CHAPTER 1 INTRODUCTION

1.1 INTRODUCTION

This thesis explains some of the processes of social and economic change occurring in a partially monetised village economy in lowland Papua New Guinea. The research focuses on the interface between the 'traditional' and 'modern' economies, and elucidates the processes by which the two types of economy interact to create inequalities within village society. The socio-economic setting for the study is one of rising commodity production (and what it entails - incorporation and monetisation) alongside the continuance of aspects of the precapitalist economy. The thesis illuminates the processes by which ordinary villagers engaged in their daily activities accommodate the mix of capitalist and precapitalist elements within the context of their everyday world, and evaluates some of the changes emerging from the articulation of the two economic forms. The thesis shows that by examining the nexus between the traditional and modern, valuable insights into the processes of change are to be gained.

1.2 RESEARCH OBJECTIVES

The two broad objectives of the study are:

1. to examine the interface between the precapitalist economy and the introduced market economy to identify some of the processes

of socio-economic change arising from the articulation of the two economic forms; and

2. to describe how the interactions between the precapitalist and introduced market economies are contributing to emerging social and economic stratification within village society.

1.3 CHOICE OF FIELDSITE AND RATIONALE FOR THE STUDY

There were several reasons for choosing the Wosera, and Miko 2 Village in particular, as a fieldsite. First, the area has a 50- year period of exposure to the modern economy (initially as a source of labour for coastal plantations), which has been especially intense since the Second World War. Despite this fairly long period of contact with the monetary sector (compared with, say, the highlands of PNG), economic development is not well advanced. Because an objective of the study was to examine the precapitalist-capitalist interface, it was important to choose a fieldsite where a partial monetisation of the local economy had occurred. The Wosera matched this criterion. The degree of monetisation appeared to have stabilised in eastern Wosera villages. Over two decades had elapsed since the widespread adoption of cash cropping, and therefore the Wosera provided an opportunity to assess the impact of economic development and the degree of capitalist penetration of the indigenous economy.

A second reason for choosing the Wosera was that the population is reputedly land short and nutritionally stressed (Chapter 2.3). This characteristic offered a framework within which to examine the subsistence/cash interface. Specifically, it provided an opportunity to determine whether the benefits/losses from incorporation within the external economy are shared equally by all sectors of village society.

In June 1986 I visited the Wosera (and other areas of PNG) with Professor David Lea who had worked among the Abelam in the early 1960s - both in the Wosera (Stapikum) and northern Abelam (Yenigo) areas (see Lea 1964). On that trip it was clear that river terraces and floodplains are cultivated more intensively than hill slopes. I decided that the village finally chosen for study should contain these three land types: at that stage I was unsure how important a focus Wosera subsistence systems would become in my study (see below).

A second observation was the widespread evidence of failed businesses. Tales of failed tradestores, passenger motor vehicles (PMVs), coffee hulling machines, chicken projects, fish ponds and cash crop enterprises were commonplace, and could not be explained solely by insufficient capital or the absence of a potential market. Despite repeated failures, the Woseras appeared enthusiastic about the potential for future development and indicated their willingness to try new ventures. This seeming paradox reinforced my decision to work there.

In 1987 while employed by the PNG University of Technology (Unitech), Lae, I made two trips to the Wosera. The first, a reconnaissance visit, was to choose a village for intensive fieldwork. Miko 2 Village was tentatively chosen as a study site after visiting many villages throughout the Wosera. It is typical of many Wosera villages, i.e., does not have vehicular access and shows few signs of economic development. It also possesses the range of environmental zones found in the Wosera (hill slopes, floodplains and river terraces). On the second visit I was accompanied by Gina Koczberski (geographer), Geoff Mills (cartographer), and 2 Unitech students. We mapped the boundary of Miko 2 territory by chain and compass, and received the consent of villagers to commence fieldwork there the following year. Koczberski and myself returned to the village in May 1988 and remained until October 1989.

My original research objective was to examine the fairly intensive subsistence gardening system of the Wosera (Chapter 2.6), particularly the floodplains and river terraces, and how the system was adjusting to increased population pressure and the introduction of cash cropping. However, after settling into Miko and commencing formal survey work, it became clear that within Miko there is an economic and social division that cuts across subclan boundaries. The division was not immediately obvious and only came to light through weekly surveys of income and expenditure and non-market transactions in the indigenous exchange economy. With the realisation that the division was a permanent one based on the status of patrilines in relation to control over

resources, my research emphasis shifted in this direction.

1.4 THE ARGUMENT

A social and economic division is shown to exist between a group[1] of established resource-holding lineages and a less well-off group of immigrant lineages which settled in Miko 2 Village within the last four generations. As immigrants, they are denied the full set of agnatic rights conferred on members of established lineages by birth. Agnatic rights consist of inalienable resource tenure and a set of relationships with other agnates founded on the principle of symmetrical exchange (equivalence, especially in regard to exchanges of food, wealth and labour). Immigrant lineages are resource poor in terms of land, sago and permanent cash crops, and are adversely affected by the monetisation of non-market exchange relative to landholding established lineages.

It is suggested that this situation has arisen since colonialism because of increasing population density associated with the cessation of tribal warfare and improvements in health status. Established and immigrant lineages have flourished demographically in this new environment. Consequently, opportunities which existed in the pre-colonial period for the assimilation of immigrants into established groups with full status as agnates have become increasingly scarce. In the contemporary situation, immigrant patrilines on the edges of village society are more likely to remain there than previously,

when openings in established patrilines or subclans appeared more frequently.

The denial of full agnatic status to immigrants means they are compelled to utilise specific indigenous exchange relationships for resource access. The relationship between wife-giving lineages (e.g., wife's or mother's natal lineage) and wife-taking lineages allows wife-takers access to resources, but entails heavy exchange obligations. To validate relationships with resource-rich wife-giving lineages for the purpose of resource access, immigrant households (HH) must provide them with wealth and labour. In contrast, resource-rich established HHs, by regulating access to resources through indigenous exchange networks, are able to extract wealth and labour from wife-taking lineages which hold few resources agnatically. Therefore, existing inequalities between immigrant and established HHs arising from differential control over resources are further increased by the mechanism of indigenous exchange.

1.5 THEORETICAL APPROACH

There are two related themes running through this thesis. One concerns the processes of articulation between the indigenous exchange economy and the introduced market economy. The second, evaluates the outcome of this interaction between the two economic forms in terms of emerging socio-economic inequalities in Miko society. Accordingly, the literature review below reflects this

division, and begins with a discussion of the resilience of precapitalist economic forms in the context of increasing integration into the global capitalist economy. Later in this section, several studies which examined the processes of articulation are briefly reviewed, before a brief discussion of the literature on inherited inequalities in PNG.

From the 1950s to early 1970s the theme dominating the literature was that pre-contact societies and their cultural infrastructure would be destroyed by colonialism and the penetration of global capitalism. The general consensus (e.g., Rowley 1965; Epstein 1968; Finney 1973) was that Papua New Guinea was on the road to incorporation within the global economy, and accordingly indigenous social structures would be transformed along capitalist lines. Emerging cargo cults were said to reflect this transformation. They were claimed to be symptomatic of 'adjustment' as old 'world views' were replaced by new ones (Guiart 1951a 1951b cited in Cochrane 1970; Worsley 1957; Lawrence 1964). Incipient class structure was reported. Tribal societies were turning into a rural proletariat, primitive capitalists or a stratified peasantry (e.g., Epstein 1968; Meggitt 1971; Finney 1973; Howlett 1973; 1980; Brown 1979; Amarshi et al. 1979; Connell 1979; Donaldson and Good 1978; 1981; Gerritson 1981; Sexton 1983; Burkins 1984; Feil 1987, 278).

Since the 1970s however, there has been growing recognition of the tenacity and resilience of precapitalist structures (Brookfield 1973, 127; Howlett 1973; Meggitt 1974, 182; Sahlins

1976; Gregory 1980; Feil 1983; M. Kahn 1983; Young 1983, 10). In some instances, aspects of traditional society "effloresced" on increasing integration with the cash economy (A. Strathern 1976; 1979; 1984; Gregory 1982, 166; Healey 1989, 4; Nihill 1989). With this realisation, recent investigation has turned to examining the linkages between indigenous economic forms and the introduced market economy (e.g., Gregory 1980; 1982; Carrier and Carrier 1989).

Some of the earlier approaches (e.g., neoclassical economics and within the political economy mould) under-estimated, or were unable to account for, the role of indigenous economic forms in the development process. For example, the neoclassical assumption of the utility maximising individual is dubious in the context of a society where corporate groupings are grounded in kinship rather than on other, 'economic', criteria (see below). Similar criticisms can be levelled at political economy approaches which have, as their theoretical underpinnings, Western concepts of class structure. Such concepts cannot readily be applied to societies where kinship remains the chief determinant of relationships of production and exchange (see Gregory 1982; Modjeska 1982; Jolly 1987; M. Strathern 1988; Carrier and Carrier 1989).

The political economy approach though, because of its emphasis on social structure, still has a greater degree of flexibility than neoclassical theory (see Gregory 1982 for a fuller discussion). The latter, with its focus on unlimited wants

and scarce resources at the level of the individual, ignores the social relations of production and reproduction in favour of utility maximisation. The model of the utility maximising individual assumes individuals have alienable rights over things that they own and are able to enter transactions where they can make decisions unfettered by ties and obligations such as those formed by kinship in clan-based societies. Thus, objects exchanged between individuals are assumed to be alienable and independent of any relationship between the parties to a transaction (see below). It is in this sense that the political economy approach is more flexible than neoclassical theory. For example, because of its focus on the structure of society, productive and distributive modes can be interpreted in light of the social relations of production and reproduction extant in non-capitalist societies. A class structured view of society, defined by its relationship to the factors of production - land, labour and capital, can be replaced with a perspective encompassing precapitalist modes - clan, kinship and their relationship to distribution and exchange outside the capitalist sphere.

The ability of capitalism to wrought change in precapitalist systems is not being underestimated by pursuing this line of reasoning. Rather, the goal is to explain the resilience and persistence of precapitalist features in the face of encroaching capitalism, and to understand how contemporary PNG society is constructed from the articulation of the two types of economy. Theoretically, there is no difficulty in asserting that global

capitalism can transform precapitalist forms by undermining their base (e.g., Bernstein's 1979 simple reproductive squeeze), but where the subsistence base remains largely intact then the possibility for survival of elements of precapitalist systems remains.

