under permanent crops, or land designated or reserved for approved uses, is considered unavailable for transmigration settlement.

ii) Soil.

Areas with chemically very poor soil, or which have serious flooding or drainage limitations, are avoided.

iii) Topography.

For arable cultivation a general slope limit of 8% is set for all crops. Fragmentation of otherwise suitable land by many small valleys can be a severe limitation.

There are practical problems associated with reliable measurement, for example, of slope steepness, length, and curvature, on the small scale and often poor quality imagery used. These problems are particularly acute in the very areas of undulating and rolling plains that have the greatest settlement potential. For these aspects of the Phase II and III interpretation, surveys provide extremely valuable hard data. A reliability index is being built into the description of key parameters for user guidance.

c) Data transfer and mapping.

It is of great importance in keeping up the momentum of data transfer and mapping to have all working materials available well in advance.

For Central Kaimantan, the lack of full cover of materials for imagery analysis, and lack of photomosaics to plot the data ready for final map production, means that a review of the development potential of the whole province is not possible. However, assistance to Bina Program has been possible in the selection of sites suitable for the laser/radar topographic profiling trials.

A further practical problem has emerged concerning map production. Bina Program has been unable to supply the full complement of draughtsmen required, and the space that they would need. Considering both aspects, it is now proposed that four draughtsmen be supplied, and the whole programme will have to be adjusted so that only the whole of Kalimantan, and the whole of Irian Jaya, are covered in the agreed period of 18 months. Other areas would have to be subject to an extension or a new agreement.
d) Data storage.

The setting up of a computerised data storage system is of great potential benefit for resource users. If efficiently done it will be possible to match land quality user requirements for many development models, not necessarily those concerned with transmigration. Considerable attention is being given to the precise design of the data cards in the early stages, in the hope that few modifications will be required later. Designing the computer compatible system has exposed the urgent need for more practical research in defining, for example, acceptable slope class limits under different soil/cropping systems in Indonesia, and internal as opposed to external site accessibility.

3.4. Alternative mapping systems.

Hitherto, mapping for the transmigration planning has been done using traditional ground and air survey methods. It is intended that these methods will continue to be used for most of the areas planned under the Trans V programme. However, alternative systems are now being investigated which may be better than the traditional methods. Funds are being provided under Trans III for pilot studies, and depending on the outcome, it may be possible to use the new techniques over as much as 25% of the area to be planned under Trans V.

3.4.1. Airborne radar topographic mapping system (ARTMS).

This system entails radar sensing from a fixed-wing aircraft flying at low altitude along regular traverses measuring ground profiles at an accuracy of about 1.5m. The resulting profiles can be used for automatic map production. The system is dependent on the accuracy of both the navigation system and the barometric sensors, and flying at low altitudes precludes survey of hilly terrain.

IBRD agreed to finance the testing of this system during the SFSE-80 programme, on the understanding that, if proved successful in production, technical, and economic terms, it would be endorsed for wider use. GOI contracted the Stanford Research Institute (SRI) for an experimental programme in Central Kalimantan. The final report in April 1984 showed that the system needed further modification and testing before it could be considered operational.

Agreement was reached between GOI and IBRD for further testing of the system under the Trans III project, with the aim of completing tests and making the system operational. The test area was defined as about 40,000 ha over a two month period, with further profiling of 280,000 ha if the system proved to be satisfactory, during which it was intended to carry out comparative trials between radar, laser (see below), and ground survey methods.

3.4.2. Airborne laser profiling.

This system uses a laser beam from a fixed-wing aircraft or helicopter to measure ground profiles. The flight altitude is 600 - 3,000 metres, and therefore the system can be used in hilly terrain. Definition of tree canopy should be possible, which might enable sampling of forest potential. GOI decided to prequalify firms for the mapping pilot project (see below). By June 1984, 22 firms had applied, and from these six were short-listed on the basis of technical experience and other factors. International competitive bidding will be used to select one firm for the pilot project.

3.4.3. Mapping pilot project.

The aim of the project is to compare mapping by airborne radar and airborne laser systems. It has been agreed between GOI and IBRD that radar and laser systems will each be used over 60,000 ha areas, which will have some area of overlap. Part of this overlap area will also be subjected to a ground survey. The whole pilot project area is intended to contain primary and secondary forest, grassland, existing cultivation, and swamp, and should thus be representative of areas used for transmigration planning.

For both radar and laser mapping, two 40,000 ha sites have been chosen in Central Kalimantan (Sungai Pinang), for survey at 1:10,000 scale with 5m contours. A third 40,000 ha site, also in C.Kalimantan (90 km SE of Palangkaraya), is a swampy area and will be surveyed at 1:10,000 scale with 1m contours.

Bina Program will arrange for ground survey and mapping of 3,000 ha within the "overlap area" in Sungai Pinang, for comparison with the radar and laser mapping of the same area, in terms of accuracy, time, and cost.

3.5. Agricultural Development.

3.5.1. Introduction.

During Repelitas I and II, the need for the settlers to become self-sufficient as soon as possible led to planning for upland rainfed cropping and a trend towards a standard holding of 2 hectares. During Repelita III, the concept of the "standard" holding of 2 hectares was still retained by GOI. However, the consultants planning under the SFSE-82 programme were given terms of reference as follows:

"The standard holding will, where possible, be based on a size of 3.5 ha, with 0.25 ha of houseplot and 1.0 ha suitable for rainfed arable crops. If alternative holding sizes are suggested, the minimum size must be 2.25 ha or more." (Physical planning for transmigration, terms of reference, Directorate-General of Cipta Karya, Oct.1982).

It was assumed that the transmigrant would achieve a subsistence standard of living quite quickly on 1.0 hectares of cleared land with rainfed arable crops (less than 8% slopes). He would then move on to sustained development based on cash surpluses using the remainder of his land allocation, which might be on more steeply sloping land (up to 25% slopes) and would therefore be suitable only for tree crops. This planning model can thus be designated as an arable/tree crop model. Given the logistical problems and high cost of supplying foodstuffs to isolated settlements, the initial objective of sustained settler self-sufficiency in food production is very sound. Subsequent tree crop development for cash income will ensure that the standard of living for the transmigrant can rise above subsistence level.

The terms of reference for SFSE consultants do not limit them to "upland dryland food crop models". A variety of models, based on a combination of arable and tree crops is possible, as are wetland arable models, combinations of wetland and dryland, and wetland/tree crop models.

As new information has come forward, notably from the work of the SFSE-80 and SFSE-82 consultants (supervised by the Technical Advisory Group in Bina Program), the continued reliance on the "standard" models used in planning has been questioned, for reasons described in the following sections. It is, therefore, logical that planning under Trans V should re-examine the concept of the "standard" holding and alternatives. 3.5.2. Factors affecting agricultural development.

The range of crops and the agricultural development possibilities in transmigration areas are governed by a number of factors:

i) Climate.

The only major climatic constraint is in SE Irian Jaya, where the long dry season limits cropping to early maturing annual crops.

ii) Drainage.

While problems of flooding and poor drainage have been a constraint to the SFSE'82 programme only in some regions, it will be necessary under Trans V to study many more potential wetland sites. The development of such sites would be contingent upon the construction of drainage and possibly flood protection works, although to a certain extent this may be alleviated by the planning of linear models along levees and foot slopes.

iii) Topography.

A high proportion of the areas studied has not been recommended for development because of unsuitable topography. Topographic constraints can be hills or depressions which divide otherwise suitable land into small and fragmented blocks with limited settlemment capability.

Many areas have not been recommended for development because there has not been sufficient arable land, i.e. land with slopes of less than 8%. The present policy of allocating to the transmigrant 1.25 ha arable land for subsistence food production has now become a major constraint to development planning, as suitable land with slopes of less than 8% is increasingly more difficult to find. Consideration can be given to relaxing the slope constraint and to reducing the area of the arable land component. In the case of the former expensive soil conservation measures would have to be introduced, with the cost of physical structures such as terraces and waterways rising geometrically as slopes increase.

iii) Soil fertility.

Soils in the areas receiving transmigrants are generally acid, and of low inherent fertility. The low pH status leads to exchangeable aluminium fixing the naturally occuring and applied phosphorus, inhibiting root

development and causing susceptibility of crops to drought. Application of lime at rates of one or two tonnes to the hectare will alleviate the problem, but is likely be impractical or too expensive unless there is a to nearby limestone deposit. Further, most of the available plant nutrients are contained in the shallow surface organic layer, which is easily destroyed by inappropriate land clearing methods. In order to maintain adequate crop yields, soils with poor fertility must be treated with appropriate applications of fertilizer. The fertilizer package supplied to the transmigrant during each of the first three years of settlement is standard and not site specific and has been reduced from 300 kg to 200 kg. Most sites are being identified with very low fertility, requiring a level of inputs well above that of the current standard package to ensure sustained arable cropping. Decisions on additional support are essential in such cases.

v) Land allocation

Land availability for transmigration development is restricted by current land classification, allocation and use and in particular by:

- a) forest classification
- b) allocation of land for tree crop estate development
- c) the traditional rights ("adat law") of existing populations

These constraints are treated more fully in section 3.6.

vi) Supply of planting materials.

The "standard" model for transmigration has a cash crop component, the development of which is essential if the standard of living of the transmigrants is to rise above subsistence level. On the vast majority of sites this second stage development will be the introduction of tree crops.

The plan to settle 750,000 families during Repelita IV implies an aggregate area for tree crop development of 1.35 million hectares, which will need about 740 million budded stumps or clonal seedlings. This quantity is believed to be beyond the present capacity of the estate crop sector, and will be a serious constraint unless a major programme is started to expand tree crop nursery capacity. Before substantial tree crop plantings can be made on transmigration sites an institutional structure will have to be created. The market opportunities for tree crops will have to be considered in such a development programme and close attention paid to the special marketing problems arising in isolated areas.

vii) Labour.

Labour is a major constraint to the development of transmigration sites as the settler is normally entirely dependent on family labour. Transmigrant families are generally young, and their labour is limited to the husband and wife, with some assistance from young children.

A shortfall in the supply of labour is evident during the early settlement period and as a result it is unlikely that all the initial land allocation will be cropped until year three.

The provision of draught animals will help to overcome the labour constraint. Local breeding and training programmes should be initiated, but it could be many years before the settlers' needs are satisfied.

viii) Extension and Research

The need to supply transmigration sites with qualified and experinced agricultural extension workers is well recognised. Every effort should be made to supply a field extension officer for each transmigration site at a density of one extension worker per 500 families.

As previously stated, sustained self-sufficiency in food production is dependent on the availability and use of adequate amounts of fertilizer, which are likely to exceed the standard package of 200 kg. A programme of fertilizer trials in transmigration areas in Kalimantan and Irian JAya is urgently required in order to identify fertilizer levels actually required to achieve the objectives of the food crop component of the "standard" arable/tree crop model and for correlation with soil analysis data.

ix) Management.

The arrangements for providing transmigrants with farm inputs are not always successful. This accelerates the decline in soil fertility and the financial status of the settlers. They are generally unable to develop the areas set aside for tree crops, because they lack planting materials and advice, and because they have often sought paid work instead. Attention needs to be given to the timely introduction of institutional support to the transmigrants.

The tree crop areas are not allocated as individual holdings, because GOI policy does not allow title to more than 2.0 ha. So far, no system for management of communal tree crop areas has been introduced.

x) Progress

above list of factors affecting the agricultural The development may appear to be formidable. however It has served the very useful purpose of identifying possible constraints to development. The next steps have been, firstly, to bring them to the attention of the Government agencies concerned, and secondly, to set up procedures to deal with them in an efficient and timely manner. is It encouraging to note that significant progress has already been made in trying to overcome some of these problems. This includes:

- a) setting up a committee, between the Ministry of Transmigration and the Department of Forestry for the purpose of reclassifying the forestry status in areas suitable for transmigration.
- b) a re-examination of the labour constraint which may lead to a reduction in the initial allocation of arable land to less than one hectare.
- c) improvement in cooperation between the Ministry of Transmigration and the tree crop sector of the Ministry of Agriculture.
- d) improvement of extension services.
- e) a new awareness of the need to increase the level of the fertilizer package from 200 kg to 400 kg.
- f) provision of draught animals to some SKPs
- g) examination of alternative models by Bina Program and cooperation with the relevant implementing agencies.

3.5.3. Planning implications.

The size and physical characteristics of the chosen farm model have far-reaching implications for transmigrant settlement. The present requirement for arable land (suitable soils and slopes of less than 8%) is Ø.25ha for the houseplot and 1.Ø ha for the farm plot. Land with these characteristics which is not already allocated for other uses (forestry, estate crops), or being used by indigenous cultivators, is becoming increasingly scarce. The consultants now screening and selecting land for settlement are concerned about the constraints described earlier, and find that they have to reject more and more sites for standard development. In contrast, there are large areas of land which could be used for alternative models. For tree crops, there are thousands of hectares of land with slopes of up to 40% which are potentially suitable. Some of this land is productive forest or would best be retained for forestry. Of the remainder, some has been allocated for estate crop development, or for other uses, but the potential number of sites for settlement would be much higher than at present.

The GOI has plans for 640,000 ha of rubber, 490,000 ha of coconut (including rehabilitation) and 910,000 ha of oil palm, based mainly on the PIR development concept. At present, planning is carried out by Team Khusus in DG Estates. Although DG Estates is aware of the need for cooperation with the development agencies in other sectors, there is scope for rationalising site selection and planning between DG Estates and Bina Program Pankim.

3.5.4. Alternative models.

One of the aims of the Trans V project is to establish pilot settlements using alternative models. To this end, be contracted to carry out project will consultants identification and site selection studies, ideally before the end of October 1984. On the basis of these studies, the consultants will continue with Phase IIIA detailed engineering and feasibility studies for the pilot settlements. These studies will be funded by the Trans III project and should be completed by September 1985, with preliminary draft by the end of April 1985. The implementation of the pilot settlements will be funded by the Trans V project. Further details are given in Section 5.7.

Of particular importance in the studies and planning of alternative models will be assessment of the resources required, including land, labour, and development costs. For some models there may be considerable delays between development and the arrival of the transmigrants and income at full production. For example, it may be six years before the planned tree crops start production, and during this period the settlers will have to be supported.

The studies should also include careful assessments of the market prospects for produce. Until now, the standard model has essentially produced subsistence food crops, but with alternative models market capacity could become a potential constraint. Studies should also consider carefully the institutional arrangements, including the management of communally held land. The latter may arise where the total land used by the settlers exceeds the maximum of 2.0 ha per family to which the GOI is now prepared to give individual title.

"Second stage" development is now being introduced to planning for transmigration. In essence, it means further investment, with or without additional settlers, to existing areas of transmigrant settlement. In theory, the marginal cost of additional settlers should be lower than for new settlers because much of the physical and social infrastructure will have already been implemented. The availability of suitable land around existing settlements depend on the farm models used and their will land requirements. Another factor is that land cleared and allocated to settlers may not coincide with plans. Thus, a reassessment of land actually available will be needed.

3.6 Land allocation

3.6.1 Introduction

Problems associated with land allocation have been an important constraint throughout the transmigration programme. They appear to be increasingly severe during Trans III as available land resources are used up. The GOI agencies responsible for various forms of land development now find that land suitable for any one purpose is a limited resource, and conflicts arise about its allocation. These conflicts have not been resolved even though working seminars have been held roughly once a year.

Perhaps the main reason for land allocation problems is the lack of a single agency responsible for overall mapping of land resources on which rational planning can be based. Selection of sites for development is often arbitrary, and the department concerned then carries out its own surveys (sometimes using consultants) only to find that the land is either unsuitable for the required purpose, or is not available because it has been allocated for development by other departments. The problem is compounded in some regions by the inaccuracy of the topographic base maps, although there is an ongoing programme to correct this (see Section 3.3 The provincial planning authority (BAPPEDA), above). the direction of the provincial Governor's office, is under responsible for land allocation, although DG Forestry must first approve the release of land from a forest use status. All undeveloped land is presently treated as "State Land" under the jurisdiction of the Forestry Department.

3.6.2 Forestry

The functional forestry categories are:

 Protection Forest (which includes the functions of watershed protection, as well as the various categories of nature reserves).

- Limited Production Forest,
- Production Forest,
- Conversion Forest,
- Land under other use.

In principal, the only forested land that is available for agricultural development is that classified as Conversion Forest, and therefore the transmigration programme is confined to either this category or to deforested land.

In practice, the Conversion Forest has already been cleared and developed. The other categories are planned to be under permanent forest cover, but commonly shifting cultivators move in along the logging roads and outwards from them, until large areas with Production Forest status are also under cultivation.

Limited Production Forest is mostly designated on steeper or higher land and is less in demand, but in West Kalimantan large areas of even this category have long been totally cleared of forest.

Thus a large proportion of SKPs lie at least partly in Production Forest, and permission to implement settlements must first be obtained from the Forestry Department on a site by site basis. Sometimes the issues are straightforward: the status boundaries are demonstrably inappropriate or based on reconnaissance data of doubtful validity, or the forest has been heavily exploited and carries a very low stock volume or regenerative capacity. More usually, the forest is of reasonable quality and under an active logging programme, and there has been an understandable reluctance on the part of the Department to release such land. Nevertheless, there is scope for much closer liaison between the two Departments, and indeed the future of the transmigration programme will be dependent upon decisions that must be taken at Ministerial level on the allocation of land to forestry and to agricul-The situation must be avoided, for example, where ture. numerous sites in West Kalimantan are still awaiting change from the status of Limited Production Forest on which there is no vestige of forest remaining, on the grounds that the Forestry Department has a re-afforestation programme. In such areas there should be potential for liaison to assist the development of the tree crops under transmigration.

3.6.3 Estate Development

A second source of conflict is the allocation of land to different modes of agricultural development, and hence under the jurisdiction of different Departments. The main contender is the DG Estates for tree crop development by:

- private estates,
- NES projects (nucleus estate smallholder development projects),
- PIR projects (similar to NES, but smaller and locally funded).

These allocations are made by the Governor through the provincial planning authority (BAPPEDA), and to a certain extent will follow the development model favoured by the provincial government. For example in the provinces of Riau, Jambi and East Kalimantan, there is a strong emphasis on tree crop development, in preference to development of an arable mixed arable/tree crop model under the Ministry of or Transmigration. In practice, both models concern the resettlement of transmigrants, but the planning and implementation is executed by different Departments under different loan agreements. Unfortunately these allocations generally have to be made on a rather arbitrary basis, as there is still not a nationwide base of land suitability maps at reconnaissance level on which to identify sites for development. There have been instances where allocations for tree crops have been made on the few remaining areas in a province capable of supporting the standard arable model, while alternative areas suitable only for tree crops are set aside for transmigration. This deficiency should be resolved once the RePPProt team has completed its studies.

