

NEW GUINEA RESEARCH UNIT

BULLETIN

THE NEW GUINEA RESEARCH UNIT BULLETIN

Introduction to the Series

The Departments of Anthropology and Sociology, Geography and Pacific History of the Research School of Pacific Studies of the Australian National University have for many years conducted research in Papua-New Guinea. The more recently established Department of Economics of the School has begun additional research there. The New Guinea Research Unit is intended to supplement this work by undertaking certain projects of an inter-disciplinary character in relation to problems which are of both practical importance and scientific interest. The Unit is both to support the research of the various Departments and to conduct research on its own. It is controlled by a committee in the School consisting of Professors Sir John Crawford, J. A. Barnes, J. W. Davidson and Drs. Harold Brookfield and David Bettison.

Senior staff were appointed to the Unit in 1961 and 1962. The Executive Officer, Dr. David G. Bettison, has headquarters in Canberra and is responsible for the day-to-day administration of the Unit as a whole. Mr. Nigel D. Oram is responsible for the Unit in Papua-New Guinea and has urbanisation and resettlement as his principal research topic. Dr. Ronald G. Crocombe is engaged in research on land tenure and its relation to productivity. Each of these Research Officers has a number of graduate research assistants and indigenous workers to help him.

From March to June 1963 Mrs. Nancy Hitchcock (formerly Miss Nancy Kirk, who studied nutrition in the Territory with Dr. Eben Hipsley of the Institute of Anatomy) will participate in a study of the socio-economic and dietary circumstances of a sample of immigrant dwellers in Port Moresby.

A generous grant from the Rural Credits Development Fund of the Reserve Bank of Australia will enable the Unit to expand further during

1963 by undertaking research on the relation of subsistence agriculture to cash cropping and the influence of indigenous social organisation on agricultural productivity. A Research Officer and at least one Research Assistant with indigenous helpers will make up the team. A Research Assistant, who it is hoped will get into the field at the earliest possible date, will begin by controlling a study of work patterns among the Orokaiva people of Popondetta on varying systems of land development. He will initially be under Dr. Crocombe's direction.

During 1962 the Unit carried out research in three areas of Papua-New Guinea - Port Moresby and environs, Popondetta and environs in the Northern District of Papua, and in the Markham Valley, Morobe District, New Guinea. It assisted the work of many research personnel throughout the Territory by the control of stores, the administration of vehicles and other routine matters and has rendered assistance to research workers from other Universities and institutions.

Early in the Unit's activities it became clear that research personnel interested in the Territory, as well as officials in the various departments of government, sought and might benefit from the speedy dissemination of research findings. The inter-disciplinary and applied character of the Unit's work meant not only that a wide coverage of interest existed in academic and administrative circles, but also that any practical benefits to be derived from this work depended substantially on getting the material to those interested as early as possible. With this in mind, ways and means were examined to produce a publication capable of reaching interested parties in the shortest possible time and yet not be too great a burden on the field worker in terms of time spent in careful preparation of a manuscript worthy of a well established journal or book.

The Bulletin will appear at irregular intervals as material from the field is written up in a form which clearly and accurately states the nature of the enquiry, the methods used, the facts obtained and possibly conclusions and comments on policy. The opportunity will be taken in each issue to indicate briefly any changes in staff or research topics undertaken by the Unit. This will serve to keep interested persons informed of the Unit's work and encourage co-operation among the many research personnel and organisations currently working in the Territory. Contributions must be complete at the level of the particular field

of enquiry, though they need not refer to the theoretical framework or overall practical problems of which the particular enquiry is only a part. A single issue may be devoted to one study or may contain a number of related studies, depending on the flow of material available. The Bulletin is not reserved for the Unit's work alone, but is available to anyone with research findings of comparable quality relating to Papua-New Guinea.

April, 1963

D. G. Bettison
Executive Officer
New Guinea Research Unit

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THE ERAP MECHANICAL FARMING PROJECT

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and

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FOREWORD

This paper is based on a survey of the Erap Mechanical Farming Project which was undertaken between 20th September and 20th October, 1962. We had the benefit of assistance, information and opinion from a number of people, of whom particular mention must be made of Numbuk and the other Erap people who are involved in the project, the District Commissioner (Mr. H. L. R. Niall), the District Agricultural Officer (Mr. E. R. Wilson), and his assistant (Mr. R. Curtis), the District Officer (Mr. D. N. Ashton), the former Assistant District Officer (Mr. T. J. Leabeater), Mr. T. J. Leahy and Mr. R. S. Ginter. Their accumulated experience has been invaluable to us and their help is acknowledged with gratitude. Responsibility for the views expressed in this paper, however, rests exclusively with ourselves. The maps and appendices were prepared by Mr. M. Rimoldi, who also assisted with the revision of the manuscript.

Three incidental features were constantly brought to our notice during the survey. Firstly, the confidence which Numbuk and his associates have in the senior officers of the Departments of Agriculture and Native Affairs, and the way in which those officers have managed to exert a beneficial influence without interfering with the management of the project, thus leaving the people with the very considerable satisfaction of running their own enterprise. Secondly, neighbouring European planters have had an important demonstration effect on the project, and the Erap people made frequent reference to points they had learned and assistance they had received from nearby planters. Finally, we are most favourably impressed with the way in which the leaders of the project have successfully launched an important enterprise of a type which bears little relation to their traditional experience. They have shown an ability to innovate, to plan and to persevere, and have made a rapid and healthy adjustment to their new economic environment.

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Numbuk (left) and Iogodupman (one of the project overseers) supervise a payout. Most workers receive £2. 10. 0. (£2. in shillings placed on top of a ten shilling note). Irregular amounts are for specialists. youths. etc.



One of the project tractors discing a sweet potato garden.

INTRODUCTORY

The Midi-speaking villages of the Erap Sub-District lie in the Nanuti mountains to the north of the Markham Valley about forty miles inland from Lae. Before the project began, many of the men of the villages had worked as labourers in gold-mining and other pursuits, particularly around Bulolo and Wau, but no income was available either from wage labour or commercial agriculture within the villages themselves.

In 1945, a man named Numbuk from the village of Aroande joined the police force and was posted to the Sepik District where he came into close contact with Simogun Peta who was one of the first Sepik men to emerge as an entrepreneur (see item 2 p. 41). From Simogun's example he conceived the possibility that his own people could achieve higher standards of living through commercial agriculture and trade. He became aware that efficient organization and new patterns of work would be necessary if a viable enterprise was to be established. Numbuk returned to Erap on holiday about 1951 and persuaded the people of Aroande, Aropak, Bibira and Bunki villages of the feasibility of his scheme by quoting Simogun's example. Numbuk was advocating a new way of life based on maximum participation in the money economy. The villagers had previously sold vegetables spasmodically to Europeans living in the Markham Valley, but they now decided to organize on a larger scale, and Numbuk persuaded the Aroande, Aropak and Bibira people to abandon their existing villages and rebuild contiguously on a central site. In the beginning Aropak and Bibira villages grew potatoes and Aroande grew cabbages, but as time went on they diversified their products and neighbouring villages joined in too.

After his leave Numbuk was posted back to Sepik and then to Goroka, but he remained only a short time before tendering his resignation and returning to Erap in 1952. When he returned the crops were already bearing and the village men and women carried the produce to Lae on their backs. It was hawked from house to house for sale to European residents. The walk to Lae took two full days and the return to the village another two days. At a later stage the Erap Agricultural Station assisted by lending donkeys to transport the produce from the hill villages to the Markham Valley, where it was bought by the Department of Agriculture for resale in Lae. The villagers were trained in the handling of donkeys and then set about building donkey roads from the villages to the Markham Valley.

THE ACCUMULATION OF CAPITAL

At first each vendor kept the proceeds of his own sales but later it was decided to pool most of the money in order to buy a new truck at some future date. By agreement the savings were held by Numbuk on behalf of the group. The people at this stage had little appreciation of the costs of the venture they were undertaking. None of them could count the money collected, and after a time some of them refused to contribute more, saying that the leaders had collected more than enough to buy a new truck. A deputation thereupon carried the money to Lae in parcels of silver coins. It was counted for them by officials who informed them that they had only £70 - "just enough for a tyre". The Erap leaders related to us how they returned home humiliated because they had disclosed their ignorance and had been laughed at, but they were determined that they would eventually achieve their goal.

By 12th June, 1953, £249. 10.0. had been accumulated and a Savings Bank Account was then opened. By 3rd March, 1955, a total of £495. 4. 0. had been deposited. At about this time meetings were held throughout Erap in an endeavour to raise additional money to buy the truck in which they proposed to take their produce to market. The truck they wanted cost £1,400 and everybody was asked to pool his or her individual savings to reach the target. Most people held some cash savings which they had acquired from employment away from the villages, from produce sales or from traditional exchanges. Further money was acquired by whole villages taking labour contracts on bridge construction, peanut picking, etc.

Collections were made on three different occasions in some villages and on four in others. Each person's contribution was noted in an exercise book, the amounts given by wives being kept separate from those of their husbands. Unfortunately the collections are not dated, and though it appears that most of the money was raised in 1955 and 1956, some later contributions, including some for tractor repairs a year or more later, have been included on the lists. The lists have been summarised as follows to show the amounts collected from each village and the total number of persons contributing. While most of the entries are clear, some are not, and in a few cases contributions which we have taken as pounds could have been shillings. The contributing villages have been divided into three categories -

- (a) The "core" villages which initiated the project, supplied most of the money, and have carried out most of the production;
- (b) the "supporting" villages which are situated further inland, are of the same language group as the "core" villages, and have participated in production to some extent, and
- (c) the "peripheral" villages which lie further away, are not all Midi-speaking, and have contributed relatively small amounts which are regarded as loans to be repaid rather than as investments in the project.

Core Villages.

