

ANTROPOLOGICA  
59-62, 1983-1984:  
199-221



## Wai-wai labour relations in the production of cassava

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### Introduction

This paper attempts to establish, at the level of economic activity, a part of Wai-wai social organisation. Abstracted from subsistence agriculture the focus falls specifically upon cassava production. Two fundamental questions are raised: what are the social relations of agricultural production (especially the dominant structure of relations), and what factor(s) determines the distribution of farm land? Briefly the process of agriculture and its predisposition to the production of cassava are presented. From the work process the division of labour is formulated. This in turn sets up the niche in which the fundamental relations are to be sought. Two case studies are presented to highlight the core relationship governing the structure of work groups. The transitional point is the subsistence criteria; defined here by the possession of farm land. Quantitative material on individual household possession of farm land, household size, and subsistence requirements are analysed to set the bounds to distribution. This method subscribes to the view that one function of the social relations of production is to determine the circulation and distribution of the means of production. By thus establishing the structural determinants of part of the economic process the directions in which that part of the means of production travels can be made manifest. Throughout the paper there is an underlying tenet; this pertains to the cogent principle of reciprocity, expressed by the medium of labour exchange.

**AUTHOR'S NOTE:** The material for this paper was collected during fieldwork in Guyana between the years 1978 and 1980. I would like to acknowledge my appreciation to the Social Science Research Council for financing this study. My indebtedness is also extended to Dr. Derick Boyd and Dr. David Harrison for their comments on an earlier draft of this paper. It is not possible, however, to express here enough gratitude to my wife, Jennifer, for her unfailing support and keen interest in my work. Finally, it would be ungracious not to thank the Wai-wai for their generous hospitality and kind patience, which was offered to a clumsy stranger who knew not how to walk—who clamoured through their forest like a tapir in a canoe.

The Wai-wai are a collection of different peoples<sup>1</sup> living and sharing the same culture and language within a territory encompassing three settlement locations near the Guyana/Brazil border. *Shepariymo* — Big Dog Village, the focus of this study (located on the Essequibo River in 1978-79), is the only remaining Wai-wai settlement in Guyana.<sup>2</sup> Since re-migration and fission from Guyana in 1975, and the culmination of persistent missionary activity in 1971, the Wai-wai have been adopting a large, widely diffused, and autonomous pattern of village residence. Their communal house has given way to separate family household units. From shifting agriculturalists, hunters, and gatherers they have acquired a more sedentary system of existence. Their fields are situated in the vicinity of a central village with auxiliary river farms at temporary camp sites up and down river. Today the Shepariymo Wai-wai are as remote from national society as they have traditionally always been. Even during missionary occupation, contact with the outside industrial world was extremely limited. A policy of missionary evangelizing was in fact to control all outside influence by restricting contact. The infrastructure of Wai-wai society thus has not undergone as many radical changes as would otherwise have been expected.

### The process of labour

The Wai-wai perceive hunger as the absence of *cure* or *woto*. To be without one or the other is tolerable adversity, to be without both, is starvation. *Cure* and *woto* are their staple foods. *Cure* is cassava bread and *woto* is meat. The farm (*marari*)<sup>3</sup> is where the highest percentage of consumable foodstuffs is produced. The primary crop is bitter cassava (*šere*), of which a great variety of species is cultivated.<sup>4</sup> There are a number of important secondary crops, many of them root vegetables with edible tubers, which like cassava are high in carbohydrates.<sup>5</sup> A number of fruits and a few plants for technological use are also cultivated. The major crop of cassava, however, takes pride of place and greater space in fields.

Agricultural work has a set and well defined pattern of procedure. An initiator will first survey prospective forest land for its agricultural suitability. He will then mark out the chosen area for clearance (*marari ninanketu*), after which he will acquaint his village leader with the plan to clear a field. The village leader conveys

<sup>1</sup> I recorded eleven different peoples living at Shepariymo in 1978-1979: Wai-wai, Wapishana, Mawayena, Hishkaryena, Katawina, Parukoto, Aaramayena, Chikena, Shereo, Marakayena and Tunayena.

<sup>2</sup> *Kashmiyowki* — Place of the Electric Eel, on the Rio Anawa and *Kumoa* — Lu Palm Tree, on the Rio Mapuera, Brazil, are the other two Wai-wai settlements.

<sup>3</sup> Yde (1965: 23-24) has *sarapo* meaning cultivated field and *marara* as newly burnt field. *Sarapo* actually means cassava stick and *marara* could, in fact, be a derivative of *marari*.

<sup>4</sup> Within a sample area of 2,229 square metres, with the aid of four informants, thirteen different species were identified.

<sup>5</sup> For example, there are three varieties of ordinary yam each classified by their colour. There is also the bell yam which is a great favourite roasted or when prepared as a drink. Sweet potatoes, tania, eddoe, *peca* (unidentified), and *kamarataru* (unidentified), are all root crops cultivated for their edible tubers.

this to his councillors who in turn inform their fellow villagers. Emerging from this sequence is the recruitment of able-bodied men for clearing.<sup>6</sup> There are two stages to land clearing, scheduled always to begin in August: underbushing (*ac̄ipso*) and tree felling (*amaša*). Once felled the trees are left to the mercy of a hot midsummer sun. The dead trees and dried leaves are burnt (*ardiso*) normally in October. There is very little clearing away of debris after burning. Planting takes place during October, November, December, and sometimes in early January. There are two phases: secondary crop planting (*yamso*) and primary crop planting (*umonoso*).<sup>7</sup> Cassava has approximately a nine month maturity rate. To obviate restrictions upon continuous demands, harvesting (*amokašī*) is always from fields of previous years. It is essential therefore that fields be planted every year. This is a crucial aspect of agricultural production. When a field is cleared in August, planted in October, and reaped in June of the following year, reaping will continue at a reduced rate for three to four years, if there is replanting in the same field. Whenever farmers reap, they replant in the same mounds from which tubers are taken. To offset a field's gradual loss of production—due to the high rate of soil leaching—this type of intermittent planting has to take place. This is in addition to the annual planting of new fields. The annual and intermittent planting cycle, in co-ordination with the four year production capability of a field, offers an all year round harvest (see Figure 1). Weeding (*aywašī*), or the general maintenance of a field, is kept up throughout the year whenever harvesting takes place.

<sup>6</sup> This paper is highly condensed; as a result, a number of details has been excluded from the main theme. Two points, although only obliquely related to labour, should not, however, be allowed to suffer from this brevity.

(a) Between the notifying of village members and the first underbushing, and before and after every session of work on a field, there is a communal ritual meal called *honari*. *Honari* can rightly be thought of as a form of payment by the initiator to the workers. But this payment should not be conceived merely in terms of the food and drink provided by initiator and consumed by participants, for there are many occasions when no food but just a little drink is presented. The real significance of *honari* lies in its power—through the symbolic paraphernalia of ritual—to coerce those attending meals also to attend work.

(b) The distribution of farm plots within a cleared field takes place after burning. Traverse parallel boundary lines of burnt timber, called *wokpo*, are placed along the length of a field. Once down they establish ownership of land. Only heads of households who have assisted the field initiator in underbushing and tree felling, and/or specifically requested space within the field, are assigned farm plots by the initiator. All initiators have a plot in the field they initiate. No household has more than one plot in any single field.

<sup>7</sup> The Wai-wai practise a particular system of intercropping which entails a planting sequence that consigns cassava to the last phase of insertion. The sequential importance of the secondary crop planting preceding that of the primary crop, is that the former can be more controlled while the latter can at least be confined by the individual farm plot owner. Secondary crop planting is carried out by the farm plot owner and members from his own household. Primary crop planting is performed by a communal work group. While the farm plot owner has command of where each secondary crop is planted (by virtue of his personal supervision) he has no such directives over a communal work group. However, by being able to plant the secondary crops first under his own supervision, the farm plot owner indirectly confines the planting of the primary crop to the remaining vacant areas within his plot.