Furthermore, many studies dealing with social and economic change in the Third World are from a national perspective (the external colonial and postcolonial economies) with little attention to the processes of articulation between the two economic forms (Carrier and Carrier 1989). This may be partly because transformation of indigenous systems was seen to be inevitable. Thus, earlier models tended to discount the possibility for the persistence of precapitalist economic forms (e.g., Rowley 1965; Epstein 1968; Finney 1973), except within the context of serving capitalism's interests (e.g., Wolpe 1980; Fitzpatrick 1980; Meillassoux 1981; for further discussion see Brookfield 1973 and Corbridge 1986). For example, in the Meillassoux/Fitzpatrick model, analysis is at a macro level with the precapitalist village sector reduced to a "black box" within which labour for the outside capitalist system is reproduced (Carrier and Carrier 1989, 12; see also Hill 1986, 16). From this national economic perspective there is no need for closer inspection, but as an explanatory tool of the processes of interaction between the capitalist and precapitalist economies it fails. The model implies a loss of autonomy at the village level. Yet in rural PNG, villagers are still able to withdraw from the

cash economy during periods of depressed commodity prices (e.g., Grossman 1984, see also Chapter 4.3.5).

The process of articulation of precapitalist and capitalist economic forms and the distinction between them has been made explicit in the analyses of Gregory (1980, 1982) and Carrier and Carrier (1989). Gregory, used a formalised model (still rooted in the political economy approach) to study the coexistence and integration of the two systems. His idea of a partly transformed society is based on the existence of two types of economy which he characterises by the distinction between 'gifts' and 'commodities.' The latter term, equates with capitalism, and involves the exchange of objects between people who are in a state of reciprocal independence, and where the objects of exchange (commodities) are alienable. Money is used as a medium of exchange, but commodities can also be exchanged by barter. In dealing with commodity exchange, the social conditions of the reproduction of things are of concern - class structure etc. In contrast, in gift exchange, which is the exchange of inalienable objects between people in a state of reciprocal dependence, the emphasis is on the social conditions about the reproduction of people - clan structure and kinship organisation. It is this distinction and the way the two economic forms interact that provides a theoretical tool to analyse non-class structured societies where the gift economy is of central importance (see Gregory 1982, 108-109 for a discussion of how neoclassical economists fail to adequately deal with production for exchange).

Gregory noted that failure to recognise this distinction has led to much confusion in the literature:

> The motivation of the gift transactor, some people believe (Epstein, 1968; Pospisil, 1963), is that of the capitalist, i.e. profit maximisation. This is a profound misunderstanding. The gift transactor's motivation is precisely the opposite to the capitalist's: whereas the latter maximises net incomings, the former maximises net outgoings. The aim of the capitalist is to accumulate profit while the aim of the 'big-man' gift transactor is to acquire a large following of people (gift-debtors) who are obligated to him. (1982, 51).

Although Gregory's assertion that the aim of the gift transactor is to maximise net outgoings needs to be qualified,[2] his distinction between gifts and commodities nevertheless provides a valuable theoretical instrument with which to analyse contemporary PNG society.

Several recent studies in PNG have examined the interaction between the modern and indigenous sectors. Research, particularly in the highlands of PNG, has documented the way in which cash has penetrated the traditional sector to become incorporated into indigenous social and political systems (e.g., Maclean 1989; Clark 1989; Nihill 1989). Bigmen[3] quickly seized on the opportunities afforded by the cash economy (Salisbury 1962; Epstein 1968; Finney 1973; Strathern 1974; Feil 1987, 277), and Finney (1973) asserted Gorokan society was 'pre-adapted' to an introduced capitalist economy.[4] Entrepreneurs (motivated by traditional desires for wealth and prestige), are either bigmen, or men who use the techniques of bigmen to achieve their objectives: these new entrepreneurs gain prominence by appealing to their supporters "in

indigenous rather than foreign idioms" (Strathern 1974).

Grossman (1984) also investigated the response of the precapitalist sector to the intrusion of the external capitalist economy. Although not making the distinction between the gift and commodity economies explicit in his analysis, he examined the influence of cultural factors on sheep production (a recent introduction) in the Kainantu District. Within the external constraints imposed by the price of coffee beans, he argued that cultural variables are "crucial forces" affecting the diffusion of sheep raising. Like Gregory, Grossman stressed that cultural factors are dynamic forces that respond to changing political-economic conditions (international coffee prices). When coffee incomes are high, the frequency of ceremonial exchanges increase, and villagers are more inclined to engage in sheep production, because of anticipated sales and money received for sheep in ceremonials. However, because sheep have lower status than other animals in ceremonial exchanges, their demand is sensitive to fluctuations in cash incomes. Pigs, which have high status, are less sensitive to variations in rural income.

In the eastern highlands, traditional pig festivals have been transformed by the 'commercialisation of ritual', into 'singsing bisnis' (M.P.), where elements of traditional gift exchange occur at the same time as "profits are being accumulated by the unencumbered sale of commodities." (Boyd 1985, 325). Cash, beer and pork are transacted both as gifts and commodities, with profits channeled into both capital investment and traditional

exchanges such as brideprices. As Gregory noted: "The essence of the PNG economy today is ambiguity. A thing is now a gift, now a commodity, depending on the social context of the transaction. ... The colonisation of PNG has not produced a one-way transformation from 'traditional goods' to 'modern goods', but complicated a situation where things assume different social forms at different times and in different places." (1982, 116).

The anomalous distinction between 'traditional' and 'modern' is neatly illustrated by Sexton's (1986) study of collective women's savings groups around Goroka. She reported how elements of the 'modern' economy - the Western institution of banking - is recast in terms of the reproduction of people in clan based society. The formation of savings groups is explicitly modelled on marriage and birth ritual. Each savings group (consisting of the wives of an agnatic male lineage), is the 'daughter' of an earlier formed group which helped set it up, and each 'daughter' group in turn is expected to produce a daughter of its own. The groups are thus related to each other on matrilineal principles, and refer to one another in appropriate classificatory kinship terms, e.g., grandmother, mother, daughter, and granddaughter. Sister groups, i.e., formed from the same mother group, do not interact with each other which "reflects the structural unimportance of the sister-sister relationship in this society." (1986, 95).

The Carriers, working on Ponam Island, extended Gregory's argument to examine how the capitalist sector articulates with

precapitalist modes. In brief, they assessed the role of ceremonial exchange in maintaining relationships between migrants and island residents through cash remittances by the former. Contrary to many earlier studies (e.g., Fitzpatrick 1980 and Meillassoux 1981), they argued that through remittances the external capitalist economy subsidises Ponam's precapitalist sector,[5, 6] but they add the proviso that Ponam is a special case. Because of deficient island soils Ponam Islanders traded fish for starch with mainlanders in the pre-colonial period. Following colonialism, traditional local trade became irregular: mainlanders themselves took up fishing and there was downward pressure on the terms of trade for the islanders' chief product - dried fish. Ponam Islanders were forced to strengthen their links with the national economy, largely through the migration to towns of educated young people. Ponam migrants worked in relatively well paid jobs in the capitalist sector, mostly in Port Moresby, and remitted money to their island.

It is how these remittances are absorbed into the village economy, and the changes in kinship, exchange and wealth relationships that is of interest in this thesis. As imported manufactured goods displaced local items and wage labour became the dominant source of wealth, traditional systems of exchange based on kinship altered. Affinal exchange became more egalitarian as the political and economic power of older, financier bigmen (lapan) was undermined. Lapan were no longer able to exert control over the flow of wealth. With cash remittances, exchange "ceased to revolve around relationships

between competing financier-lapan, and came instead to revolve around relationships among sets of siblings: the young on Ponam and their employed brothers and sisters, from whom they hoped to extract wealth to use in exchange." This put an end to the old gerontocratic system.

A similar undermining of the power of bigmen occurred in parts of the PNG highlands. Europeans imported vast quantities of pearlshells to pay for food and labour (Hughes 1978, 315). The resultant inflation induced a 'democratisation' of the system as young men gained access to pearlshells by working for Europeans (A. Strathern 1966; Feil 1982; 1987, 119; Nihill 1991; see also Lederman 1986; 1990). Later, Hagen bigmen tried to keep control over cash by defining it as a valuable and attaching ritual to it, in ways similar to the control they formerly exerted over pearlshells (A. Strathern 1979; see also Healey 1985; 1989b; and Nihill 1989). As Feil (1987, 285) noted, cash cannot be kept solely within a framework of exchange: it can be put to other uses, and other people have ready access to it, apart from bigmen.

This leads to an important point, which was briefly mentioned above. Traditional society is not static and unresponsive to change. Numerous studies attest to the flexibility of precapitalist systems to respond to changes brought about by contact with colonial and postcolonial influences (see A. Strathern 1974; J. Kahn 1980; Smith 1980; Gewertz 1981; Healey 1989a). As Gregory (1982) succinctly put it: "... the whole

economy is 'modern'. The gift exchange practised in PNG today is not a pre-colonial relic but a contemporary response to contemporary conditions." (1982, 115). Thus contemporary rural PNG is not characterised by a declining traditional sector paralleled by an emerging modern economy. Instead, the backdrop to the present study is an economy undergoing a "simultaneous rise of both commodity production and gift production." (Gregory 1982, 115).

The foregoing discussion illustrates that transformation of indigenous social and political systems has not proceeded in ways predicted by some of the earlier models. Perhaps timescales are too short, and full transformation is yet to occur. However, it is now known that the processes of change are more complex than originally envisaged, and as studies begin to examine the interactions between precapitalist and capitalist economic forms, new insights are being gained into the processes of change. For example, it is realised that dualistic conceptualisations of precapitalist and capitalist productive modes and relations are too simplistic, and a decline or stagnation of precapitalist village society does not seem to be happening in much of rural Papua New Guinea. Rural society is changing, but not in the manner predicted. Rather, it seems a complex two-way interaction between the two types of economy is taking place to produce a curious blend of the two.

1.6 INHERITED INEQUALITIES IN PNG

A central argument of this thesis, is that social and economic status is inherited, and reinforced by the articulation of the precapitalist and capitalist economies. Several studies have addressed the issue of whether systematic inequalities exist between people claiming a birthright in their group (e.g. agnates in a patrilineal group) and members recruited from outside the group (nonagnates such as immigrants). Some researchers have found that nonagnates are less well-off than the agnatic members of their host group (see below). Explanations fall into two categories: those attributed to a decline in cooperation between an immigrant and his natal agnates, and those that argue the existence of active discrimination against immigrants by their hosts.

Because nonagnates are separated spatially from their natal social group, they interact less with their true agnates and are less able to draw upon the resources of the latter for help in the indigenous exchange economy (e.g., raising brideprices and servicing affinal exchange obligations) (see Ryan 1961, 29-30, 303; Healey 1979, 116). As Healey commented, "...the amount of co-operation in exchanges is a function of both genealogical and geographic propinquity." (1979, 106). Thus, the ability of nonagnates to participate in exchange networks at the same level as their hosts is curtailed.

Economic discrimination against immigrants by their hosts is most well known from the work of Meggitt (1965; 1967; 1971) among the highlands Enga. Meggitt argued that the most clearly defined agnatic descent systems with the most rigid patterns of residence are to be found in the most densely populated highland societies (Meggitt 1965; see also Waddell 1973 who proposed a slightly different mechanism[7]). Meggitt compared the densely populated central Enga (up to 350-400 sq. mile - 1971, 195) with the more sparsely populated fringe Enga groups, and argued that the former place more emphasis on patrilineality and patrilocality than the latter. Although Meggitt's stress on patrilineal descent systems has been questioned (e.g., Barnes 1967; McArthur 1967; see also Chapter 10), he provided some cogent arguments to support his claim that nonagnates suffer economic discrimination.