	MEN (No.)				WOMEN (No.)				TOTAL (No.)			
Aroande	£201	0	0	(46)	£47	6	0	(27)	£248	6	0	(73)
Aropak	146	15	0	(59)	36	7	0	(46)	183	2	0	(105)
Bibira	25	12	0	(19)	9	13	0	(11)	35	5	0	(30)
Bunki	104	3	0	(63)	55	13	0	(47)	159	16	0	(110)
Sintogura	47	13	0	(24)	4	15	0	(8)	52	8	0	(32)
Total of above	£525	3	0	(211)	£153	14	0	(139)	£678	17	0	(350)
Naramonki*	-				-				241	17	0	(76)
									£920	14	0	(426)

* No lists have been located for Naramonki contributors, but a note shows their total contribution to be as above. The number of contributors shown for Naramonki is an estimate only.

Supporting villages

	MEN (No)				WOMEN (No)				TOTAL (No)			
Faeang	£48	13	0	(28)	£14	11	0	(17)	£63	4	0	(45)
Usop	31	17	0	(11)	6	12	0	(7)	38	9	0	(18)
Sialla	21	0	0	(18)	18	5	0	(18)	39	5	0	(36)
Toroa	62	11	0	(59)	7	12	0	(34)	70	3	0	(93)
Tinebi	16	9	0	(36)	4	2	0	(15)	20	11	0	(51)
Fi	24	3	0	(24)	2	6	0	(6)	26	9	0	(30)
Dondok	47	16	0	(61)	10	3	0	(42)	57	19	0	(103)
Sufu	15	2	0	(23)	2	14	0	(21)	17	16	0	(44)
	£267	11	0	(260)	£66	5	0	(160)	£333	16	0	(420)

Peripheral Villages

Kawalala	x)			
Barawang	x)			
Kwarebo	x)	Total collected at a single meeting at Funuwang. No details of individual amounts.		
Silling	x)			
Badibo	x)			
Munkip	x)			
Sigu	x)			£68 3 0
Gume	x	Single collection only		
Ganambuwan	x			
Simbung	x			
Daknaman	x			
Durak	x			
Kawan	x			

Continued

£98 19 0

Peripheral Villages (continued)

	MEN	WOMEN	TOTAL		
		B/fwd.	£	98	19 0
Uiangen	x	Single collection only		5	0 0
Aret	x	"		5	0 0
Dakgu	x	"		5	0 0
Siopak	x	"		15	0 0
Som	x	"		20	17 0
Funuwang	x	"		11	0 0
Gafang		"		15	0 0
Sumsum		"		31	0 0
Mama		"		20	0 0
Buguba		"		21	4 0
Silasila		"		8	19 0
Pupup		"		9	0 0
Yuweng		"		16	0 0
Narangkung		"		36	0 0
				£317	19 0

x denotes that the amount has since been repaid.

TOTALS	Core Villages	£920	14	0	(435 persons)
	Supporting Villages	333	16	0	(420 persons)
	Peripheral Villages	317	19	0	(? persons)
		£1,572	9	0.	

Whereas the inland people favoured a truck to transport their produce, those of Naramonki village (of the same language group but living in the Markham Valley), preferred to invest in a tractor. Two of the Naramonki leaders were employed as tractor drivers for a neighbouring farmer (Mr. T.J. Leahy), and were aware of the value of tractors for production. After further deliberations and consultation with appropriate officials it was decided to buy a tractor. They now had sufficient capital to do so. They did not, however, have any suitable land.

THE SHIFT TO THE MARKHAM VALLEY

As the villages are situated in mountainous country which is too rugged for tractors, it was necessary to acquire some flat land in the Markham Valley. In about 1946, well before mechanization was contemplated, the people of Gampipmalan village left the hills and came to the valley where they established Naramonki village. They settled on land made available by arrangement with the Gabsonkek people, who claimed to be the land-owners. When the inland villagers brought produce for sale in Lae they came into the Markham Valley close to Naramonki village and this became something of a staging camp in the valley for the Midi-speaking people. During 1954 or thereabouts some Naramonki people, assisted by some inland villagers, attempted to grow rice on the foothills near Naramonki village. The crops were worked by hand but as the price paid for the produce was low the experiment was soon abandoned.

Although the Gabsonkeks had allowed the Gampipmalan people to settle and establish gardens at Naramonki, in 1955 the Gabsonkeks sold most of the land without consulting the people who were living on it. The land was bought by the Administration for extension of the Erap Agricultural Station. Numbuk was looking for land in the valley and the Gabsonkek people were willing to sell it to him, but owing to the Naramonki experience he was cautious and wanted more certainty of tenure. He therefore negotiated through the Administration and in March 1957 Numbuk, in the presence of the Assistant District Officer, Mr. Young-Whitford, paid the Gabsonkek people £30 for "rights of perpetual usage" to an area of ground about two miles west of Naramonki village. The new settlers thereupon began farming in the area.

Meanwhile the Agricultural Station was extended, the Naramonki people were instructed to leave the area they had been occupying, fences were erected and government cattle were turned into paddocks in which the Naramonki food gardens were situated. Several cattle were speared in retaliation. The village split up - one group moved back into the foothills and the other moved about two miles westward to their present location, close to the place where Numbuk's people were farming. The Naramonkis were loaned some land by a European farmer on which to plant an emergency food supply, and some by Numbuk for commercial gardening with his project.

DEVELOPMENT OF THE PROJECT

The first tractor, a Fordson Major, was purchased new for £1,066 early in 1957 and work on the land acquired from Gabsonkek commenced. At first ploughs were hired from the Erap Agricultural Station and paid for in produce but before long the project acquired its own plough and disc harrow.

The project began with two main crops, sweet potatoes and peanuts. A little sorghum and rice was also grown though these crops were soon discontinued owing to low prices. There are few records of output or income at this stage. The project prospered and during 1957 the savings bank balance rose by £481. 12. 4. after labour and other production costs had been met.

To assist the project the Department of Agriculture sent Sau, who is one of the leaders of the scheme and a parallel cousin of Numbuk, to Madang for three months in 1957. He attended classes in elementary agricultural theory and was shown co-operatives, Rural Progress Societies, and techniques of weighing and grading produce. Sau was the only literate man on the project for though he had never been to school he had learned elementary reading, writing and arithmetic while in the police force in Port Moresby from 1947-49. He was employed as a policeman in Goroka until 1952 when Numbuk called him back to the village to assist the new scheme. Since his return from the course in Madang, Sau has maintained records and has trained two assistants. Neither of the assistants had any schooling except for a matter of months on one occasion with a passing missionary. Despite their obvious inability to maintain any regular accounting system, they have carefully preserved all receipts and other papers, and, since August 1958, have kept books of record in Pidgin in which most sales and savings and some expenses are noted.

It has not been possible to make up detailed accounts for several reasons. Firstly, the clerks take turns, usually month about, at keeping the records and each has a different system of spelling and arithmetical notation. For example, one man writes £16 to mean £16 or £106 except that in the latter case he usually leaves a gap to represent the "0"; another does not keep figures in regular columns and 12 may be £12, £1. 2. 0. or 12/-. Where quantities are stated or other clues are

available it is usually possible to interpret the intended meaning, though this is far from always the case. There are also several periods for which the relevant pages of the records have been lost or mislaid. In view of their lack of experience in such matters, however, we are very favourably impressed by the serious attempts they have made to maintain records. The first available records are those for the period 7th April to 27th May, 1958, during which time sweet potatoes to the value of £776. 10. 0 were sold.

The first period for which fairly full records are available is from 22nd August, 1958 to 5th September, 1959. In this period of just over a year, recorded income is as follows* -.

Sales of sweet potato - 201 tons	£2,002 0 0
Sales of peanuts	574 19 0
	£2,576 19 0
Income was distributed as follows -	
Repayment of loans from villages marked	
x on pages 4 and 5	£ 160 16 0
Tractor maintenance	258 14 6
Tractor fuel and oil	170 5 0
Bags	24 15 0
Purchase of new trailer	382 0 0
Payments to producers	1,163 7 2
Net lodgements in bank	460 2 1
	£2,619 19 9

Thereafter productivity was restricted by the tenure problems discussed in a later section.

* It should be noted that some figures are not clear and that in cases of doubt, we have had to take what appeared to be the intended amount. Two clerks worked during this period and their records overlap to some extent. It seems likely that not all sales were recorded and an Agriculture Department estimate made in 1959 put sales for the year about £3,500.

In October, 1959 the project tendered for the supply of five tons of sweet potato weekly to the Administration. Their tender was not accepted and it is understood that this was due to the uncertainty of their tenure of the land. The project in fact supplied the bulk of the sweet potato for this contract at 1d. per pound to a European planter who sold it to the Administration at the tender price of 2½d. per pound.

Records for the calendar year 1960 seem to be incomplete. 130 tons of sweet potatoes were sold for £1,303, and the tractor was hired to a neighbour for £12. Disbursements recorded are -

Tractor maintenance	£ 77	5	3
Tractor fuel and oil	72	19	8
Bags (amount not shown)			
Purchase of new plough	177	15	0
Rice for workers	4	5	0
Payments to producers	208	15	0
Net lodgements in bank	172	18	4
	<u>£713</u>	<u>18</u>	<u>3</u>

It is likely that actual income was in the vicinity of £2,000. During 1960 and 1961 the project was unable, owing to the limitations on available land, to supply more than a small proportion of the demand for sweet potato.

There are many short gaps in the records for the year 1961 and it has not been possible to work out even approximate figures for output and expenditure. During the year a second-hand tractor was purchased for £680 and a plough for £50. These were only about a year old, but a new tyre and some replacement parts costing an additional £100 were necessary. Net cash savings banked during the year amounted to £60.0.7.