The terms secondary and primary crop(s) have been used because: (a) they help to distinguish the variant positions of bitter cassava and non-bitter cassava crops in Wai-wai consumption, and (b) they emphasize each category's relative contribution to Wai-wai agricultural production.

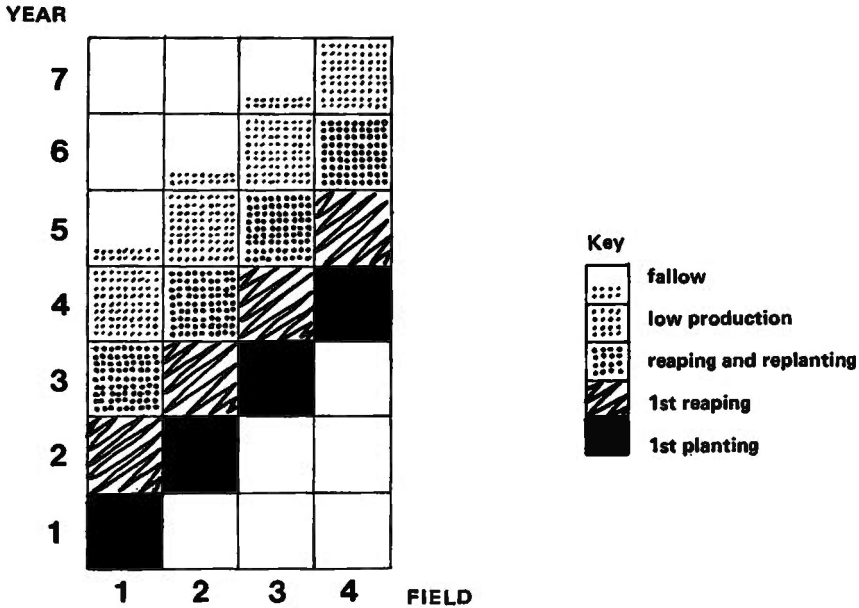


FIGURE 1  
ANNUAL FIELD ROTATION

The conversion of crops into consumable foodstuffs in the procedure of agricultural labour is conceived as a continual process indistinguishably linked to cultivation. The production of cassava cannot be complete therefore until tubers are transformed into their basic consumable form of baked bread. The technique of conversion is well documented, and among the Shepariymo housewives varies little from that of other users (see Yde 1965: 36-38). Basically there are five phases: peeling (*šereñipiketa*), grating (*šereñikña*), squeezing (*šerenamoso*), sifting (*kwašari-ñimyaŋe*), and baking (*čirenaya*). These need no further elaboration. Suffice it to say, that like the work pattern in fields, transforming tubers to bread is a fixed and clearly defined operation.

### Division of labour

Agricultural work, as well as work in general, is fundamentally sexually divided. This perhaps is a rather simplified view of the more elaborate apportionment of work which also includes discrimination by age and kinship. It is however practical to begin with the obvious gender classification.

It can be seen from Figure 2 that the categories of work which are primarily female accomplished, correspond more to the later stages of production and to the household bound grouping. During the preliminary and early stages of production it is men who constitute the work force. Their work involves tasks dealing mainly with the field. Basically, it is their job to transform forest into farm, while the

TYPE OF WORK	TYPE OF GROUPING					
	COMMUNAL				HOUSEHOLD	
	M	F	Large	Small	Intra-House	Individual
surveying & marking up	✓			✗	✗	✓
underbrushing	✓		✓	✗	✓	✓
tree felling	✓		✓	✗	✓	✓
burning	✓			✓	✓	✓
secondary crop planting	✓	✓			✓	
primary crop planting	✓	✗	✓	✓	✗	
weeding	✗	✓	✗		✓	
harvesting	✗	✓	✗		✓	
peeling	✗	✓		✓	✓	
grating		✓		✓	✓	✗
squeezing		✓			✓	✗
sifting		✓			✓	✗
baking		✓			✓	✗

KEY	
✓	standard
✗	irregular
✓	rare

FIGURE 2  
DIVISION OF LABOUR IN THE PRODUCTION OF CASSAVA

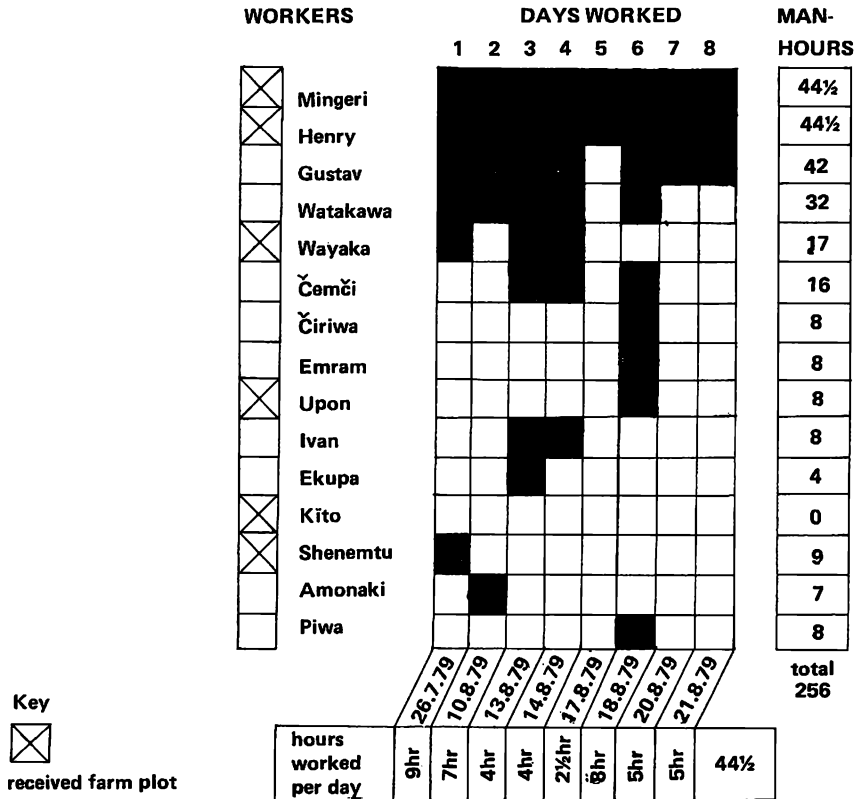
women convert farm products into edible foods. The character of each category of work has a priori gender classification. That is, they are socially defined as being occupations either of a male or female bias, exclusively male or female, or in the single case of secondary crop planting, work both equally for male and female. Nine of the thirteen work categories listed in Figure 2 are female accomplished, i.e., women can and do take part. Three of them, weeding, harvesting and peeling, are female biased; grating, squeezing, sifting, and baking are all exclusively female tasks, while primary crop planting is male biased. Men also participate in nine categories of work. Three of them (as just mentioned) are female biased, one is male biased, and another (secondary crop planting) is shared equally between the sexes. Only surveying and marking up, underbrushing, tree felling, and burning are exclusively male occupations. Of the tasks that can communally be achieved, five are consistently performed by this type of grouping. Three involve communal groups of the large inter-household work force and two are of the smaller. Two of the three large groups are male exclusive and the other is male biased. One of the two small groups is female exclusive and the other is female biased. Of the tasks that are

household bound ten are consistently performed by this grouping. Two of them are regularly achieved by an individual male, four are female exclusive, and three are female biased. The remainder is performed by both male and female together equally. Two female communal small groups alternate with their respective household bound groups for equivalent tasks. These are the only ones that consistently overlap. From these findings, it can be said that the majority of work in the production of cassava is accomplished by women within their household bound units. Categorically, the crucial early stages of production are performed exclusively by men communally. The dominant relations of production existing outside the household unit are, therefore, best sought for within the communal work groups and between the male members of the society.

