[Chronological file - 1985 (3)

The World Bank Group
Archives
30084765
A2011-001 Other #: 353987B
Gloria Davis - Chronological file - 1985 - 3

INDONESIA

TRANSMIGRATION SECTOR REVIEW

Agricultural Production

Performance to Date

Examples of the various development models for transmigrant farms have now been in existence for long enough to draw conclusions about their present and likely future productivity. Some of the evidence regarding yields, areas cultivated and settler incomes appears contradictory, but this is not surprising given the diversity of situations in which transmigrants find themselves. Significant differences are likely to arise due to variations in

- the physical characteristics of settlement sites,
- differential access to services and markets,
- climatic variation between years, and
- different abilities and motivation of settlers.

Wide ranges in settler performance must be expected and it is important that judgments on overall performance should not be made on the basis of information related to isolated settlements or farms.

Over the years a number of studies of settler production and incomes in upland and tidal sites have been made. In all, 14 upland studies were available to the mission, mostly site-specific. A total of seven studies of tidal sites were available. Not all studies ~~did not~~ recorded the full range of performance parameters of interest, but all ~~did~~ recorded rice yield, which is

the most important single variable in terms of agricultural incomes. In addition, the Bureau of Statistics ~~has recently~~ carried out a survey of incomes of transmigrants in February 1985, which covers settlers in all categories. In the case of upland settlements, this information is supplemented by a ~~recent~~ 1984/1985 survey of settler incomes which was carried out in connection with the Smallholder Cattle Development Project. In the sections below, settler performance has been assessed by averaging data from the various socio-economic surveys and this has been reconciled as far as possible with the results of the two income surveys.

Upland Foodcrop Sites

The yields and areas cultivated of the main food crops are presented in Table 1 and compared with appraisal estimates. This comparison indicates that:

(a) the area of rice cultivated is as forecast in SARs, but yields are less than half,

(b) yields of both cassava and maize are ~~also~~ well below forecast levels, and

(c) ~~planted areas of~~ peanuts are planted on less than 20% of ~~forecast~~ the projected areas.

Table 1: FOOD CROP AREAS PER HOUSEHOLD AND YIELDS, UPLAND SITES

Crop	Recorded in socio-economic surveys				Projected in SARs			
	Area (ha)		Yield (t/ha)		Area (ha)		Yield (t/ha)	
	Average	Range	Average	Range	Average	Range	Average	Range
Rice	1.05	.8-1.3	.68	.39-1.15	1.00	.8-1.25	1.54	.7-1.7
Maize	.32	.14-.69	.48	.11-1.19	1.02	.8-1.25	1.03	.4-1.25
Cassava	.43	.05-.86	4.20	2.00-9.40	.52	.1-1.25	8.1	3-12
Peanuts	.08	.05-.13	.57	.25-.95	.5	-	.17	.5-.9

Some caution should be used in interpreting reported areas of maize and cassava since these are frequently intercropped with rice and it is not always clear whether the areas refer to pure stands or intercrops. However, peanuts are not intercropped, and the observed lower level of plantings is believed to represent accurately the situation on farms. Overall, production of rice is only about half that forecast and that of the minor food crops 15%-25% of forecast levels.

The ranges reported are large and, bearing in mind that the figures reported are themselves averages of different farms within a site, farm-to-farm variation is very high. Interestingly, while appraisal estimates have been generally optimistic, in most cases they fit within the range recorded in different sites. That is, there are entire sites which conform to the planning assumptions used. It is also noteworthy that the problems of foodcrop production on upland soils have been increasingly recognized in project planning. The more recent SARs assume production parameters much closer to the average actual performance of transmigrants than those of earlier projects.

The gross annual income per household from the levels of production recorded, at current farm prices, would be roughly:

	Production (t)	x Price (R '000/ton)	= Income (R '000)
Rice	.714	135	96.4
Maize	.154	120	18.4
Cassava	1.806	19	34.3
Peanuts	.046	450	20.5
Total			169.6

This estimate of gross income compares with average annual net incomes from food crops reported in the BPS survey of R 112,000 for Repelita 2 sites, R 210,000 for Repelita 3 small sites and R 163,000 for larger Repelita 3 sites. The SCDP survey reported average gross cash incomes from annual food crops of R 105,000 per household, with a range from less than R 6,000 on one site to R 236,000 on another. On the assumption that these farms would also be producing most of their subsistence requirements of basic food, total agricultural income would be increased by R 100,000 to R 150,000 to a total of about R 200,000-R 250,000. Since half the respondents in the SCDP survey were recipients of cattle under the cattle distribution program, who were themselves selected leading farmers, the higher incomes reported in this survey are not necessarily inconsistent with the averages calculated above and those recorded in the BPS survey. Of the incomes reported in both the BPS and SCDP surveys, some would be attributable to houselot production of vegetables, though the proportion is not known.

Transmigrants also produce livestock, mainly chickens and goats, and income from this source supplements crop income. Livestock income reported in the income survey is presented in Table 2. Small livestock have been ignored in most of the planning for upland foodcrop transmigrant sites and this income is therefore a bonus not allowed for in estimates of income. It partially offsets the shortfall in crop income.

Settlers not included in the NES/PIR or PMU systems for establishing tree crops also earn income from estate crops. Reported averages are presented in Table 2. For settlers for whom no special provision was made to establish tree crops, income from this source is surprisingly high, especially for Repelita 2 settlers. Given the immature period of estate crops, it is not surprising that estate crop incomes from households settled during Repelita 3 (1979-84) are still negligible. It is likely that estate incomes of Repelita 2 settlers will increase rapidly as trees planted by them would not yet have reached peak producing age.

Table 2: ANNUAL FARM INCOME BY CATEGORIES - UPLAND FOODCROP SITES

Source		Foodcrops	Estate	Livestock	Other	Total
BPS	Repelita 2 - R '000	112	52	26	20	210
	%	53	25	12	10	100
	Repelita 3 small R '000	210	17	32	4	263
	%	80	6	12	2	100
	Repelita 3 large R '000	163	6	37	18	224
	%	73	3	16	8	100
	SCDP (cash only) R '000	105	50	27	-	182
	%	58	27	15	-	100

The BPS survey also reported "other agricultural income" which is mainly from forest (including sale of charcoal and firewood) and fishing activities. This averaged R 20,000 per household for Repelita 2 settlers, R 18,000 for Repelita 3 (large sites) settlers and only R 4,000 for Repelita 3 (small sites) settlers.

Recorded income by categories for the various settler groups is reported in Table 2. In the more mature Repelita 2 settlements just over 50% of farm income is derived from food crops, indicating large-scale diversification away from the basic food crops model over time. A similar result is reported for cash income in the SCDP survey - 42% of cash income is earned from non-food crop enterprises. In Repelita 3 sites, food crop income is far higher in both absolute and percentage terms, accounting for 73% of income on large sites and 80% on smaller sites. When considered with the Repelita 2 results this gives cause for concern since it suggests that foodcrop income is decreasing over time. While this result alone is far from conclusive proof that this is the case, it is consistent with technical assessments which indicate that food crop production on the inherently unsuitable upland soils will decline as soil fertility and structure deteriorate concurrently with increasing pest problems.

The diversification away from foodcrops has partially compensated for the poor food crop performance. However, total farm incomes still fall well short of expectations e.g. Trans. II estimated food income of R 379,000/ household (1979 prices), Trans. III estimate of R 400,000 (1983 prices) and Trans. IV over R 1 million at full production.

Helen, can you update to ___ prices.

Tidal Foodcrop Sites

Less survey work has been done on tidal sites and the information collected relates almost entirely to rice. Most surveys relate to the earlier tidal settlements and the following results were reported:

rice area (2 studies) average 1.82 ha range 1.81-1.83

rice yield (7 studies) average 1.26 t/ha range 0.70-2.25

As with the upland foodcrop sites the areas planted are roughly in line with appraisal forecasts, while average yields are well below forecast levels of 2.6 tons per ha at full production. The fact that the surveys generally ignored other crops suggests that plantings are of minor importance. ~~The~~ Most sites ~~are suited to~~ permit maize and cassava production, but ~~less so to~~ not leguminous crops and few are cultivated.

Although no comprehensive data are available on tidal sites settled in Repelita 3 it is known that there are acute problems with pests on some sites. Some cases of total destruction of crops have been reported and harvested yields as low as 100-200 kg/ha are reported to be common on the worst-affected sites. Under those circumstances, there is little incentive to expand the area cultivated and areas brought into production are reported to be generally less than 1 ha, with negligible dry-season production. Average production is estimated to be of the order of 1 ha of rice with a harvested yield of 0.5 ton per ha, with some cassava and corn cultivated to supply the balance of household food requirements.

Table 3: FOOD CROP PRODUCTION AND INCOME - TIDAL SITES

	Repelita 2			Repelita 3		
	Production (tons)	Price (R '000/ton)	Income R '000	Production (tons)	Price (R '000/ton)	Income R '000
Rice	2.29	135	310	.5	135	68
Maize	.20	120	24	.12	120	14
Cassava	.90	19	17	1.35	19	26
Total			351			108

Estimates of production and income from foodcrops are presented in Table 3. These estimates compare with recorded net annual income per household from food crops in the BPS survey of R 289.000 for Repelita 2 settlers and R 116,00 for Repelita 3 settlers. The production parameters derived are therefore broadly consistent with income survey results.

As on upland sites, tidal settlers also earn income from livestock and estate crops. In the case of Repelita 2 settlers, average income from these sources amounts to R 78,000 or 21% of total farm income. For Repelita 3 settlers, estate and livestock income amounts to R 37,000 or 19% of total farm income. The BPS survey also reports significant income in Repelita 3 sites (R 36,000 per household) from "other agricultural" which includes fishing and forestry income. Presumably these settlers are driven to these activities because of unsatisfactory farm returns coupled with limited alternative economic opportunities. The survey reported no income from these sources for Repelita 2 settlers. Reported incomes by categories are presented in Table 4.

Table 4: ANNUAL FARM INCOME BY CATEGORIES - TIDAL SITES
(R '000 per household)

	Foodcrops	Estate	Livestock	Other	Total
Repelita 2 - income	289	36	42	00	367
percent	79	10	11	-	100
Repelita 3 - income	117	-	18	36	171
percent	68	-	11	21	100

Source: BPS Survey of Transmigrant Incomes.

These incomes compare with appraisal estimates of farm incomes in year 5 of settlement of R 400,000 to R 700,00 (1983 prices) (Second Swamp Reclamation Project SAR). On Repelita 2 sites, actual incomes are lower than forecast, but give some grounds for optimism that targets could be achieved. On Repelita 3 sites incomes are well below half of target and likely to remain so until the pest problems are solved. Unlike the situation on upland sites, the more mature tidal settlements appear to be performing better than those more recently settled. However, it is thought that this is due to the pest problems in the new settlements which are more related to settlement layout and other factors than to the age of the settlement. Nevertheless, the results provide no support for the hypothesis that tidal foodcrop productivity will decline over time.

Estate Crop Sites

Transmigrants on sites designated for tree crop development establish their tree crop areas under the supervision of Project Management Units (PMUs) or as part of a Nucleus Estate and Smallholder (NES) development. Credit is ~~readily~~ available (including credit for part of the settler's labor input), input supplies are assured and the necessary technical expertise is

built into the NES and PMU structures. This level of support services guarantees that in most cases crop development will proceed roughly as planned and be technically correct.

Incomes of estate crop settlements as recorded in the BPS survey are presented in Table 5. These indicate that sites which were settled in Repelita 2 and are based on estate crops have by far the highest net farm incomes of any transmigrant group. Incomes of these settlers should increase further as most of their trees would not yet have reached peak bearing age. ~~On the other hand,~~ Repelita 3 estate settlers recorded the lowest net farm incomes of any group~~,~~ ~~Estate income was zero,~~ because trees are not yet in production, ~~but~~ and food crop production ~~was also~~ is the lowest of any category. This is probably explained by the high level of wage income (about double that of any other category) which presumably stemmed from their work developing the block plantings which they will eventually take over, and a lack of incentive to grow food crops, when food can be purchased for cash.

Table 5: ANNUAL FARM INCOME ON ESTATE SITES

	Foodcrops	Estate	Livestock	Other	Total
Repelita 2 R '000	144	376	11	8	539
%	27	70	2	1	100
Repelita 3 R '000	101	0	4	17	122
%	83	0	4	14	100

Source: BPS Survey of Transmigrant Incomes.

Income from livestock, forestry and fishing is relatively unimportant on estate sites. The high level of foodcrop production on Repelita 2 sites is surprising. In fact it exceeds that on the specialist foodcrop farms established in Repelita 2. This suggests a strong desire to continue to

produce most basic food requirements, even when attractive alternative activities exist.

Meeting Subsistence Needs

The Transmigration Program involves moving people with generally very low incomes to areas in which there is greater scope for them to engage in agricultural production. It is therefore of some interest whether transmigrants are able to meet their subsistence food needs in their new homes; if so, the settlement is in a sense viable; if not it is unlikely that settlers will stay.

Estimates of the requirements of basic foodstuffs vary, but an allowance of 1,000 kg milled rice equivalent would be regarded by most as generous for a typical transmigrant family of five. Production of basic foodstuffs in different transmigration situations relative to this target is assessed below in Table 11. The various products were converted to milled rice equivalent using the following factors: padi - 60%; maize (dry grain) - 100%; cassava (wet root) - 30%; and peanuts - 11%.

Table 11: FOOD PRODUCTION (MILLED RICE EQUIVALENT) BY CATEGORY OF TRANSMIGRATION SITE (Kg)

	Upland low input	Tidal with pest	Tidal with pest control	Estates /a
Rice	428	300	1,374	310
Maize	154	120	200	111
Cassava	542	405	270	392
Peanuts	51	-	-	37
Total	1,175	825	1,774	850

/a Average of Repelita 2 and Repelita 3 sites.

With the exception of the better tidal sites, farmers on average would only be marginally producing enough food and in the case of the Repelita 3 tidal sites there appears to be a shortfall. These figures relate to average production; given the variability between sites and farmers, many farmers would be producing quantities far less than household subsistence requirements. Also of importance is the fact that half the basic food requirements are being met from cassava. As the preferred food is rice, this would appear to be ~~decidedly~~ a second-best situation as far as the settlers are concerned.

~~However~~, Reliance on cassava is a likely result when subsistence production is under pressure, due to the superiority of cassava as a means of producing carbohydrates. ~~food~~. This is demonstrated by the data presented in Table 12. Although it is not the preferred food, basic food requirements can be met with cassava using only about one third the resources required to produce equivalent quantities of cereals.

Table 12: RESOURCES REQUIRED TO PRODUCE 1,000 KG MILLED PRICE EQUIVALENT

	------Upland Site-------			----Tidal Sites /a ----		
	Rice	Maize	Cassava	Rice	Maize	Cassava
Land (ha)	2.22	2.00	0.74	3.33	2.50	0.74
Labor (man-days)	266	180	67	400	200	67
Financial cash inputs	33	34	8	23	17	10

/a Lower productivity situations used both for upland and tidal sites.

While it appears that many transmigrant households are not producing their subsistence food requirements, that does not necessarily mean that they cannot. Even at the low levels of productivity being achieved, about .75 ha of cassava, requiring about 70 man days labor input would produce basic household requirements. ~~The major~~ one reason some farmers are not producing subsistence requirements is that they prefer to work off the farm. This reduces both their necessity and ability to produce food; they can use wage income to buy food to supplement subsistence production and in any case the off-farm work reduces the time available for agricultural production. The relative efficiency of off-farm and farm work as a means of acquiring food is illustrated in Table 13. This shows that where off farm work is available at R 1,500 per day, it represents the most labor-efficient means of feeding the household, other than in the case of growing cassava.

Table 13: NUMBER OF MAN DAYS REQUIRED TO ACQUIRE 1,000 KG MILLED RICE EQUIVALENT

Commodity Bought	Off-farm Work (at R 1,500 per day) Price (Rp/kg) — rice equivalent	Kg/day	Days per 1,000 kg	Production Man-days/ 1,000 kg
Rice	320	4.69	213	266
Maize	220	6.82	147	180
Cassava	150	10.00	100	67

Sponsored Versus Spontaneous

Data on the performance of spontaneous as opposed to sponsored transmigrants are scarce, though the question of their relative performance is important in formulating transmigration policy. A small sample (152 out 2,195) of spontaneous transmigrants was included in the BPS survey of transmigrant incomes. This found average total income of spontaneous transmigrants to be marginally (4%) above that of sponsored transmigrants. Farm incomes of spontaneous transmigrants were, however, 25% lower than those of sponsored. This is not surprising since spontaneous transmigrants receive no assistance in acquiring land and are likely to have limited access to it.

Collier[1/], on the other hand, found that spontaneous settlers in tidal areas had rice yields about 20% higher than sponsored and generally cultivated larger areas. The spontaneous settlers in this case were Buginese, who were the pioneers in developing swamp reclamation technology. This result is again to be expected.

1/ Collier, William L. "Social and Economic Aspects of Tidal Swamp Land Development" Paper presented to the Symposium on Tidal Swamp Land Development Aspects, February 5 to 10, 1979, Palembang, Indonesia.

In general,

Spontaneous transmigrants could be expected to perform better than sponsored for a number of reasons. First, they can choose their destinations and would presumably choose to go to areas of relatively good economic potential, whereas sponsored transmigrants have no choice. Second, the fact that they use their own resources would encourage a greater commitment to making a success of the move; if they return to their area of origin, they personally have lost all the costs associated with the move and return. On the other hand, sponsored transmigrants receive free travel, housing and rations and this must inevitably attract a proportion of people who have no intention of seriously attempting agricultural or any other form of production. Third, the fact that spontaneous transmigrants have enough money to transmigrate without official assistance implies that they would also have some working capital to help them get started in economic activities on arrival. For the same reasons it might be argued that the opportunity cost of labor of spontaneous transmigrants would be higher than that of their sponsored colleagues.

The main difference between spontaneous and sponsored transmigration is in relation to the use of GOI funds; the spontaneous move at no direct cost to the GOI whereas the GOI meets all costs of movement and establishment of the sponsored. If the same standards of settlement were applied to both spontaneous and sponsored, there would be no difference in their economic costs. However, it is also likely that the total cost of spontaneous movement is less. They frequently live initially with relatives or friends, thereby avoiding or postponing the cost of housing and they usually have no land on arrival thereby avoiding the cost of land acquisition, titling and clearing. Unfortunately, there are no data upon which to base quantification of these

cost differences. However, on this basis, it seems likely that spontaneous transmigration would produce higher rates of return on investment than sponsored. It is certain that greater reliance on spontaneous movement would produce budgetary savings to the GOI.

Cost Recovery

The scope for cost recovery depends on the level of settler incomes relative to basic subsistence requirements. Cost recovery strategy in the Transmigration Program closely follows this principle. All settlers will eventually have to pay IPEDA (land tax) which is estimated to amount at about R 9,000 per ha per year at full production. This, however, potentially returns only a negligible proportion of the total cost of settlement and this is the only avenue of cost recovery from food crop-based settlements. The low level of cost recovery has been recognized in SARs and explained in the case of the Trans II SAR by "the inherent risk and hardship associated with the project". However, it was envisaged that higher rates of recovery would be associated with the development of the balance of the settler's land (with tree crops), development which in the vast majority of cases has not occurred.

Cost recovery for tree crop development occurs through financing farm development by BRI credit and by taxes on production. In the case of smallholder rubber development, recovery is estimated at 48% of costs (discounted at 10% per year) and in the case of coconuts (Trans IV) 55-61%. Recipients of cattle under the smallholder cattle development project repay in kink by returning two calves for each cow received. This is estimated to amount to 25-31% cost recovery.

The scope for increasing the rate of cost recovery from food crop settlements is limited by the low incomes earned by those settlers. Better

cost recovery overall is likely to be possible only by more widespread second phase development mainly based on tree crops.

Farm Size

A variety of farm sizes have been used in transmigrant settlements, ranging from two to five ha. Typically, on upland sites, one to two ha have been allocated for foodcrop production and in some cases with a further two to three ha allocated for subsequent tree crop development. Tidal sites have generally been based on allocation of 2 to 2.25 ha for foodcrop production.

In practice, upland foodcrop settlers are only cultivating about 1 ha of land on average and, for those without tree crops, this is the total area of land in use. The linear programming analysis carried out during the foodcrop sector review[2/] indicated that the optimum area of foodcrop cultivation per farm in upland areas was 1.35 ha. That study concluded that areas allocated for foodcrop production should not exceed 1.5 ha. The gross margins calculated in this review support these conclusions. Given the financial advantages of wage employment over foodcrop production, in areas where there are employment opportunities, areas allocated should be considerably less than 1.5 ha. The more promising development alternatives, apart from tree crops, for upland sites, i.e., fruit, vegetables and small livestock would not require larger areas of land, but require reasonable marketing prospects.

The gross margins analysis confirms the desirability of tree crop development on upland sites, a situation long recognized by planners. The allocation of land for tree crop development therefore has merit. However, if there is no way of providing the resources to develop these areas, the policy

---

2/ Indonesia: Policy Options and Strategies for Major Food Crops, IBRD Report No. 3686b-IND.

is questionable. Uncleared areas of land in settlement areas can harbor pests and cause additional problems for food producers. Since performance in developing tree crops in these areas has so far been poor, to achieve consistency there is a need for either a major increase in the tree crop development effort or a change in policy so as not to allocate land for tree crop development. If resources are to be made available for tree crop development, an area of 3.5 ha appears appropriate. A minor change in relation to rubber development could be considered. The area developed per settler is presently 2 ha, which is equivalent to 1.4 tapping tasks. Reduction of the area to 1.4 ha would enable 1 tapper to cover the whole area in one day, requiring three days work per week. This would leave time available for existing foodcrop production.

The situation on tidal sites ~~is similar~~ somewhat varies. Most settlers are cultivating 1 to 1.5 ha for food production and it is unlikely to be either possible, given labor constraints, or economically advantageous to expand this area. The current allocation of 2.0 - 2.25 ha therefore appears adequate and appropriate. The budget analysis presented above indicates large potential increases in income from coconut development on tidal sites. If it is intended to pursue this form of development, a farm size of 2.5 ha to 3 ha would be required to allow 2 ha for coconut plus an area for foodcrops.

One reason for erring on the side of generosity in land allocation is to provide scope for accommodating the children of settlers in the farm system as they grow up and enter the work force. However, in economic terms this can be expensive since benefits from land brought into production by the settler's children are delayed by ten years or more. More importantly, pest problems in both upland and tidal sites are being aggravated by the existence

of uncleared reserve land close to farming areas. This is a further reason for allocating only areas of land which can be brought into production within a reasonable time.

Settlement Layout

Settlements are organized in two basic layouts. Nuclear layouts involve housing settlers in a village, each household with an 0.25 ha houselot and agricultural land in the surrounding area, generally within 3 km of the village. Linear settlments have houses and houselots fronting roads, with foodcrop land adjoining the houselot running back from the road.

Table 14: FARM INCOME BY SETTLEMENT LAYOUT
(R '000 per household per year)

	Layout	Sample size	Food-crops	Estate	Live-stock	Other	Total farm income
Upland (sponsored)	Linear	413	152	47	34	5	238
	Nuclear	737	144	3	33	12	192
	Combination	82	362	63	42	94	561
Tidal (sponsored)	Linear	264	177	13	23	13	226
	Nuclear	236	94	2	20	56	172
	Combination	18	480	2	72	0	554

Source: BPS Survey of Transmigrant Incomes

Information on farm incomes for settlements with different layouts was collected during the BPS survey of transmigrant incomes and results are presented in Table 14. In both tidal and upland sites, "combination" settlements with some linear and some nuclear performed far better than either nuclear or linear sites. The reasons for this are unclear and the samples are small, so the result could be due to a few "combination" sites with particular

advantages such as being near towns or in an agronomically favored tidal area ~~being in the sample.~~

1. Otherwise, the linear sites have a modest 20% plus advantage over nuclear in terms of total farm income. In the tidal areas, linear sites enjoy a clear advantage for foodcrop production. The reason for this appears to be the difficulty of controlling rats and pigs when the foodcrop fields are distant from the house, as is the case in nuclear settlements. This is partially offset by higher "other" earnings on nuclear sites from fishing and forestry. In upland sites, the difference is largely due to higher estate crop earnings on linear sites. Foodcrop production is only marginally higher on linear sites.

2. Nuclear settlements are perceived to have advantages in being consistent with the Javanese preference for living in villages and involving lower costs of providing access roads. Against this, the separation of house and farm, which is a necessary part of nuclear layouts, causes problems for farm development and production. The advantages of extending "houselot-style" integrated fruit, vegetable and livestock production have been outlined above. Such extension is very difficult if the house is not adjacent to the rest of the farmland. The severe pest problems in nuclear tidal settlements have been referred to elsewhere and the solution will require, inter alia, a reorganization to something like a linear layout. It is considered that these factors outweight the advantages of nuclear layouts and that future settlements should be linear.

Summary

It is clear from the results that, if viewed as an agricultural development operation, the upland foodcrop models are extremely disappoint-

ing. Moreover, the results provide no grounds for optimism that performance will improve over time. Settlers have apparently recognized the shortcomings of foodcrop production in that environment and are diversifying into livestock and tree crops, without ~~any~~ assistance from GOI.

Results from tidal sites give some grounds for optimism that food-crop production can be viable in those areas. However, if pests are not adequately controlled, incomes are ~~unsatisfactorily~~ particularly low. The highest farm incomes are recorded by tree crop farmers, as they should be given the high level of support services provided to them. Unfortunately, limitations on the ability of the GOI to provide support services severely constrains the number of transmigrants who can participate in the tree crop program, despite the fact that most of the upland sites are technically suited to tree crop production.

~~Farm Economics~~ Farm Economics

In order to assess the production and income possibilities from agricultural enterprises, gross margins for the main crops and settlement situations are presented in Table 6. Crops considered are rice, maize, cassava, peanuts, rubber and coconuts. Situations considered are upland sites using high- and low-input technology and tidal areas with and without severe pest problems. Results are tabulated in economic prices (with labor opportunity costed at R 650 per day), financial farm gate prices (with labor costed at R 1,500 per day) and with produce valued at a home consumption price (in financial terms) as outlined in section __.

The upland low input parameters are those believed to represent those pertaining to typical transmigrant upland foodcrop sites. Results of most interest are:

Rice production is only worth about R 100,000 per ha gross at farm gate prices, or R 139,000 if rice is valued at the home consumption price. Net returns to labor are less than R 1,000 per day, except when the product is valued at home consumption prices.

Maize production is only worth R 60,000 per ha gross at farm gate prices, with returns to labor less than the opportunity cost of labor in all situations.

Cassava production produces attractive returns when valued at home consumption prices. However, the volume of production which can be valued at these prices is very limited. Economic returns exceed the economic opportunity cost of labor, by a small margin.

Groundnut production for sale yields returns to labor less than the financial opportunity cost. For home consumption, the return of R 1,742 per man day exceeds the financial cost of labor. Net economic returns are also attractive.

The upland high input parameters are those based on heavy use of fertilizer and other inputs as indicated by the results of research work. Such yields would be rare on transmigrant farms due to difficulties in acquiring the necessary inputs and maintaining the necessary standards of management. However, they give an indication of potential incomes if all constraints to input supply and management standards could be removed.

Rice production is valued at R 270,000 per ha at financial farm gate prices, rising to R 372,000 at home consumption prices. However, financial returns per man day are still less than the financial opportunity cost of labor, even when production is valued at home consumption prices.

Maize production is valued at R 180,000 per ha at financial farm gate prices, rising to R 330,000 at home consumption prices. Production for home consumption yields attractive returns to labor, but production for sale is unattractive in both financial and economic terms.

Cassava production at the high yield assumed is valued at R 255,000 per ha at financial farm gate prices. Returns to labor are marginal for production which is marketed and very attractive for consumption.

Groundnut production yields returns to labor of R 1,000 per man day at financial farm gate prices. In economic terms, and for home consumption, returns to labor are attractive.

Rubber production is valued at over R 500,000 per ha gross and over R 400,000 net in both economic and financial terms. Returns to labor exceed opportunity costs in both financial and economic terms.

In tidal sites, the major variable influencing productivity is the incidence of pests. Soils, providing deep peats and highly acid soils are avoided, are generally satisfactory for food crop production without heavy applications of fertilizer. The two situations considered are therefore representative of actual situations in these areas, the first where pests are very serious, the second where pests are under control and reasonable standards of production are maintained.

Somewhat surprisingly, both rice and maize produce returns less than the opportunity cost of labor in all situations. However, the return to labor in the "no pest" situation is R 1,287 per man day from production for home consumption, which could be regarded as marginal. Even a rice yield of 2 tons per ha would produce returns to man day of only around R 1,500 per man day. Cassava production is attractive for home consumption only, not for sale.

Coconut production for copra is attractive in both financial and economic terms, a conclusion corroborated by the tendency of Buginese tidal settlers to grow coconuts as the major long-term crop.

Current food crop recommendations are based on intercropping and relay cropping. Such systems have the potential to increase overall production by about 20% due mainly to more efficient utilization of sunlight. Some economies would also be possible in labor use and possibly in the use of other inputs. However, the recommended system is not used by the vast majority of farmers and there is little evidence available on production parameters applicable to actual farm situations. The costs and returns to an intercrop system are therefore not analyzed, but interpretation of the results is made on the basis that overall food crop productivity increases of the order of 20% could be achieved by intercropping.

Food Crops

The margins and returns shown in Table 6 indicate consistently bad economic and financial results from food crop production. Results from the higher-input strategy are better than those from the predominant low-input technology, but not dramatically so. However, several factors would in any case prevent widespread adoption of this techology in the short term throughout transmigration areas. These are:

(a) Input supply. Supply systems are not always able to achieve timely delivery of the existing, more modest input supply package to farmers.

(b) Credit/working capital. Changing to systems requiring intensive use of fertilizers and other chemicals greatly increases the cost of the input package and hence requirements for working capital. Linear programming analysis carried out as part of the 1983 sector review[2/] identified working capital as a major constraint to the adoption of high-technology production methods.

(c) Risk. There are high risks, both climatic and pests in food crop production which make farmers reluctant to incur high input costs associated with high-input strategies, and wisely so.

2/ Indonesia: Policy Options and Strategies for Major Food Crops. IBRD Report No. 3686b-IBRD April 4, 1983.

Production of groundnuts and cassava gives generally better returns than that of rice and maize, especially in the high-input model. However, cassava is bulky and highly perishable so that marketing it is impractical from most transmigrant sites. In practice, therefore, in many situations, attractive returns from cassava are available only for that required for home consumption which would be less than 0.1 ha in most cases. Groundnuts have relatively high-value per unit weight, so can be marketed economically from remote areas. However, good yields are dependent on the right soils and the crop is susceptible to disease. The high cost of inputs, a large proportion which is seed, for the high input model, is likely to deter most farmers from planting a large area.

Not unexpectedly, returns to production for home consumption are far higher than those from marketed produce. This finding is consistent with the apparent strategy of many farmers, especially on upland sites, to produce approximately the amount of food needed for household consumption.

The observed tendency of transmigrants to take off-farm wage employment rather than work on their farms is, on the basis of this analysis, entirely rational. It must therefore be expected that until commercially superior agricultural enterprises are available to farmers, they will prefer off-farm work whenever it is available.

Tree Crops

The economic returns of tree crops are spectacularly superior to those from food crops, a fact which has been recognized within the GOI and the Bank for some time. Moreover, the soils in transmigation sites are well-suited to tree crop production while food crop production entails risk of erosion and long-term decline in soil fertility. This analysis does not take

account of the fact that incomes from tree crops are delayed, while food crop returns are received within the year of planting, so the relative advantage of tree crop production is slightly overstated.

The rubber model analyzed is of a heavily-supported PMU-style development and it is certainly unfair to compare the economics of food and tree crops by way of this model and the low-input food crops model. However, the high-input food crop model is comparable and a comparison indicates both net and gross returns per ha about twice as high for rubber. The number of transmigrant settlers who produce rubber is constrained by the policy of insisting that high standards of management are maintained, which requires supervision by a PMU of NES organization. The capacity of these organizations to supervise new developments is in turn constrained by manpower and financial limitations.

The superiority of rubber over food crops in upland areas is so clear-cut that significant falls in the productivity of rubber could occur without tipping the balance in favor of food crops. There could be great benefits to upland transmigrants if a lower cost-lower productivity method of establishing rubber, requiring less supervision, could be developed so as to permit more transmigrants to take advantage of the commercial superiority of rubber. As an example of the type of program which might suit, the Smallholder Rubber Development I Project makes provision for partially assisting farmers who have small or isolated plantings of rubber. Assistance involves provision of planting materials and extension. Yields of 740 kg d.r.c. ha are predicted which would still produce far higher returns to land and labor than those obtainable from food crops.

The coconut model analyzed is based on moderate levels of management and productivity which could be maintained by transmigrants without the need for intensive support services. For comparison, a peak yield of 1.6 t/ha has been used, compared with yields of 3.9 t/ha for hybrids and 2.3 t/ha for talls in the Smallholder Coconut Development Project appraisal. Even at this level of yield, returns to both land and labor are vastly superior to any returns likely from food crops. They are also superior to those from PMU-style rubber, indicating the need to consider coconuts as well as rubber for any suitable upland sites.

Methods of establishing tree crops in a manner which avoided the constraints of the NES/PMU support system would need, at a minimum, to address two key questions:

(a) the need for good quality planting material - tree crops which remain in production for 30-50 years must be based on genetic material with good yield potential, and

(b) the long wait (about six years) until production commences - some means of providing an adequate family income during the tree crop immature period would need to be developed.

In relation to the question of planting material, it is likely that some officially-sponsored production and distribution system would be required. In relation to the question of income maintenance during the immature period, much of the requirement could be met by adding tree crops to existing food crop enterprises, with limited inter-cropping between rows of establishing trees. With sufficient supervision, credit could be considered.

Cattle

Cattle are being introduced onto upland food crop farms under a Bank-assisted project and it is likely that in the long run, most transmigrant farmers in these sites will have the opportunity to acquire a cow. To date there have been no official efforts to distribute cattle to farmers on tidal sites and opinion is divided as to whether they would be successful there. Some observers believe the environment would be inhospitable to the cattle themselves and that their hooves would damage the fragile soil structures there. Others maintain that cattle or buffaloes could ease labor constraints and permit more efficient farm development and operation. To date, however, the negative view has prevailed.

The introduction of cattle can have three types of benefits for farmers:

(a) the use of their draft power permits large savings of labor, especially in cultivation;

(b) the manure produced can be used to improve soil structure and fertility; and

(c) they produce, and reproduce, livestock and meat for sale.

The importance of these benefits has been assessed in relation to the Second Smallholder Cattle Development Project. This assessment projected that the introduction of a cow would permit more land to be cultivated, both for wet-season rice and dry season crops. The availability of manure would also

permit the maintenance or improvement of crop yields on upland soils, as compared with the declining yields in the "without-cow" case. After the required repayment of two calves to the project, farmers would earn around R 200,000 per year from the sale of cattle.

The rate of return to the project was estimated at 26% and, while it is too early to assess the final result, progress in implementation so far is good. It is expected that the introduction of cattle to transmigration farms will produce attractive economic returns to the country and attractive financial returns to participating farmers.

Integrated Small Livestock, Fruit and Vegetable Production

Settlers located close to urban centers or with a reliable, low-cost transport link to them have opportunities to produce and sell higher-value perishable items. Whether those opportunities are exploited depends on the entrepreneurial ability of settlers as well as location and land suitability. The number of farmers seriously engaging in the commercial production of perishable crops is not known. However, it would be safe to assume that respondents in the BPS survey of transmigrant incomes who reported abnormally high agricultural incomes would have earned them mainly from the sale of fruit and vegetables rather than from staple food crops.

The observation has been made in most transmigration loan SARs that returns from houselots are higher per ha than those from the production of staple foodcrops, though the data necessary to quantify these earnings have not been available. This observation is corroborated by the tendency of settlers where the farm layout permits to expand houselot-style production (with fruit trees and vegetables) beyond the 0.25 ha allocated.

Recently, work has begun within the Ministry of Agriculture on formulating integrated farm models incorporating the production of staple food crops, vegetables, fruit, other tree crops and livestock. This work indicates much higher potential returns than those from staple food crops, though such a production system requires reasonable market access. Bevan[3/] also proposes a farm model based on an area of 0.5 ha for staple food crop production with a further 0.5 ha planted to trees, with some food crop intercropping. This model was seen as having potential to avoid several of the serious problems inherent in the upland food crop model.

While there is no comprehensive information on the productivity of fruit and vegetable crops in transmigration areas, BPS collects information on production, areas and farm gate prices by Province. These statistics are analyzed in Table 7 to given an indication of potential income per ha.

3/ Bevan 1985 op. cit.

Table 7: YIELDS, PRICES AND INCOME PER HA FOR FRUIT AND VEGETABLE CROPS

	Average Yields /a		Farmgate prices /b	Gross income /c
	Sumatra	Indonesia	(Rp '000/ton)	Rp'000/ha
	(tons/ha)			
Fruit				
Avocadoes	4.7	2.6	544	2,557
Mangoes	4.4	6.2	750	3,300
Rambutan	3.8	3.4	573	2,177
Papaya	4.0	12.5	231	924
Bananas	7.2	11.3	275	1,980
Pineapple	12.6	5.5	214	2,696
Citrus	8.1	9.3	676	5,476
Vegetables				
Onions	6.1	4.4	889	5,423
Cabbage	12.3	12.9	224	2,755
Carrot	7.0	8.5	343	2,401
Chillies	2.4	1.9	1,000/d	2,400
Tomato	4.4	4.1	417	1,835
Cucumber	6.8	5.9	208	1,414
Eggplant	2.6	3.1	171	447

/a For 1984 from "Luas Panem Rata Rata Produksi Dan Produksi Tanaman Hortikultura 1984" Angka Semantara. Directorat Bina Program Tanaman Bangan. DGFCA.