Early in 1962 Numbuk successfully tendered for the supply of about five tons of sweet potato per week to be delivered to Administration departments in Lae as from 1st March 1962. The tender price is two pence per pound (double the previous price of one penny per pound at which they had sold for several years). At one stage Numbuk was unable to produce sufficient potatoes to supply the contract and he bought supplies from other indigenous growers up to fifty miles away. Local

planters, who sometimes provide their own transport are still supplied at one penny per pound, though it is unlikely that production is economic at this price. Records for sales for the first two months of the year are only spasmodically kept, but for the seven months from the date of the new contract (1st March 1962) until the time of our research (30th September 1962) details seem to have been recorded more carefully. 197 tons of sweet potatoes were sold for £3,431.13.6. Disbursements were not so thoroughly recorded but include -

Tractor maintenance, registrations etc.	£137	17	2
Fuel and oil	70	0	0
Payments to workers	838	8	0
Net lodgements in bank	373	2	5
	<u>£1419</u>	<u>7</u>	<u>7</u>

In addition to the above, many expenses which are paid for in cash at the time income is received have not been recorded. These include at least £372.0.0. for transport of the sweet potatoes to Lae to supply the government contract (31 weeks at £12 per week for two trips, though extra trips are often made). While bags have been purchased, no record has been kept of the value or the quantity. It is certain that not all payments to producers have been recorded, though it is difficult to make any assessment of how much has been omitted. The workers are also issued with rice and tinned meat at irregular intervals but these costs have not been noted. Not all fuel and oil purchases have been recorded owing to the fact that fuel is often acquired by barter for sweet potatoes from neighbouring planters. Such transactions are not usually entered either under sales or purchases.

In calculating total real income allowance must also be made for the volume of sweet potato which is consumed in the village, for all employees and their families use it as their staple food and draw their requirements from the project's gardens. (Bananas, pumpkins, sugar cane, manioc, etc., are grown by individual families in a separate gardening area.) When the "home" villages in the mountains are engaged in unpaid community work, as in their current task of building a vehicle road to the valley, the project provides free food for the workers.

At the suggestion of the District Agricultural Officer, an additional Savings Bank Account was opened this year for tractor maintenance and £5 weekly is deposited in it. This gives some assistance with repair bills but is usually inadequate to meet the whole cost, the balance being paid from current income. At present it contains a credit balance of £35*. No deposits have been made recently in the account for the Mechanical Farming Project as a whole, and it now has a balance of £167. 17. 3.

Almost since its inception the project has operated a trade store, which is managed by Numbuk with the assistance of a lad who serves at the counter. Wholesale purchases are made from Chinese merchants in Lae. The "company store" as it is called, was set up both to provide a local source of supply for day to day requirements and to enable the project to profit from the spending power which it creates. As no store accounts are kept and as store funds are not kept separate from other project funds, there is little evidence to indicate whether it is a profitable venture. Numbuk, who does the wholesale buying and costing, does not understand writing or arithmetic. Nevertheless, the people appear to be satisfied by the convenience and prestige which the store provides.

In addition to the "company store", there are three other stores in the village. The largest of the others is owned by Sea, who represents Naramonki village on the project. The project clerk and another Naramonki man each operate a small store. Numbuk has a private trade store in his home village of Aroande, serving the surrounding villages. The only other store in the inland area is located at Sintogura and belongs to Sea.

* The project member who acts as machinery overseer carries out routine maintenance of equipment at regular intervals. Machines which need major repairs are immediately taken to a qualified mechanic who has a workshop in the neighbourhood. The equipment is thus maintained in good working condition.

THE REPAYMENT OF CAPITAL

It was noted on page 5 that a total of £1572.9.0. was collected from a wide range of villages to set the project in motion, The average contribution was about £2.5.0. per contributor from the "core" villages, 15/- from the "supporting" villages, and a much smaller though unknown amount from the "peripheral" villages. For the "core" villages at least almost all income for several years was contributed to the project.

So far as we can ascertain, the money collected from the "peripheral" villages (£333.16.0.) was regarded as a loan to be repaid at some future date. In 1959 £160.16.0. was refunded, leaving an outstanding balance of £173.0.0., * which Numbuk intends to repay at some future date. As the £160.16.0. was repaid when the villages concerned requested it, there is no reason to believe that the rest will not also be repaid on request. It is of interest to note that several "peripheral" villages which were offered repayment in 1960 refused it, preferring to remain associated with the enterprise. At least one village regards its contribution as an outright donation on the ground that one of Numbuk's forebears came from there. Almost certainly counter-obligations have been set up by the grant of this assistance, but these will be handled within a context of other rights and obligations and are no doubt best left to the people themselves to work out, as only they are aware of the total complex of transactions within which these are fitted.

Money collected from the "core" and "supporting" villages was not regarded as a loan, but as a means to establish an enterprise that would enable them to earn an income and raise their standards of living. It is doubtful indeed that these people conceive of their particular sums of money as being still available to them, though some of the leaders are aware that this point of view is common among Europeans. Under the circumstances, however, it would be inappropriate to insist on conformity to the European pattern by requiring the project to treat

* Assuming that our interpretation of the available figures is correct. The exact amount may be a few pounds more or less.

the contributions from "core" and "supporting" villages as an outstanding debt. For example, because of their joint contribution of £101. 13. 0. the neighbouring villages of Faeang and Usop were allowed to plant one of the first gardens. The project supplied the mechanical and marketing facilities without charge and the people of Feang and Usop netted £186. 12. 0. from the arrangement. Again, Aropak village contributed £183. 2. 0. and from its first large garden, worked on the same basis as the previous case, they netted £282. 1. 0.

Detailed figures are unfortunately not available to show precisely what income each village has received, or how this relates to its contribution. What is clear, however, is that many villages were given facilities which enabled them to recoup their outlay quite early in the development of the project. The amounts collected and not repaid cannot therefore be regarded as outstanding debts.

This is not to deny that, having helped Numbuk and his village in this way, the donors are probably in a position to call on his assistance in return. Numbuk recognizes this obligation, and is prepared to assist those who wish to branch out on their own (see page 34 et seq). He appears to be strict in limiting the obligation to assistance in establishing economic enterprises.

MANAGEMENT

In 1959, the people say, they were advised by an officer of the Department of Native Affairs that they would have to appoint trustees as their legal representatives. People from Aroande, Aropak, Bunki, Sintogura and Naramonki accordingly met and appointed:

Numbuk Kapok of Aroande
Igodupman Uanin of Aropak
Sea Sengam of Naramonki
Kuapise Muruk of Aroande
Dakna Firisa of Bunki.

The agreement was signed by 548 men and women who placed their marks on it on 17th February, 1960. It is understood that this document was not officially recognized owing to the fact that division of profits, ownership and disposals of assets, audit and other technical matters were not set out in detail.

On 8th July, 1960 articles of association were drawn up, and signed by the same people. While the villages of the signatories are not shown in either list of signatures, the 'Company Census', from which the names were drawn, lists 569 names (with men and women in approximately equal proportions) of whom

79			came from Aroande
145	"	"	Bunki
159	"	"	Aropak (including Bibira)
186	"	"	Naramonki and Sintogura
569			

It is of interest to note that whereas capital was drawn from a wide range of villages, only people belonging to the villages which initiated the project were considered (by the Erap people) as having any voice in the organization. Within this group of villages Aroande was regarded as the principal one in so far as the project was concerned.

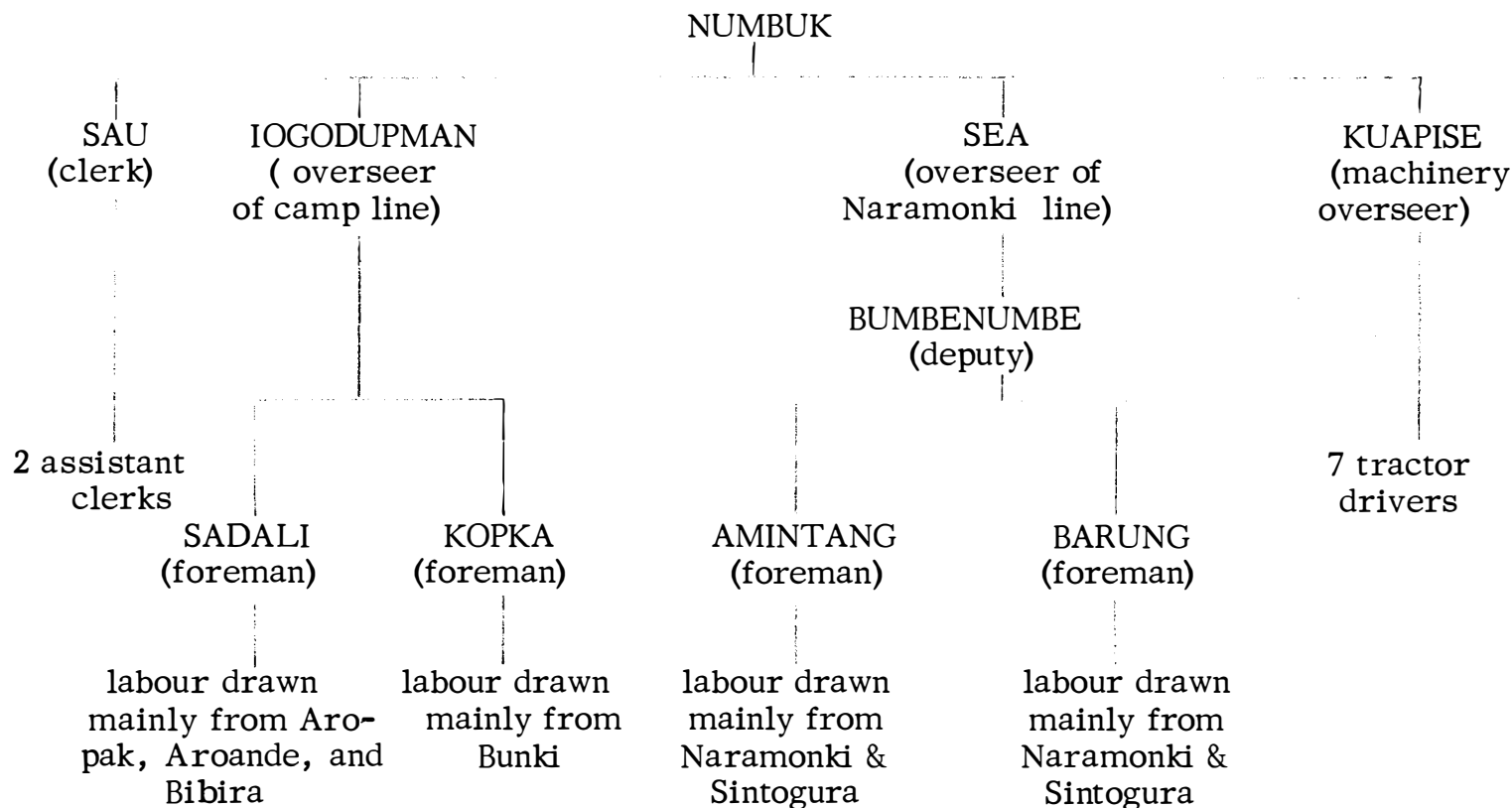
The articles of association specified the European customs by which meetings and other affairs should be conducted, and required inter alia that voting on certain issues would be by secret ballot, that books of account would be kept, and that shares might be issued (though "on the death of a member the paid up value of his shares shall be refunded to his estate"). These requirements are too comprehensive and detailed to be worked effectively by illiterate people and in fact they are neither understood nor adhered to. Moreover, for a group with only £1,400 worth of capital given in varying amounts from one shilling upwards by 549 people, adherence to the articles of association would be unduly time-consuming and costly even if there were people capable of performing the necessary formalities. Various alternative systems of organization have been proposed by the Administration but none has been formally instituted as yet.