In Enga clan groups, agnates are wealthier (more pigs and greater participation in exchange), have more wives and work less hard than nonagnatic residents (Meggitt 1965, 40-43). Meggitt contended that because agnates can demonstrate putative agnation, they are able to restrict the access of nonagnates to wealth and authority. The key to their power is their control over land tenure. By withholding security of land tenure, agnates are able to thwart the long-term plans and political ambitions of nonagnates. Discrimination against nonagnates is justified by stressing the ideals of clan identity and cohesion. However, discrimination varies, and depends on the perceived level of danger of an enemy attack: "...if the clan is threatened by attacks from outside, they relax these restrictions

[discrimination] and offer more privileges ... when the danger passes, the terms of recruitment to the parish group return to normal." (Meggitt 1965, 44; see also Meggitt 1977, 25 and Chapter 5.2).

Nonagnates can be evicted from their host territory for failing to fulfil obligations (Meggitt 1965, 36). Also, because of the high demand for land, immigrants try to maintain gardens in both their natal and host territories but "bitter disputes and forcible evictions may follow." (1967, 196). Although immigrants may be granted use of garden land, their hosts may encourage them to reside with their natal agnates to forestall inheritance claims to gardening rights by the sons of immigrants (Meggitt 1965, 39). Meggitt commented further: "a Mae-Enga man who moves away from his natal patriclan ... may condemn himself to a relatively precarious future ... his claims to important resources are seriously impaired ... he may become something of a second-class citizen." (1967, 196).

Meggitt's work makes for interesting comparisons with that of Reay (1959a; 1959b; 1971) who worked among the Kuma of the Western Highlands Province. In Reay's earlier papers (1959a; 1959b) she drew attention to the relative abundance of land and said that conquest of land was unknown - "what needed to be defended ... [was] the agnatic descent group itself ..." (1971, 184). This is in direct contrast to the central Enga where, because of high population densities, inter-group disputes over land were, until recently, the main cause of warfare (Meggitt 1971, 195). Although

clan strength among the Kuma was a critical factor in warfare, clans "fought, not over land, but over women as the potential mothers of agnates yet unborn." (Reay 1971, 185). Yet in her later study the situation was beginning to change following pacification and the introduction of cash cropping.

Previously, ridges and hills were the preferred settlement sites of the Kuma. The lower lying Wahgi flats were undesirable because of malaria and their vulnerability to enemy attack (Reay 1971, 184). With the introduction of cash cropping the flats became highly valued because of their suitability for coffee. As a direct consequence of a functional land shortage for coffee one subclan "had plainly acquired an Enga-like exclusiveness and, far from trying to attract new non-agnates to join its ranks, was even pruning itself of birth members who were known to be only quasi-agnates." (Reay 1971, 187). Traditional values regarding the importance of recruitment of outsiders for defence purposes are adjusting to the new conditions. As land shortages (for growing cash crops) emerge, and the need to maintain group strength lessens (warfare declined), the Kuma are becoming more selective in granting rights of tenure. They are responding to the perceived land shortage in ways similar to the more densely settled Enga. Jural rights to subclan membership (hence land tenure) are becoming increasingly dependent on agnatic descent, to the extent that evictions of nonagnates are beginning to occur.

Amongst the Wosera Abelam, variations in socio-economic status have been investigated by Gorlin (1973; 1977). There are

some serious flaws in Gorlin's anaylsis (Chapter 7.4), but in general his findings lend support to the present argument. He found agnates to be wealthier than nonagnates and to have a lower rate of infection with the skin disease Tinea imbricata (1973, 160; 1977), which has been negatively correlated with nutritional status (Schofield et al. 1963; Gorlin 1973, 106; see also Chapter 7.4).

The above studies (Meggitt, Reay and Gorlin), lend support to the arguments of this thesis. Apart from demonstrating the existence of inherited social and economic inequalities within some largely subsistence-based rural societies, both Meggitt and Reay throw light on the processes and mechanisms involved (Gorlin reported inequalities without explaining the processes contributing to them - Chapter 7.4). Amongst the Enga restrictions on nonagnates are relaxed (i.e., less discrimination) when the threat of warfare is high; whereas, amongst the Kuma an innovative response to a functional land shortage is increased emphasis on agnatic descent for jural rights of land tenure.

Whilst Meggitt and Reay suggest reasons for discrimination against immigrants (e.g., high population density, declining warfare and functional land shortages), neither of them (nor Gorlin for that matter) adequately dealt with the role of indigenous exchange, in maintaining, or accentuating, economic differences between immigrants and members of their host groups. In this regard the present study by focussing on the interface between the indigenous exchange economy and the external market

economy, provides additional insights into these processes of economic differentiation.

1.7 THESIS ORGANISATION

Notes on presentation.

Case studies are used throughout the thesis to amplify some of the arguments raised in the thesis. To distinguish them from the main text of the thesis, they are indented, single spaced with left and right margins justified. For reasons of confidentially, individuals named in the case studies are given pseudonyms from the Wosera electoral roll. Finally, Abelam words are spelt phonetically, and are in bold face type underlined. Words or phrases in Melanesian Pidgin are tagged in the text with 'M.P.'. In place of a footnoting system, notes referred to in the text are collated at the end of each chapter.

Plan of thesis.

Chapter 2 provides a general overview of the social, cultural, economic and environmental setting of the Wosera, with particular emphasis on the study site of Miko 2 Village. Methods of field research and subsequent data analyses are described in Chapter 3, together with any shortcomings and difficulties identified while collecting and collating data. The historical processes of incorporation that have shaped contemporary Miko society are summarised in Chapter 4. This is important for

understanding the development of the present cash economy and some of the current frustrations and difficulties facing Wosera people. The chapter concludes with an analysis of Miko's contemporary cash economy, which highlights the impact of collapsed prices for export cash crops, and the importance of cash in the indigenous exchange economy.

Chapter 5 marks a major division in the thesis, where the focus shifts to examining the emergence of inherited inequalities in Miko society. In this chapter the historical factors contributing to a social and economic division between established and immigrant lineages are outlined. Chapter 6 examines how different kinship relationships mediate social and economic relationships, particularly resource access, and explores the implications for various categories of immigrants. In the following chapter, immigrant and established HHs are defined and compared on some demographic and medical variables, and an assessment is made of their relative holdings of some strategic resources (yam gardens, sago, coconuts palms and export cash crops). Chapter 8 examines cash income and expenditure for the two groups, and Chapter 9 assesses flows of garden labour in indigenous exchange networks. Both these chapters reveal a high degree of inequality between immigrant and established HHs. Further, they indicate the significant role that indigenous exchange networks play in contributing to socio-economic inequalities.

Finally, Chapter 10 provides a synthesis of the material

presented in the thesis and draws out some of the major implications arising from this study.

ENDNOTES TO CHAPTER 1

1. This definition of groups ('immigrant' and 'established') is an analytical division. Each group, composed of individual lineages, is not a group in the sociological meaning of the term. For example, lineages within the immigrant group do not have any specific allegiances to each other that differentiates them on this basis from lineages in the established group.

2. His assertion is questionable for two reasons. First, it implies that gift exchange is confined to valuables (using the Abelam as an example: shell rings, bilums, certain food categories such as pigmeat and uncooked yams and sago), and thereby excludes labour which also circulates in exchange (Chapter 9). If labour is also included in the set of exchanges, bigmen may well be net receivers in exchange. Second, by creating debt through indigenous exchange networks, bigmen are in effect creating assets (political and economic) by enlarging their pool of debtors to them, which they can draw upon to expand their influence and personal interests.

3. The term 'bigman' is thought to have been coined by Mead in 1935 (Lindstrom 1981 cited in Feil 1987, 96). Sahlins (1963) used the term to describe Melanesian societies where leadership is achieved rather than ascribed, and to distinguish them from Polynesian chiefly societies of inherited rank. Males become bigmen by competing with each other to prove themselves in various fields such as oratory, warfare, magic, ritual and horticulture. Most important however, is that they excel in ceremonial exchange by accumulating and strategically redistributing wealth. From this system of competitive exchange bigmen emerge from a mass of economically undifferentiated ordinary men. Males, if successful in competition with other males, become bigmen and accrue advantages from such status including political power, wealth, and more wives (labour) than ordinary men. The bigman system is not ubiquitous in PNG and there are deviations from the classic type as envisaged by Sahlins (for further discussion see Salisbury 1964; M. Allen 1972; 1984; Douglas 1979; Godelier 1982; Modjeska 1982; Feil 1987; Brown 1990; Lederman 1990; Lepowsky 1990).

4. Both Finney and Epstein have been criticised for their assertion that precapitalist society was pre-adapted to capitalism (Fitzpatrick 1980; Carrier and Carrier 1989, 13). Finney selected his entrepreneurs on the basis of their success in business in the urban sector without considering the social processes that give rise to them. But as Fitzpatrick (1980) commented, if Finney had studied the majority of villagers he could just as well have concluded

that Gorokan society was pre-adapted to socialism because of the emphasis on redistribution of surplus.

5. Burawoy (1976) and Curtain (1980) also point out that remittances may contribute to the maintenance of some subsistence economies.

6. Curtain (1980) suggested that the capitalist sector has been the main beneficiary from the articulation (through a migrant labour system in the Sepik) of precapitalist and capitalist productive modes. He argued that the migrant labour system linking the external capitalist sector and the non-capitalist village sector interact to produce a peasantry while inhibiting the emergence of a permanent rural proletariat. His analysis has been criticised (Fahey 1986, 154-5). He gave a dualistic interpretation of modes of production when in fact there is no clear-cut distinction; and, in analysing the peasant mode of production, he examined relations of production internal to the household rather than between HHs or between classes.

7. Waddell (1973, 52), while supporting Meggitt's contention that 'stress on agnation' is related to population density, argued that it is not population density per se that is the determining factor. Rather, he argued that it is the degree of agricultural intensification that influences stress on agnation: "... it is precisely those societies that effect substantial improvements to agricultural land through tillage that place the greatest emphasis on agnatic status, for it is those that are likely to suffer the most materially from fluidity of group membership and loyalty." (1973, 51-52).