/b Where available January-May 1985 average. Otherwise 1984 average. Source: BPS.

/c Price x Sumatra average yield.

/d No BPS price data available, mission field observation.

Collection of such statistics is difficult and some caution should be used in applying the results to transmigrant farm models. Two observations are relevant in this context. First, the recorded average yields are generally very low by commercial production standards. This could be due to incomplete harvesting or to difficulties in assessing areas in the mixed cropping situations in which these crops are mostly grown. Generally, however, fruit trees on transmigrant farms appear healthy and there is no reason to believe that their yield potential should be unusually low. Second,

the mission observed in transmigrant areas farm gate prices far lower than those reported, though these observations were in locations which would not be regarded as having ideal access to markets. While these effects would tend to offset each other, whether the net result would be to validate the estimates of gross income per ha is unclear.

Notwithstanding these reservations, it is clear that potential returns from fruit and vegetables are far higher than those from staple food crops in upland sites. Vegetables and fruit trees (at full maturity) are capable of producing returns of over Rp 2 million per ha per year.

In addition, both the Ministry of Agriculture and Bevan have identified opportunities for increasing incomes through additional livestock production. This is consistent with existing settler behavior and with the findings of the transmigrant incomes surveys which reported incomes from livestock well in excess of project estimates. The Ministry of Agriculture has estimated the effect on incomes of adding chickens and goats to the foodcrop farm model.

A farm model indicating how these activities might be integrated has been developed, based on the ideas of the Ministry and Bevan. Basic parameters are:

- land total area 1.05 ha including 0.05 ha house site, .5 ha foodcrop area and 0.5 ha fruit tree/vegetable area;

- livestock - 25 chickens plus two breeding goats;

- investment costs;

- tree establishment Rp 53,000 over two years;

- chickens 25 x Rp 15,000 = Rp 37,500;

- goats 2 x Rp 20,000 = Rp 40,000.

- labor requirements - maximum 470 man-days year 2, 400 man-days year 6 onward (200 each food crops and fruit);

- income- fruit - maximum of Rp 900,000 per year (Rp 1.8 million per ha) from year 6 onwards;

- vegetables (intercropped with fruit years 1-4), maximum Rp 300,000 years 2 and 3;

- livestock 700 eggs x Rp 80 = Rp 56,000 plus 25 chickens x Rp 1,500 = Rp 37,500 plus 2 goats x Rp 20,000 = Rp 40,000 for total Rp 133,500 per year at full production.

The situation at full production is summarized in Table 8 below. Returns are highly attractive, amounting to about Rp 1 million per ha per year and Rp 2,600 per man-day. However, opportunities for transmigrant farmers to engage in this type of farming will be limited to those sites with good access to markets.

Table 8: INTEGRATED FARM MODEL - ANNUAL COSTS AND RETURNS AT FULL PRODUCTION

Income	
Fruit	900
Livestock	133
Foodcrops	125
Total	1,158
Cash costs (Rp'000)	105
Net cash income (Rp'000)	1,053
Labor (man-days)	400
Net cash return per man-day	2,632

Prices

Pricing of many of the products from transmigrant farms is complicated by the facts that much of the food produced is consumed by the farm household and that prices for most of the traded items vary widely between sites according to access for markets.

Pricing of Outputs Consumed by the Farm Household

Because of the significance of subsistence consumption of food items, a departure has been made from the procedures normally followed in pricing them at farm gate trade prices. The rationale for the change is that farm gate prices understate the value to the household of food produced and consumed by the household. If the food was not produced on the farm, the household would need to get supplies from another source or buy food at retail prices. The pricing system used for home consumption items is:

Economic price	=	landed cost of imports
(for import parity items)	+	port handling, losses and transport to wholesaler
	+	freight to consuming areas
	+	cost of distribution to consumer
	-	processing and storage costs
	x	raw: final conversion factor
Financial price	=	retail price
	-	processing and storage costs
	x	raw: final conversion factor

For the purposes of analyzing the economic effects of the transmigration program, economic home consumption prices have been assessed on the basis of the cost of supplying food to consumers in the sending areas, rather than receiving areas. The rationale for this is that, in the absence of transmigration, food would have been supplied to these areas and economic prices should be assessed on this basis.

Differences between prices assessed on this basis and conventionally analyzed farmgate prices are significant. In the case of rice, the economic home consumption price is 45% higher than the economic farm gate price and 38% higher in financial terms.

This method is only used for quantities of food up to the levels normally consumed by a household, assumed in the case of transmigrant families to consist of five people. Household consumption varies to some extent according to preference and the availability of different foods. For the purposes of this analysis, the following amounts are taken as typical annual household subsistence consumption quantities:

	Amount (kg)	Milled rice equivalent
Rice (padi)	600	390
Maize (drygrain)	100	100
Cassava (wet root)	1,000	300
Total	100	918

In the economic and financial analyses, production of these items up to the levels listed is priced at home consumption prices. Derivations of home consumption prices, as well as conventional price analysis, is presented in Table 9.

Farmgate Prices. Prices of agricultural products, with the exception of rice, are not subject to intervention and are determined by local market forces. Rice prices are supported by the Bulog buying price of the Rp 175/kg for dry, clean padi. In practice, however, farmers cannot always take full advantage of that support price due to lack of direct access to Bulog buying centers. It is also reported that much of the padi traded contains excess moisture and foreign matter which causes discounting from the official price for dry, clean padi. For example in 1984, the average price paid by Bulog was Rp 138 per kg for padi with average moisture content of 22 and 8% impurities, which would yield only about 50-55% milled rice.

The recent change of status for Indonesia from a deficit to a surplus rice producer has apparently also resulted in reduced buying pressure which is being reflected in local market prices. As a result, farmgate prices are far lower than the Bulog buying prices. Prices as low as Rp 100 per kg are being reported. A price of Rp 135 per kg has been used for the financial

analysis. This price is consistent with padi quality which would result in a milled rice yield of about 60%. Economic farmgate prices have been calculated in the conventional manner, based on Thai export prices.

Prices of other agricultural products are also highly variable from place to place and over time. The Bureau of Statistics collects prices in different parts of the country and farmgate price statistics were also supplied to the mission by the Ministry of Agriculture. In addition, the mission recorded prices received by farmers in the transmigration sites visited. The results are presented in Table 10.

Table 10: FARMGATE PRICES (RP/kg)

	BPS (1984)		Min Agric.	
	Sth. Sum	Sth.Sul.	1985	Mission
Maize	183	126	170	120
Cassava	50	56	75	6-25
Peanuts	604	793	944	450

It is believed that the BPS and Ministry of Agriculture prices overestimate prices received by transmigrants since transmigration sites by the nature of the program, usually in locations with relatively poor access. The price of cassava is especially difficult to assess. At one end of the spectrum, cassava is nutritionally equivalent to about 30% of the same weight of milled rice and on that basis could be worth up to Rp 100/kg at the consumer level. In fact, BPS has recorded prices above that level. At the other end of the spectrum, in the more remote areas, cassava cannot be marketed at all and any not required for household consumption is not harvested. At the margin this has zero value. Given the general remoteness of transmigration

sites, it is considered that an appropriate weighted average price for cassava (including that grown but not harvested) would be nearer the lower than the upper end of the spectrum and a price of Rp 19/kg has been used.

Implementations for Future Programs

Returns to investment in the food crop farm models are very low. while in upland areas, settler welfare is being maintained by off-farm employment, opportunities for this are limited in some tidal areas and incomes are unsatisfactorily low. A continuation of present conditins must be expected to lead to high levels of desertion and ultimate failure of the scheme.

Proposals have been prepared for the rehabilitation of Karang Agung, one of the tidal sites most seriously affected by pests. This involves consolidation of landholdings and the area under cultivation, land clearing, erection of a barrier to stop pigs and rats gaining access to crops and strengthening farmer organization to engender more discipline in and coordination of cropping programs so as to reduce scope for continuous presence of peats in the cropping area. the rehabilitation program, which would relate to 9,000 ha of cropland and 4,500 transmigrant households, is estimated to cost US$6 million. If successful, it would result in productivity increases from the "with pest problems" situation outlined in section --- to the "with effective pest control" situation. If the rehabilitation is not successful and cost effective alternative methods of control cannot be devised, the future of tidal settlement based foodcrops should be questioned.

Upland foodcrop production has serious limitations and continued reliance on this type of development will restrict effectiveness of the program in producing economic and social benefits. Settlers will probably be

able to produce subsistence food requirements, though not entirely in the form of the preferred rice staple, but there will be little produce marketing. the lack of marketed produce would result in negligible secondary benefits of settlement to the reginal economy. Incomes would not only ensure a continuation of existing low levels of cost recovery, but would make it difficult for settlers to contribute to thecost of maintaining services and infrastructure. Settlements would be a continuing drain on government funds, alternatively, services might not be maintained and settler welfare would suffer.

Improvements in farm incomes, capacity for cost recovery and secondary regional economic benefits might be achieved by the introduction of estate crops or an integrated fruit-vegetable-livestock farming system. The GOI is devoting a lot of resources to estate crop development, but at the likely rate of progress the program will only be able to assist about --% of transmigrants. The constraint is exacerbated by the existing policy only to encourage planting at a high standard under close government supervision.

Budget analysis indicates tha even at lower standards of productivity returns to tree crops are still clearly superior to those from food crops. This applies particularly to coconuts which, provided growing conditions are reasonable, are fairly tolerant of poor management. It is therefore concluded that the tree crop development program should provide for a low-cost form of development which might include the provision of good quality planting material, initial doses of fertilizer and assistance with land clearing where relevant. If these resources were provided, possibly on credit, it is believed many more transmigrants would plant trees and thereby diversify away from foodcrop in production.

Opportunities for higher incomes from integrated crop and livestock farming have also been identified. Some of the enterprises would only be suited to sites close to urban markets, but others, including goats, would not need such fast or low-cost access to markets. It is believed that the scope for this type of development is very limited in relation to the overall Transmigration Program and indeed that the most suitable sites would have been developed already. Programs are already in place to distribute cattle to transmigrants, but no comparable programs exist for small ruminants and poultry. Returns to small livestock are high where markets exist, but even in isolated areas, the addition of goats and chickens could significantly improve subsistence living standards. It is suggested that the need for a program to help transmigrants acquire small livestock should be assessed and, if a need exists that a project should be prepared. It is noted that the Ministry of Transmigration has done some preparatory work on a goat distribution program.

Transmigration to date has been directed substantially to Sumatra, but in future there will be a much smaller flow to Sumtra and corresponding increase in flows to Kalimantan and West Irian. This has implications for the mize of transmigration activities. On Sumatra, settlers have had reasonable access to off-farm work and have been able to increase earnings by selling fruit, vegetables and livestock to urban markets. In this way they have been able to compensate for the shortcomings of upland food crop production. New settlers in more remote, less developed provinces of Kalimantan and Irian Jaya will have far fewer opportunities in these areas. For example, an assessment by the Directrate of Livestock of the potential for livestock development in Repelita 4, based on markets and production potential, found that 68% of the potential was on Sumatra. Kalimantan had 16% of the potential, followed by

Sulawesi with 8% and Irian Jaya with less than 1%. There are less urban centers which need fruit and vegetables and it must be expected that off-farm work opportunities will be limited. In these areas, if settlers are not to be condemmed to the low incomes from foodcrop production, definite provision for tree crop development will need to be made in project planning.

With the cost per household of developing infrastructure and providing settlement services ranging from R 4.4 million to R 6.6 million for upland sites and around R 6.3 million for tidal, it is not surprising that the returns to agricultural production are low, generally between zero and 5%. However, since settlers do not repay development costs and some inputs are in any case subsidized, returns to the farm household can be attractive within this situation of poor overall returns.

Lembaga Ilmu Pengetahuan Indonesia - Indonesian Institute of Sciences

PUSAT DOKUMENTASI ILMIAH NASIONAL

NATIONAL SCIENTIFIC DOCUMENTATION CENTER

Alamat Telegram/Cable Address: PDIN
Telp. : 583465 (2 saluran); 583467; 510719; 511063
Telex: 45875 IA

Jl. Jenderal Gatot Subroto
P.O. Box 3065/Jkt.
Jakarta, Indonesia

No. : 3034/Perp/PDIN/85

Lampiran / Enclosure :

Surat Sdr. / Your ref. :

Perihal / Subject Matter : Acknowledgement of receipt

November 20, 1985

Dr. Gloria Davis
World Bank,
1818 H Street N.W.,
Washington, D.C.,
U.S.A.

Dear Dr. Gloria,

We have the pleasure to acknowledge receipt of three copies of your PhD dissertation entitled :

Parigi: A Social History of the Balinese Movement to Central Sulawesi, 1907 - 1974

which have been passed to us by Dr. A.J. Whitten, to whom we also give our thanks.

Your contribution is indeed a useful addition to our collection, thank you very much.

Yours Sincerely,
for the Director

Karyeti Karwenda (Miss)
Head, Acquisition Section

cc. : Dr. A.J. Whitten
Jl. Sangga Buana No. 2
Bogor

LB/hb.

Lembaga Ilmu Pengetahuan Indonesia - Indonesian Institute of Sciences

PUSAT DOKUMENTASI ILMIAH NASIONAL

NATIONAL SCIENTIFIC DOCUMENTATION CENTER

Alamat Telegram/Cable Address: PDIN
Telp. : 583465 (2 saluran); 583467; 510719; 511063
Telex: 45875 IA

Jl. Jenderal Gatot Subroto
P.O. Box 3065/Jkt.
Jakarta, Indonesia

T20
7

25

No. : 3034/Perp/PDIN/85

E624

Dr. Gloria Davis
World Bank,
1818 H Street N.W.,
Washington, D.C.,
U.S.A

FACSIMILE TRANSMITTAL FORM

Data : November 20, 1985

No. of Pages : 1

From : G. B. Fox, RSI Jakarta

To : Ms. Gloria Davis, AEPA4 (Washington DC)
Copy to AEAIN & Asia Files

Fax No. : F/2433

Subject : Transmigration Tree Crops

Delighted to receive your fax! Yes, we will do the tree crop models for you, but you will need to wait a week. I think we have a real prob' using the Bank's latest commodity projections. They will probably blow the models apart. Ugh! Imagine all the meetings that will then follow. Since Colin in field doing NES VI, Dennis off to Washington and me away for next ten days on NES II and NES Sugar, we will get Philip to run models through on the diskettes we kept from TCSR. He is here working for Dennis, so it is opportune.

Best wishes,

Geoff

File: Trans
GFox/lk

UNITED NATIONS
DEVELOPMENT PROGRAMME

Soedarto M.

NATIONAL EXPERT

INS / 80/006 Coordination of Technical Cooperation Activities for Transmigration

Office Address :
DEPARTEMEN TRANSMIGRASI
Jl. H. Agus Salim 58
Jakarta Pusat
Phone : 347013 (DL) or
375709 Ext. 23
Telex : 45123 TRANS IA

Residence :
G, 34 Kompleks Kejaksaan Agung
Jl, Ragunan Pasar Minggu
Jakarta Selatan

CATATAN PENGANTAR

Kepada : Miss Gloria Davis

- [ ] mohon persetujuan
- [ ] mohon tanda tangan
- [ ] mohon instruksi / petunjuk selanjutnya
- [ ] mohon saran / komentar
- [x] untuk informasi bapak / sdr.
- [ ] sesuai instruksi bapak / sdr.
- [ ] sesuai pembicaraan sebelumnya

- [ ] mohon segera dilaksanakan
- [ ] mohon bantuannya
- [ ] mohon dicatat lalu kembalikan
- [ ] mohon disimpan dalam file
- [ ] mohon konsep jawaban
- [ ] mohon jawaban segera
- [ ] mohon bicarakan dengan saya

Nota :

Dari : Sudarto M.

Tanggal : 22/11-84

SPONTANEOUS TRANSMIGRATION

INCORPORATED WITH W.F.P.

PROJECT - 1985/'86 - 1986/'87 - 1987/'88

B A C K G R O U N D

WFP assistance has also been requested on a pilot basis for 5,000 transmigrants who will move into five settlements areas in three provinces viz South Kalimantan, South Sumatera and Riau on their own accord. These transmigrants are termed "Spontaneous transmigrants" and the number of families who had moved to the outer islands during Repelita III numbered 154,560.

Spontaneous transmigrants can be classified into two types:

(1) Partially assisted

(11) Not assisted

The majority of transmigrants are in the second category.

Basically there is no difference between those who are fully assisted by the government viz fully sponsored migrants and spontaneous migrants. Category I transmigrants fulfil all the criteria for selection but are generally not prepared to wait the long process that of necessity must take to move those selected to allotsment to settlements schemes. One or more forms of assistance are provided by the central or provincial government or voluntary organizations to this category of transmigrants varying from province to province, volag to volag viz transport from village to settlement site, food supply to a limited period generally about 3 months and timber for house construction. Land is allocated to them within the settlement scheme whcih is in no way, inferior to the land allocated to fully sponsored transmigrants and they share with the latter the infrastructure provided and technical guidance given.

In the case of category II, they too fulfil all the criteria for selection but due to the fact that government's resources are limitted cannot be assisted. Unlike category I these transmigrants have relatives already established in settlement schemes in the majority of cases whom they join until land is allocated to them.

The difference therefore between the assistance given to guided transmigrants and spontaneous transmigrants is that in teh case of the latter the homestead is not cleared nor is the house constructed whilst the first hectare of land has also to be cleared by them.

WFP assistance has been requested for the clearance of the first hectare and for house construction whilst in respect of the clearanceand development of the second agricultural allotment and communal works, the same assistance as for fully sponsored transmigrants is requested from WFP. Details of the latter work will be the same as for normal transmigrants but for clearing the homelot 100 mandays, 300 mandays for the first hectare. 250 mandays for the second hectare (for tidal lands 300 mandays) and 50 mandays for house constructions have been requested. During the first 18 to 24 months in particular when nil to minimal returs wil be received from the first hectare WFP food will provide most useful. In addition since the land will be cleared utilising manual methods, unlike the landcleared for normal transmigrants, it may be a better means preserving the top soil. An FAO consultant in a report on "Land Clearing for transmigration in the outer islands of Indonesia" has stated taht not only is there a waste of commercial timber with the present mechanised clearing methods employed by contractors but bare soil is exposed ti high density rainfall and where plan cover has not been established serious damage arises. He reported that manual methods are the only effective and safe way of preservation of the top soil.

In brief, in cases where regional government with or without the help of voluntary agencies undertake.

(1) To transport a migrant the family from their village to a main transit camp (Transito) where guidance is provided, from transito to debarcation transit camp and from there the settlement site.

(11) To provide themigrant with seed packages for his home allotment.

(111) To provide food for the mogrants family up to the time of his being placed in possesion of his allotment.

The central government would provide timber for house construction and all the facilities accorded to fully sponsored migrants except that it would not clear the first hectare or the homeplot or construct the migrant's house. For these three items WFP assistance is requested. In addition spontaneous transmigrants will also participate in communal activities for which 100 family rations are requestedunder an umbrella type of assistance pending the working out of details.

Financial requirement for the project to be met by the Government:

A. Non-Food Cost

1. Capital Costs.

i.	Construction of storage facilities (main warehouses and godowns)	US $ 2,000,000,-
ii.	Office and warehouse equipment	US $ 1,500,000,-

2. Operating Cost

i.	Training cost	US $ 30,000,-
ii.	Monitoring and evaluation	US $ 750,000,-
iii.	Development Cost (land clearing equipment, seedlings, and other materials)	US $ 7,550,000,-

B. Cost of food assistance

i.	Staff for food assistance	US $ 1,250,000,-
ii.	Unloading and clearance	US $ 1,800,000,-
iii.	Cost of transport of WFP food from the port to distribution points	US $ 15,000,000,-
iV.	Cost of adequate storage (incl. warehouse hygienes, disinfection, fumigation, and/or reconditioning of commodities)	US $ 120,000,-
	Total	US $ 30,000,000,-

B. FOREIGN ASSISTANCE EXPECTED TO SUPPORT THE TRANSMIGRATION PROGRAMME FOR FIRST YEAR OF REPELITA

No.	Title of project	Donor	Project Cost US $
1.	Technical Assistance to Develop the Planning and Implementation of Transmigration Programme	GOI/UNDP GOI/UNDP	3,000,000,- UNDP 10,197,220,- GOI
2.	Strengthening the Communication and Information System for the Transmigration Programme, Indonesia	JICA	9,700,000,-
3.	Transmigration V	World Bank	200,000,000,-
4.	Transmigration VI	World Bank	Cost will be computed by coming appraisal mission
5.	Swamp Reclamation Project II	World Bank	64,500,000,-
6.	Technical Assistance	ADB	350,000,000,-
7.	ADB Project II	ADB	
8.	Sebulusalam and Merauke settlement projects	USAID	200,000,-
9.	Seed multiplication for "Lampung Center"	France	Estimated cost not yet known.
10.	Study site preparation, settlement development of fisherman transmigration in the eastern part of Indonesia	Denmark	Estimated cost not yet known.
11.	Cattle development programme for second stage development	Italy	2,300,000,-
12.	Technical Assistance for National Center for Transmigration Development at Lampung Province, Sumatra	TCP/FAO	240,000,-

A. FOREIGN ASSISTANCE ALREADY INVOLVED

No.	Title of Project	Donor	Project Cost US $
1.	Transmigration Project I New Settlement Project inBaturaja, South Sumatera and Second Stage development project in North Lampung (completed)	IBRD	30,000,000,-
2.	Transmigration Project II New Settlement of about 30.000 families Jambi and South Sumatera	IBRD	157,000,000,-
3.	Transmigration Project III site selectionfor new settlement in the whole Indonesia, and extension of Trans. Project I.	IBRD	101,000,000,-
4.	Transmigration Project IV New Settlement Project in East Kalimantan	IBRD	63,000,000,-
5.	Swamp Reclamation I New Settlement Project at Karang Agung, South Sumatra.	IBRD	22,000,000,-
6.	Regional Development Project of Luwu, South Sulawesi (completed).	USAID	15,000,000,-
7.	New Settlement and Regional Development Project at Bengkulu (completed)	Netherland	13,700,000,-
8.	New Settlement and Irrigation Project of ADB I/SESTAD at South East Sulawesi	A D B	44,300,000,-
		T o t a l:	446,000,000,-

DISCRIPTION OF PROJECT

I. Model of the project : Pilot Project.

II. Number of settlers : 5,000 K.K.

III. Duration of the project : 3 years.

IV. L o c a t i o n :

1. Province of South KAlimantan:
   Kintap - Sebamban/
   District of Kotabaru and
   Kabupaten Tanah Laut.

2. Province of Riau:
   Kemang and Buluh Nipis
   District of Kampar

3. Province of South Sumatera:
   Jayaloka and Kelingi
   District of Ogan Komering Ulu (OKU).

V. T a r g e t :

1. Province of South KAlimantan : 2,000 K.K.
2. Province of Riau : 2,000 K.K.
3. Province of South Sumatera : 1,000 K.K.

VI. Province of Origin :

1. East Java : South KAlimantan.
2. Central Java : - R i a u
   - South Sumatera
3. D.I. Yogyakarta : - R i a u
   - South Sumatera

VII. Sources of fund:

1. Government of Indonesia/Department of Transmigration.
2. United Nations/F.A.O. - World Food Programme.
3. Local Government of the Province of Origin.
4. Private Sectors/Foundations.
5. Transmigrants/Settlers.

VIII. Sharing of Responsibility.

1. Government of the Republic of Indonesia.

The Government of Indonesia (GOI)/
Department of Transmigration (DOT)
will provide the budget for:

1.1. Site preparation.
1.2. Planning and design.
1.3. Housing materials.
1.4. Public facilities.
1.5. Infrastructures.
1.6. Handling cost of W.F.P. food aid.
1.7. Information, registration and select in areas of origin.
1.8. Guidance and development.

2. Provincial Government from the Place of Origin of Transmigration Provincial Government will provide budget for:

2.1. Transportation from their village to main transit camp (embarcation transit camp).

2.2. Transportation from embarcation transit camp to debarcation transit camp.

2.3. Seed package for homelot.

3. .....

3. Private Sectors/Foundations participation.

3.1. The social/religious foundation concerned will provide transportation cost from debarcation transit camp to project site.

3.2. Providing food for transmigrant while waiting in the transit camp.

IX. Estimated man-days and number of food required.

1. Type of works:

1.1. Clearing of homelot (0.25 ha./K.K.).

1.2. Clearing of first hectare (1.00 ha./K.K.).

1.3. Housing construction.

2. Number of mandays required:

2.1.	Clearing of homelot (0.25 ha.)	: 100	mandays
2.2.	Clearing of first hectare (1.00 ha.)	: 300	mandays
2.3.	Housing construction	: 50	mandays
2.4.	Clearing of second lot	: 250	mandays
2.5.	Communal works	: 100	mandays.

3. Distribution of mandays:

1st year	: 300	mandays
2nd year	: 250	mandays
3rd year	: 150	mandays
T o t a l	: 700	mandays

4. Number of food required:

1st year: 300 X 5,000 X 2,425 gram = 3,637,500 kgs.
2nd year: 250 X 5,000 X 2,425 gram = 3,031,250 kgs.
3rd year: 150 X 5,000 X 2,425 gram = 1,818,750 kgs.

Total number of food required = 8,487,500 kgs.

X. .....

X. Estimated cost for placing 5,000 K.K. spontaneous transmigrants.

1. Handling cost for W.F.P. food aid (8,487,500 kgs.) X Rp 350,- = Rp 2.970.625.000,-
(including warehousing facilities, operating cost and management cost)

2. Materials for transmigrant housing:
5,000 X Rp 550.000,- = Rp 2.750.000.000,-

3. Public facilities (Project office, village hall, mosque/church, small post-office, etc.)
10 units X Rp 35.000.000,- = Rp 350.000.000,-

4. Planning and design of settlement scheme (10 units) = Rp 350.000.000,-

5. L a n d u s e :
10 X 2,000 ha. X Rp 7.000,- = Rp 140.000.000,-

6. Land measuring and certificate:
5,000 X 2 ha. X Rp 15.000,- = Rp 150.000.000,-

7. Road construction (not including access roads):

- Main road
10 X 12 km. X Rp 20.000.000,- = Rp 2.400.000.000,-

- Village road
10 X 14 km. X Rp 7.500.000,- = Rp 1.050.000.000,-

Rp 3.450.000.000,-

8. Seed fertilizers, pesticides, and sprayers, etc. (first year)
5,000 X Rp 125.000,- = Rp 625.000.000,-

9. .....

9. Agricultural tools (first year)
   5,000 X Rp 20.000,- = Rp 100.000.000,-

10. Health (medicines, tools, etc.)
    3 X 5,000 X Rp 15.000,- = Rp 225.000.000,-

11. E d u c a t i o n
    3 X 10 X Rp 120.000,- = Rp 3.600.000,-

12. School and Health Center building : (INPRES)

13. Transportation cost (for transmigrant) from area of origin to project site (x)

    13.1. Sea transportation
    (2,000 K.K./South Kalimantan)
    2,000 X Rp 350.000,- = Rp 700.000.000,-

    13.2. Land transportation
    (3,000 K.K./Sumatera)
    3,000 X Rp 115.000,- = Rp 345.000.000,-

    = Rp 1.045.000.000,-

14. Information, registration, selection and health
    5,000 X Rp 30.000,- = Rp 150.000.000,-

15. Food providing (xx)
    5,000 X Rp 15.000,- = Rp 75.000.000,-

Grand Total = Rp 13.084.225.000,-

R o u n d e d = US$ 13,084,225.-

NOTES:

(x) Responsibility of the Local Government and Private Sectors (Foundations concerned).

(xx) Responsibility of the Foundations concerned.

US $ 1 = Rp 1.000,-

3.7.1984.

GLORIA F/2472/1

RECEIVED

9

1985 NOV 26 AM 7:10

CABLE SECTION

FACSIMILE TRANSMITTAL FORM

Date : November 26, 1985

Number of Pages : 1 + Attachments = 40

From : RSI Jakarta (Geoffrey B. Fox)

To : World Bank, Washington (Gloria Davis, AEPA4)

Fax No. : F/ 2472

Subject : TREE CROPS TRANS

Attached is my draft of the tree crops chapter for the Transmigration Sector Review. I am sending it to you now so that you may have a chance to read it and see what you are up against so far as settlement on tree crops is concerned. If anything I believe my projections are optimistic. The draft incorporates comments from Rachmat, Badrun (Acting Head of Team Khusus), Soetardjo (PMU King), Notley and Klempin. The DGE reviewers fully support (unofficially) my assessment and are glad for their concerns to be raised in this forum. I expect to make changes to the economic and financial rates of return section once these are done, and there are a few other odd changes which I need to follow-up on when I return from NES II supervision Monday December 2. Once the final draft is completed about December 5 I shall pouch it to you and arrange for the word processing diskette to be hand carried so that you can use it for further changes. I should be glad for your comments sometime around December 2 when I return from the field. In case you are wondering as you read the draft, Philip's section in the last transmigration report on the economic impact of delayed planting after settlement, no longer applies. Circumstances have changed. Both he & Notley agree.

Hope all the rest is progressing well.

Best wishes,

Geoff

Geoff

File: Tree Crops

GBFox/mc

F/2472/2

TRANSMIGRATION AND TREE CROPS DEVELOPMENT

I. THE TREE CROPS SCHEMES

1. The orientation of the Repelitas I & II transmigration programs towards settlement based on continuous arable cropping broadened at the end of Repelita II to include tree crops when it became clear that tree crops are agronomically and economically better suited to the low fertility uplands of Central Sumatra and Kalimantan. In 1976 the Bank assisted Transmigration I project included a tree crop component to establish 7,100 ha of rubber apportioned one hectare per settler family. Under the Nucleus Estates and Smallholders III project two hectares of rubber were provided transmigrant families. Early results from these projects demonstrate the importance of tree crops for increasing smallholder incomes and for ecologically sound development of underutilized land.

2. The added benefit of tree crops development for increasing non-oil exports, satisfying the growing domestic demand for fats and oils and providing employment both on-farm and in related processing and manufacturing industries caused the Government in Repelita III to initiate an ambitious program for tree crop establishment. Some 540,000 ha of estate and smallholder rubber, oil palm and coconuts were planted or replanted during Repelita III. This was an impressive accomplishment. The Indonesian tree crop planting program has became the largest in the world.

3. The plantings during Repelita III were promoted through four major schemes: (i) the externally financed nucleus estates and smallholders (NES) projects using the Government owned estates (the PTPs) as the development agency to settle mainly local poor and landless, but also transmigrants; (ii) the Perkebunan Inti Rakyat (PIR) wholly Government-financed nucleus estates and smallholders schemes using the PTPs to settle either local farmers (PIR Lokal) or transmigrants (PIR Khusus); (iii) the Bank-supported Smallholder Rubber and Coconuts Development Projects (SRDP, SCDP) using project management units (PMUs) mainly to replant uneconomic smallholdings, but also to undertake new planting for local people; and (iv) the extensive Proyek Rehabilitasi dan Peremajaan Tanaman Ekspor (PRPTE) schemes fully financed by the GOI and implemented by small PMUs for replanting and new planting.

Planting achievements under Repelita III

4. The area planted under each of these schemes during Repelita III is summarised in Table 1. The NES programs for rubber, oil palm and coconuts realised about 95% of their Repelita III planting targets. The quality of establishment was of acceptable standard for 80% of the planted rubber, 90% for oil palm, and 70% for coconuts. Results for the PIR Khusus program were disappointing, only about 30% of the target smallholder rubber and oil palm areas being planted. The quality of establishment was substantially below that of the NES schemes.

Table 1: PLANNED AND ACTUAL PLANTINGS FOR ONGOING AND NEW SMALLHOLDER TREE CROPS DEVELOPMENT PROGRAMS REPELITAS III AND IV
(Hectares)

Planting Programs	Repelita III			Repelita IV							
	Planned (Ha)	Actual (Ha)	%	1984/85 Plan	1984/85 1/ Actual	%	1985/86 Plan	1986/87 Plan	1987/88 Plan	1988/89 Plan	TOTAL (1984/85 actual + plan 1985/86 - 1988/89)
RUBBER											
NES, Foreign aided	59,870	54,972	91.8	18,462	8,886	48	10,100	8,400	6,030	-	33,416
Transmigration III	-	-	-	1,000	1,000	100	1,000	-	-	-	2,000
PIR Khusus	61,100	17,875	29.2	30,486	3,680	12	36,400	30,000	9,000	6,000	85,080
PIR Lokal	7,000	4,725	67.5	2,275	-	0	4,000	2,000	-	-	6,000
Sub-total NES/PIR	127,970	77,572	60.6	52,223	13,566	26	51,500	40,400	15,030	6,000	126,496
SRDP I planting/replanting	28,100	26,400	93.9	9,280	4,772	51	5,815	16,750	20,500	20,000	67,837
PRPTE planting/replanting	150,982	78,257	51.8	-	-	-	23,293	2/	2/	2/	23,293
PIRSB (West Sumatra)	7,600	4,994	65.7	806	409	51	-	-	-	-	409
Sub-total PMU planting	186,682	109,651	58.7	10,086	518	51	29,108	16,750	20,500	20,000	91,539
Sub-total rehabilitation (PRPTE)	50,134	893	1.8	-	-	-	-	2/	2/	2/	
Total rubber	364,786	186,116	51.6	62,309	18,747	30	80,608	57,150	35,530	26,000	218,035
OIL PALM											
Ongoing Programs											
NES, Foreign aided	16,840	16,099	95.6	12,482	3,611	29	10,320	10,350	4,298	-	28,569
PIR Khusus	17,000	5,440	32.0	21,300	7,423	35	8,000	9,500	6,780	3,000	34,703
PIR Lokal	21,742	13,059	60.1	9,072	2,000	22	3,873	-	-	-	5,873
Sub-total	55,582	34,598	62.2	42,853	13,034	30	22,183	19,850	11,078	3,000	69,145
New Programs											
NES	-	-	-	-	-	-	-	8,750	6,050	5,600	20,400
PIR	-	-	-	-	-	-	500	8,000	26,500	35,000	70,000
PIR Akselerasi	-	-	-	-	-	-	-	14,500	22,000	23,500	60,000
PIR Swasta	-	-	-	-	-	-	-	28,500	74,000	108,500	211,000
Sub-total	-	-	-	-	-	-	500	59,750	128,550	172,600	361,400
Total Oil palm	55,582	34,598	62.2	42,853	13,034	30	22,683	79,600	139,628	175,600	430,545
COCONUTS 1/											
NES, Foreign aided	5,370	6,278	116.9	3,857	1,823	47	3,500	2,980	1,000	3,000	12,303
Transmigration IV	-	-	-	1,000	500	50	3,000	4,000	-	-	7,500
SCDP planting (hybrids)	33,399	17,693	53.0	8,100	4,768	59	11,240	-	-	-	16,008
PRPTE planting - hybrids	9,656	6,966	72.1	-	-	-	5,113	10,000 2/	15,000 2/	25,000 2/	55,113
PRPTE planting - talls	168,423	125,874	74.7	-	-	-	26,164	30,000 2/	35,000 2/	40,000 2/	131,164
PRPTE Rehabilitation	262,449	169,218	64.5	-	-	-	-	10,000 2/	15,000 2/	20,000 2/	45,000
Total coconuts	479,297	326,029	68.0	12,957	7,091	55	49,017	56,980	66,000	88,000	267,088
Total all crops	899,665	548,743	61.0	118,119	38,872		152,308	193,730	239,158	289,600	915,668

1/ Data provided by Team Khusus and the managers of each planting program, October 1985. The following programs in effect during Repelita III: SRDP rubber rehabilitation, SCDP cocount rehabilitation, SCDP planting of talls are not planned for continuation in Repelita IV.

2/ Bank projection rehabilitation and replanting are planned, but annual targets not finalised. 246,000 ha of PRPTE plantings for tall and hybrid cocount and 107,200 ha of PRPTE cocount rehabilitation are targeted for Repelita IV.

Table 1

The PIR Lokal rubber and oil palm programs realised about 60% of the Repelita III targets; quality, in general, was inferior to the PIR Khusus plantings. Of the PMU based schemes, SRDP and SCDP were most successful, an average of 72% of the targets for both schemes being achieved, and the quality of plantings only slightly below that of the NES schemes. By far the largest programs to plant rubber and coconuts during Repelita III were the PRPTE programs, some 79,000 ha of rubber (52% of target) and 133,000 ha (74% of target) reportedly being established. Surveys indicate that about 75% of the rubber and 66% of coconut plantings are of acceptable standard.

Settlement on tree crops smallholdings in Repelita III

5. A summary of settlement on tree crops smallholdings for the past five years commencing 1980/81, is provided in Table 2. Some 32,000 families were settled; 77% on rubber, 19% on oil palm and 4% on coconuts. About 35% of these families were transmigrants and the remainder local settlers many of whom had their roots in earlier transmigration. By Government design, transmigration comprised a greater proportion of settlement under the PIR Khusus program (71%) than in the NES schemes (16% transmigrants). The PIR Lokal program settled only 725 families, all of them from the surrounding local area.