In the system that has evolved, the project is effectively managed by Numbuk and a hierarchy of subordinates (see chart page 16). These people consult with the rest of the work force before any major decision is made. Meetings are held as often as two or three nights a week at the camp and are attended by most of the men and some of the women. The work to be undertaken by labour and tractors, the proportion of produce to be supplied from each garden, and the disciplining of unsatisfactory workers are discussed.

The work force is divided into two major lines each under an overseer. People from Aroande, Aropak, Bibira and Bunki villages work under Ilogodupman of Aropak, while those from Naramonki and Sintogura work under Sea of Naramonki. Under Ilogodupman there are two foremen who take turns at supervising that line's work in the gardens. * The one foreman supervises a line of workers drawn mainly from his own village of Bunki, and the other, workers drawn mainly from Aroande, Aropak and Bibira. The lines do not work concurrently. When a line is divided for specific tasks, a senior man is placed in charge of each group. The wife of Ilogodupman (she is Numbuk's cross-cousin) is the only woman holding a responsible position. It is her duty to check on

* Originally there were three foremen under Ilogodupman - one from Aropak (Sadali) one from Bunki (Kopka) and one from Aroande. The last was relieved of his position for not taking his share of supervising work, and has not been replaced.

WORK ORGANIZATION AUTHORITY STRUCTURE



NOTE: This diagram does not illustrate the decision-making structure which is much more complex and which we did not have time to investigate fully. It appears, for instance, that some luluais and tultuls in the mountain villages and some unskilled workers have important roles in decision-making and that decisions are reached only after consultation with all persons resident on the project.

attendance in the labour line and to report absences and idleness directly to Numbuk. Under the other overseer (Sea) is a deputy and the work of their line is supervised by two foremen. Responsibility for the mechanical equipment rests with Kuapise, and for clerical work with Sau. The marketing of produce and the handling of finance is controlled by Numbuk with some assistance from one of the two overseers (on alternate weeks) and one clerk.

So far as we could ascertain Numbuk has no claim to traditional rank, being the second son of a second wife of a man of no particular standing.* Likewise we are not aware that any other men in the management hierarchy hold traditional authority. In the short time available, however, we were unable to investigate the traditional leadership system in any detail, and it is therefore possible that there is some connection between the traditional authority system and that of the project. The officially appointed leaders (luluais, tultuls, "coffee bosses" and medical assistants) support the project, and some luluais and tultuls appear to have considerable influence in the making of decisions and the selection of labour.

The people engaged in the project have a clear-cut goal - the achievement of what they conceive to be a European way of life (and this conception is steadily broadening). Their machinery provides them with a symbol of their success to date, and Numbuk acts as a focus for group action aimed at achieving their aspirations.

* Numbuk is the classificatory father of the luluai of his area (being a parallel cousin of his true father) but the luluai succeeded to his title from his mother's brother who is not related to Numbuk.

THE LABOUR FORCE

As noted in the previous section the labour force is organized into two lines. The first draws workers mainly from the mountain villages of Aroande, Aropak, Bibira and Bunki and we shall refer to it as "the camp line". These people usually work for approximately one month at the project and then return to their home villages for one to three months. Most of the physically active persons from these villages participate in the project, but some who do not work satisfactorily, and others who are unwilling, do not take part. The four villages between them provide a pool of approximately 400 workers from which the project can draw its labour requirements. Additional workers are occasionally drawn from some of the "supporting" villages (in particular Faeang and Dondok)* either in response to their request for the opportunity to earn money, or if the project is temporarily short of labour.

Labourers for the project camp line are recruited by Numbuk working through the village luluais and tultuls. We gather that there are usually more people offering for work than can be employed and thus the luluai's role is really one of allocating available jobs rather than of recruiting workers. To the extent that there is competition for jobs, there is encouragement to those selected to work efficiently but the power of selection may well enhance the luluai's status, though we are not aware of the limitations on his right of selection. Luluais and tultuls receive moderate remuneration for their services.

Except for a nucleus of permanent residents, the population of the project camp is continually changing as people come down from the mountains to replace those who are returning after completing their month's term working on the project. At the time of our census there were 43 adult males, 46 adult females, 34 youths and 83 children living there. We assume that this was a fairly normal population, but because

* Supporting villages are listed on page 4. It should be noted that although Faeang is located within the Irumu sub-district, it is populated by people who originate from Erap.

of the shortness of the period of our observations we could not ascertain the rate of population turnover. *

Of the total of 30 dwellings in the project camp, only 6 are permanently occupied. ** The other 24 dwellings house transient workers and their families (it should be noted that people come from the mountains in family units and not as individuals). In the project camp they follow the traditional pattern of virilocal residence. *** All the houses have been built by people from the "core" villages of Aroande, Aropak, Bibira and Bunki, and with two exceptions they are considered to be the property of individuals. When one family returns to the mountains it is replaced by a related family and frequently there are two or more families in residence at once. One of the exceptions is a communal residence for people from Bunki and the other is used by some young men who work more or less permanently on the project. **** Almost all the workers have their permanent homes in the mountain villages.

* The size of the labour force remains fairly constant except during the dry season when production falls off.

** These belong to Numbuk, the labour overseer, and the man in charge of the machinery (together with their respective families); and three to project labourers who live fairly permanently at the camp.

*** Of the 71 marriages for which we have details, in 40 instances both spouses came from the same village, in 22 the wife came from another of the "core" villages, in 8 the wife came from elsewhere in Erap. The last instance was an uxori-local marriage by a man of one "core" village to a woman of another.

**** A small proportion of workers appears to work fairly regularly on the project and to spend more time there than in their home villages. We are not sure whether this is due to considerations of kinship, work efficiency, or otherwise.

At the time of our investigation, 4 of the houses at the project camp were empty, as the occupants had moved back to their respective villages and had not yet been replaced by other families. When workers are drawn from the "supporting" villages they are accommodated by "core" village families with houses at the camp. During the second week of our stay, 17 workers from Faeang were incorporated into 6 households in the camp.

The second labour line is smaller and consists of workers drawn from Naramonki village, supplemented to a small extent by others from the mountain villages (principally Sintogura). We will refer to this as "the Naramonki line". There are approximately 70 workers in Naramonki itself, but we do not know the extent of the labour resources in the mountain villages upon which this line draws. If the camp line is temporarily short of labour it sometimes draws workers from the Naramonki line.

The changing population of the camp is in contrast with the stable population of Naramonki village, in that the Naramonki people live there permanently and do not have houses in the mountains. There are 28 houses in the village, only one of which was empty at the time of our survey.* On the outskirts of the village there are two other houses, one for a part-time unofficial teacher and the other for transient workers from Sintogura. A survey of 24 of the 28 households was made (the heads of the other 4 being away on plantations). They were found to accommodate 33 adult males, 40 adult females, 7 youths old enough to work, and 66 children. All but a few were permanent residents.

The houses in both the project camp and the Naramonki village range from temporary, relatively crude structures with earth floors, to large timber buildings with iron roofs. The people appear to be keen to erect permanent structures with iron roofs and sawn timber walls and floors, and it is assumed that more of them will do so once security of tenure is assured.

* The owner of the empty house had moved with his family to a plantation where he was working.

Although workers are supplied with their staple food (sweet potato) by the project, most families grow other food crops. The people in the project camp have gardens in their home villages from which they periodically collect food (and some Naramonki people have gardens at Sintogura). There is also some garden land in use adjacent to the project site. Pigs and fowls are also kept. To avoid damage to the gardens most people who live permanently at the project settlements keep their pigs in two isolated spots in the foothills.*

The Erap people have only during the past generation emerged from the isolation of their purely subsistence economy based on shifting agriculture. The patterns of work to which they were accustomed are markedly different from those required in a mechanical farming project. The success of the project can be attributed in part to the manner in which the people have adapted their way of life to fit the requirements of the new type of organization. This adaptation may have been facilitated by the considerable contact which the Erap men have had with the Administration, missions and private enterprise. Of the 76 men living in the project camp and at Naramonki village at the time of our survey, 67 claimed to have been employed outside their home villages for a year or more. Most had worked as gold diggers or plantation labourers, but some had been road workers, cooks, sailors or police. They had worked in places as far apart as Bulolo, Madang, Rabaul, Port Moresby, Kavieng and Manus Island. None of the women have been employed.