CHAPTER 2 THE SETTING: MIKO VILLAGE

2.1 MIKO VILLAGE: AN INTRODUCTION

The people of Miko 2 Village (hereafter referred to as Miko), the focus of this study, live in the northeast of the Wosera subdistrict in the southern foothills of the Prince Alexander Ranges, about 12km south of Maprik (Fig. 2.1). Miko is without vehicular access, lies between the Amuk and Amogu (Screw) Rivers, and is separated from the Hayfield-Pagwi Road by the Amogu River and a 20-30 minute walk.[1] In 1988 the de jure population was 246, with almost 13% living away. The majority were temporary absentees - men working on plantations mostly in West New Britain Province, or young men visiting relatives for short periods of a few months in the hope of finding work.[2]

Miko contains 13 hamlets, all within 10 minutes walking distance of each other. Six hamlets are located on the banks of the Amogu River, and six on the main ridges running north-south through the village. This represents a significant change in settlement patterns from the pre-colonial period when hamlets were confined to ridge tops for purposes of defence (Chapter 5.2.1). However, despite a fairly long period of contact (see below) Miko retains much of its 'traditional' appearance and shows few signs of economic prosperity. Lea commented, during a visit to Miko in 1989, that little seemed to have changed in 30 years. Most houses are still built in the traditional style from bush materials. They have an A frame construction, tied together

with bush rope, that gently slopes downwards and narrows to the rear of the house. Younger men prefer the coastal style dwelling raised on stilts, but there are few in the village. Much more labour and timber is used in these houses, and the added expense of nails limits their construction.[3]

Miko villagers possess few Western goods. A family typically owns one large aluminium saucepan, a few enamel bowls and spoons, a kerosene lamp, a torch and a couple of bush-knives.[4] However, several families are without kerosene lamps, and clay pots for cooking and coconut shells for bowls are still commonly used. Personal 'modern' items such as radios,[5] mattresses, mosquito nets, watches, shoes, and lighters are limited, and only in the possession of males, particularly those recently returned from work outside the village. Likewise, not many people have bank accounts. The few that do are men who opened them while working away from the village. 'Modern' tools such as axes, spades, saws and hammers are scarce, and those without such tools borrow them from relatives or friends. There are four village tradestores, three of which closed during fieldwork. They stocked basic items only such as tinned fish, rice, newspaper for smoking, kerosene for lamp fuel, and occasionally razor blades, soap, batteries and lighter flints.[6]

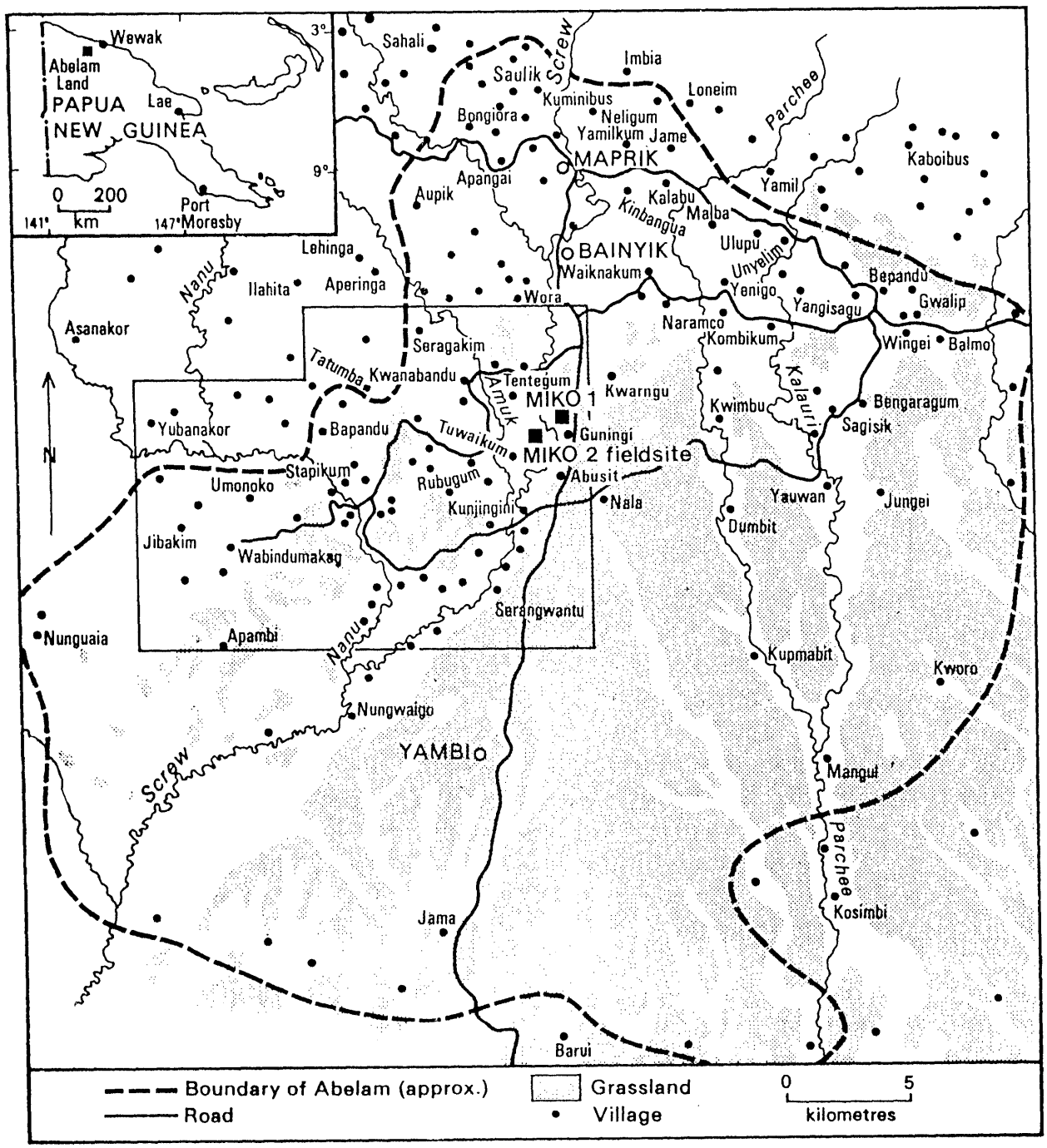

Figure 2.1 Location of study site.

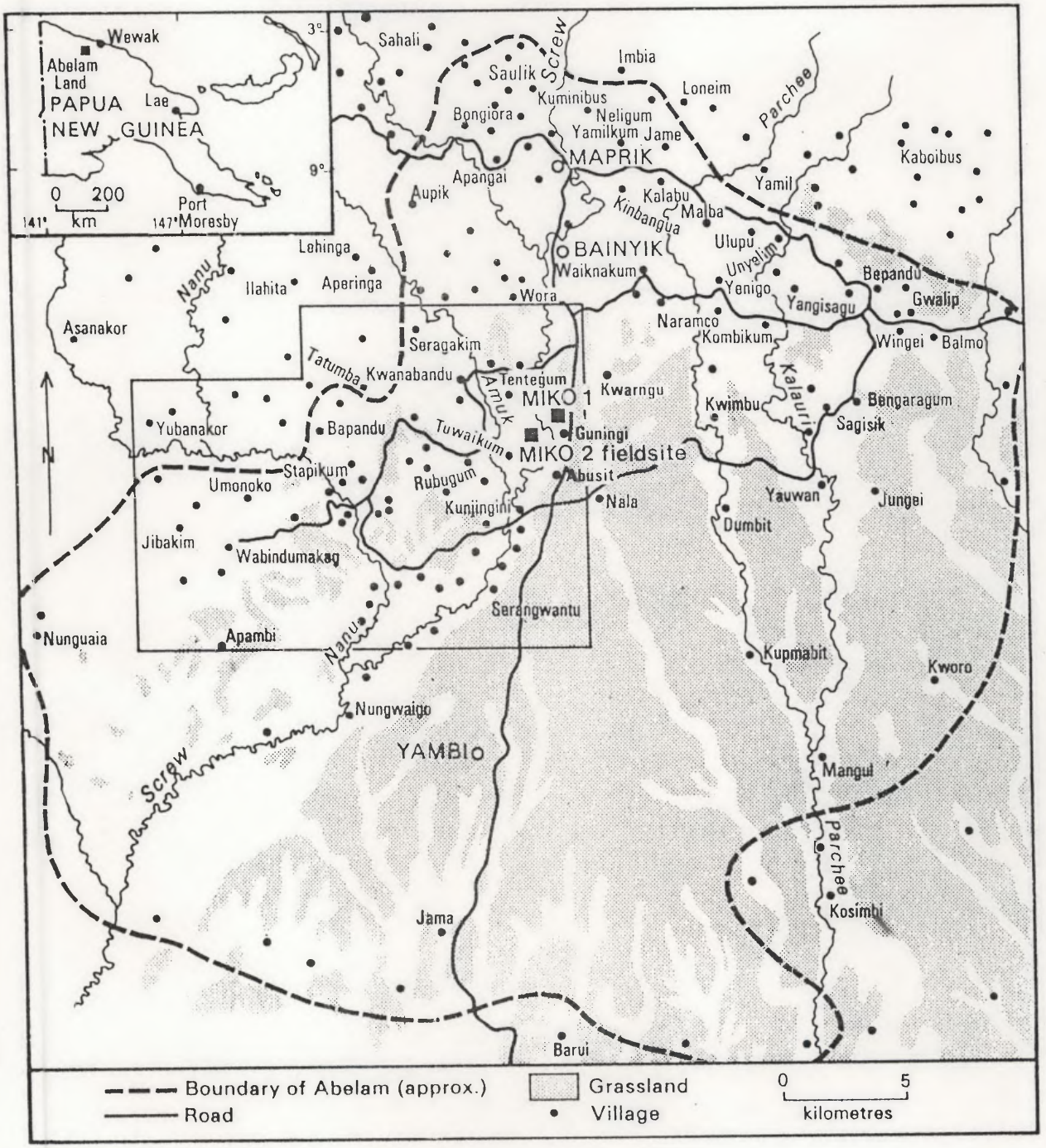

Figure 2.1 Location of study site.

Services

Two community schools and a high school are within a two-hour-walk of the village. However, no-one in Miko 2 has been to high school, and in 1988/89, only 6 children were attending the local community school. These attendance figures are astonishingly low and may represent a disengagement from one sector of the modern economy. Most married men (very few married women) have had some elementary schooling (78% of married men for whom I have records, n = 36), but today there are many children who have never enrolled in school. Relatively high school fees (K10 per year) and the perceived failure of a community school education to produce any tangible benefits are cited as reasons for children not attending school.[7] Reduced cash incomes because of falling commodity prices (Chapter 4.3.5) is probably a factor restricting the ability of families to educate their children.

There are five health centres in the Wosera. Kunjingini health centre (run by the Roman Catholic Mission) is the nearest to Miko and most people have favourable impressions of the service provided (see Koczberski 1989). The district hospital is located in Maprik, but was without a permanent doctor for most of 1988/89. Other major services available in Maprik include postal services, banking facilities,[8] a range of government services (e.g., police station, district court, Division of Primary Industry), and three large stores. A new post office was completed in 1989, but Miko, like many other villages, receives its mail via local mission stations.