A household is defined and determined by marriage and the individual family unit. An individual family household at its most comprehensive is comprised of a man, his wife, their non-married children, wife's non-married siblings, and any unmarried parents. It is here being suggested that these are the labour relations of the household bound grouping. Within this composition female tasks are dominant; outside in the broader spectrum of society, male occupations predominate. With any labour process, however, gender can only serve to identify the structure of work groups by its narrow distinction. Kinship in this instance provides a more rigorous means. Inter-household relations, where the structure of dominant labour relations are being sought, can best be perceived through the most prevalent system of social classification — kinship.

### The core structure

*Case one.* Even though many able-bodied men were absent from the village, land clearing and field preparation for 1979 continued as usual. On 26 July 1979, Mingeri, the initiator of field 9, arranged for underbushing on his field. The men who attended worked that day for nine hours. It took eight days — working a total of forty-four and a half hours — finally to clear field 9. A varying number of men and boys attended work sessions on each day (see Figure 3). When the land was cleared only five of the eleven men who contributed their labour received farm plots within the field. Mingeri and Henry attended every day of work and contributed the same amount of labour time as each other. In terms of household contribution, however, Henry's household provided more labour time than Mingeri's: i.e., if the working hours of both Henry and his son Gustav are added together as a single contribution, representative of their household effort to communal work, they would total eighty-six and a half man hours. On the other hand, Mingeri and his son Ivan together provided only a total of fifty-two and a half man hours. Both households received farm plots, but the combined working effort of Watakawa and his three sons Čemči, Čiriwa and Emram, who totalled sixty-four man hours between them, was not rewarded with land. This is in marked contrast to Kīto, who received land, but was not in attendance at any work session. With regard to the amount of work put in and the direct concrete gains received, there does not seem to be any correlation between labour and land. The obvious advantages in attracting men to



Key  
  
 received farm plot

FIGURE 3  
 STUDY OF WORK ON FIELD 9

communal work sessions who have able-bodied household dependants are however manifest.

*Case two.* On 21 August 1979, Piwa, the initiator of field 4 began proceedings for underbushing and tree felling. Both were accomplished in twenty-one and a half hours (see Figure 4). Field 4 is larger than field 9 but it took almost half the time to clear, the reason being that a greater number of workers attended daily sessions on field 4 than for field 9. During the four days of work Piwa attracted sixteen men who all but cleared the entire area on day three. Compare this to the eight days it took to clear field 9 and three days when Mingeri and Henry, who were accompanied for two days by Gustav, were the only workers present. From field 4 eight men received farm plots. Three recipients were absent from the village and so were not able to contribute to work sessions. There were eleven men who worked and did not receive plots. Some of them like Kikoriso, Caruma, Amanyana, and Upon had high man hour figures. Even in this case the results of distribution do not offer a commensurate balance, but here there are no instances of intra-household

members taking part in work sessions. All examples, as were the majority in case one, are of male inter-household representatives.

From the existing relationship between men attending work on both fields, the internal structure of communal labour relations can be established.

With the working group of field 9 the predominating linking relationships are those of wife's father/daughter's husband, wife's brother/sister's husband (see Figure 5). These are between Mingeri and Watakawa = WB/ZH; Mingeri and Shenemtu = WB/ZH; Mingeri and Wayaka = DH/WF; Mingeri and Henry = ZH/WB; Piwa and Upon = DH/WF; Ekupa and Gustav = WB/ZH; Wayaka and Ivan = WB/ZH. This excludes the potential in-law relationship between mother's brother and sister's son which exists between Watakawa and Ivan, Shenemtu and

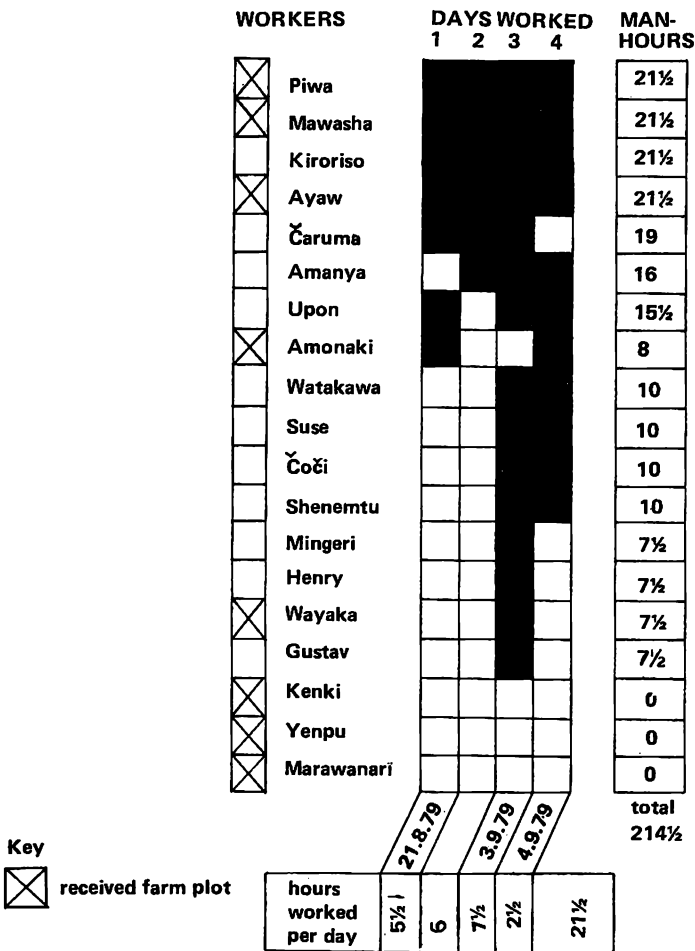


FIGURE 4  
STUDY OF WORK ON FIELD 4



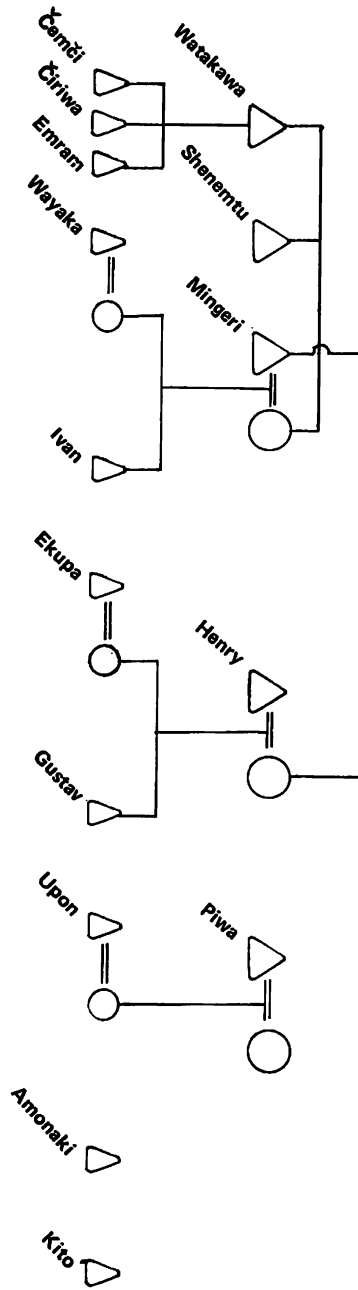


FIGURE 5  
KINSHIP TIES BETWEEN WORKING MEN OF FIELD 9

Ivan, and between Mingeri and Gustav. There is also the affinal tie between Mingeri and Watakawa's sons expressed by WBS/FZH relationship. Of the ten represented household units, Mingeri's forms the axis to a linked cluster of six. The inter-household kinship tie brings together the units of Shenemtu, Watakawa, Wayaka, Henry, and through Henry, Ekupa. Piwa and Upon form a separate cluster bound to each other by the DH/WF tie. Amonaki and Kito exchange fictitious sibling ties.<sup>8</sup> The only other relationship linking household units is the full sibling tie between Watakawa and Shenemtu. Thus with the exception of Piwa, Amonaki, Upon, and Kito, all other inter-household kinship ties between Mingeri and the men who attended work on his field are in-law defined.