Table 2: Settlement Recruitment under the tree crops programs
Actual for 1980/81 - 1984/85, planned for 1985/86 - 1986/87
(KK)

Schemes	Total Program Trans	Total Program Local	1980/81 Trans	1980/81 Loc	1981/82 Trans	1981/82 Loc	1982/83 Trans	1982/83 Loc	1983/84 Trans	1983/84 Loc	1984/85 Trans	1984/85 Loc	1980/81-1984/85 Cumulative Actual Trans	1980/81-1984/85 Cumulative Actual Loc	% Trans. of cumulative total	Program 1985/86 Trans+Local	Program 1986/87 Trans+Local
ES Rubber	17,762	22,188	-	675	416	4,054	-	4,169	475	2,277	2,446	1,835	3,337	13,010	20.4	6,250	5,900
ES Oil Palm	2,800	15,600	-	-	-	570	-	1,269	-	378	-	843	-	3,060	-	6,605	4,600
ES Coconuts	-	17,966	-	-	-	68	-	337	-	540	-	289	-	1,234	-	3,749	3,377
Subtotal	20,562	55,754	-	675	416	4,692	-	5,775	475	3,195	2,446	2,967	3,337	17,304	19.3	16,604	13,877
R Khusus rubber	49,800	18,075	-	-	2,274	747	2,609	945	324	400	614	111	5,821	2,203	72.5	7,925	6,708
oil palm	23,050	10,450	-	-	750	-	544	100	-	-	796	138	2,090	238	89.8	8,268	4,600
R Lokal rubber	-	6,500	-	-	-	-	-	-	-	-	-	-	-	-	-	658	-
R Lokal oil palm	-	11,825	-	-	-	-	-	-	-	-	-	725	-	725	-	1,981	-
Subtotal			-	-	3,024	747	3,153	1,045	324	400	1,410	974	7,911	3,166	71.4	18,832	11,308
TAL			-	675	3,440	5,439	3,153	6,820	799	3,595	3,856	3,941	11,248	20,470	35.5	35,436	25,185

tal settlement on rubber 1980/81 - 1984/85 : 24,371 (38% transmigrants)
tal planned settlements on rubber 1985/86 - 1986/87 : 27,441
tal settlement on oil palm 1980/81 - 1984/85 : 6,113 (34% transmigrants)
tal planned settlements on oil palm 1985/86 - 1986/87 : 26,054
tal settlement on coconuts 1980/81 - 1984/85 : 1,234 (0% transmigrants)
tal planned settlements on coconuts 1985/86 - 1986/87 : 7,126

17/4726

Table 2

II. CONSTRAINTS TO ACCELERATED TREE CROPS DEVELOPMENT

6. The rapid acceleration of the tree crops planting program during Repelita III and its continued growth in the first years of Repelita IV has given rise to a number of serious constraints on implementation capacity. This is scarcely surprising since such a large program has required the identification and evaluation of huge areas of land; the employment and training of thousands of new managers, administrators, technicians and farm leaders; the expansion and coordination of the activities of the dozen or so Government agencies that contribute to the program; and the allocation of much larger sums of money to the sector than ever before. A detailed examination of the implementation problems and their implications for successful implementation of the Repelita IV tree crops program was made in a recent Bank report on the Tree Crops Sector 1/. There are organizational, management, manpower and financial problems which constrain sustained growth of the tree crops program if reasonable quality of development is to be assured.

Institutional Problems

7. The rapid build up in the NES programs, and more recently, the increasing demands for the large and growing PIR programs have stretched the management, financial, and technical capacity of the PTPs to the

---

1/ IBRD Report No. 5318-IND Indonesia: The Major Tree Crops: A Sector Review April 15, 1985.

limit. This is clearly seen in the decline in the quality of plantings which started toward the end of Repelita III, and the marked reduction in estate investments for new plantings, maintenance and replanting. Estate manpower, management skills and finances have been diverted to facilitate implementation of the smallholder programs with the result that the PTPs' own development programs have suffered and their financial viability weakened.

8. The institutional support of the Directorate General of Estates, in particular its non-structural units, Team Khusus, SRDPU and SCDPU, has been stretched to the point that it can no longer be relied upon to implement the growing smallholder development program to the standards required for successful development. The disbandment of the Staf Bina Perusahaan Negara (SBPN) in the Department of Agriculture in 1983 which eliminated the direct supervisory role of Government and its ability to coordinate and act as controller of the PTPs, has further exacerbated the situation. Also, there is continued uncertainty over responsibility for various part of the tree crops program among senior officials in the Department of Agriculture. The reorganisation of the extension service which commenced in 1983 has resulted in temporary dislocation of tree crops extension to smallholder while the new service takes effect. Particularly affected have been the PMU based schemes, mainly PRPTE.

9. There is a need also for improved coordination between the Dit-Gen E and the Department of Transmigration. This is exemplified in the duplication of effort in the identification of land for settlement. Land rejected by the Department of Transmigration as being unsuited to settlement based on the food crop model has not normally been made available for NES/PIR tree crops settlement. It is estimated that there are some 1.2 million hectares of surveyed land rejected for food cropping which could be used for tree crop development. A further problem concerns the late arrival of transmigrants for settlement on tree crops smallholdings.
This is principally the result of poor coordination between provincial authorities, the Department of Transmigration and the PTPs.

10. There are a number of initiatives underway to overcome these institutional constraints, but progress understandably will be slow. Efforts are being made to clear the perceived ambiguities in the reponsibilities for the overall direction, coordination and implementation of the tree crop program through the issuance of a decree by the Minister of Agriculture. A review into ways to strengthen the internal organisation and management of the Dit-Gen E, in particular its non structural units, is almost complete and the first actions are expected at the commencement of the new government fiscal year in April 1986. Steps have been taken to improve coordination between the

Departments of Transmigration and Agriculture and to merge the transmigration program for tree crops with the NES/PIR program of the Dit-Gen E. A Presidential decree 1/ is in preparation which will detail the responsibilities for all government departments associated with the implementation of the NES/PIR programs.

Management and Development Planning

11. The emphasis of planning for tree crops development has been on program size, planting targets and location. Planning for implementation capacity and the strengthening of institutions, planning for manpower development, and financial and investment planning have generally received secondary consideration. The diverse number of agencies in the planning process, with the consequent problems of coordination, has also contributed to delays in implementation. Clear priorities are not defined between programs or projects with different development objectives. Priorities, for example, have not been set for PTPs planting tree crops for existing settlers, for new transmigrant settlement in PIR Khusus projects, or for PIR Khusus compared to PIR Lokal projects. Setting priorities for strengthening and expanding PMUs by geographic areas, crop development and target farmers has also been largely overlooked.

1/ Inpres tentang Pengembangan Perkebunan dengan Pola Perusahaan Inti Rakyat yang dikaitkan dengan Program Transmigrasi is expected to be issued December 1985.

12. The effectiveness of the agencies involved in planning for tree crops development, has also been eroded in the past when new instructions were given the Dit-Gen E and the PTPs to undertake additional and unscheduled projects. The introduction of the PIR Akselerasi program with an original objective to plant 500,000 ha of oil palm using 5 PTPs is such an example. Little or no consideration was given to the PTPs' implementation capacity, their commitments under existing projects, the rational siting of the PTPs in proposed PIR settlement areas or to the financial capacity of the PTPs to undertake the additional plantings. Later, the target was reduced to 300,000 ha, but even at this level the plan is overly ambitious within the timeframe.

Manpower Development

13. Mobilization of sufficient skilled manpower and management to implement the tree crops program has been, and remains, a formidable task for the Government. The demand for skilled manpower and training is much larger than the present system can handle. To establish one million hectares of tree crops (770,000 ha smallholders, 230,000 ha estate) which had been judged by the Bank to be feasible during Repelita IV, 1/ would require the training of about 23,000 incremental staff for PTPs and PMUs

---

1/ IBRD Report No. 5318-IND, April 1985.

in the management and supervisory grades, and a further 160,000 field and factory workers on the PTPs' nucleus estates. Also, the 385,000 new farmers would require training and extension in addition to the existing 200,000 farmers who received tree crops during Repelita III.

14. In Repelita III it was evident that there was a large shortfall in the number and training of staff to implement the program. Funding for training is not sufficiently specific, adequate or timely and in the past it has not been viewed in Government as a critical input to the sector. The placement of training in the Dit-Gen E is not well defined and there is heavy reliance on outside agencies to provide, long largely irrelevant formal training programs. To correct these problems Government intends to establish a manpower unit in the Dit-Gen E; to adapt the existing agencies concerned with manpower development and training to better serve current needs; and, to create simple, but effective training units in the PMUs and PTPs. A Bank-financed project in support of these initiatives is being prepared.

Financial Constraints

15. The cost of the 1.47 million ha GOI Repelita IV tree crops program is estimated to be US$ 4.3 billion in constant 1984 prices and US$ 5.6 billion in current terms. Smallholder programs would account for 57% and estate land development for 43% of these costs.

Continued depressed oil prices and projected low commodity prices for major export crops and timber products are likely, however, to reduce the availability of the Government development budget over the next several years. In Repelita III as in previous Repelitas, the GOI relied principally on budget sources to finance the predominant share of expenditures in the tree crop sector. In addition, the PTPs received loans from the State Banks, and SRDP and SCDP used BI/BRI/IBRD funds for credit expenditures with an interest subsidy from budget sources. The strains that these demands have placed on the Government budget over the past few years are indicated in the abnormally slow release of funds (for both resource and procedural reasons) for virtually all tree crops projects and programs. In 1984/85 the first budget drops for most programs did not occur until nine months into the financial year causing substantial slow down in the planting program and reduced maintenance. In 1985/86 there was a slight improvement, but still unsatisfactory situation, with budget drops being delayed about six months into the financial year.

16. To help overcome these problems, Government intends to move the funding of NES/PIR tree crops development from a general account No. 16 which includes the Dana Tanaman Ekspor, to account No. 18 specifically allocated to the Department of Agriculture. Funding for transmigration settlement under tree crops schemes will come from the Department of Transmigration budget commencing FY 86/87. A further measure being examined which will improve budget flows is reduction in the specificity of the line items in the approved budgets (the DIPPs) for projects. An additional improvement under examination

would be allowance of current unit costs to be charged against the unspent portions of the previous two years budgets - the SIAPs. Present requirements are for only the unit costs agreed at the time of DIPP approval to be funded under the SIAPs. Recently an exception was made for settler housing; current unit costs of Rp. 900,000 now being financed under the SIAPs instead of the Rp. 750,000 unit cost approved in the previous year(s) DIPP.

17. The challenge for the Government now is to finance as much of the program as possible from non-budgetary sources. To achieve this the borrowing capacity of the PTPs from banks will need to be improved principally through the conversion of existing Government debt to equity and the improved efficiency of existing operations. The need for the PTPs to borrow, often short term at high interest rates, to prefinance smallholder development costs should also be reduced or eliminated. Government is also trying to base smallholder financing on bank-mobilized funds rather than on Government funds distributed through banks. To encourage this the Government agreed to subsidize participating executing banks. Significant delays in the release of credit funds for smallholder development, particularly from BRI has, however, seriously constrained project implementation. In SRDP I only 55% of the DIPP approval for 1984/85 has been received to date and only 21% of that for the 1985/86 DIPP. Corresponding releases for SCDP I are 32% of the 1984/85 DIPP and 17% of the 1985/86 DIPP. No funds were made available for the PRPTE programs in 1985/86. The reasons for these delays is unclear and under review.

III. HARNESSING THE PRIVATE SECTOR FOR TREE CROPS DEVELOPMENT

18. With the dominance of the public sector estates in tree crops development during Repelita III, the private sector received relatively little encouragement. There are about 850 estate companies which have rubber as their main crop. Most of these plantations are fairly small and in need of rehabilitation. Private foreign estate companies constitute 21% of total rubber production. Of the 28 estates predominantly or exclusively planted to oil palm, 18 are privately owned occupying about 30% of the 362,000 ha of estate oil palm. Only 3% of the three million ha under coconuts is estate managed; the private estates contributing only 60,000 ha. Investors such as PT Indosawit, PT Astra and the Regunas and Berca groups have large pending investment decisions, mainly in oil palm. The demand for capital for rehabilitation and expansion of existing private estates is also very large.

19. In June 1985 the Minister of Agriculture issued a decree detailing development policy implementation procedures for a private sector nucleus estates and smallholders scheme for oil palm named PIR Swasta Kelapa Sawit. This decree was followed by two decrees from the Dit-Gen E which provided terms of reference for feasibility studies and the physical standards for field development. PIR Swasta Kelapa Sawit is the first major effort by Government to harness the managerial and financial resources of the private sector to increase tree crops production, promote area development and settle transmigrants. The Dit-Gen E target is for the private sector to plant about 360,000 ha and settle 180,000 families from 1984/85 to 1988/89. There were no

smallholder plantings in 1984/85 (Table 1) and it is unlikely that any significant plantings will occur before end 1986. The 30 private investors who have so far been accepted by Government for the scheme are in various stages of project identification and completion of feasibility studies. A further 75 private investors have indicated interest in the scheme and ten of these are likely to be accepted as participants. Investors are required to submit completed feasibility reports for Government review, and if approved, a decree allowing work to proceed will be issued by the Minister of Agriculture. The fairly long lead time before the first plantings commence seems to suit many of the private investors since it gives them time to persuade Government to remove some of the existing disincentives for participation in the scheme. The investors are required by Government to develop four hectares of smallholders land for each one hectare of nucleus estate developed and to finance all smallholder development costs until the smallholding is surrendered to the participating farmer in the fourth year and the investment repaid by a State Bank. The principal concerns of the investors are the 1:4 ratio of nucleus estate: smallholder development, the 16% interest rate for borrowed funds, and the possibility that conversion of the smallholder area will be delayed beyond the fourth year due to problems of land titling or tight liquidity of the state banks. Government has agreed that smallholder credit to repay investors should cover the basic costs of development, the cost of interest payments and a 15% overhead and management fee. About Rp 240 billion is being set aside in the Kredit Investasi Kecil (KIK) fund each year to repay investors at smallholder conversion to the state banks in the fourth year. The scheme has much potential and hopefully will earn the full support of the private sector.

20. There are a number of other constraints to private investment in the sector. Private estates confront investment decisions in an atmosphere of uncertain domestic market controls, particularly for palm oil. Also, title and mortgage constraints adversely affect financing options. Presidential Decree No. 23 of March 1980 provides that Hak Guna Usaha (HGU) or basic land title (right of exploitation) can only be held by an Indonesian legal entity and cannot be transferred to a foreign investor in joint venture companies. Attempts to circumvent this problem such as conveyance by the local partner of a Serah Pakai title, or "handover use" of the HGU to a joint venture company are ineffective. The final constraint concerns the Foreign Investment Law (Act No. 1 of 1967) which allows joint venture enterprises a life of 35 years with minimum equity participation of 20% held by Indonesians at the outset, with the possibility of extension for another 30 years. These provisions are not attractive to foreign sponsors since Indonesian ownership is stipulated to evolve to at least 51% within 10 years. Even if Government permits the 10 years to be considered from start of production rather than start of the project, precise timing of divestment within the period remains unclear. Profitability and cash flows in tree crop plantations are rarely positive prior to years 8-10 (which can be 3-6 years into production) with the result that the 10 year divestment policy is likely to be unattractive to most foreign investors.

IV. STRATEGIES AND OPTIONS FOR TREE CROPS DEVELOPMENT IN THE TRANSMIGRATION PROGRAM

21. The heterogeneity of the tree crops sector has necessitated the adoption of a multiplicity of development strategies employing different management systems to achieve diverse objectives. The complexity and plurality of these strategies makes planning to maximise tree crops development in support of the transmigration program over the next five years difficult. The experience gained during implementation of the tree crops programs over the past eight years, however, provides a number of useful observations on the weaknesses and strengths of the various programs. These are summarised below:

A. The NES and PIR Schemes

22. (a) Utilization of the public sector estates is best suited for extensive block planting of new areas and the provision of essential infrastructure in difficult areas which could not otherwise be developed for smallholders. The use of PTPs is not suited to the development of scattered smallholdings or to the replanting of existing smallholder areas as was tried, but with little success, in the Bank financed NES II project.

(b) The capacity for utilization of the nucleus estates in smallholder development is limited by the extent of the management, technical and financial strength of each PTP. Existing project commitments prior to the commencement of Repelita IV, particularly the addition of the large PIR programs, have absorbed virtually all this capacity.

(c) Although the PTPs have shown their ability to establish and maintain tree crops, they have performed less well as trainers for smallholders or as an advisory service to provide extension to smallholders.

(d) Estates which specialize in the growing of one particular tree crop have been found to be poor implementers of smallholder development schemes involving a different tree crop.

(e) The NES/PIR schemes have not been successful in establishing food crop areas to the extent planned for smallholders. The PTPs do not have the technical experience necessary to organize food cropping, and the responsible agency, the Directorate General of Food Crops (Dit-Gen FC), lacks sufficient qualified extension personnel to do the work. In an effort to correct the situation the Dir-Gen E and Dir-Gen FC in October 1984 issued a joint decree outlining a scheme for acceleration of food crop extension services to smallholders in the NES/PIR schemes. So far there has been little improvement.

(f) "New" settlement by smallholders in the NES/PIR schemes sometimes involves the costly provision of housing and infrastructure for people already living on or very close to the land to be developed. An issue arises whether settlement of local people is justified, using the costly NES system to provide housing and infrastructure, or whether these benefits should be restricted to transmigration settlement under NES or PIR projects, and the cheaper PMU programs used to settle local smallholders.

(g) In general, the preparation of PIR projects has been less rigorous than that of NES projects. PIR projects seem also to be more likely to receive inadequate budget allocations and have slower fund releases, poorer PTP management and technical supervision than NES projects. The effect has been poorer tree establishment and maintenance in PIR than in NES projects.

(h) Problems continue with the timing of smallholder entry into NES/PIR projects in relation to the labor requirements for land development, due mainly to the extensive use of contract clearing, and difficulties coordinating the development program of the estates with settler selection by the provincial government. The intention in NES/PIR projects is to use settlers to clear land, plant and maintain the tree crops over the entire development period and thereby provide them with maximum employment and training benefits. The critical problem is how to achieve these advantages without delaying implementation.

B. The PMU Schemes.

23. Experience gained implementing the SRDP, SCDP and PRPTE schemes, give rise to the following observations:

(a) PMU schemes are generally best suited to the development of new or existing scattered clusters of smallholdings either through replanting or new planting. Since there is considerable resistance by many smallholders to felling existing old and uneconomic stands of

rubber and coconuts for replanting, about 60 to 70% of the SRDP and SCDP programs have been for new planting mainly for local people. The success of these schemes planting new rubber and coconuts argues strongly for them to be accelerated and adopted to assist transmigration settlement in fairly small undeveloped areas of from about 300 to 1500 hectares. It is becoming increasingly difficult, particularly on Sumatra, Kalimantan and Sulawesi to find large contiguous areas of unoccupied, undeveloped land suited to block planting under the NES/PIR programs. The areas that are available are usually reserved for the planting of oil palm. There seems therefore to be a place for schemes which can develop small to medium sized pockets of land planting rubber and coconuts using PMUs instead of expensive nucleus estates as the development agency.

(b) The current SRDP and SCDP schemes, since they do not provide settler housing or infrastructure and require that at least 50% of the cost of labor be provided in "sweat equity", provide a substantially less costly (in cash terms) means for establishing tree crops than the NES schemes. The advantages to the GOI in long-term mobilization of capital for the sector are significant. If SRDP and SCDP are to be used to settle transmigrants, housing costs will have to be included in the schemes and preferably the full wage rate paid smallholders (instead of 50% at present) to assist them over the difficult years while their crops are maturing.

(c) The PMU schemes, in particular PRPTE have been seriously affected by slow release of budget and BRI funds. In the case of PRPTE the cause lies in the lack of agreement between BI, BRI and MinFin on the terms and conditions for financing the program. The reasons are less clear with the SRDP and SCDP projects. The effect of the shortage of funds is much more severe than for the NES/PIR projects, since the PMUs, unlike the PTPs, cannot prefinance development.

(d) The PRPTE programs have an important role assisting existing smallholders to replant and rehabilitate their tree crops. The need for these programs is increased as the current trend of the SRDP and SCDP progress toward new plantings continues. Neglect of the vast area of existing smallholders could give rise to social inequity between the 'fortunate' new settlers and their poorer local neighbours.

(e) The main determinant of the speed and success with which the PMU schemes for rubber and coconuts can be accelerated is the speed the existing PMUs can be rationalized and staffed with adequately trained personnel, operating under adequate supervision from the Dit-Gen E. This particularly applies to the PRPTE programs which have been poorly administered in the past.

C. Options for Settlement Design

24. The design of settlement layout for tree crops smallholdings has important consequences for settler productivity. In general terms, the closer the proximity of the farmer to his farmland the better the prospects are for good management of his crops and the control of pests and weeds. Two basic designs are followed in new settlement, nucleated and linear development. In the nucleated model, settlers are grouped in villages and are usually separated from their food crop and tree crop areas both of which are seldom contiguous. The advantages of this design are that there can be a greater economy of road network, utility and social services, better social/community cohesion and more concentrated block development. In the linear design settlers are scattered, their houselots usually continuing into their food crop and tree crop land. The advantage of this model lies eventually in the proximity of the farmer to this crops.

25. The choice of settlement design in large measure will depend on the outcome of detailed land suitability studies and the cultural preference of settlers for village or scattered development. In locations where the land is judged to be suitable for both food crops and tree crops development, other things being equal, it is preferable that settlement be based on the linear design. In general terms the likelihood of greater productivity will offset the added costs for this mode of settlement.

26. As much of the land reserved for food crops on tree crops smallholdings is not utilised, the question arises whether the design of the smallholding should be changed to reduce the food crops area. The present smallholding comprises 0.25 ha house and garden lot, 0.75 ha of food crops

land and 2.0 ha of tree crops. Generally only the house lot and 0.1 to 0.2 ha of the food crops land is utilised, the remaining areas continuing under scrub and lalang. The principal reason for under utilisation is that tree crops smallholdings are preferably located in areas judged to be unsuited for food crops production. There are two options for change in the design of the smallholding; (i) reduce the overall area from 3.0 ha to 2.5 ha; or (ii) consider the 0.5 ha of unutilised food crop land as a reserve for later development using tree crops or another cash crop. In view of the growing number of dependants on each smallholding resulting from spontaneous in-migration of relatives and from succeeding generations of the settler family, and the need to establish a visible smallholding particularly during periods of low farm gate prices, the option to keep reserve land is preferred.

27. The phasing of settler arrival with the development of the smallholding has important consequences for the efficiency and cost of settlement. Usually the NES/PIR schemes use new settlers as estate wage labor for land clearing, house and village infrastructure construction, and the planting and maintenance of estate and smallholder tree crops. In this manner the settlers receive wage income while waiting for their crops to mature, and training in most aspects of tree crops maintenance and production. If, as is anticipated in the forthcoming Presidential decree outlining the responsibilities of government departments for the NES/PIR programs (para 10), the Department of Transmigration is responsible for all works associated with the settlement of the transmigrants, and the Department of Agriculture for the establishment of the tree crops, the coordination of settler arrival with that for tree crops development becomes most important. The tree crops cannot be properly established and maintained at lowest possible costs without

transmigrant labor (particularly in the more isolated areas, and the transmigrant are much less likely to attain subsistence levels without estate employment. The experience in the Rimbobujang transmigration area in the NES III project argues strongly for the transmigrants to become full-time employees of the estate during establishment and maintenance to maturity. In this way the work force may be better disciplined and trained, with consequent improvement in the quality and timeliness of field operations.

D. The Low Input - Low Output Option for Tree Crops Development

28. A long debated issue concerning the best strategies for smallholder development is the potential for using less intensive, cheaper approaches for tree crops development than those which have been used in the past. There are two basic options: high or relatively high input-high output development models and low cost-low output models. Those who support the first approach argue that intensive assistance and support is necessary to ensure reasonable yields and farmer incomes, to provide for adequate cost recovery, and to enhance the economic rate of return. Those who argue for a more extensive approach believe that in Indonesia, where technical expertise, managerial skills and capital are in short supply, but labor and land are relatively plentiful, it is appropriate to design programs which may have lower benefits per family but will reach greater number of families at less cost per family.

29. The central issue is the minimum amount of financial and institutional support required for smallholders to assure their financial viability in the long term. One way often proposed to reduce input costs to the public sector is to supply smallholders with high yielding planting material, but no other inputs, and a minimum of technical advice. The argument is that even if the full potential of the material (to yield about four times the level of unselected material) is not realized, the benefit to the individual and to the economy will nevertheless be substantial. Preliminary experience with these low input schemes with rubber in Repelitas I and II indicates poor results and there appears to be a growing volume of evidence which suggests that some inputs in addition to improved planting material are needed if smallholder plantings are to achieve satisfactory levels. The recently commenced SRDP II project includes a component based on a low cost "partial approach" to smallholder rubber replanting, and it will be monitored closely to judge its success. Until new and contrary evidence comes to light, it would appear that Indonesia's present strategies involving medium to high inputs and outputs for rubber development (the NES/PIR, SRDP, and PRPTE programs) are probably more advantageous to the economy. The situation may not be so clear cut with 'partial' schemes for coconut development since coconut establishment and maintenance is not as demanding as that for rubber.

E. Development Cost Options

30. As one basis for selecting strategies for development, much is now known of the costs of development options. Field development costs are more expensive in the NES/PIR schemes than in PMUs. Rubber field establishment

under NES/PIR costs about US$ 1,950 which is respectively 20% and 35% higher than PRPTE or SRDP rubber development. NES hybrid coconut development is about 20% and 35% more expensive than the PRPTE and SCDP schemes. The most significant cost differential results from wage payments. PTPs in the NES/PIR schemes pay full market wage rates or estate salaried wages while the SRDP and SCDP schemes, since they were originally designed to assist existing smallholders, pay cost of living allowances equivalent to 50% of the financial wage rate. PRPTE schemes pay full wage rates. If the wage payment differential is adjusted in the SRDP/SCDP schemes to the NES levels, field establishment costs are about the same for all schemes. It has been the use of the schemes to meet varying objectives, e.g. new settlement with the full provision of infrastructure in NES/PIR schemes, that has resulted in the large differences in total costs of development. Adding the cost of housing, infrastructure and social services in the NES schemes raises the cost of settlement to US$ 3,300/ha for rubber and coconuts more than twice the total cost of development in the PMU-style schemes for the same crops. The field costs to establish rubber, oil palm or hybrid coconuts under NES type schemes or rubber and coconuts by SRDP or SCDP schemes are about equivalent.

V. ECONOMIC AND FINANCIAL VIABILITY OF TREE CROPS PRODUCTION

31. The economic rates return for selected schemes based on two hectares of tree crops per smallholding are given in Table 3.

F/2472/28

Table 3: ECONOMIC RATES OF RETURN FOR SELECTED SCHEMES

	NPV	ERRs %	
	Total Scheme a/ Rp Million	Total Scheme a/	Tree Crops only b/
Rubber			
NES	1.77	12.3	17.0
PIR	0.65	11.0	15.9
SRDP	1.59	13.6	15.0
PRPTE	0.00	10.0	10.8
Spontaneous	0.49	11.8	13.0
Oil Palm - NES	-0.41	9.4	14.3
Coconut			
Hybrids - NES/PIR	1.35	11.7	15.9
Hybrids - SCDP	2.25	14.7	15.3
Talls - SCDP	1.03	12.7	13.2

a/ Total scheme include roads, housing, buildings, health and education non-credit costs as applicable to project type. Net Present Values (NPV) are for 2 ha at 10% discount rate, and shown in Rp million in 1984 constant values.

b/ Exludes the infrastructure items.

Source: IBRD Report No. 5318-IND Indonesia: The Major Tree Crops: A Sector Review, April 15, 1985, page 83.

32. As would be expected, the economic rates of return for NES/PIR rubber and coconuts settlement, are lower than those for SRDP and SCDP due to the higher costs of settler housing and infrastructure. If the latter costs are omitted to provide a basis of comparison for field related benefits, there appear to be no strong economic grounds for choosing NES/PIR rubber schemes over SRDP developed rubber or SCDP coconut over NES coconut development. The range of economic rates of return between the development strategies for the same crop is not significant. PRPTE schemes have slightly lower economic returns due mainly to poor maintenance.

33. The main conclusion to be reached from the economic analyses is that none of the estimated rates of return present a constraint to Government objectives for expansion of rubber, oil palm and coconuts during Repelita IV. There does not appear to be any economic justification for favoring one crop over another; therefore soil suitability, closeness to nucleus estates, PMUs or other relevant facilities, and maintaining a reasonable balance between crops to spread risks should guide the overall choice of crops.

34. The financial cost-benefit analyses of smallholdings with two hectares of tree crops indicate that each of the schemes and crops have adequate financial rates of return for them to be attractive to farmers (Table 4). It appears probable that smallholders will be able to attain the target income of Rp. 1,500,000 per family (before debt service payments) by about 1995. Any reduction in the size of the smallholder tree crops area would jeopardize this outcome.

F12472/30

Table 4: Financial Rates of Return for Selected Schemes

	Excluding non-wage Labor %	Including Imputed Cost of non-wage labor %
Rubber		
NES	17.6	14.9
SRDP	23.4	19.2
PRPTE	15.2	11.4
Oil Palm		
NES/PIR	17.0	13.7
Hybrid Coconuts		
NES/PIR	16.0	14.6
SCDP	25.7 a/	20.5

a/ Because of management difficulties it seems unlikely that this return will be achieved on a significant scale.

Source: IBRD Report No. 5318-IND Indonesia: The Major Tree Crops: A Sector Review, April 15, 1985, page 83.

35. As is the case with the economic analysis, the financial returns from the NES schemes are expected to have lower financial rates of return for farmers than SCDP and SRDP due to the added costs of housing and infrastructure and wage labor. The trade-off for lower wage payments in initial years and reduced credit costs appear to promote higher returns for smallholders over the life cycle of the development. Offsetting these higher returns is the need to provide new settlers with sufficient wage income during the immature years of development to meet their subsistence needs. In areas where it is difficult to sustain food crops production in the first years after settlement payment of the full wage rate is usually necessary. To help make tree crops development as financially attractive as possible for transmigrants and to assure credit

repayment at a time when low commodity prices are projected, and to compensate for an increase of immature interest from 12% to 16%, Government is finalising plans for reducing the credit component under the private estate PIR projects. The proposal is for overhead costs (currently 10%), the management fee (currently 5%), and most of the expenditures associated with development of the food lot/home garden, house construction and the construction of inter and intra village roads and bridges to be made non credit costs. The effect will be to maintain an adequate financial return to settlers. This may lead to the problem of social equity of this scheme with other NES/PIR settlement programs, where financial return assumptions were made at a time of higher output price assumptions in dollar terms. GOI agrees that repayment capabilities under existing schemes need to be monitored and repayment obligations adjusted if necessary.

VI. MARKETING

36. Both the Food and Agriculture Organization [1/] and the Bank in the Tree Crops Sector Report have studied the long-term market outlook for rubber, oil palm and coconuts. Although there are likely to be bad years as well as good, the general outlook is encouraging, fully justifying the large production increases that will result from the Indonesian program, and from planting programs in other countries. The analyses for world rubber supply and demand suggest that if Indonesian rubber production remains less than 2.4 million tons per annum by the year 2000 the current market share and price of natural rubber relative

---

1/ FAO Report No. 101/83 TA. INS 41; November 1983.

to synthetic rubber in the future should continue at about present levels. Under the most optimistic planting and yield projections, Indonesia is not considered likely to reach the 2.4 million tons production level by 2000; the range in projected production being from 1.7 million to 2.3 million tons. The projections for the domestic supply and demand for palm oil and coconut oil assuming implementation of the Repelita IV planting programs indicate that Indonesia is likely to have a domestic deficit of edible oils through 1986 if the growth in per capita disposable income is low at 1% in real terms through 1987 and 2% thereafter, or a deficit through 1990 if per capita income increases 3% over the period. Unless the rate of planting outside Indonesia increases markedly, which is considered unlikely it is expected that there will be a fairly stable market for future exports.

VII. DEFINING A TREE CROPS PLANTING PROGRAM FOR THE NEXT FIVE YEARS

A. Capacities of the Tree Crops Programs

37. From the earlier discussion there appear to be no significant economic, financial or marketing constraints on the volume of tree crops production Indonesia is likely to achieve through the year 2000. While economic rates of return do not favor one crop over another, it would be in Indonesia's interest to seek a balance in the development of the three major tree crops, and in the next five years, to give preference to oil palm and coconut development in view of the existing and growing domestic demand for fats and oils. The need to reach the enormous number of smallholders who require assistance to replant rubber, should, however, argue for a balance in the setting of planting targets. Of equal, concern is the need to plant tree crops for the Phase II development of

existing transmigrants' smallholdings to achieve the smallholder family income target of Rp 1.5 million per year by 1995. Given the overstretched capacity of the PTPs it is prudent that the burden for smallholder rubber development focus on completion of existing NES projects and well advanced PIR project, and that planting for new NES or new PIR Khusus rubber development be reduced, as long as PTPs continue to be overstretched, in favor of accelerated plantings in the SRDP and PRPTE schemes. NES/PIR schemes should concentrate on oil palm where large scale block planting for new settlement on oil palm is required, with special attention being given to the managerial and financial capacity of the PTPs concerned.

38. The limited capacity of the PTPs to undertake additional plantings much beyond their current obligations necessitates the increased participation of the private sector if Government targets for Repelita IV are to come near to being achieved. The constraints to achieving this, discussed earlier, are well known to Government and are mainly within its ability to correct. On present indications it is most unlikely that the private sector can be relied on to begin substantial new settlement before the end of 1986. Given this situation it is important that as much as possible of the Government NES/PIR, SRDP and SCDP planting programs be directed to new settlement until the private PIR schemes come on stream. In view of the probable need to settle the majority of the 750,000 families planned for transmigration during Repelita IV on tree crops smallholdings, it is important that as much of the new settlement as possible be reserved for transmigrants. The limit to this is the consideration to balance the needs of the local poor landless for settlement on smallholdings.

Rubber:

NES/PIR Plantings

39. The role of the PTPs in block planting should emphasize completion of existing NES/PIR projects initiated in Repelita III, the planned PIR oil palm development programs for new settlement during Repelita IV and the replanting of tree crops on the PTPs' own estates. About 60,000 ha of NES/PIR smallholder rubber under existing commitments remains to be planted and there is need for replanting of about 8,000 ha of rubber annually on the PTP estates to provide a minimum replacement of 3% p.a. An achievable program for PTP involvement in new NES and PIR smallholder rubber projects over the next five years is estimated to be 45,000 ha. In aggregate, a feasible target for NES/PIR plantings of smallholder rubber is about 107,000 ha over five years. This should fully utilize the capacity of the PTPs when the requirements for rubber development on the estates to support the NES/PIR program and the PTPs' commitments under the oil palm program, are taken into account.

SRDP and PRPTE Plantings

40. Based on the achievement and build-up in the capacity of the SRDP program during Repelita III and 1984/85, it is expected that the SRDP will be able to increase annual plantings from a peak of 13,000 ha in Repelita III to 25,000 ha by 1990/91. 1984/85 plantings were only 4,800 ha due mainly to slow Government and BRI releases. It is estimated that about 70,000 ha of SRDP rubber can be planted over a five year

period. This projection is based on the assumptions that the SRDP absorption of the PRPTE PMUs occurs at a steady pace, the program is adequately funded and the present initiatives to provide increased skilled manpower and prove successful. Although no annual targets for the future have been set for the PRPTE rubber program there appears to be Government support for its continuation. The scheme has an important role assisting existing smallholders (para 23(d)). If properly funded the scheme could provide about 29,000 ha of quality plantings over the coming five years. Careful monitoring of the program would be needed, however, to avoid the problems of the past and to assure the quality of plantings.

Oil Palm

41. The planting capacity of the eleven oil palm PTPs will depend on the ability of each to maximize its activities in new oil palm development given that almost all of them are committed to large existing programs of oil palm and rubber development. Any major plantings by non-oil palm PTPs diversifying to oil palm in the next five years is unlikely. The existing capacity of smallholder oil palm development by the PTPs is 13,000 ha/year and could be increased to 55,000 ha annually if the financial and management/manpower constraints are alleviated. Total plantings of 219,000 ha of smallholder plantings by the PTPs are therefore considered possible over the next five years. The corresponding estate development required to support such a program is about 150,000 ha. Projected private estate plantings in the PIR Swasta program are 120,000 ha over five years building from 10,000 ha in 1987/88 to 50,000 ha in 1990/91.

F/2472/36

Coconuts

42. Expansion of coconut production in the next five years should primarily be the responsibility of the PMU-based schemes since these are better suited to the development of vast areas of scattered smallholdings. Apart from the fulfillment of the existing NES commitments (11,000 ha) the PTPs would best be used to provide planting material from their seed gardens to support the SCDP and PRPTE programs. Based on the rate of past plantings and on the assumption that there is improvement in the management and skilled manpower availability of both schemes, it is expected that SCDP and PRPTE combined could plant about 234,000 ha over the five years. SCDP has the potential to reach annual plantings of 15,000 ha by 1990. The PRPTE program can be increased from the present level of 30,000 ha annually to 45,000 ha within five years, particularly if talls are emphasized.