2.2 CLIMATE, TOPOGRAPHY, SOILS AND VEGETATION

Apart from a marked diurnal temperature range, climate is consistently hot and humid throughout the year, with average monthly daily temperatures of 26°C. Annual rainfall is approximately 1700mm and falls mostly (64%) from November to April (McAlpine et al. 1975). Seasonality and intensity of precipitation become more marked from the foothills towards the Sepik River. Droughts severe enough to reduce garden yields (and floods[9]) are not infrequent and were reported in the Wosera/Maprik area in 1956 (M. Hovey pers. comm.),[10] 1963, 1978, and 1983/84 (Tyson 1987, 252) (section 2.3). Droughts probably occur more often: the incidences cited, either came to the attention of administrators, or were recorded by researchers working in the area at the time.

Elevation is around 200m, and the topography is characterized by a series of north-south ridges separated by valleys often containing dense sago groves. Hill soils are mainly brown forest soils, shallow black earths, yellow clays and dark colluvial soils, and are considered to be moderately fertile (CSIRO 1961; PNGIMR 1986, 18). Floodplain soils are deficient in nitrogen, but fertile (Lea 1964, 23). Grasslands to the east of the Hayfield-Pagwi Road are relict alluvial plains consisting of acidic dark grey to greyish brown clay or clay loams. They are infertile and deficient in phosphorus (Dept. of Agriculture, Stock and Fisheries 1959/60, 71). Bainyik Agricultural College has been grazing cattle on part of them for a number of years

(Mr. P. Tringin, Deputy Principal, Bainyik Agricultural College, pers. comm.). Towards the end of the dry season large areas of these grasslands are burnt-off during pig hunts and the new growth supports high densities of lepidoptera larva which are gathered as a food supplement.

Most lowland primary forest in the Wosera has been cleared and is in various stages of garden and garden regrowth. Floodplains and river terraces along the Amogu and Amuk Rivers have been completely cleared and fallow periods are too short to permit the emergence of secondary forest. Within the Wosera there are fairly extensive Themeda-Ischaemum grasslands that are thought to be anthropogenic in origin (Robbins 1961; Lea 1964, 29). The Australian colonial administration, concerned about grassland expansion, tried unsuccessfully to discourage the annual burnoffs in the dry season (M. Hovey pers. comm.). In 1965 the grasslands were estimated to cover 19% of the central Wosera area (Bureau of Statistics 1965), and are probably expanding under increasing population pressure.

2.3 LAND PRESSURE AND NUTRITIONAL STATUS

The Wosera is one of the most densely settled rural lowland areas in PNG, with densities ranging from 60 to 200 people per sq. km in some north Wosera villages (see Chapter 5.2 and 5.3). In the 1960s there was concern that Wosera subsistence systems were under stress and in the long-term would be unsustainable

with high population growth rates (e.g., Forge 1963; Lea 1964; Forge and Lea n.d.; Oxer 1965; see also Chapter 5.3). Fortunately, predicted population growth rates have not been realised (most estimates were in the range of 3% to 4% - Forge 1963) and much of the impact of population growth has been ameliorated by high rates of emigration.

With regard to the viability of Wosera subsistence systems, a recent report concluded that subsistence food production was adequate and there is no evidence of environmental degradation (PNGIMR 1986, 3). However, the report was limited to a five day rapid rural appraisal and so took a generalised macro perspective. There was insufficient time to assess microscale variations either within or between villages, though the possibility of between HH differences in access to land was recognised (1986, 47) (see Chapter 7.4). Moreover, the report dismissed the potential impacts of climatic extremes on subsistence food supplies (1986, 48). The Wosera is drought prone and severe flooding of river terraces and floodplains occurs periodically (see below). Such climatic perturbations may significantly reduce the supply of garden foods and thus extend the period of dependence on nutritionally inferior sago and bananas with adverse nutritional consequences. Also, not all families have adequate supplies of sago (Chapter 7.4.2).[11] Although Wosera subsistence systems appear adequate at present to meet the subsistence needs of the population as a whole, extreme climatic events can interrupt subsistence foods supplies, and

there remains the possibility of differential access to resources such as land (Chapter 7.4).

Under-nutrition has been recognised as a problem in the area since the early 1960s with earlier research pointing to severe food shortages as the cause (e.g., Lea 1965b; Bailey 1963). Recent studies continue to report a high rate of childhood malnutrition in the area (e.g., Ross 1984; Heywood et al. 1988; Koczberski 1989), and the Maprik district (which includes the Wosera) has one of the nation's highest levels of malnutrition (Gillett 1990, 58-59). The National Nutrition Survey of 1982/83 reported that 63% of under fives were below 80% weight-for-age (NCHP) (Heywood et al. 1988). Koczberski (1989) found that over 25% of the Miko 2 population were infected with the skin disease Tinea imbricata, which has been linked with poor nutritional status (Schofield et al. 1963; Gorlin 1977; see Chapter 7.3.4). The later studies found no evidence of absolute food shortages, and suggest instead that maternal workloads, traditional infant feeding strategies, and high illness rates in children and pregnant women, are factors contributing to malnutrition.

2.4 CULTURAL GROUP

The Wosera people belong to a cultural group known as the Abelam, and number about 65,000 people (Lea et al. 1988) (Figure 2.1). They speak a dialect of the Ndu language known locally as Kamu Kundi, but which varies slightly across the Wosera. The

Abelam are renowned for their artwork, elaborate exchange systems, male initiation ceremonies, and like other parts of PNG, traditionally had a bigman system of political organisation (see Kaberry 1941a; 1941b; 1966; Oxer 1965; Forge and Lea n.d.; Forge n.d.; 1970; 1971; 1990; Lea 1964; Lutkehaus et al. 1990). Bigmen derived their support at the village level, and achieved bigman status by several means including expertise in ceremonial yam cultivation, skilled oratory, access to sorcerers and yam magic, and by having a high degree of control over the flow of wealth, particularly shell rings.[12] Bigmen are still important in many villages, but the last of the traditional bigmen in Miko died in the early 1980s. Although traditional ways of achieving bigman status are still important throughout the Wosera, other avenues to power and influence have become available as a result of education, business and local government opportunities.

2.5 LEVELS OF SOCIAL ORGANISATION

Within the Wosera, levels of organisation in order of decreasing size and increasing within group solidarity are: confederacy, village, clan, subclan, patriline, and family (Oxer 1965). Usufruct rights to parcels of land and economic trees are normally inherited patrilineally,[13] and marriages are predominantly patrilocal.

2.5.1 Confederacy and village

Earlier ethnographers described the largest political unit as the village 'confederacy', which consists of two or more villages without a common boundary, but which share a common ancestry (Forge 1965; Lea 1964; Gorlin 1973, 35). Miko 2 Village is composed almost entirely of one clan, Sarakum, said to be descended from a lineage in Sarakum Village, 5-6 km to the west, that settled in Miko 2 Village at least six generations ago.[14] The confederacy used to be important for certain ritual purposes, but is no longer functionally active.

Villagers' perceptions of village boundaries do not necessarily coincide with administratively imposed boundaries. Often the latter are village segments; a group, of which make up a true village (see Lea 1964). Miko 2 Village for example, is one segment of a village unit that also includes Miko 1 and Miko 3 (now called Tentegum). Garden land belonging to the different village segments is diffused and mixed at their boundaries. Sago holdings are even more dispersed and mixed than gardening land because of differences in tenure arrangements between the two resources (see below). When village segments are viewed in total, the boundary, though often disputed, is more clearly defined (e.g., ridge tops or gullies). In the day-to-day activities of villagers it is the village segment that is important. It is here that villagers produce most of their food, grow cash crops, raise families, and to which most of their social activities are orientated.

2.5.2 Clan

At the next level of social organisation is the clan. Four clans are represented in Miko 2: Sarakum, Wiarakum, Biarkum and Woisakum. Members of Biarkum and Woisakum also claim membership of Sarakum clan. They are originally from Miko 1 and have become incorporated within subclans of Sarakum clan. Thus, in Miko 2 there are two functioning clans: Sarakum and Wiarakum, with Sarakum representing 93% of the Miko 2 population (Table 2.1). Though technically a clan, Wiarakum functions like a small subclan. Its component HHs interact closely (e.g., gardening together and sharing food), whereas there is little cooperation across subclan boundaries within Sarakum clan. Each clan has a major bird totem djambu, other minor totems, a major ancestor spirit gwalndu, a fertility spirit wale, and the ancestral spirits collectively called gwaleaba.

Large clans such as Sarakum have little to do with the organisation of daily activities, and are more concerned with ceremonial events. Although clan membership is patrilineal in principle, there is a certain degree of flexibility with recruitment of outsiders and, as indicated above, some individuals claim affiliation with more than one clan (see Chapter 7.2 and Kaberry 1941a, 254-255; Forge 1963, 12; 1965, 30; Forge and Lea n.d., 18; Lea 1964; Oxer 1965, 17). In practice, individuals claiming multiple clan or subclan affiliations, usually associate more closely with one in particular, rather than dividing their social or economic activities equally between

them. During ceremonial events, such as the yam and tamberan cults, men assert their allegiance to one particular clan or subclan (Lea 1964; Forge pers. comm.).

TABLE 2.1 Total membership, number of HHs and mean HH size per clan and subclan in Miko 2 Village.

CLAN	SUBCLAN	TOTAL MEMBERSHIP	No. of HHs	MEAN HH SIZE
Sarakum	Marka	56	10	5.6
Sarakum	Ninda	39	8	4.88
Sarakum	Gini	106	21	5.05
Wiarakum	----	15	4	3.75

2.5.3 Subclan

The landholding unit is the subclan. Sarakum clan is subdivided into 3 subclans: marka (head), ninda (middle), and gini (last), corresponding to older, middle, and youngest brother (Table 2.1). Previously, the three subclans of Sarakum shared the one bird totem namio, but at least 6 generations ago, the subclan marka died out and was replaced by the bird totem paal. Because it is small, Wiarakum clan, does not have subclan subdivisions. Women marry out of their subclan, but marriage is not exogamous at the clan level.[15] The subclans are intermarried despite jealousies, mistrust, and covert sorcery accusations.[16] The relationship between subclans appears an uneasy alliance with built-in contradictions. On the one hand, competition and rivalry between them can be intense. Tradestores, business and youth groups are often subclan enterprises which can lead to jealousies and sometimes sabotage of successful enterprises. Yet

at the village level there is need for cooperation and support in dealings with outsiders, especially when the integrity of the village is under threat. On these occasions clan or village level concerns override inter-subclan antagonisms.

Each subclan has its own parcels of garden land, and subclan patrilines have rights, as agnates, to cultivate garden land belonging to their subclan. Usually the last member of a subclan to garden a section of their subclan land is referred to as 'papa bilong graun' (M.P. - 'father' of the ground) and often re-uses it after the land has been fallowed. Subclans permit others to cultivate gardens on their land, but these temporary alienations of land do not violate the subclan's acknowledged ownership of the land. These access rights are for temporary gardens only. It is rare that a non-subclan member is allowed to plant permanent cash crops or sago, which remove land permanently from garden production (Chapter 6.3). A person seeking to garden on another subclan's land must first obtain permission from the landholding subclan. Failure to do so is construed as an attempt to assert ownership and such an offence is taken very seriously. Crops are uprooted and entry to the garden by the offending subclan forbidden.