3.6.4. Land Tenure

A third major constraint to the allocation and development of sites for transmigrant settlements is existing agriculture under various forms of traditional rights (Adat Law).

Shifting cultivation is still the predominant agricultural system in most regions of the outer islands. In West Kalimantan, less than 20 percent of the area studies at Phase II level in the ongoing SFSE'82 programme carries primary forest, and this is generally preserved on the remaining land that is unsuitable for agricultural development. Most of the remainder is under shifting cultivation. In the other Kalimantan provices, the proportions of used land are lower, but areas affected by shifting cultivation are expanding rapidly.

On the poor soils of most of the Outer Islands, a long fallow period is necessary to maintain crop yields and avoid soil degradation; this entails a large area per family. Consequently, the system is very sensitive to increasing population density. Fallow periods which should, ideally, be around 15 years have been reduced to five in many places. As the rate of transmigration settlement accelerates, the competition for land is bringing increasing pressures on local populations, requiring fundamental changes in their agricultural systems and rural institutions.

At present, local populations are compensated only for the loss of land already bearing tree cops, and not for loss of land under customary rights or for income from other natural resources. In West Kalimantan, land is usually reserved for the local people outside the transmigration schemes, but ther has also been a considerable effort to integrate them within the schemes. In South Sumatera there is the problem of very large areas of poor quality, "jungle" rubber. The PIR tree crop projects have included both local cultivators and transmigrants, but problems of aquiring land remain. In Irian official policy is that 25% of settlers should be of local origin.

there appears to be increasing resistance by local However, people to integration within transmigration settlements. The methodology and costs of parallel development of settled agriculture among local populations need investigation with a careful assessment of present rural institutions and economic systems. Undoubtedly, the social advantages of the transmigration programme are appreciated by the local population, but they are less convinced by the economic realities. Nevertheless, the transmigration programme provides an effective platform in which to achieve rationalisation and intensification of land use within the existing agricultural sector.

A more detailed account of the shifting cultivation system is contained in Section 9.3.

3.6.5 Other Land Availability Constraints

Other problems over land allocation are generally of local and minor importance, such as municipal area expansion, tribal resettlement, settlement schemes for pensioned personnel of the armed forces, etc.. Up to now, concessions for mineral exploitation have not seriously hindered the transmigration programme, but the issues involved have never been resolved satisfactorily, and the problem tends to arise only when the site is required for implementation. Nevertheless, in some areas (Bangkinang in Riau, for example) implementation is in progress within oil concession areas; certainly oil extraction and agriculture need not be mutually exclusive.

3.6.6 Conclusions

Future conflicts on allocation should be further resolved by the proposal in this Trans V project that all Phase II studies will be executed by the Ministry of Transmigration, and that sites suitable for other models of development will then be allocated, either before or after Phase IIIA, to the relevant agency, such as DG Estates or the Swamps Directorate, for implementation.

A more formal system of coordination between the Ministry of Transmigration and other involved departments is essential. Basic procedures for rapidly resolving conflicts on land allocation need to be devised.

A much clearer picture of existing and proposed land allocation regionally is required; such information is gradually being assembled by Provincial Authorities, the Central and Regional Advisory Groups and SATLAPS, by SFSE-82 consultants in their regional setting studies and by the RePPProt programme. It is intended that this work should be intensified and extended under Trans V.

During the site investigation and planning studies, more detailed studies of land tenure and rural institutions are required, and site specific recommendations made for resolving these issues in the long term.

CHAPTER 4. THE PROJECT AREAS

4.1. Introduction.

Basic to the objectives of the transmigration programme are the populations of the islands, population growth rates and densities. This information is summarised in Table 4.1.

Table 4.	l. Populations densities b	, average annu oy region (1971	al growth - 1980).	rates, and
Region	Population gro (1980)	Annual owth rate (%) (1971-1980)	Density (p (1971)	ersons/sq.km) (1980)
Java	91,282,000	2.0	576	691
Bali	2,470,000	1.7	381	426
Sumatera	27,980,000	3.3	44	59
K'mantan	6,721,000	3.0	10	13
Sulawesi	10,377,000	2.2	45	5 5
Maluku	1,407,000	2.9	15	19
I.Jaya	1,146,000	2.4	2	3
Ind .	147,383,000	2.3	63	78

Source: IBRD Report No.4279-IND.

The table illustrates the concentration of population in the "inner islands" and the relatively low population densities in the "outer islands" towards which transmigrants are directed.

4.2. Site Identification

List of sites for study are continuously changing and evolving as new information on land suitability and site availability comes on hand. The SFSE-80 programme started with a degree of optimism, which was not realised when it become apparent that inadequate attention had been given at the Phase I stage to the fundamental criteria of suitability and availability. The Advisory Group has subsequently played an important role in reducing the site rejection rate, through a process of screening for suitability by the study of airphotos, and through the collection of information on availability via the Regional Advisers and SATLAP offices.

Site screening, together with the relaxation of the strict suitability criteria used in SFSE-80, and the introduction of non-standard models of development, has reduced the rejection rate on grounds of land suitability. It cannot be avoided completely as there will always be a number of sites for which unsuitability can be confirmed only through a Phase II field study. However site availability still remains a major constraint, as discussed in the previous chapter, and the Trans V targets can be achieved only if high level policy decisions are taken on this issue. There is still a forestry constraint on the major proportion of the sites proposed in Appendix F. Planning studies or implementation must not be indefinitely delayed pending resolution of this issue.

It must be emphasised now that most of sites listed in Appendix F would have been rejected for the standard dryland arable/tree crop model under the SFSE-80 programme, with its strict criteria for slope, present land use and minimum holding capacity. Most of the sites will be suitable for some form of non-standard model only. Generally this will be a tree crop model, with or without an arable component.Other sites would be suitable only with a sustained high level of fertilizer input, for example or as linear models along edges of swamps, perhaps with a fishery component. An entirely flexible approach must be used for the Phase II programme, to determine the most appropriate model for development, and possible options, for each individual site. The consultants' terms of reference must allow for this, and a high degree of competence will be required. After completion of Phase II, a decision must be taken on whether to allocate the Phase IIIA study to the same consultant, or to another agency such DG Estates or DG Swamps for the detailed study and ementation. These decisions should be taken by the as implementation. Steering Committee, at their monthly meetings (see Chapter 7.).

The list of sites in Appendix F is <u>provisional only</u>, and there will be major revisions before the final list is drawn up. The late start of the RePPProt programme, delayed from May 1983 to May 1984, is the main reason for inability to finalise the list at the present time. From Phase IB studies, the data is already available for Central Kalimantan. Data from the remaining provinces of interest (West and East Kalimantan and Irian Jaya) will become available between now and November 1985. There will be an opportunity to use the data as soon as it is prepared in draft, probably by December 1984 for Central Kalimantan and West Irian Jaya.

On receipt of the draft land suitability maps, the structure plans must be revised in the light of the landform data, taking full note of provincial development plans, forest status and areas already studied or implemented for transmigration. The latter is important because there may be potential for using suitable portions of an SKP which has been studied and rejected on the grounds of low capacity.

The provisional list in Appendix F has been prepared from whatever information is currently available on landforms and land availability. The Advisory Group has prepared its own very rapid and preliminary screening from small scale airphotos of relevant areas, mostly in Kalimantan. Other regional survey data is also available such as the Nation Wide Study of Coastal and Near Coastal Swamp Land recently completed for DG Water Resources Development. In some areas, however, including most Irian Jaya, remote sensing materials have not yet been studied, and the 1:250,000 topographic maps, which are very unreliable, are the only source of data.

Appendix F lists 362 SKPs, but this number is an approximation only. It is also considered optimistic, as it includes sites which clearly lie at the extreme limit of suitability, and which may be rejected at the Phase I stage. Allocations of land to other purposes will further reduce the list. However the list is based on a standard size of SKP of about 25,000 ha, and it is the intention that restructuring after the Phase IB studies will allow reduction of this standard to about 15,000 ha, using a higher confidence level than was previously possible.

Appendix F lists only the four provinces of West, Central and East Kalimantan and Irian Jaya. This does not preclude the possibility of further sites being identified in other islands for a variety of non-standard models, including nonagricultural models.

The sites in Appendix F can be grouped according to their general geographical characteristics, which summarise the likely models of development and their constraints. The geographical groups are discussed in Sections 4.3.1-4.3.4 below.

4.3. Description of areas.

4.3.1. West Kalimantan.

suffered West Kalimantan has extremely extensive deforestation through shifting cultivation, accompanied by soil degradation. Indeed over most of the Kapuas basin and adjoining areas, the presence of lowland forest is an almost certain indicator of unsuitable soils, either peat swamp or severely flooded terrain, or white sandy terraces. The province is needs an immediate programme of agricultural intensification, with shifting cultivation replaced by permanent cropping, and the transmigration programme should be used to achieve this. Inevitably there are complex social issues involved which have far-reaching implications (see Section 3.6.2), and much of the terrain would be most suited for tree crops only.

Up to now, the sites have been concentrated in the less populated areas where the problems can be resolved comparatively easily with land set aside for the present population to continue with shifting cultivation until a leisurely transition can be made. However the transmigration programme can continue in West Kalimantan only if a more determined effort is made to reduce the transition period, or to more fully integrate the settlers with the present farmers.

The list of sites given in Appendix F is probably very optimistic, as there is now very little information on present population, land use, and land suitability. Nearly all of the sites fall in this category. A few sites lie along or close to the west coast, either as wetland sites or as sites between the swamps and the uplands, but little is known about them (WPPs I, VI, IXc, Xc, Xd and XIVb).

4.3.2 Central Kalimantan

Central Kalimantan has a low population density, mainly because of of a very wide infertile zone, of peat swamps and white sandy terraces, lying between the coast and the uplands of the interior. At the present state of knowledge, these soils must be considered to have no potential for development, except for some localised possibilities for highly capital intensive schemes close to major markets. Any such possibilities can only follow the development of the regional infrastructure, and must not be used to spearhead this development as this would result in certain failure. For this reason, the infertile zone is not included in the Trans V proposal, except perhaps for some limited development (linear models) along the river valleys (e.g. WPPs XVI, XVIa, XIVc).

To the south of the infertile zone, the main area of coastal swamps with development potential lies between the Kahayan River and Banjarmasin, and has mostly been developed for transmigration under the Tidal Swamp Land Development West from the Kahayan, the coastal swamp zone Project. narrower and development options more limited. becomes Nevertheless there is some potential for swampland development along the coast, supplemented with mixed dryland cropping and perhaps fisheries, and 23 sites are presently listed (WPPs VIIa, b, c, VIII, IXc, XIIIa, b, c, d).

North of the white sands and peats there is a transitional zone of extremely marginal soils, which were generally rejected for the standard dryland model under SFSE-80, but which would have some potential especially for tree crops and locally even dryland arable crops, provided that the problems of extreme low fertility, moisture stress in the dry season, and erodibility can be overcome. These sites include WPPs Ia, b, Xa, IXa, XId, XIIa, and parts of more northerly WPPs.

In the interior of the province, south of the mountains, soils improve but there is a major slope constraint, as well as a moderately extensive constraint of present land use (shifting cultivation). There are also forestry restrictions over most of the area at the present time. The area can be developed only under tree crops, with or without an arable component which must be determined by field survey. The remaining WPPs belong to this category, but an early draft map from the RePPProt study indicates several additional areas for which no structure plan exists yet.

4.3.3 East Kalimantan

The sites listed for East Kalimantan have been identified mainly from preliminary screening studies, and await confirmation on land availability and also restructuring. The provincial planning authorities place strong emphasis on tree crop development in the province, which is supported by the slope constraints in most areas, and also give priority to transmigration settlement along the axis of the provincial road from Tanah Grogot in the south to Bontang in the north. this must now be added the priority for development To of agriculture within the zone of forest fire damage. In the north of the province there has been limited transmigration development up to now, but the proposed pulp mill complex at Sesap (inland from Tarakan) is expected to act as a catalyst for regional development.

The majority of sites would be suitable for development based on a tree crop model, though there is likely to be potential for arable cropping as well in about half the sites. There are presently forestry restrictions on about half the sites, but there are strong arguments to relax these in view of the priorities and development proposals outlined above.

Assuming that the Sesayap area will be studied under Trans III, there remain some seven sites for study in WPPs Ib and V in the surrounding area.

Southwards, WPPs VIIb, IX, IXb, X, Xe, Xf and Xg form an interesting group of sites developed to a large extent on limestone. Despite the hummocky terrain and often shallow soils, the consultants working in Talisayan under the SFSE-80 extension programme were still able to make a positive recommendation. The entire area requires study to assess its development potential, which may also include a major source of lime.

Part of the previous group lies within the fire zone, which also covers WPPs XVIIb, d, Xa, XIa, c and XII. Much more work is still required to assess the degree and effects of the damage on an area basis, and this should be done in conjunction with other agencies, particularly Bappeda and the Forestry Department, in order to determine priorities for rehabilitation (either under forest replanting or by timber plantations) and agricultural development. Such studies form an interesting component for the consultant packmight age in this area. While it is difficult to be specific without further information, the biggest problem lies in the swamp areas which were severely damaged by fire, particularly where this caused burning and skrinkage of the peat soils. No sites have been listed for a fisheries model in the adjacent lakes, but this could also form an input to the consultants' package.

Finally WPPs XVa, b, c and f lie in the south of the province, close to the axis of the provincial road. Although both slope constraints and forestry restrictions apply to much of this area, they are less important in WPPs XVc and XVf which include sites held over in reserve from Trans-III.

4.3.4. Irian Jaya

Projections of settlement capacity in this province have tended to be rather optimistic, as the SFSE-80 and 82 studies are encountering major constraints of land suitability, because of peat swamps, steep slopes or very dissected terrain, and infertile, highly erodible soils. There is almost no information available yet from remote sensing, except for some Landsat studies in the Merauke region, and so the list is based mainly on the topographic maps which are often very unreliable. Extensive revisions are likely once the RePPProt studies are available, scheduled in December 1984 for the western part and November 1985 for the eastern part. Few of the sites are expected to be suitable for a dryland arable model, so that the consultants must investigate the range of development options at Phase II. For example, screening studies in the Steenkool area identified potential for linear settlements along the nearly unpopulated rivers, and possibility also for development of coastal fisheries.

4.4. Conclusions.

Appendix F lists a total of 362 sites, distributed as follows:

West Kalimantan	86
Central Kalimantan	129
East Kalimantan	75
Irian Jaya	72

However the list is very provisional and will be substantially revised, as information becomes available on the following criteria:

- a) Reconnaissance land suitability mapping (Phase IB) by RePPProt.
- b) Information on land availability and allocation, including forest functional status.

c) Restructuring in the light of the above two criteria.

Phase IIIB mapping is scheduled to be completed only for Central Kalimantan and western part of Irian Jaya by the end of 1984, and for the other listed areas before end of 1985.

Information on land availability will emerge steadily but can never be definitive, as the planned allocations to other forms of development are themselves provisional. The issue of release of land from permanent forest status has been one of the major problems during Trans III (Section 3.6.). About half the sites listed in Appendix F presently have some form of forestry constraint.

To date the WPP structure plans have been prepared mainly without the benefit of accurate reconnaissance data on landforms. Major restructuring will be required in all areas when the Phase IB maps are completed. At present SKPs are structured to a size of at least 20,000 ha, but it is hoped that this might be reduced to 15,000 ha once Phase IB data is available.

Factors of unsuitability and unavailability may considerably reduce the list, but to a certain extent this should be compensated by the reduction of SKP size for Phase II studies and increased confidence levels.

It must be emphasised that very few of the provisionally identified sites would pass the criteria adopted for the SFSE-80 standard dryland arable model. Lack of suitable land for settlement and food crop production is forcing a large scale shift of emphasis towards tree crops. The majority of sites listed would be suitable only for a tree crop model, through there may be sufficient land in many of them for some component of arable cropping. Slopes of up to 40% will be used for tree crops, and up to 60% under some slope and soil configurations. The implications of such an intensive tree crop development programme must be fully understood.

The remaining land areas that are topographically suitable for arable cropping generally have major soil or drainage constraints, requiring very high and sustained fertilizer inputs and high capital cost of development. Huge areas of such land (peat swamp, deeply flooded areas, white sand terraces) must still be rejected for agricultural development at the present time. In some coastal areas, different modes of development will be required, such as linear models along rivers and swamp margins.

Only those sites that justify study for an agricultural model are listed in Appendix F. There may be other sites available for other forms of development such as freshwater or salt water fisheries, silviculture, mining, lime production and industry.

There may be a small number of further sites available in Sumatera, Sulawesi and Maluku, and perhaps other islands.

Finally, the problem of shifting cultivation under traditional rights must be resolved, especially in Kalimantan, through integration with the transmigration programme.

CHAPTER 5. THE PROJECT.

5.1. Project description.

The main objectives of the Transmigration V project are:

a) To prepare plans for 300,000 transmigrant families to be settled during the latter part of Repelita IV. The settlements will be designed to incorporate a variety of farm models, including wetland rice, tree crops, and fishing. However, the main emphasis is expected to continue with the arable/tree crop farm model aimed at self-sufficiency in basic food requirements within 12 - 18 months.

b) To implement new types of settlement for about 3,000 sponsored transmigrants, and 5,000 spontaneous transmigrants. These pilot settlements would aim to test alternative economic activities, and would include the creation of new village and urban centres.

c) To provide programme support to the executing agencies directly involved in the physical planning of settlements, namely Bina Program Pankim, Bakosurtanal, and possibly DG Agraria.

The main components of the project will be:

- a) Planning, including remote sensing, land resource studies, regional development plans, mapping, and Phase II, Phase IIIA and Phase IIIB studies.
- b) Implementation of pilot settlements.
- c) Special studies (including marketing, rural centres, and social and economic benefits, mid-term Repelita IV review, spontaneous transmigration, land use).
- d) Programme support, including the Technical Advisory Group in Bina Program, staff training, and support for Bakosurtanal and Agraria.