Among the working group of field 4 the ties of relations are numerous and more complex (see Figure 6). There are seventeen household units represented, forming nine separate clusters, each one structured by a WF/DH and/or WB/ZH relationships. Categorically the dominant binding tie here is the in-law relationship: Mawasha and Kikoriso = DH/WF; Mawasha and Kenki = DH/WF; Mawasha and Ćaruma = WB/ZH; (Ćaruma and Mawasha's wife called each other brother and sister. Ćaruma's father was once married to Mawasha's wife's mother); Kenki and Amonaki = ZH/WB; Kikoriso and Amanyā = ZH/WB; Amanyā and Ayaw = WF/DH; Ćaruma and Marawanarī = WF/DH; Upon and Ćaruma = ZH/WB; Piwa and Upon = DH/WF; Upon and Yenpu = WB/ZH; Yenpu and Wayaka = W (classificatory) B/ (classificatory) ZH; Suse and Yenpu = WB/ZH; Piwa and Suse = WDH/WMH; Mingeri and Wayaka = DH/WF; Henry and Mingeri = WB/ZH; Mingeri and Shenemtu = WB/ZH; Mingeri and Watakawa = WB/ZH; (Marawanarī and Ayaw = ZS/MB). All other ties that exist outside the household and link household to household through men are: Marawanarī and Upon = F/S; Ayaw and Kikoriso = F/S; Mingeri and Amanyā = WS/MH (F/S); Piwa and Yenpu = F/S; Watakawa and Shenemtu = B/B.

From the above, it can be maintained that underbushing and tree felling on fields 9 and 4 were achieved by alliances created by the in-law relationship.

Once marriage has forged an alliance between in-laws and it is consolidated by a co-residency stipulation (in this case uxori-locality), the social commitment between affines is continuously expressed through economic assistance. To give one's labour in pursuit of an in-law's gains, is to carry out a social duty built into the relationship. When an in-law hosts or attends work sessions one is obligated to attend regardless of remuneration prospects. The process of labour, however, is one that implies a concept of "social investment"; in that individual labour at communal work sessions, while being indicative of kinship obligations, is calculable not in immediate rewards but in long term returns. The implication is, by giving one's labour now, this guarantees repayment of labour in kind at a later date. This of course applies not only for in-laws but for all committed members of society. It is that the in-law relationship, being more formalized in its nature, ensures reliable returns. This security originates from its formal character. Because the possibilities of

<sup>8</sup> They are neighbours sharing a common first language and a similar cultural heritage —both are of the Chikena people.

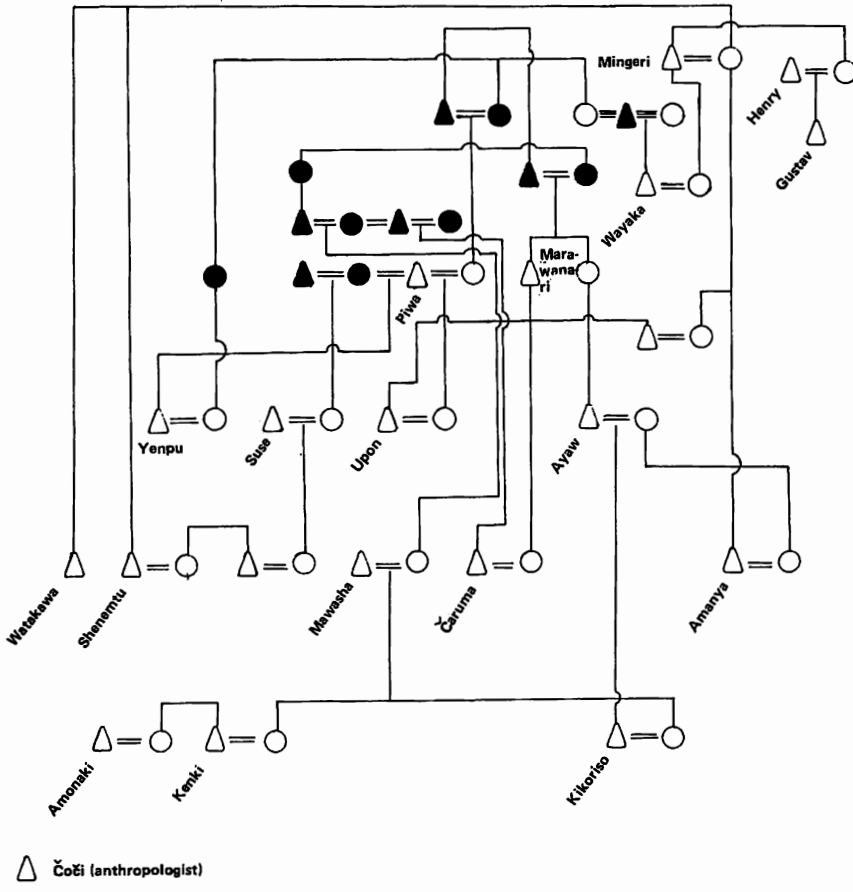


FIGURE 6  
 KINSHIP TIES BETWEEN WORKING MEN OF FIELD 4

manoeuvring in a formal relationship are greatly reduced, this has the consequence of facilitating the direction of behaviour. Once a son has left his natal household for marriage, he has no fixed responsibilities toward his father, nor a father any formal tie with his son. Also, there are no rigid institutional commitments between brothers. In fact, most formal duties are passed on to the relationship between in-laws. It becomes the more reliable relationship for communal labour relations, and obviously the one in which most investment is placed. It is the *combination* of both reciprocity and the nature of relations between recipients which imparts reliability to the in-law tie within communal labour relations. It must not be forgotten that reliability is an aspect of social relations significant for an economy dependent upon its immediate and available labour resources. It is rather revealing, therefore, that the dominant binding tie across households is the affinal relationship, which is itself the core unit of male work groups.

At this point there is little need to extend into the super-structure of disproportional power between in-laws. It is sufficient to mention that when abstracted and displayed in isolation, the in-law relationship is reflective of hierarchy. This pertains to the incipient exchange between wife giver and wife receiver. What has here been more essential for establishing the organization of labour relations, is the pattern of interdependence displayed by its process and structure.

In-law relationships between men also shape the structure of labour relations among communal working groups of women. As would be expected with uxorilocality and a strong WF/DH and WB/ZH core unit, working groups of women across households consist predominantly of mothers and daughters and/or sisters. The nature of relations between sisters, mothers, and daughters is based on informality. In consequence, women are not highly dependent upon assistance from outside their household, as is shown from the small size of female communal groups and the high incidence of household bound female work groups. In the process of labour exchange, a wife's priority is to the household of her husband. While she may willingly assist and be assisted by a wide range of kinfolk, her formal duties are to her own marital unit. This is what stamps the character of female labour as being primarily household bound. Men's labour is noticeably orientated to outside the household; appropriately it is the in-law relationship between men that induces the Z:D/M tie and at the same time, maintains it as a dominant inter-household grouping among women.