For yam exchanges and male initiations, Miko is divided into two ritual groups called ara. Members of one ara have exchange partners (tschambera) in the other ara with whom they exchange yams and pigs. Tschambera also initiate each others' sons into the tamberan cult.[17] Despite an abeyance of ceremonial yam

exchange and initiation ceremonies in Miko during the last 20 years, most men (including young men) know who their tschambera are and the membership structure of each ara. In the absence of ceremonial exchange and initiations, there is little evidence that this bisection of the male population into two ritual groups has any influence on day-to-day living.[18] Gini, which is the largest subclan, approximates roughly to one ara, while the subclans of marka and ninda, and the clan of Wiarakum make up the second ara. Because of the requirement for equal numbers in each ritual group, ara membership does not fit perfectly with subclan divisions. Immigrant males to gini, have been allocated to the ara dominated by ninda and marka to maintain a balance in numbers between the two ritual groups.

2.5.4 Patriline

Most land in Miko is held in common by the subclan, but some land and resources, such as sago and coffee, are held by close agnates of a patriline. Members of a patriline with rights of access may include a man and his married sons, and sometimes also his brothers and their sons. Other economic trees or palms such as coconut and betel nut palms, Gnetum gnemon, breadfruit, and other fruit and nut trees are owned individually and inherited by individual sons and occasionally daughters. Each generation, sago holdings are subdivided between sons so that holdings become smaller and more fragmented. Subdivision of coffee blocks amongst sons is a recent innovation (within the last 15 years) and may be in response to a functional shortage of land, i.e.,

land may be available to everyone for say temporary subsistence gardens, but restricted for permanent cash crops (Chapters 1.6 and 6.3).

Ownership, or rights to economic trees and palms, is separate from rights to the land on which they are grown. For example, although a patriline may own a coffee block, the land on which it grows may technically belong to the subclan as a whole. The same principle applies to recent plantings of sago (within living memory). But after extended use of the land, de facto ownership effectively passes to the patriline which planted it. Villagers say that all land suitable for sago within the village has been planted. There are however, some sago stands which villagers claim are held at the subclan level. This is doubtful in the sense that **all** subclan members have agnatic rights to harvest them. One is held by a patriline of the subclan gini which 'purchased' it several generations ago (see Chapter 6.3). It has not been subdivided between the sons of the present generation, but in practice other members of the subclan are denied access except through special kinship relationships that are qualitatively different from relationships of agnatic kinship (Chapter 6.2).

2.5.5 Family

The basic economic unit is the family (equates with HH in this thesis). But the distinction between the family and the patriline as a unit of production, consumption and mundane

exchange (as distinct from ceremonial exchange) is blurred. The family provides much of the routine labour inputs to the production of garden crops (e.g., weeding of yam gardens, and the planting and harvesting of subsidiary garden crops - bananas, taro, sweet potato, pitpit (Saccharum edule), green vegetables, tobacco and peanuts). In other areas of production such as the cutting, clearing and fencing of new gardens, the planting, harvesting and carrying of yams, cutting and processing sago palms, and house building, the patriline and often other members of the subclan amongst other classes of kin may contribute labour. The tasks for which labour is recruited from the patriline and subclan tend to be labour intensive and predominately male work (with the exception of sago processing which is a female task), though women cook food for communal work groups of men.

Similarly, in other areas such as consumption and exchange the family is not a clearly distinct unit. For example, inter-household exchanges of cooked and uncooked food occur on a daily basis, usually within the same hamlet. But in certain contexts such as during periods of mourning, following childbirth, initial menstruation seclusion, house thatching, dispute resolutions, food exchanges also occur between hamlets. Wives and daughters of agnates who contribute labour to yam harvesting (cooking food and carrying harvested yams to the house of the grower), are presented with a 'bilum'[19] of new yams. The yams are said to be given in recognition of the close ties that exist between agnates, rather than a payment for labour.

Agnates also contribute towards the cost of importing brides to the subclan. A family usually relies on contributions from its patriline and other subclan members to raise the necessary valuables for a son's brideprice (approximately 20 shell rings, 20 bilums and K200 cash). The more closely related are agnates, the larger their contribution tends to be, so that the patriline of the groom's father tends to make a larger contribution than more distantly related subclan members. Except for the contribution by the groom's father, contributions from agnates are gradually repaid over the years. For example, if a man contributes to his brother's son's brideprice, the brother's son is expected eventually to make a return payment, perhaps to the brideprice of his father's brother's son (see Chapter 6.2.1). These forms of delayed exchange between agnates contribute to the corporate identity of the agnatic group (subclan, patriline), and bind its members more closely together (Chapter 6.2 provides a discussion of the differences between agnatic exchange and exchange between lineages related by marriage).

2.6 SUBSISTENCE SYSTEM

2.6.1 Subsistence gardening

The Woseras practice a bush fallow system of gardening with mixed gardens dominated by root staples and interplanted with a range of greens and bananas. River terraces (gara) along the Amogu and Amuk rivers are more intensively cultivated than

hillslopes (numbu), and are more highly valued for garden land. River terrace gardens are bounded by 1 m ridges which form a network of paths between gardens.[20] Estimates of fallow periods range from 2 to 7 years for river terraces and from 10 to 15 years on hillslopes. Mature hillslope fallows are characterised by a fairly dense shrub layer with some emergent trees.[21] Mature river terrace/flood plain fallows consist of a cassava/shrub/Pueraria[22, 23] fallow with some old bananas remaining from the previous garden (see PNGIMR 1986 for a brief review of studies of Wosera subsistence systems).

The gardening cycle begins towards the end of the dry season in September/October when new gardens are cleared, and gardens cut the previous year are made ready for a second planting of yams (Dioscorea esculenta).[24] There are two main cultivars of D. esculenta: nyemka (vine staked) and asakwa (vine unstaked). As well as being the dominant cultivars for food (as opposed to exchange), they are also the indigenous generic names for two classes of D. esculenta. The classification is based on whether yams are staked or unstaked, rather than on the degree of genetic relatedness between cultivars. Imported varieties from the coast or islands have been incorporated into this classification (Figure 2.2). From September to December, nyemka varieties are planted followed by asakwa from October to March. Nyemka are planted at a higher density than asakwa, perhaps because they are staked and have smaller mounds than asakwa. They are frequently planted in old asakwa gardens as a second yam crop, but asakwa

are always planted in new gardens (see Lea 1964 and Quin n.d., for descriptions of Abelam yam cultivation).

Men plant and harvest yams. Following the yam planting, women generally take over the more routine and continuous tasks of weeding, and planting and harvesting subsidiary crops.[25] After a new garden has been fired and before, or shortly after the yams are planted, Amaranthus and tobacco (Nicotiana tabacum) seeds are scattered over the bare soil. Amaranthus are the first garden greens to be harvested.[26] Following the yam planting, other supplementary crops are planted including a range of greens (Hibiscus manihot, Brassica spp., Cucurbita moschata, spring onions), taro (Colacasia esculenta and Xanthosoma sagittifolium), banana (Musa spp.), maize, pawpaw (Carica papaya), tomato, cucumber and beans (Vigna spp., and Psophocarpus tetraglobus). Peanuts (Arachis hypogaea) are rarely interplanted with yams. They are either cultivated in separate gardens or as a first crop before yams. The planting of pitpit (Saccharum edule) marks the end of the garden cycle.[25] Very little labour is invested further in the garden, but they do not cease to produce after the harvest of pitpit. Bananas, pawpaw (for pig food), some taro and various fruits that emerge in the fallow may be collected for several years.

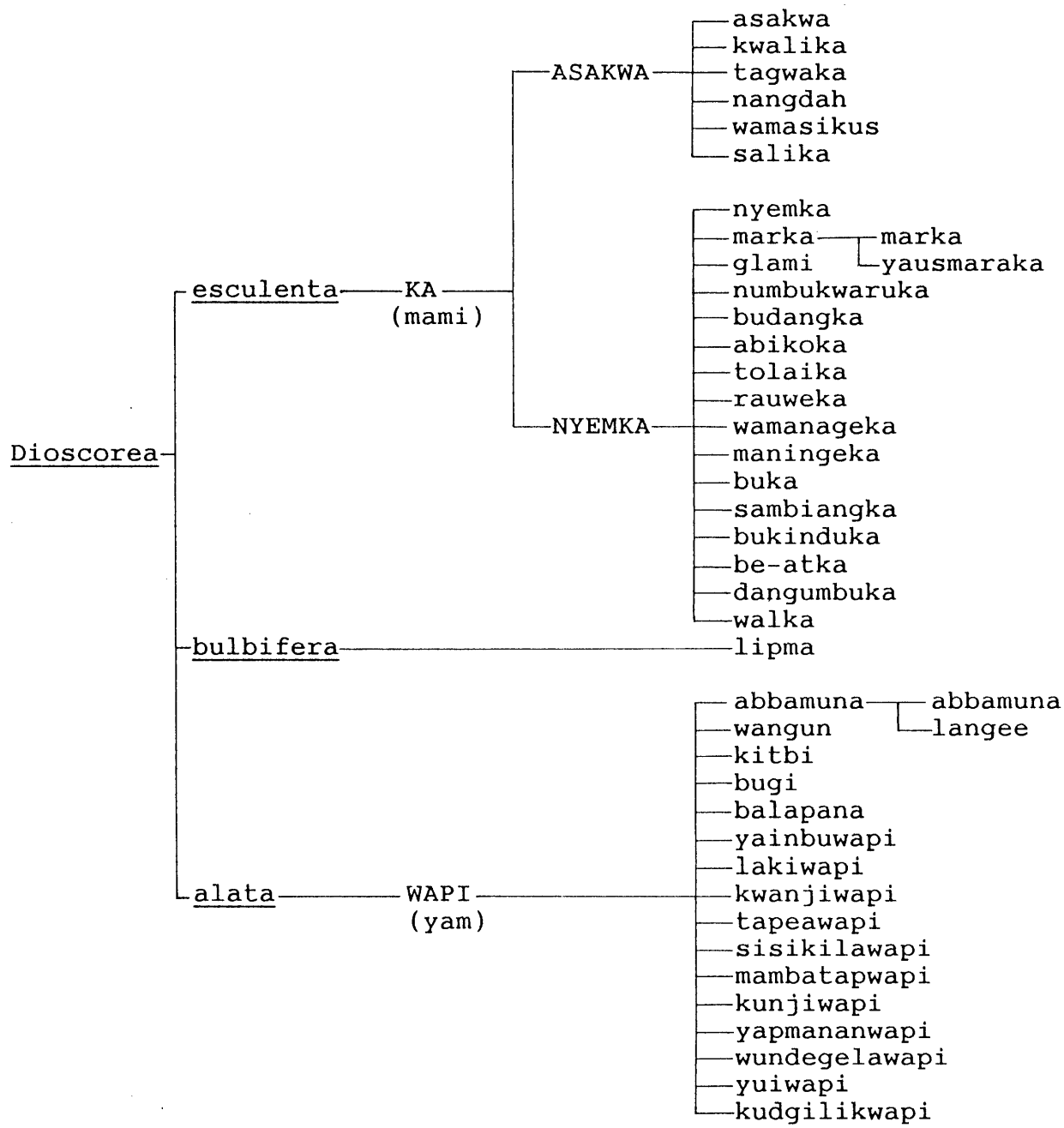

Figure 2.2 Indigenous system of yam (Dioscorea) classification and names of cultivars grown in Miko Village. (Scientific names underlined and Melanesian Pidgin names enclosed in brackets.)