Over half of the men claimed to have been employed for 5 years or more, and one for 20 years. While their estimates are not likely to be precise, they do indicate that the Erap men have had considerable experience in the money economy outside their village environment. Although this experience has been largely in unskilled occupations, it is apparent that they have gained some insight into the principles on which commercial enterprise is based, including an awareness that income

* The permanent residents of the project camp and Naramonki village claimed to have a total of 138 pigs and 59 fowls (though we did not check them all by actual count). This gives an average of about four pigs and two fowls for each permanent household. Transient workers leave their livestock in the mountain villages.

is dependent on certain techniques of management and on the manipulation of factors of production. It is probable that the insights and behavior patterns which they have acquired during their previous employment have contributed to the success of the project.

On the other hand the Erap people have had very little formal education. Out of the total work force of nearly 200 residing at the project, only 51 claim to have had any education, but almost all of these people are under 25 years of age. They received only elementary education (ranging from $1\frac{1}{2}$ to 5 years) at mission schools close to their villages. None of the project leaders has had any formal education. Only 8 household heads and 6 wives of household heads have been to school. The influence of formal education on the project has been negligible.

There is little specialization in the labour force. There are 7 tractor drivers who move between their home villages and the project as other workers do. The original drivers were selected because of their previous experience as drivers on plantations, but some of the younger ones have been trained on the project. The senior clerk used to live permanently at the camp, but has since trained two assistants with whom he alternates. One man lives near the pig-sty about two miles from the camp and attends pigs belonging to permanent residents of the project camp. He is paid monthly and is supplied with some food. A young lad is employed as storeman in the company store.

PATTERNS OF WORK

At approximately 6.15 am. each working day a gong is sounded at the project camp and another at Naramonki village. The two workforces then assemble separately, each within its own residential area. When all are assembled (usually within five or ten minutes of the sounding of the gong) the line bosses and foremen allocate the day's tasks and other matters of group interest are discussed. Meetings last up to an hour, after which the groups disperse to collect their tools* before moving to the sweet potato gardens which lie up to half a mile distant. Work in the gardens commences at about 7.15 am. and continues until, approximately 11.00 am. when a stop gong is sounded to end the morning's work. The workers then return to the village for the midday break. At about 1.15 pm. gongs are again sounded, but work is often not resumed until about 2.15 pm. A final gong is sounded at about 4.30 pm. and the people return to their homes.

In order to maintain their section of the gardens it is necessary for the camp line to work regularly for five or five and a half days a week. Saturday afternoons and Sundays are considered to be rest periods. Over the three weeks' period during which we made detailed observations there were only three half-days when this line did not work. On the first of these there did not seem to be anything for the line to do, and after assembling as usual in the morning the labourers dispersed to their homes. In the afternoon they resumed work as usual and harvested some produce for sale the following day. The second half-day was lost when both the project camp line and the Naramonki line took time off to mourn the death of a child. Numbuk was in favour of this but some of the leaders were outspoken in their disapproval, maintaining that if the output was to be sustained they could not allow the labour lines to be idle, even for a half a day. After the half-day of mourning

* Workers are required to provide their own hand tools for work in the project gardens. Each man owns at least one bush knife, one grass knife and one axe. In addition some have shovels, files, picks, hammers, saws etc. Women, and children over about ten years of age, usually have a bush knife each.

was observed work continued as usual. The third half-day stoppage was caused by rain. The labour lines do not work in the rain, except when sweet potato has to be harvested to fulfill contract requirements. Table 1 below gives some indication of the consistency with which the project camp line works. *

TABLE 1
PROJECT CAMP LABOUR LINE

Hours worked over a three week period of observation

	No. of half- days worked	Hours actually worked	Hours worked plus assembly time
Week 1	10	29 $\frac{1}{4}$ hrs	33 $\frac{1}{4}$ hrs
Week 2	9	26 $\frac{1}{2}$ hrs	30 $\frac{1}{4}$ hrs
Week 3 (a)	10	27 hrs	33 $\frac{3}{4}$ hrs

(a) Work times for the Saturday of week 3 were not recorded.

If the time spent on subsistence gardening was added to that spent in labour on the project, it is probable that the total would average about 40 hours per week.

The Naramonki line works its sweet potato gardens independently of the camp line. After the project machinery has been used to prepare the ground the Naramonki line does the weeding, planting and harvesting. This line cultivates a smaller area and fewer gardens than the camp line and therefore does not need to work continuously throughout the year.

* The conscious effort to establish regular work patterns is illustrated by the fact that the people have deliberately chosen to limit their "sing sings" to one each year, normally held at Christmas time.

A schedule of the number of workers engaged and type of work done by the Naramonki labour line over a three week period appears in Table 11. The work force is much smaller and works less regularly than the project camp line (cf. Table 1). There were many days when the line did not work in the sweet potato gardens simply because there was no work for them to do*. On such days the people usually attended to their food gardens, went hunting or relaxed in the village, but on two separate days the whole work force undertook a labour-contract job on a nearby plantation.

TABLE 11
NARAMONKI LABOUR LINE

Number of workers engaged each day (youths rated as half) and type of work done over a period of three weeks.

	Mon.		Tues		Wed.		Thurs.		Fri.		Sat.	
	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm
Week 1	-	-	-	-	-	-	-	-	-	-	37W	-
Week 2	40W	27H	-	24H	24H	-	-	-	-	-	-	-
Week 3	27H	27H	28H	27H	8W	8W	7R	7R	4R	4R	-	-

H = Harvesting sweet potato

W = Weeding sweet potato garden

R = Maintenance of project roads

* For this reason Naramamonki workers are paid their "monthly wage" at longer than monthly intervals.

TABLE 111
PROJECT CAMP LABOUR LINE

Daily Attendance Record for Three Week Period 1/10/61 — 20/10/62

Description of Work		Week 1												Week 2												Week 3*												Aggregate Including Saturday of Week 1	Aggregate excluding Saturday of Week 1
		M		T		W		T		F		S		M		T		W		T		F		S		M		T		W		T		F					
		a	p	a	p	a	p	a	p	a	p	a	p	a	p	a	p	a	p	a	p	a	p	a	p	a	p	a	p	a	p	a	p						
Harvesting	Adults	72	72	77	77	82	82	47	70	70	18			54	68	79											84	84	84	36	71			50	50				
	Youngs	13	13	14	14	15	15	11	13	13	4			6	10	16											12	11	13	4	11			7	7				
Weeding																	81	41	89	79												49	52						
																	16	7	16	12												8	7						
Planting																						96	95					87	21										
																						16	16					13	7										
Maintenance of Project Roads																																27	25	25	23				
																																4	3	4	4				
Grass Cutting																															11								
																																1							
Actual Daily Attendance		72	72	77	77	82	82	47	70	70	18			54	68	79	81	41	89	79	96	95				84	84	87	84	68	71	76	77	75	73	2128	2110		
		13	13	14	14	15	15	11	13	13	4			6	10	16	16	7	16	12	16	16				12	11	13	13	12	11	12	10	11	11	356	354		
Maximum Possible Attendance **	Adults	84	84	84	84	88	88	88	88	88	76			83	83		90	86	86	97	97	101	101			91	91	93	93	87	87	89	89	89	89	2574	2498		
	Youngs	16	16	16	16	16	16	17	17	17	17			15	15		16	16	16	16	16	16	16			13	13	13	13	13	13	13	13	13	13	436	419		

* Details of attendance for Saturday of week 3 not recorded.

** The figures for the maximum possible attendance are different for each day because of the daily changes in the population of the camp.

An assessment of the rate of absenteeism in the camp line has been made by comparing the actual attendance with the estimates of the current available work force for each of the twenty-nine half-days of observation. The rate of absenteeism was found to be 17.5% if all half-days were included, but if the Saturday of the first week, when only part of the line was called to work, is excluded, the rate is 15.5% (see Table 111). We could not calculate a rate of absenteeism for the Naramonki line because the full labour force is seldom called to work.

When a piece of ground (usually about five to ten acres) is selected for a garden it is cross-disked by machine several times to a depth of about twelve inches. It is then broken down to a finer tilth by disc harrowing and finally thrown into ridges about one foot high with four feet between troughs. On sloping ground the ridges are oriented along contour lines. The tractor drivers work half-day shifts on this job.

Some of the workers then select propagation material from vines growing in an old garden and transport it to the new garden where others prepare it for planting. The prepared runners are planted on both sides of the ridges in small holes made with a bush knife. The project camp line, with just over 100 workers, planted approximately five acres in this way in two half-days. Weeding is carried out when necessary until the sweet potato is ready to be harvested.

The tubers are dug from the ground with a pointed digging stick or a bush knife. They are carried to one corner of the garden and heaped for sorting. Small and inferior tubers are rejected (and used for local consumption) and the remainder placed into 120 pound bags. The bags are transported in a tractor-drawn trailer to the loading point where they are stacked in a shed. Potatoes to supply the government contract are taken each Thursday by hired truck to Lae where Numbuk and his assistants distribute them in accordance with the terms of the contract. They collect payment for it the following day, pay outstanding debts, purchase goods for the store, bank their savings and return home. Sales to neighbouring plantations are made at any time and paid for in cash.

Productive work in the camp line is shared about equally between the sexes. * Planting, weeding and harvesting are carried out by men and women working together in the labour line. However, the job of carrying the potatoes to the sorting point is women's work and the sorting, bagging and loading is men's work. Heavy road-building work is carried out by the men. The women's work is not interrupted by the need to care for children because they bring them to the gardens. Small babies are placed in string bags which are hung in the shade, while the older children play nearby or help their mothers with the work. Men and women also share the work in the individual food gardens, but domestic chores fall more heavily on the womenfolk. We do not have any comparative data on work patterns in the home villages, but it is likely that the women there carry considerably more of the work-load than the men. With warfare abolished, hunting simplified by the use of rifles, and the time-consuming work of making artifacts replaced by the purchase of goods, the men are probably left with considerable leisure time. The women on the other hand, with larger families, and coffee gardens in addition to subsistence crops to care for, may well have less leisure today**. The Mechanical Farming Project has both increased the time spent on productive work and equalised the proportions of work undertaken by men and women.