B. Estimated Smallholder Tree Crop Plantings 1986/87 to 1990/91

43. The planting capacities outlined in paras 36-39 have been used to estimate the tree crop plantings for smallholders which are likely to be achieved over the next five years (Table 5). The projections take into account the existing constraints on tree crops development while assuming modest progress overcoming these constraints during the five years. Programs for rehabilitation and intensification of existing tree crop areas are not included in the estimates. It is believed that about 207,000 ha of rubber, 344,000 ha of oil palm and 246,000 ha of coconuts could be planted from 1986/87 through 1990/91. These estimates should however, be regarded as optimistic since in total they are about double the plantings of the 395,000 ha of smallholder plantings achieved during Repelita III.

Table 5: BANK PROJECTIONS FOR NEW PLANTING AND REPLANTING FOR SMALLHOLDER TREE CROPS DEVELOPMENT 1986/87 THROUGH 1990/91

Planting Programs	1986/87	1987/88	1988/89	1989/90	1990/91	Total
Rubber						
NES/TRANS III	9,000	7,000	6,000	6,000	6,000	34,000
PIR Khusus	6,000	8,000	11,000	15,000	18,000	58,000
PIR Lokal	3,000	3,000	3,000	3,000	3,000	15,000
Sub-total NES/PIR	18,000	18,000	20,000	24,000	27,000	107,000
SRDP	7,000	9,000	12,000	18,000	25,000	71,000
PRPTE	7,000	6,000	6,000	5,000	5,000	29,000
Sub-total PMU	14,000	15,000	18,000	23,000	30,000	100,000
Total Rubber	32,000	33,000	38,000	47,000	57,000	207,000
Oil Palm						
NES	15,000	10,000	10,000	15,000	15,000	65,000
PIR Khusus	10,000	15,000	20,000	25,000	25,000	95,000
PIR Akselerasi	10,000	12,000	12,000	15,000	15,000	64,000
PIR Swasta	-	10,000	20,000	40,000	50,000	120,000
Total Oil Palm	35,000	47,000	62,000	95,000	105,000	344,000
Coconuts						
NES/TRANS Projects	6,000	6,000	-	-	-	12,000
PMU - SCDP	8,000	3,000	8,000	10,000	15,000	44,000
PMU - Partial approach	30,000	35,000	40,000	40,000	45,000	190,000
Total coconuts	44,000	44,000	48,000	50,000	60,000	246,000
Total Tree Crops	111,000	124,000	148,000	192,000	222,000	797,000

VIII. TRANSMIGRATION SETTLEMENT UNDER THE PROJECTED PLANTING PROGRAM

44. The estimated number of transmigrant families that can be settled through implementation of the tree crops planting program described in para 43 is summarised in Table 6. The assumptions for settlement for each of the schemes are given in the footnotes to the table. Based on an allocation of two hectares of tree crops per smallholding it is estimated that about 186,000 transmigrant families could be settled on tree crops development schemes from 1986/87 through 1990/91. The breakdown is 41,000 families on rubber, 129,000 families on oil palm; and, 16,000 families on coconuts. It should be noted that achievement of settlement of the magnitude of 186,000 families over five years, will be at the cost of establishing tree crops on existing smallholdings and the settlement of local landless and poor people. The estimate for transmigrant settlement of 10,000 families under SRDP assumes that 60% of these programs will be directed to plantings for new settlement from 1986/89 to 1987/88 and 50% thereafter, and that 50% of the settlers will be transmigrants. In the case of SCDP the estimated settlement of 11,000 families is based on 50% of the program being new plantings and 50% of the area being settlers by transmigrants. For the NES programs the estimates are based on 50% of plantings for new transmigrants, even though the present rate of transmigrant settlement on NES projects is only 16%.

45. To achieve a degree of balance in development between new transmigration settlement and the establishment of tree crops on existing transmigration and local smallholdings it is important that the Government improve and continue its PRPTE programs until the SRDP and SCDP replanting are sufficiently strengthened to take them over. Based on the assumptions for transmigrant settlement outlined in Table 6 and given the continuation and

Table 6: ESTIMATED NUMBER OF TRANSMIGRANT FAMILIES WHICH COULD BE SETTLED ON TREE CROP SMALLHOLDINGS FROM 1986/87 TO 1990/91

Rubber	1986/87	1987/88	1988/89	1989/90	1990/91	Total
NES/PIR 1/	4,650	4,950	5,900	7,500	8,700	31,700
SRDP 2/	1,050	1,350	1,500	2,250	3,125	9,275
Sub-total	5,700	6,300	7,400	9,750	11,825	40,975
Oil Palm						
NES 3/	4,500	3,000	3,000	4,500	4,500	19,500
PIR Schemes 4/	8,000	14,800	20,800	30,000	36,000	109,600
Sub-total	12,500	17,800	23,800	34,500	40,500	129,100
Coconuts						
NES/TRANS 5/	2,250	2,250	-	-	-	4,500
SCDP 6/	2,000	750	2,000	2,500	3,750	11,000
Sub-total	4,250	3,000	2,000	2,500	3,750	15,500
Total all crops	22,450	27,100	57,000	46,750	56,075	185,575

Assumptions

General: All settlers receive two hectares of tree crops.

1/ NES rubber: 50% of plantings for new transmigrant settlement, the remainder local settlement. PIR Khusus rubber: 80% of plantings for new transmigrants.

2/ SRDP: 60% of plantings new, 40% replanting until 1988/89; after then 50% new planting, 50% replanting. Of new plantings, 50% for transmigrants.

3/ NES oil palm: 60% of plantings for new transmigrants.

4/ PIR oil palm: 80% of plantings for new transmigrants.

5/ NES/TRANS coconuts: All transmigration plantings for new transmigrants, 50% of NES plantings for new transmigrants.

6/ SCDP 50% of plantings for new transmigrants.

improvement in the quality and capacity of the PRPTE programs, it is estimated that about 106,000 ha of tree crops to benefit about 53,000 existing or local settlers can be established in the next five years. (Table 7)..

Table 7: Estimated number of existing settler families and local landless poor families which can be assisted through tree crops development from 1986/87 to 1990/91

Schemes	No. of hectares 1986/87 - 1990/91
Rubber	
NES	8,500
PIR Khusus	14,500
PIR Lokal	3,750
SRDP	9,275
PRPTE	7,250
Sub-total	43,275
Coconuts	
NES	3,500
SCDP	11,000
PMU partial	47,500
Sub-total	62,000
Total all schemes	105,275
Assuming 2 ha tree crops per family	52,637 families

WORLDBANK MS SYSTEM

INDONESIA Trans Sector Review Project
Loan/Credit No. -INS
Assigned to:
Reply/No Reply: (date)
Letter/telex
Filed: Asia Files/Div. Files

ZCZC AGRP0338 WUI749
AGRDR
REF : TCP FCA

WUI749
WOT788 271825 ROP842 ((DDC)) 27.11.85 19:13
PP OUT

FAO/ITC/DDC/842/ 27.11.85
FOR VERAABI NO. 232 ONE FOR SMITH WOULD APPRECIATE RECEIVING Smith
COPY BANK REPORT CHINA LONG TERM DEVELOPMENT ISSUES AND
OPTIONS PLUS ANNEXES.
TWO FOR KRISHNA INDONESIA TRANSMIGRATION SECTOR REVIEW WE Krishna
WELCOME YOUR PROPOSAL TO USE BEVAN'S REVIEW OF RAINFED FOOD
CROP PRODUCTION ON UPLAND SOILS AS WORKING PAPER FOR ABOVE
REVIEW. VERSION TO BE USED SHOULD BE DOCUMENT 120/84 CP-INS
50 W.P. (UPDATED) OF 3 MAY 1985. BEVAN'S REVIEW DOES NOT GIVE
EXCHANGE RATE WHICH WAS US$1 = RUPIAH 1065. GRATEFUL YOU HAVE
THIS
INAERTED IN APPROPRIATE PLACE.
REGARDS.
(GROENEWOLD)

BK 103/2.12 INS
PU 2/1

(FOODAGRI ROME TELEX 610181-610248)

Rec'd 12/3/85

=

246686 1829 271185
01710171 749

=11271343

NNNN

Annex 4
Tabel 1

TABLE A2 TRANSMIGRANTS* AS % 1980 PROVINCIAL AND KABUPATEN POPULATION

PROVINCE/Kabupaten	TRANS-MIGRANTS	POPULA-TION 1980	% TRANS-MIGRANTS	PROVINCE/Kabupaten	TRANS-MIGRANTS	POPULA-TION 1980	% TRANS-MIGRANTS
ACEH	60957	2611271	2.3	Kapuas	56201	258473	21.7
Aceh Utara	7533	625296	1.2	Kot Waringin Timur	23900	183166	13.0
Aceh Timur	9271	423418	2.2	Kot Waringin Barat	27730	94544	29.3
Aceh Barat	23878	288422	8.3	Barita Selatan	1940	69020	2.8
Aceh Selatan	16093	275458	5.8	Barito Utara	28	63601	0.0
Aceh Tengah	4182	163341	2.6	SOUTH KALIMANTAN	91442	2064649	4.4
NORTH SUMATRA	37070	8360894	0.4	Kota Baru	78913	193650	40.8
Tapanuli Selatan	37070	757159	4.9	Barito Kuala	11442	169952	6.7
RIAU	177880	2168535	8.2	Tabalong	1087	124939	0.9
Indragiri Ilir	10312	398276	2.6	EAST KALIMANTAN	55513	1218016	4.6
Indragir Ulu	34246	229182	14.9	Kutai	32784	368501	8.9
Bengkalis	38368	566671	6.8	Samarinda (KM)	2375	264718	0.9
Kampar	91582	362867	25.2	Balikpapan (KM)	2586	280675	0.9
Kepulauan Riau	3372	425277	0.8	Bulongan	6069	176923	3.4
WEST SUMATRA	23153	3406816	0.7	Berau	11699	45903	25.5
Sawah Lunto	17594	224446	7.8	TOTAL KALIMANTAN	388644	6723086	5.8
Pasisir Selatan	4288	315954	1.4	NORTH SULAWESI	18817	2115384	0.9
Solok	1271	355539	0.4	Gorontolo	12146	502695	2.4
JAMBI	107819	1445994	7.5	Bolaang Mongondow	6671	299696	2.2
Bungo Tebo	24457	302386	8.1	CENTRAL SULAWESI	75531	1289635	5.9
Sarko (Sarolangun)	48585	217653	22.3	Banggai	27396	268203	10.2
Tanjung Jabung	20922	216897	9.6	Donggala	17818	581772	3.1
Batang Hari	13855	237604	5.8	Poso	21794	266708	8.2
BENGKULU	61112	768064	8.00	Buol Toli-Toli	8523	172952	4.9
Bengkulu Utara	49207	178250	27.6	SOUTH SULAWESI	24991	6062212	0.4
Bengkulu Selatan	7465	236775	3.2	Luwu	14424	503757	2.9
Rejang Lebong	4440	288256	1.5	Mamuju	10567	99796	10.6
SOUTH SUMATRA	378959	4629801	8.2	S.E. SULAWESI	92114	942302	9.8
Banyuasin	250012	591074	42.3	Kendari	59583	306675	19.4
Ogan Kom Ilir	42595	564080	7.6	Kolaka	4566	144446	3.2
Ogan Kom Ulu	27100	750799	3.6	Buton	21662	317124	6.8
Lahat	32204	484893	6.6	Muna	6303	174057	3.6
Musi Rawas	19937	367037	5.4	TOTAL SULAWESI	211453	10409533	2.0
Lematang Ilir	7111	430834	1.7	MALUKU	35139	1411006	2.5
LAMPUNG $	188178	4624785	4.1	Maluku Tengah	35139	443940	7.9
Lumpung Utara $$	207053	882479	23.5	WEST NUSA TENGGARA	6878	2724664	0.3
Lampung Tengah	4949	1690947	0.3	Dompu	6878	95827	7.2
TOTAL SUMATRA	1035128	28016160	3.7	IRIAN JAYA	75604	1173875	6.4
WEST KALIMANTAN	131890	2486068	5.31	Jayapura	12071	151308	8.0
Pontianak	10734	608893	1.76	Manokwari	9980	84757	11.8
Sanggau	14540	323499	4.49	Sorong	24881	134833	18.5
Sambas	92792	603104	15.39	Merauke	22229	172662	12.9
Ketapang	10870	253828	4.28	Paniai	6443	177619	3.6
Kapuas Hulu	2954	128647	2.30	EAST TIMOR	965	555350	0.2
CENTRAL KALIMANTAN	109799	954353	11.51	Bobonaro	965	61980	1.6
				ALL RECEIVING AREAS	1753811	51013674	3.4

*Repelitas II, III and IV to August 1985. (KM=Kotamadya). Source: Dept. Transmigration, 1985.

notes: $ does not include resettlement within province; $$ includes resettlement from other kabupaten in Lampung

25.9

TABLE A4 ESTIMATED LENGTH OF TRANSMIGRATION ROADS CONSTRUCTED 1981/82 to MID-1985

PROVINCE	HOUSEHOLDS SERVED	(%)	CATEGORY OF ROAD CONSTRUCTED (Km.) PHB. *	POROS §	DESA'
ACEH	13,450	2.8	118	218	404
N. SUMATRA	13,795	2.9	121	223	414
W. SUMATRA	5,925	1.2	52	96	178
RIAU	41,337	8.7	364	670	1240
JAMBI	26,520	5.6	233	430	796
S. SUMATRA	64,879	13.6	568	1051	1946
BENGKULU	12,320	2.6	108	200	370
LAMPUNG	54,580	11.5	480	884	1637
SUMATRA	232,806	49.0	2,046	3,771	6,984
W.KALIMANTAN	45,485	9.5	398	737	1365
C. KALIMANTAN	40,322	8.4	353	653	1210
S. KALIMANTAN	17,117	3.6	150	277	514
E. KALIMANTAN	30,705	6.4	269	497	921
KALIMANTAN	133,629	28.0	1,170	2,165	4,009
N. SULAWESI	6,250	1.3	55	101	188
C. SULAWESI	21,242	4.5	186	344	637
S. SULAWESI	8,000	1.7	70	130	240
S.E. SULAWESI	18,450	3.9	162	299	554
SULAWESI	53,942	11.3	473	874	1,618
MALUKU	10,770	2.2	94	174	323
NTB	2,140	0.5	19	35	64
IRIAN JAYA	41,245	8.6	361	668	1227.3
E. TIMOR	1,800	0.4	16	29	54.0
TOTAL	476,332	100.0	4,179	7,717	14,280

source: Directorat PLP, 1985.

*access road at 8.8 m./household; §main site road at 16.2 m./household;

' village road 30 m./household.

TABLE 22 ROAD CONSTRUCTION (C), MAINTENANCE (M) & REHABILITATION (R), TRANSMIGRANT RECEIVING PROVINCES

PROVINCE	LOCAL ROADS DAMAGED 1984' KABUPATEN (%)	OTHER'' (%)	ALL ROADS (%)	TRANSMIGRATION ROADS (Km.)* (C) 1981-84	(M) 1984	(R) 1984	ROAD UPKEEP** (M) AS % (C)	(M & R) AS % (C)
ACEH	56.3	15.2	44.3	579	171	116	29.5	49.6
N. SUMATRA	37.7	26.9	34.0	374	69	82	18.4	40.4
W. SUMATRA	61.3	15.0	46.4	146	45	22	30.8	45.9
RIAU	62.5	14.0	46.9	840	102	303	12.1	48.2
JAMBI	62.1	13.1	40.2	1077	318	92	29.5	38.1
S. SUMATRA	50.6	7.9	33.5	1779	305	184	17.1	27.5
BENGKULU	40.4	8.6	31.1	505	112	91	22.2	40.2
LAMPUNG	46.9	16.2	33.5	2202	670	331	30.4	45.5
W.KALIMANTAN	32.7	28.5	30.9	1269	212	432	16.7	50.7
C. KALIMANTAN	39.9	9.3	34.8	511	157	134	30.7	56.9
S. KALIMANTAN	50.3	5.3	37.4	166	26	54	15.7	48.2
E. KALIMANTAN	22.0	38.3	34.5	214	45	47	21.0	43.0
N. SULAWESI	59.5	18.1	47.4	40	20	0	50.0	50.0
C. SULAWESI	55.0	32.4	45.0	1440	243	0	16.9	16.9
S. SULAWESI	43.1	5.3	35.9	131	68	5	51.9	55.7
S.E. SULAWESI	40.5	18.3	34.8	459	149	56	32.5	44.7
MALUKU	41.6	41.8	41.7	595	146	106	24.5	42.4
NTB	41.8	5.2	34.0	79	3	33	3.8	45.6
IRIAN JAYA	45.0	16.8	41.5	825	287	76	34.8	44.0
E. TIMOR	-	-	33.7	49	13	0	26.5	26.5
TOTAL	47.7	19.5	38.4	13280	3161	2164	23.8	40.1

source: Dept. Transmigration, 1985.

*includes main linkage (penghubung), inter-village access (poros) and village (desa) roads. Dept. Transmigration estimates the following ratios in site planning: (a) 15 km. main road per SKP; (b) 17.5 m. access road per household; (c) 35 m. village road per household.

** Because Min. Transmigration responsiblity for sites covers approx. 7 years (2 years construction + 5 years support), the actual length of road under its responsibility is greater than the 1981-84 construction figures indicate.

' includes damaged (rusak) and heavily damaged (rusak berat) roads, but does not include moderately damaged (sedang) roads. ''includes national, provincial and kotamadya roads. source: BPS, Statistik Indonesia 1984, Table 8.1.5b (road condition as of 31 December, 1984).

3.9

TABLE ~~A4~~ ESTIMATED LENGTH OF TRANSMIGRATION ROADS CONSTRUCTED 1981/82 to MID-1985

PROVINCE	HOUSEHOLDS SERVED	(%)	CATEGORY OF ROAD CONSTRUCTED (Km.) PHB. *	POROS §	DESA'
ACEH	13,450	2.8	118	218	404
N. SUMATRA	13,795	2.9	121	223	414
W. SUMATRA	5,925	1.2	52	96	178
RIAU	41,337	8.7	364	670	1240
JAMBI	26,520	5.6	233	430	796
S. SUMATRA	64,879	13.6	568	1051	1946
BENGKULU	12,320	2.6	108	200	370
LAMPUNG	54,580	11.5	480	884	1637
SUMATRA	232,806	49.0	2,046	3,771	6,984
W.KALIMANTAN	45,485	9.5	398	737	1365
C. KALIMANTAN	40,322	8.4	353	653	1210
S. KALIMANTAN	17,117	3.6	150	277	514
E. KALIMANTAN	30,705	6.4	269	497	921
KALIMANTAN	133,629	28.0	1,170	2,165	4,009
N. SULAWESI	6,250	1.3	55	101	188
C. SULAWESI	21,242	4.5	186	344	637
S. SULAWESI	8,000	1.7	70	130	240
S.E. SULAWESI	18,450	3.9	162	299	554
SULAWESI	53,942	11.3	473	874	1,618
MALUKU	10,770	2.2	94	174	323
NTB	2,140	0.5	19	35	64
IRIAN JAYA	41,245	8.6	361	668	1227.3
E. TIMOR	1,800	0.4	16	29	54.0
TOTAL	476,332	100.0	4,179	7,717	14,280

source: Directorat PLP, 1985.

*access road at 8.8 m./household; §main site road at 16.2 m./household;

' village road 30 m./household.

TABLE 3.9 ROADS CONSTRUCTED AND MAINTAINED IN TRANSMIGRATION AREAS 1981-84

PROVINCE	TRANSMIGRATION ROADS (Km.)* CONSTRUCTED 1981-1984	MAINTAINED 1984	REHABIL. 1984	% DISTRIBUTION (C)	(M)	(R)
ACEH	579	171	116	4.4	5.4	5.4
N. SUMATRA	374	69	82	2.8	2.2	3.8
W. SUMATRA	146	45	22	1.1	1.4	1.0
RIAU	840	102	303	6.3	3.2	14.0
JAMBI	1077	318	92	8.1	10.1	4.3
S. SUMATRA	1779	305	184	13.4	9.6	8.5
BENGKULU	505	112	91	3.8	3.5	4.2
LAMPUNG	2202	670	331	16.6	21.2	15.3
SUMATRA	7502	1792	1221	56.5	56.7	56.4
W.KALIMANTAN	1269	212	432	9.6	6.7	20.0
C. KALIMANTAN	511	157	134	3.8	5.0	6.2
S. KALIMANTAN	166	26	54	1.2	0.8	2.5
E. KALIMANTAN	214	45	47	1.6	1.4	2.2
KALIMANTAN	2160	440	667	16.3	13.9	30.8
N. SULAWESI	40	20	0	0.3	0.6	0.0
C. SULAWESI	1440	243	0	10.8	7.7	0.0
S. SULAWESI	131	68	5	1.0	2.2	0.2
S.E. SULAWESI	459	149	56	3.5	4.7	2.6
SULAWESI	2070	480	61	15.6	15.2	2.8
MALUKU	595	146	106	4.5	4.6	4.9
NTB	79	3	33	0.6	0.1	1.5
IRIAN JAYA	825	287	76	6.2	9.1	3.5
E. TIMOR	49	13	0	0.4	0.4	0.0
TOTAL	13280	3161	2164	100.0	100.0	100.0

source: Min. Transmigration, 1985.

*includes main (penghubung), access (poros) and village (desa) roads.

TABLE 7 TRANSMIGRATION ROADS AS A PROPORTION OF LOCAL ROAD NETWORK

PROVINCE	PROVINCIAL ROADS 1984 (KM.)* KABUPATEN	NAT'L, PROV., KOTAMADYA	TOTAL	TRANSMIGRATION/ PROVINCE (%) KABUPATEN	TOTAL
ACEH	7076	2906	9982	8.2	5.8
N. SUMATRA	9944	5188	15132	3.8	2.5
W. SUMATRA	5860	2772	8632	2.5	1.7
RIAU	4918	2344	7262	17.1	11.6
JAMBI	2533	2047	4580	42.5	23.5
S. SUMATRA	5801	3891	9692	30.7	18.4
BENGKULU	2496	1031	3527	20.2	14.3
LAMPUNG	2589	2007	4596	85.1	47.9
SUMATRA	41217	22186	63403	18.2	11.8
W. KALIMANTAN	2370	1812	4182	53.5	30.3
C. KALIMANTAN	3633	722	4355	14.1	11.7
S. KALIMANTAN	2942	1177	4119	5.6	4.0
E. KALIMANTAN	788	2550	3338	27.2	6.4
KALIMANTAN	9733	6261	15994	22.2	13.5
N. SULAWESI	3982	1645	5627	1.0	0.7
C. SULAWESI	3509	2800	6309	41.0	22.8
S. SULAWESI	14413	3394	17807	0.9	0.7
S.E. SULAWESI	3707	1305	5012	12.4	9.2
SULAWESI	25611	9144	34755	8.1	6.0
MALUKU	2408	1850	4258	24.7	14.0
NTB	3420	928	4348	2.3	1.8
IRIAN JAYA	4551	643	5194	18.1	15.9
E. TIMOR	0	1687	1687	-	2.9
TOTAL	86940	42699	129639	15.3	10.2

source: Dept. Transmigration, 1985. See Table 6 for Transmigration Road length.

TRANSMIGRANTS* AS % 1980 PROVINCIAL AND KABUPATEN POPULATION

PROVINCE/Kabupaten	TRANS-MIGRANTS	POPULA-TION 1980	% TRANS-MIGRANTS	PROVINCE/Kabupaten	TRANS-MIGRANTS	POPULA-TION 1980	% TRANS-MIGRANTS
ACEH	60957	2611271	2.3	Kapuas	56201	258473	21.7
Aceh Utara	7533	625296	1.2	Kot Waringin Timur	23900	183166	13.0
Aceh Timur	9271	423418	2.2	Kot Waringin Barat	27730	94544	29.3
Aceh Barat	23878	288422	8.3	Barita Selatan	1940	69020	2.8
Aceh Selatan	16093	275458	5.8	Barito Utara	28	63601	0.0
Aceh Tengah	4182	163341	2.6	SOUTH KALIMANTAN	91442	2064649	4.4
NORTH SUMATRA	37070	8360894	0.4	Kota Baru	78913	193650	40.8
Tapanuli Selatan	37070	757159	4.9	Barito Kuala	11442	169952	6.7
RIAU	172880	2168535	8.2	Tabalong	1087	124939	0.9
Indragiri Ilir	10312	398276	2.6	EAST KALIMANTAN	55513	1218016	4.6
Indragir Ulu	34246	229182	14.9	Kutai	32784	368501	8.9
Bengkalis	38368	566671	6.8	Samarinda (KM)	2375	264718	0.9
Kampar	91582	362867	25.2	Balikpapan (KM)	2586	280675	0.9
Kapulauan Riau	3372	425277	0.8	Bulongan	6069	176923	3.4
WEST SUMATRA	23153	3406816	0.7	Berau	11699	45903	25.5
Sawah Lunto	17594	224446	7.8	TOTAL KALIMANTAN	388644	6723086	5.8
Pasisir Selatan	4288	315954	1.4	NORTH SULAWESI	18817	2115384	0.9
Solok	1271	355539	0.4	Gorontolo	12146	502695	2.4
JAMBI	107819	1445994	7.5	Bolaang Mongondow	6671	299696	2.2
Bungo Tebo	24457	302386	8.1	CENTRAL SULAWESI	75531	1289635	5.9
Sarko (Sarolangun)	48585	217653	22.3	Banggai	27396	268203	10.2
Tanjung Jabung	20922	216897	9.6	Donggala	17818	581772	3.1
Batang Hari	13855	237604	5.8	Poso	21794	266708	8.2
BENGKULU	61112	768064	8.00	Buol Toli-Toli	8523	172952	4.9
Bengkulu Utara	49207	178250	27.6	SOUTH SULAWESI	24991	6062212	0.4
Bengkulu Selatan	7465	236775	3.2	Luwu	14424	503757	2.9
Rejang Lebong	4440	288256	1.5	Mamuju	10567	99796	10.6
SOUTH SUMATRA	378959	4629801	8.2	S.E. SULAWESI	92114	942302	9.8
Banyuasin	250012	591074	42.3	Kendari	59583	306675	19.4
Ogan Kom Ilir	42595	564080	7.6	Kolaka	4566	144446	3.2
Ogan Kom Ulu	27100	750799	3.6	Buton	21662	317124	6.8
Lahat	32204	484893	6.6	Muna	6303	174057	3.6
Musi Rawas	19937	367037	5.4	TOTAL SULAWESI	211453	10409533	2.0
Lematang Ilir	7111	430834	1.7	MALUKU	35139	1411006	2.5
LAMPUNG $	188178	4624785	4.1	Maluku Tengah	35139	443940	7.9
Lumpung Utara $$	207053	882479	23.5	WEST NUSA TENGGARA	6878	2724664	0.3
Lampung Tengah	4949	1690947	0.3	Dompu	6878	95827	7.2
TOTAL SUMATRA	1035128	28016160	3.7	IRIAN JAYA	75604	1173875	6.4
WEST KALIMANTAN	131890	2486068	5.31	Jayapura	12071	151308	8.0
Pontianak	10734	608893	1.76	Manokwari	9980	84757	11.8
Sanggau	14540	323499	4.49	Sorong	24881	134833	18.5
Sambas	92792	603104	15.39	Merauke	22229	172662	12.9
Ketapang	10870	253828	4.28	Paniai	6443	177619	3.6
Kapuas Hulu	2954	128647	2.30	EAST TIMOR	965	555350	0.2
CENTRAL KALIMANTAN	109799	954353	11.51	Bobonaro	965	61980	1.6
				ALL RECEIVING AREAS	1753811	51013674	3.4

*Repelitas II, III and IV to August 1985. (KM=Kotamadya). Source: Dept. Transmigration, 1985.

notes: $ does not include resettlement within province; $$ includes resettlement from other kabupaten in Lampung

Table 4.5: ROADS CONSTRUCTED BY TRANSMIGRATION AS A PROPORTION OF LOCAL INFRASTRUCTURE

Province	Provincial Road Network			Transmigration roads /a			Total trans-migration roads		Transmigration roads as % of local roads			% of total
	Total (1)	National/ provincial (2)	Kabu-paten (3)	Access (4)	Main (5)	Village (6)	(4+5)	(4+5+6)	(4+5) as a % of (3)	(4+5+6) as a % of (3)	(4+5+6) as a % of (1)	(3+4+5)
Aceh	9,982	2,906	7,076	118	218	404	336	740	5	10	7	3
North Sumatra	15,132	5,188	9,944	121	223	414	344	758	3	8	5	3
West Sumatra	8,632	2,772	5,860	52	96	178	148	326	3	6	4	1
Riau	7,262	2,344	4,918	364	670	1,240	1,034	2,274	21	46	31	9
Jambi	4,580	2,047	2,533	233	430	796	663	1,459	26	58	32	6
South Sumatra	9,692	3,891	5,801	568	1,051	1,946	1,619	3,565	28	61	37	14
Bengkulu	3,527	1,031	2,496	108	200	370	308	678	12	27	19	3
Lampung	4,596	2,007	2,589	480	884	1,637	1,364	3,001	53	116	65	11
Sumatra	63,403	22,186	41,217	2,044	3,772	6,985	5,816	12,801	14	31	20	49
West Kalimantan	4,182	1,812	2,370	398	737	1,365	1,135	2,500	48	105	60	10
Central Kalimantan	4,355	722	3,633	353	653	1,210	1,006	2,216	28	61	51	8
South Kalimantan	4,119	1,177	2,942	150	277	514	427	941	15	32	23	4
East Kalimantan	3,358	2,550	788	269	497	921	766	1,687	97	214	51	6
Kalimantan	15,994	6,261	9,733	1,170	2,164	4,010	3,334	7,344	34	75	46	28
North Sulawesi	5,627	1,645	3,982	55	101	188	156	344	4	9	6	1
Central Sulawesi	6,309	2,800	3,509	186	344	637	530	1,167	15	33	18	4
South Sulawesi	17,807	3,394	14,413	70	130	240	200	440	1	3	2	2
Southeast Sulawesi	5,012	1,305	3,707	162	299	554	461	1,015	12	27	20	4
Sulawesi	34,755	9,144	25,611	473	874	1,619	1,347	2,966	5	12	9	11
Eastern Islands	10,293	4,465	5,828	129	238	441	367	808	6	14	8	3
Irian Java	5,194	643	4,551	361	668	1,227	1,029	2,256	23	50	43	9
E.I and Irian	15,487	5,108	10,379	490	906	1,668	1,396	3,064	13	30	20	12
Total	129,639	42,699	86,940	4,177	7,716	14,282	11,893	26,175	14	30	20	100

/a Access road at 8.8 m/household; main site road at 16.2 m/household; village road at 30 m/household.

Source: Directorate PLP, 1985.

Can this be squeezed onto a table that runs vertically

Table 4.3

POPULATION BY PLACE OF BIRTH, PLACE OF PREVIOUS RESIDENCE, PLACE OF RESIDENCE 5 YEARS AGO AND PLACE OF PRESENT RESIDENCE

Urban and Rural

TEMPAT LAHIR/TEMPAT TINGGAL TERAKHIR/TEMPAT TINGGAL 5 TAHUN YANG LALU *PLACE OF BIRTH/PLACE OF PREVIOUS RESIDENCE/PLACE OF RESIDENCE 5 YEARS AGO*	TEMPAT TINGGAL SEKARANG / *PRESENT RESIDENCE*					
	SUMATERA	JAWA	KALIMANTAN	SULAWESI	KEPULAUAN LAIN *OTHER ISLANDS*	JUMLAH/*TOTAL*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
~~TEMPAT LAHIR~~/*PLACE OF BIRTH*						
Sumatera	24 825 271	718 420	25 474	22 651	19 879	25 611 695
Jawa	2 906 014	89 999 829	374 097	167 393	137 364	93 584 697
Kalimantan	19 594	121 807	6 165 294	9 758	4 626	6 321 079
Sulawesi	145 417	136 745	123 413	10 108 689	139 614	10 653 878
Kepulauan Lain/*Other Islands*	30 789	114 883	11 282	74 185	10 126 012	10 357 151
Luar Negeri/*Abroad*	39 703	59 310	10 220	7 990	7 525	124 748
Tak Terjawab/*Not Stated*	29 139	65 976	7 116	9 882	11 112	123 225
JUMLAH / *TOTAL*	27 995 927	91 216 970	6 716 896	10 400 548	10 446 132	146 776 473
~~TEMPAT TINGGAL TERAKHIR~~ *PLACE OF PREVIOUS RESIDENCE*						
Sumatera	24 729 720	767 199	19 676	24 093	14 265	25 554 953
Jawa	2 849 120	89 621 756	373 046	196 381	154 013	93 194 316
Kalimantan	25 481	156 685	6 142 569	25 364	6 183	6 356 282
Sulawesi	127 617	151 183	117 960	10 008 948	141 535	10 547 243
Kepulauan Lain/*Other Islands*	38 146	150 707	10 780	88 719	10 083 534	10 371 886
Luar Negeri/*Abroad*	35 658	56 060	9 368	9 673	8 520	119 279
Tak Terjawab/*Not Stated*	190 185	313 380	43 497	47 370	38 082	632 514
JUMLAH / *TOTAL*	27 995 927	91 216 970	6 716 896	10 400 548	10 446 132	146 776 473
~~TEMPAT TINGGAL 5 TAHUN YANG LALU~~/*PLACE OF RESIDENCE 5 YEARS AGO* *)						
Sumatera	22 544 460	261 137	12 949	12 451	10 670	22 841 667
Jawa	810 340	78 296 777	151 438	77 794	67 463	79 403 812
Kalimantan	10 432	43 860	5 446 630	7 855	2 246	5 511 023
Sulawesi	21 269	38 891	38 173	8 674 190	44 703	8 817 226
Kepulauan Lain/*Other Islands*	15 116	76 806	4 868	43 006	8 709 324	8 849 120
Luar Negeri/*Abroad*	4 154	10 269	1 243	2 611	3 265	21 542
Tak Terjawab/*Not Stated*	35 387	77 630	8 310	11 663	8 127	141 117
JUMLAH / *TOTAL*	23 441 158	78 805 370	5 663 611	8 829 570	8 845 798	125 585 507

*) Catatan/*Note* : ~~Penduduk berumur 5 tahun ke atas~~
Population 5 years of age and over

Can this be squeezed onto a table that runs vertically

Table 4.3

POPULATION BY PLACE OF BIRTH, PLACE OF PREVIOUS RESIDENCE, PLACE OF RESIDENCE 5 YEARS AGO AND PLACE OF PRESENT RESIDENCE

Urban and Rural

TEMPAT LAHIR/TEMPAT TINGGAL TERAKHIR/TEMPAT TINGGAL 5 TAHUN YANG LALU *PLACE OF BIRTH/PLACE OF PREVIOUS RESIDENCE/PLACE OF RESIDENCE 5 YEARS AGO*	TEMPAT TINGGAL SEKARANG / *PRESENT RESIDENCE*					JUMLAH/*TOTAL*
	SUMATERA	JAWA	KALIMANTAN	SULAWESI	KEPULAUAN LAIN *OTHER ISLANDS*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
~~TEMPAT LAHIR~~/*PLACE OF BIRTH*						
Sumatera	24 825 271	718 420	25 474	22 651	19 879	25 611 695
Jawa	2 906 014	89 999 829	374 097	167 393	137 364	93 584 697
Kalimantan	19 594	121 807	6 165 294	9 758	4 626	6 321 079
Sulawesi	145 417	136 745	123 413	10 108 689	139 614	10 653 878
Kepulauan Lain/*Other Islands*	30 789	114 883	11 282	74 185	10 126 012	10 357 151
Luar Negeri/*Abroad*	39 703	59 310	10 220	7 990	7 525	124 748
Tak Terjawab/*Not Stated*	29 139	65 976	7 116	9 882	11 112	123 225
JUMLAH / *TOTAL*	27 995 927	91 216 970	6 716 896	10 400 548	10 446 132	146 776 473
~~TEMPAT TINGGAL TERAKHIR~~ *PLACE OF PREVIOUS RESIDENCE*						
Sumatera	24 729 720	767 199	19 676	24 093	14 265	25 554 953
Jawa	2 849 120	89 621 756	373 046	196 381	154 013	93 194 316
Kalimantan	25 481	156 685	6 142 569	25 364	6 183	6 356 282
Sulawesi	127 617	151 183	117 960	10 008 948	141 535	10 547 243
Kepulauan Lain/*Other Islands*	38 146	150 707	10 780	88 719	10 083 534	10 371 886
Luar Negeri/*Abroad*	35 658	56 060	9 368	9 673	8 520	119 279
Tak Terjawab/*Not Stated*	190 185	313 380	43 497	47 370	38 082	632 514
JUMLAH / *TOTAL*	27 995 927	91 216 970	6 716 896	10 400 548	10 446 132	146 776 473
~~TEMPAT TINGGAL 5 TAHUN YANG LALU~~/*PLACE OF RESIDENCE 5 YEARS AGO* *)						
Sumatera	22 544 460	261 137	12 949	12 451	10 670	22 841 667
Jawa	810 340	78 296 777	751 438	77 794	67 463	79 403 812
Kalimantan	10 432	43 860	5 446 630	7 855	2 246	5 511 023
Sulawesi	21 269	38 891	38 173	8 674 190	44 703	8 817 226
Kepulauan Lain/*Other Islands*	15 116	76 806	4 868	43 006	8 709 324	8 849 120
Luar Negeri/*Abroad*	4 154	10 269	1 243	2 611	3 265	21 542
Tak Terjawab/*Not Stated*	35 387	77 630	8 310	11 663	8 127	141 117
JUMLAH / *TOTAL*	23 441 158	78 805 370	5 663 611	8 829 570	8 845 798	125 585 507

