A common observation from around mining projects in Papua New Guinea is that the local communities become stratified as 'different members of the local community will experience the different aspects of the development process in different forms and degrees, and the process as a whole will give rise to new forms of inequality, division and conflict within the community' (Filer 1992:6). This observation influenced the focus of the fieldwork reported in this chapter, which aimed to identify some of the inequalities developing within the Porgeran community.

The objectives of this initial piece of fieldwork were defined as
- collection and analysis of information from all available documentary sources (especially mining company records and local business records) relevant to construction of a model of the local economy
- design, testing and refinement of household survey instruments which measured local patterns of income and expenditure and other relevant variables, plus tabulation and analysis of data collected by these methods
- design, testing and refinement of additional methods of collecting information at the level of the household, for example diaries
direct observation and open-ended questioning of local informants in respect of transactions which occurred at critical or nodal points in the local economy, such as the market places on pay fortights.

The primary task of this fieldwork was thus to establish a set of baseline data, and a system for collecting measures of economic change, with the intention of constructing a ‘model’ of the workings of the Porgeran economy.¹

Methodology

Economies, even local ones, are complex, dynamic entities, and so their modelling and monitoring requires the use of a variety of methods which can provide information on the mechanics of their different elements. This chapter is largely based on six weeks of fieldwork conducted in Porgera in November and December 1992. In the case of this portion of fieldwork, the need for a variety of methods was doubly important, as one of the objectives was the testing of these different methods. Questionnaires, interviews and the analysis of company records were used as part of a wider effort to build up baseline data against which future changes could be measured.

The contribution of the Porgera Joint Venture (PJV) to local employment levels and wage incomes was calculated for the whole period in which records had been kept. This meant making a monthly record of the levels of Porgeran employment at the mine from early 1990 (when the records began) to the end of November 1992 (when the fieldwork began), and then taking a random sample of local employees and using the value of their wages for the first 11 months of 1992 to calculate the total local annual, monthly and fortnightly wage contribution of the company. Two problems were encountered with this approach:

- there was some doubt amongst local community members and company staff alike as to whether all the ‘Porgerans’ employed were in fact Porgerans, and representatives of both sides were taking steps to resolve this question
- the high local employee turnover rate may have affected the validity of using a random sample of employees to calculate the total wage contribution of the PJV.

Neither of these factors is thought to have had a significant effect on the results.
The PJV Business Development Office records were analysed to try and establish the value of local goods and services purchased by the company. The supply of services was relatively easy to establish, as the bulk had been let by contracts recorded in the quarterly reports submitted by the company to the government. There were a number of smaller contracts (predominantly labour only) for which records were less accessible, but total values were still available. The value of goods locally supplied to the company was harder to establish, mainly because these were low-value items provided at irregular intervals. The PJV Business Development Office also had records of a trade store survey carried out in early 1991, which are discussed below.

The company records relating to compensation were analysed in order to calculate the amounts of cash injected into the local community from this source. A problem encountered here was that, while there were detailed records of each individual payment for the most recent years, there were no aggregate figures for annual compensation payments since the start of construction. The figures that were available represented internal company transactions, and included the cost of items such as relocation houses and even some wage payments. Wherever possible, I excluded all but cash payments made to local people, but in some cases it was impossible to determine exactly what the itemised figures represented and, as a result, my own figures may err on the side of underestimating the amount of compensation actually received by Porgerans.

Department of Enga royalty payment records at Porgera Station were also examined. An attempt was made to get figures from the Porgeran branch of the PNG Banking Corporation (the only alluvial gold mining in Porgera) relating to the levels of deposits at various dates, but no response was forthcoming.

Questionnaires were utilised to determine both the significance of the PJV contribution to the local economy and the way in which money circulated within it. Three separate questionnaires were developed for this purpose. The first questionnaire focused on households and their assets. This included demographic questions relating to the make-up of the respondent’s household the previous night, and examined household assets, sources of income, contributions to traditional exchange, and trips to various places. The objective was to provide some basic economic data on the local communities around the mine and to establish a baseline of quantitative measures against which future changes could be
measured. Wherever possible, this questionnaire built on earlier surveys which had been carried out in the area.