48

5.2. The planning programme

As indicated in Chapter 3, the planning requirements in Repelita IV (1984/85 - 1988/89) are for 1,050,000 families. It is expected that the initial site selection and screening carried studies will be out by the Ministry of Transmigration. However, there are various other GOI agencies which could prepare detailed settlement plans for a large number of sites when the screening studies have been completed. These agencies include:

- a) Ministry of Public Works for P3S (swamp settlement) schemes;
- b) Ministry of Agriculture for NES/PIR (nucleus estate/smallholder tree crop) projects;

The details of the GOI's transmigration planning target are given in Table 5.1 below. These estimates are based on GOI policy decisions. If it is assumed that the Trans III target of 300,000 KK is met and that Trans V will provide settlement plans for a further 300,000 KK, then funding for the remaining 450,000 KK will need to come from the local budget or from some other source. The GOI have stated that it will be necessary for the studies for the Trans V programme to be carried out over a period of 2 years.

Table 5.1 Transmigration planning targets for Repelita IV (1000 KK)

		84/85	85/86	86/87	87/88	88/89	Total
APBN		150	50	-	20	230	450
Trans	III	40	150	110	-		300
Trans	V	-	-	100	200	-	300
Total		190	200	210	220	230	1050

Source: Bina Program from GOI policy statements.

Although the Trans V project is due to become effective in October 1985, it is unlikely that consultants will be mobilised for field studies before the start of the 1986/87 financial year. Therefore under Trans V during the 2 years 1986/87 and 1987/88 Bina Program will be responsible for producing detailed settlement plans (Phase IIIA) for about 300,000 families. To achieve the target of detailed settlement plans for 300,000 families it is estimated that some 220 Phase IIIA studies will need to be undertaken.

Assuming that only 70% of the Phase II studies are found suitable for Phase IIIA, it is estimated that some 325 Phase II studies will need to be carried out. The Phase II studies will cover an area of about 6.5 million hectares.

This is obviously a very ambitious programme and will involve very careful planning. It is the GOI intention to prepare as many Phase II studies and Phase IIIA studies as possible by using radar/laser mapping techniques. However nether of these methods have yet been proved in Indonesian conditions. Any delay or problems in finalising the above systems will invalidate the whole programme.

To achieve a 2 year implementation programme for Phase II and Phase IIIA studies it will be necessary to monitor other activities in the overall programme very carefully. These include timely arrival of source materials for the Phase Ib studies, timely implementation of contracts for aerial photographs and careful selection of consultants to carry out the studies.

To plan for 300,000 KK in a two year period the number of studies which would need to be completed each year is as follows:

	Phase II	Phase IIIA
1986/87	175	80
1987/88	150	140
	325	220

For Phase IIIB studies it is assumed that these will be completed in the year following the corresponding Phase IIIA studies.

5.3 Regional planning.

The revision of Phase IB (5 year, medium term) regional plans prepared for Repelita III is required before sitespecific transmigration planning studies are made for Repelita IV. In certain areas entirely new plans are needed. It is intended that sites planned under Trans V should be selected on the basis of regional development priorities, both between recipient regions and within them.

The revised Phase IB plans, which delineate WPP and SKP boundaries, and WPP centres, should be based on:

- -land capability studies (under RePPProT, see Section 5.4. below);
- -up to date information on the status of all potential transmigration sites (i.e.settled, planned, and screened; rejected for standard model; potential for non-standard model; passed to other agency; etc.);
- -existing regional or sub-regional studies, including "regional setting" studies carried out by SFSE-82 consultants; and

1

-the known programmes of provincial authorities (e.g. BAPPEDAS, Forestry, DG Estates, DG Swamps, Bina Marga).

Certain of the WPP centres will be promoted under the Trans V loan on the basis of priorities yet to be established.

SFSE-82 consultants are required to undertake "regional setting" studies covering all their Phase IIIA sites. Where practicable, the sites are grouped into one or more WPPs, and a study's coverage includes communications with the port through which essential inputs and marketable outputs must pass. Other types of development, adjacent to, or conflicting with, transmigrant settlements, are identified and mapped; existing or potential road links are established; marketing possibilities are assessed and, where appropriate, recommendations are made for priority investment. Further regional setting studies will be undertaken by Trans V consultants so that most of the main recipient regions will have been studied by the end of the loan period.

It is intended that Bina Program, assisted by the Technical Advisory Group, will establish priorities for SKP planning under Trans V, to maximise use of infrastructure and to justify investment in selected marketing and processing facilities at certain WPP centres, and in second stage development of certain settlements.

It is therefore proposed that the Technical Advisory Group include a qualified Regional Planner. His main tasks would be:

- -liaison with the RePPProT team assessing land capability; -advice to Bina Program on Phase IB revision for the recipient regions (and priority site selection);
- -advice to Bina Program on the impact of transmigration on the donor regions (and their selection);
- -advice to Bina Program on WPP centre selection and development;
- -supervision of Trans V consultants' regional setting studies; and
- -liaison with other development agencies at, provincial level and in Jakarta.

The Regional Planner will be based in Jakarta but will have to spend much of his time in the provincial centres. His post will be additional to the Physical Planner, who will supervise the detailed planning of all the sites studied by consultants. 5.4. Land resource studies.

Recognising the weakness of Phase I planning, Bina Program is now making considerable efforts under Trans III to improve this critical phase. In particular, the RePPProT team has established a working methodology for mapping physical land resources on a regional basis, which will greatly enhance regional planning (Section 5.3. above).

The output is two series of maps at 1: 250,000 scale:

a) Land systems mapping.

The first map series, showing land systems, will delimit the different kinds of landscape, the valleys, swamps, plains, hills and mountains of the region. On the map legend will be described important aspects of the land system for planning. These include topographic properties: height of hills; dominant slope steepness, shape and length; principal land facets; drainage patterns; degree of fragmentation of the land. In addition, major soil types, climatic variables, groundwater, flooding, rock types, and an index describing the reliability of the information, will be shown. The legend will also show the suitability of each land system for all defined land utilisation types (transmigration models).

b) Land availability mapping.

The second map series, equally important for the planner, will show land availability through existing land use and land status. The land use component will be expressed essentially as forest and non-forested areas. Depending on image quality, however, shifting cultivation will be distinguished from fixed cultivation types, and logged forest will be distinguished from unlogged forest. Certain types of natural forest reflecting extreme soil conditions will also be identified. Where grassland occurs extensively it will be mapped.

Forest zoning data, as provided by Departamen Kehutanan, will be shown on these maps, as well as other areas already in use, or officially reserved for designated uses, such as conservation areas and agricultural development schemes.

With the information shown in these two map series, although it is strictly reconnaissance level data, there will be a stronger physical basis for improving regional planning, showing not only where there are severe limitations for development, but also which types of land are most suitable for the selected development models. The reliability of the information will not be uniform because image interpretation will vary with image quality, and in some areas there will be no supporting field data. The methodology, however, has been under trial for two months in the first area to be studied, Central Kalimantan. It is already clear that where:

- i) reliable topographic base maps or semi-controlled photo/radar mosaics are available,
- ii) airphotography of moderate to good quality exists,
- iii) if airphotos are lacking, radar mosaics can be obtained for landform analysis,
- iv) if airphotos are lacking, Landsat imagery can be obtained for landform analysis,

then the maps described above can be produced, and selection of sites for Phase II studies can be greatly improved. This has been done in a block in Central Kalimantan where sites for radar/laser profiling trials have been selected.

The planned period to study the land resources for virtually all of Indonesia was 18 months, finishing in November 1985, funded under Trans III. This would have made available and the required data for locating Phase II study sites a11 for Trans V . However, practical restrictions have already occurred which will curtail the study to Kalimantan and Irian Jaya within the 18 month period. These restrictions include delays in purchasing working materials, which delays interpretation of imagery, and administrative problems in supplying adequate working space for, and numbers of, draughtsmen, which severely reduces the rate of interpretation-data plotting and final mapping.

With the agreement of Bina Program the new order of priority of provinces in the current 18 months is:

-Central Kalimantan, -Irian Jaya, west then east, -West Kalimantan, -East and South Kalimantan.

BAKOSURTANAL plays a key role in the coordination and supply of working materials used by the RePPProT project. The principle being followed for obtaining the materials is that if they already exist, they should be purchased through the contingency vote of SFSE-82 consultants. This applies to client area radar mosaics, and Landsat airphotography, imagery. New photography, photo- and radar mosaics (including speculative mosaics) will, however, be funded by Trans V. The production of these materials for Bina Program by Bakosurtanal is covered by a Joint Decision in a Cooperation Agreement between the two agencies signed on May 29 1984.

The present status of maps, photos, and mosaics is outlined in Table 5.4., together with the needs for Phase I planning by the RePPProT project. "Available" means that the materials currently exist and have already been obtained, or will be obtained through the SFSE-82 consultants. "Required" means that the materials should be purchased through Trans V.

TABLE 5.4

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Availability of and requirements for working materials for comprehensive Phase I planning from Tans V

RECION	Kalimantan	Irian Jaya	Sumatra	Sulawesi Maluku	Nusa Tenggara	Java-Bali
MATERIALS	(560000km2)	(365000km2)	(470000km2)	(265000km2)	(100000km2)	(135000km2)
<pre>1. TOP MAPS Available no sheets (% region) 1 : 50 000 1 : 100 000 1 : 250 000 (a)</pre>	137 (20) 14 (7) 48 (100)	- 68 (50)(d) 45 (100)	524 (100) 311 (100) 47 (100)	- 47 (100)	- 19(100)	? ([*] 100) ? 16(100)
2. PHOTO MOSAICS Required (d) 1 : 100 000 No sheets (% region)	77(c)(40)	98 (80) 9	-	-		
3. AIR PHOTOS AVAILABLE (e) km2 % region) 1 : 50 000 1 : 100 000	c.80000(15) (e) c.318000 (55)(g)	c.33 000 (90)(h)		460 000	-	- - -
4. AIRPHOTOS required km2 (% region) 1 : 50 000 1 : 100 000			460 000 (100)(1)	-	-	-
5. RADAK MOSAICS Available (km2) Client area Spec. area Other	c.180 000 c.120 000 c.40 000	c. 80 000 'c. 90 000 c. 50 000	c. 100 000 c. 130 000	c. 50 000	c.100 000	-
6. RADAR MOSAICS Required 1 : 100 000 (km2) and 1 : 250 000	-	- 80 000(new) 70 000(spec)	c.230 000 (i)(new)) c.130 000 (spec).	-	-	-
7. LAND SAT Available (i) No frames	30	30	30	10	10	10

Notes:

- (a) Joint Operations Graphic series: reasonably reliable near coast but inaccurate inland where horizontal displacement bad and height data lacking.
- (b) Semi-controlled mosacis: used as proxy topographic base maps where BAKOSURTANAL 1 : 50 000 and 1 : 100 000 published sheets not available.
- (c) 21 sheets already supplied by BAKOSURTANAL
- (d) 58 sheets in manuscript not yet obtained from JANTOP.
- (e) RAAF and CIDA: quality varies from bad to good; gaps occur.
- (f) 80% already obtained.
- (g) 30% already obtained.
- (h) Held, by DPU but 2nd or 3rd generation prints. Resincoated (RC) prints required from negatives held in Australia.
- (i) Existing photoquality poor. Ideally, new set required at 1 : 50 000 or radar mosaics.
- (j) Selection of most useful frames and best method of processing and analysing being investigated.

Existing Aerial Photography.

INDONESIA







Map 4(b)



INDONESIA

5.5. Remote sensing.

The end results of the Phase IB land resource studies are two map series:

-land systems with land suitability for defined development models.

-present land use with land status to show land availability.

With this information selection of regions, and sites within them for Phase II field study, will be far more successful than hitherto.

a) Airphotography.

The land system map shows the distribution of different types of land, together with associated soils. It is derived mainly through land form analysis. The best way of doing this is to use conventional airphotography, in this case at scales between 1:50,000 and 1:100,000 to cover large areas rapidly. Airphotography enables stereoscopic image analysis, estimates of slope gradients, altitude assessment, and, if required, contour mapping. Photo-mosaics can be produced, serving as interim base maps. Land use is also readily interpreted from airphotography.

Where photo quality is poor, or is missing altogether, the next best materials are:

-radar mosaics for landform pattern analysis -landsat scenes for land use/forest types.

b) Radar imagery.

Images can be produced at scales between 1:100,000 and 1:400,000, as strips or as mosaics. The chief advantage is that they are unaffected by haze and cloud, and permit easy analysis of gross landform patterns. Disadvantages are that stereoscopic examination is difficult or not possible, subtle landform differences in lowland areas may not be well expressed, and land use differentiation is unreliable.

Three radar systems have operated in Indonesia, and a fourth has been proposed:

57
i) Shuttle imageing radar (SIR).

Images are in 40 km strips at a scale of 1:250,000. The picture is rather grainy but useful for macro topographic analysis. Very limited areas are covered when space shuttles have radar on board.

ii) Side-looking airborne radar (SLAR).

The real-aperture type uses a conventional antenna of maximum practical length, and produces rather grainy mosaics from single-look swathes up to 16 km wide. Horizontal scale is not uniform. The system is used by Westinghouse in Indonesia, but the cost is not known.

iii) Synthetic aperture radar (SAR).

This is a version of SLAR using a small antenna with doppler data processing techniques to produce better quality mosaics with sharper definition. The horizontal scale is relatively uniform. The system is used by Aeroservice in Indonesia. Originally, costs for new areas were as high as US\$ 40/sq.km, but the latest quote is US\$ 16/sq.km, and for areas marginal to client blocks may be as low as US\$ 2.50/sq.km.

Under the Trans V project, it is intended to purchase existing SAR imagery at a total cost of US\$ 3.04 million (details of the areas covered and costs are given in Section 5.6. below). The imagery is required for planning in Sumatera and Irian Jaya because existing airphotography (1:100,000) is of bad quality and outdated, and in E.Kalimantan and Irian Jaya for areas where no photography exists.

iv) Another newer SLAR technique is proposed by Mars Associates (Canada). This uses a seven-look system and compact on-board digitising equipment to achieve a less distorted and uniformly scaled mosaic, with the possibility of stereoscopic analysis. The system has not yet been used in Indonesia. The cost is estimated at US\$ 5/sq.km, but will probably escalate to US\$ 7 - 8/sq.km.

c) LANDSAT.

Each image covers 185 * 185 km. The original scale is 1:1,000,000, and enlargements to 1:250,000 are grainy. Cloud cover spoils many scenes. Horizontal scale is uniform. Different bands (Bands 4 - 7) offer different potential for analysis. Data can be purchased as magnetic tapes (CCT) which can be manipulated by computer to enhance images on video screens, with the possibility of making hard copy prints, or purchased directly as prints of single bands or multiple bands (FCC).

The cost of CCT (ex Bangkok) is US\$ 450/frame. The cost of FCC (ex Bangkok) is US\$ 300/print at 1:250,000 scale. Negatives at 1:1,000,000 scale for Indonesia east of Irian Jaya can be bought from Japan at US\$ 20/frame.

The principles being followed for acquisition of working materials for Phase IB are:

-Existing airphotography, client-area radar mosaics, and Landsat imagery, to be purchased through the contingency vote of SFSE-82 consultants. This has been instructed by Indra Samiarsa for BIPRAM. The cost is relatively low.

-New photography, photo-mosaics, and radar mosaics, will be funded by the IBRD loans. On 29/5/84, a Joint Decision was signed by Bina Program and BAKOSURTANAL covering production of maps, photography, and photo-mosaics, for Phase I and Phase II. Trans V Project areas. Existing photography and maps.

Map 5(a)



IRIAN JAYA

Trans V Project areas. Existing photography and maps.



Map 5(b)

5.6. Mapping.

Maps are made at different scales for the various stages of planning. At Phase I, most of the maps are at 1:250,000 scale; for Phase II at 1:50,000; at Phase IIIA at 1:20,000; and for Phase IIIB at 1:5,000.

a) Phase I.

Mapping for Phase I has been described in Section 5.4. above.

b) Phase II.

It is expected that for at least 25% of the area to be planned, maps at 1:50,000 scale or semi-controlled mosaics will be available from BAKOSURTANAL, the national mapping agency. These will have contours at 25m intervals or no contours. Depending on the quality of airphotography and the experience of interpretors, it may be possible for some sites to proceed to Phase IIIA mapping without conducting Phase II field surveys.

Depending on the outcome of the pilot studies of laser/radar profiling, for about 25% of the total Phase II area maps will be made without the conventional field survey work. Also dependent on the quality of airphotography and the experience of interpretors, it may be possible to proceed to Phase IIIA without Phase II field surveys.

For the remaining 50% of the Phase II area, it may be necessary to prepare maps using traditional graphical methods.

c) Phase IIIA.

For about 25% of the total area, maps at 1:20,000 scale or larger will be made using airborne remote sensing devices. In areas of logged forest and grassland, maps will be at 1:10,000 scale with 5m contour intervals. In swamp areas the contour interval will be reduced to one metre. Following Phase II studies, the consultants will recommend areas suitable for photogrammetric mapping. The maps will be made by local companies having the required instrumentation. Ground control for aerial triangulation will be provided, and the maps will be at 1:20,000 scale with 10m contours. The cost of this mapping should be less, and the timing and accuracy better, than when using traditional ground survey methods.

For the remainder of the Phase III area, 1:20,000 scale maps may have to be made with traditional ground survey methods.

d) Phase IIIB.

For some areas, traditional ground survey methods will be used to make maps at 1:5,000 scale. In other areas, where Phase IIIA mapping is at 1:10,000 scale with 1m or 5m contours, the maps can be enlarged to 1:5,000 scale and then checked and corrected in the field. The same procedure will be used for 1:5,000 scale maps made with photogrammetric methods.

e) "As built" drawings.

Agraria will be responsible for finalising and recording land allocations. If construction has followed the Phase IIIB structure plans, it will be necessary only to check and make minor modifications to the 1:5,000 scale maps. However, if there have been major changes, new surveys will be required, and to make provision for this, monuments will be constructed one km apart at the time of the Phase IIIB survey.

5.7. Pilot settlements.

5.7.1. Introduction.

As described in Chapter 3, there are serious constraints affecting the "standard" settlement model based on rainfed arable/tree crops. Furthermore, it is increasingly evident that land suitable for the standard model is limited. Consequently, greater flexibility is needed in settlement models, long as they meet the aims and criteria of as the transmigration programme. It will become more difficult to achieve GOI objectives for settling transmigrants unless this flexibility is introduced. One of the main components of the Trans project is the implementation of pilot settlements which V are being studied under Trans III. So far, the following types of "non-standard" model have been identified as having potential for detailed feasibility studies:

-agri-silviculture, -rottan, -fresh water fisheries, -brackish water fisheries, -sea water fisheries, -abaca, -rubber, -cocoa, -coconut, -rainfed arable food crops with early introduction of livestock for draught power, -limestone production, -sago, -sugarcane, within range of a sugar factory, -small-scale irrigation.