*) Catatan/*Note* : ~~Penduduk berumur 5 tahun ke atas~~
Population 5 years of age and over

Can this be squeezed onto a table that runs vertically

Table 4.3

POPULATION BY PLACE OF BIRTH, PLACE OF PREVIOUS RESIDENCE, PLACE OF RESIDENCE 5 YEARS AGO AND PLACE OF PRESENT RESIDENCE

Urban and Rural

TEMPAT LAHIR/TEMPAT TINGGAL TERAKHIR/TEMPAT TINGGAL 5 TAHUN YANG LALU PLACE OF BIRTH/PLACE OF PREVIOUS RESIDENCE/PLACE OF RESIDENCE 5 YEARS AGO	TEMPAT TINGGAL SEKARANG / PRESENT RESIDENCE					JUMLAH/TOTAL
	SUMATERA	JAWA	KALIMANTAN	SULAWESI	KEPULAUAN LAIN OTHER ISLANDS	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
~~TEMPAT LAHIR~~/PLACE OF BIRTH						
Sumatera	24 825 271	718 420	25 474	22 651	19 879	25 611 695
Jawa	2 906 014	89 999 829	374 097	167 393	137 364	93 584 697
Kalimantan	19 594	121 807	6 165 294	9 758	4 626	6 321 079
Sulawesi	145 417	136 745	123 413	10 108 689	139 614	10 653 878
Kepulauan Lain/Other Islands	30 789	114 883	11 282	74 185	10 126 012	10 357 151
Luar Negeri/Abroad	39 703	59 310	10 220	7 990	7 525	124 748
Tak Terjawab/Not Stated	29 139	65 976	7 116	9 882	11 112	123 225
JUMLAH / TOTAL	27 995 927	91 216 970	6 716 896	10 400 548	10 446 132	146 776 473
~~TEMPAT TINGGAL TERAKHIR~~ PLACE OF PREVIOUS RESIDENCE						
Sumatera	24 729 720	767 199	19 676	24 093	14 265	25 554 953
Jawa	2 849 120	89 621 756	373 046	196 381	154 013	93 194 316
Kalimantan	25 481	156 685	6 142 569	25 364	6 183	6 356 282
Sulawesi	127 617	151 183	117 960	10 008 948	141 535	10 547 243
Kepulauan Lain/Other Islands	38 146	150 707	10 780	88 719	10 083 534	10 371 886
Luar Negeri/Abroad	35 658	56 060	9 368	9 673	8 520	119 279
Tak Terjawab/Not Stated	190 185	313 380	43 497	47 370	38 082	632 514
JUMLAH / TOTAL	27 995 927	91 216 970	6 716 896	10 400 548	10 446 132	146 776 473
~~TEMPAT TINGGAL 5 TAHUN YANG LALU~~/PLACE OF RESIDENCE 5 YEARS AGO *)						
Sumatera	22 544 460	261 137	12 949	12 451	10 670	22 841 667
Jawa	810 340	78 296 777	331 438	77 794	67 463	79 403 812
Kalimantan	10 432	43 860	5 446 630	7 855	2 246	5 511 023
Sulawesi	21 269	38 891	38 173	8 674 190	44 703	8 817 226
Kepulauan Lain/Other Islands	15 116	76 806	4 868	43 006	8 709 324	8 849 120
Luar Negeri/Abroad	4 154	10 269	1 243	2 611	3 265	21 542
Tak Terjawab/Not Stated	35 387	77 630	8 310	11 663	8 127	141 117
JUMLAH / TOTAL	23 441 158	78 805 370	5 663 611	8 829 570	8 845 798	125 585 507

*) Catatan/Note : ~~Penduduk berumur 5 tahun ke atas~~
Population 5 years of age and over

4.3

Table 1: Population in the Outer Islands as a Result of Sponsored Migration between 1950-78 and Associated Population Growth

PROVINCE*	Individuals moved as sponsored migrants from 1950-78 (1)	Expected population, 1980 census from sponsored movement** (2)	Number of Inner Island Language speakers enumerated in 1980 census, Rural Areas (3)	Rural Excess (Spontaneous Migrants) (4) (3)-(2)	Ratio of Spontaneous to Sponsored Migrants Rural only (5) (4)/(1)	% of Inner Island Language Speakers directly as a result of sponsored migration (6) (2)/(3)	1980 Provincial Population, ~~1980~~ Rural Only (7)	Total (8)	% of population as a result of sponsored migration Rural Only (9) (2)/(7)	Total (10) (2)/(8)	% of Rural areas Speaking Inner Island Language (11) (4)/(7)
Aceh	9692	10933	156,266	145,333	15.0	7%	2,377,027	2,610,528	0%	0%	7%
Riau	16563	22777	148,263	125,486	7.6	15%	1,575,684	3,406,132	1%	1%	9%
West Sumatra	35986	48257	52,704	4,447	0.1	92%	2,973,012	2,163,896	2%	2%	2%
Jambi	70703	82783	236,211	153,428	2.2	35%	1,261,630	1,444,476	7%	6%	19%
Bengkulu	30619	37262	132,207	94,945	3.1	28%	695,566	767,988	5%	5%	19%
South Sumatra	262450	430124	585,792	155,668	0.6	73%	3,360,710	4,627,719	13%	9%	17%
Subtotal	426,014	632,136	1,311,443	679,307	1.6	48%	12,243,629	15,020,739	5%	4%	11%
West Kalimantan	32644	43211	153,423	110,212	3.4	28%	2,067,968	2,484,901	2%	2%	7%
Central Kalimantan	14516	20036	35,971	15,935	1.1	56%	855,919	954,176	2%	2%	4%
South Kalimantan	50163	70247	97,320	27,073	0.5	72%	1,622,326	2,063,227	4%	3%	6%
East Kalimantan	41279	59307	62,257	2,950	0.1	95%	729,383	1,214,602	8%	5%	9%
Subtotal	138,602	192,802	348,971	156,169	1.1	55%	5,275,596	6,716,906	4%	3%	7%
North Sulawesi	17757	25518	29,912	4,394	0.2	85%	1,760,215	2,114,822	1%	1%	2%
South Sulawesi	42206	54940	51,131	(3,809)	-0.1	107%	4,963,489	6,059,564	1%	1%	1%
Central Sulawesi	55489	68400	70,907	2,507	.0	96%	1,169,056	1,284,528	6%	5%	6%
Southeast Sulawesi	31683	39435	45,122	5,687	0.2	87%	853,598	941,454	5%	4%	5%
Subtotal	147,135	188,293	197,072	8,779	0.1	96%	8,746,358	10,400,368	2%	2%	2%
East Nusa Tenggara	2132	2416	745	(1,671)	-0.8	324%	2,531,521	2,736,988	0%	0%	0%
Maluku	4218	7120	15,913	8,793	2.1	45%	1,255,507	1,408,451	1%	1%	1%
Total	718,101	1,022,767	1,874,144	851,377	1.2	55%	30,052,611	36,283,452	3%	3%	6%

* Exclude North Sumatra and Lampung provinces because of large migrant communities settled there prior to WWII. Exclude Irian Jaya because of probable census error (number of Javanese, Madurese and Balinese speakers enumerated in census less than number would expect from sponsored movement (or they deserted).

** Including offspring of sponsored migrants

Table 4.3: Population in the Outer Islands as a Result of Sponsored Migration between 1950-78 and Associated Population Growth

PROVINCE*	Individuals moved as sponsored migrants from 1950-78 (1)	Expected population, 1980 census from sponsored movement** (2)	Number of Inner Island Language speakers enumerated in 1980 census, Rural Areas (3)	Rural Excess (Spontaneous Migrants) (4) (3)-(2)	Ratio of Spontaneous to Sponsored Migrants Rural only (5) (4)/(1)	% of Inner Island Language Speakers directly as a result of sponsored migration (6) (2)/(3)	1980 Provincial Population, ~~1980~~ Rural Only (7)	Total (8)	% of population as a result of sponsored migration Rural Only (9) (2)/(7)	Total (10) (2)/(8)	% of Rural areas Speaking Inner Island Language (11) (4)/(7)
Aceh	9692	10933	156,266	145,333	15.0	7%	2,377,027	2,610,528	0%	0%	7%
Riau	16563	22777	148,263	125,486	7.6	15%	1,575,684	3,406,132	1%	1%	9%
West Sumatra	35986	48257	52,704	4,447	0.1	92%	2,973,012	2,163,896	2%	2%	2%
Jambi	70703	82783	236,211	153,428	2.2	35%	1,261,630	1,444,476	7%	6%	19%
Bengkulu	30619	37262	132,207	94,945	3.1	28%	695,566	767,988	5%	5%	19%
South Sumatra	262450	430124	585,792	155,668	0.6	73%	3,360,710	4,627,719	13%	9%	17%
Subtotal	426,014	632,136	1,311,443	679,307	1.6	48%	12,243,629	15,020,739	5%	4%	11%
West Kalimantan	32644	43211	153,423	110,212	3.4	28%	2,067,968	2,484,901	2%	2%	7%
Central Kalimantan	14516	20036	35,971	15,935	1.1	56%	855,919	954,176	2%	2%	4%
South Kalimantan	50163	70247	97,320	27,073	0.5	72%	1,622,326	2,063,227	4%	3%	6%
East Kalimantan	41279	59307	62,257	2,950	0.1	95%	729,383	1,214,602	8%	5%	9%
Subtotal	138,602	192,802	348,971	156,169	1.1	55%	5,275,596	6,716,906	4%	3%	7%
North Sulawesi	17757	25518	29,912	4,394	0.2	85%	1,760,215	2,114,822	1%	1%	2%
South Sulawesi	42206	54940	51,131	(3,809)	-0.1	107%	4,963,489	6,059,564	1%	1%	1%
Central Sulawesi	55489	68400	70,907	2,507	.0	96%	1,169,056	1,284,528	6%	5%	6%
Southeast Sulawesi	31683	39435	45,122	5,687	0.2	87%	853,598	941,454	5%	4%	5%
Subtotal	147,135	188,293	197,072	8,779	0.1	96%	8,746,358	10,400,368	2%	2%	2%
East Nusa Tenggara	2132	2416	745	(1,671)	-0.8	324%	2,531,521	2,736,988	0%	0%	0%
Maluku	4218	7120	15,913	8,793	2.1	45%	1,255,507	1,408,451	1%	1%	1%
Total	718,101	1,022,767	1,874,144	851,377	1.2	55%	30,052,611	36,283,452	3%	3%	6%

* Exclude North Sumatra and Lampung provinces because of large migrant communities settled there prior to WWII. Exclude Irian Jaya because of probable census error (number of Javanese, Madurese and Balinese speakers enumerated in census less than number would expect from sponsored movement (or they deserted).

** Including offspring of sponsored migrants

Table 1: MIGRANTS IN THE OUTER ISLANDS AS A RESULT OF SPONSORED MIGRATION BETWEEN 1950-78 AND ASSOCIATED POPULATION GROWTH

Province	Individuals moved as sponsored migrants from 1950-78 (1)	Expected population in 1980 census based on sponsored movement (2)	Number of Javanese, Sundanese, Madurese and Balinese speakers enumerated in 1980 census (3)	2 ÷ 3, i.e., % of Javanese, Sundanese, Madurese and Balinese speakers in outer islands as a result of sponsored migration (4)	Total no. of people in each province (5)	2 ÷ 5, i.e., % of people in the province as a result of sponsored migration (6)	3 ÷ 5, i.e., % of people in province from the inner islands /a (7)
Aceh	7,641	8,694	175,349	5	2,610,528	0	7
North Sumatra	15,699	26,426	1,767,796	1	8,350,950	0	21
Riau	16,560	22,774	189,591	12	3,406,132	1	6
West Sumatra	26,763	38,185	56,106	68	2,163,896	2	3
Jambi	58,340	69,283	255,389	27	1,444,476	5	18
Bengkulu	29,470	36,007	134,932	27	767,988	5	18
South Sumatra	259,292	426,675	635,042	67	4,627,719	9	14
Lampung	220,489	347,958	3,400,807	10	4,624,238	8	74
Subtotal	634,254	976,002	6,615,012	15	27,995,927	3	24
West Kalimantan	31,381	41,832	197,624	21	2,484,901	2	8
Central Kalimantan	12,411	17,737	62,942	28	954,176	2	7
South Kalimantan	46,031	65,735	115,723	57	2,063,227	3	6
East Kalimantan	39,979	57,888	126,219	46	1,214,602	5	10
Subtotal	129,802	183,192	502,508	36	6,716,906	3	7
North Sulawesi	14,697	22,177	31,011	72	2,114,822	1	1
South Sulawesi	38,928	51,360	53,611	96	6,059,564	1	1
Central Sulawesi	50,639	63,104	71,623	88	1,284,528	5	6
Southeast Sulawesi	27,197	34,536	46,025	75	941,454	4	5
Subtotal	131,461	171,177	202,270	85	10,400,368	2	2
East Nusa Tenggara	155	257	3,248	8	2,736,988	0	0
Maluku	4,208	7,109	16,300	44	1,408,451	1	1
Irian Jaya	4,415	6,128	4,432/b	138	1,107,291	1	0
Subtotal	4,363	13,494	23,980	56	5,252,730	0	0
Total	899,880	1,343,865	7,343,770	18	50,365,931	3	15
Excluding North Sumatra and Lampung	663,692	969,481	2,175,167	45	37,390,743	3	6

/a Inner islands language speakers.

/b Error in Irian Jaya figure. Either 1980 census undercounts Javanese or migrants were actually moved after 1980 census was completed.

Todai International Lodge C-406
Shiroganedai 4-6-41, Minato-ku
Tokyo, Japan 108

Ms. Gloria Davis
World Bank
1818 H Street N.W.
Washington, D.C.
U.S.A. 20043

27 November 1985

Dear Gloria,

On bended knee I ask your forgiveness for the late delivery of my paper, which I am mailing to you today by express service under separate cover. I sincerely hope you can put it to use.

As you will see, I did some mixing of the survey data and case studies to try to look more closely than Tim or UNDP did at the regional question. From what I could understand from Byron's paper (the absence of explanatory footnotes made me give up trying to unravel a number of potentially interesting lines of investigation), the differences between the survey and the studies were not all that great on the points I was trying to look at. The data unfortunately wasn't rich enough in terms of off-site linkages to do very much about the idea of studying variations in site development within a single province (South Sumatra).

I think you knew the basic themes which I was going to elaborate from our many good discussions in Jakarta. I guess I can sum up my position by saying that I have become much more positive about transmigration as a planned/ supported activity, but I worry greatly that the current planning arrange- ments will miss most of the potential which the program could offer. You and I may still disagree about what I believe is your position that the achievement of an adequate basic needs level existence for transmigrants is a sign of success, but as I tried to say in the paper, transmigration not doing better in the "golden" decade of the 70's when the economy was booming was one thing, but given the budgets it now has and the employment situation which has arisen in the 1980's, it really must do better-- not only for the transmigrant's sake, but, because the options lost by giving that amount of money to a single activity are obviously many, also for the regional economies where transmigrants are destined.

I did receive the demographic data from you and Helen. Thanks very much. I did take it into account, but you'll see that it doesn't surface in the text. My understanding from Jakarta was that I would look backward, as it were, and do the kabupaten level analysis, and the Helen would take care of the projections which, at any rate, would probably diverge greatly from mine once you received the awaited for data from Jakarta. Concerning the data which I used, you will also see that in order to show the impact on regions, I used Peter Gardner's transmigration estimates for 71 to 80 which allowed me to use the census to generate provincial ratios. Also, if you look at the kabupaten data given to us by the Transmigration, it makes a distinction between time of targeted arrival and actual arrival, with virtually all of the actural arrival data beginning at the earliest in 1979, i.e., Repelita III. I therefore took this data to cover the Repelita III and IV period only, and not the Repelita II period. I hope this does not create too many disturbances with regard to data sets you have used. Finally, the kabupaten road data we recieved is nothing more than the mechanistic working out of predetermined road/kk ratios, so I did not use it in the text.

I would have loved to have had much more interaction with all of you during the write-up (so many details!). If there are any really serious problems, please let me know. I'll be at the above address (apt C-406 now) until 22 December (tel. 03-442-7177); then from 13 January at the Department of Urban and Regional Planning, Porteus 107, University of Hawaii 2424 Maile Way, Hawaii 96822.

I greatly enjoyed working with you and everyone else. It was a very good and supportive group of people.

Best regards,

Mike Douglass

Why debt has rescued us from economic oblivion

By Bill Neikirk
Chicago Tribune

Analysis

WASHINGTON — Every time someone criticizes America for no longer being competitive in the world, the hackles rise. The naysayers obviously are just trying to tear our country down.

What they don't realize is that America makes something that no one else in the world can match, and it is by far the most important commodity of all.

It's called debt.

We manufacture it more efficiently than any country in the world and, because the price is right, almost everyone wants to snap it up. To put it in economists' terms, we have a comparative advantage in debt throughout the globe.

The Japanese can't manufacture cars and the French can't make wine like we can manufacture debt. We make so much of it that we are flooding the market.

And our debt has rescued us from economic oblivion.

Let us talk about government debt first. It is approaching $2 trillion. The U.S. Treasury pays a nice interest rate to get people to buy the debt, so there are many takers, including investors from all over the world.

We are now pulling in $100 billion in capital because foreigners are willing to buy our debt securities. With this money, we have been able to get an economic recovery going and buy the nice things we all want.

"Why is everyone complaining about our debt to foreign countries?" asked a government economist. "It's a very nice arrangement. They give us goods and we give them paper."

Why are foreigners seemingly so stupid? Well, they are not that stupid. They figure this is a nice place to put money because the return is better than they can get anywhere else. America is also safer economically and politically than most other nations. Finally, they can't, or won't, make debt as well as we can.

Michael Mussa, a University of Chicago economist who soon will join the Reagan team in Washington, said the United States is following a rational policy lending so much to the rest of the world because we have a higher need for investment.

Why are we able to garner so much of this money? As Mussa figures it, the population in Western Europe and Japan is aging more rapidly than in the United States, where immigration is helping to keep us relatively young as a nation. More senior European and Japanese investors are looking for investment opportunities, and the United States is the most likely target.

The Japanese also save roughly 20 percent of their income (compared with less than 6 percent in the United States), and this creates a bigger pool of money than the creaky Japanese really need. So off to the United States it goes.

All this foreign capital sloshing around in our country pays for our consumer merry-go-round.

Like baseball, debt has become a national pastime. Consumers use credit cards to buy videotape recorders, and big-time investors use junk bonds to finance corporate takeovers. Consumer debt continues to set records, but that doesn't seem to phase people.

When interest rates rose too high for people to buy homes, financial institutions created variable-rate mortgages with lower initial rates to lure buyers. Other types of "creative financing" also were invented.

When bank interest rates rose too high for people to buy cars, the automobile companies stepped in and offered special incentives that featured rates as low as 7.5 percent.

Just when you think debt is going to disappear, companies find ways to make more of it.

When Ronald Reagan speaks of the dawning of a new entrepreneurial age, he is really talking about the nation's competitive vantage in creating debt.

Reagan himself has caugh spirit. He came into office as a get-balancer but has been con ed to a debt-creator. He once t Washington gathering: "I n worry about the deficit. The d is big enough to take care self."

Deficit financing has bee large under Reagan that the tional debt will have more doubled by the time he leave fice.

You skeptics who worry a product quality are spreading that one day we won't be very at manufacturing debt, that it turn shoddy like many of our products. When people lose c dence in our debt, you say, won't buy it anymore.

But you're wrong. We m good, Republican debt in this c try, not Democratic inflatio debt. It's strong, solid pa backed by Ronald Reagan Paul Volcker.

Ref. CMA/aj/85/128 16th December, 1985

To : I. Schuetz Mueller

From : Colin MacAndrews

Subject : Irian Jaya Study

A. In our discussions with various companies bidding on the Irian Jaya Study a number of points have come up in relation to the TOR which I think would be useful for your consultant who is doing the evaluation to be aware of. Basically these points address some of the things lacking in the present TOR but which are points that the Government of Indonesia would be looking for when they evaluate the best proposal. (In highsight we should have tried to include these in the TOR as the present TOR is far too technical and what we are looking for in fact is broader).

B. From the Government of Indonesia side would hope that proposals would include the following points :

1. The need for the team to work closely with the Bappeda and the local government at all levels. This study should be seen not only as a technical operation but as an institutional building process where the local government will take on the later implementation work. It is therefore critical that the bidding companies show an understanding of how local government in Indonesia is organised, the constraints of working with it and the importance of training their counterparts at all stages. Three fields where this is of particular importance are those of methods of data collection, data analysis, and policy decision making.

2. The need to examine and suggest the model of development that will encompass the needs and culture of the local people in Irian Jaya, particularly in view of the very diverse tribal backgrounds. They should also show they have the flexibility to adapt their findings and proposal plan as they go through the process of decision making with the policy makers in the Government. They should also demonstrate that they are fully aware of the fragile nature of the environment and ecosystems in this province.

.....2/-

3. The need to utilize local resources in Irian Jaya. These include the local university, the experience of the missionaries and of NGO's.

4. The need to put forward a well selected team both technically and in terms of team dynamics (i.e. the ability to work together in an isolated and difficult area). It is particularly important that they choose an experienced team leader who can work throughout the length of project (i.e. 24 months), who has the demonstrated ability to handle a project of this size both conceptionally and in terms of administration, and also can work effectively within the constraints of working at the local government level in Indonesia. The numbers of the team should also have the flexibility and background to work in these conditions. In all cases knowledge of Bahasa Indonesia and Indonesian experience is highly desirable.

5. We hope that the companies will have a section commenting on the TOR to show that they fully understood the study, be able to comment on any weaknesses and demonstrate to you their ability to formulate a practical but flexible approach to getting the study completed. They should in particular show that they are aware of the social administrative, managerial, physical and financial constraints on project selection and design.

C. In addition questions have been raised about :

1. Paragraph 4.10 (page 14). It is unclear as to what extent bidding firms should or can in fact provide all the short term consultants that might be needed in project preparation particularly as we have no idea of how many manmonths could be needed. We have told the companies that we would expect the team to provide in usual circumstances the 'core expertise' but are not expected to field all the possible short term staff.

.....3/-

2. The budget ceiling. A couple of firms are finding it difficult to budget all the costs including manmonths within the $2,25 million limit. We have told them to put in a realistic estimate and also indicate a 'perfect' scenerio of what they feel they would propose if there was no budget ceiling.

We would hope that your evaluator would keep these points in mind in looking at the proposals. They will certainly be given strong emphasis from the Government of Indonesian side.

cc : Ben Fisher (AEPTA)
Gloria Davis (AEPAGR4)
John Russell (RSI)
A. Patten (UNDP - Jakarta)

Colin MacAndrews
Chief Technical Advisor
PP PD INS / 83 / 013
CIPTA KARYA
Jl. Gaten Patah I / 1
Kebayoran Baru
Jakarta Selatan
Tel. 738116

Ms. Gloria Davis

AEPAGR 4

The World Bank

Washington

Glorié

Some of the remarks / observations on pp 1-528 might of be interest to the Transnational Review report.

Fatih

Jan 2

Record Removal Notice

The World Bank Group Archives & Records Management

File Title	Barcode No.
Gloria Davis - Chronological file - 1985 - 3	30084765

Document Date	Document Type
18 December, 1985	Board Record

Correspondents / Participants

To: Executive Directors and Alternates, President, Senior Vice Presidents, Senior Management Council, Vice Presidents, IFC, Directors and Department Heads, Bank and IFC

From: Vice President and Secretary

Subject / Title

Summary of Discussions at the Joint meeting of the Executive Directors of the Bank and IDA and the Board of Directors of IFC, November 21, 1985

Exception(s)

Additional Comments

Declassification review of this record may be initiated upon request.

The item(s) identified above has/have been removed in accordance with The World Bank Policy on Access to Information. This Policy can be found on the World Bank Access to Information website.

Withdrawn by	Date
Tonya Ceesay	17-Feb-16

COUNTRY: INDONESIA

Date: 9/11/84

1. OPPORTUNITY COST OF CAPITAL
(cut-off rate) 10.0%

---

2. CONVERSION FACTORS

(i)	SCF	General Conversion Factor 0.8	
(ii)	SWR	Rural Unskilled Labor: Java 0.65, Outer Islands 0.80	
(iii)	Other:	Industrial Plant and Machinery	0.85
		Other Traded Manuafactures	0.8
		Construction	0.8
		Non-traded services	0.75
		Transport	1.0

Gloria:

This was issued by the Programs Sometime ago.
Have we used similar assumptions?

Faleh
Jan 2

MIKE DOUGLASS
DURP - PORTEUS 107
UNIVERSITY OF HAWAII
2424 MAILE WAY
HONOLULU, HAWAII
U.S.A. 96822

Fresh Snow on Mt. Maehotaka

KAMIKOCHI 上高地風景 ● Photograph by Ahmad Mardo

Dear Gloria,

Wishing you a
very Merry Christmas
and a relaxing
New year!

Mike Douglas

From 13 Jan → '86

DURP--PORTEUS 107
UNIVERSITY OF HAWAII
2424 MAILE WAY
HONOLULU, HAWAII
U.S.A. 96822

郵便番号はハッキリと

日本郵便 60 8512.9.8-12 TAKANAWA

日本郵便 100 NIPPON

Ms. Gloria Davis
The World Bank
1818 H Street, N.W
Washington, D.C.
USA 20043

E 624

TANKEI MAISON AOYAMA 402 2-7-24 KITA-AOYAMA MINATO-KU TOKYO 107 TEL 03-405-1681~2

An Overview of Major Issues & Constraints related to Land clearing in the conversion of Tropical Moist Forests
Ross, M.S. & Donovan, D.G. 1983
Intern. Inaugural Wrkshp on Landclearing & Development for Increased Agricultural Production. Aug 22 - Sept 3 85. Jakarta

Lack of coordination and cooperation within the government administration resulting from division of sectoral responsibilities and intersectoral jealousies often results in an abominable waste of precious resources. With better interagency cooperation, collection of forest produce could provide raw materials for local forest products industries, both timber and non-timber based. Harvesting of similar raw materials from the permanent forest estate could thus be delayed and the produce conserved for future harvests.

Nationally then a much more attractive alternative would be to integrate land clearing with collection of those products of the forest which could be sold whilst at the same time preventing harvesting of similar products from the permanant forest estate.

Another problem in disposal of the vegetation concerns the location of the forests being cleared in relation to the potential markets. Often they are in relatively remote areas of a country and the cost of transportation makes their recovery at present uneconomical. A good example of this is the vast areas of the Amazon inaccessible to waterways. Providing waterways exist, however, the majority of the logs can be cheaply transported to points of loading for export or processing. If the alternative is to waste the resource as opposed to the possibility of utilisation by changing existing regulations, serious favourable consideration to do so should be given by governments.

6.5 Economic issues concerned with land clearing

Two major issues are at stake here: comparative costs and benefits of using one type of land clearing as opposed to the others and the effect of choosing mechanical land clearing on foreign exchange reserves of a particular country.

Several economic issues surround the choice of land-clearing method and effect the financial feasibility and economic soundness of land development as a whole. Moreover, the economic issues reach beyond area development projects to impinge on national development as well. As the selection and implementation of land clearing techniques can affect significantly the future productivity of the land, the choice of land clearing methods must be examined in the context of land development and each element of the economic feasibility examined in detail. These issues and their relationship is examined below.

From the point of view of the contractor, for any piece of land, the clearing operation is largely a temporary job. Mechanized methods are therefore favoured because of the speed and efficiency with which they clear the vegetation and their ease of operation and the mobility of the equipment. Planners argue that on the contrary, manual methods require more administrative and logistical support to provide for the needs of the labourers. Moreover, employing new settlers to clear their own land would require organization and training of a new labour force at each settlement site. Although more expensive, mechanical landclearing methods offer speed and ease of operation which are seen, largely by the contractor and the supervising government agency, as compensating advantages.

Political expediency also favours mechanical methods as it allows development targets to be met more quickly. Permitting the hasty development of land, however, may boomerang on government politicians. That the land may be rendered nearly useless for agricultural purposes by careless and improper land clearing may be of little concern to the contractor in charge of vegetation removal. It is, however, crucial to the success of the subsequent farming enterprises and land development as a whole.

The success of the land development projects will depend largely on the success of selecting a production system well suited to the land capability. As discussed above, however, the characteristics of the moist tropical forest ecosystem are such that the selection of a land clearing method can significantly affect land capability. The environmental impacts resulting from hasty land clearing operations can be corrected, however, the onus of this task falls to the farmer who may come to own the land. Even if the soil ameliorants would be available and delivered to the farm in a timely manner, the farm family would still be expected to provide the labour for the required remedial actions. Consequently we see that what has been the advantage to the land clearing contractor has become a cost to the farmer, the socio-economic class of society which is most probably the least able to support these costs. As previously discussed, these soil amendments are seldom available though often promised by the land developers. The result is reduced agricultural productivity which may eventually fall to such low levels as to jeopardize the feasibility of the farm itself as well as the feasibility of the entire land development effort.

Land clearing by manual methods on the other hand would not only have provided job opportunities and cash income for local villagers and the new settlers but also reduced damage to the soils and enabled recovery of the usable commercial forest products. The longer time period involved in land clearing would have allowed the planning and development of social infrastructure with the participation of the local settlers rather than its being provided as a <u>fait accompli</u>.

In the macroeconomic context, the choice of land clearing techniques can also be significant. Between the two extremes of methods available, manual and mechanical, the total cost and the recipients of these expenditures are vastly different, in fact in most cases worlds apart. The money spent on labour intensive manual land clearing would largely accrue to rural populations in the development areas. The necessary tools would also be purchased in country from local factories. The on-the-job training that would be required would benefit local people.

Mechanical land clearing methods on the other hand require heavy equipment which usually can only be purchased overseas, therefore requiring precious foreign exchange. Often specially skilled equipment operators must also be imported as well as replacement parts and maintenance materials. Again, however, the great advantage of the mechanical methods is their speed and ease of materials handling. Is this speed truly an advantage in the context of development, when more careful planning and execution might better serve the objective of

long-term sustained growth? A judicious combination of manual techniques and mechanical techniques could better serve national development objectives by expanding rural employment opportunities, utilizing the nation's natural resources in a more efficient manner, and utilizing financial resources in a more prudent and effective manner.

6.6 Social issues

While tropical forest land clearing may be done in remoter areas far from major population centers, the choice of a particular land clearing method may have significant social impacts. Selection of a socially favorable land clearing policy could increase rural employment opportunities, improve the skills of rural labour through on the job training. Moreover involvement of the prospective settlers in the initial stages of land use conversion will increase the citizenry's sense of participation and responsibility in the development process.

From Table 3, it can be seen that the labour requirements for the two different extremes of land clearing differ at least by a factor of ten (five mandays to 50 mandays per hectare for mechanical and manual methods respectively). The benefits which accrue in countries with large unemployed populations can be a massive help in temporarily relieving this problem. Other countries in the tropics do not have such population densities, e.g., Peninsular Malaysia, and therefore to implement a policy of manual land clearing would create many difficulties in trying to find sufficient labour for the job.

Low labour availability in forest areas and the logistical difficulties of organizing, managing and providing for a manual land clearing labour force are the major arguments put forth in opposition to manual land clearing methods. If the ultimate purpose of land clearing is to establish smallholder agricultural settlement in the area, then this argument appears fallacious. At some stage it will be necessary to move settlers into the area and these problems will be addressed. If these pioneers are expected to be responsible partners in the development process, experience has shown that their earliest involvement is most desirable. It is in the best interest of the new farmers as well as the nation for the potential settlers to clear their own land with environmentally less destructive methods and thus begin to take responsibility for their own future. Given the marginally productive existence from which most of the new settlers will be drawn, the opportunity cost for the settler would be expected to be minimal. The support of a socially responsible government agency would be vital to the success of such a program.

Distortions in market prices for goods and services, including labour, whether through subsidies, price fixing or other government intervention may make labour intensive land clearing operations uneconomic in some situations. For instance in Nigeria, a minimum wage policy setting the basic wage at 35 pounds (Nigerian) per week virtually precludes the widespread use of labor intensive technology such as manual land clearing by the private sector or government sponsored projects. Thus, despite the desperate need to increase employment opportunities in Nigeria, only small farmers use manual methods while others employ the heavy machinery for mechanical methods.

THE DEMOGRAPHIC IMPACT OF TRANSMIGRATION IN INDONESIA

(Hull)

The population impact of the transmigration program in Indonesia is mainly a function of the number of sponsored and spontaneous transmigrants who move permanently from the inner islands to the outer islands, and their fertility and mortality after they arrive. The first section of this paper uses existing data on the transmigration program from 1950 to 1978 combined with data from the 1980 census to estimate the demographic impact of the program thus far. Using what this suggests about the importance of spontaneous migration, the second section of this paper then projects the population of Indonesia from 1980 to 2020 under several scenarios about the level of sponsored and spontaneous migration.

I. Estimating Past Levels of Sponsored and Spontaneous Transmigration

While the Ministry of Transmigration keeps statistics about the number of families it settles, no direct statistics have recorded flows of spontaneous transmigration. The most recent census (November 1980) did not ask rural residents of the outer islands if they had been settled officially under the transmigration program, or if they had settled spontaneously. But the census did ask all respondents which language was their "mother tongue". From this question, the number of inner island language speakers living in rural areas of the outer islands in 1980 can be estimated. With this information, along with GOI data on sponsored transmigration, an estimate can be made about the relative importance of spontaneous and sponsored transmigration in the past. This can then be used to judge what might be reasonable scenarios for spontaneous transmigration associated with sponsored transmigration in the future.

Table 1 summarizes this exercise. Ministry of Transmigration statistics are used to derive the total number of individuals moved, by province, from 1950 to 1978 budget year (column 1). Since transmigrants are moved with a considerable lag from the budget year, the numbers of assisted migrants through budget year 1978 are assumed to be the actual flows of assisted transmigrants up to the time of the census in November 1980. Population projections were then made of the number of people that would result from the flows of sponsored families over time at the time of the census (1). These projections were based upon fertility and mortality rates from each province over the period. Cohort projections were made using these fertility and mortality rates applied to a typical age-sex structure for transmigrants (column 2, Table 1) to estimate the population in end-1980 resulting from the sponsored settlers. The age-sex structure for migrants when they move was assumed to be the same as that derived from a sample of 1130 transmigrants on arrival at Baturaja in 1983/84 (2).

The number of people in the 1980 census who responded that their mother tongue is Javanese, Sundanese, Madurese or Balinese (column 3, Table 1) is assumed to reflect all the residents in Sumatra, Kalimantan, Sulawesi, East Nusa Tenggara, Maluku and Irian Jaya originally from the inner islands. For this exercise, Lampung, North Sumatra and Irian Jaya are dropped from the outer islands. Since this exercise is intended to link sponsored migration from 1950 to 1978 to spontaneous flows, the provinces of Lampung and North Sumatra are excluded, because they are the two provinces with sizeable flows prior to 1950 (from Dutch-sponsored resettlement of Javanese laborers to Sumatran plantations in the 1920s and 1930s) (3). Irian Jaya is also excluded because of data problems; it appears that there was an significant undercount in the 1980 census in Irian Jaya.

By subtracting the number of rural residents who speak an inner island

Table 1: Population in the Outer Islands as a Result of Sponsored Migration between 1950-78 and Associated Population Growth

PROVINCE*	Individuals moved as sponsored migrants from 1950-78 (1)	Expected population, 1980 census from sponsored movement** (2)	Number of Inner Island Language speakers enumerated in 1980 census, Rural Areas (3)	(3)-(2) Rural Excess (Spontaneous Migrants) (4)	(4)/(1) Ratio of Spontaneous to Sponsored Migrants Rural only (5)	(2)/(3) % of Inner Island Language Speakers moved as sponsored migrants (6)	Provincial Population, 1980 Rural Only (7)	Total (8)	% of population as a result of sponsored migration Rural Only (9) (2)/(7)	Total (10) (2)/(8)	% of Rural areas Speaking Inner Island Language (11) (4)/(7)
Aceh	9692	10933	156,266	145,333	15.0	7%	2,377,027	2,610,528	0%	0%	7%
Riau	16563	22777	148,263	125,486	7.6	15%	1,575,684	3,406,132	1%	1%	9%
West Sumatra	35986	48257	52,704	4,447	0.1	92%	2,973,012	2,163,896	2%	2%	2%
Jambi	70703	82783	236,211	153,428	2.2	35%	1,261,630	1,444,476	7%	6%	19%
Bengkulu	30619	37262	132,207	94,945	3.1	28%	695,566	767,988	5%	5%	19%
South Sumatra	262450	430124	585,792	155,668	0.6	73%	3,360,710	4,627,719	13%	9%	17%
Subtotal	426,014	632,136	1,311,443	679,307	1.6	48%	12,243,629	15,020,739	5%	4%	11%
West Kalimantan	32644	43211	153,423	110,212	3.4	28%	2,067,968	2,484,901	2%	2%	7%
Central Kalimantan	14516	20036	35,971	15,935	1.1	56%	855,919	954,176	2%	2%	4%
South Kalimantan	50163	70247	97,320	27,073	0.5	72%	1,622,326	2,063,227	4%	3%	6%
East Kalimantan	41279	59307	62,257	2,950	0.1	95%	729,383	1,214,602	8%	5%	9%
Subtotal	138,602	192,802	348,971	156,169	1.1	55%	5,275,596	6,716,906	4%	3%	7%
North Sulawesi	17757	25518	29,912	4,394	0.2	85%	1,760,215	2,114,822	1%	1%	2%
South Sulawesi	42206	54940	51,131	(3,809)	-0.1	107%	4,963,489	6,059,564	1%	1%	1%
Central Sulawesi	55489	68400	70,907	2,507	.0	96%	1,169,056	1,284,528	6%	5%	6%
Southeast Sulawesi	31683	39435	45,122	5,687	0.2	87%	853,598	941,454	5%	4%	5%
Subtotal	147,135	188,293	197,072	8,779	0.1	96%	8,746,358	10,400,368	2%	2%	2%
East Nusa Tenggara	2132	2416	745	(1,671)	-0.8	324%	2,531,521	2,736,988	0%	0%	0%
Maluku	4218	7120	15,913	8,793	2.1	45%	1,255,507	1,408,451	1%	1%	1%
Total	718,101	1,022,767	1,874,144	851,377	1.2	55%	30,052,611	36,283,452	3%	3%	6%

* Exclude North Sumatra and Lampung provinces because of large migrant communities settled there prior to WWII. Exclude Irian Jaya because of probable census error (number of Javanese, Madurese and Balinese speakers enumerated in census less than number would expect from sponsored movement (or they deserted).