Four distinct areas were targeted with this survey, and these were chosen to represent four differently impacted communities. Apalaka and Yarik were relocated communities within the Special Mining Lease (SML). Mungalep was just outside the SML and was relatively out of the way, having previously been a centre for alluvial mining. Anawe was also just outside the SML, but this ‘community’ was rather less marginalised, since it was located between the mine and the government station. Tipinini was the least ‘impacted’ of the four communities, being located ten kilometres down the valley from the township and mine (see Map 1.1). A fifth sample was made up of PJV Porgeran employees, as it was felt that daytime visits to the different communities might miss employees at work.

The original plan had been to visit each of these communities and interview people inside their own homes. Very early on, it became apparent that this was unrealistic as people tended not to be in their homes during the daytime. Instead, it was found necessary to interview people in the central areas within these communities, where they tended to congregate on our arrival. As a result, the survey samples were not random in the statistical sense, but they do generally represent a cross-section of the community. Whenever possible, interviewers carried out the interviews in private, taking their subjects away to a quiet corner. However, this was not always possible. Interviews typically lasted around 15 minutes. Since Susanne Bonnell was engaged in a parallel round of interviews with local women (see Chapter 4), and since the interviewers in this economic study were all males, it was decided to focus largely (but not exclusively) on male respondents.

The second questionnaire focused on the recall of income and expenditure categories for the previous fortnight, as well as basic demographic information. For reasons discussed below, the sample used for this questionnaire was different from (and larger than) that for the household survey. The objective here was to understand both sources of income and patterns of spending, and hence the circulation of money within the community. Originally, it had been hoped to follow up the household survey with weekly or fortnightly visits to determine income and expenditure patterns. However, given the changes that were made to the household survey method, this proved impractical. Instead, an attempt was made to cover all the areas in the
valley, including those in the household survey. Basic demographic questions were included in this questionnaire, to allow a comparison of this sample with that of the household survey. A sample of the crowd at the government station one pay Wednesday was also surveyed.

The third questionnaire was directed at the sellers of goods and produce at either the markets or along the roadside. The intention was to record the goods being sold, the origin of both the seller and the goods, and an estimate of the average daily income of the seller. All the major markets were surveyed at least once, and the main market (Yanjakale) several times, including two pay Wednesdays.

Unstructured interviews were carried out with company and government workers, and other individuals (such as Father Phil Gibbs), to gain information on particular aspects of the local economy. Thus, the role of women in the economy, the workings of the Infrastructure Tax Credit Scheme, the contribution of commercial agriculture, and the role of the Porgera Development Authority (PDA) were addressed in this way. A series of semi-structured interviews was also carried out with the recipients of large, recent compensation payments made by the company in order to establish what had happened to the money. As will be seen below, 12 payments accounted for around 50 per cent of the K3 million paid in compensation during 1992. This obviously represented a large proportion of the money that the company injected into the local economy.

Finally, a search was carried out of all literature relating to the pre-mine Porgera Valley. This included the early patrol reports, the anthropological studies of Meggitt and Gibbs, and the reports commissioned by the company as part of its Social and Economic Impact Study (SEIS). The objective was to build a picture of the pre-mine economy against which the current situation could be compared.

Validity

Social surveys, questionnaires, and any other research which depends on information from individuals have a widely acknowledged blind spot—much of the information collected is inaccurate. There are three main reasons for this—respondents cannot remember accurately, they deliberately mislead, or they misunderstand the intent of the questions being asked.

In relation to the first, few people can remember exactly their expenditure patterns for the last two weeks. The problem is
exacerbated when asking about income for the previous 12 months (see Overfield 1993:24). In the case of our own household survey, however, the bulk of the questions related to large, very irregular payments such as compensation, royalties and traditional exchange, with the implication that these were more likely to be remembered with a fair degree of accuracy.

Previous work in Porgera (Meggitt 1957; Gibbs 1977; Pacific Agribusiness 1987) has made much of the secrecy of the Ipili. In addition, the PJV, the mine, and money in general had become very political topics in the survey area, and people may have been presenting figures to match their particular view of the changes that were occurring in the area. For these and other reasons, respondents may have deliberately provided inaccurate information. Against this possibility, we have the comment of Jackson (1987) in respect of his earlier social survey work in the area—where ‘respondents appear to have been unexpectedly frank’ when discussing household assets. In our surveys, we found that people were usually only too willing to discuss personal financial matters with the interviewers, and certainly keen to air their grievances.