### Testing for distribution

To gain a comprehensive view of relations of labour in the wider society it is necessary to examine the available information on rewards that stimulate production. Among Shepariymo farmers the most positive incentive to work is subsistence. It has been suggested that their main source of production is the forest, which they convert into agricultural land by communal labour. Access to such land is determined by one's membership of an individual household that must itself be a member of the village. Divisibility of the social product — farm land, allows for

claims and allocation. Direction of distribution is towards the individual household, through representative male heads of households. But what factors determine the distribution of this vital means of production? It would be expected that the number, and thus total size, of farms possessed by individual households would depend on subsistence requirements. It should follow that it is household subsistence criteria which ultimately influences annual distribution of farm plots. In testing this hypothesis, it would be constructive to present first the data collected on Shepariymo farm lands.

In November 1979, Shepariymo village had twenty-two fields in various stages of productivity, with the oldest and the lowest producers dating from 1975. Six fields are at river locations: two at Mosakinari and four at Aposo (see Figure 7). Sixteen fields are found in the vicinity of Shepariymo. From a total of twenty-two fields there are one hundred and one household farms. This is for an overall membership population of 139 people, divided into twenty-seven individual household units.<sup>9</sup> Fields 4, 9, 10, 11, 12, and 22 (see Figure 8) are the most recent; they were planted in November 1979 and are therefore not yet productive. The fields of 1978 are 6, 8, 14, 17, 19, and 21. These had their first harvest in mid-1979, thus their yield is very high. So too are those of the 1977 fields 6, 8, 14, 17, 19, and 21. Those fields with the lowest yields, 2, 13, 20, 5, and 15, were planted in 1976 and 1975. In any given year fields with the highest productivity are always those of the two preceding consecutive years. In 1979, the fields with the highest productive rates are those of 1978 and 1977, which are in their first and second crop phase respectively. The 1976 and 1975 fields are in their third and fourth year of low and sporadic yields.

Of the one hundred and one recorded farms fifty-eight were measured and the names of individual household owners and the history of productivity documented. There are no data for fields 20 and 22. However, it is known that both 20 and 22 are located at Aposo and were initiated (20 in 1976 and 22 in 1979) by Suse, the head of household R. There are no measurements for fields 4, 5, 9, 10, 11, 12, 13, 15, and 16, but distribution of household farms in these fields has been documented (see Figure 8).

When a newly wedded couple forms an independent household it is mutually understood that, until their first child is secure in the world after its first year, they should harvest their crops from the wife's father's farms. This is why there are no farms recorded for households E and F. Similarly, there are no farms recorded for household Y, for in the year of its first child and the clearing of its first field, 1978, its members decided to go on an extended visit to Surinam. The field they cleared (22) was given over to the wife's father, Suse.

There is one exception to the rule that only married men can own farm plots, and this applies when a head of household dies. An eldest son inherits his father's farm land as the next representative male head of his father's household. He has to be unmarried and living in the household of his deceased father. When he marries, the land remains with his deceased father's household. If his mother remarries,

<sup>9</sup> This excludes household K which migrated to Kumoa, Brazil: on 6 November 1978.

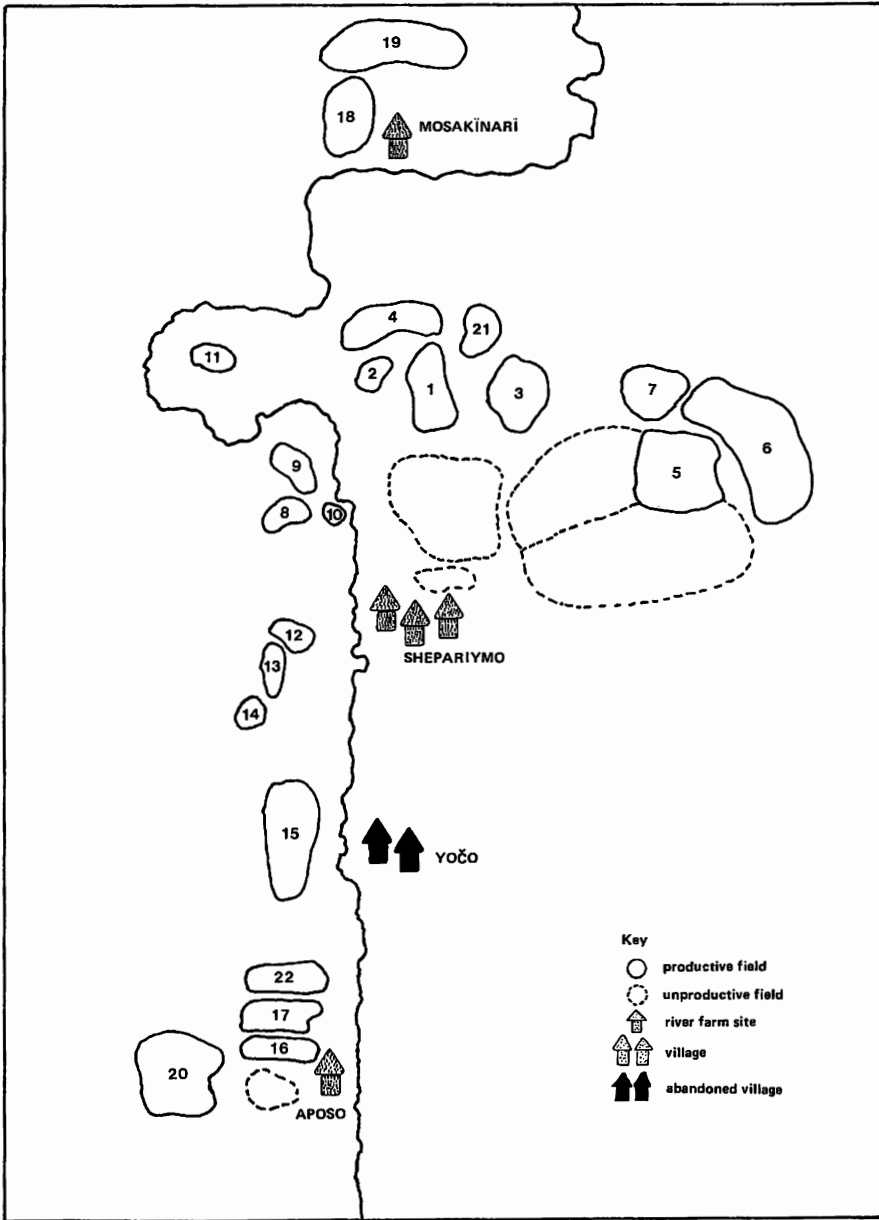


FIGURE 7

ownership of the land passes on to her new husband. In other words, land ownership moves not with a male head of household, but with the female head and her dependants. This is the situation between household B and E. After succeeding to the headmanship of his father's household, Amanyia subsequently married and formed his own family unit. He forfeited the land he held as trustee for dependence upon his wife's father's farms (D). His widowed mother remarried into household B carrying her ex-husband's land with her. Thus household B acquired not only a wife, but her three dependent children and her household land.

Given these qualifications, it can be seen that all households bar those mentioned above, have farm plots for their own subsistence requirements. The actual size of fields varies from 0.6 (21) to 4.8 (6) hectares. The number of farms in a field does not exceed ten. The farm size with the highest frequency —seventeen— is that which falls within the class interval 0.2 and 0.3 hectare (Diagram I). There is a cluster of forty-eight farms within the 0.1 and 0.5 hectare range which constitutes 82.8% of the total measured farm plots cultivated.