Almost all men and some women who work on the project have coffee trees on their land in the mountains***. They consider the pro-

* During the period of our observations women in the camp line worked 1331 half-days and men 974 half-days, but if the work times of overseers, clerks and drivers are added, the total time worked by men comes to 1219 half-days. (In making these calculations a youth has been rated as half an adult).

** In Naramonki village, where the full labour force does not need to work the project gardens all the time, the burden of work falls on the women, who are called on to work much more frequently than the men. During our stay Naramonki women worked about 50% more frequently than the men.

*** In addition each village has a "community garden", half of the proceeds of which is paid to the persons who work it and the other half is paid into a fund for use in village projects.

duction of coffee to be an integral part of the total enterprise and in fact the two projects dovetail neatly. The monotony of continuous work at the one occupation in the one location is thus broken, and the people also have the opportunity to be employed fairly continuously. Of a total of 81 nuclear families covered in the survey, 68 have their own coffee plots. Most of those who do not are Naramonki people, many of whom have no access to land suitable for coffee production.

It might have been expected that participation in the Mechanical Farming Project may have resulted in fewer coffee plantings. This, however, is not the case, and in fact the coffee planting in the "home" villages was largely organized and promoted by the project. Appendix B shows that the "core" villages have planted about the same number of coffee trees per planter and per head of population as the other villages of the Erap Sub-District.

The location of the project in the Markham Valley facilitates access to other paid work in the vicinity. Some of the men who previously worked for the project are now employed permanently on neighbouring plantations; and whole labour lines from the project occasionally obtain seasonal labour contracts when many workers are needed at short notice.

RETURNS TO LABOUR AND MANAGEMENT

At first workers were paid ten shillings per month and in addition they received some of their food requirements (mostly sweet potato). After two years the pay was increased to £1 per month and since the new contract was acquired in March this year the rate has been increased to £2. 10. 0 per month plus some food. It should be noted that husbands and wives both work so that current cash income is £5 per month per couple. Children over about ten years of age are also paid from five shillings upwards per month depending on their size and the amount of work they do. Those over about fifteen years of age receive full pay. The senior clerk is now being paid £11 per month, and foremen, tractor drivers and assistant clerks £5 per month. The wives of foremen are paid £3. 10. 0 or £4 and other women working permanently with the project are paid £3 per month. Tultuls, "coffee bosses" or other persons holding any form of office who come to work are given a little more than the ruling rate of £2. 10. 0 per month. In payouts we have observed they receive from £2. 13. 0 to £3. 10. 0.

There is some doubt as to whether these rates of payment can be maintained, especially if further capital expenditure is to be made, but rather than the amount paid to the labourers each month being lowered, it is more likely that the frequency of payment will be reduced. One payout which we observed included some people who had finished their term of work some weeks earlier.

Whereas other workers are paid on a monthly basis, the two overseers are paid ideally on the completion of each garden. After the government contract was acquired this seems to have changed to a fortnightly basis, one of the overseers being paid each week from the contract money. Since March 1962 they have been entitled to £15 per fortnight but when tractor repair bills have to be met (which is quite frequently) they receive whatever lesser amount can be spared. In times of acute shortage of funds the clerks, drivers and other more highly paid workers also receive reduced amounts. These deficits are not made up later.

Until the new contract was obtained, Numbuk drew no income beyond that needed for his cash purchases of food and clothing and from

our observations while living with him in his house for a month, he lives quite frugally. Since acquiring the new contract (which is held by him personally) he has opened a personal savings account in which he deposits from £5 to £15 weekly depending on the extent of sales and the expenses to be met. In the seven months since the contract began he has accumulated £322. 15. 9 or an average of about £10. 10. 0 weekly. In addition he probably spends about £1 weekly on food and personal items. His total share of gross income is thus approximately 10%. In view of the amount of work he puts in and the responsibility he carries this appears to us to be quite reasonable. Income from the project seems to be more evenly distributed than it is in a plantation economy.

Most people said they had no cash savings but 17 people claimed a total of £241 (apart from Numbuk's £322)*. Some of this is held in savings bank accounts and some in cash at home. Most of those with savings are connected with the project management or are drivers, luluais or tultuls. Quite apart from cash savings, there has been considerable investment in capital assets. In addition to investments in the project, the people of the "core" villages have purchased seven coffee hullers at a total cost of £210 from income derived from the project. The Sintogura people recently purchased a jeep for £155, and some villages have group savings for community projects.

* In only three instances was the claim confirmed by counting and reference to bank books. We did not include small amounts kept in silver in the above total.

THE LAND

Only a few months after the project got under way in 1957, the Erap Agricultural Station was surveyed and it was found that the land which Numbuk had acquired from Gabsonkek had previously been purchased by the Crown from Chivasing village. The project occupied portions of blocks UAL 145, UAL 147 and UAL 203, but none of them completely. As the land had been acquired by Numbuk in good faith and with government advice, and as it had been purchased by government for resettlement and was as yet unused, Numbuk was permitted to remain in occupation tentatively. He was informed, however, that he might be required to vacate the land at any time and that no long-term crops were to be planted. This insecurity has continued to the present time.

During 1958 they were instructed by the Administration to harvest their gardens on UAL203 which they had earlier been permitted to use, and to limit cultivation to the area around the villages. This restriction seriously inhibited development as they were thus limited to the light sandy soils which are only usable during the wet season. The heavier swampy soil which they had been using was ideal for cultivation during the dry season, but they were not permitted to use it as it was intended to make the land concerned available for European settlement*.

The Administration was agreeable in principle to making at least some of the land available to the Erap people, but the question of the precise form of tenure has not been settled. To some extent the system of organization under which the project is run is determined by the nature of the tenure under which the land is held.

During 1961 the people were informed by the Administration that the land they were occupying would be divided into small blocks of about twenty acres and that individuals would each be given a separate block. This proposal was later abandoned.

* The proposal to open the land for European settlement was later abandoned.

Earlier this year it was again proposed that the land be sub-divided into individual farms. The three sections, portions of which are occupied by the project, comprise approximately 1,990 acres in total. However, while no detailed surveys have been made, tentative surveys indicate that much of the land is not usable for agriculture. The approximate areas are as follows:

Section	Good Soil: (acres)	Marginal Soil (acres)	Unusable Soil (acres)	Total (acres)
UAL145(excluding portion used by Agricultural Station)	130	120	100	350
UAL147	100	250	650	1000
UAL203	90	200	350	640
	320	570	1100	1990

The area of good soils (cultivable at all times) is only a small proportion of the total, and is scattered in relatively small patches. The marginal soils are those which are swampy during the wet season, or which are stony but usable if given long periods of fallow. It was therefore obvious that if the land was to be individualized, only a few individuals could be given blocks and the rest would have to either work for those to whom the land was allocated or return to their villages in the mountains. It is understood that the latest proposal is for division into five individually-held blocks, one block being allocated to the leader of each of the five participating villages. However, the intention is that each person to whom a block is allocated will own and operate it individually and not as a representative of his village.

FUTURE POSSIBILITIES

The Erap people have given considerable thought to future expansion. The plans outlined to us, and which they have been discussing among themselves for several years past, are as follows -

Firstly they would like to acquire the whole of sections UAL 145, 147 and 203 under some secure form of tenure. This would enable them to maintain their rate of production, because much of the ground now in use is in need of fallowing. They would like to expand sweet potato production a little to the limit of the existing market, and also to grow peanuts and possibly other short term crops. Given secure tenure of the land they intend to plant coconuts on some of the areas which are not well suited to annual crops. Permission to plant coconuts has been requested on several occasions, but this has not been granted owing to the uncertainty of tenure. They have nevertheless purchased coconut seedlings and planted them along the roads and watercourses, and are ready to proceed with large-scale planting as soon as the tenure problem is overcome.

The Naramonki people have plans to acquire separate lands of their own. They have already arranged with Gabsonkek village to obtain land there (through the Administration) as soon as they are ready to move out on their own. The Naramonki people claim to have over £600 in hand towards the purchase of a tractor. When they move to their new location they will be entitled to some financial assistance from the Erap project, in return for the assistance they gave to get it established. They concede that their interest in the Erap project then ceases. The only records located show that they contributed £247.10.0 though they claim to have given £300.

Next, Numbuk hopes to acquire some land from the Tereran people (who have rights to large areas of unused land) and tentative arrangements to do so have already been made. The people of Tereran have marked out two areas of ground, one for themselves and another of equal size alongside it for the Erap people. The Erap project is to supply tractors to work both areas but the land cultivation will be done by the Tereran people on the one area and by the Erap people on the other. The produce is to be sold through the project, and all proceeds from the Tereran half will be banked for them by the project in a

separate account. When this account contains sufficient money to buy a tractor, the Tereran people have agreed to sell that part of their land which the project has cultivated, to the Administration for lease to the Erap people. In other words Numbuk's people intend to buy the right to continuous use of a block of Tereran land for the price of allowing the Tereran people to use the project tractor long enough to produce crops worth the price of a new tractor for themselves. This may be an effective (if unorthodox) means of acquiring more land for the Erap project and of giving the Tereran people a new start in mechanical agriculture.* Numbuk states that he has consulted the Administration on this proposal.

If the Tereran land is acquired they intend to cut it into two or more parts and to allocate the first part to Aropak village. Aropak has its own land for subsistence and coffee in the mountains and would probably work their portion on a labour rotation system in conjunction with their mountain village (on the same lines as the existing project). The new group would be financed and organized in the early stages by the Erap project, but once firmly established it would become independent. It is proposed that the second part of the land should be used to resettle another party or perhaps two more depending on the adequacy of the land acquired.

Finally, Numbuk is interested in acquiring rights to UAL209 (1, 269 acres) which lies adjacent to UAL 147. At the moment this land is unused but in conjunction with the western portion of UAL147 it would be suitable for cattle.