Another potential problem was the misunderstanding of the questions being asked. This does appear to have occurred with some of the information, particularly in regard to ‘profits’ from businesses, and with older respondents. In most cases, however, the interviewers felt that they had few ‘understanding’ problems with their interviewees.

For much of the data collected, direct questioning of individuals was the only practical method available. In some cases, it was possible to cross-check the survey data against figures from other sources. As we shall see, the aggregate survey figures appear to be remarkably close to figures obtained by other means. This gives greater weight to the other figures from the survey. Figures on alluvial gold mining balances (total personal accounts, rather than individual balances) would have been useful, but the PNG Banking Corporation branch at Porgera, while not averse to the idea, did not provide access to the information.

Several small design problems were discovered during the use of the survey questionnaires. This was particularly the case with the market survey, which should have gone into more detail on both the interviewee (with more information on their length of stay in Porgera, whether they were male or female, who they were staying with, etc.),
and the goods being sold. In the case of the last, it would have been useful to have listed the value and the quantity of goods that the sellers had with them for sale. This would have given a more reliable estimate of the value of daily sales. The demographics pages of the household survey could have been simplified somewhat, and extended to allow for more names to be included, even though details of up to 22 family members were recorded by the interviewers. In the income and expenditure survey, specific questions about expenditure on alcohol would also have been useful, given the level of anecdotal evidence about both the price and quantity of alcohol in the area.3

Finally, the methods of sampling used for the surveys were not random, reflecting the practicalities of working around Porgera. Biases may have crept in, particularly those associated with using relatively young male interviewers. In some cases (though certainly not the majority), there was an element of self-selection on the part of the respondents. All the areas surveyed were accessible by road, which again may have introduced an element of bias into the sample, although it appears that most people in the valley were within easy walking distance of a road.

The pre-mine economy

The Ipili of the Porgera Valley have a relatively short history of European contact, but during this period they have had almost continuous exposure to the gold economy. It is now thought that the Fox brothers, on an (unauthorised) expedition in 1934 down the Lagaip Valley seeking gold and other minerals, were the first Europeans to enter the Porgera Valley. However, it is likely that they crossed the Porgera River at a low level, just above the junction with the Lagaip, and thus missed the bulk of the population in the valley (Chris Ballard, pers. comm.).

The first documented contact occurred during the 1938–39 Hagen-Sepik patrol, though the interim patrol report, somewhat prophetically, mentions the 'Poredigar' only in the context of mineral resources. Black examined 'the area very closely and ascertained that his gold discovery was of very little value and had no commercial possibilities' (Taylor 1971:43). H.J. Ward, an Australian Bureau of Mineral Resources geologist, located the source of the gold and mapped mineralised areas on the east side of Waruwari in 1943 (Handley and Henry 1990).

Meggitt (1957) describes the subsequent history of contact in the valley, with the first of the gold claims being staked in 1946 on the
upper Porgera, near Mungalep, by Joe Searson. A small ‘rush’ followed in 1948, with about half a dozen prospectors entering the area (with Administration permission), though none seriously worked their claims. Soon after, an Administration geologist and a party of Bulolo Gold Dredging Company officers surveyed the valley, but decided that there was insufficient gold to warrant large-scale commercial activity. A patrol post was manned at Mungalep during 1948–49 to ensure the prospectors’ safety, but this was withdrawn in 1949. There was a break between 1949 and 1952, when the area was only visited a couple of times by patrols. In 1952, the establishment of a permanent patrol post at Laiagam meant more regular Administration visits (twice a year), and a permanent post was re-established in the area in 1961. Searson transferred his leases on the Kogai (Kakai) and Porgera rivers to Jim Taylor in 1955, and Taylor ran them on a tribute system for many years (Pacific Agribusiness 1987[1]:6). Missions were allowed into the area in 1962, when it was de-restricted, and four moved in immediately (Gibbs 1977).

Placer Pacific and Mount Isa Mines (MIM) first entered the area in the mid 1960s, and the latter, with Ada Explorations Pty Ltd, put two adits into Waruwari in 1970. MIM acquired Searson’s leases in 1973, and operated a medium-scale sluicing operation which ran at a loss until 1985, when the leases were transferred to a trust for the PJV (Pacific Agribusiness 1987[1]:7). The PJV consortium carried out extensive exploration work on the Porgera lode from the late 1970s. However, it was not until October 1985 that the high-grade zone was discovered and a sizeable mine became a viable prospect.