Harvesting begins with nyemka in June after the full moon, but only young children eat the new yams. Adults wait a further few weeks before starting to consume them. Several weeks prior to harvesting there is a noticeable air of excitement especially when garamuts (slit gong drums) ring out in distant villages announcing that they have begun to harvest their yams. Villagers look forward in anticipation to eating new yams (most have been eating sago supplemented with bananas since January) and the exchange festivals and visiting that follow. The asakwa harvest which begins later in August does not produce quite the same level of excitement.

The proportion of total yam yields available for consumption from river terrace gardens appears to be lower in Miko than in other Abelam villages studied previously (e.g., Lea 1964; PNGIMR 1986; Quin n.d.). For the present study, yield data were collected from 9 first year river terrace gardens of nyemka yams (see Appendix 2.1 for methods and results). Making no allowance for wastage or deterioration of seed yams in storage, 31% of total yam yields would be required as seed stock to replant the same number of mounds. This extraordinarily high figure is due to the large size of tubers kept for replanting in Miko. Seed tubers from these 9 gardens had a mean weight of 1.76 Kg,[27] which is considerably heavier than seed tubers recorded from other villages in the study area. For example, Lea (1964, 88) using data from Yenigo reported seed tubers of D. esculenta in the range 1-2 lbs (0.45-0.9Kg), and Quin (n.d.) in a description of the basic Wosera system said planting setts weighed between

0.6-1.0 Kg. As well as revealing the high degree of variability between Abelam villages in yam production techniques, these data reflect the importance of tuber size amongst the Abelam: villagers maintain that seed tuber size is positively correlated with the size of harvested tubers.

The cultural value of large tubers from food gardens was recognised by the PNGIMR when they visited one of Quin's experimental sites in Mikau.[28] They found that men were opposed to increasing planting density to the same level as Quin used in her trials, even though they knew total yields would be increased. In the trade-off between increased yields and reduced tuber size, growers preferred larger tubers for exchange. This is an important point. Yams are not grown solely for food. They are of high social and cultural value, and by using fairly large seed tubers and planting at relatively low densities, growers are not aiming solely to maximise food production. Amongst the Abelam, reputations are built and lost on a man's yam growing skills, with status and prestige accruing to growers of good size tubers. Moreover, yams do not have to be presented in large ceremonial exchanges to bring prestige to the grower. Word of a good or bad harvest quickly spreads throughout the village and perhaps further afield. Large tubers are also channelled into mundane exchange networks between kin, so it is important for an ambitious man to have good quality yams for exchange purposes (see Appendix 6.2).

Yam garden areas

Yam gardens belonging to sample HHs in the 1988/89 season were surveyed including those which were replanted a second time (see Chapter 3.2.2). As indicated above, river terraces are usually planted twice with yams, while hill slopes are less commonly replanted. Variation in the area of yams cultivated is high (Table 2.2), ranging from 51 to 1242 sq.m., per adult equivalent.[29] Factors that can contribute to HH variability in yam production in a given year include: illness, birth, death, male out-migration and disputes. Illness for example, may directly reduce HH labour supply through temporary incapacitation. Post-partum taboos prevent both the mother and father from attending their gardens for up to a week after a birth (Koczberski 1989, 110), and death may have indirect effects through cultural taboos against the deceased's kin engaging in subsistence production during the mourning period (Appendix 6.2). Male absenteeism reduces the pool of available labour for specific male tasks such as garden clearing and the planting and harvesting of yams (Case 9.3), and disputes with a landholding subclan sometimes restrict planting (Case I5, Appendix 6.1). The effects may flow-on into the following year, because of diminished planting stocks.

High variability between HHs has been noted previously for other Abelam villages by Lea (1964, 86), Ross (1984, 48) and Tyson (1987, 247). Ross and Tyson suggested that differential use of sago may partly explain variations in HH garden areas.

This was not found to be the case in this study. A very weak negative relationship was found between HH yam garden areas and net numbers of palms processed per HH during the sago season (January to June) (R squared = 0.09), and over the entire year (R squared = 0.03). Resources of bananas, sago purchases at local markets and food circulating in exchange networks (particularly processed sago) are additional variables that are likely to influence HH garden areas. The HH with the smallest per adult equivalent of yam gardens in Miko has extensive holdings of bananas. It is probable that these factors in combination with those mentioned in the preceding paragraph explain much of the variation in HH garden areas.

Comparison of garden area data with other studies

Comparisons of yam garden areas between studies are problematic because of the different ways researchers assessed HH garden resources. Ross (1984, 48-49) only surveyed gardens less than one-year-old, so gardens planted with a second yam crop were omitted from his analysis. Therefore his figures probably underestimate HH resources of yam gardens, though by what proportion cannot be answered. Quin (n.d.) who worked in an environment similar to Miko reported very small areas of yams per HH (Table 2.2). The PNGIMR (1986, 40) however, suggested that she may not have considered the possibility that HHs had other yam gardens apart from those in the communal blocks that she surveyed. Both Lea (1964) and Tyson (1987, 43) measured all yam gardens belonging to HHs, so their data can be more reliably

compared with data from Miko (Table 2.2). Bearing in mind the problems in comparing these data from different sources, it would appear that variablity in HH yam garden areas is high both within and between villages (Table 2.2).

There is some evidence that agricultural intensification may have occurred since the early 1960s. Although Lea did not differentiate between old and new gardens (pers. comm.), he implied that a single planting of yams was typical: "The garden usually has a life of about two years, but it is only intensively cropped for about nine to ten months." (1964, 80; see also his comments on p. 107). He was clearly of the opinion that a single yam planting was the norm in the early 1960s. More recently, Tyson who examined all yam gardens planted in the 1983-84 season in Gwelikum (1987, 43), stated that garden re-use is common (1987, 248). Garden re-use is also common in Miko, particularly on river terrace land. Although by no means definitive, these data suggest that agricultural intensification, through an extension of the cultivation period, may have taken place since the early 1960s. Because of variability in land types (between and within villages), and differences in subsistence strategies between villages, the question cannot be resolved at present. An updated analysis of subsistence production strategies in Lea's former fieldsites of Yenigo and Stapikum could perhaps answer this question.

Aside from Quin's data, which has been questioned by the PNGIMR (see above), Miko HHs cultivate smaller areas of yams as

Table 2.2 Yam garden areas (square metres) in some northern Abelam and Wosera villages.

	NORTHERN ABELAM		WOSERA			
	Lea[1] (1964)	Tyson[2] (1987)	Lea[1] (1964)	Ross[3] (1984)	Quin[4] (n.d.)	This study
LOCATION	Yenigo	Gwelikum	Stapikum	Kaugia	Mikau	Miko 2
Mean area per HH (s.d.)	-	3041 (1746)	-	1429 (511)	720 (-)	1498 (926)
Mean area per adult equiv. (s.d.)	596 (-)	-	603 (-)	-	-	389 (257)
Mean area per producer (s.d.)	-	-	-	697 (294)	-	591 (328)

1. Calculated from data in Lea (1964, 77, 96, 135).
2. " " " " Tyson (1987, 249).
3. " " " " Ross (1984, 48). N.B., gardens replanted a second time with yams excluded from total.
4. N.B. Probably an underestimate because not all gardens surveyed - see note in text.

measured by HH, adult equivalents or producers[29] (Table 2.2). Large-scale inter-village exchanges and drought are two variable factors likely to influence village production from year-to-year.[30] For example, with ceremonial exchange involving groups of villages, host villages supply their guests with food (yams), tobacco, and betel nut. Planning for such events would presumably include increasing yam production in the year prior to the event but the impact on total yam production is difficult to predict. Lea mentions that Yenigo was actively involved in yam exchanges during his fieldwork, and this may partly explain their larger yam plantings - to feed guests. However, Tyson (1987, 242-247) reported that large-scale ceremonial exchanges had

ceased in Gwelikum (a village near Yenigo), but they were still cultivating areas of yams on a par with Yenigo HHs. In this regard, Tyson's and Lea's results are difficult to reconcile. Again, it may simply reflect differing subsistence strategies between villages (see below).

In 1988/89 Miko was not planning for any large-scale inter-village exchange activities, so production levels were geared towards satisfying domestic consumption and mundane exchange activities. Droughts can be ruled out as a factor contributing to Miko's smaller plantings of yams in 1988/89, because sufficient time had passed since the last major drought in 1983/84 (documented by Tyson 1987, 252) to allow the restoration of 'normal' production levels.[31]

Given that yam garden areas measured in earlier studies (i.e., Lea 1964, Ross 1984, Quin n.d., and Tyson 1987) were not influenced by drought, and that yam production in both Gwelikum and Miko were not geared for large-scale ceremonial activities (cannot be ascertained for the other studies), it is probable that the mix of subsistence production strategies are different in Miko. With smaller yam gardens, Miko villagers (as a group) are perhaps more dependent on sago than other Abelam villages studied. Certainly, sago is extremely important in Miko (Chapter 7.4.2), but there is insufficient data on sago consumption from elsewhere in the Wosera to make meaningful comparisons. Furthermore, banana cultivation may be of greater importance in Miko, but again there are insufficient data to evaluate its

significance in either Miko subsistence strategies or in other villages in the study area.

In summary, it can be stated that although there is considerable variability both within and between villages in garden areas planted to yams, Miko villagers clearly cultivate smaller yam gardens than in other Abelam villages which have been studied.

2.6.2 Sago and other non-garden foods

The subsistence system is strongly seasonal. From January to June when yams are in short supply, sago (nang, Metroxylon sagu) supplemented with bananas (Musa spp.) dominates diets (see Ross 1984). Sago is the most important non-garden food (see Chapter 7.4.2 for data on quantities processed). Villagers recognise three varieties of sago growing in Miko. They are differentiated by thorn size, and the presence or absence of thorns: raming (large thorns and common locally), nyamio (small thorns) and mara (rare and has no thorns).[32] Raming and nyamio are preferred to mara because their starch gels more readily into large globules in one of the most popular sago soups, tenonang.

Other non-garden foods provide significant contributions to diets, and in descending order of importance include coconut, tulip (Gnetum gnemon), bush greens (when garden greens are scarce - July to November), breadfruit, and various fruits and nuts (see

Ross 1984). Small game and insects are also important supplements at various times of the year.