5.7.2. Plans for studies.

The sago study has already started (see below). For the other studies, terms of reference were drafted in September 1984, with the aim of completing the first stage while the IBRD appraisal mission visits Jakarta in October/November. first stage would be broadly equivalent to Phases I and This in the SFSE studies, and would include testing II the economic and financial viability of a wide range of model sizes and crop combinations. The second stage of the studies, broadly equivalent to the SFSE Phase IIIA, should be completed by the end of April 1985.

The first batch of studies which were contracted to consultants in packages during September 1984 are:

- i) Limestone production (Halcrow Fox),
- ii) Small scale valley irrigation (Halcrow Fox),
- iii) Spontaneous transmigration (Halcrow Fox),
- iv) Fresh- and brackish water fisheries (PCI).

The remaining "non-standard" model feasibility studies could be started as soon as consultants are appointed.

The main components of the studies are:

a) Model and site selection.

The consultants will prepare a report describing a number of farm models suitable for smallholder development, ranked in order of economic viability, and will then assist GOI to select the models with the greatest potential for pilot settlement.

The consultants will be required to review relevant literature, including reports prepared under the SFSE-80 and SFSE-82 programmes. They will then develop technically feasible models, and test their economic and financial feasibility, including appropriate sensitivity analyses. Careful consideration will be given to the period before the smallholders become self-reliant.

Using the site selection criteria for the chosen model, the consultants will assist in the location of sites for the next stage.

b)Phase II study.

This study will be used to confirm the suitability of the site selected for the particular pilot settlement. The report will identify a Phase IIIA study area, based on an outline plan for the settlement of about 500 families.

c) Phase IIIA.

This study will entail detailed planning, including a structure plan and delineation of blocks within which clearing and site preparation will take place.

5.7.3 The sago study.

Consultants (RDI) have been contracted to do this study in Irian Jaya. Field work was expected to start in August 1984. Sites investigated by API indicate about 4,000 ha of sago. A constraint is likely to be the availability of flat dryland for settlement and food crops. 5.8. Special studies.

5.8.1. Marketing.

While transmigration settlements remain at subsistence level, marketing of surplus produce is not a problem. However, if production exceeds subsistence, as planned, marketing will become an important consideration. The "nonstandard" models, producing mainly tree crops, or nonagricultural products, will be particularly dependent on succesful marketing.

At a regional level, marketing studies should be undertaken for the main commodities envisaged in the settlement proposals. These regional studies will take account of differences in access, infrastructure, spatial aspects of marketing centres, and differences in costs.

In addition to the regional studies, detailed marketing studies must be made for each of the proposed pilot settlements.

In general, the marketing studies should include: a description of the existing market structure, trends in supply and demand, pricing, production components, competetive products, storage, cooperatives, marketing facilities, and logistical aspects of the proposed market structure.

At the level of the international market, such matters as government policies, subsidies, supply and demand trends, and price levels, should be discussed.

The studies would include detailed consideration of the following:

i) Transport.

The relatively remote nature of many of the settlements mean that producers may have to bear high transport costs, and losses resulting from failures of the transport system, e.g. roads becoming impassible in the rains.

ii) Storage.

Storage facilities may be needed at settlement sites, and products may have to be processed into a form that can be stored. Provincial and regional storage facilities must be considered in relation to potential production from transmigration settlements.

64

iii) Processing.

Many of the secondary crops now being considered, including those for "non-standard models", will require some form of processing to ensure that they can be stored and transported without excessive losses or cost.

iv) Cooperatives.

GOI is encouraging the development of improved facilities for storing inputs and produce on a cooperative basis, as well as cooperative service centres (PPKs) which will provide management assistance to groups of four or five villages.

5.8.2. Rural centre studies.

a) Introduction.

The promotion of WPP centres is a key element in the longer term transmigration programme, particularly in provinces where established settlements are emerging from the initial "subsistence" phase. Under Trans V it is proposed that DG Settlement Preparation assume responsibility for planning WPP centres, where they consist wholly or mainly of transmigrant settlements.

A WPP centre will be a small town located on the main communication links, which will contain the trade, service, social, and administrative facilities required by its dependent SKPs, as well as its own resident population. The development of the centre, and of improved roads and/or river transport, will promote "second stage" growth of SKPs and creation of non-agricultural employment opportunities.

Tentative locations of WPP centres have been established, but will require revision when Phase II and Phase IIIA studies have been completed, and as Phase IB studies are revised.

b) WPP centre studies under Trans III and Trans V.

Before the development of WPP centres can be fully integrated into Bina Program's ongoing transmigration preparation programme, a number of separate but interlinked studies are required:

- i) Identification or confirmation of WPP locations, based on regional setting studies.
- ii) Determination by Bina Program of priorities for WPP development.
- iii) Liaison between Bina Program Pankim and other agencies potentially responsible for regional development, and for WPP centre design and implementation.
 - iv) Preparation of terms of reference for standard WPP centre design studies, based on discussions with Ditada.
 - v) Marketing studies for the output of transmigration settlements.
- vi) Survey and design studies for centres selected for priority development.
- vii) Evaluation of administrative, budgetary and implementation procedures for WPP site reservation, initial development (by GOI), and longer term development (involving the private sector).

Items i) to v) are being started as part of the Trans III programme, mainly as part of the regional setting studies made by SFSE-82 consultants. In areas not covered by these studies (notably the already largely settled areas of Sumatera) the planning will be done by Bina Program, assisted by the Physical Planner in the Technical Advisory Group.

It is proposed that items vi) and vii) will be started under Trans V, in two ways:

-A separately contracted study for a limited number of WPP centre survey, design, and evaluation studies in S.Sumatera (Lampung) where Trans V settlement preparation studies will not be carried out.

-WPP centre studies integrated into Trans V consultant studies in the main Repelita IV recipient provinces, i.e. West, Central, and East Kalimantan, and Irian Jaya.

Eventually an ongoing programme of WPP centre identification, selection, survey, design, and implementation, would be established. The proposed marketing studies have been discussed in Section 5.4.1.(above). Details of the other proposed studies are given in Appendix A.

5.8.3. Social and economic benefits.

The objective of these studies is to measure the impact of the transmigration programme on national and regional economies. A preliminary assessment should be included in this report, to be drafted by a consultant economist, who should also draft terms of reference for more detailed studies to be carried out under Trans V. The assistance of BAPPENAS should be sought for these studies.

5.8.4. Mid-term Repelita IV review.

5.8.5. Policy paper on spontaneous transmigration.

It is the intention of GOI to increase the number of spontaneous transmigrants during Repelita IV in order to reduce the overall cost of the programme. It is therefore important that GOI policy on spontaneous transmigration should be defined, after wide discussion among implementing agencies and with BAPPENAS. The final project document could take the form of a Presidential or Ministerial Decree.

IBRD have provided funds under Trans III for the recruitment of an Indonesian consultant to assist the Ministry of Transmigration with the preparation of a draft discussion paper. This paper should be available for the IBRD appraisal mission in November 1984.

The technical advisory group has suggested (Memo.916/2/-4208 of 14/7/84) that the Package B (HFA) Phase II study should be modified to include plans to accommodate spontaneous transmigrants at Batu Raja/Peninjauan.

5.8.6. Policy paper on land use.

Land use has emerged as the fundamental constraint to the further implementation of the transmigration programme. It is therefore proposed that under Trans V a national policy should be determined. IBRD is willing to assist the Ministry of Transmigration under Trans III to engage consultants to prepare a draft discussion paper, which should be available in time for the visit of the IBRD appraisal mission in November 1984.

67

5.8.7. Water Studies

The Directorate of Building and Water Supply within the D.G. Settlement Preparation has identified several key issues which are important to the continued development of many transmigration areas.

It is now apparent that these are several transmigration areas which are agriculturally successful, but do not yet have a reliable supply of water to meet all the transmigrants' demands throughout the year.

In addition there are two specific regions, namely South Kalimantan and south east Irian Jaya which, although receiving large numbers of transmigrants, have very severe water shortages. As there is a very limited amount of water resource data available for these areas it is suggested that some form of regional study is carried out to determine how best the water resources of these areas could be developed.

There are also a large number of transmigration sites which have been developed, especially in South Sumatra based on 'pasang surut' schemes. It is considered that the water supply to these areas needs a special approach.

It is considered that the studies should be split as follows.

i) A regional water resource study of parts of South Kalimantan which are transmigration receiving areas.

ii) A regional water resource study of that part of south east Irian Jaya which is known to have water supply problems in existing transmigration and planned transmigration areas.

iii) A study, mainly in South Sumatra, to investigate problems and propose solutions to water supply problems in 'pasang surut' schemes.

iv) An investigation of some specific transmigration areas which are already settled, but which do not have a reliable supply which meets demands throughout the year. It is proposed that 6 or 7 village areas (SPs) are studied initially and detailed designs, cost estimates and tender documents are prepared. These would ideally cover a range of solutions and should be considered as pilot studies.

v) Implementation iv) above pilot projects. The purpose of this would be to test the suitability of the proposed solutions before implementation is carried out on a large scale.

Cost estimates for the above have been included in Chapter 6.

5.8.8 Regional Planning Study South East Irian Jaya

It is proposed through Transmigration, to increase the population of South East Irian Jaya 5 times to approximately 600,000 (present population 125,000). Some 480,000 transmigrants are to be moved into an area that has very poor infrastructure and almost no transport system.

Koad building is made extremely difficult/costly due to the large distance to reserves of granular materials to produce an all weather system. There is a good river system but very few boats of any size exist at the present time.

To service such a large transmigrant population over a large remote area a capability initially to transport tens of thousands of tonnes of inputs and eventually hundreds of thousands of tonnes of outputs must be developed.

In addition all Government Departments and all public services must be expanded to cope with the population increase.

A Regional Planning Study is needed to identify physical and financial constraints and to plan for staged and integrated development.

The study is expected to take 8 months in all with a draft report being submitted at the end of month 6. The study would identify the following:

- i) A transport system to be developed as the transmigrant population increases.
- ii) The order and timing of individual SKP development to ensure the needs of the transmigrants are catered for.
- iii) Timed upgrading of existing port facilities and expansion in storage and port facilities as outputs mount to ensure produce can reach a market outside Irian Jaya.
- iv) Expansion and upgrading of town facilities and public services (electricity and water supply etc).
- v) Personnel and capability increases required of other Government Ministries to cope with the growth in population (education, health, transport, agriculture and security).

5.9. Programme support.

5.9.1. Technical Advisory Group.

a) Introduction.

The Technical Advisory Group (TAG) was formed in 1980, when planning for transmigration was done by the Directorate of City and Regional Planning (DITADA), DG Cipta Karya, in the Ministry of Public Works. The group was expanded in June 1982 so that advisers could be assigned to six provincial offices, and was extended under the Trans III loan until about June/July 1985.

The TAG has been provided by Sir M.MacDonald & Partners Asia, in association with Hunting Technical Services 'Ltd., Water and Power Consultancy Services India, Huszar Brammah and Associates, and INKINDO TAC-1.

This section of the report proposes the continuation of the TAG, in modified form, for the period of the Trans V loan, i.e. until mid 1988.

b) Functions and staff.

The main functions of the TAG have been:

- -to assist in the direction and supervision of the SFSE-80 and SFSE-82 consultants, including provision of detailed guidelines, monitoring of the progress of work,field supervision to maintain quality of work, and evaluating the results;
- -to assist in the improvement of planning procedures, including the guidelines mentioned above, but also "advisory notes" on specific subjects, and frequent discussions with the study teams;
- -to assist Bina Program in site selection for both the Trans III consultant programme and locally funded planning activities which involves considerable liaison at Provincial level.
- -to assist Bina Program in supervision of local consultants' planning activities and supply support as required to local consultants.
- -to assist in other transmigration planning activities as requested, which has sometimes entailed bringing in specialists in particular disciplines, such as forestry and evaluation.

The regional advisers have assisted with monitoring progress on settlement sites where site preparation or construction is in progress. They also ensure that other agencies are aware of transmigration plans, and monitor the work of local consultants involved in Phase IIIB planning.

Central Advisory Group (CAG) presently consists of a The of expatriate and local consultants. The expatriate team team comprises: team leader, agriculturalist, agricultural economist, land use planners (3), physical planner, topographers (2), planning engineer, rural development engineer, and regional coordinator. At full strength, the local consultants' team will comprise: co-team leader, agricultural economist, planning engineer, land use planner, agriculturalist, topographer, forester, rural engineer, physical planner, and computer specialists (3). The CAG also has a complement of supporting administrative staff.

There are six regional advisory groups (RAGs) with the following expatriate staff: planning engineers in Palembang, Banjarmasin, and Samarinda; topographer in Pekanbaru; in Pontianak, planning engineer and land use planner; in Jayapura, a planning engineer, land use planners (2), topographer, and agriculuralist. The groups in Banjarmasin and Jayapura are supported by a local consultant topographer and land use planner respectively.

c) Proposed composition of the TAG 1986 - 1988.

The TAG has successfully carried out its main tasks of assisting in the planning and monitoring of the transmigration programme, and in the last four years has accumulated considerable experience in these matters. However issues have come to light over the last four years such as the allocation of land to transmigration where forestry and agricultural interests have conflicting claims, the integration of plantation development with transmigration and the evaluation of transmigration work in to provide guidelines for improvement of the basic planning activities. These lead to the recommendation that the composition of the Advisory Group should be modified slightly to allow the team members to be available to other sections within the Ministry assist them with their duties when requested. to It is considered that this would also be beneficial to Bina Program in their overall planning programme. It is proposed that the Advisory Group's contract runs from 1 January 1986 until mid This would allow for continuity after the 1988. present contract expires and will assist Bina Program in preparing reports, reviews etc. after the end of the Trans V consultants' programme.

i) A team of advisers attached (as at present) to Bina Program, DG Settlement Preparation.

These specialists would be organised in much the same way as the present TAG. Their functions would be the same as the present TAG, i.e. they would continue to guide, supervise, and evaluate the planning studies for transmigration settlements, but would also include providing information and assistance to the offices of other departments within the Ministry as requested.

This team within the TAG would contain the following specialists, as at present both expatriates and local professional advisers:

-team leader (expatriate), -co-team leader (local), -regional coordinator (expatriate), -agricultural economist (expatriate and local), -agriculturalists (expatriate and local), -forester (local), -land use planners (expatriate (2) and local (2), -planning engineer (expatriate and local), -regional and physical planners (expatriate (3) and local (2) -topographers (expatriate (2) and local), -systems analyst (local), -rural development engineers (expatriate and local), -documentation specialist/librarian (local). -data processor (local) -economic planner (expatriate) -water resources/rural water supply engineer (expatriate)

is proposed that one of the expatriate physical planner It and the economic planner assist Bina Program with the monitoring and evaluation of the Transmigration programme and would be available to assist other departments within the Ministry with specific tasks as requested including the planning and implementation of second stage development. The of the water resources/rural introduction water supply engineer would be to give detailed guidance to Bina Program the first stage planning of sites but would also in be available to give advice and recommendations for the implementation of second stage water supply to those sites requiring this. A substantial part of the loan is allocated water supply as it has proved difficult to plan anything to but the most simple and generalized systems under the consultats planning programme.

In addition, sufficient contract time should be available for specific inputs which may be identified later.

ii) Regional Advisory Groups.

Teams of advisors will be based at Pekanbaru, Pontianak, Palangkaraya/Banjarmasin, Samarinda and Jayapura and Merauke. The size of each team will be related to the expected workload.

a) Jayapura and Merauke.

A six man team will be stationed in Irian Jaya for the full Trans V implementation period. It is likely that 3 persons will be based in Jayapura and the other 3 will be based in Their main duties would be to assist Bina Program Merauke. with the supervision of a number of consortia of consultants conducting Phase II and Phase IIIA surveys in Irian Jaya; to assist Bina Program in the monitoring and supervision of local consultants carrying our Phase IIIA and IIIB studies as providing assistance as required well as to these consultants; to assist the Kakanwil Transmigration and the Satlap with organizational matters as required and to provide training to their staff; to establish a regular reporting system to keep Bina Program headquarters in Jakarta up to date on the progress of planning related activities such as land clearance, consultant progress and Phase IIIB studies.

The	team	will comprise :	
		Planning Engineer	(foreign)
		Land Use Planners	(local and foreign)
		Physical Planner	(foreign)
		Agriculturalist	(foreign)
		Topographer	(local)

b) Pekanbaru, Pontianak, Samarinda and Banjarmasin/Palangkaraya.

Teams of two to four advisers will be based at these provincial centres. The size and composition of each team will depend on workload. Their main duties will be similar to those of the Irian Jaya teams but with a reduced responsibility in assisting with supervision of consultant consortia. They will draw on the central team for assistance in disciplines not covered by the individual advisers.

The teams will comprise:

Pekanbaru	2	Advisers	(topographer, planning engineer or
			land use planner) foreign and local
Pontianak	3	Advisers	(topographer, planning engineer or
			land use planner) 2 foreign and 1
			local

Samarinda

3 Advisers (topographer, planning engineer or land use planner) 2 foreign and l local

Banjarmasin/

Palangkaraya 4 Advisers (topographers , planning engineer , land use planner) 2 foreign and 2 local

5.9.2 Ministry of Transmigration staff training

a) Introduction

One of the project components, under the main heading "programme support" (technical assistance) was staff training for Bina Program. It has been decided that the training programme should include the whole Ministry.

The IBRD project appraisal mission in July 1984 estimated the cost at US\$ 4 million, and requested that the PPR should contain some proposals. This memo is intended to form the basis for discussion with staff of Bina Program about their training requirements.

The proposals should be relevant to the activities of the department and the problems facing it. Ideally, they should include some analysis of the strengths and weaknesses of manpower available to the department. The relationship of the proposed training programme to the Trans V project should also be indicated.

b) Activities/disciplines.

The following activities/disciplines are relevant to the work of Bina Program and to the Trans V project, in the general field of planning for agricultural development and settlement.

-interpretation of remote sensing imagery
-land resource evaluation,
-regional planning,
-soil surveys,
-land use planning,
-structure planning,
-civil engineering,
-economic/financial analysis,
-monitoring and evaluation,
-use of computers.

c) Training institutions.

The following institutions specialise in training for the above activities/disciplines:

i) Silsoe College, Cranfield Inst. of Tech., Silsoe, England.