The next move in an investigation of this kind is to compare size of household with total size of farm land possessed by each household. This can quickly and superficially be extracted from the chart in Figure 8. Excluded from the survey, however, are households Y, E, F, H, and S. Y, E, and F are all newly formed dependent households without land. Household H in 1979 does have possession of two farm plots, but previous to this, was dependent on wife's father's farms. Household S is not a full village member, although it does have title to one plot in field 15, which it acquired as a member of the now abandoned Yočo village. From

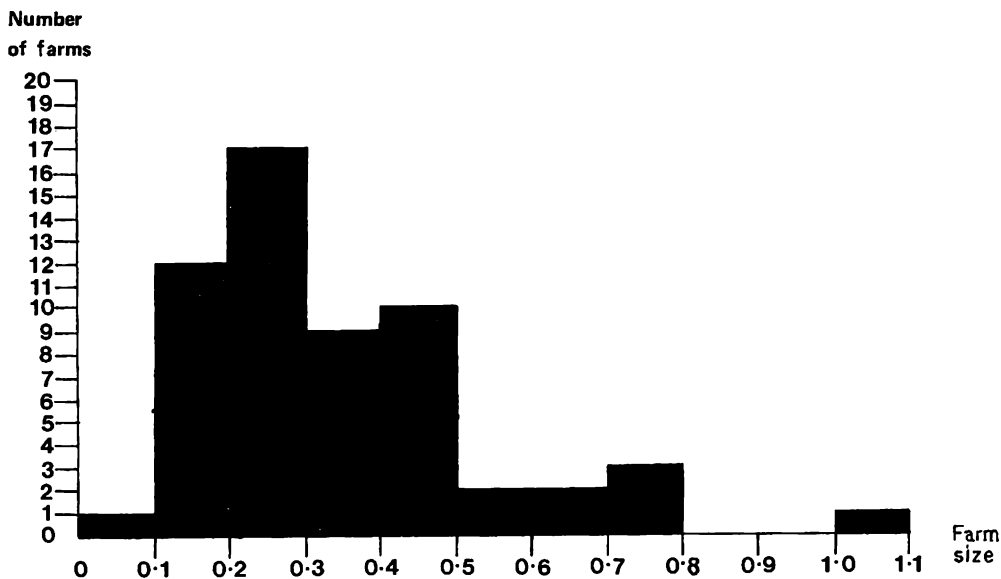


DIAGRAM 1  
DISTRIBUTION OF FARMS BETWEEN 0.064 AND 1.105 HECTARES

the twenty-two households which will be considered, three are comprised of a minimum occupant figure of two. All three are irregular in that they form exceptions to the norm. The young couple of household AZ, instead of being dependent upon wife's father's lands, were in possession of their own farm, given to them by the husband's sister's husband. Household AZ's wife's father, Mingeri (B), was at the time in no position to support additional members (see further on). The remaining households, comprising two occupants, are C and I. Both notably are of couples unable to have children. All other family units vary in number from three to as many as ten in a household.

From the scatter diagram (Diagram II) it can be shown that there is a pattern of correlation existing between size of farm and size of household. Households with the smallest total farm area begin at the bottom left and rise in a gradual line to the right in conjunction with their growth in household size. In other words, as the numbers in a household increase, so too does the total area of its farm lands. There is, therefore, a positive relation between household size and household farm area; this is depicted by the positive slope of the "guessed" regression line.

The assumption posited, however, was that household subsistence requirement determined size of farm area held by each household. It is understandable that subsistence criteria would depend on household size, but how can individual requirements best be measured? Independent measurements are here going to be applied to standardize requirements for comparative analysis. The Medical Research Council (U.K.) is the independent source. Their estimates for daily energy needs are presented in terms of age, gender, and physical activity (see Figure 9).<sup>10</sup> The standard figure is 5,000 kilocalories, which is the daily energy consumption estimate for males nineteen years old and over, carrying out extremely heavy work. The figure is converted into a unit of one (or 100%). All other calorie estimates are relative to this unit figure. The daily requirement for each household (determined by each member's age, gender and physical activity), is represented by its maximum calorie unit figure. That is, each person's highest unit figure, tallied with that of their fellow household members, constitutes a "household's estimated maximum daily calorie requirement" —HEMDCR. When for example, it is established that household X has a total calorie standard figure of between 5,700 minimum to 10,500 maximum, this will be transposed into the unit figures of 1.15 minimum to 2.1 maximum. This is to say, that household X with a man and his wife both over the age of nineteen, who have two children ages one and two, would have a HEMDCR of 2.1. By applying this type of scale the comparative test can be corrected for age, gender, and work performed, which was not possible from just counting heads.

The test results for comparing HEMDCR with size of farm area (Diagram III), support the distribution pattern of the previous test. The frequency composition is very similar. It reveals that when the level of HEMDCR rises, so too

<sup>10</sup> The daily calorie figures presented here were taken from Nuffield Biology 1966a: 61. These figures, it states "...are based on the recommendations of *The Committee on Nutrition of the British Medical Association*" (Nuffield Biology 1966b: 74).



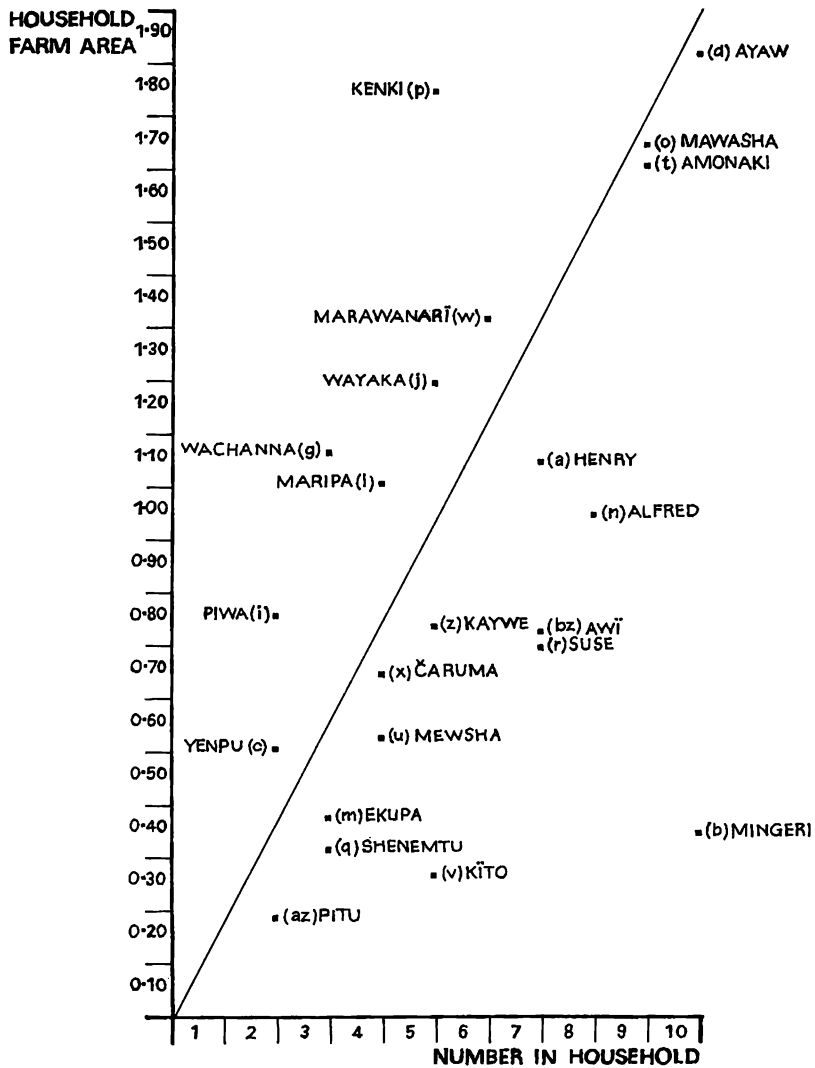


DIAGRAM II  
 COMPARING NUMBER IN HOUSEHOLD WITH TOTAL HOUSEHOLD  
 FARM SIZE

Age (years)	Children (either sex)	Males	Females	Daily Unit kcal figures
0-1	1000 Kcal/day			1000 = 0.20
2-6	1500 Kcal			1500 = 0.30
7-10	2000 Kcal			1750 = 0.35
11-14		2750 Kcal	2750 Kcal	2000 = 0.40
15-19		3500 Kcal	2500 Kcal	2250 = 0.45
19	lying in bed	1750 Kcal	1500 Kcal	2500 = 0.50
	light work	2750 Kcal	2250 Kcal	2750 = 0.55
	heavy work	3500 Kcal	3000 Kcal	3000 = 0.60
	extremely heavy work	5000 Kcal		3500 = 0.70 5000 = 1.00