2.7 CONCLUSION

To contextualise this study, a general overview of Miko's social, cultural, environmental and economic environment was presented in this chapter. Economic development in Miko (and the Wosera generally), is limited, and malnutrition in the Wosera continues to be a serious problem. Although change has been considerable including a strengthening of links with the 'modern' world through education, government services and participation in the monetary economy, villagers retain much of their 'traditional' culture, both in the social and economic realms. They remain very much dependent on subsistence production, and indigenous social structures continue to play a fundamental role in delimiting rights to resources.

In the next chapter, field research techniques and methods of data analyses are described.

ENDNOTES TO CHAPTER 2

1. The Amogu River is frequently subject to flash floods in the wet season, making village access difficult.

2. Periods of work away from the village may be a modern alternative to customary male rites of passage. Young men gain prestige and worldly experience from their visits to distant places, and all young males in the village express a desire to travel when old enough (Chapter 8.5.6).

3. During fieldwork three separate attempts at building houses raised on stilts ended in failure. Two were not finished because the owners were unable to purchase or borrow enough nails to complete the job. The third, was beginning to fall apart by the time it was finished. The owner had taken so long to procure enough nails that by the time it was thatched much of the frame had rotted.

4. The bush knife is the most important and versatile modern tool introduced to the village. In new gardens it is used to cut undergrowth, fell small trees, lop branches from larger trees and to loosen soil while weeding. It is also used to chop firewood, shell coconuts, butcher animals, pare yams and chop other vegetables and yams, and is used as a tin opener, sago pith thresher, saw, plane, chisel, and even as a screwdriver for fixing radios! If the blade breaks, or becomes excessively worn, it is often filed down to make smaller knives or ground to a pointed blade for spear points.

5. Radios are an important source of government information (e.g., government services and dates and times of court cases).

6. Tradestore robberies were common in the area. Tradestore operators in Miko and surrounding villages said they carried minimal stock to make their stores less lucrative targets for burglary.

7. Because young boys make little economic contribution to their HHs a son at school is not a major loss of HH labour. A daughter at school on the other hand, is a significant loss of HH labour in gardening, sago processing, local marketing of domestic produce and HH chores. Some parents, particularly mothers, discourage their daughters from attending school. In my hamlet, one young girl who expressed a desire to attend school was actively discouraged by her mother, who said that she could not forgo her daughter's labour. Her mother refused to pay the school fees. Eventually, her older brother loaned her the money,

but she withdrew from school several weeks later under continual pressure from her mother.

8. Banking facilities at the Maprik branch of the Papua New Guinea Banking Corporation were suspended on several occasions in 1988/89 because of armed holdups.

9. Severe flooding of floodplain and river terraces occurs periodically along the Amogu, Amuk and Nanu Rivers. Oxer (1965, 2) reported extensive flood damage to gardens along the Nanu River in 1965. In February 1988, 545 HH heads from 18 villages (3815 people were estimated to be directly affected), lost their gardens from severe flooding along the Amuk and Nanu Rivers (Situation Report 4/88, Subdistrict Office, Wosera).

10. Mr M. Hovey, a retired A.O.G. missionary, worked on and off in the Maprik-Wosera area since the early 1950s.

11. As well as reduced garden yields during droughts, soaks in sago gullies often dry-up so that sago pith must sometimes be carried long distances for processing, a point also made by Tyson (1987, 252) for the northern Abelam village of Gwelikum.

12. Shell rings (yua) are cut from giant clam shells (Tridacna gigas) by six mountain Arapesh villages to the north (Forge 1990, 165; see also Gardi 1958). Traditionally the Wosera traded pigs for them at the rate of six per pig (see Chapter 4.2.4). The six rings vary in size and are matched with various parts of a pig's body. Rings range from a few inches to nearly a foot in diameter and are used in brideprices, mortuary payments, compensation payments, exchange networks between kin and to settle disputes. For details of their manufacture see Mead (1938, 317-319).

13. Occasionally a father will give his daughter a coconut palm, or part of a tulip (Gnetum gnemon) grove (section 2.5.4).

14. This cannot be taken literally as Abelam genealogies tend to be short with the intervening generations between founding members and recent generations collapsed (see Scaglion 1990 for a discussion of the problem of collecting accurate genealogies).

15. Exogamy rules vary amongst the Abelam. Lea (1964, 49) for instance, reports that in Yenigo Village both clans and subclans are not exogamous. In contrast Kaberry (1941a, 250) states that both levels of social organisation are exogamous.

16. Several informants maintain that until recently marka and ninda subclans were allied against gini subclan in warfare through sorcery. The alliance between marka and ninda broke down after a spear fight following marka's allegations of witchcraft against ninda.

17. No male initiation ceremonies have occurred in the last 15 to 20 years in Miko 2 Village, but some young men underwent initiation ceremonies in Miko 1 Village in 1983. Villagers maintain that all the men with the necessary knowledge for staging initiations have died in recent years. There is even some doubt as to their ability to stage a yam exchange successfully.

18. During fieldwork the issue of ara division was raised in a dispute between a man and his married son. The son removed some stakes from his father's yam garden and used them to stake his own yams. The dispute escalated to the point where the son raided his father's garden house and destroyed a quantity of his father's yams that were in storage. Immediately, their tschambera from the opposite ara demanded compensation and the man and his married son presented their half-grown pig to their tschambera as compensation. I was told later that disputes between agnates 'worry' exchange partners and can lead them to demand compensation. I am not sure why compensation was demanded in this case but not in other disputes which I witnessed between close agnates. One can speculate that because tschambera exchange yams, the destruction of planting stocks is considered to be more serious than other forms of disputes between agnates (see Case 6.1).

19. Bilums are hand-woven string bags usually made by women from the bark fibre of a particular species of tree. The Wosera is famous for the quality and intricate patterning of its bilums. Women use them to carry all manner of things including their infants. Bilums are also an important exchange valuable used in brideprices, mortuary payments, and in various exchanges between kin (Chapter 6.2).

20. The ridges between gardens are formed by the dumping of unburnt debris and weeds along garden margins. Villagers are vigilant about their neighbours' dumping of garden rubbish. Some throw garden rubbish over the apex of the ridge so that it slides down into neighbouring gardens, especially those in fallow and so less likely to be visited. Gradually, the boundary ridge will encroach into their neighbour's land, and over many years the border may be shifted a metre or so into an adjacent garden.

21. Lea (1964, 109) identified the most common of these shrubs and trees in second and third year fallows as: Macaranga quadriglandulosa, Kleinhovia hospita, Melanolepis multiglandulosa, Commersonia bartramii, Ficus spp., Abroma augusta, Pipturus spp., Timorius spp., Mallotus spp., Callicarpa spp., Trema cannabinna, Pandanus palms.

22. Nitrogen fixing Pueraria phaseloides was introduced in the 1950s as a cover crop (M. Hovey pers. comm.). On the river terraces it dominates early stages of fallow regrowth and is succeeded by a cassava/shrub fallow from which new

gardens are cut. Prior to its introduction, river terrace fallows were dominated by grasses. Villagers are not agreed on whether Pueraria has been a beneficial introduction. Some point out that a cassava/shrub/Pueraria fallow is easier to clear than a grass fallow where the roots must be grubbed out. Others say that the new composition of fallow vegetation is more difficult to burn after it is cut and much has to be carried from the garden site.

23. Cassava (Manihot esculenta) grows wild in the area. Miko villagers say that it is inedible.

24. There are two other species of yam (D. alata and D. bulbifera), But plantings are minor relative to D. esculenta. Small varieties of D. alata are sometimes planted in the same mounds as D. esculenta and occasionally a gardener will plant a few D. bulbifera in the same garden block as D. esculenta. Yams grown for ceremonial exchange purposes are the long varieties of D. alata and specially cultivated D. esculenta. D. alata are usually planted in a separate section of a D. esculenta garden on sloping land. The mounds are very much larger and their downslope side reinforced with a fence (see Lea 1964 for details on the cultivation of D. alata). Large D. esculenta (biad) cultivated for ceremonial exchange, are planted in new river terrace gardens. The seed tubers are very much larger than normal (> 3Kg), and like D. alata much labour is invested in their cultivation. The growing tubers are inspected regularly and thinned over the growing period to eventually one or two tubers.

25. The sexual division of gardening tasks may result in conflicts in gardening strategies between genders. In one case, a man was angered when his wife and unmarried daughter planted pitpit in a hillslope garden after the first yam harvest (pitpit is the final crop planted before gardens revert to fallow). It meant that he had to cut a new garden (male labour) rather than planting a second crop of yams in the old garden. His wife and daughter insisted on a new garden because they thought that weeds would become a problem if the old garden was re-used a second time (weeding is predominantly a female responsibility). The women won-out and the man cleared and fenced a new area of garden land.

26. When garden supplies of green vegetables diminish, tulip (Gnetum gnenom) increases in importance. Less preferred 'bush' greens (mostly species of bracken fern) are also gathered to supplememt diets.

27. Seed tubers for asakwa yams are larger than nyemka, usually weighing more than 2 Kg in Miko.

28. Ceremonial yams Dioscorea alata have long been recognised by researchers as being of extremely high cultural value to the Abelam (e.g., Kaberry 1941b; Forge 1965; Lea 1964). Their value as a food source is extremely low in relation to the very large amounts of labour invested in their cultivation (Lea 1964).

29. 'Producer' was taken from Ross (1984, 46) to compare his results with the present study. Under this category, persons over 18 years are given a value of 1.0; 14 to 18-year-olds, a value of 0.5; and, those less than 14, a value of 0.0.

30. Floods are also a hazard in some Wosera villages (section 2.3).

31. Tyson's (1987, 251) period of fieldwork in 1983/84 coincided with a major drought. Yam yields were only half those for comparable cultivars recorded by Lea (Tyson 1987, 252). Tyson left the field before the following year's yam plantings had begun. It is likely that the impact of the 1983/84 drought was reflected in smaller yam plantings as suitable supplies of planting stock would have been considerably reduced.

32. Villagers say that the thornless variety of sago (mara) occurs naturally in the area and would dominate sago stands if not controlled. Varieties with thorns (raming and nyamio) have been encouraged by transplanting their suckers.

APPENDIX 2.1 - YIELDS FROM YAM GARDENS

In Miko 2 Village, 9 first year river terrace gardens of nyemka (D. esculenta) were surveyed for which mounds were counted and the yield measured by weight class (consumption in short term - small or damaged yams, consumption over longer term - larger, undamaged yams, and yams set aside for replanting. Nyemka cultivated for consumption only were included: those grown specifically for ceremonial exchange purposes were omitted. Likewise, nyemka mounds in which D. alata had also been planted were dropped from the analysis. Villagers considered yields from all 9 gardens to be average to good. Assuming no wastage or deterioration of seed tubers in storage and the same number of mounds to be replanted, the proportion of total harvest for replanting ranged from 20.7% to 52.6%. This gave a mean of 31.4% and a median of 29.3%. Weights of tubers kept for replanting ranged from 0.9 to 2.5 Kg (mean = 1.76 Kg), considerably above Lea's (1964) estimate for Yenigo and Quin's (n.d.) for the Wosera generally.