It is important to note that local labour was used from the beginning, first by the individual miners (often on a tribute system), and subsequently on a larger scale by the companies. For example, in 1974, MIM alone employed between sixty and one hundred local men. In addition, occupation fees were paid to the local landowners on the mining leases. This meant a fairly continuous supply of trade goods and cash to the local community for over thirty years. Smalley (1983:4) noted that

Joe Searson introduced the people to a cash economy. They were paid cash with which goods were purchased at the local tradestore owned by Jim Taylor. The people soon developed a taste for Western products.

Gibbs (1977) recorded that, during 1974, up to A$20,000 a month was paid into the local economy, with A$10,000 paid in a single week at one point. By his estimate, the annual total was made up of
**A$4,500** in annual occupation fees paid by MIM

**A$3,500** earned by small-scale miners on the claims of MIM and Taylor

**A$1,200** in fortnightly wages from MIM

**A$500** in compensation paid by government and mission for damage to pandanus

**A$200** in monthly wages for mission workers.

Three studies which describe aspects of the local economy were carried out in the Porgera area during the mid 1980s. These can be used to build up a picture of the pre-mine environment and allow comparison with the more recent situation. The first of these was the Department of Enga’s ‘Subsistence Systems of Enga Province’ study, carried out by Paul Wohlt between 1982 and 1986 (Wohlt 1986). This was primarily directed at subsistence agriculture, though it also covered some socioeconomic measures. It is useful as a comparison with the current study, because it also involved sampling households in different parts of the Porgera Valley. In total, 47 households (279 residents) in Porgera were sampled, ten each from Paiam, Pandami and Yanjakale, eight from Tipinini, and nine from Yuyan.

The second study was coordinated by Richard Jackson, and involved a series of social surveys in the Porgera Valley for the PJV in 1986–87 (see Jackson 1987). Like the Wohlt report, the Jackson study included a number of questionnaire surveys in different parts of the valley. The actual numbers of households surveyed varied in each of the different surveys, though ten was the target number. Five separate areas were covered—Paiam, Mungalep, Suyan, Anawe and Alipis. The SEIS utilised some of this earlier work, and described the economy of the area in some detail. Much of the material in that report can be used for comparative purposes.

In summarising these studies, four points are emphasised. First, the opportunities presented by the presence of gold in the valley (alluvial mining and employment with the miners) had been utilised by some Porgerans for over forty years. This had led to a gradual shift away from dependence on subsistence activities—gold was a ‘second garden’ for some Porgerans before the PJV began operations. Second, and balancing this, the bulk of the population were still dependent on the subsistence sector for food and housing. Related to this were the inequalities in access to cash-earning opportunities within Porgera, for only some areas had access to the gold. Third, the scant data available confirms the anecdotal evidence that consumption patterns in Porgera...
have long focused on food and alcohol, rather than investment or consumer goods. Finally, local business aspirations tended to be relatively modest, primarily directed to the establishment of family-based businesses such as trade stores and transport.

The picture given by these studies of the pre-mine Porgeran economy is generally one in which subsistence agriculture was still the predominant activity and major source of livelihood. However, the impact of at least forty years of contact with the gold economy was evident. The gold economy, both for alluvial miners and wage employees, was virtually the only cash-earning opportunity available to the local Porgerans. In 1986, it was estimated that local incomes from alluvial gold came to at least K1 million per annum (Pacific Agribusiness 1987[1]:39). A time budget survey reported in Jackson (1987) showed that, at Mungalep and Alipis, male and female respondents spent 12–14 per cent of their time (excluding absences and sleeping) engaged in alluvial mining. The maximum reported paid employment (amongst males) was 14 per cent for Paiam and Alipis, and averaged 9 per cent for the five sites. Although it is not specified, the bulk of this employment was likely to have been with the PJV, the only alternatives being the missions and the government, or some other limited opportunities with local businesses.

These figures compare with averages of 15 per cent for males and 31 per cent for females engaged in gardening, bush work and tending pigs, primarily subsistence activities. In summary, the SEIS and Jackson’s report give the impression that Porgeran males, at least, while still heavily dependent on the subsistence sector, were spending almost as much time on cash-earning activities as they were on subsistence (44 per cent of their time on cash earning, 56 per cent on subsistence).