FIGURE 9  
DAILY ENERGY REQUIREMENTS

does the size of farm area. Compared within their own separate category HEMDCR and farm area figures offer very different clusters and frequencies. HEMDCR figures have a short range of from 1.00 to 5.40. The largest cluster occurs within 1.00 to 3.00 and the highest frequency rate in the 2.20 to 2.60 range. Farm area figures spread out along a low horizon from 0.10 to 1.80 hectares. The largest cluster and the highest frequency occurs between 0.50 and 0.80 hectares. It is only when a comparison is made between each variable that the correlation appears.

Only household Q has a HEMDCR equally proportional to its farm area figure (see Diagram IV). There are only three examples —households B, R, and V— where farm area figures fall below HEMDCR figures. All other households have farm area figures proportionally larger than their HEMDCR. If households S, H, Y, E, and F are re-introduced, it would be found that 18.5% of households have no recorded farm measurements (note that 14.8% are dependent in-laws without land); 3.7% have HEMDCR equal to farm area; 11.1% have HEMDCR in excess of farm area; and 66.7% have HEMDCR below farm area figures. The two most conspicuous households, B and P, fall at the extreme opposite ends of the comparative scale. Household B's farm area is eighty-one times smaller than its HEMDCR. All the other households fall within a block cluster of twenty times greater farm area than HEMDCR.

The culminating test shows not an unusual result for a small subsistence economy reliant upon agriculture. Where the vicissitudes of climate, pests, and soil deterioration combine to affect crop failure, many techniques in protection are

FIGURE 8  
FIELDS AND FARM PLOT SIZE AND THEIR DISTRIBUTION BY HOUSEHOLD

			FIELDS																						
head of household	household reference	number in household	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	total household farm plot hectares
HENRY	A	7	0.23517					0.4047		0.40825	■		■												1.04812
MINGERI	B	10								0.35136	■				■		■								0.351367
YENPU	C	2	0.22855		0.175896	■											■						0.1073487	0.5117947	
AYAW	D	10	0.23517		0.21435	■	■	0.5908						■	■					0.4197523	0.2300331		0.134244	1.8243494	
AMANYA	E	3																							
KIKORISO	F	3																							
WACHANNA	G	3		0.7935044										■		0.2765044	■								1.0700088
UPON	H	4									■	■													
PIWA	I	2	0.409227		0.2349887	■																	0.114029	0.7582447	
WAYAKA	J	4	0.2823623		0.224254	■	■			0.6794	■				■										1.1860168
CEMCI	K	3																							
MARIPA	L	4	0.44380											■		0.5592825									1.0090825
EKUPA	M	3	0.3769										■												0.3769
ALFRED	N	8		0.7843				0.16722										■							0.95152
MAWASHA	O	9			0.06390	■		0.6652	0.2861					■	■					0.3659617	0.1835617		0.0855653	1.6502887	
KENKI	P	5				■		1.0145	0.2898									■			0.4458924			1.7501924	
SHENEMTU	Q	3	0.31622								■							■							0.31622
SUSE	R	7							0.2979										■	0.406159					0.704059
WATAKAWA	S	7																■							
AMONAKI	T	9				■		0.45709	0.3158						■					0.2425803	0.3530079	0.2432774			1.6117556
MEWSHA	U	4					■	0.3902	0.1374					■											0.5276
KITO	V	5						0.1412			■											0.1284932			0.2696932
MARAWANARI	W	6			0.154108	■		0.7655	0.1783						■								0.22852		1.326428
CHARUMA	X	4	0.28236											■	■	0.3650323									0.6473923
WAKO	Y	3																							
KAYWE	Z	5							0.4106										■	0.333199					0.743799
PITU	AZ	2														0.1912295									0.1912295
AWI	BZ	7						0.2378							■								0.4937579		0.7315579