Short courses on: labour and machinery planning by microcomputer, irrigation principles and practices, soil management, field drainage, remote sensing in natural resource surveying, airphoto interpretation for planners and engineers, data logging in agriculture, small farm mechanisation for developing contries, soil conservation, basic agriculture for engineers.

ii) Remote Sensing Centre, Agricultural Research Institute, Thailand.

Certificate (one term), Diploma (one year), or Degree (20 months): agricultural and food engineering, water resources. Remote sensing (4 months). Short courses on most subjects (3 weeks to 3 months) 20 to 25 persons.

iii) Institute of Development Studies, U. of Sussex.

Three month course on rural research and rural policy, also mid-career and MSc courses for students with an economic background, also special courses can be set up. Strong interest in SE Asia.

iv) School " " , U. of E. Anglia.

Short courses on monitoring and evaluation; microcomputing, census geography; nutrition, agriculture, and rural development, etc.. Special courses, e.g. agricultural policy, planning and project analysis; and monitoring and evaluation.

- v) Land Resources Development Centre, ODA, Surbiton, England
- vi) Agric. Ext. and Rural Development Centre, U. of Reading,

Diplomas in agricultural education, agricultural extension, rural social development, also degrees.

vii) University of Bradford, Bradford, England.

Special courses in: planning and appraisal of rural development projects, agricultural project planning, development finance institutions, regional project planning, planning and appraisal of agro-industrial project, transport planning and projects.

viii) Consortium for International Development (a consortium of nine American universities).

Formal long-term training, short courses, and study tours.

Main areas of interest: economics, business, planning, appropriate technology, agriculture, engineering, forestry, fisheries, education, institutional services. ix) IBRD, Economic Development Institute, Washington, USA.

Mainly training staff themselves involved in training programmes.

x) Mananga Agricultural Management Centre (CDC), Swaziland,

Special courses for senior managers in: planning and control in agricultural management; agricultural development.

xi) Development Planning Unit, University College, London.

Mid-career, diploma, and degree courses in: settlement planning, rural planning, area development, appropriate technology.

xii) Town and Country Planning Dept., University of Wales, Institute of Science and Technology.

Conventional planning courses, special overseas courses for SE Asia graduate students.

xiii) Institute of Local Government, Birmingham University.

A variety of courses on management and institutional development. Strong interest in SE Asia.

xiv) Bouwcentrum, Rotterdam, The Netherlands.

A variety of courses particularly related to physical development. Standard course 5 months; many special courses, e.g. housing, rural development, physical planning, regional planning. (English language).

xv) Institute of Social Studies, The Hague, The Netherlands.

Graduate courses in: regional planning, rural development, institutions. (English language).

77

d) Types of courses.

Most of the institutions listed above offer a variety of courses, ranging from first and post-graduate degrees to short courses lasting a few weeks. It is probable that the most effective training for staff of the Ministry of Transmigration will be short courses of less than three months, identified as being specifically related to the needs of the transmigration programme. Some of the courses would entail travel abroad to the institutions concerned. Other courses could be arranged in Indonesia and could be more specifically related to the needs of Ministry staff.

One option worth considering would be to be set up and fund for, say, five years, a "Transmigration Development Course". would consist of an integrated approach to planning, This settlement, and development, in a regional context. The course could be sited at ITB (Bandung), or at Gadjah Mada University (Yogyakarta), or at the University of Indonesia (Jakarta), or at IPB (Bogor). The course should preferably be an extension of an existing department. It would require, say, or five staff members (soils/agronomy, four regional/physical planning, engineering, rural institutions/social development, management/monitoring/data analysis, economic/financial analysis) full time for five years. In addition, about 50 man months of one term a year inputs would be needed over the five year period.

e) In-service training

Training courses that the specific to the Ministry's requirements can be arranged by consultants, possibly in conjunction with the institutions listed above. These courses could be arranged within the work programmes of the staff concerned, both consultants and Ministry. The advantages would be greater flexibility in content and timing, as well as more opportunity for later supervision, and to develop refresher courses.

Training by the consultant firms already working in the Ministry would have the advantage that these firms could more easily assess training needs, and would be better able to design the training to suit the specific requirements of the transmigration programme, with which they are thoroughly familiar. Some of this training could take place in the head offices (overseas) of the firms concerned.

f) Potential cost.

The average cost of training is roughly US\$ 1,000 per man months, whether overseas or in Indonesia, obviously with some variation dependent on content and venue.

g) Procedure

The Ministry should draw up a programme for the period of the Trans V loan, ensuring that disruption of normal activities is minimised. Individuals intended for training should be identified and matched to appropriate courses at the times when they are available.

CHAPTER 6. COST ESTIMATES.

6.1. Introduction.

Cost estimates are being continually refined as more detailed information becomes available about the nature and scope of the project components. This process of refining cost estimates is expected to continue until the visit by the IBRD appraisal mission in October 1984, and while they are in Jakarta.

Before the departure of the IBRD project preparation mission from Jakarta in July 1984, a draft Aide-Memoire was presented to the Ministry of Transmigration, indicating that the total project cost, including 25% for physical and financial contingencies, was tentatively estimated at US\$ 295 million, and would become effective in October 1985. The schedule of project costs presented by the IBRD project preparation mission in July 1984 (Table 6.1) totalled US\$ 228 million, including contingencies.

Since July, Bina Program, assisted by the Technical Advisory Group, has refined and modified the cost estimates, as described in the following sections.

Currency conversion rates used in this report are:

US dollar = Rp 1,000 Pound sterling = US\$ 1.35 " " = Rp 1,350

These rates are slightly different to the ones used by the IBRD project preparation in their Aide-Memoire (July 1984), and accounts for slight differences in some of the cost estimates.

1

1983 prices have been adjusted to 1984 prices by an increase of 3.5% for foreign costs, and 12% for local costs.

Bina Program's estimate of the cost of the Trans V project is summarised in Table 6.2., and details are shown in further tables in this chapter. For some of the project components, physical contingencies have been included, e.g. in the costs of Phase IB, II, IIIA, and IIIB studies. For other components the cost estimates are still preliminary, and when they are refined, allowances for physical contingencies should be included. Price contingencies have been estimated by using annual inflation factors of 5% for foreign costs and 10% for local costs to convert the base costs (1984 prices) to current prices. The resulting cost increase is just over 25%.

The total cost of the Trans V project is estimated to be Rp 195,004 million (at 1984 prices), i.e. US\$ 195,004,000 at a currency conversion rate of US\$1.00 = Rp 1,000. This includes 5% for physical contingencies. At current prices, i.e. including price contingencies, the total project cost is estimated to be Rp 236,240 million (US\$ 236,240,000).

Table 6.2. also shows the probable phasing of project component costs, and therefore could form the basis for a more detailed disbursement schedule when costs are refined during project appraisal.

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component	cost		12	cost	cost	000 05		00707		01100			
	(\$'000)	(Rp m)	(%)	(\$'000)	(Rp m)((\$'000)	(Rp m)(\$'000)	(Rp m)(\$'000)	(Rp m)		
. Mapping and airphotos													
Existing SAR imag'y	5440	5440	0	0	5440	0	5440						
New SLAR imagery	2480	2480	90	2232	248	2232	248						
Existing airphotos	26	26	0	0	26	0	26						
New airphotos	4400	4400	65	2860	1540	2860	1540						
Mapping	600	600	0	0	600	0	600						
 Phase I studies Land resources eval. 	1149	1149	59	676	473	270	189	406	284			χ.	
Dhane II studion													
325 @ \$90,680	29471	29471	45	13262	16209			7141	8728	6121	7481		
• Phase IIIA studies 220 @ \$335.390	73786	73786	44	32466	41320			11806	15025	20660	26295		
220 (\$353,570													
, Phase IIIB studies 80 @ \$19,200	1536	1536	5	77	1459					77	1459		
Pilot settlements													
3,000 spons.@ \$8,000/	24000	24000	60	14400	9600	4800	3200	9600	6400				
5,000 spont.@ \$3,000/	15000	15000	. 20	3000	12000	1000	4000	2000	8000				
Special studies	500	500	15	205	175	200	110	125	45				
wPP rural centres	500	500	65	325	175	200	110	125	65				
Marketing	500	500	65	323	175	200	110	125	65				
socecon.ben.survey	500	500	65	325	175	200	110	125	65				
later studios	2/85	2485	20	525	1988	164	656	333	1332				
South Irian Jaya	500	500	65	325	175	325	175	555	1992				
rogramme support													
Tech.Advisory Group	13445	13445	65	8739	4706	874	471	3496	1882	3496	1882	873	471
staff training	4000	4000	65	2600	1400	371	200	743	400	743	400		
Bakosurtanal	2400	2400	71	1713	687	246	99	489	196	489	196		
Agraria	3000	3000	65	1950	1050	279	150	557	300	557	300		
total (1984 prices)	185718	185718	46	86097	99621	14221	17434	37071	42807	32143	38013	873	471
sical cont. 5%	9286	9286	46	4305	4981	711	872	1854	2140	1607	1901	44	24
al project costs 34 prices)	195004	195004	46	90402	104602	14932	18306	38925	44947	33750	39914	917	495
rrent prices)	235329	235329	42	101123	134207	16052	21052	43936	56858	39994	55540	1141	757

Foreign cost infl. factors (5%) Local cost " " (10%)

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Source: Bina Program

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6.2. Planning

6.2.1. Remote sensing materials and mapping.

a) Purchase of existing SAR imagery.

Synthetic aperture radar (SAR) imagery has been described in Section 5.5. Details of the areas covered by the imagery and their cost are given in Table 6.3. The unit cost of US\$ 17/sq.km is based on a quote of US\$ 16/sq.km from the aeroservice agent (PENAS) for speculative cover.

For purchase of mosaics covering areas in Sumatera it has proved difficult to determine from Pertomina the cost of obtaining copies of client area mosaics, and the actual cost may be 50% less than the estimate. Provisional estimates of the area covered have been based on the assumption that 50% of Sumatera has radar cover, while the remainder requires new imagery to support the landform analysis.

b) Production of new SLAR imagery.

This remote sensing technique has also been described in Section 5.5. The areas and costs of producing new imagery are also shown in Table 6.3. The unit cost is conservative because there is no experience of using the new SLAR technique in Indonesia.

c) Airphotography.

The cost estimates for acquiring existing and new airphotographs are shown in Table 6.4. The unit cost of the new 1:20,000 scale airphotos could be reduced to about US\$ 20/sq.km by using the Hasselbad type camera.

d) Mapping.

Depending on the quality of the 1:100,000 scale airphotos, basic maps could be either rectified photo-maps at 1:50,000 scale derived from airphotos at 1:100,000 scale, or semicontrolled photomosaics at 1:50,000 scale prepared with new airphotos at the same scale. The 25m contours could be plotted either by radar/laser profiling, or from aerial triangulation.

Assuming that the area to be mapped will be 150,000 sq.km, 200 map sheets will be required at 1:50,000 scale. At a unit cost of US\$ 3,000/sheet, the total cost of mapping will be US\$ 600,000.

Table 6.3. Estimated costs of remote sensing materials.

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SAR imagery (pu	rchase of existi	ng mosaics)			
Region		Sumatera	E.Kalimantan	Irian Jaya	All regions
Area covered	(sq.km)	130000	120000	70000	320000
•• ••	(mill.ha)	13	12	7	32
Unit price (US\$	/sq.km)	17			
Total cost (US\$	'000)	2210	2040	1190	5440
SLAR imagery (p	production of new	mosaics)			
Area covered	(sa.km)	230000	0	80000	310000
	(mill.ha)	23	Ŭ	8	31
Unit price (US\$	/sq.km)	8			
Total cost (US\$	'000)	1840	0	640	2480

Source: RePPProT

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Existing photographs. -----Areas Scale Chars. Sq.km No.of Unit Total prints cost cost (US\$)(US\$)C.Kal. 1:50,000 Inf.red 60,000 1,500 10 15,000 1:40,000 Panch. 1,000 25,000 5 5,000 .. •• 10,000 1:50,000 300 5 1,500 .. 5 S.Kal. 1:20,000 6,000 1,000 5,000 _____ Sub-total US\$ 26,000 New photographs. -----Areas Scale Chars. Unit cost Total cost (US\$)(US\$) E.Kal. 1:50,000 Infra-red & (40 1,000,000 & 1:30,000 Panch. (25,000 Ir.Ja. 1:50,000

Table 6.4. Estimated costs of acquiring airphotographs.

Infra-red & (& 1:30,000 Panch. (60,000 .. 2,400,000 Kal. & Infra-red & (Ir.Ja. 1:20,000 Panch. (10,000 100 1,000,000 95,000 Sub-total US\$ 4,400,000

Source: G.Casaux.

6.2.2. Land resources evaluation.

The estimated costs of the Phase I land resources evaluation are shown in Table 6.5. They are based on the contract cost of the existing RePPProT project, adjusted to 1984 prices. The estimated foreign cost is US\$ 676,130, and the local cost Rp 473.34 million including the cost of counterpart consultants.

6.2.3. Regional planning.

This component was identified by the IBRD project preparation mission in July 1984, and an amount of US\$ 2 million was provisionally allocated to cover the cost. However, it is considered that the subject will be adequately covered by the regional planning elements in the extension of the RePPProT project (Section 6.2.2. above), and by including regional planning advisers in the Technical Advisory Group (Section 5.9.1.).

6.2.4. Phase II studies.

The estimated cost of these studies has been based on an analysis of the cost of the SFSE-82 consultant contracts made by the IBRD project preparation mission in July 1984. This analysis is reproduced in Tables 6.6. and summarised in Table 6.8. After adjusting to 1984 prices, the average cost of each Phase II study contract was found to be US\$ 85,970. This average updates that used by the IBRD mission (USS 85,500/study).

The IBRD project preparation mission assumed that the cost of the Phase II studies using radar/laser mapping (i.e. 25% of Phase II studies) would be US\$ 96,780/study. This estimate was based on:

20,000 ha @ \$2.70/ha = \$54,000 and Reconnaissance survey= 42,780 Total \$96,780

The cost of the reconnaissance survey was based on half the cost of the Phase II study carried out by conventional methods, i.e. \$85,550/2= \$42,780. The unit cost of \$2.70/ha was based on an arbitrary allocation of the airborne radar topographic mapping cost, shown in Table 6.9. below. These costs in turn were based on the SRI contract. Bina Program have made two changes in the estimate of Phase II study costs:

a) Averaging.

As Table 6.8. shows, the average cost of Phase II studies are higher in Kalimantan and Irian Jaya than in Sumatera. The main reasons are the greater distance from Jakarta, and the logistical costs involved. Because it is probable that the Trans V study programme will be in Kalimantan and Irian Jaya, the weighted average cost of the SFSE-82 studies in these two regions have been used as a basis for estimating costs, shown in Table 6.8. This cost estimate is US\$90,680 per study, i.e. about 5% higher than the IBRD mission's estimate.

b) Topographical survey costs.

The radar or laser profiling should be used in the Trans V project only if it proves in the trials to have technical and cost advantages over conventional methods. Consequently, the costs of Phase II studies (which in any case entail little topographic work) using radar/laser profiling should not be greater than studies using conventional techniques. Therefore, no distinction has been made in the cost estimates between the studies using the two topographical survey techniques. Table 6.5. Estimated costs of land resources evaluation.

	(L'000)	(Rpm)	
Programme support (75 mm (5 * 15 mths) @ L5648/mm)	423.60		
Mobilisation/demob.	41.80		
Housing		61.20	
Veh.running costs and equip.		28.50	
Other costs		13.00	
Contingencies	18.50	5.10	
Total costs (mid-1983 prices)	483.90	107.80	
Adjustment to 1984 prices (L @ 3.5%, Rp @ 12%)	500.84	120.74	
Conversion to $USS'(000)$ (L @ 1.35 Rp @ 1.000)	676.13	120.74	
Total costs (US\$'000)	796.87		
Pat any tracts			
Counterparts (75 mm (5 * 15 mths)@ Rp 1.5m)		112.50	
Cartographers, etc. 150 man months @ Rp 0.5m		75.00	
Support staff, 135 man months @ Rp 0.3m		40.50	
Vehicles, 6 @ Rp 7.2m/yr		43.20	
Office furniture & equipment		15.00	
Contingencies		28.62	
Total counterpart costs (mid-1983 prices)		314.82	
Adjustment to 1984 prices (Rp @ 12%)		352.60	
Conversion to US\$'000 (Rp @ 1,000)		352.60	

		Sumatera Package A		Sumatera Package B		W.Kalimant Package C	an	W.Kalimanta Package D	n
No.of st	udies	25		26		22	5 4 1	22	
Expatria	te man months	124.50		129.50		120.25		112.00	
Local co	ns. man months	105.00		131.00		109.75		101.50	
Expat or	of foor	(US\$'000)	(Rp m)	(US\$'000)	(Rp m)	(US\$'000) 801 50	(Rp m)	(US\$'000) 752.00	(Rp m)
Local pr	of fees	015.10	82.40	405.50	105.70	001.50	99.00	/ 52 000	79.90
Local su	pport staff		287.60		359.28		391.71		364.81
Equipmen	t		154.70		74.91		216.32		231.45
Office r	ental		19.40		31.92		26.43		16.28
Running	costs		2.20		224.58		156.35		22.54
Mobilisa	tion -expat.	37.70	11.40	79.40	6.45	48.10	5.52	35.58	6.15
Local tr	avel- "		10.00		10.14				21.75
Allowanc	es-expat.		20.30						
Housing .	-expat.		58.00		100.08		63.80		
Mobilisa	tion- local assoc.		7.00		1.54		10.91		16.70
Housing	- " "		13.80		12.60		11.52		
Duty tra	vel - " "		9.50						113.78
Allowanc	es - "		50.50			(1 00		50 (7	
Continge	ncies	44.70	1	33.50		64.90		52.67	
Other ex	pat.costs		•						
Other lo	cal assoc.costs								
Other co	SES								
Total	(US\$'000)	895.50		578.40		914.50	interest dens	840.25	
	(Rp m)		726.80		927.20	A.	981.56		873.36
Regional	totals	Sumatera						Kalimantan	
	(US\$'000)	1473.90						3/12.18	
	(Kp m)	1654.00						3824.24	

Table 6.6. Analysis of SFSE-82 Phase II study contract costs.

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Source: IBRD Project Preparation Mission (July 1984), updated by Bina Program.