Given the importance of the gold economy noted in both the SEIS and Jackson’s study, it is perhaps surprising that Porgera, the major source of gold in Enga, does not stand out from the rest of the province economically in the findings from Wohlt’s (1986) study. Only one respondent reported (a possible) income from sale of gold, and the (possible) contribution of gold to household income was well below the provincial average (0.4 per cent compared to 1.8 per cent). As sale of gold was included in the ‘other’ category, it is hard to be definitive; yet these findings point to a far less significant role for alluvial mining. The contribution of wages to household income in Porgera was marginally greater than the provincial average, with a greater
proportion of wage-earners (4 per cent of residents compared to 2.5 per cent) and lower average earnings (K20 per wage-earner compared to K32). In total, the implied annual per capita cash income for Porgera of K81 was less than the provincial average of K87. Likewise, the survey of non-traditional economic indicators reported in Wohlt’s study shows little difference between Porgera and the province as a whole, with Porgera generally coming in behind the provincial averages.

A possible reason for the discrepancy between the Wohlt and Jackson findings is that Wohlt’s study was targeted at ‘ordinary’ Enga farming households and specifically excluded urban areas, rural non-village areas (such as aid posts, schools), successful businessmen or large-scale commercial ventures. In contrast, the Jackson study included a representative sample in areas already affected by mining and exploration activity. Both suffer from the small sample size used in the different areas, which could also account for the differences in their findings.

The SEIS made the following comments in relation to the impact of earnings from gold.

The gold economy reverberates through Ipili society. People often equate gold with consumption...Tradestores symbolise the wealth and consumption made possible by gold...Cash is now very much a part of traditional payments...Gold-induced inflation is apparent in most aspects of daily life...Cash has greatly weakened traditional leadership in Ipili society...

From school-age children who are cashing in gold at tradestores to buy luxury food and drink, to the adults who are gambling, drinking and discoing, there is heavy consumption financed by a finite asset. When asked about this, many people seem both aware and worried (Pacific Agribusiness 1987[1]:40).

The report also commented on the consumption patterns ‘creating wealth for a growing Ipili elite’—the gold buyers and trade store owners. They noted an ‘untapped desire for secure investments’ and widespread hoarding of gold. In 1974, Gibbs had also noted that the availability of cash from gold was promoting a switch from dependence on garden produce to food bought at trade stores, with 5,000 pounds (2.3 tonnes) of foodstuffs and 50 cartons of beer being brought in each week by plane (Gibbs 1977:22).

Business activity in Porgera was limited before the start of the mine. Trade stores were common. A PJV survey in 1987 found 143 established trade stores in the Porgera Valley (including Muritaka)—
93 still operating and 50 which had closed. This amounted to one trade store for every ten families (Pacific Agribusiness 1987). Wohlt (1986) records a frequency of one trade store per 16.7 households for Porgera, compared to one trade store per 5.2 households found for Enga as a whole. The SEIS found that, apart from Ipili Porgera Investments (IPI), business activity in Porgera was limited to small-scale activities, including gold buying and sawmilling, and most of the numerous business groups which had been formed in the area had, for one reason or another, failed. This had left many Porgerans viewing such activities with suspicion, and contributed to gold hoarding. In spite of this, bisnis, along with employment, were the two most sought-after aspects of mine development.

From the Jackson survey, and from the general comments in the SEIS, it is clear that different parts of the Porgera Valley have had uneven access to cash-earning opportunities. Initially, Yuyan and Mungalep, being closest to the alluvial areas, were the focus of the cash economy, and people in these communities became relatively more wealthy than people elsewhere in the valley. Mungalep's dominant position was reinforced by the presence of the mission, then fell as Yuyan took over as the gold-buying centre. From the early 1980s, Alipis became more important, being the site of intense exploration. Jackson notes that independent gold panning may have been the principal reason for the greater accumulation of wealth by families in Mungalep and Alipis, and that inequality of assets appeared to be a well-established feature of life in Porgera. Certainly, the results of the Jackson survey point to significant differences between the various communities covered.

Similarly, all the studies noted the different cash-earning opportunities available to men and women, and the consequent marginalising of women from the cash economy. Alluvial mining was one lucrative activity where women (and children) could become involved.

The main points to be taken from the above review of material on the pre-mine economy are:

- The area had been a significant gold producer since the 1950s, and Porgerans had thus had a relatively long exposure to cash and the gold economy. In some areas, significant amounts of cash had been earned by the local communities. The PJV was therefore not suddenly introducing money into a cashless society—Porgerans had been dealing in cash for many years.
• For as long as Porgerans had been earning cash, there had been opportunities for them to spend it quickly—food, drink and gambling have a history in Porgera that goes back longer than the influence of the missions.