If the people's plans as outlined above are realized, Numbuk will be left on the land now occupied by the project with only the people of his own village of Aroande (and perhaps a few from neighbouring villages) participating. He will probably find it necessary to draw some labour from the surrounding Erap villages which are not actively participating in any of the development schemes, but these people would be paid wages and would not necessarily have a financial interest in the project.

The suitability of any form of land tenure depends upon the type of organization working it, the social system of the people concerned, and technical considerations of crop, capital and marketing. The project

* The Tereran people had earlier made an unsuccessful attempt to introduce mechanization.

site, the Gabsonkek land, the Tereran land and the proposed cattle land (UAL209) will each be operated in a different social and economic context, and the form of tenure will need to fit the circumstances of each particular case. It must also, of course, be compatible with legislation on the subject.

Individual ownership of land is likely to be productive if the owner has sufficient land, capital and managerial ability to mechanize and/or to employ labour. It may also be successful on a small-scale basis if the peasant concerned is strongly motivated to individual work patterns, but the mere possession of individual title of itself does little to create these patterns.

The current re-settlement policy being effected under the Ex-Servicemen's Credit Board and the Native Loans Board is ideal for those persons who wish to work individually and can give some evidence of their fitness to do so. These schemes usually select only a very small percentage of persons from any one village and resettle them on productive land away from their home environment with secure title, credit facilities and extension services. The evidence from other territories is clear that such schemes succeed only if people who are highly motivated to work their own small-scale farms are chosen. When a whole village is to be resettled on contiguous blocks within the existing social context, it is most unlikely that production will increase. Example elsewhere in the Pacific, in fact, suggest that a decrease is just as likely.

The project is a success in its present form, though it is seriously impeded by the uncertainty of the tenure situation. It is a functional part of Erap society, being closely integrated with activities in the mountain villages. Since 1961 they have obtained a little income from coffee, but the area of land suitable for coffee is so limited that coffee production will not fully absorb the labour which is surplus to subsistence gardening. The project has provided additional income and experience without interfering with either coffee or food production. There might be a valid argument for divorcing the project from the villages if the people had idle land suitable for agriculture or if there were opportunities for more productive employment elsewhere in the Territory. But neither possibility in fact exists.

*offer of increasing
production on price
growth of demand.*

At present the project functions because of the active participation of a group, most members of which have invested cash in it and draw income from it. It could not have emerged or developed without group participation, and if the land were divided into five individually owned blocks, as at present proposed, three problems would be created.

The first is marketing. The project at present derives most of its income from the sale of sweet potato under contract to the Administration and during the dry season has difficulty in maintaining supply. No individual could meet the requirements of the contract from any one of the proposed sub-division blocks. A marketing co-operative would not be feasible because there would be no guarantee that all five individuals would co-operate in the task and if even one dropped out it is unlikely that the rest could supply the contract during the dry season from the given area of land. If this contract was lost it is unlikely that an alternate market could be found for such a large quantity. Moreover, a marketing co-operative is an intricate organization which requires detailed book-keeping, but only three individuals are partially literate, the rest illiterate.

The second problem relates to capital invested. The blocks proposed could not support a tractor each, and large quantities of sweet potato cannot be produced economically by hand cultivation alone. A machinery pool would not be feasible, for even in countries like Australia with highly developed accounting facilities the sharing of services and costs is a constant problem. In the absence of accounting facilities it is unlikely that such a scheme could survive for long. In any case, for a machinery pool to be set up by five individual farmers, it would be necessary for them to buy out the people who originally paid for the machines, but in fact those people with whom we have spoken value their participation in the existing project and have no wish to sell their interests. They have not only contributed money, but have also worked on the construction of roads, drains and buildings used by the project.

The third problem relates to leadership. In the existing organization Numbuk, who is clearly the most accomplished organizer available, holds a position where his skills are most usefully employed. Managerial ability is one of Territory's scarcest resources and should be encouraged and given the necessary scope to bring the maximum number of people into productive employment. The Erap people would not now be producing sweet potato at a rate of £6,000 per year, with plans for

expansion, were it not for the fact that Numbuk has had the opportunity to exercise his talents and that he and the other leaders have derived satisfaction from the responsibility they hold (as do leaders in economic enterprise in any society). Numbuk's ability has developed in a particular social context and could not necessarily be adapted to markedly different organizational structures such as would be necessary if a Western-type system of organization were imposed.

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✓ We are of the opinion that sub-division of the project area into individual blocks at this stage would in all probability result in a decline in production and the disintegration of the project. If individualization were insisted upon it would seem to be preferable (assuming that the other villages had obtained the land they are now seeking) to give title to Numbuk alone. He would no doubt continue to work it as at present as a group enterprise. In view of the fact that it is a group project we feel that it would be better to grant a title which would preserve the interests of the group - either by declaring the area a native reserve, or by granting it to Numbuk as trustee for the people of Aroande village, or by granting it to the village elders as tenants in common. Of these possibilities, that of declaring the area a native reserve would have the advantage of giving security for the time being without committing any party to a permanent form of tenure at this stage, when the respective advantages of alternative systems are not yet clear.

If it is possible to combine section UAL209 with the unused portion of UAL 147 for stock breeding, Numbuk would like, at a later stage, to see it developed as a cattle venture. If finance was to be derived from the existing project, the land would need to be controlled by Numbuk's organization in the early stages at least and some form of group tenure would be necessary. On the other hand, if Numbuk was to establish the cattle project personally (either with his own capital or with a loan), or if finance were available to promote such a venture as a company ranch or as a series of smaller farms, individual title would be preferable.

If the Naramonki people succeed in acquiring the land they now seek they intend to remove their whole village to the new site. Their present village is situated on the project land and the people do not wish to remain there. They moved from the mountain area to their present site in 1946 due to a shortage of land, and established their present village in 1957. Although they retain land rights in the mountain area, they are inadequate for their total needs, and it would not be practicable for

more than a small proportion of them to return there, even if they wished to do so.

As already noted, the Naramonki people have saved more than half the money necessary for a tractor and hope to buy one by the time they move. Their present overseer, Sea Sengam, has proved himself to be a competent organizer and it is their wish to establish the new project as a group enterprise under Sea on the same lines as the present one.

Given these circumstances, three alternative tenure forms present themselves: firstly group tenure, as a native reserve, a company or a joint tenancy; secondly, individual tenure to Sea Sengam alone with a view to establishing him as a plantation operator on the same lines as European farmers in the area; thirdly, sub-division and the grant of separate blocks of land to each man. It appears to us that the most appropriate of these alternatives in this case would be either group tenure (even if only as a transitional phase) or individual title to Sea, who appears to have the ability to run a large-scale enterprise. A possible compromise would be to allocate part of the land in individual blocks and the balance as a plantation held either by Sea alone or by the whole group.

The Aropak and Bunki people who hope to acquire land near Tereran propose to work the new land on a labour rotation system in the same way that the present project functions. Although this may be successful, neither group at present has leaders of the calibre of Numbuk or Sea. Moreover, as they have their permanent homes and adequate land for subsistence and small-scale coffee growing in the mountains, there is no necessity for whole villages to move. In this instance therefore, it would appear feasible to select only the most promising candidates and to resettle them on individual blocks on the Tereran land. Given adequate credit and agricultural extension facilities, there is good reason to believe that they would be as successful as other settlers on similar schemes.

* * * * *

After widespread study of agrarian systems throughout the world, the Food and Agriculture Organization of the United Nations came to the conclusion that: "No standard blueprint exists for agrarian reform: it has to be shaped anew to every time and place, since the natural,

economic and social conditions and even the human responses vary greatly..."* Without a knowledge of the Mili language, and in the time available for our research, we cannot claim to have mastered all the nuances of this particular situation. In view of our lack of detailed knowledge it would seem that the appropriate policy for the future would be that followed by the senior officers of the Departments of Agriculture and Native Affairs who have maintained contact with the project since its inception: to make available such technical assistance as is feasible and desired by the people while leaving the development of the scheme, and its management and operation, entirely in their hands.

The Erap project is not a unique or isolated instance of successful economic enterprise by indigenous groups on other than individual lines. Many others exist in various parts of the Territory of Papua and New Guinea as well as elsewhere in the Pacific. Such ventures can be a source of considerable satisfaction to the participants and can have important demonstration effects on neighbouring villages (as the Erap project is having). They offer scope for local initiative and leadership and can make a significant contribution to the economy. In appropriate circumstances they have an important part to play in the development of the Territory, even if only as a transitional phase.

* Inter-relationship between Agrarian Reform and Agricultural Development, F.A.O., 1953

NOTES

1. For a general description of the Erap-Irumu-Wain country see Fear Drive My Feet by Peter Ryan, Angus and Robertson, 1959.
2. The scheme with which Simogun Peta was associated (at Dagua-Wokinara in the Sepik District) is described in a valuable article entitled "Community Development through Rural Progress Societies" in South Pacific, Vol. 5 No. 7, September 1951. For further details see Annual Report, Territory of New Guinea, 1949-50 p. 29, 1950-51 p. 41 and subsequent reports. See also "The Rice Problem in New Guinea" by O. H. K. Spate, in South Pacific, vol 7 No. 6, November 1953 P. 735-6.
3. The South Seas in Transition by W. E. H. Stanner, Australasian Publishing Company, Sydney, 1953, contains a discussion of a messianic cult movement in the Erap-Irumu area at pages 59-73. The movement is described in Annual Report, Territory of New Guinea 1934-5, p. 26-7.
4. We have been unable to locate any accurate climatic or geological data on the project area. Rainfall is said to be 60" to 70" per year, and most of it falls between March and August. The project is situated in the Markham Valley on light alluvial soils, some of which are covered by gravel outwash from the Erap foothills. The natural vegetation is kunai grass with scattered clumps of small trees.