	E/C.Kaliman Package E	ntan •	E.Kalimant Package F	an	Irian Jaya Package H	L	Irian Jaya Package I		Irian Jaya Package J	1	
	25		22		. 28		28		30		
	104.00 100.50		129.00		172.00		118.50 149.00		115.00		
	(US\$'000) 798.10	(Rpm)	(US\$'000) 917.30	(Rp m) 98.20	(US\$'000) 1208.90	(Rp m)	(US\$'000) 836.83	(Rp m) 147.60	(US\$'000) 896.00	(Rp m) 90.80	
		371.17 84.73 27.22		313.31 273.50 34.95		125.70					
	2.52 103.79	113.88	53.00	21.45							
		26.42 74.07 32.67 23.40		35.48 60.98 57.64 19.44							
	57.62	29.58	25.10	145.62 25.57				07 (0	00.05	152 00	
					84.40	84.00 1064.80	31.69	97.60 104.10 914.60	28.00	155.40 882.20	
ž	962.03	883.18	995.40	1086.14	1397.90	1405.50	972.11	1263.90	1012.25	1281.40	
							Irian Jaya 3382.26 3950.80				
											y.
				, 							
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		Sumatera		Sumatera		W.Kalimant	an	W.Kalimant	an		
	•	Package A		Package B		Package C		Package D			
No.of st	udies	13		. 11		11		11			
Expatria	te man months	276.00		201.00		226.25		205.00			
Local as	soc.man months	310.00		246.50		233.25		206.00			
		(US\$'000)	(Rpm)	(US\$'000)	(Rp m)	(US\$'000)	(Rpm)	(US\$'000)	(Rpm)		
Expat.pr	of.fees	1616.00		801.20		1509.40		1336.30			
Local pr	of.fees		165.30		212.90		196.60		161.20		
Local su	pport staff		739.50		616.07		771.18		706.08		
Equipmen	t		397.90		128.46		425.88		447.96		
Office r	ental		49.80		54.73		52.04		31.62		
Running	costs		5.80		385.10		307.82		43.62		
Mobilisa	tion -expat.	84.00	25.40	123.20	11.07	90.66	10.50	65.23	11.28		
Local tr	avel- "		22.40	1	17.38				39.88		
Allowanc	es-expat.		45.10								
Housing	-expat.		129.20		182.79		121.42				
Mobilisa	tion- local assoc.		20.70		2 86		23 19		33 90		
Housing	- " "		41 20		23 40		23.19		55.70		
Local tr	aval- " "		28 40		23.40		24.40		221 02		
Allowanc			151 40						231.02		
Contingo		115 00	131.40	57 70		107 70		101 0/			
Otherage		115.00		57.70		12/./0		101.94			
Other la											
Other 10	cal assoc.costs										
other co	SES				. *						
 m . 1											
lotal	(055.000)	1815.00		982.10		1727.82	na se tende , na sé	1503.47			
	(Kp m)		1822.10		1634.76		1933.11		1706.56		
Regional	totals	Sumatera						Kalimantan			
	(US\$'000)	2797.10						7275.43			
	(Rp m)		3456.86						7631.69		

Table 6.7. Analysis of SFSE-82 Phase IIIA study contract costs.

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Source: IBRD Project Preparation Mission (July 1984), updated by Bina Program.

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Table 6.7 (Continued)

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E/C.Kalima Package E	ntan	E:Kalimant Package F	an	Irian Jaya Package H		Irian Jaya Package I		Irian Jaya Package J	
12		11		13		14		14	
217.00 239.00		245.00		205.50 230.00		218.50 232.00		252.50 232.50	
(US\$'000) 1795.00	(Rp m)	(US\$'000) 1749.80	(Rp m) 177.40	(US\$'000) 1648.90	(Rp m)	(US\$'000) 1439.73	(Rp m) 224.80	(US\$'000) 1540.18	(Rp m) 179.20
	821.87 187.61		580.55 506.77		175.00				
5.58 219.56	60.26 252.15 32.67	99.60	64.76 40.30				8		
	55.88 156.70 76.23 54.60		66.65 120.12 102.46 34.56	× y	,				
127.60	69.02	47.00	258.88 47.38	124.90	158.80	190.56	146.30	193.65	366.70
				100.80	1397.70	58.93	1343.60	57.26	1876.00
2147.74	1992.19	1896.40	1999.83	1874.60	1852.90	1689.22	1853.50	1791.09	2743.40
	x					Irian Jaya 5354.91	6449.80		

	•					Weighted
Region		Sumatera	Kalimantan	Irian Jaya	All regions	ave.Kal.
Packages		Α, Β	C, D, E, F	H,I,J	A – J	& Ir.Ja.
No.of studies		51	91	86	228	177
fotal for.cost	(US\$'000)(mid-1983 prices)	1473.90	3712.18	3382.26	8568.34	7094.44
" local cost	(Rpm) (""")	1654.00	3824.24	3950.80	9429.04	7775.04
Ave.for.cost	(US\$'000)(mid-1983 prices)	28.90	40.79	39.33	37.58	40.08
ve.local cost	(Rpm) (""") 32.43	42.02	45.94	41.36	43.93
Conversion to 198	4 prices					
Foreign costs @ 3	. 5%	29.91	42.22	40.71	38.90	41.48
Local costs @ 12%		36.32	47.07	51.45	46.32	49.20
Conversion to US\$	'000 (@ US\$ 1.00 = Rp 1,000)			85.97	90.68
						90.68
Conversion to Rn	m (0 USS 1.00 = Rp 1.000)				84.59	

Table 6.8. Summary of SFSE-82 Phase II and IIIA study cost(sum2&3)

PHASE IIIA					
Region Packages No.of studies	Sumatera A,B 24	Kalimantan C,D,E,F 45	Irian Jaya H,I,J 41	All regions A - J 110	Weighted ave.Kal. & Ir.Ja. 86
Total for.cost (US\$'000)(mid-1983 prices) "local cost (Rp m) (""")	2797.10 3456.86	7275.43 7631.69	5354.91 6449.80	15427.44 17538.35	12630.34 14081.49
Ave.for.cost (US\$'000)(mid-1983 prices) Ave.local cost (Rp m) (" " ") 116.55	161.68	130.61 157.31	140.25	146.86 163.74
Conversion to 1984 prices Foreign costs @ 3.5% Local costs @ 12%	120.62	167.33 189.94	135.18 176.19	145.16 178.57	152.00 183.39
Conversion to US\$'000 (@ US\$ 1.00 = Rp 1,000))			326.63	335.39
Conversion to $Rp m$ (@ US\$ 1.00 = $Rp 1,000$))			321.41	335.39

Source: Bina Program.

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	US\$'000	Rp million
Hardware	678.0	
Software	268.0	
Management and training Mobilisation/demob.of staff	413.9 46.6	5.90
Office costs		14.40
Housing Operating costs		34.25 .50.10
Sub-total	1,406.5	117.61
Flight/ground operations Subcontracts for services	554.4	432.70 125.00
Contingencies	27.7	36.10
Total	1,988.6	711.41
Area: 200,000 ha		
Average cost per ha	US\$ 9.94	Rp3,557.05 US\$ 3.61
11 II II II	13.55	

Table 6.9. Estimated cost of airborne radar topographic mapping.

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Source: IBRD Project Prep. Mission (July 1984).

The allocation between Phase II and Phase III studies was made in the proportions:

Phase II 20% of \$13.55 = \$ 2.70 Phase III 80% " = 10.80

Table 6.10. Analysis o	f costs of	f SFSE-82	Phase	e IIIB s	tudy c	ontracts	·		(phase36					-
Area	Malaku	Irian Jaya	C. Sul.	SE Sul.	S. Sul.	Total Sul.	S. K'tan	E. K'tan	Total K'tan	S. Sum.	Jambi	Total Sum.	Total IND.	
No.of SP studies	20	71	16	34	9	59	21	21	42	16	13	29	221	
Total man months	56.36	183.17	42.27	84.54	28.18	154.99	56.36	56.36	112.72	70.45	70.45	140.90	648.14	
Costs (Rp.million)					~									
Salaries Allowances Support staff Tools Equipment Transport	25.10 21.70 6.60 8.80 3.40 15.20	81.50 70.50 21.50 11.10 32.40 86.60	18.80 16.20 5.00 2.60 6.00 10.50	37.60 32.60 9.90 5.10 14.70 18.50	12.50 10.90 3.30 1.70 4.70 6.00	68.90 59.70 18.20 9.40 25.40 35.00	25.10 21.70 6.60 3.40 16.40 9.00	25.10 21.70 6.60 3.40 10.60 11.10	50.20 43.40 13.20 6.80 27.00 20.10	31.30 27.10 8.30 4.30 12.20 8.00	31.30 27.10 8.30 4.30 13.40 9.70	62.60 54.20 16.60 8.60 25.60 17.70	288.30 249.50 76.10 44.70 113.80 174.60	
Total (Rp.m) Ave.cost/SP (Rp.m)	4.04	4.28	3.69	3.48	4.34	3.67	3.91	3.74	3.83	5.70	7.24	6.39	4.29	
Source: IBRD Project P	reparation	n Mission	(July	1984).										

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6.2.5. Phase IIIA studies.

The cost estimates for these studies used the same basis as for Phase II studies, i.e. analysis of the SFSE-82 contract costs (details in Tables 6.7. and 6.8.). The average cost (in 1984 prices) of a Phase IIIA study using conventional methods was found by the IBRD project preparation mission (July 1984) to be US\$325,380 subsequently updated to \$326,630.

For Phase IIIA studies using radar/laser mapping, the IBRD project preparation mission estimated an average cost of \$ 193,510/study. This was made up from:

Airbo: (see	rne 1 f) abo	radar to; ove) =	pographic	mapping,	10,00	0 ha	0	\$ 10.80/ha \$108,000
Phase	IIIA	Kampsax	contract,	increased	by 2	5% =		85,420
Total	cost							\$193,420

As for the cost estimates for Phase II studies, Bina Program has used the weighted average cost of only the Kalimantan and Irian Jaya study contracts, and have not distinguished for cost purposes between studies using radar/laser profiling and conventional topographic survey methods.

The resulting weighted average cost (Table 6.8.) is US\$335,680 per study, roughly 3% higher than the IBRD mission estimate.

6.2.6. Phase IIIB studies.

The average cost of Phase IIIB studies was analysed by the IBRD project preparation mission, and for each SP was found to be Rp 4.29 million (Table 6.10.). It was assumed that there are four SPs in an SPK, so that the estimated cost of an SKP Phase IIIB study was Rp 17.14 million in 1983 prices, increased to Rp 19.20 million in 1984 prices.

6.3. Pilot settlements.

The feasibility studies for the pilot settlements, based on non-standard models, is being funded under Trans III. The implementation of the settlements will be funded under Trans V. It is anticipated that six pilot settlements, each consisting of 500 transmigrant families, will be implemented, at an average cost of US\$ 8,000 per family. Thus the total cost will be 3,000 x \$8,000 = US\$ 24 million.

In addition, it is expected that about 5,000 spontaneous transmigrants will be assisted to move to pilot settlements at an estimated average cost of US\$ 3,000 per family. The total cost is thus estimated at US\$ 15 million.

6.4. Special studies.

No detailed estimates have yet been made for the content and cost of the four special studies planned under the Trans V project, described in Sections 5.8.1. - 5.8.4. The IBRD project preparation mission used an estimate of US\$ 0.5 million per study, and it is considered that this amount should be adequate.

For water studies and pilot project implementation estimated costs have been calculated based on the following:

(a) Regional water resource study of par	ts (of South
Kalimantan and South Irian Jaya.		
(i) 24 mm expatriate professional staff		
@ \$12,500/mm	\$	300,000
(ii) 72 mm local professional staff		
@ \$2,500/mm	\$	180,000
(iii) Drilling and testing 200 boreholes,		
average depth 60m @\$50/m	\$	600,000
	\$1	,080,000
(b) Investigation of water supplies for pasang	suru	t schemes
(i) 4 mm expatriate professional staff		
@ \$12,500/mm	\$	50,000
(ii) 20 mm local professional staff		
@ \$2,500/mm	\$	50,000
(iii) Test drilling 40 boreholes		
average depth 60m @\$50/m	\$	120,000
	\$	220,000

(c)	Investigation of specific problem sites		
(i)	12 mm expatriate professional staff		
	@ \$12,500/mm	\$	150,000
(ii)	36 mm local professional staff		
	@ \$2,500/mm	Ş	90,000
(iii)	Test drilling 15 boreholes,		
	average depth 60m @\$50/m	\$	45,000
		\$	285,000
(d)	Implementation of pilot projects		
	6 SPs of 500 KK each @ \$300/KK	\$	900,000
(e)	Total cost of Water Studies	\$2	,485,000
			and the second sec

For the regional planning study of South Irian Jaya a cost of US\$ 0.5 million has been used (which allows for some 36 mm expatriate and 34 mm local professional input). 6.5. Programme support.

6.5.1. Technical advisory group.

a) Assumptions.

In the cost estimates for the Technical Advisory Group, the following assumptions have been made:

- i) the loan becomes effective on 1/10/85;
- ii) the present TAG is extended to 31/12/85 under Trans III.
- iii) salary cost for expatriates L5400 (\$7290) per man month,
 - iv) other costs based on existing TAG contract: -air fares and excess baggage L450/mm, -mobilisation and positioning L200/mm, -equipment, materials,misc. L800/mm, -total of other costs L1450/man month (US\$1998/mm).

v) salary cost for local professional staff Rp 2.0
million/mm, other costs:
 -mobilisation and demobilisation Rp18,000/mm,
 -accommodation Rp350,000/mm,
 -duty visits Rp300,000/mm,
 -transport Rp210,000/mm,
 -support staff Rp80,000/mm,

-total cost per man month:

Rp2.958 million (US\$ 2958).

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v)	Supporting	costs	for	expatriates:				
	- housing			Rp850,000/mm,				
	- visa cost	s		Rp40,000/mm.				
	- duty visi	lts		Rp345,000/mm.				
	- office cos	sts		Rp540,000/mm,				
	- supporting	staff		Rp478,000/mm,				
	- equipment			Rp358,000/mm.				
	- printing			Rp50,000/mm,				
	- transport			Rp616,000/mm,				
	- misc.			Rp121,000/mm,				
	- total			Rp3.398million/mm				

b) Inputs.

- i) Bina Program Jakarta; 29 advisers, 15 expatriate and 14 local, over a period of 30 months, total 533 expatriate man months, 630 local man months including supervision, short term specialists and unallocated inputs.
- Regional advisory teams; 6 teams, of between 2 and 4 ii) advisers, total 324 expatriate man months and 240 local man months.
- iii)Total 857 expatriate man months, 870 local man months.

c) Total costs (at 1984 prices).

Expat.staff charges : 857 mm at \$7290 =\$ 6,247,530 Other foreign costs (mobilisation, equipment etc) : 857 mm at \$1998 =\$ 1,712,286 Supporting local cost: 857 mm at \$3398 =\$ 2,912,086 Local Professional costs : 870 mm at \$2958 =\$ 2,573,460 US\$13,445,362

Total

6.5.2. Staff training: Ministry of Transmigration.

The IBRD project preparation mission indicated a sum of US\$4 million for Bina Program staff training. It is considered that these funds should be used for a training programme for appropriate staff throughout the Ministry of Transmigration. The Centre for Research and Development (Puslitbang) in the Secretariat-General has been asked to formulate a training programme. The indicative cost is US\$1,000 per man month of training, whether overseas or in Indonesia. Therefore US\$4 million would provide roughly 4,000 man months of training, about 330 man years.

6.5.3. Programme support: Bakosurtanal.

The following information has been taken from a memo. entitled "Project proposal for the completion of base mapping to support the transmigration program", prepared by Bakosurtanal, and discussed with Bina Program, in September 1984.

a) Training.

The following training is proposed in Section 5.9.3.:

Field of study.	D-3 level	Grad.Dipl/
		S-2/S-3
	(man years)	(man years)
Geodesy	5	10
Photogrammetry	5	10
Cartography	5	5
Computer science	5	5
Total (man years)	20	30

Bakosurtanal estimated the cost at US\$ 1.25 million, i.e. US\$ 25,000/man year, roughly US\$ 2,000/man month.

b) Technical assistance.

A total of 6 man years is required for assistance in developing computer software, and solving scientific and technological problems, in the fields of automated photogrammetry and geodesy.

Local consultants should be used to assist Bakosurtanal in management of the mapping project, drafting laws and regulations pertaining to survey and mapping integration, and to develop a resources information systems network. A total of 10 man years was proposed by Bakosurtanal. The estimated cost of this technical assistance is:

6.6. Phasing of cost estimates.

The phasing of cost estimates has been based on the Trans V project programme described in Chapter 7, and illustrated in Figure 7.3. At this stage, the phasing is very tentative, but gives a broad indication of how the project funds will be disbursed. In addition, the cost phasing has been used as a basis for estimating price contingencies (Table 6.2.). The phasing should be continually updated as more information becomes available.

CHAPTER 7. ORGANISATION AND MANAGEMENT.

7.1. Institutional background.

Increasing responsibilities and work load led to the upgrading of the Department of Transmigration in the Ministry of Manpower and Transmigration to a full Ministry in April 1983.

The Ministry of Transmigration has an Inspectorate-General, a Secretariat-General, and two Directorate-Generals (DGs), one dealing with Settlement Preparation, and the other dealing with Mobilisation and Development (see Figure 7.1.). All policies and plans emanating from the Directorate-Generals must pass through the Secretariat-General, which includes the Planning Bureau.

The DG Settlement Preparation has five Directorates. One of these is the Directorate of Settlement Planning (see Figure 7.2.) i.e. Bina Program. Before the creation of the Ministry of Transmigration, settlement planning was carried out by the Directorate of City and Regional Planning (DITADA) in the DG Cipta Karya, in the Ministry of Public Works.

At the national level, coordination between the various agencies involved in transmigration is achieved by meetings of the Ministerial Body for Coordination of Transmigration Implementation (BAKOPTRANS) consisting of Ministers involved in transmigration policy and implementation. Under BAKOPTRANS Transmigration Control Unit (SATDALTRANS), which is the consists of the Directors-General of the main implementing agencies. The decree setting out the functions of Bakoptrans and Satdaltrans lists over 50 DGs in the latter. At the level regional is a Transmigration Development Unit (SATBINTRANS) which liaises with the other agencies involved, under a Provincial Committee chaired by the Governor.

In the Secretariat-General of the Ministry of Transmigration are a number of Sub-Project Coordinators, including one for World Bank projects.

Technical assistance is provided to the Ministry of Transmigration through advisers funded by the World Bank, and by UNDP. A Technical Advisory Group is attached to Bina Program, funded under the Trans III project (see Section 5.9.1.for details). This group has regional advisers and teams in the regional centres.