** Including offspring of sponsored migrants

language from the projected population from sponsored transmigration, one can estimate the number of inner island language speakers living in rural areas of the outer islands that are not sponsored transmigrants or offspring of sponsored transmigrants (column 4, Table 1).

As many micro-level studies of transmigration communities have shown, almost all of these spontaneous settlers have moved as a result of chain migration. With the exception of the government's sponsored program, virtually no one moves to transmigration areas without friends or relatives in the destination area who can provide them with information about what to expect, a place to stay and other help getting started in the new area. The move would otherwise be unacceptably risky for a poor laborer from the inner islands.

The ratio of rural spontaneous traansmigrants to sponsored transmigrants is highest in Sumatra, particularly in Aceh and Riau. In South Sulawesi and East Nusa Tenggara the ratio is negative (the number of "excess rural migrants" is negative). In Sulawesi, this is partly explained by the anomoly that many spontaneous migrants there have registered as sponsored. In East Nusa Tenggara, the number of excess rural migrants is also negative. This could be due to a census undercount in rural areas there, or could arise from high desertion rates from sponsored migration. Overall, the ratio of rural spontaneous to sponsored transmigrants observed in 1980 is 1.2 to 1. This ratio is a crude measure of the association between sponsored and spontaneous migration. It does not indicate how many spontaneous transmigrants will eventally be attracted to these areas, but does show a strong relationship between the two types of migration flows.

Overall, the percent of the rural population in the outer islands from

sponsored migration is 3%. This rises to 13% for South Sumatra. The percent in rural areas speaking inner island languages (both sponsored and spontaneous transmigrants as well as their children) is only 6%, but again this rises to 11% for all of Sumatra, and 19% for both Jambi and Bengkulu.

Modeling Chain Migration

In explaining the differences in the ratio of rural spontaneous to sponsored transmigrants between provinces, one would like to model how chain migration occurs. Information is readily available only on the sponsored transmigrant's length of residence in the destination area (flows of official transmigrants are available by receiving province by year). Many other factors are expected to be important as well in explaining how many transmigrants eventually move as a result of one household's move. These factors include length of residence of that household in the destination province, availability of land near the household, income levels in both destination and origin, and distance between destination and origin. Holding all of the other factors constant and focusing on length of residence only, we asked the question what intensity and shape of chain migration can predict the number of inner island language speakers present in rural areas of the outer islands at the time of the 1980 census.

Both the shape and intensity of pull of associated migration resulting from one household's move can vary over time. There are an infinite number of curves one could argue may represent this force of chain migration over time. The pull may be insignificant at first, while friends and neighbors wait to hear if there are opportunities for them in the migrant's new home. Once the migrant sends for relatives and friends, associated migration may peak and then diminish over time (although the relatives and friends may induce, in turn, other migrants). To simplify the picture, we considered

only a fixed pull of associated migration, lasting for a limited period of time. A transmigrant (either sponsored or spontaneous) moves, and then for a fixed time period induces a fixed proportion of transmigrants per year. Those migrants, in turn, induce other migrants. The following tabulations illustrate the population impact, starting with 100 sponsored transmigrants in the year 1980, of different time periods and factors of associated migration.

Cumulative Number of Transmigrants from 1980 to 2020 as a Result of 100 Sponsored transmigrants moved in 1980 under Alternative Assumptions about associated Migration (the length of time and intensity of associated migration (percent of migrants induced per year))

Spontaneous Migration Assumptions (Time Period and Intensity)	Year				
	1980	1990	2000	2010	2020
GOI Method	25	25	25	25	25
5 year time period					
2% per year	0	11	11	11	11
5% per year	0	33	33	33	33
7.5% per year	0	56	60	60	60
10% per year	0	86	98	100	100
10 year time period					
2% per year	0	22	25	25	25
5% per year	0	63	88	96	99
7.5% per year	0	106	181	228	256
10% per year	0	159	337	518	700
20 year time period					
2% per year	0	22	49	57	63
5% per year	0	63	165	255	351
7.5% per year	0	106	325	632	1112
10% per year	0	159	573	1409	3203

The GOI method shown in the table assumes that very low levels of spontaneous transmigration are produced from sponsored transmigration--every 100 spontaneous transmigrants induce 25 associated spontaneous

transmigrants in that year and in that year only. Under this assumption, spontaneous transmigrants do not, in turn, induce other spontaneous transmigrants. The other columns in the above tabulation illustrate the cumulative number of transmigrants under alternative assumptions about the length and intensity of spontaneous attraction. In the first year, the 100 sponsored transmigrants do not induce any associated migration. Following that year for 5, 10 or 20 years associated migration occurs at a fixed rate. The assumptions in the tabulation result in cumulative numbers of associated transmigrants in the year 2020 from as low as 11 to as high as 3203.

To get an idea of what level of migration might explain the flows shown in Table 1, a ten year period was imposed (somewhat arbitrarily) as the length of time that spontaneous migration occurs following another transmigrant's move, and alternative coefficients for the intensity of migration pulls were tested, iteratively, until the number of rural spontaneous transmigrants or spontaneous transmigrant's offspring shown in Table 1 (851,377) was approximated (the 851,377 refers to the number of people living in rural areas whose native language is an inner island language in excess of the number explained by sponsored transmigrants and their offspring). The coefficient that accurately predicted the number of people speaking inner island languages living in rural areas in the outer islands that were not sponsored transmigrants or their offspring was 7.9% (a transmigrant attracts other transmigrants for a ten year period following the move, at .079 people per year). In making this calculation, the population growth of spontaneous transmigrants was incorporated into the assumptions.

Figure 1 plots the cumulative number of sponsored transmigrants sent

Figure 1
Cumulative Sponsored and Projected Spontaneous Transmigrants
to the Outer Islands: 1950 to 1978

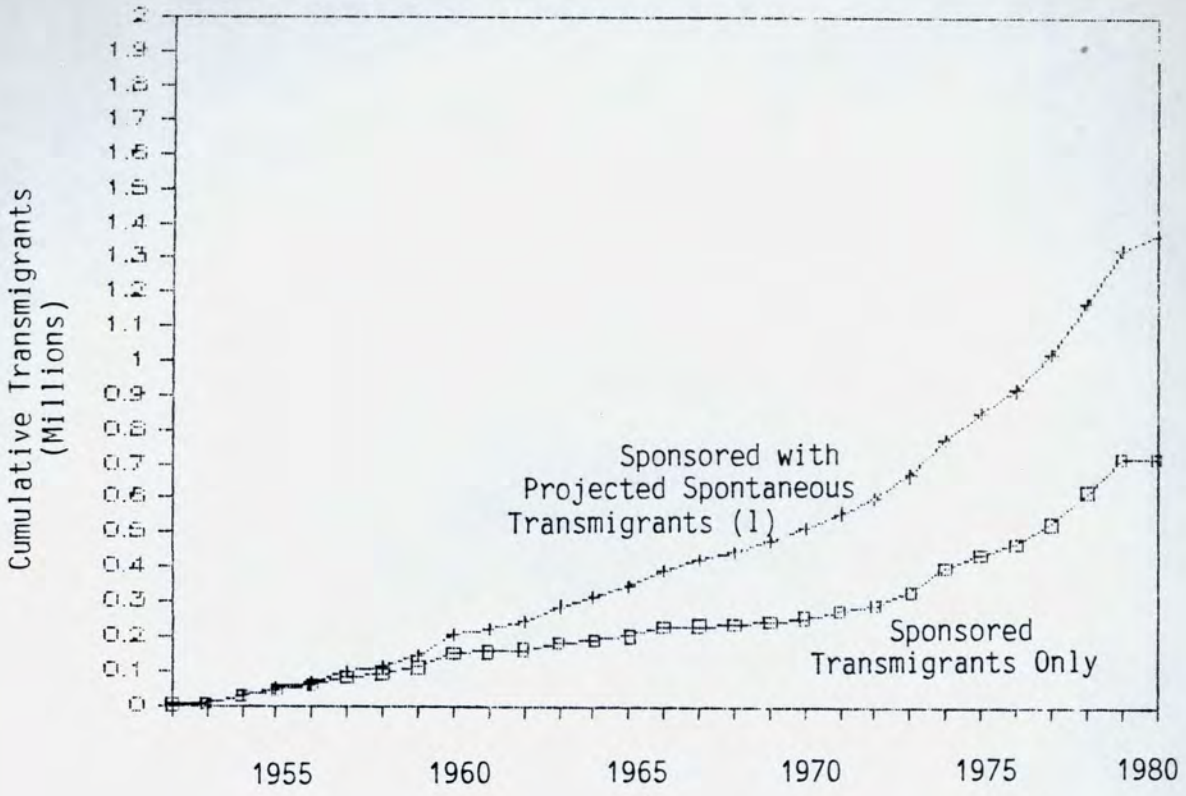
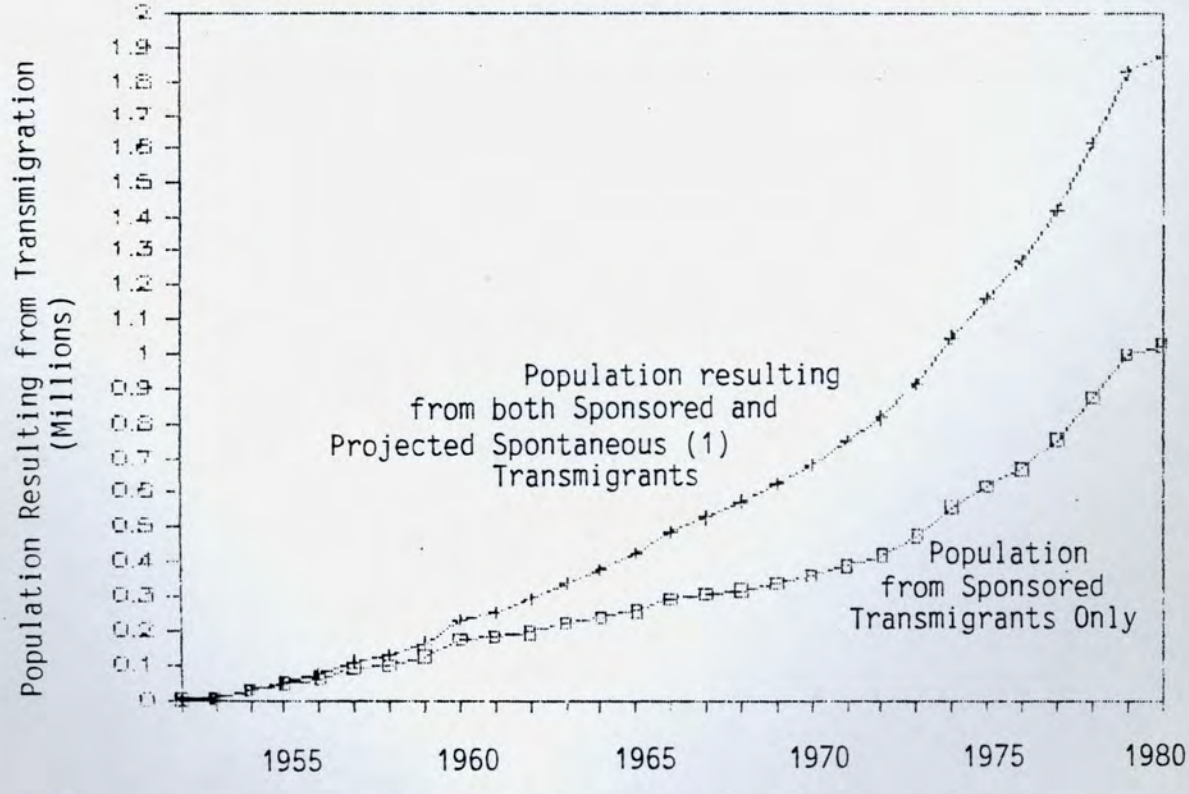


Figure 2
Rural Population Impact of Sponsored and Projected
Spontaneous Transmigrants to the Outer Islands: 1950 to 1980



(1) Pull factor assumed to be 7.9% per year for ten years (see text)

to the outer islands (excluding those to Lampung, North Sumatra, and Irian Jaya as discussed before) from 1950 to 1978. In total, about 720,000 individuals were moved. In Figure 2, the lower curve shows the population resulting directly from those sponsored transmigrants over the period 1950 to 1980 (about 1.02 million people in 1980). In order to reach the number of inner island language speakers enumerated in rural areas of the Outer Islands in the 1980 census (excluding Lampung, North Sumatra and Irian Jaya), 1.87 million people, each sponsored transmigrant would have to attract .079 people per year for 10 years, with those transmigrants in turn attracting others at the same rate. Using this coefficient, the cumulative number of sponsored and projected spontaneous transmigrants is shown in Figure 1 (about 1.4 million people in 1980), and the population impact resulting from both groups (Figure 2) is 1.87 million people, the number of inner island language speakers enumerated in rural areas of the Outer Islands in the 1980 census.

This exercise, using crude assumptions about the form of spontaneous migration, simply illustrates the strong association in the past between sponsored and spontaneous migration, even though GOI policy did not intentionally facilitate spontaneous transmigration over the period. If GOI policy towards transmigration site development was redirected to stimulate the flow of spontaneous transmigration, the pull would be even higher, while if policies did nothing to facilitate transmigration, the pull might decrease over time as the constraint of land availability increased. Two assumptions about the degree of spontaneous migration associated with sponsored migration will be used to estimate the demographic impact of alternative levels of transmigration in Repelita IV, V, and VI. Both assumptions assume that continuing spontaneous migration continues for a fixed period of ten years following a transmigrant, but the

first assumption assumes that .05 people are attracted every year, and the second assumes that .075 people are attracted every year, numbers that seem reasonable, or perhaps a little conservative, given the above estimate of spontaneous migration from 1950 to 1978.

II. Population Projections for Inner and Outer Islands of Indonesia under alternative levels of Sponsored and Spontaneous Transmigration: 1980 to 2020

In Repelita III, approximately 320,000 sponsored transmigrant families were settled in the Sumatra, Kalimantan, Sulawesi and the Moluccas and Irian Jaya. Of these, approximately 10% were local families already residing near transmigration sites. Thus, about 290,000 families were moved from the inner islands to the outer islands under Repelita III. The pace at which sponsored transmigration will continue over the next two decades is unclear, due to budgetary, land, and implementation constraints. Four levels of sponsored migration were chosen to estimate the population impact of the transmigration program in Repelitas IV, V and VI. The scenarios range from the lowest, where only 270,000 more families are moved officially from the inner islands (less than the number moved under Repelita III alone), to the highest scenario of 1,350,000 families moved. Tables 1.1 to 1.4 show the projected yearly movement of families to provinces in the outer islands under the four levels of sponsored transmigration. A distinction must be made here between numbers moved by the Minstry of Transmigration and numbers settled. Numbers moved exclude the local residents settled under the program.

The potential population impact of this movement on the outer islands depends upon several factors including the rate at which sponsored transmigrants or their offspring might return to the inner islands, their

LEVELS OF SPONSORED TRANSMIGRATION FROM 1980 TO 1999 UNDER FOUR SCENARIOS
(numbers refer to families and exclude locals settled in transmigration sites)

TABLE 1.1 - LOWEST SCENARIO

	Total Families Settled	
	Excluding Locals	Including Locals
REPELITA III	288564	320627
REPELITA IV	180000	200000
REPELITA V	90000	100000
REPELITA VI	0	0

Receiving Provinces	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99
Aceh	2322	3352	3951	781	403	419	0	0	0	0	0	0	0	0	0	0	0	0	0
North Sumatra	770	1787	977	3045	1037	1076	603	666	722	0	0	0	0	0	0	0	0	0	0
West Sumatra	1800	357	936	1225	518	538	603	333	361	0	0	0	0	0	0	0	0	0	0
Riau	609	11057	6766	5118	2995	3110	3014	3330	3608	1500	1537	1304	1429	1452	0	0	0	0	0
Jambi	3765	3416	2326	7615	4147	4306	4822	4329	3207	1286	1317	1043	1143	1161	0	0	0	0	0
South Sumatra	20653	22206	16346	10698	5184	4306	4822	4662	3608	1500	1537	1304	1429	1452	0	0	0	0	0
Bengkulu	2336	1511	3250	2693	922	538	301	333	361	0	0	0	0	0	0	0	0	0	0
Lampung	4684	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	36939	43686	34552	31175	15206	14292	14166	13653	11866	4286	4390	3652	4000	4065	0	0	0	0	0
West Kalimantan	1689	5778	5830	7250	4147	4306	4822	4070	4410	2357	2415	1826	2000	1742	0	0	0	0	0
Central Kalimantan	2005	3665	4302	6689	3859	4007	3684	3478	3768	1929	1976	2348	2571	2613	0	0	0	0	0
South Kalimantan	5192	6330	3308	2683	1555	1076	1206	888	802	429	0	0	0	0	0	0	0	0	0
East Kalimantan	1892	2568	2299	5301	3110	3767	4220	4440	4811	2571	2634	2348	2571	2613	0	0	0	0	0
Subtotal	10778	18340	15739	21923	12672	13156	13931	12876	13791	7286	7024	6522	7143	6968	0	0	0	0	0
South Sulawesi	585	675	1098	1876	1037	658	603	0	0	0	0	0	0	0	0	0	0	0	0
Central Sulawesi	2135	5024	2946	3147	1555	1076	603	666	361	0	0	0	0	0	0	0	0	0	0
S.E. Sulawesi	3535	5306	4130	2749	1555	1076	603	666	361	0	0	0	0	0	0	0	0	0	0
N. Sulawesi	1094	1500	329	608	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moluku and T.T.	1347	1796	2282	1742	864	897	670	740	0	0	0	0	0	0	0	0	0	0	0
Subtotal	8697	14301	10785	10121	5011	3708	2478	2072	722	0	0	0	0	0	0	0	0	0	0
Irian Jaya	2269	2419	4826	3038	3110	4844	5425	7400	9621	6429	6585	7826	6857	6968	0	0	0	0	0
Total	58683	78746	65902	66257	36000	36000	36000	36000	36000	18000	18000	18000	18000	18000	0	0	0	0	0

TABLE 1.2 - LOW SCENARIO

	Total Families Settled	
	Excluding Locals	Including Locals
REPELITA III	288564	320627
REPELITA IV	270000	300000
REPELITA V	180000	200000
REPELITA VI	0	0

Receiving Provinces	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99
Aceh	2322	3352	3951	781	700	700	0	0	0	0	0	0	0	0	0	0	0	0	0
North Sumatra	770	1787	977	3045	1800	1800	900	900	900	0	0	0	0	0	0	0	0	0	0
West Sumatra	1800	357	936	1225	900	900	900	450	450	0	0	0	0	0	0	0	0	0	0
Riau	609	11057	6766	5118	5200	5200	4500	4500	4500	3500	3500	2500	2500	2500	0	0	0	0	0
Jambi	3765	3416	2326	7615	7200	7200	7200	5850	4000	3000	3000	2000	2000	2000	0	0	0	0	0
South Sumatra	20653	22206	16346	10698	9000	7200	7200	6300	4500	3500	3500	2500	2500	2500	0	0	0	0	0
Bengkulu	2336	1511	3250	2693	1600	900	450	450	450	0	0	0	0	0	0	0	0	0	0
Lampung	4684	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	36939	43686	34552	31175	26400	23900	21150	18450	14800	10000	10000	7000	7000	7000	0	0	0	0	0
West Kalimantan	1689	5778	5830	7250	7200	7200	7200	5500	5500	5500	5500	3500	3500	3000	0	0	0	0	0
Central Kalimantan	2005	3665	4302	6689	6700	6700	5500	4700	4700	4500	4500	4500	4500	4500	0	0	0	0	0
South Kalimantan	5192	6330	3308	2683	2700	1800	1800	1200	1000	1000	0	0	0	0	0	0	0	0	0
East Kalimantan	1892	2568	2299	5301	5400	6300	6300	6000	6000	6000	6000	4500	4500	4500	0	0	0	0	0
Subtotal	10778	18340	15739	21923	22000	22000	20800	17400	17200	17000	16000	12500	12500	12000	0	0	0	0	0
South Sulawesi	585	675	1098	1876	1800	1100	900	0	0	0	0	0	0	0	0	0	0	0	0
Central Sulawesi	2135	5024	2946	3147	2700	1800	900	900	450	0	0	0	0	0	0	0	0	0	0
S.E. Sulawesi	3535	5306	4130	2749	2700	1800	900	900	450	0	0	0	0	0	0	0	0	0	0
N. Sulawesi	1094	1500	329	608	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moluku and T.T.	1347	1796	2282	1742	1500	1500	1000	1000	0	0	0	0	0	0	0	0	0	0	0
Subtotal	8697	14301	10785	10121	8700	6200	3700	2800	900	0	0	0	0	0	0	0	0	0	0
Irian Jaya	2269	2419	4826	3038	5400	8100	8100	10000	12000	15000	15000	15000	12000	12000	0	0	0	0	0
Total	58683	78746	65902	66257	62500	60200	53750	48650	44900	42000	41000	34500	31500	31000	0	0	0	0	0

TABLE 1.3 - INTERMEDIATE SCENARIO

	Total Families Settled	
	Excluding Locals	Including Locals
REPELITA III	288564	320627
REPELITA IV	360000	400000
REPELITA V	360000	400000
REPELITA VI	180000	200000

Receiving Provinces	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99
Aceh	2322	3352	3951	781	900	900	700	0	0	0	0	0	0	0	0	0	0	0	0
North Sumatra	770	1787	977	3045	2700	2700	1800	1800	900	1000	1000	1000	500	500	250	250	0	0	0
West Sumatra	1800	357	936	1225	900	900	900	450	450	500	500	500	500	500	250	250	0	0	0
Riau	609	11057	6766	5118	6750	8550	8550	6750	6750	6500	6000	5500	5000	5000	3000	3000	3000	2000	2000
Jambi	3765	3416	2326	7615	7200	5850	5850	5850	5850	5500	5000	4500	4000	4000	3000	3000	3000	2000	2000
South Sumatra	20653	22206	16346	10698	10800	9000	9000	6300	5400	5000	5000	4500	3000	3000	1500	1500	1000	1000	1000
Bengkulu	2336	1511	3250	2693	1600	900	450	450	450	500	500	0	0	0	0	0	0	0	0
Lampung	4684	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	36939	43686	34552	31175	30850	28800	27250	21600	19800	19000	18000	16000	13000	13000	8000	8000	7000	5000	5000
West Kalimantan	1689	5778	5830	7250	7200	9000	9000	11700	11700	14000	14000	12000	12000	10000	6000	6000	5000	5000	3000
Central Kalimantan	2005	3665	4302	6689	9000	10800	10800	11700	11700	12000	12000	10000	10000	8000	5000	5000	3000	3000	3000
South Kalimantan	5192	6330	3308	2683	2700	2700	1800	1800	1800	2000	2000	2000	2000	2000	1000	1000	1000	1000	1000
East Kalimantan	1892	2568	2299	5301	5400	6300	8100	8100	8100	8000	8000	8000	8000	7000	5000	5000	3000	3000	2000
Subtotal	10778	18340	15739	21923	24300	28800	29700	33300	33300	36000	36000	32000	32000	27000	17000	17000	12000	12000	9000
South Sulawesi	585	675	1098	1876	1800	1800	900	0	0	0	0	0	0	0	0	0	0	0	0
Central Sulawesi	2135	5024	2946	3147	2700	1800	900	900	900	500	0	0	0	0	0	0	0	0	0
S.E. Sulawesi	3535	5306	4130	2749	2700	1800	1800	900	900	500	0	0	0	0	0	0	0	0	0
N. Sulawesi	1094	1500	329	608	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moluku and T.T.	1347	1796	2282	1742	1500	1500	1000	1000	1000	1000	0	0	0	0	0	0	0	0	0
Subtotal	8697	14301	10785	10121	8700	6900	4600	2800	2800	2000	0	0	0	0	0	0	0	0	0
Irian Jaya	2269	2419	4826	3038	5400	8100	12600	14400	16000	20000	23000	23000	25000	25000	20000	15000	15000	15000	15000
Total	58683	78746	65902	66257	69250	72600	74150	72100	71900	77000	77000	71000	70000	65000	45000	40000	34000	32000	29000

TABLE 1.4 - HIGH SCENARIO

	Total Families Settled	
	Excluding Locals	Including Locals
REPELITA III	288564	320627
REPELITA IV	450000	500000
REPELITA V	450000	500000
REPELITA VI	450000	500000

Receiving Provinces	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99
Aceh	2322	3352	3951	781	900	900	700	500	500	500	500	0	0	0	0	0	0	0	0
North Sumatra	770	1787	977	3045	3500	3500	2700	2700	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
West Sumatra	1800	357	936	1225	1800	1800	1800	900	450	500	500	500	500	500	500	500	500	500	500
Riau	609	11057	6766	5118	9000	11000	11000	8550	8550	8500	8500	7500	7500	7500	6500	6500	6500	6500	6500
Jambi	3765	3416	2326	7615	8200	8200	8200	7650	5800	5800	5800	4800	4800	4800	4800	4800	4800	4800	4800
South Sumatra	20653	22206	16346	10698	10800	10800	9000	9000	9000	7000	7000	7000	7000	7000	6000	6000	6000	6000	6000
Bengkulu	2336	1511	3250	2693	2500	1800	1800	900	900	900	900	400	400	400	400	400	400	400	400
Lampung	4684	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	36939	43686	34552	31175	36700	38000	35200	30200	27000	25000	25000	22000	22000	22000	20000	20000	20000	20000	20000
West Kalimantan	1689	5778	5830	7250	7200	10800	13500	16500	16500	16500	14500	14500	14500	12500	12500	12500	12500	12500	12500
Central Kalimantan	2005	3665	4302	6689	9000	11700	12500	14500	14500	12500	12500	12500	12500	10500	10500	10500	10500	10500	10500
South Kalimantan	5192	6330	3308	2683	2700	2700	2700	2700	3500	3500	3500	3500	2500	2500	2500	2500	2500	2500	2500
East Kalimantan	1892	2568	2299	5301	5400	6300	8100	10500	10500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500
Subtotal	10778	18340	15739	21923	24300	31500	36800	44200	45000	45000	43000	43000	42000	38000	38000	38000	38000	38000	38000
South Sulawesi	585	675	1098	1876	1800	1800	900	900	0	0	0	0	0	0	0	0	0	0	0
Central Sulawesi	2135	5024	2946	3147	3000	2700	1800	1800	1800	1000	1000	1000	1000	0	0	0	0	0	0
S.E. Sulawesi	3535	5306	4130	2749	2700	1800	1800	1800	1800	1600	1000	1000	1000	0	0	0	0	0	0
N. Sulawesi	1094	1500	329	608	500	500	0	0	0	0	0	0	0	0	0	0	0	0	0
Moluku and T.T.	1347	1796	2282	1742	1500	1500	1500	1500	1400	1400	1000	1000	1000	0	0	0	0	0	0
Subtotal	8697	14301	10785	10121	9500	8300	6000	6000	5000	4000	3000	3000	3000	0	0	0	0	0	0
Irian Jaya	2269	2419	4826	3038	5600	8100	16000	16600	20000	20000	20000	20000	25000	25000	30000	30000	30000	35000	35000
Total	58683	78746	65902	66257	76100	85900	94000	97000	97000	94000	91000	88000	92000	85000	88000	88000	88000	93000	93000

Table 2

Population Projections for Inner and Outer Islands of Indonesia under alternative levels of sponsored and spontaneous transmigration: 1980-2020 (1)
('000 of people; parentheses indicate negative numbers)

Scenarios	OUTER ISLANDS POPULATION PROJECTIONS									Population, year 2020 as proportion of population with natural increase only	Absolute Difference in Population with migration and without	INNER ISLANDS POPULATION PROJECTIONS									Population, year 2020 as proportion of population with natural increase only	Absolute Difference in Population with migration and without
	1980	1985	1990	1995	2000	2005	2010	2015	2020			1980	1985	1990	1995	2000	2005	2010	2015	2020		
Natural Increase Only (2)	50,479	57,948	65,571	73,141	80,429	87,781	94,856	101,262	106,753	1.00	0	96,280	106,659	116,558	126,579	135,877	144,749	152,954	161,215	169,136	1.00	0
Lowest sponsored																						
No spontaneous	50,479	59,318	67,885	76,061	83,650	91,319	98,716	105,421	111,164	1.04	4,411	96,280	105,315	114,330	123,805	132,860	141,483	149,443	157,456	165,146	0.98	(3,991)
Low spontaneous	50,479	59,476	68,570	77,354	85,585	93,764	101,558	108,593	114,620	1.07	7,867	96,280	105,160	113,661	122,555	130,999	139,152	146,762	154,472	161,882	0.96	(7,254)
High spontaneous	50,479	59,560	68,992	78,254	87,179	96,109	104,641	112,377	119,107	1.12	12,354	96,280	105,078	113,250	121,682	129,457	136,896	143,813	150,853	157,560	0.93	(11,576)
Low sponsored																						
No spontaneous	50,479	59,437	68,412	76,950	84,636	92,402	99,898	106,698	112,524	1.05	5,771	96,280	105,198	113,816	122,948	131,922	140,467	148,349	156,281	163,892	0.97	(5,244)
Low spontaneous	50,479	59,594	69,174	78,479	87,059	95,541	103,578	110,826	117,035	1.10	10,283	96,280	105,044	113,073	121,466	129,586	137,466	144,866	152,385	159,617	0.94	(9,519)
High spontaneous	50,479	59,679	69,637	79,524	89,004	98,481	107,503	115,688	122,846	1.15	16,093	96,280	104,961	112,620	120,451	127,701	134,632	141,105	147,724	154,007	0.91	(15,129)
Medium sponsored																						
No spontaneous	50,479	59,467	68,973	78,424	86,869	94,867	102,589	109,610	115,639	1.08	8,887	96,280	105,169	113,266	121,511	129,764	138,119	145,818	153,554	160,967	0.95	(8,170)
Low spontaneous	50,479	59,625	69,786	79,993	89,981	99,286	108,023	115,825	122,463	1.15	15,710	96,280	105,014	112,472	119,991	126,748	133,866	140,634	147,639	154,390	0.91	(14,746)
High spontaneous	50,479	59,709	70,277	81,177	92,395	103,221	113,545	122,883	131,162	1.23	24,409	96,280	104,931	111,992	118,840	124,403	130,059	135,321	140,842	146,003	0.86	(23,134)
High sponsored																						
No spontaneous	50,479	59,498	69,454	79,481	89,036	97,265	105,210	112,447	118,678	1.11	11,925	96,280	105,139	112,794	120,483	127,658	135,823	143,342	150,886	158,100	0.93	(11,036)
Low spontaneous	50,479	59,655	70,319	81,055	92,687	102,804	112,296	120,664	127,853	1.20	21,100	96,280	104,984	111,950	118,960	124,112	130,475	136,552	143,029	149,285	0.88	(19,851)
High spontaneous	50,479	59,740	70,838	82,355	95,475	107,590	119,265	129,762	139,186	1.30	32,433	96,280	104,901	111,442	117,695	121,400	125,836	129,831	134,244	138,258	0.82	(30,878)

(1) Inner Islands include Java, Bali and Lombok. Outer Islands refer primarily to Sumatra, Kalimantan, Sulawesi, Irian Jaya, and Moluku.
There are four levels of sponsored migration projected (including locals settled):

Lowest: 300,000 families settled over Repelita IV and V (270,000 families moved).
Low: 500,000 families settled over Repelita IV and V (450,000 families moved).
Medium: 1,000,000 families settled over Repelita IV, V and VI ~~1,350,000 families moved~~. (900,000 families moved).
High: 1,5000,000 families settled over Repelita IV, V and VI. (1,350,000 families moved).

Another 305,000 families were included in the population impact of all levels of sponsored migration because they were moved under Repelita III from 1980/81 to 1984/85. In calculating the demographic impact, only those families settled who were actually moved from another island were included, i.e. locals, approximately 10% of the total sponsored, were excluded. There are three levels of spontaneous migration under each level of sponsored migration: no spontaneous migration, low spontaneous migration, and high spontaneous migration. For the purposes of the projections, low spontaneous migration is defined as each mover attracting .05 people per year for ten years. High spontaneous migration is defined as each mover attracting .075 people per year for ten years. Movers are both sponsored migrants and spontaneous migrants.

(2) Fertility rates and mortality rates decline over the period to replacement level by the year 2010 for the inner islands and 2020 for the outer islands. Total fertility is projected to decline as follows:

	1980-84	1985-89	1990-94	1995-2000	2000-04	2005-09	2010-14	2015-19
INNER ISLANDS								
TFR	4.16	3.70	3.17	2.76	2.48	2.20	2.17	2.15
E(o) males	53	55	57	59	62	65	67	68
E(o) females	56	58	61	63	66	69	70	72
OUTER ISLANDS								
TFR	4.94	4.33	3.63	3.11	2.88	2.65	2.43	2.2
E(o) males	55	58	60	62	63	64	64	65
E(o) females	58	61	64	66	67	67	68	69

Age-sex structures for 1980 are taken from the 1980 census. Natural increase is a function of fertility and mortality only; all types of migration are assumed to be zero.