APPENDIX "A" - EQUIPMENT

ITEM	COST	YEAR PURCHASED	CURRENT VALUE (Depreciated @20% p. a.)
Fordson Tractor	£1066 0 0	1957	£350 0 0
Harvey Lancia plough	304 16 0	1958	125 0 0
Tractor trailer	382 0 0	1959	196 0 0
I. H. C. Tandem Disc	171 15 0	1960	137 0 0
Massey Fergusson tractor (No. 35)	680 0 0	1961	544 0 0
I. M. F. plough	50 0 0	1961	40 0 0
Sundry tools & equipment			20 0 0
	<u>£2654 11 0</u>		<u>£1412 0 0</u>

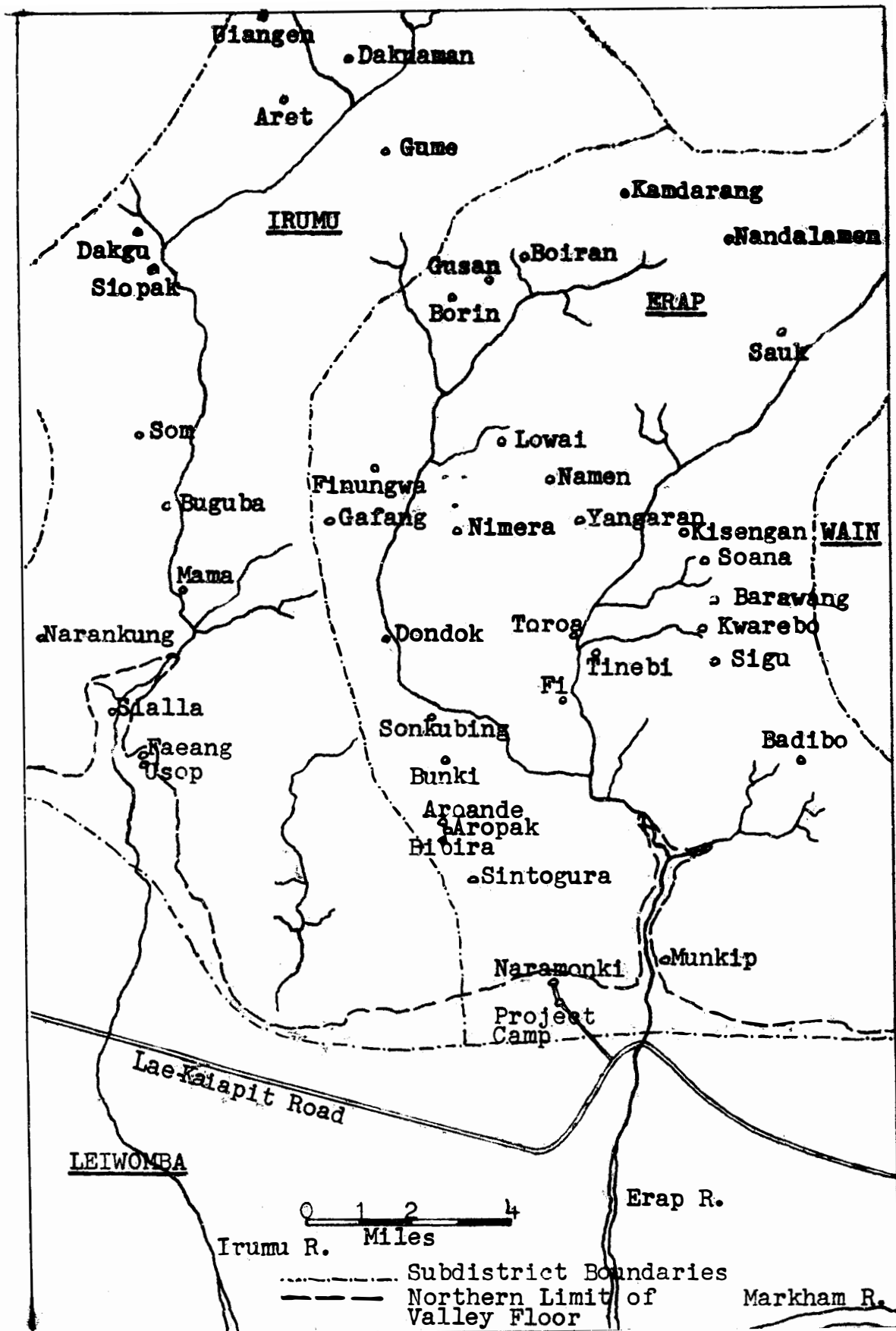
Buildings.)
 Roads) No cash value, but considerable labour expended.
 Drains)

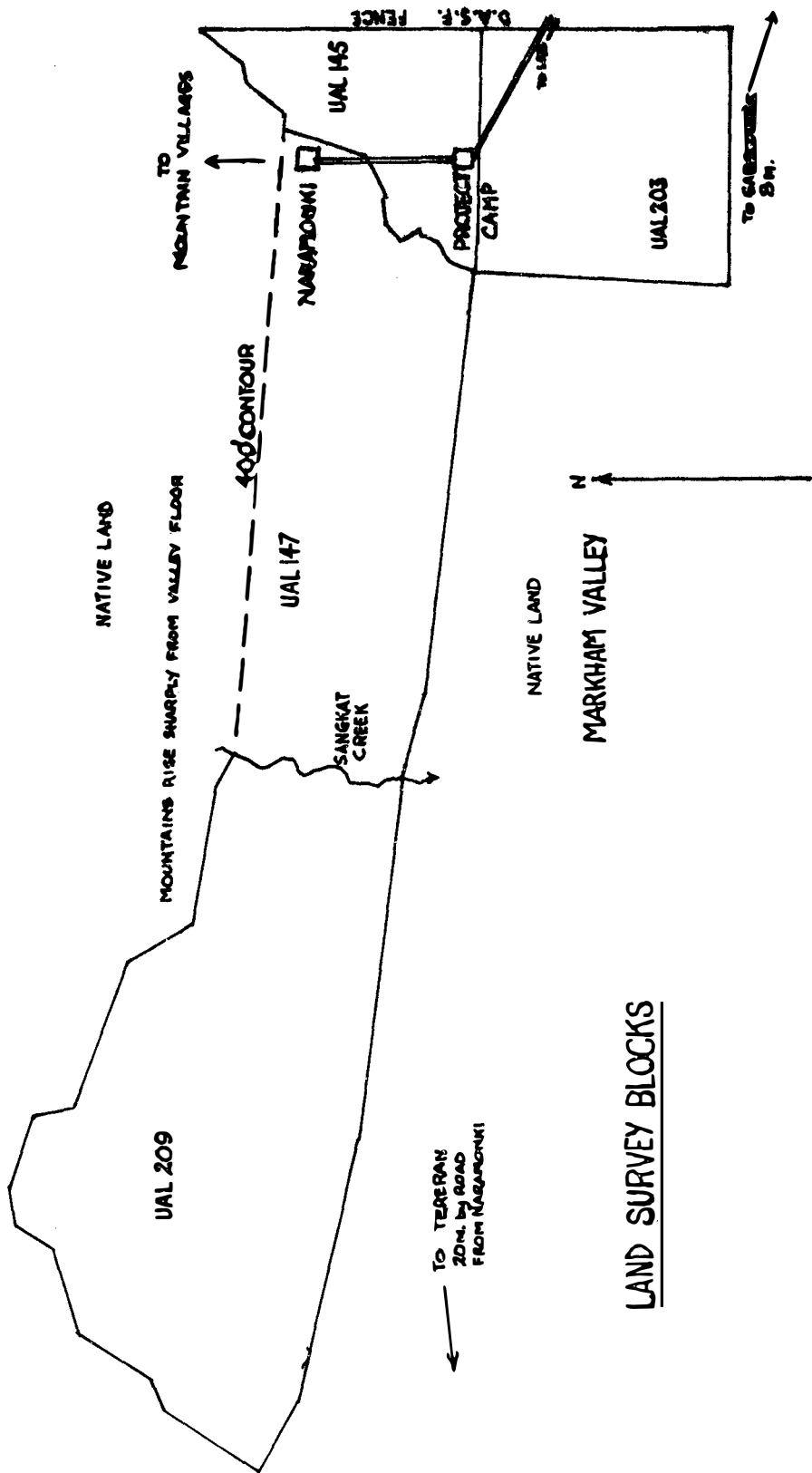
COMPARISON OF COFFEE PLANTINGS BETWEEN "CORE"
VILLAGES AND OTHER ERAP VILLAGES.

Village	Population	No. of Planters	No. of trees	Trees per head	Trees per planter
Core Villages					
Aropak	257	64	6,787	26	106
Bibira	86	16	1,617	19	101
Aroande	164	47	5,591	35	119
Naramonki	186	19	2,336	13	127
Sintogura	140	31	3,341	24	108
Bunki	202	56	5,917	29	108
Other Erap villages					
Soana	70	24	1,947	28	81
Sonkubing	85	14	1,341	16	96
Namen	98	21	2,590	26	123
Fi	101	40	3,863	38	96
Tinuebi	121	52	5,290	44	102
Nimera	215	85	8,835	41	104
Finungwa	317	69	8,735	27	125
Kamdarang	219	75	7,696	35	103
Nandalamen	153	43	3,588	23	85
Borin	93	35	2,724	29	79
Gom	239	70	4,824	20	69
Gusan	212	49	5,763	27	119
Kwarebo	152	52	6,621	43	126
Kisengan	188	57	5,633	30	98
Sigu	170	59	4,107	24	69
Barawang	212	39	4,213	20	108
Gafang	103	12	916	9	76
Boiran	74	13	657	9	50
Yangaran	179	51	5,407	30	106
Dondok	186	45	4,087	22	91
Toroa	301	84	10,586	31	126
Lowai(No. 1 &2)	283	101	8,858	31	88
Munkip	64	31	4,454	69	147
Badibo	180	66	5,706	32	86
Sauk	310	99	9,420	30	94
Average of all villages				28	100
Average of core villages				27	112
Average of other Erap villages				29	97

(Details of coffee trees supplied by Department of Agriculture
Details of population supplied by Department of Native Affairs.)

* Naramonki excluded as most villages do not have a population of 100.





SCALE: 1-5 INCHES TO 1 MILE (APPROX)