It has been proposed that a Steering Committee should be set up, consisting of those Ministers most directly involved in the transmigration programme: Transmigration, Manpower, Public Works, Agriculture, Home Affairs, and Finance. This committee might meet every few months to discuss and decide matters of policy and strategy. The Steering Committee would have an Executive Committee consisting of the DGs and representatives of those organisations most directly involved in transmigration. This committee would have the task of implementing the decisions agreed by the Steering Committee. The Executive Committee would include:

Chief, Planning Bureau	-Min.of	Transmigration
Representative, Bappenas		
", Bakosurtanal		
DG Water Resources Development	-Min.of	Public Works
DG Settlement Preparation	-Min.of	Transmigration
DG Mobilisation and Development	- " "	
DG Agraria	-Min.of	Home Affairs
DG Estates	-Min.of	Agriculture
DG Forestry	- " "	
DG Livestock	- " "	
DG Agronomy	- " "	

The Executive Committee would meet at least once every two months. One of their initial tasks would be to review the project proposals for Trans V, and to ensure the smooth transition from the ongoing Trans III project to implementation of Trans V.



Figure 7.1 Organisation Structure of the Ministry of Transmigration

Figure 7.2

ORGANIZATION CHART

DIRECTORATE BINA PROGRAM

DIRECTORATE GENERAL SETTLEMENT PLANNING



7.2. Organisation.

Under the present Trans III project, all planning for transmigration is carried out by the Directorate Bina Program. It is proposed that this is continued under Trans V even though some non-standard models will be implemented. However a proper organisation will need to be set up to deal with the non-standard models to ensure that the planning carried out by Bina Program will be acceptable to the implementing agency.

A great deal of cooperation will be needed between all the Ministries involved, to deal with the complexities arising from combining several types of development in the transmigration programme. This cooperation is also vital for planning and implementing the standard model settlements, because other Ministries are involved in a variety of tasks.

A number of contraints affecting the planning and implementation of the transmigration programme have emerged. They have been described in detail elsewhere in this report, and include:

a) Poor initial site selection.

The LRDC RePPProT project, which is proposed to continue under Trans V, should select sites on better and more reliable information.

b) Lack of suitable airphotography.

Under Trans V it is proposed that new mapping techniques be used, based on a variety of remote sensing methods (Chapter 5). The Trans V project includes a component to provide the remaining remote sensing data required (Section 5.3.) based on more efficient site selection.

c) Conflicts over land allocation.

As described in detail in Section 3.6. some settlement has not been allowed because the DG Forestry has ruled that the forestry classification of the area made it unavailable. However general agreement has now been reached on how these problems will be tackled.

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d) Cooperation between central and provincial government.

On some occasions, land proposed for study by central government has not been accepted by the provincial BAPPEDAS, which may have already allocated the land for alternative use. To resolve these difficulties, closer liaison is needed, and this should be pursued with the assistance of the regional advisory teams (Section 5.9.1.) to achieve a mutually acceptable development strategy.

e) The standard dryland arable/tree crop model.

Most studies so far have concentrated on finding and planning areas suitable and available for the standard model. This required large areas of land with slopes of less than 8% which had no existing land use claims. Many sites were rejected when they failed to meet these criteria. If the nonstandard models, which will be studied under Trans III, and implemented on a pilot basis under Trans V, prove viable, the implications for site selection will be considerable.

7.3. Project phasing.

The overall implementation programme is illustrated in Figure 7.3. which includes the phasing of key activities which have to be completed before the Trans V project starts.

a) Remote sensing.

So that Phase IB studies can be completed for Irian Jaya during Trans III, a contract needs to be awarded for SLAR mapping of about 50,000 sq.km in the eastern part of the province. Funds for this mapping should be available from the Trans III loan. If not the funds must be made available from the Trans V loan. This will however entail retroactive financing.

To avoid delays in the planned continuation of SFSE-82 studies, areas of Sumatera not already covered by SLAR imagery will need to be flown immediately after the Trans V loan is approved, but tender documents must be prepared in advance.

the RePPProT planning progresses and areas for potential As transmigration settlement are identified, tender documents must be prepared for 1:50,000 scale airphotos for those areas covered by existing medium-scale photos. not Because the photography must take place during the dry season, and to avoid delays in the other parts of the programme, the first contract for sites in Central and West Kalimantan and Irian Jaya must be flown during mid-1985. This means that the implementation of the contracts will start before the proposed loan is fully effective, and therefore retro-active financing will be needed. It is expected that two further rounds of airphotography will be rquired during mid-1986 and mid-1987, when the results of the Phase IB studies become available.

b) Radar/laser mapping.

The radar and laser mapping trials must be completed in time for the results to be evaluated before the loan agreement is finalised. It is expected that the results will be available for review in July 1985. If the trials are succesful, tenders can be called for and negotiations can start, after the loan is finalised, and will allow a contract start date of April 1986. The number and content of the contracts for radar/laser mapping awaits detailed evaluation of the trials. Figure: 7.3

Implementation Programme

	UNIT	NO FOR TRANS V	, 1984 - 1985					1985 - 1986						1986 - 1987					T	1987-1988							1988 - 1989																
			AN	IJ	JA	s o	N	DJ	FN	AN	M	JJ	A	s	0 N	D	JF	= M	A	м.	JJ	A	s o	NC	J	FN	A	M	JJ	A	so	N	DJ	FN	AN	M	JJ	A	s o	N	D	JF	: M
1 LOAN PREPARATION	2									+														1																			
2 PHASE IB STUDIES			CEN	T.KA	L. WE	ST IRJI	A WE	EST E	AST	AND	SOUTI		L. E7	STIF	λ ζ JΑ		22			ma	ma	SUL	AWESI		am			anno												1.1			
3 S.L.A.R. TENDER DOCUMENTS						EAST	IRJ	λ			SU	UMATI	RA																														
S.L.A.R. IMPLEMENTATION	ΚM ²	310,000							E?	AST	IRJA		-		SU	JMATE	RA				4																						
4 1:50,000 FALSE COLOUR TENDER DOCUMENTS						С	ENT.F	KAL.	WEST I		WES KAI	ST	EAST SOUT	AND H KAI	E	CAST 000001	IRJA					SUMAT					1												-				
1:50,000 FALSE COLOUR IMPLEMENTATION	KM²	95,000									CE	NT A	ND W	EST K	(AL.					EAS	EA		JA	L.				E	SUM SUL	AWES													
5 RADAR MAPPING SYSTEM FINALISATION							8													2																							
6 RADAR AND LASER MAPPING TRIALS									G	2000																																	
7 RADAR/LASER PROFILING/MAPPING	HA	1,625,000				V																					72			-													
8 PRE PHASE II SCREENING										5000 0000															-																		
9 PH II AND PH IIIA STUDIES - PROPOSALS													272		4																				_								
- NEGOTIATIONS																uni							2																				_
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10 1:50,000 RECTIFIED PHOTO MAPS							H			+	ON	GOIN	G PR	OCESS	5																												
11 SPECIAL STUDIES						5900	000 000000 1	000001 0001			2																						-										_
12 PILOT SETTLEMENTS - IMPLEMENTATION																			777								22																
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TRANS III ACTIVITIES

TRANS V ACTIVITIES

c) SFSE studies.

For contracts involving consultants for Phase II and IIIA studies, is recommended that approved consultants are invited to submit proposals before the date of effectiveness of the Trans V loan. This will allow negotiations to start as early as possible, followed by contracts allowing a start to be made on Phase II studies in April 1986, with Phase IIIA studies starting soon after.

In Chapter 5 it was shown that 325 Phase II studies and 220 Phase IIIA studies will be needed to meet the Trans V target. To complete these studies in a two year period it is estimated that some 15 consortia of foreign and local consultants will be required, with each consortia carrying out approximately 22 Phase II and 15 Phase IIIA studies.

CHAPTER 8. ECONOMIC AND SOCIAL JUSTIFICATION.

8.1. The Transmigration Programme.

a) Introduction.

Because the Trans V project is essentially to enhance the planning of the transmigration programme, this chapter starts with a brief outline of the economic and social implications of the programme as a whole. Information based on evaluation of previous phases of the programme, including economic analyses, are lacking. Consequently, this report proposes (Chapter 5) a special study on the social and economic benefits of the transmigration programme to be carried out under Trans V. The recruitment of a consultant to make a preliminary assessment, and to draft the terms of reference for the special study, is now being considered by the Ministry of Transmigration.

GOI views the role of transmigration as an effort to achieve a balance in population distribution, to increase job opportunities, to raise production and incomes, and to equitably distribute development among the regions of Indonesia. It is intended that the transmigrants should have opportunities for a better livelihood than they could expect in their place of origin.

b) Infrastructure.

As earlier indicated, a large proportion of transmigration funds are used for infrastructure. It has been demonstrated that the programme has significantly increased the proportion of new roads serving the provinces to which the transmigrants have been sent. Likewise, river jetties have been built, enlarged, or rehabilitated. Detailed and objective measurement of incremental infrastrucure should be made in the special study, including a cost/benefit analysis. The latter should set guidelines for planning infrastructure in future regional planning.

Some irrigation schemes have been started through the transmigration programme with varied success. Doubts about the future viability of dryland arable holdings give emphasis to the need for greater attention to be given to rigorous economic and financial evaluation of the schemes that have been implemented so far. This evaluation, which should use well established procedures for analysis, should form the basis for future feasibility studies. Roughly a quarter of transmigration funds are spent on social infrastructure, including housing, schools, clinics, and buildings for cooperatives and administration. Evaluation of the benefits provided by this infrastructure is required, indicating priorities for future development, capital cost projections, and estimates of recurrent costs for maintenance.

c) Production.

A major objective of the transmigration programme is to increase food production. Evaluation of earlier settlements, well as ongoing monitoring, is required to as measure achievement of this objective. It has been estimated that the Repelitas I and II programmes resulted in the incremental production of 184,000 tonnes of padi (unhusked rice) and 43,000 tonnes of maize by 1982. This is equivalent to 1.0 of total production for Indonesia. The impact in 1.5% specific provinces has been significant, and will increase with the larger numbers of transmigrants settled in Repelita III and planned for Repelita IV. Monitoring and evaluation of tree crop planting and production is also needed, particularly because there is general agreement that tree crops will become more important in the transmigration programme.

d) Secondary production and employment.

Experience throughout Asia suggests that the ability of farms to absorb additional labour has been over-estimated. Conversely, the importance of non-farm employment has been Balanced development of small-scale, labourneglected. intensive agricultural and non-agricultural industries should to increased employment in the lead areas receiving transmigrants. Significant employment opportunities are provided by the infrastructure investments described above, which should be enhanced by the growth of WPP centres. Other important sources of employment are: timber, processing of farm products, and manufacture of building materials (e.g. bricks and tiles).

is intended to explore the potential of non-standard It settlement models (Section 5.3.), including: sago production processing in Irian Jaya, rottan in Kalimantan, and and limestone extraction and distribution to farms. The generating potential employment and income of these activities must be carefully assessed and monitored during implementation. Studies should carefully distinguish between benefits to indigenous people and transmigrants.

8.2. Analysis of farm models.

GOI policy limits the size of holding allocated to transmigrants to 2.0 ha, divided as follows:

-houseplot	0.25	ha			
-arable plot	1.00		(for	food	crops)
-reserve plot	0.75	••			
	2.00	ha			

The intention is that the transmigrant family should become self-sufficient in food within the first year. This means that on most settlement sites the farm model is based on rainfed arable crops. However, most soils in the settlement areas can sustain arable cropping only with regular and sometimes rather high levels of fertilisers and lime. The basic model thus becomes dependent on inputs which, though planned, may not be available, or cannot be afforded by the transmigrant. IBRD appraisal reports have assumed that 1.5 t/ha of padi plus 1.25 t/ha of maize can be regularly achieved, yet this is clearly not feasible.

The capacity of the family to cultivate one hectare of arable crops has also been questioned, and it has been suggested that the limit is as low as 0.4 ha, which probably would not achieve subsistence production.

Economic analyses of the standard farm model (Momal and Ross, 1981; Vaughan Evans, 1982; RMI, 1983) have indicated negative returns at a discount rate of 10%. The Trans IV feasibility study proposed a 3.5 ha farm model, with an additional 0.25 ha per family for infrastructure. This much larger holding was proposed because it was estimated that a family could not subsist on the "standard" holding growing rainfed arable food crops.

The Technical Advisory Group in Bina Program used a dryland farm model of 3.5 ha as the basis for terms of reference for consultants engaged in Phase II and IIIA planning under Trans III (SFSE-82 studies). This holding consists of:

-houseplot		0.25	ha				
-arable plot		1.00	••				
-additional crops)	plot	2.25		(intended	for	future	tree
		and the second se					

3.50 ha

The 2.25 ha additional plot can be on slopes up to 25%.

The IBRD Transmigration Program Review (3170a-IND),1981, indicated that the food crop farm model was barely economic at a discount rate of 10%, whereas models including rubber were much more viable. One of the report's conclusions was that less reliance should be placed on "externally supplied" inputs such as fertilisers, pesticides, and extension, and that more emphasis should be given to extended home gardens, trees inter-cropped with arable food crops, and off-farm employment.

Where settlements have already been planned and implemented on the basis of 2.0 ha holdings, viability will probably be dependent on the introduction of tree crops and/or "second stage" development of non-farm activities. It has been proposed that an "intervention programme" should be started with the aim of assisting already settled transmigrants to become viable. This could include components from the Trans VI project, and from the World Food Programme project which provides food for work and should thus relieve farmers from the need to grow some of their food crops while they establish tree crops.

As a prerequisite for future planning, it is proposed that alternative farm models are subjected to detailed economic and financial analysis. This can be achieved in two main ways:

i) SFSE-82 consultants should be instructed to compare different models, including the 2.0 ha and 3.5 ha models, as well as others which they consider should be adopted as viable alternatives. The methodology for the analyses must be agreed between the consultants and Bina Program (assisted by the Technical Advisory Group).

The Technical Advisory Group should write a report ii) on alternative farm models and their implications for transmigration planning. This report would be based on a review of existing reports and data, and would be later updated and supplemented with the findings of consultants (i) above). The report would also be used as a means for establishing appropriate methodologies for economic and financial analysis, based on conventional techniques adapted for the specific requirements of transmigration settlement. It may be necessary to bring in an additional agricultural economist under Trans III for this purpose.

8.3. The Trans V project.

The economic and social justification for the Trans V project is difficult to quantify because it is only a small, albeit important, component in a very large project. As already described in Chapter 5, the main objectives of the project are to prepare plans for the transmigration programme, to plan and implement pilot settlements, for special studies into important matters relevant to the future strategy of the programme, and to provide programme support for the GOI agencies involved in planning.

The planning component of the project is essential, to provide remote sensing data, land evaluation, and maps, as a basis for detailed screening and planning of settlement sites. The project will improve the quality and timing of planning, and should thus prevent waste of funds and hardship to settlers caused by settlement in unsuitable areas and delayed implementation.

The planning and implementation of the pilot settlements, and the special studies, will provide much needed information on alternative strategies for the transmigration programme, which are expected to lead to increased economic and social benefits.

The programme support for the agencies involved in transmigration planning should also enhance the quality and timing of the programme, leading to benefits for the economy and for the transmigrants.

CHAPTER 9. ENVIRONMENTAL ASPECTS.

9.1 Land and Water.

During Repelita III, some 500,000 families from the crowded inner islands have been settled in the outer islands mainly in Kalimantan, Sumatera, Sulawesi and Irian Jaya. In Repelita IV, it is planned that a further 750,000 families will be settled. Each family should receive: a houselot of 0.25 ha, ha first arable, 0.75 ha second arable and 1.50 ha of 1.0 reserve area for future development; in addition, 0.25 ha/family is reserved for social infrastructure, and 150 ha/village for services, small industries etc. The 1.50 ha of reserve area has rarely been utilized, so that approximately 2.5 ha/family is the present developed area. Therefore, between 1979 and 1989 about 3,125,000 ha of land have been cleared and settled. will In addition, the Government of Indonesia has set a target of 2.4 million ha for tree crop planting during Repelitas III and IV. While this total will included some second stage development and replanting of existing tree crop areas, most of the 2.4 million hectares will be new lands. Very approximately, about 5.0 million hectares of land in the various outer islands will undergo drastic changes in vegetation cover, land use and rural/social institutions.

Of major importance is the loss of primary forest under the various development programmes. It is not possible to quantify accurately the areas which will be felled, but it will be very large, especially in the tree crop sector with its use of relatively steeply sloping land. It is likely that between 1.0 and 1.5 million hectares of primary forest will have disappeared in the ten years to 1989.

An assessment of the environmental impact of these huge changes is urgently required. The disasterous forest fires in East Kalimantan during 1982/83 may have been due largely to the prolonged drought during that time, but logging activities and the spread of shifting cultivation must have been a contributary factor. The environmental impact of these fires and of plans for rehabilitation or various forms of land use needs careful evaluation.

Loss of forest cover very significantly alters the water balance within watersheds leading to increased run off, decreased deep recharge and increased erosion. This in turn tends to increase flood levels and decrease low flows during drought. This latter effect is especially important in small streams and rivers which serve as the source of water for transmigrant settlements; not only do small streams dry up during drought periods, but low flows increase the risk of pollution and resulting health hazard. The wider effects of reduced evapotranspiration on climatic parameters is very difficult to quantify, but should not be ignored.

After the forest has been cleared, the most effective method to ensure the long-term conservation of land and water resources is probably the early establishment of permanent agricultural systems using the most modern techniques available to the farmers and their government extension services. On land unsuitable for arable use, a tree crop canopy should be established as quickly as possible to replace the previous forest canopy. A well-grown plantation will minimize the run-off and accelerated erosion, but it can never replace the sponge affect of the vegetation mass in a natural forest, and thus some deleterious affects on . river regimes are inevitable. The large scale, regional aspects of major changes in land use and vegetation cover need to be considered very early in the planning stage, since it is difficult for the planners and implementers, concerned only with the settlement of individual sites, to grasp these wider aspects and to identify fully the important factors in environmental control.

During the implementation stage, the timely supply of inputs essential to minimise the adverse effects of land is clearing. Factors such as inaccurate land suitability mapping planning, inadequate supervision of and land clearance boundaries, the use of inappropriate equipment, operations during periods of excessive moisture content, failure to plant promptly and maintain an adequate cover crop, or to supply the required inputs for the settlement at the correct time can all lead to unnecessary damage at a time when the land is especially susceptible. A carefully planned, supervised, and programmed implementation process is essential to minimise initial damage to land.