Population Projections for Major Islands of Indonesia under alternative levels of sponsored and spontaneous transmigration: 1980-2020 (1)

	PROJECTED POPULATION (000)									Population, year 2020 as proportion of population with natural increase only	Absolute Difference in Population with migration and without, year 2020
	1980	1985	1990	1995	2000	2005	2010	2015	2020		
SUMATRA											
No migration (natural increase only)	27,714	31,774	35,995	40,226	44,308	48,413	52,353	55,928	59,005	1.00	0
Lowest sponsored with:											
low spontaneous	27,714	32,587	37,456	42,175	46,657	51,112	55,365	59,215	62,525	1.06	3519
high spontaneous	27,714	32,636	37,679	42,629	47,424	52,211	56,787	60,941	64,555	1.09	5549
Low sponsored with:											
low spontaneous	27,714	32,638	37,679	42,544	47,135	51,682	56,010	59,925	63,291	1.07	4286
high spontaneous	27,714	32,686	37,919	43,052	48,023	52,978	57,706	62,000	65,746	1.11	6740
Medium sponsored with:											
low spontaneous	27,714	32,658	37,844	42,905	47,777	52,494	56,967	60,998	64,465	1.09	5459
high spontaneous	27,714	32,706	38,093	43,452	48,781	54,019	59,018	63,553	67,533	1.14	8527
High sponsored with:											
low spontaneous	27,714	32,684	38,075	43,362	48,702	53,674	58,375	62,583	66,205	1.12	7200
high spontaneous	27,714	32,732	38,339	43,962	49,859	55,513	60,932	65,832	70,169	1.19	11164
KALIMANTAN											
No migration (natural increase only)	6,658	7,666	8,677	9,663	10,606	11,559	12,477	13,304	14,007	1.00	0
Lowest sponsored with:											
low spontaneous	6,658	8,058	9,542	10,921	12,166	13,382	14,524	15,547	16,418	1.17	2411
high spontaneous	6,658	8,077	9,651	11,169	12,626	14,074	15,446	16,689	17,781	1.27	3774
Low sponsored with:											
low spontaneous	6,658	8,100	9,767	11,344	12,721	14,051	15,286	16,389	17,329	1.24	3322
high spontaneous	6,658	8,119	9,891	11,645	13,312	14,967	16,525	17,937	19,191	1.37	5184
Medium sponsored with:											
low spontaneous	6,658	8,110	10,102	12,149	14,137	15,848	17,400	18,760	19,924	1.42	5916
high spontaneous	6,658	8,129	10,240	12,525	14,973	17,261	19,419	21,367	23,140	1.65	9133
High sponsored with:											
low spontaneous	6,658	8,110	10,301	12,602	15,337	17,419	19,314	20,930	22,318	1.59	8311
high spontaneous	6,658	8,129	10,448	13,019	16,327	19,201	21,971	24,444	26,735	1.91	12728
SULAWESI AND MOLUCCAS (2)											
No migration (natural increase only)	15,008	17,227	19,441	21,630	23,734	25,867	27,928	29,795	31,390	1.00	0
Lowest sponsored with:											
low spontaneous	15,008	17,472	19,839	22,139	24,337	26,553	28,691	30,624	32,276	1.03	886
high spontaneous	15,008	17,486	19,903	22,266	24,544	26,842	29,059	31,067	32,792	1.04	1403
Low sponsored with:											
low spontaneous	15,008	17,488	19,887	22,203	24,416	26,645	28,793	30,736	32,396	1.03	1007
high spontaneous	15,008	17,502	19,956	22,342	24,646	26,969	29,208	31,236	32,981	1.05	1591
Medium sponsored with:											
low spontaneous	15,008	17,488	19,913	22,238	24,463	26,700	28,856	30,806	32,471	1.03	1081
high spontaneous	15,008	17,502	19,983	22,382	24,704	27,043	29,297	31,339	33,097	1.05	1707
High sponsored with:											
low spontaneous	15,008	17,492	19,968	22,356	24,620	26,892	29,075	31,048	32,734	1.04	1344
high spontaneous	15,008	17,506	20,041	22,512	24,897	27,296	29,606	31,697	33,503	1.07	2113
IRIAN JAYA											
No migration (natural increase only)	1,099	1,282	1,458	1,623	1,780	1,942	2,097	2,235	2,350	1.00	0
Lowest sponsored with:											
low spontaneous	1,099	1,359	1,733	2,119	2,425	2,717	2,978	3,207	3,401	1.45	1051
high spontaneous	1,099	1,362	1,758	2,190	2,585	2,982	3,348	3,680	3,979	1.69	1629
Low sponsored with:											
low spontaneous	1,099	1,369	1,841	2,388	2,788	3,164	3,490	3,776	4,018	1.71	1668
high spontaneous	1,099	1,373	1,872	2,485	3,023	3,567	4,064	4,516	4,929	2.10	2578
Medium sponsored with:											
low spontaneous	1,099	1,369	1,927	2,701	3,603	4,244	4,800	5,262	5,658	2.41	3308
high spontaneous	1,099	1,373	1,961	2,819	3,938	4,898	5,810	6,624	7,393	3.15	5042
High sponsored with:											
low spontaneous	1,099	1,370	1,975	2,736	4,027	4,819	5,532	6,103	6,596	2.81	4245
high spontaneous	1,099	1,373	2,011	2,861	4,392	5,579	6,757	7,789	8,778	3.74	6428
TOTAL											
No migration (natural increase only)	50,479	57,948	65,571	73,141	80,429	87,781	94,856	101,262	106,753	1.00	0
Lowest sponsored with:											
low spontaneous	50,479	59,476	68,570	77,354	85,585	93,764	101,558	108,593	114,620	1.07	7867
high spontaneous	50,479	59,560	68,992	78,254	87,179	96,109	104,641	112,377	119,107	1.12	12354
Low sponsored with:											
low spontaneous	50,479	59,594	69,174	78,479	87,059	95,541	103,578	110,826	117,035	1.10	10283
high spontaneous	50,479	59,679	69,637	79,524	89,004	98,481	107,503	115,688	122,846	1.15	16093
Medium sponsored with:											
low spontaneous	50,479	59,625	69,786	79,993	89,981	99,286	108,023	115,825	122,518	1.15	15765
high spontaneous	50,479	59,709	70,277	81,177	92,395	103,221	113,545	122,883	131,162	1.23	24409
High sponsored with:											
low spontaneous	50,479	59,655	70,319	81,055	92,687	102,804	112,296	120,664	127,853	1.20	21100
high spontaneous	50,479	59,740	70,838	82,355	95,475	107,590	119,265	129,762	139,186	1.30	32433

(1) Levels of sponsored migration from lowest to high and levels of spontaneous migration are explained in previous table.

(2) Includes Nusa Tenggara Timur and Timor Timur

PROVINCIAL SUMMARY: ALTERNATIVE TRANSMIGRATION SCENARIOS 1980-2020
(000 of people)

Low migration is low levels sponsored migration and low levels of spontaneous migration. High migration is medium levels of sponsored migration and high levels of spontaneous migration.

Province	*POP* 1980	*POP* 1985	*POP* 1990	*POP* 1995	*POP* 2000	*POP* 2005	*POP* 2010	*POP* 2015	*POP* 2020	Population in year 2020 as proportion of population in absence of migration	Absolute difference in population with and without migration
Aceh											
No Migration	2589	2964	3347	3726	4089	4455	4809	5130	5406		
Low	2589	3021	3432	3833	4214	4598	4967	5302	5589	1.03	183.3
High	2589	3025	3453	3871	4272	4676	5064	5416	5721	1.06	315.4
North Sumatra											
No Migration	8287	9493	10774	12078	13331	14586	15794	16898	17855		
Low	8287	9533	10855	12184	13460	14734	15959	17077	18047	1.01	191.9
High	8287	9539	10892	12261	13580	14896	16161	17317	18322	1.03	467.4
West Sumatra											
No Migration	3384	3836	4309	4788	5251	5716	6164	6574	6931		
Low	3384	3863	4360	4854	5331	5807	6265	6685	7050	1.02	118.6
High	3384	3864	4370	4883	5380	5877	6354	6792	7174	1.04	243.3
Riau											
No Migration	2143	2476	2816	3148	3468	3792	4103	4383	4621		
Low	2143	2618	3129	3608	4040	4461	4855	5207	5507	1.19	886.2
High	2143	2632	3257	3880	4540	5165	5758	6292	6772	1.47	2151.3
Jambi											
No Migration	1427	1650	1875	2094	2305	2519	2724	2908	3066		
Low	1427	1767	2181	2539	2861	3169	3455	3710	3927	1.28	862.0
High	1427	1772	2220	2671	3166	3627	4065	4459	4816	1.57	1750.1
South Sumatra											
No Migration	4581	5256	5956	6656	7332	8012	8662	9251	9756		
Low	4581	5655	6674	7625	8503	9361	10169	10895	11517	1.18	1761.7
High	4581	5688	6829	7938	9041	10119	11142	12067	12888	1.32	3131.9
Bengkulu											
No Migration	756	864	977	1093	1208	1323	1432	1531	1617		
Low	756	920	1069	1212	1349	1484	1611	1726	1825	1.13	208.1
High	756	923	1086	1247	1406	1563	1712	1847	1965	1.22	348.6
Lampung											
No Migration	4547	5235	5942	6644	7324	8011	8665	9254	9755		
Low	4547	5260	5979	6688	7376	8069	8730	9323	9830	1.01	74.3
High	4547	5263	5987	6702	7396	8096	8763	9363	9875	1.01	119.3
SUMATRA Subtotal											
No Migration	27714	31774	35995	40226	44308	48413	52353	55928	59005		
Low	27714	32638	37679	42544	47135	51682	56010	59925	63291	1.07	4286.1
High	27714	32706	38093	43452	48781	54019	59018	63553	67533	1.14	8527.4
West Kalimantan											
No Migration	2469	2842	3218	3585	3938	4295	4640	4951	5216		
Low	2469	2977	3564	4114	4604	5079	5523	5921	6260	1.20	1044.1
High	2469	2982	3722	4545	5427	6254	7033	7737	8378	1.61	3162.5
Central Kalimantan											
No Migration	945	1083	1224	1367	1506	1646	1779	1899	2001		
Low	945	1195	1516	1836	2099	2348	2572	2771	2941	1.47	940.3
High	945	1210	1720	2280	2894	3457	3983	4459	4901	2.45	2899.7

South Kalimantan											
No Migration	2053	2371	2686	2989	3273	3560	3839	4092	4307		
Low	2053	2474	2867	3220	3549	3876	4190	4474	4716	1.09	409.0
High	2053	2480	2912	3340	3765	4179	4577	4938	5254	1.22	947.6
East Kalimantan											
No Migration	1191	1370	1548	1722	1889	2058	2219	2363	2484		
Low	1191	1454	1820	2174	2469	2748	3000	3223	3413	1.37	928.9
High	1191	1457	1886	2360	2887	3371	3825	4233	4607	1.85	2123.2
KALIMANTAN Subtotal											
No Migration	6658	7666	8677	9663	10606	11559	12477	13304	14007		
Low	6658	8100	9767	11344	12721	14051	15286	16389	17329	1.24	3322.3
High	6658	8129	10240	12525	14973	17261	19419	21367	23140	1.65	9133.0
South Sulawesi											
No Migration	6035	6954	7860	8747	9594	10455	11290	12047	12695		
Low	6035	6983	7912	8815	9675	10548	11393	12160	12816	1.01	121.0
High	6035	6984	7924	8836	9710	10596	11455	12233	12901	1.02	206.1
Central Sulawesi											
No Migration	1268	1455	1645	1837	2025	2214	2395	2557	2695		
Low	1268	1534	1780	2010	2230	2449	2656	2841	2999	1.11	304.0
High	1268	1538	1805	2059	2309	2559	2796	3010	3195	1.19	500.0
S.E. Sulawesi											
No Migration	933	1077	1223	1371	1517	1665	1806	1934	2043		
Low	933	1169	1376	1567	1750	1930	2101	2254	2385	1.17	343.0
High	933	1174	1410	1630	1849	2067	2274	2460	2624	1.28	581.8
N. Sulawesi											
No Migration	2098	2402	2713	3020	3309	3600	3882	4140	4361		
Low	2098	2420	2739	3053	3347	3643	3930	4191	4416	1.01	55.4
High	2098	2421	2744	3062	3361	3662	3954	4220	4449	1.02	88.2
Moluku											
No Migration	1399	1591	1787	1987	2184	2382	2572	2743	2888		
Low	1399	1634	1867	2090	2307	2524	2729	2914	3071	1.06	183.2
High	1399	1636	1888	2128	2368	2608	2836	3041	3219	1.11	330.6
SULAWESI AND MOLUKU Subtotal											
No Migration	11733	13479	15229	16962	18628	20315	21944	23420	24682		
Low	11733	13740	15675	17535	19310	21093	22809	24361	25688	1.04	1006.5
High	11733	13754	15771	17714	19599	21491	23313	24964	26388	1.07	1706.8
Irian Jaya											
No Migration	1099	1282	1458	1623	1780	1942	2097	2235	2350		
Low	1099	1369	1841	2388	2788	3164	3490	3776	4018	1.71	1667.9
High	1099	1373	1961	2819	3938	4898	5810	6624	7393	3.15	5042.4
TOTAL (excluding East Nusa Tenggara and East Timor)											
No Migration	47204	54200	61358	68474	75323	82230	88872	94887	100044		
Low	47204	55846	64961	73811	81953	89990	97594	104451	110327	1.10	10282.8
High	47204	55961	66065	76509	87290	97669	107561	116508	124454	1.24	24409.5
East Nusa Tenggara	2722	3109	3489	3867	4235	4609	4971	5298	5578		
East Timor	553	639	723	801	871	942	1013	1077	1130		
Total Including East Nusa Tenggara and East Timor											
No Migration	50479	57948	65571	73141	80429	87781	94856	101262	106753		
Low	50479	59594	69174	78479	87059	95541	103578	110826	117035	1.10	10283
High	50479	59709	70277	81177	92395	103221	113545	122883	131162	1.23	24409

fertility and mortality in the outer islands, how many spontaneous transmigrants are attracted, in turn, who remain in the outer islands, and those spontaneous transmigrants' fertility and mortality rates after their arrival.

A cohort component population projection was done to illustrate the long run population impact of these levels of transmigration, with alternative levels of associated spontaneous transmigration (Tables 2 to 4). Population both in the inner and outer islands was projected under four levels of sponsored transmigration, with an additional three levels of associated spontaneous transmigration under each level of sponsored transmigration. The three levels of spontaneous transmigration are no spontaneous movement, low spontaneous migration, with each transmigrant attracting .05 people per year for ten years, and high spontaneous migration, with each transmigrant attracting .075 people per year for ten years. Transmigrants are projected to have the same age-sex structure as the sample of transmigrations arriving in Baturaja in 1983/84 (4).

Within each level of sponsored migration, the degree of spontaneous migration makes a striking difference of the population impact in the year 2020. Under the medium scenario of sponsored movement, 900,000 families are moved but the total population impact of this is an addition 8.9 million people in the outer islands (and a reduction of 8.2 million people in the inner islands) by the year 2020, because of the population growth after their arrival. (The population impact in the inner and outer islands is not equivalent because of different assumptions about fertility and mortality in the inner and outer islands (5)). But if low levels of associated spontaneous migration are added to the scenario, the population impact increases to 15.7 million more people in the outer islands by the year 2020. If government policy actively facilitated spontaneous

transmigration, the population impact would increase even further to about 24.4 million people or more. This population impact is even higher than the high level of sponsored migration under no or low spontaneous migration. In order to achieve transmigration targets, there is clearly a large budgetary tradeoff to investing large sums of money to sponsor a certain level of transmigrants without facilitating spontaneous movement versus using less resources to fully sponsor fewer transmigrants and use the remainder to facilitate or partially assist spontaneous migration.

The overall impact on population distribution is significant in all scenarios, but particularly under the highest scenarios. Under the highest assumption about population movement, the high level of sponsored movement with high spontaneous migration, the population of the inner islands is reduced by 30.9 million people over what it would be under natural increase alone by the year 2020, or a reduction of 18% in the total population. Under the medium scenario with high spontaneous migration, the reduction in the total population is 14% less than under natural increase in the year 2020 (Table 2).

In absolute terms the biggest increase in population is in Sumatra and Kalimantan (Table 3) by the year 2020. As a proportion of its total population, the biggest increase occurs, of course, in Irian Jaya, followed by Kalimantan, since these are the least densily populated islands. In Irian Jaya, the increase in population in the year 2020 over what it would be under natural increase alone ranges from an increase of 45% under the lowest scenario with low associated transmigration to a remarkable 274% of the population under the high scenario with high transmigration. Kalimantan ranges from an increase of 17% by the year 2020 over what would occur from natural increase alone, to 91% with high sponsored and high

spontaneous migration. Since Sumatra and Sulawesi are more densly populated, the population impact of continuing transmigration is less in proportion to the population under natural increase alone. These figures are also shown at the provincial level in Table 4, but only 3 scenarios are shown: natural increase alone (no migration), low migration (low levels of sponsored migration with low levels of spontaneous migration) and high migration (medium levels of sponsored migration and high levels of spontaneous migration).

Notes

(1) This projection assumes that no transmigrants desert the transmigration program and return to the inner islands.

(2) Age structure for sponsored migrants taken from a sample of Baturaja families on arrival in 1983/84:

Age	Males	Females
0-4	.09	.08
5-9	.08	.06
10-14	.06	.04
15-19	.04	.05
20-24	.05	.08
25-29	.07	.06
30-34	.06	.03
35-39	.03	.02
40-44	.03	.01
45-49	.01	.01
50-54	.01	.01
55-59	.00	.00
60-64	.00	.00
65+	.00	.00

(3) While only about 223,000 official transmigrants were moved into Lampung from 1950 to 1978, over 3 million rural residents, or 78% of the rural population, speaks an inner island language. Clearly associated migration from the inner islands to Lampung has been going on for many decades.

(4) See note (2).

(5) The Total Fertility Rate is assumed to decline to replacement level (NRR=1) by the year 2010 for the inner islands and by the year 2010 for the outer islands. The TFR is higher in the outer islands than the inner islands over the period, starting at 4.94 children per women in 1980-84 compared to 4.16 children per women in the inner islands. Transmigrants are assumed to have the fertility and moratality rates of the destination area after they arrive. Detailed assumptions about mortality rates and fertility rates over the period are shown in the footnote to Table 2.

THE DEMOGRAPHIC IMPACT OF TRANSMIGRATION IN INDONESIA

The population impact of the transmigration program in Indonesia is mainly a function of the number of sponsored and spontaneous transmigrants who move permanently from the inner islands to the outer islands, and their fertility and mortality after they arrive. The first section of this paper uses existing data on the transmigration program from 1950 to 1978 combined with data from the 1980 census to estimate the demographic impact of the program thus far. Using what this suggests about the importance of spontaneous migration, the second section of this paper then projects the population of Indonesia from 1980 to 2020 under several scenarios about the level of sponsored and spontaneous migration.

I. Estimating Past Levels of Sponsored and Spontaneous Transmigration

While the Ministry of Transmigration keeps statistics about the number of families it settles, no direct statistics have recorded flows of spontaneous transmigration. The most recent census (November 1980) did not ask rural residents of the outer islands if they had been settled officially under the transmigration program, or if they had settled spontaneously. But the census did ask all respondents which language was their "mother tongue". From this question, the number of inner island language speakers living in rural areas of the outer islands in 1980 can be estimated. With this information, along with GOI data on sponsored transmigration, an estimate can be made about the relative importance of spontaneous and sponsored transmigration in the past. This can then be used to judge what might be reasonable scenarios for spontaneous transmigration associated with sponsored transmigration in the future.

Table 1 summarizes this exercise. Ministry of Transmigration statistics are used to derive the total number of individuals moved, by province, from 1950 to 1978 budget year (column 1). Since transmigrants are moved with a considerable lag from the budget year, the numbers of assisted migrants through budget year 1978 are assumed to be the actual flows of assisted transmigrants up to the time of the census in November 1980. Population projections were then made of the number of people that would result from the flows of sponsored families over time at the time of the census (1). These projections were based upon fertility and mortality rates from each province over the period. Cohort projections were made using these fertility and mortality rates applied to a typical age-sex structure for transmigrants (column 2, Table 1) to estimate the population in end-1980 resulting from the sponsored settlers. The age-sex structure for migrants when they move was assumed to be the same as that derived from a sample of 1130 transmigrants on arrival at Baturaja in 1983/84 (2).

The number of people in the 1980 census who responded that their mother tongue is Javanese, Sundanese, Madurese or Balinese (column 3, Table 1) is assumed to reflect all the residents in Sumatra, Kalimantan, Sulawesi, East Nusa Tenggara, Maluku and Irian Jaya originally from the inner islands. For this exercise, Lampung, North Sumatra and Irian Jaya are dropped from the outer islands. Since this exercise is intended to link sponsored migration from 1950 to 1978 to spontaneous flows, the provinces of Lampung and North Sumatra are excluded, because they are the two provinces with sizeable flows prior to 1950 (from Dutch-sponsored resettlement of Javanese laborers to Sumatran plantations in the 1920s and 1930s) (3). Irian Jaya is also excluded because of data problems; it appears that there was an significant undercount in the 1980 census in Irian Jaya.

By subtracting the number of rural residents who speak an inner island

Table 1: Population in the Outer Islands as a Result of Sponsored Migration between 1950-78 and Associated Population Growth

PROVINCE*	Individuals moved as sponsored migrants from 1950-78 (1)	Expected population, 1980 census from sponsored movement** (2)	Number of Inner Island Language speakers enumerated in 1980 census, Rural Areas (3)	Rural Excess (Spontaneous Migrants) (4) (3)-(2)	Ratio of Spontaneous to Sponsored Migrants Rural only (5) (4)/(1)	% of Inner Island Language Speakers directly as a result of sponsored migration (6) (2)/(3)	Population, 1980 Rural Only (7)	Population, 1980 Total (8)	% of population as a result of sponsored migration Rural Only (9) (2)/(7)	% of population as a result of sponsored migration Total (10) (2)/(8)	% of Rural areas Speaking Inner Island Language (11) (4)/(7)
Aceh	9692	10933	156,266	145,333	15.0	7%	2,377,027	2,610,528	0%	0%	7%
Riau	16563	22777	148,263	125,486	7.6	15%	1,575,684	3,406,132	1%	1%	9%
West Sumatra	35986	48257	52,704	4,447	0.1	92%	2,973,012	2,163,896	2%	2%	2%
Jambi	70703	82783	236,211	153,428	2.2	35%	1,261,630	1,444,476	7%	6%	19%
Bengkulu	30619	37262	132,207	94,945	3.1	28%	695,566	767,988	5%	5%	19%
South Sumatra	262450	430124	585,792	155,668	0.6	73%	3,360,710	4,627,719	13%	9%	17%
Subtotal	426,014	632,136	1,311,443	679,307	1.6	48%	12,243,629	15,020,739	5%	4%	11%
West Kalimantan	32644	43211	153,423	110,212	3.4	28%	2,067,968	2,484,901	2%	2%	7%
Central Kalimantan	14516	20036	35,971	15,935	1.1	56%	855,919	954,176	2%	2%	4%
South Kalimantan	50163	70247	97,320	27,073	0.5	72%	1,622,326	2,063,227	4%	3%	6%
East Kalimantan	41279	59307	62,257	2,950	0.1	95%	729,383	1,214,602	8%	5%	9%
Subtotal	138,602	192,802	348,971	156,169	1.1	55%	5,275,596	6,716,906	4%	3%	7%
North Sulawesi	17757	25518	29,912	4,394	0.2	85%	1,760,215	2,114,822	1%	1%	2%
South Sulawesi	42206	54940	51,131	(3,809)	-0.1	107%	4,963,489	6,059,564	1%	1%	1%
Central Sulawesi	55489	68400	70,907	2,507	.0	96%	1,169,056	1,284,528	6%	5%	6%
Southeast Sulawesi	31683	39435	45,122	5,687	0.2	87%	853,598	941,454	5%	4%	5%
Subtotal	147,135	188,293	197,072	8,779	0.1	96%	8,746,358	10,400,368	2%	2%	2%
East Nusa Tenggara	2132	2416	745	(1,671)	-0.8	324%	2,531,521	2,736,988	0%	0%	0%
Maluku	4218	7120	15,913	8,793	2.1	45%	1,255,507	1,408,451	1%	1%	1%
Total	718,101	1,022,767	1,874,144	851,377	1.2	55%	30,052,611	36,283,452	3%	3%	6%

* Exclude North Sumatra and Lampung provinces because of large migrant communities settled there prior to WWII. Exclude Irian Jaya because of probable census error (number of Javanese, Madurese and Balinese speakers enumerated in census less than number would expect from sponsored movement (or they deserted).

** Including offspring of sponsored migrants

language from the projected population from sponsored transmigration, one can estimate the number of inner island language speakers living in rural areas of the outer islands that are not sponsored transmigrants or offspring of sponsored transmigrants (column 4, Table 1).

As many micro-level studies of transmigration communities have shown, almost all of these spontaneous settlers have moved as a result of chain migration. With the exception of the government's sponsored program, virtually no one moves to transmigration areas without friends or relatives in the destination area who can provide them with information about what to expect, a place to stay and other help getting started in the new area. The move would otherwise be unacceptably risky for a poor laborer from the inner islands.

The ratio of rural spontaneous traansmigrants to sponsored transmigrants is highest in Sumatra, particularly in Aceh and Riau. In South Sulawesi and East Nusa Tenggara the ratio is negative (the number of "excess rural migrants" is negative). In Sulawesi, this is partly explained by the anomoly that many spontaneous migrants there have registered as sponsored. In East Nusa Tenggara, the number of excess rural migrants is also negative. This could be due to a census undercount in rural areas there, or could arise from high desertion rates from sponsored migration. Overall, the ratio of rural spontaneous to sponsored transmigrants observed in 1980 is 1.2 to 1. This ratio is a crude measure of the association between sponsored and spontaneous migration. It does not indicate how many spontaneous transmigrants will eventally be attracted to these areas, but does show a strong relationship between the two types of migration flows.

Overall, the percent of the rural population in the outer islands from

sponsored migration is 3%. This rises to 13% for South Sumatra. The percent in rural areas speaking inner island languages (both sponsored and spontaneous transmigrants as well as their children) is only 6%, but again this rises to 11% for all of Sumatra, and 19% for both Jambi and Bengkulu.

Modeling Chain Migration

In explaining the differences in the ratio of rural spontaneous to sponsored transmigrants between provinces, one would like to model how chain migration occurs. Information is readily available only on the sponsored transmigrant's length of residence in the destination area (flows of official transmigrants are available by receiving province by year). Many other factors are expected to be important as well in explaining how many transmigrants eventually move as a result of one household's move. These factors include length of residence of that household in the destination province, availability of land near the household, income levels in both destination and origin, and distance between destination and origin. Holding all of the other factors constant and focusing on length of residence only, we asked the question what intensity and shape of chain migration can predict the number of inner island language speakers present in rural areas of the outer islands at the time of the 1980 census.

Both the shape and intensity of pull of associated migration resulting from one household's move can vary over time. There are an infinite number of curves one could argue may represent this force of chain migration over time. The pull may be insignificant at first, while friends and neighbors wait to hear if there are opportunities for them in the migrant's new home. Once the migrant sends for relatives and friends, associated migration may peak and then diminish over time (although the relatives and friends may induce, in turn, other migrants). To simplify the picture, we considered

only a fixed pull of associated migration, lasting for a limited period of time. A transmigrant (either sponsored or spontaneous) moves, and then for a fixed time period induces a fixed proportion of transmigrants per year. Those migrants, in turn, induce other migrants. The following tabulations illustrate the population impact, starting with 100 sponsored transmigrants in the year 1980, of different time periods and factors of associated migration.

Cumulative Number of Transmigrants from 1980 to 2020 as a Result of 100 Sponsored transmigrants moved in 1980 under Alternative Assumptions about associated Migration (the length of time and intensity of associated migration (percent of migrants induced per year))

Spontaneous Migration Assumptions (Time Period and Intensity)	Year				
	1980	1990	2000	2010	2020
GOI Method	25	25	25	25	25
5 year time period					
2% per year	0	11	11	11	11
5% per year	0	33	33	33	33
7.5% per year	0	56	60	60	60
10% per year	0	86	98	100	100
10 year time period					
2% per year	0	22	25	25	25
5% per year	0	63	88	96	99
7.5% per year	0	106	181	228	256
10% per year	0	159	337	518	700
20 year time period					
2% per year	0	22	49	57	63
5% per year	0	63	165	255	351
7.5% per year	0	106	325	632	1112
10% per year	0	159	573	1409	3203

The GOI method shown in the table assumes that very low levels of spontaneous transmigration are produced from sponsored transmigration--every 100 spontaneous transmigrants induce 25 associated spontaneous

transmigrants in that year and in that year only. Under this assumption, spontaneous transmigrants do not, in turn, induce other spontaneous transmigrants. The other columns in the above tabulation illustrate the cumulative number of transmigrants under alternative assumptions about the length and intensity of spontaneous attraction. In the first year, the 100 sponsored transmigrants do not induce any associated migration. Following that year for 5, 10 or 20 years associated migration occurs at a fixed rate. The assumptions in the tabulation result in cumulative numbers of associated transmigrants in the year 2020 from as low as 11 to as high as 3203.

To get an idea of what level of migration might explain the flows shown in Table 1, a ten year period was imposed (somewhat arbitrarily) as the length of time that spontaneous migration occurs following another transmigrant's move, and alternative coefficients for the intensity of migration pulls were tested, iteratively, until the number of rural spontaneous transmigrants or spontaneous transmigrant's offspring shown in Table 1 (851,377) was approximated (the 851,377 refers to the number of people living in rural areas whose native language is an inner island language in excess of the number explained by sponsored transmigrants and their offspring). The coefficient that accurately predicted the number of people speaking inner island languages living in rural areas in the outer islands that were not sponsored transmigrants or their offspring was 7.9% (a transmigrant attracts other transmigrants for a ten year period following the move, at .079 people per year). In making this calculation, the population growth of spontaneous transmigrants was incorporated into the assumptions.

Figure 1 plots the cumulative number of sponsored transmigrants sent

Figure 1
Cumulative Sponsored and Projected Spontaneous Transmigrants
to the Outer Islands: 1950 to 1978

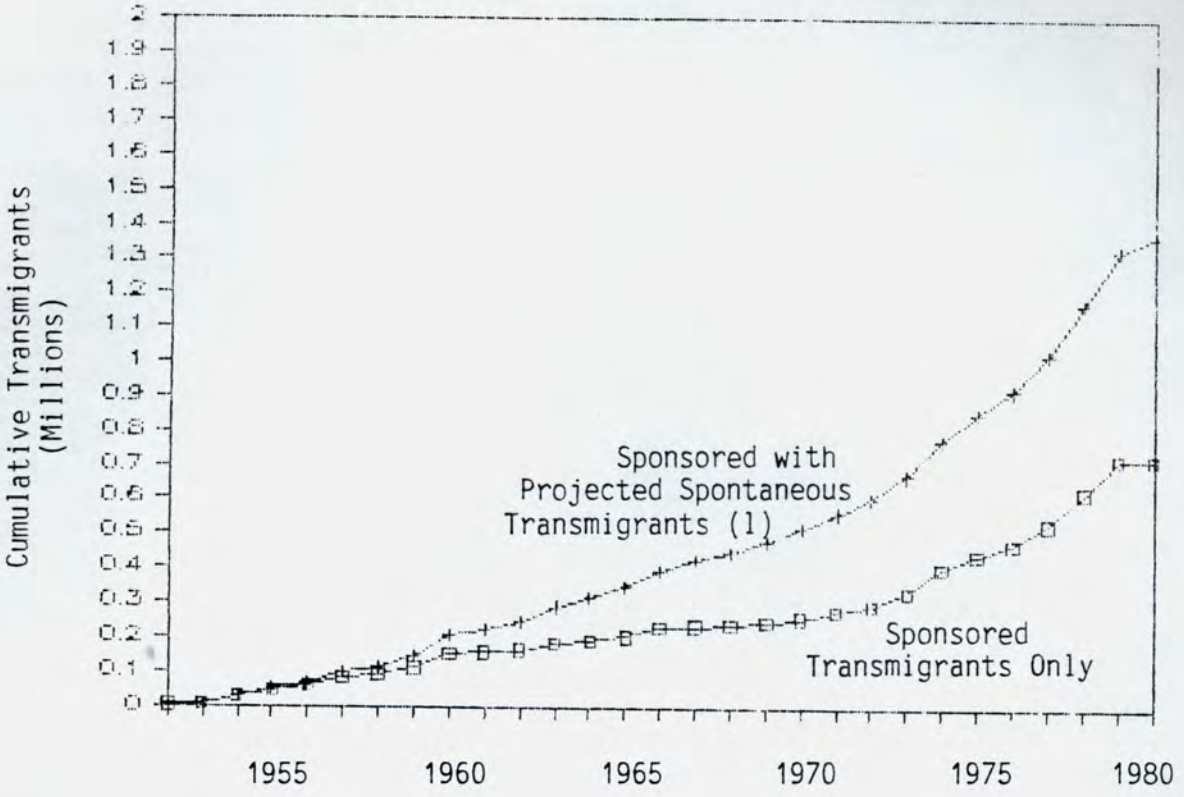
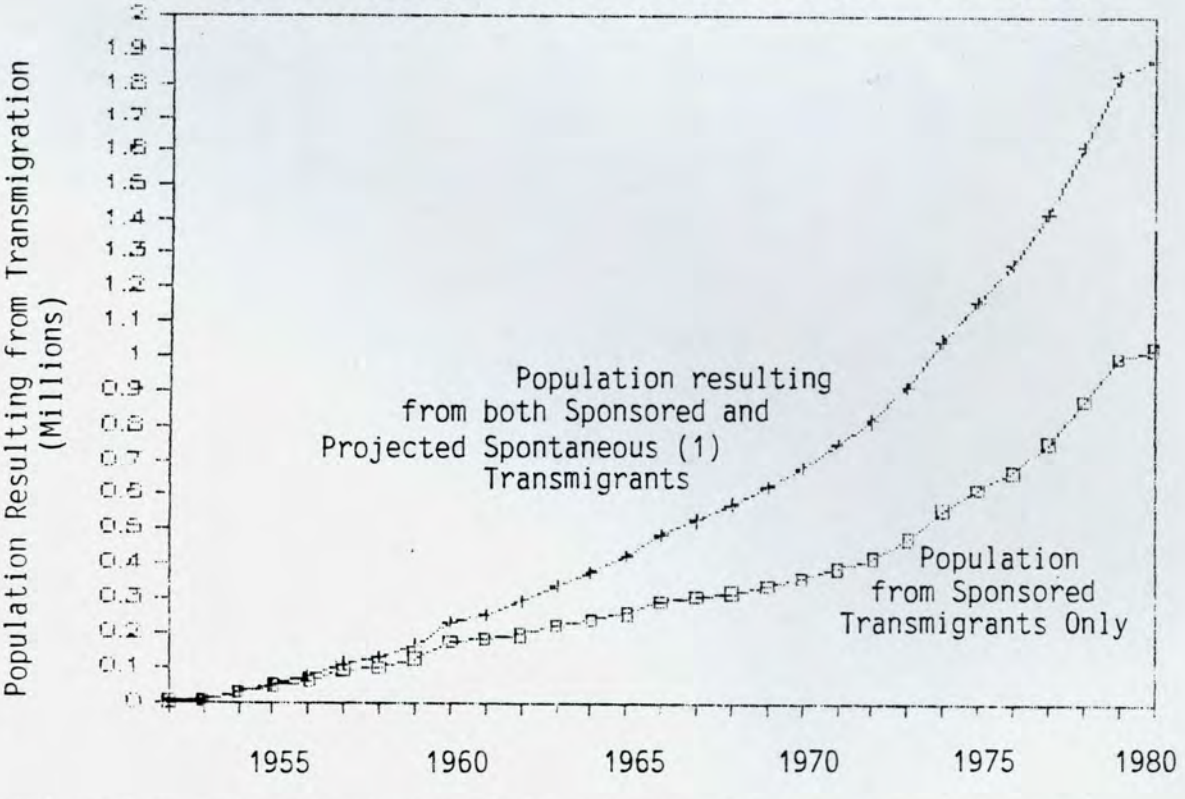


Figure 2
Rural Population Impact of Sponsored and Projected
Spontaneous Transmigrants to the Outer Islands: 1950 to 1980



(1) Pull factor assumed to be 7.9% per year for ten years (see text)

to the outer islands (excluding those to Lampung, North Sumatra, and Irian Jaya as discussed before) from 1950 to 1978. In total, about 720,000 individuals were moved. In Figure 2, the lower curve shows the population resulting directly from those sponsored transmigrants over the period 1950 to 1980 (about 1.02 million people in 1980). In order to reach the number of inner island language speakers enumerated in rural areas of the Outer Islands in the 1980 census (excluding Lampung, North Sumatra and Irian Jaya), 1.87 million people, each sponsored transmigrant would have to attract .079 people per year for 10 years, with those transmigrants in turn attracting others at the same rate. Using this coefficient, the cumulative number of sponsored and projected spontaneous transmigrants is shown in Figure 1 (about 1.4 million people in 1980), and the population impact resulting from both groups (Figure 2) is 1.87 million people, the number of inner island language speakers enumerated in rural areas of the Outer Islands in the 1980 census.

This exercise, using crude assumptions about the form of spontaneous migration, simply illustrates the strong association in the past between sponsored and spontaneous migration, even though GOI policy did not intentionally facilitate spontaneous transmigration over the period. If GOI policy towards transmigration site development was redirected to stimulate the flow of spontaneous transmigration, the pull would be even higher, while if policies did nothing to facilitate transmigration, the pull might decrease over time as the constraint of land availability increased. Two assumptions about the degree of spontaneous migration associated with sponsored migration will be used to estimate the demographic impact of alternative levels of transmigration in Repelita IV, V, and VI. Both assumptions assume that continuing spontaneous migration continues for a fixed period of ten years following a transmigrant, but the

first assumption assumes that .05 people are attracted every year, and the second assumes that .075 people are attracted every year, numbers that seem reasonable, or perhaps a little conservative, given the above estimate of spontaneous migration from 1950 to 1978.

II. Population Projections for Inner and Outer Islands of Indonesia under alternative levels of Sponsored and Spontaneous Transmigration: 1980 to 2020

In Repelita III, approximately 320,000 sponsored transmigrant families were settled in the Sumatra, Kalimantan, Sulawesi and the Moluccas and Irian Jaya. Of these, approximately 10% were local families already residing near transmigration sites. Thus, about 290,000 families were moved from the inner islands to the outer islands under Repelita III. The pace at which sponsored transmigration will continue over the next two decades is unclear, due to budgetary, land, and implementation constraints. Four levels of sponsored migration were chosen to estimate the population impact of the transmigration program in Repelitas IV, V and VI. The scenarios range from the lowest, where only 270,000 more families are moved officially from the inner islands (less than the number moved under Repelita III alone), to the highest scenario of 1,350,000 families moved. Tables 1.1 to 1.4 show the projected yearly movement of families to provinces in the outer islands under the four levels of sponsored transmigration. A distinction must be made here between numbers moved by the Minstry of Transmigration and numbers settled. Numbers moved exclude the local residents settled under the program.