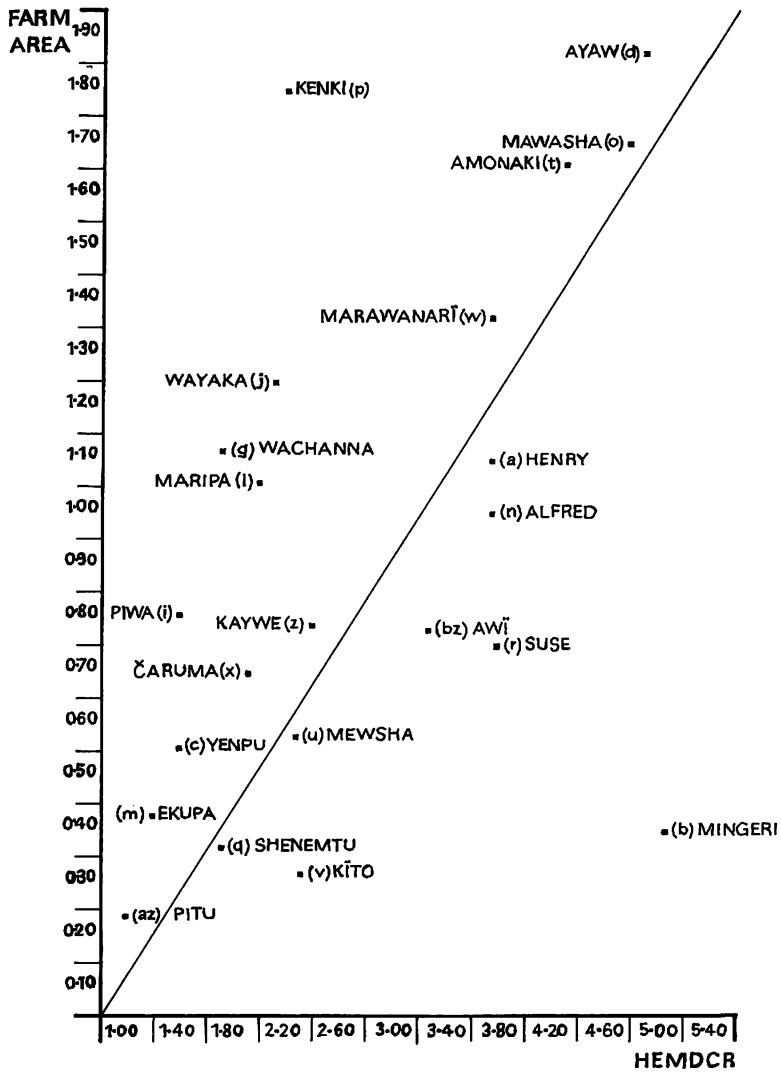


DIAGRAM III  
 COMPARING HEMDCR WITH TOTAL HOUSEHOLD FARM SIZE

\*HOUSEHOLD Q IS EXCLUDED

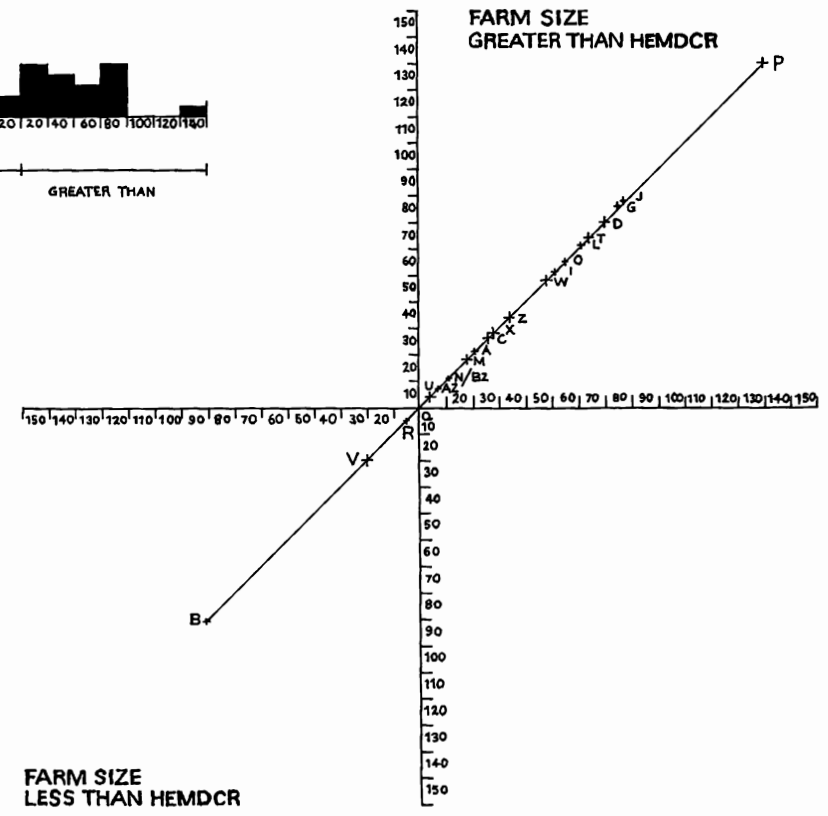
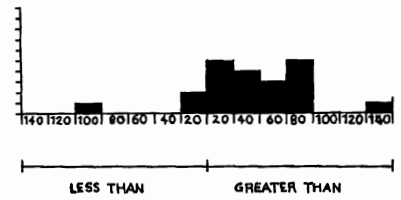


DIAGRAM IV  
COMPARATIVE SCALE OF FARM SIZE GREATER AND LESS THAN HEMDCR

implemented. An obvious step to cover possible loss of crops is to produce more than is required; 66.7% of households do this in varying degrees, but it would not be too contentious to assume that they do this also to compensate for those households whose land possessions do not meet their subsistence requirements. The disparity between households that over-produce and those that under-produce can be seen in this way also. But they have to be viewed holistically.

Within the Wai-wai economy the motive for agriculture is expressed by "production for use;" as such, individual over-production is absorbed back into the system by those that under-produce. This is verified by the fact that the products of agriculture are never produced for entry into the flow of trade and by the balanced subsistence level of each household. The exchange of agricultural goods is restricted institutionally to non-commercial trading spheres. It is through the regular occurrence of social intercourse, in the interwoven fabric of social exchange, that these goods are distributed and redistributed. At this stage they have become part of the medium of social existence, that which expresses community membership. The political implications for such intrinsic social phenomena are of course present. Here there is need only to explain their economic base and mechanism.

In the distribution and redistribution of the agricultural products of social labour symmetry is sought. Parity, however, is never actually achieved. For in the giving and the taking new obligations to return are created. Allocation and possession of farm land have not only a diachronic reality, as is expressed in current seemingly uneven distribution, they also have a synchronous perspective, which has an on-going time base that allows for adjustments in returns. This is why the social investment created by men's communal labour is so important and why it is that the relationship between household subsistence requirements and farm area holds.

## Conclusion

It has been established that even though the process of production in cassava is largely performed by women within the bounds of their household, it is men, from outside the domestic unit, who control the crucial stages. Field clearing and the allocation of farm plots are the points of abstraction. The collective nature of men's labour, characterized by its wider reaching inter-household grouping, endorses its position as being representational of society. It is the predominant affinal ties between wife's father/daughter's husband, wife's brother/sister's husband, which prove to be the core unit of this structure. The in-law relationship between men not only provides the main source of their labour force, it also has the ability to influence the structure of women's working groups. It was because the distribution of land appeared to offer no correlation between amount of labour put in and the amount of land received, that the factor determining the allocation of farm plots was investigated. The tests suggest however, that a correlation does exist, between level of household subsistence requirements and farm area possessed by each household. The majority of households have land in proportion to their subsistence requirements. The amount of labour put in at any given time and the land rewards

received are not the pertinent issue. The comparison is more of lateral equivalents. It is the accumulation and exchange of labour which provides the impetus to their system. The in-law relationship between men allows for such prestations.

It can be said for the Wai-wai, that in the early stages of agricultural production, it is the men who inject the element of social investment. Underbushing and tree felling are "like" the production of capital goods, in that men actually produce the means of production. The significance of female labour in the process of production, is that it uses the means of production in order to produce final consumption goods. In modern economics there is traditionally a demarcation in terms of capital goods sector and consumption goods sector. Output from the capital goods sector is used in the consumption goods sector in order to produce the final output. A critical question in political economy, predating Adam Smith, is the question of the distribution of the means of production, i.e., the distribution of capital goods. The two main schools of thought are: (1) capital goods should be distributed in a freely competitive way; and (2) control of the means of production should be in the hands of everyone, in other words, the state. Among the Wai-wai there is a formal similarity between the sectors of their economy and that of the modern economy. However, the distribution of the means of production in the capital goods sector, is solved in a non-competitive manner. Because men work communally in clearing the land, this gives them a right to some of the cleared land. The amount of land received is determined by household subsistence requirements. The system is not competitive in that it does not deprive some while making others better off. Distribution is determined by the simultaneous factors of right to land and household subsistence requirements.

### ***Abstract***

*The theme is agricultural production. The objective is to divulge the economics of Wai-wai subsistence and, in so doing, render explicit those social relations determining the organisation of the labour process and the access to, and distribution of, the primary means of production. The paper first describes procedure and sequence of work in agriculture. It establishes from the work process that the gender division of labour has two principal task groups: communal and individual household. Both are structured in terms of kinship and sex. Their structural formation is maintained by a basic core unit within the male labour force whose binding relationships are expressive of Wai-wai social organisation. Both the cultivatable land and its allocation to individual households are controlled by the core unit, members of which are not delegates for any individual interest group but rather representatives of society.*

### ***Resumen***

*Esta contribución se dedica al estudio de la producción agrícola Wai-wai. Es nuestro propósito explicar la economía de su subsistencia y, de esta manera, hacer explícitas las relaciones sociales que determinan la organización del trabajo y el*

*acceso y la distribución de los medios primarios de producción. Primero describimos el procedimiento y la secuencia de las tareas agrícolas, lo que hace ver que la división del trabajo por sexo se organiza en torno a dos grupos principales: el grupo doméstico comunal y el individual, que ambos se estructuran en base al parentesco y al sexo. Estos grupos domésticos se mantienen estructuralmente a través de una unidad básica existente en la fuerza de trabajo masculina. La tierra cultivable y su adjudicación a los grupos domésticos individuales vienen siendo controladas por la mencionada unidad básica, cuyos miembros no actúan como delegados de ningún grupo de intereses individuales sino más bien como representantes de la sociedad.*