Unused land with the suitability requirements for arable cropping is becoming increasingly rare and it is inevitable land suitability standards must be relaxed and farm that models modified, to allow for this land shortage. The result will be that increasingly marginal land must be utilized, whether in terms of less suitable soils or of steeper slope limits. It need not be necessary to reject such land, provided that it is firmly established and formally accepted that its development is based (usually) on tree crops, requires higher capital cost in terms of increased management skills, higher fertilizer inputs and facilities for their continuous use, more prolonged subsistence aid to the settlers, and soil conservation measures. It is particularly recommended that a soil conservation specialist is engaged by each Consultant in order to assess the most appropriate conservation requirements for every site.

Much more positive attention must be paid to aspects of soil conservation than the rather cursory attention paid hitherto, both in planning and implementation, otherwise there is a very real danger that the objectives of the programme will be defeated, resulting in both transmigrant and local settlers reverting to shifting cultivation and, in substanstial areas, of land being rendered unuseable by erosion.

9.2 Plant and Animal Communities.

The lowland Dipterocarp rain forest contains perhaps the richest biological environments in the world. Its clearance results in the total and irreversible loss of this ecosystem, inevitably it occupies the land in greatest demand but for agricultural use. Apart from timber and the better known minor resources that are traditionally collected, the many resources both plant and animal have been inadequately studied and understood. It is vitally important that areas representative of this ecosytem are set aside for conservation and study, and are adequately protected. Areas required for conservation may be lost before they can be legally ratified. Even once established, such areas are very difficult to police. Once the surrounding lands become developed, the pressures on the conserved areas will increase to the point of intolerance, unless adequate measures are taken now to control these. It is equally important that areas for conservation are carefully selected and delineated, so that conflict with other forms of land use are minimised.

Within the proposed Trans V programme, it is recommended that a specialist input by a biologist conversant with forest bio-systems and their conservation is added to each Consultant package that is working in areas still carrying extensive natural forest habitat. His impact would be greatest where the consultant packages cover whole regions, rather than scattered individual sites. He would need to be conversant with all branches of the plant and animal community of SE Asian forests (though complementary to the forester without overlapping with the latters' terms of reference). He would be expected to liaise closely with the relevant authorities (Sub-Directorate PLPA), and also to make comparative studies in both the designated areas and the nearby reserves. He may make recommendations for the permanent conservation of additional areas.

9.3. Rural Institutions and Indigeneous Populations.

By 1989, roughly 3.0 to 3.5 million hectares of land with existing land use patterns and rural institutions will have been absorbed within the transmigration settlement programme. Inevitably, the impact on the local population and their institutions will be far reaching and fundamental. There is no doubt that the transmigration programme will bring benefits in skills and infrastructure, but it will also bring problems which must be identified and overcome.

Jaya where the indigeneous population are In Irian still basically hunter-gatherers, dependent entirely on natural forest products, the sudden impact of large numbers of more technically peoples advanced can result in the destabilisation and rapid breakdown of existing institutions without the complementary evolution of new systems to replace them.

the local population are dependent In Kalimantan, on shifting cultivation with its very extensive agricultural production and its sensitivity to population pressure. As described in section 3.7, the system is already under great pressure; the loss of very large areas to formal transmigrant settlements will increase this pressure. The problem is acute Kalimantan Barat now, and will rapidly become so in in the other Kalimantan Provinces as a result of both natural population increase and migration. The constraint of present land use and the need to resolve the, presently, conflicting land requirements of indigeneous and transmigrant populations crucial to the continued expansion of the transmigrant is programme. The shifting cultivation system will have to be stabilised to reduce the area required per family, which will require a programme of land rationalisation, re-allocation, and settlement supported by necessary inputs. There is the opportunity through the transmigration programme, to implement a programme of planned permanent settlement, although the short-term social problems of integration and the loss of traditional sources of employment must still be resolved.

A thorough understanding of existing rural institutions is necessary if a reasonably smooth transition from traditional to more intensive agricultural production is to be achieved. It is unlikely that there will be a single formula suitable for all Regions, and careful assessment will have to be made area by area. For example, integration of the local and transmigrant population may be possible in some areas, but parallel development may be necessary in others.

Since new land available for settlement is becoming scarcer, the need to increase the carrying capacity in areas of existing land use will assume greater and greater significance. In response to this it is recommended that the individual Consultants should provide a Rural Institutions/Sociology specialist to carry out detailed investigations into the existing socio-economic parameters of the local population, the likely impact of the proposed transmigration programme on them, and to help identify a which will allow equitable development of both system communities. Such investigations are especially important and necessary in Irian Jaya, where the local population are most vulnerable to the effects of rapid institutional change.

APPENDIX A

WPP Centre Design and Implementation Studies

1. Introduction

The promotion of WPP Centres - small towns with marketing, processing and extension services - is a key element in the longer-range national transmigration programme, especially in provinces where established transmigrant settlement are ready to emerge from the initial "sustained self-sufficiency" development phase. However WPP Centre planning has not been the responsibility of DG Mobilisation and Development; it is proposed that this should be changed under Trans V, with preparatory work being done under Trans III.

The National Structure of Regional Development defines a hierarchy of trade-oriented settlements within each 42 Development Regions (SWP) outside Java, Madura and Bali; the highest level SWP centre is normally an established coastal riverine port through which regional trade with other or parts of Indonesia must pass. The SWP is sub-divided into a number of Partial Development Regions (WPP) which are in turn into Units of Developments Areas (SKP) most of which divided transmigration settlements. are A fully settled WPP will contain some 50 to 80,000 sponsored transmigrants together existing population and, in time, spontaneous with some transmigrants. Unlike SKP centres, which are merely large villages, a WPP centre will be a small town concentrating, at convenient location on the main communications link with a the SWP Centre the trade, service, social and administrative facilities required by its dependent SKPs and its own resident urban population. The development of the centre, of improved roads and/or river transport, will promote and second stage development in SKPs (by providing the incentive to cultivate cash crops and other marketable products) and the creation of non-agricultural employment opportunities. Clearly it is the responsibility of the Department of Transmigration to assist with Centre development in those WPPs consisting wholly or largely of transmigrant settlements.

Tentative locations of WPP Centres are established in Phase WPP Structure Plans prepared by Bina Program (formerly IB These plans require through revision for Repelita DITADA). once Phase II and Phase IIIA studies for constituent SKPs IV have been completed (see Section 5.1.). Although most tentative centres are located where some settlement already exists, this is often on a very small scale, with few facilities, and relocation of the centre may be justifiable. Once a centre's location is confirmed, site boundaries must be established, an outline plan produced and a phased programme set out and agreed with relevant development implementing agencies.

2. WPP Centre Studies under Trans III and Trans

Before WPP Centre Development can be fully integrated into Bina Program's ongoing transmigration preparation programme, a number of separate but interlinked studies are required:

i) identification or confirmation of WPP Centre locations;

- ii) determination of priorities in WPP Centre develop; ment;
- iii) liaison between Bina Program and other agencies potentially responsible for regional development and for WPP centre design and implementation;
 - iv) preparation of TOR for standard WPP centre design studies;
 - v) marketing studies for transmigrant settlement produce, including the potential for processing this within a WPP;
 - vi) survey and design studies for priority centres (selected in b2); and
- vii) evolution of administrative, budgetary and implementation procedures for WPP centre site reservation, initial development (by Government) and longer-term development (involving the private sector).

The essential characteristics of each of the itemised studies are discussed below.

3. WPP Centre location

SFSE-82 consultants are already obliged by their TOR to discuss the regional context in all Phase IIIA studies Trans V consultants should be undertaken, required to continue and possibly expand this context work. The planning guidelines have recently been elaborated to encourage consultants to prepare a separate regional context report for each WPP or group of adjacent WPPs within which they have a number of Phase IIIA studies. Consultants are expected to liaise with provincial planning authorities and agencies to build up as complete a picture as possible of the region or partial regions projected short-term (5 year) and long-term (20 year) development.

They should state the following:

 a) existing, already planned and projected transmigrant and other development within the WPP(s), emphasising the probable build up and distribution of population, including existing residents;
- b) expected marketable and processable produce of the WPP(s) with roughly estimated quantities over time, emphasising at what stage these quantities may justify the establishment of processing industries or specialised marketing facilities at the centre(s).
- c) the need for extension and administration offices and facilities to support the farming and other activities in the WPP(s); and
- d) existing and planned transport links connecting possible centre(s) both the various SKPs dependent on them and to the SWP centre.

On the basis of the assembled information Consultants should confirm each WPP centre's location (as originally suggested in Bina Program's Phase I WPP Structure Plan) or propose a more suitable alternative.

Each SFSE-82 local consultant is contracted to undertake or supervise some 20-30 Phase III studies and many perhaps produce 4 or 5 regional setting reports; thus some 40 reports may be submitted. However it would be unrealistic to assume that more than about 25 of these will be sufficiently comprehensive for immediate future use.

Also relevant will be the parallel ODA/LRDC "Regional Planning Project for Transmigration". From the results of this project it will be possible to assess the potential for increasing settler numbers and productive areas within WPPs with priority centres.

4. Determination of Priorities in WPP Centre Development

Prior to the start of Trans V the consultants' regional context reports, plus the results of the regional project and the ongoing work of Bina Program's Phase I Structure Planning team, must be synthesised with the aim of identifying first priorities for WPP Centre development in each region. Priorities will be assessed by considering, in particular:

- actual, programmed or planned transmigrant settlement in each WPP;
- b) relative urgency for second-stage development dependent on WPP centre promotion (e.g. processing facilities);
- c) potential for additional settlement by formal or spontaneous transmigrants (especially where this will be made possible by WPP centre development);

- d) other rural development in the area; and
- e) existing or programmed roads within and from the WPP.

It is proposed that this work will be undertaken within Bina Program, primarily by the TAG, during the first half of 1985.

5. Liaison between Bina Program and other Agencies

The relocation of Bina Program (Transmigrant Settlement Planning) has weakened the Directorates links with DITADA and other agencies involved in regional development, both in Jakarta and in the provinces. It is essential that these links be reestablished and strengthened to avoid to avoid duplication of effort and ensure coordination within the overal promotion of 'balanced' regional development in Indonesia. For example liaison must be maintained with the National Urban Development Study (UNDP within DITADA); this study is scheduled to define (by mid-1985) an overall national strategy for urban development. Other agencies which must necessarily be involved in WPP centre and other secondstage development projects include:

- i) BINA MARGA (National and provincial),
- ii) BAPPENAS,
- iii) Provincial BAPPENAS,
 - iv) Provincial Governor's offices,
 - v) Social service agencies (e.g. Education, Health),

in addition to the agricultural, estates and forestry agencies concerned with rural development marketing and processing.

The TAG will work with Bina Program to promote the establishment of common objectives with these agencies.

6. TOR for Standard WPP Centre Design

Before consultants can be contracted to undertake WPP Centre survey and design studies under Trans V, terms of reference and planning guidelines must be written for a "standard model" WPP Centre, with a limited number of permutations, taking into accont variations which may be necessary if the Centre already exists in some form. The TOR should define:

 site survey methods to be used (slopes, soils, drainage, potable water supply, land use, land ownership, concessions etc.);

- ii) basic facilities to be incorporated into all WPP centres (with plot sizes, building sizes and any limiting factors);
- iii) additional facilities which may be appropriate in certain centres (various processing, special storage etc.);
 - v) infrastructure requirements (roads and road reserves, drainage, water supply, electricity supply, sewage disposal, solid waste disposal);
- vi) reserves for future expansion;
- vii) implementation, programming and budgetary specifications.

The TOR should be available, at least in draft, before consultants start negotiating contracts. Guidelines would be prepared before the first WPP survey and design commences.

7. Marketing Studies

These are discussed separately in Section 5.8.1.

8. WPP Centre Survey and design studies under Trans V

It is proposed to undertake survey and design studies for a limited number of selected WPP centres under Trans V in two ways:

- a) a separately contracted study (or studies) for 5 to 10 WPP centres in Southern Sumatra, where Trans V Phase II and Phase IIIA studies will not be commissioned; and
- b) in other provinces, WPP centre studies contracted with Phase II and Phase IIIA studies (including regional setting studies).

The approach to WPP centre studies, will be the same in each case although it is hoped the Sumatran studies will be undertaken before those in other provinces, enabling Bina Program with the TAG, to treat the Sumatran project as a pilot study.

5

8a. WPP Centre studies in southern Sumatra.

A provisional list of 10 sites in Lampung and South Sumatra provinces, selected by Bina Program in consultation with DITADA, is attached. It is proposed that contracts be let for groups of four or five of these; lead firms should be recognised urban and regional planning consoultants, working with local associates. Profesional staff should comprise:

team leader/regional planner,
physical planner/settlement specialist,
civil engineer,
topo surveyor.

Minor inputs from social scientist, quantity surveyor, marketing and/or processing specialists should be allowed for, with appropriate survey, drafting and administrative support staff.

The tasks undertaken for each WPP centre will essentially be the same as those undertaken in other provinces but additional time will be required for Sumatran consultants to familiarise themselves with the area and to undertake or verify regional setting studies for the WPP.

8b. WPP Centre Studies in Kalimantan and Irian Jaya

Each package consultant working in Kalimantan or Irian Jaya will be contracted to undertake 2 or 3 WPP centre studies; these will not necessarily be implemented immediately but will enable appropriate sites to be reserved and development priorities established. At least one WPP centre will be identified for study by Bina Program before each contract is let; the rest will be determined during the consultants own Phase IIIA Regional Setting work and agreed with Bina Program.

Consultants activities will include:

- i) undertaking a topographic survey of the WPP Centre site;
- ii) preparing a 1:5,000 scale base map with contours at lm or 0.5m intervals;
- iii) drawing up an outline plan of the initial development area.

The outline plans will establish areas for general uses/residential, marketing etc) and sites reserved for specific uses (extension and administrative offices, processing units, transport depots, high school etc). Land

6

already occupied will be identified and necessary improvements proposed. The plan will be accompanied by a brief explanatory report contraining:

- i) an analysis of current land use, land ownership and constraints to the centre's development;
- ii) a programme and budget for the centre's initial development and the construction of specific facilities, correlated with planned development of SKPs within the WPP, other rural development projects and communications improvements; and
- iii) a statement on the responsibility of various agencies for the implementation of the proposed works, to assist Bina Program in coordinating the centre's development.

APPENDIX F

Provisional List and Location of Potential Sites

This list is provisional and likely to be substantially amended following completion of Phase IB studies under the RePPProt programme and restructuring. Issues of land allocation and availability have not yet been studies. The list should be used in conjunction with Chapter 4.

WEST KALIMANTAN

WPP	NAME	SKPs
I	Sambas	D – F
Ib	Bengkayang	A – D
III	Sanggau Ledo	F
IV	Singkawang	C, F, G, I
V	Menjalin	A - G
Vc	Siddas	A – D
VI	Mempawah	D
VIIb	Sosok	A, B, C, E, F
VIIc	Sungai Dangin	A - F
VIId	Seropong	A - G
VIII	Bawayan	C
IXc	Terentang	2 linear sites to be structured
Хc	Padang Tiker	2 sites
Xd	Bajauh	B, C, plus 3 new sites to north-west
XIa	Tembawang Muda	2 sites
XID	Melian Toyan	F
XIC	Tayan	A - D
XIIIc	Sepotong	3 sites
XIVЬ	Kendawangan	3 sites
ХУЬ	Nanga Mahap	В, С, G, Н
XVc	Nanga Taman	A, F, G
XVIb	Balai Sabut	B - E
XVIIIb	Sintang Sepauk	E
XXIa	Sungai Antu	D, E
XXIc	Lanjak	A
XXIIf	Sibau	B, D - H, plus one site to north
	Total	86 sites

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CENTRAL KALIMANTAN

Ia	Tambakan Nilam	A - F
Ib	Bintuni Mea	A, G
IIIa	Tewe	A - C
V	Tumbang Kaman	C, D, E, F, G, I, J plus 5 new sites
Vb	Mansulan	A - H
VIIa	Bagadang	3 sites
VIIb	Bapinang Hulu	l site
VIIc	Kuala Pembuang	3 sites
VIII	Padas	l sites
IXa	Kumai	J, K, L, M, P, O, S, T plus 1 new
		site
IXb	Kumai Kondang	Н, І
IXc	Kuala Jelai	4 sites
Xa	Riam Talawi	C, D, E
XId	Paropa	A, C
XIIa	Batu Tungga	A, E
XIIIa	Telaga	l site
XIIIb	Pangkum	l site
XIIIc	Pegatan	2 sites
XIIId	Sebangan	7 sites
XIVc	Lungkolayang	2 sites
XV	Pujon	G
XVI	Teluk Kajang	2 sites
XVIa	Pulang Pisau	2 sites
XIXa	Muara Tewe	G plus 4 new sites to North
XIXc	Lahei	A, C, D, E, G, H
XX	Sepangsimin	B, C, D, E, G
XXI	Kuala Kurun	A, B, C, E
XXIa	Tanjung Kokop	10 sites
XXIb	Sungai Pinang	7 sites
plus 4	sites nothwest o	f XXI, and 5 sites north of XXIb
		, and the second s

Total

129 sites

EAST KALIMANTAN

Ib	Sesayap	A – D
V	Sekatak	B, C, D
VIIb	Tanah KUning	A – D
IX	Talisayan	4 sites
IXb	Damang Dayak	5 sites
Xa	Rantau Pulung	В
Xe	Muara Bulon	A - G
Xf	-	A – F
Xg	Menubar	A – F
XIa	Muara Wahau	D, E
XIc	Muara Atap	А, В
XII	Muara Ancalong	G
XVa	Panajam	А – Н
ХУЬ	Long Ikis	А – Н
XVc	Tanjong Pinang	A – E
XVf	Bangkung	A, B, D
XVIID	Bromo K.J	A – D
XVIId	Serekan	Α, Ε

IRIAN JAYA

Ic	Ayamaru	4 sites
Id	Teminabuan	7 sites plus sites between Id and Vb
		(Mogol)
XIC	Namami	8 sites
XIIb	Gunung Sanuringga	A - E
XIIc	Nisa	A - E
XVIb	Lembah-Grime	A - C
XVIIa	Krau	4 sites
XXIc	Mindip Tanah	5 sites
XXId	Kauh	7 sites
XXV	Timika	A - F
XXVI	Katan	A - F
	Total	72 sites

Total, four provinces: - 362 sites