The potential population impact of this movement on the outer islands depends upon several factors including the rate at which sponsored transmigrants or their offspring might return to the inner islands, their

LEVELS OF SPONSORED TRANSMIGRATION FROM 1980 TO 1999 UNDER FOUR SCENARIOS
(numbers refer to families and exclude locals settled in transmigration sites)

TABLE 1.1 - LOWEST SCENARIO

	Total Families Settled	
	Excluding Locals	Including Locals
REPELITA III	288564	320627
REPELITA IV	180000	200000
REPELITA V	90000	100000
REPELITA VI	0	0

Receiving Provinces	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99
Aceh	2322	3352	3951	781	403	419	0	0	0	0	0	0	0	0	0	0	0	0	0
North Sumatra	770	1787	977	3045	1037	1076	603	666	722	0	0	0	0	0	0	0	0	0	0
West Sumatra	1800	357	936	1225	518	538	603	333	361	0	0	0	0	0	0	0	0	0	0
Riau	609	11057	6766	5118	2995	3110	3014	3330	3608	1500	1537	1304	1429	1452	0	0	0	0	0
Jambi	3765	3416	2326	7615	4147	4306	4822	4329	3207	1286	1317	1043	1143	1161	0	0	0	0	0
South Sumatra	20653	22206	16346	10698	5184	4306	4822	4662	3608	1500	1537	1304	1429	1452	0	0	0	0	0
Bengkulu	2336	1511	3250	2693	922	538	301	333	361	0	0	0	0	0	0	0	0	0	0
Lampung	4684	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	36939	43686	34552	31175	15206	14292	14166	13653	11866	4286	4390	3652	4000	4065	0	0	0	0	0
West Kalimantan	1689	5778	5830	7250	4147	4306	4822	4070	4410	2357	2415	1826	2000	1742	0	0	0	0	0
Central Kalimantan	2005	3665	4302	6689	3859	4007	3684	3478	3768	1929	1976	2348	2571	2613	0	0	0	0	0
South Kalimantan	5192	6330	3308	2683	1555	1076	1206	888	802	429	0	0	0	0	0	0	0	0	0
East Kalimantan	1892	2568	2299	5301	3110	3767	4220	4440	4811	2571	2634	2348	2571	2613	0	0	0	0	0
Subtotal	10778	18340	15739	21923	12672	13156	13931	12876	13791	7286	7024	6522	7143	6968	0	0	0	0	0
South Sulawesi	585	675	1098	1876	1037	658	603	0	0	0	0	0	0	0	0	0	0	0	0
Central Sulawesi	2135	5024	2946	3147	1555	1076	603	666	361	0	0	0	0	0	0	0	0	0	0
S.E. Sulawesi	3535	5306	4130	2749	1555	1076	603	666	361	0	0	0	0	0	0	0	0	0	0
N. Sulawesi	1094	1500	329	608	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moluku and T.T.	1347	1796	2282	1742	864	897	670	740	0	0	0	0	0	0	0	0	0	0	0
Subtotal	8697	14301	10785	10121	5011	3708	2478	2072	722	0	0	0	0	0	0	0	0	0	0
Irian Jaya	2269	2419	4826	3038	3110	4844	5425	7400	9621	6429	6585	7826	6857	6968	0	0	0	0	0
Total	58683	78746	65902	66257	36000	36000	36000	36000	36000	18000	18000	18000	18000	18000	0	0	0	0	0

TABLE 1.2 - LOW SCENARIO

	Total Families Settled	
	Excluding Locals	Including Locals
REPELITA III	288564	320627
REPELITA IV	270000	300000
REPELITA V	180000	200000
REPELITA VI	0	0

Receiving Provinces	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99
Aceh	2322	3352	3951	781	700	700	0	0	0	0	0	0	0	0	0	0	0	0	0
North Sumatra	770	1787	977	3045	1800	1800	900	900	900	0	0	0	0	0	0	0	0	0	0
West Sumatra	1800	357	936	1225	900	900	900	450	450	0	0	0	0	0	0	0	0	0	0
Riau	609	11057	6766	5118	5200	5200	4500	4500	4500	3500	3500	2500	2500	2500	0	0	0	0	0
Jambi	3765	3416	2326	7615	7200	7200	7200	5850	4000	3000	3000	2000	2000	2000	0	0	0	0	0
South Sumatra	20653	22206	16346	10698	9000	7200	7200	6300	4500	3500	3500	2500	2500	2500	0	0	0	0	0
Bengkulu	2336	1511	3250	2693	1600	900	450	450	450	0	0	0	0	0	0	0	0	0	0
Lampung	4684	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	36939	43686	34552	31175	26400	23900	21150	18450	14800	10000	10000	7000	7000	7000	0	0	0	0	0
West Kalimantan	1689	5778	5830	7250	7200	7200	7200	5500	5500	5500	5500	3500	3500	3000	0	0	0	0	0
Central Kalimantan	2005	3665	4302	6689	6700	6700	5500	4700	4700	4500	4500	4500	4500	4500	0	0	0	0	0
South Kalimantan	5192	6330	3308	2683	2700	1800	1800	1200	1000	1000	0	0	0	0	0	0	0	0	0
East Kalimantan	1892	2568	2299	5301	5400	6300	6300	6000	6000	6000	6000	4500	4500	4500	0	0	0	0	0
Subtotal	10778	18340	15739	21923	22000	22000	20800	17400	17200	17000	16000	12500	12500	12000	0	0	0	0	0
South Sulawesi	585	675	1098	1876	1800	1100	900	0	0	0	0	0	0	0	0	0	0	0	0
Central Sulawesi	2135	5024	2946	3147	2700	1800	900	900	450	0	0	0	0	0	0	0	0	0	0
S.E. Sulawesi	3535	5306	4130	2749	2700	1800	900	900	450	0	0	0	0	0	0	0	0	0	0
N. Sulawesi	1094	1500	329	608	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moluku and T.T.	1347	1796	2282	1742	1500	1500	1000	1000	0	0	0	0	0	0	0	0	0	0	0
Subtotal	8697	14301	10785	10121	8700	6200	3700	2800	900	0	0	0	0	0	0	0	0	0	0
Irian Jaya	2269	2419	4826	3038	5400	8100	8100	10000	12000	15000	15000	15000	12000	12000	0	0	0	0	0
Total	58683	78746	65902	66257	62500	60200	53750	48650	44900	42000	41000	34500	31500	31000	0	0	0	0	0

TABLE 1.3 - INTERMEDIATE SCENARIO

	Total Families Settled	
	Excluding Locals	Including Locals
REPELITA III	288564	320627
REPELITA IV	360000	400000
REPELITA V	360000	400000
REPELITA VI	180000	200000

Receiving Provinces	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99
Aceh	2322	3352	3951	781	900	900	700	0	0	0	0	0	0	0	0	0	0	0	0
North Sumatra	770	1787	977	3045	2700	2700	1800	1800	900	1000	1000	1000	500	500	250	250	0	0	0
West Sumatra	1800	357	936	1225	900	900	900	450	450	500	500	500	500	500	250	250	0	0	0
Riau	609	11057	6766	5118	6750	8550	8550	6750	6750	6500	6000	5500	5000	5000	3000	3000	3000	2000	2000
Jambi	3765	3416	2326	7615	7200	5850	5850	5850	5850	5500	5000	4500	4000	4000	3000	3000	3000	2000	2000
South Sumatra	20653	22206	16346	10698	10800	9000	9000	6300	5400	5000	5000	4500	3000	3000	1500	1500	1000	1000	1000
Bengkulu	2336	1511	3250	2693	1600	900	450	450	450	500	500	0	0	0	0	0	0	0	0
Lampung	4684	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	36939	43686	34552	31175	30850	28800	27250	21600	19800	19000	18000	16000	13000	13000	8000	8000	7000	5000	5000
West Kalimantan	1689	5778	5830	7250	7200	9000	9000	11700	11700	14000	14000	12000	12000	10000	6000	6000	5000	5000	3000
Central Kalimantan	2005	3665	4302	6689	9000	10800	10800	11700	11700	12000	12000	10000	10000	8000	5000	5000	3000	3000	3000
South Kalimantan	5192	6330	3308	2683	2700	2700	1800	1800	1800	2000	2000	2000	2000	2000	1000	1000	1000	1000	1000
East Kalimantan	1892	2568	2299	5301	5400	6300	8100	8100	8100	8000	8000	8000	8000	7000	5000	5000	3000	3000	2000
Subtotal	10778	18340	15739	21923	24300	28800	29700	33300	33300	36000	36000	32000	32000	27000	17000	17000	12000	12000	9000
South Sulawesi	585	675	1098	1876	1800	1800	900	0	0	0	0	0	0	0	0	0	0	0	0
Central Sulawesi	2135	5024	2946	3147	2700	1800	900	900	900	500	0	0	0	0	0	0	0	0	0
S.E. Sulawesi	3535	5306	4130	2749	2700	1800	1800	900	900	500	0	0	0	0	0	0	0	0	0
N. Sulawesi	1094	1500	329	608	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moluku and T.T.	1347	1796	2282	1742	1500	1500	1000	1000	1000	1000	0	0	0	0	0	0	0	0	0
Subtotal	8697	14301	10785	10121	8700	6900	4600	2800	2800	2000	0	0	0	0	0	0	0	0	0
Irian Jaya	2269	2419	4826	3038	5400	8100	12600	14400	16000	20000	23000	23000	25000	25000	20000	15000	15000	15000	15000
Total	58683	78746	65902	66257	69250	72600	74150	72100	71900	77000	77000	71000	70000	65000	45000	40000	34000	32000	29000

TABLE 1.4 - HIGH SCENARIO

	Total Families Settled	
	Excluding Locals	Including Locals
REPELITA III	288564	320627
REPELITA IV	450000	500000
REPELITA V	450000	500000
REPELITA VI	450000	500000

Receiving Provinces	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99
Aceh	2322	3352	3951	781	900	900	700	500	500	500	500	0	0	0	0	0	0	0	0
North Sumatra	770	1787	977	3045	3500	3500	2700	2700	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
West Sumatra	1800	357	936	1225	1800	1800	1800	900	450	500	500	500	500	500	500	500	500	500	500
Riau	609	11057	6766	5118	9000	11000	11000	8550	8550	8500	8500	7500	7500	7500	6500	6500	6500	6500	6500
Jambi	3765	3416	2326	7615	8200	8200	8200	7650	5800	5800	5800	4800	4800	4800	4800	4800	4800	4800	4800
South Sumatra	20653	22206	16346	10698	10800	10800	9000	9000	9000	7000	7000	7000	7000	7000	6000	6000	6000	6000	6000
Bengkulu	2336	1511	3250	2693	2500	1800	1800	900	900	900	900	400	400	400	400	400	400	400	400
Lampung	4684	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	36939	43686	34552	31175	36700	38000	35200	30200	27000	25000	25000	22000	22000	22000	20000	20000	20000	20000	20000
West Kalimantan	1689	5778	5830	7250	7200	10800	13500	16500	16500	16500	14500	14500	14500	12500	12500	12500	12500	12500	12500
Central Kalimantan	2005	3665	4302	6689	9000	11700	12500	14500	14500	12500	12500	12500	12500	10500	10500	10500	10500	10500	10500
South Kalimantan	5192	6330	3308	2683	2700	2700	2700	2700	3500	3500	3500	3500	2500	2500	2500	2500	2500	2500	2500
East Kalimantan	1892	2568	2299	5301	5400	6300	8100	10500	10500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500
Subtotal	10778	18340	15739	21923	24300	31500	36800	44200	45000	45000	43000	43000	42000	38000	38000	38000	38000	38000	38000
South Sulawesi	585	675	1098	1876	1800	1800	900	900	0	0	0	0	0	0	0	0	0	0	0
Central Sulawesi	2135	5024	2946	3147	3000	2700	1800	1800	1800	1000	1000	1000	1000	0	0	0	0	0	0
S.E. Sulawesi	3535	5306	4130	2749	2700	1800	1800	1800	1800	1600	1000	1000	1000	0	0	0	0	0	0
N. Sulawesi	1094	1500	329	608	500	500	0	0	0	0	0	0	0	0	0	0	0	0	0
Moluku and T.T.	1347	1796	2282	1742	1500	1500	1500	1500	1400	1400	1000	1000	1000	0	0	0	0	0	0
Subtotal	8697	14301	10785	10121	9500	8300	6000	6000	5000	4000	3000	3000	3000	0	0	0	0	0	0
Irian Jaya	2269	2419	4826	3038	5600	8100	16000	16600	20000	20000	20000	20000	25000	25000	30000	30000	30000	35000	35000
Total	58683	78746	65902	66257	76100	85900	94000	97000	97000	94000	91000	88000	92000	85000	88000	88000	88000	93000	93000

Population Projections for Inner and Outer Islands of Indonesia under alternative levels of sponsored and spontaneous transmigration: 1980-2020 (1)
('000 of people; parentheses indicate negative numbers)

Table 2

Scenarios	OUTER ISLANDS POPULATION PROJECTIONS									Population, year 2020 as proportion of population with natural increase only	Absolute Difference in Population with migration and without	INNER ISLANDS POPULATION PROJECTIONS									Population, year 2020 as proportion of population with natural increase only	Absolute Difference in Population with migration and without
	1980	1985	1990	1995	2000	2005	2010	2015	2020			1980	1985	1990	1995	2000	2005	2010	2015	2020		
Natural Increase Only (2)	50,479	57,948	65,571	73,141	80,429	87,781	94,856	101,262	106,753	1.00	0	96,280	106,659	116,558	126,579	135,877	144,749	152,954	161,215	169,136	1.00	0
Lowest sponsored																						
No spontaneous	50,479	59,318	67,885	76,061	83,650	91,319	98,716	105,421	111,164	1.04	4,411	96,280	105,315	114,330	123,805	132,860	141,483	149,443	157,456	165,146	0.98	(3,991)
Low spontaneous	50,479	59,476	68,570	77,354	85,585	93,764	101,558	108,593	114,620	1.07	7,867	96,280	105,160	113,661	122,555	130,999	139,152	146,762	154,472	161,882	0.96	(7,254)
High spontaneous	50,479	59,560	68,992	78,254	87,179	96,109	104,641	112,377	119,107	1.12	12,354	96,280	105,078	113,250	121,682	129,457	136,896	143,813	150,853	157,560	0.93	(11,576)
Low sponsored																						
No spontaneous	50,479	59,437	68,412	76,950	84,636	92,402	99,898	106,698	112,524	1.05	5,771	96,280	105,198	113,816	122,948	131,922	140,467	148,349	156,281	163,892	0.97	(5,244)
Low spontaneous	50,479	59,594	69,174	78,479	87,059	95,541	103,578	110,826	117,035	1.10	10,283	96,280	105,044	113,073	121,466	129,586	137,466	144,866	152,385	159,617	0.94	(9,519)
High spontaneous	50,479	59,679	69,637	79,524	89,004	98,481	107,503	115,688	122,846	1.15	16,093	96,280	104,961	112,620	120,451	127,701	134,632	141,105	147,724	154,007	0.91	(15,129)
Medium sponsored																						
No spontaneous	50,479	59,467	68,973	78,424	86,869	94,867	102,589	109,610	115,639	1.08	8,887	96,280	105,169	113,266	121,511	129,764	138,119	145,818	153,554	160,967	0.95	(8,170)
Low spontaneous	50,479	59,625	69,786	79,993	89,981	99,286	108,023	115,825	122,463	1.15	15,710	96,280	105,014	112,472	119,991	126,748	133,866	140,634	147,639	154,390	0.91	(14,746)
High spontaneous	50,479	59,709	70,277	81,177	92,395	103,221	113,545	122,883	131,162	1.23	24,409	96,280	104,931	111,992	118,840	124,403	130,059	135,321	140,842	146,003	0.86	(23,134)
High sponsored																						
No spontaneous	50,479	59,498	69,454	79,481	89,036	97,265	105,210	112,447	118,678	1.11	11,925	96,280	105,139	112,794	120,483	127,658	135,823	143,342	150,886	158,100	0.93	(11,036)
Low spontaneous	50,479	59,655	70,319	81,055	92,667	102,804	112,296	120,664	127,853	1.20	21,100	96,280	104,984	111,950	118,960	124,112	130,475	136,552	143,029	149,285	0.88	(19,851)
High spontaneous	50,479	59,740	70,838	82,355	95,475	107,590	119,265	129,762	139,186	1.30	32,433	96,280	104,901	111,442	117,695	121,400	125,836	129,831	134,244	138,258	0.82	(30,878)

(1) Inner Islands include Java, Bali and Lombok. Outer Islands refer primarily to Sumatra, Kalimantan, Sulawesi, Irian Jaya, and Moluku.
There are four levels of sponsored migration projected (including locals settled):

Lowest: 300,000 families settled over Repelita IV and V (270,000 families moved).
Low: 500,000 families settled over Repelita IV and V (450,000 families moved).
Medium: 1,000,000 families settled over Repelita IV, V and VI ~~(1,350,000 families moved)~~. (900,000 families moved).
High: 1,5000,000 families settled over Repelita IV, V and VI. (1,350,000 families moved).

Another 305,000 families were included in the population impact of all levels of sponsored migration because they were moved under Repelita III from 1980/81 to 1984/85. In calculating the demographic impact, only those families settled who were actually moved from another island were included, i.e. locals, approximately 10% of the total sponsored, were excluded. There are three levels of spontaneous migration under each level of sponsored migration: no spontaneous migration, low spontaneous migration, and high spontaneous migration. For the purposes of the projections, low spontaneous migration is defined as each mover attracting .05 people per year for ten years. High spontaneous migration is defined as each mover attracting .075 people per year for ten years. Movers are both sponsored migrants and spontaneous migrants.

(2) Fertility rates and mortality rates decline over the period to replacement level by the year 2010 for the inner islands and 2020 for the outer islands. Total fertility is projected to decline as follows:

	1980-84	1985-89	1990-94	1995-2000	2000-04	2005-09	2010-14	2015-19
INNER ISLANDS								
TFR	4.16	3.70	3.17	2.76	2.48	2.20	2.17	2.15
E(o) males	53	55	57	59	62	65	67	68
E(o) females	56	58	61	63	66	69	70	72
OUTER ISLANDS								
TFR	4.94	4.33	3.63	3.11	2.88	2.65	2.43	2.2
E(o) males	55	58	60	62	63	64	64	65
E(o) females	58	61	64	66	67	67	68	69

Age-sex structures for 1980 are taken from the 1980 census. Natural increase is a function of fertility and mortality only; all types of migration are assumed to be zero.

Population Projections for Major Islands of Indonesia under alternative levels of sponsored and spontaneous transmigration: 1980-2020 (1)

	PROJECTED POPULATION (000)									Population, year 2020 as proportion of population with natural increase only	Absolute Difference in Population with migration and without, year 2020
	1980	1985	1990	1995	2000	2005	2010	2015	2020		
SUMATRA											
No migration (natural increase only)	27,714	31,774	35,995	40,226	44,308	48,413	52,353	55,928	59,005	1.00	0
Lowest sponsored with:											
low spontaneous	27,714	32,587	37,456	42,175	46,657	51,112	55,365	59,215	62,525	1.06	3519
high spontaneous	27,714	32,636	37,679	42,629	47,424	52,211	56,787	60,941	64,555	1.09	5549
Low sponsored with:											
low spontaneous	27,714	32,638	37,679	42,544	47,135	51,682	56,010	59,925	63,291	1.07	4286
high spontaneous	27,714	32,686	37,919	43,052	48,023	52,978	57,706	62,000	65,746	1.11	6740
Medium sponsored with:											
low spontaneous	27,714	32,658	37,844	42,905	47,777	52,494	56,967	60,998	64,465	1.09	5459
high spontaneous	27,714	32,706	38,093	43,452	48,781	54,019	59,018	63,553	67,533	1.14	8527
High sponsored with:											
low spontaneous	27,714	32,684	38,075	43,362	48,702	53,674	58,375	62,583	66,205	1.12	7200
high spontaneous	27,714	32,732	38,339	43,962	49,859	55,513	60,932	65,832	70,169	1.19	11164
KALIMANTAN											
No migration (natural increase only)	6,658	7,666	8,677	9,663	10,606	11,559	12,477	13,304	14,007	1.00	0
Lowest sponsored with:											
low spontaneous	6,658	8,058	9,542	10,921	12,166	13,382	14,524	15,547	16,418	1.17	2411
high spontaneous	6,658	8,077	9,651	11,169	12,626	14,074	15,446	16,689	17,781	1.27	3774
Low sponsored with:											
low spontaneous	6,658	8,100	9,767	11,344	12,721	14,051	15,286	16,389	17,329	1.24	3322
high spontaneous	6,658	8,119	9,891	11,645	13,312	14,967	16,525	17,937	19,191	1.37	5184
Medium sponsored with:											
low spontaneous	6,658	8,110	10,102	12,149	14,137	15,848	17,400	18,760	19,924	1.42	5916
high spontaneous	6,658	8,129	10,240	12,525	14,973	17,261	19,419	21,367	23,140	1.65	9133
High sponsored with:											
low spontaneous	6,658	8,110	10,301	12,602	15,337	17,419	19,314	20,930	22,318	1.59	8311
high spontaneous	6,658	8,129	10,448	13,019	16,327	19,201	21,971	24,444	26,735	1.91	12728
SULAWESI AND MOLUCCAS (2)											
No migration (natural increase only)	15,008	17,227	19,441	21,630	23,734	25,867	27,928	29,795	31,390	1.00	0
Lowest sponsored with:											
low spontaneous	15,008	17,472	19,839	22,139	24,337	26,553	28,691	30,624	32,276	1.03	886
high spontaneous	15,008	17,486	19,903	22,266	24,544	26,842	29,059	31,067	32,792	1.04	1403
Low sponsored with:											
low spontaneous	15,008	17,488	19,887	22,203	24,416	26,645	28,793	30,736	32,396	1.03	1007
high spontaneous	15,008	17,502	19,956	22,342	24,646	26,969	29,208	31,236	32,981	1.05	1591
Medium sponsored with:											
low spontaneous	15,008	17,488	19,913	22,238	24,463	26,700	28,856	30,806	32,471	1.03	1081
high spontaneous	15,008	17,502	19,983	22,382	24,704	27,043	29,297	31,339	33,097	1.05	1707
High sponsored with:											
low spontaneous	15,008	17,492	19,968	22,356	24,620	26,892	29,075	31,048	32,734	1.04	1344
high spontaneous	15,008	17,506	20,041	22,512	24,897	27,296	29,606	31,697	33,503	1.07	2113
IRIAN JAYA											
No migration (natural increase only)	1,099	1,282	1,458	1,623	1,780	1,942	2,097	2,235	2,350	1.00	0
Lowest sponsored with:											
low spontaneous	1,099	1,359	1,733	2,119	2,425	2,717	2,978	3,207	3,401	1.45	1051
high spontaneous	1,099	1,362	1,758	2,190	2,585	2,982	3,348	3,680	3,979	1.69	1629
Low sponsored with:											
low spontaneous	1,099	1,369	1,841	2,388	2,788	3,164	3,490	3,776	4,018	1.71	1668
high spontaneous	1,099	1,373	1,872	2,485	3,023	3,567	4,064	4,516	4,929	2.10	2578
Medium sponsored with:											
low spontaneous	1,099	1,369	1,927	2,701	3,603	4,244	4,800	5,262	5,658	2.41	3308
high spontaneous	1,099	1,373	1,961	2,819	3,938	4,898	5,810	6,624	7,393	3.15	5042
High sponsored with:											
low spontaneous	1,099	1,370	1,975	2,736	4,027	4,819	5,532	6,103	6,596	2.81	4245
high spontaneous	1,099	1,373	2,011	2,861	4,392	5,579	6,757	7,789	8,778	3.74	6428
TOTAL											
No migration (natural increase only)	50,479	57,948	65,571	73,141	80,429	87,781	94,856	101,262	106,753	1.00	0
Lowest sponsored with:											
low spontaneous	50,479	59,476	68,570	77,354	85,585	93,764	101,558	108,593	114,620	1.07	7867
high spontaneous	50,479	59,560	68,992	78,254	87,179	96,109	104,641	112,377	119,107	1.12	12354
Low sponsored with:											
low spontaneous	50,479	59,594	69,174	78,479	87,059	95,541	103,578	110,826	117,035	1.10	10283
high spontaneous	50,479	59,679	69,637	79,524	89,004	98,481	107,503	115,688	122,846	1.15	16093
Medium sponsored with:											
low spontaneous	50,479	59,625	69,786	79,993	89,981	99,286	108,023	115,825	122,518	1.15	15765
high spontaneous	50,479	59,709	70,277	81,177	92,395	103,221	113,545	122,883	131,162	1.23	24409
High sponsored with:											
low spontaneous	50,479	59,655	70,319	81,055	92,687	102,804	112,296	120,664	127,853	1.20	21100
high spontaneous	50,479	59,740	70,838	82,355	95,475	107,590	119,265	129,762	139,186	1.30	32433

(1) Levels of sponsored migration from lowest to high and levels of spontaneous migration are explained in previous table.

(2) Includes Nusa Tenggara Timur and Timor Timur

PROVINCIAL SUMMARY: ALTERNATIVE TRANSMIGRATION SCENARIOS 1980–2020
(000 of people)

Low migration is low levels sponsored migration and low levels of spontaneous migration. High migration is medium levels of sponsored migration and high levels of spontaneous migration.

Province	*POP* 1980	*POP* 1985	*POP* 1990	*POP* 1995	*POP* 2000	*POP* 2005	*POP* 2010	*POP* 2015	*POP* 2020	Population in year 2020 as proportion of population in absence of migration	Absolute difference in population with and without migration
Aceh											
No Migration	2589	2964	3347	3726	4089	4455	4809	5130	5406		
Low	2589	3021	3432	3833	4214	4598	4967	5302	5589	1.03	183.3
High	2589	3025	3453	3871	4272	4676	5064	5416	5721	1.06	315.4
North Sumatra											
No Migration	8287	9493	10774	12078	13331	14586	15794	16898	17855		
Low	8287	9533	10855	12184	13460	14734	15959	17077	18047	1.01	191.9
High	8287	9539	10892	12261	13580	14896	16161	17317	18322	1.03	467.4
West Sumatra											
No Migration	3384	3836	4309	4788	5251	5716	6164	6574	6931		
Low	3384	3863	4360	4854	5331	5807	6265	6685	7050	1.02	118.6
High	3384	3864	4370	4883	5380	5877	6354	6792	7174	1.04	243.3
Riau											
No Migration	2143	2476	2816	3148	3468	3792	4103	4383	4621		
Low	2143	2618	3129	3608	4040	4461	4855	5207	5507	1.19	886.2
High	2143	2632	3257	3880	4540	5165	5758	6292	6772	1.47	2151.3
Jambi											
No Migration	1427	1650	1875	2094	2305	2519	2724	2908	3066		
Low	1427	1767	2181	2539	2861	3169	3455	3710	3927	1.28	862.0
High	1427	1772	2220	2671	3166	3627	4065	4459	4816	1.57	1750.1
South Sumatra											
No Migration	4581	5256	5956	6656	7332	8012	8662	9251	9756		
Low	4581	5655	6674	7625	8503	9361	10169	10895	11517	1.18	1761.7
High	4581	5688	6829	7938	9041	10119	11142	12067	12888	1.32	3131.9
Bengkulu											
No Migration	756	864	977	1093	1208	1323	1432	1531	1617		
Low	756	920	1069	1212	1349	1484	1611	1726	1825	1.13	208.1
High	756	923	1086	1247	1406	1563	1712	1847	1965	1.22	348.6
Lampung											
No Migration	4547	5235	5942	6644	7324	8011	8665	9254	9755		
Low	4547	5260	5979	6688	7376	8069	8730	9323	9830	1.01	74.3
High	4547	5263	5987	6702	7396	8096	8763	9363	9875	1.01	119.3
SUMATRA Subtotal											
No Migration	27714	31774	35995	40226	44308	48413	52353	55928	59005		
Low	27714	32638	37679	42544	47135	51682	56010	59925	63291	1.07	4286.1
High	27714	32706	38093	43452	48781	54019	59018	63553	67533	1.14	8527.4
West Kalimantan											
No Migration	2469	2842	3218	3585	3938	4295	4640	4951	5216		
Low	2469	2977	3564	4114	4604	5079	5523	5921	6260	1.20	1044.1
High	2469	2982	3722	4545	5427	6254	7033	7737	8378	1.61	3162.5
Central Kalimantan											
No Migration	945	1083	1224	1367	1506	1646	1779	1899	2001		
Low	945	1195	1516	1836	2099	2348	2572	2771	2941	1.47	940.3
High	945	1210	1720	2280	2894	3457	3983	4459	4901	2.45	2899.7

South Kalimantan											
No Migration	2053	2371	2686	2989	3273	3560	3839	4092	4307		
Low	2053	2474	2867	3220	3549	3876	4190	4474	4716	1.09	409.0
High	2053	2480	2912	3340	3765	4179	4577	4938	5254	1.22	947.6
East Kalimantan											
No Migration	1191	1370	1548	1722	1889	2058	2219	2363	2484		
Low	1191	1454	1820	2174	2469	2748	3000	3223	3413	1.37	928.9
High	1191	1457	1886	2360	2887	3371	3825	4233	4607	1.85	2123.2
KALIMANTAN Subtotal											
No Migration	6658	7666	8677	9663	10606	11559	12477	13304	14007		
Low	6658	8100	9767	11344	12721	14051	15286	16389	17329	1.24	3322.3
High	6658	8129	10240	12525	14973	17261	19419	21367	23140	1.65	9133.0
South Sulawesi											
No Migration	6035	6954	7860	8747	9594	10455	11290	12047	12695		
Low	6035	6983	7912	8815	9675	10548	11393	12160	12816	1.01	121.0
High	6035	6984	7924	8836	9710	10596	11455	12233	12901	1.02	206.1
Central Sulawesi											
No Migration	1268	1455	1645	1837	2025	2214	2395	2557	2695		
Low	1268	1534	1780	2010	2230	2449	2656	2841	2999	1.11	304.0
High	1268	1538	1805	2059	2309	2559	2796	3010	3195	1.19	500.0
S.E. Sulawesi											
No Migration	933	1077	1223	1371	1517	1665	1806	1934	2043		
Low	933	1169	1376	1567	1750	1930	2101	2254	2385	1.17	343.0
High	933	1174	1410	1630	1849	2067	2274	2460	2624	1.28	581.8
N. Sulawesi											
No Migration	2098	2402	2713	3020	3309	3600	3882	4140	4361		
Low	2098	2420	2739	3053	3347	3643	3930	4191	4416	1.01	55.4
High	2098	2421	2744	3062	3361	3662	3954	4220	4449	1.02	88.2
Moluku											
No Migration	1399	1591	1787	1987	2184	2382	2572	2743	2888		
Low	1399	1634	1867	2090	2307	2524	2729	2914	3071	1.06	183.2
High	1399	1636	1888	2128	2368	2608	2836	3041	3219	1.11	330.6
SULAWESI AND MOLUKU Subtotal											
No Migration	11733	13479	15229	16962	18628	20315	21944	23420	24682		
Low	11733	13740	15675	17535	19310	21093	22809	24361	25688	1.04	1006.5
High	11733	13754	15771	17714	19599	21491	23313	24964	26388	1.07	1706.8
Irian Jaya											
No Migration	1099	1282	1458	1623	1780	1942	2097	2235	2350		
Low	1099	1369	1841	2388	2788	3164	3490	3776	4018	1.71	1667.9
High	1099	1373	1961	2819	3938	4898	5810	6624	7393	3.15	5042.4
TOTAL (excluding East Nusa Tenggara and East Timor)											
No Migration	47204	54200	61358	68474	75323	82230	88872	94887	100044		
Low	47204	55846	64961	73811	81953	89990	97594	104451	110327	1.10	10282.8
High	47204	55961	66065	76509	87290	97669	107561	116508	124454	1.24	24409.5
East Nusa Tenggara	2722	3109	3489	3867	4235	4609	4971	5298	5578		
East Timor	553	639	723	801	871	942	1013	1077	1130		
Total Including East Nusa Tenggara and East Timor											
No Migration	50479	57948	65571	73141	80429	87781	94856	101262	106753		
Low	50479	59594	69174	78479	87059	95541	103578	110826	117035	1.10	10283
High	50479	59709	70277	81177	92395	103221	113545	122883	131162	1.23	24409

fertility and mortality in the outer islands, how many spontaneous transmigrants are attracted, in turn, who remain in the outer islands, and those spontaneous transmigrants' fertility and mortality rates after their arrival.

A cohort component population projection was done to illustrate the long run population impact of these levels of transmigration, with alternative levels of associated spontaneous transmigration (Tables 2 to 4). Population both in the inner and outer islands was projected under four levels of sponsored transmigration, with an additional three levels of associated spontaneous transmigration under each level of sponsored transmigration. The three levels of spontaneous transmigration are no spontaneous movement, low spontaneous migration, with each transmigrant attracting .05 people per year for ten years, and high spontaneous migration, with each transmigrant attracting .075 people per year for ten years. Transmigrants are projected to have the same age-sex structure as the sample of transmigrations arriving in Baturaja in 1983/84 (4).

Within each level of sponsored migration, the degree of spontaneous migration makes a striking difference of the population impact in the year 2020. Under the medium scenario of sponsored movement, 900,000 families are moved but the total population impact of this is an addition 8.9 million people in the outer islands (and a reduction of 8.2 million people in the inner islands) by the year 2020, because of the population growth after their arrival. (The population impact in the inner and outer islands is not equivalent because of different assumptions about fertility and mortality in the inner and outer islands (5)). But if low levels of associated spontaneous migration are added to the scenario, the population impact increases to 15.7 million more people in the outer islands by the year 2020. If government policy actively facilitated spontaneous

transmigration, the population impact would increase even further to about 24.4 million people or more. This population impact is even higher than the high level of sponsored migration under no or low spontaneous migration. In order to achieve transmigration targets, there is clearly a large budgetary tradeoff to investing large sums of money to sponsor a certain level of transmigrants without facilitating spontaneous movement versus using less resources to fully sponsor fewer transmigrants and use the remainder to facilitate or partially assist spontaneous migration.

The overall impact on population distribution is significant in all scenarios, but particularly under the highest scenarios. Under the highest assumption about population movement, the high level of sponsored movement with high spontaneous migration, the population of the inner islands is reduced by 30.9 million people over what it would be under natural increase alone by the year 2020, or a reduction of 18% in the total population. Under the medium scenario with high spontaneous migration, the reduction in the total population is 14% less than under natural increase in the year 2020 (Table 2).

In absolute terms the biggest increase in population is in Sumatra and Kalimantan (Table 3) by the year 2020. As a proportion of its total population, the biggest increase occurs, of course, in Irian Jaya, followed by Kalimantan, since these are the least densily populated islands. In Irian Jaya, the increase in population in the year 2020 over what it would be under natural increase alone ranges from an increase of 45% under the lowest scenario with low associated transmigration to a remarkable 274% of the population under the high scenario with high transmigration. Kalimantan ranges from an increase of 17% by the year 2020 over what would occur from natural increase alone, to 91% with high sponsored and high

spontaneous migration. Since Sumatra and Sulawesi are more densly populated, the population impact of continuing transmigration is less in proportion to the population under natural increase alone. These figures are also shown at the provincial level in Table 4, but only 3 scenarios are shown: natural increase alone (no migration), low migration (low levels of sponsored migration with low levels of spontaneous migration) and high migration (medium levels of sponsored migration and high levels of spontaneous migration).

Notes

(1) This projection assumes that no transmigrants desert the transmigration program and return to the inner islands.

(2) Age structure for sponsored migrants taken from a sample of Baturaja families on arrival in 1983/84:

Age	Males	Females
0-4	.09	.08
5-9	.08	.06
10-14	.06	.04
15-19	.04	.05
20-24	.05	.08
25-29	.07	.06
30-34	.06	.03
35-39	.03	.02
40-44	.03	.01
45-49	.01	.01
50-54	.01	.01
55-59	.00	.00
60-64	.00	.00
65+	.00	.00

(3) While only about 223,000 official transmigrants were moved into Lampung from 1950 to 1978, over 3 million rural residents, or 78% of the rural population, speaks an inner island language. Clearly associated migration from the inner islands to Lampung has been going on for many decades.

(4) See note (2).

(5) The Total Fertility Rate is assumed to decline to replacement level (NRR=1) by the year 2010 for the inner islands and by the year 2010 for the outer islands. The TFR is higher in the outer islands than the inner islands over the period, starting at 4.94 children per women in 1980-84 compared to 4.16 children per women in the inner islands. Transmigrants are assumed to have the fertility and moratality rates of the destination area after they arrive. Detailed assumptions about mortality rates and fertility rates over the period are shown in the footnote to Table 2.

Chapter VII - Other Factors Affecting the Scale of the Future Program

A. Land Availability

7.01 Prior to Repelita III most land was identified on a site by site basis by the Governors or transmigration officials in receiving provinces. Since the program was relatively small, and the potential settlement areas appeared vast, it seemed unlikely that land availability would would be a major constraint to settlement in the foreseeable future. However, the ~~This perception has changed~~ and the consolidation of interests in other ministries including Forestry the scale of Repelita III program has changed this perception. ~~dramatically~~. By Repelita IV Sumatra and Sulawesi were virtually closed to further large-scale settlement, & ~~Both areas suitable for agriculture in~~ the scope of settlement in East Kalimantan and Central Kalimantan ~~will general appeared limited by the extent of for on the resolution of~~ depends on large maps. on decisions taken on the boundaries of ~~pro~~ conversion and production forest and settlement in Irian Jaya faced special environmental and social problems. Further an assessment of the scale of future program now depends, in part, on land suitability and availability and the ability of government agencies to reconcile conflicting ~~the~~ priorities and make appropriate policy decisions

Shii

The most sensitive ~~aspect of settlem~~ issue in settlement ~~has to~~ is the accuracy and fairness with which the rights and ~~land rights are carried out~~ interests of the local people are taken into account. As noted (chapter IV) ~~the site selection effort is intended to assess the areas required for local people to meet their subsistence needs and to assess the benefit~~ the Bank policy statements recognize that the process of acculturation and political awareness is a long one and for this reason slow ~~soundly based~~ well planned transmigration ~~will be~~ coupled with sound programs to benefit the local people are to be preferred over ~~large~~ crash programs. This coupled with financial constraints (covered in Section c) suggests that while Irian Jaya has very large areas slow development of the area may be desireable

Summary

Consultant reports indicate that there may be sufficient land to sustain a transmigration program of 300,000 families through Repelita ~~IV~~ and ~~V~~ ~~(2000)~~ if the institutional capacity is developed to establish most ~~upland~~ families with tree crops (at ~~250,000~~ 400-500,000 ha/year) and ~~implementation problems in swamp~~ production ~~areas~~ heavily influenced can be overcome if forestry constraints in East and Central Kalimantan are relaxed.