• Aspirations in Porgera focused strongly on bisnis—generally trade stores, public motor vehicles (PMVs) and machinery—in spite of several recent disappointments.

• Variations in access to cash-earning activities were well entrenched in the valley, in terms of both gender and regional differences. The focus of these activities in the cash economy had shifted several times. Inequality (and jealousy) were well established before the arrival of the PJV.

The Porgeran economic base in 1992

One way to approach the analysis of the Porgeran economy in 1992, and the one adopted here, is by breaking down the various input and output components of the economy to gain an idea of their relative contributions and the broad-scale flows within the community. Vail (1995) carried out a similar exercise for the distribution of monies from the Mount Kare gold rush. When this is combined with the household-level data collected, a good understanding of the workings of the local economy can be obtained.5

A convenient and measurable starting point for analysis of the cash economy is the range of inputs into the system. At Porgera, the PJV was clearly the engine of the local economy, with direct payments of wages and occupation fees, compensation, donations, and royalty payments, and indirect contributions through business contracts to local Porgeran companies and individuals, and through the support provided for the PDA. The figures given below, despite their apparent precision, are nevertheless approximate. They do, however, give an indication of the relative importance of the various types of inputs.

Compensation6

Landowners were paid by the company for loss of land, for damage to land or improvements (including 'economic plants'), and for various other losses (such as livestock killed by vehicles, various kinds of nuisance, and the loss of alluvial earnings). Annual occupation fees paid to SML and LMP (Lease for Mining Purposes) landowners are also covered under the heading 'compensation'. Rates paid were in
accordance with a schedule negotiated between the PJV and the major landowning clans of the SML, which was agreed on 31 January 1988.

Strictly speaking, compensation payments were not a benefit of the mine, but represented reimbursement for costs incurred by the recipients due to damage caused by the company. Compensation payments could also represent a shift from the subsistence sector to the cash economy on the part of the recipient, since the cash could be used as seed capital to establish trade stores or other businesses.

One feature of the compensation payment process at Porgera which distinguished it from the Ok Tedi situation was that the assessment, negotiation, administration and payment process itself was carried out by PJV employees on Department of Enga letterhead, rather than by the Department of Enga itself. The practical effect of this had been a much more rapid response to landowner claims at Porgera than at Ok Tedi (John Burton, pers. comm.).

Compensation registers, detailing the amount of each compensation claim paid, had been kept by the PJV since August 1987. In total, the PJV had paid 6,605 compensation claims totalling K25.9 million between August 1987 and the end of December 1992. It is important to note, however, that each individual claim was usually distributed among a number of recipients at the payment stage. That is to say, each payment form usually had a list of recipients receiving differing amounts from the payments. For large payments, or where the area affected involved several families, the list could be extensive—up to sixty people. On the other hand, there were a number of individuals who featured prominently amongst the lists of recipients, usually collecting a substantial proportion of the payments. This made it very difficult to determine just how many people had received PJV compensation, although it appeared that the majority of Porgerans within or close to the SML or the LMPs would have received at least some cash over this five-year period.

Figure 3.1 provides a breakdown of the payments made by quarter for the period 1987–92. The pattern matches the stages of development of the mine—large amounts are associated with the construction phases of the plant site, the Anawe spoil, the relocation roads and houses, Kairik airstrip, the Hides transmission line, Suyan, the open pit expansion, and the waste dumps. The implications of these variations for the local economy are very significant—when combined with irregular royalty payments, it is clear that short-lived periods of ‘boom’ were frequently followed by relatively lean times. When these
Figure 3.1  PJV compensation payments by quarter, 1987–92

Source: PJV/Department of Enga records.

Table 3.1  PJV compensation payments made during 1992 by type

<table>
<thead>
<tr>
<th>Type of compensation</th>
<th>Number of payments</th>
<th>Total amount paid (kina)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lands General Compensation</td>
<td>107</td>
<td>187,298.60</td>
</tr>
<tr>
<td>Kairik area</td>
<td>11</td>
<td>34,028.20</td>
</tr>
<tr>
<td>Suyan area</td>
<td>10</td>
<td>9,689.00</td>
</tr>
<tr>
<td>Maiapam area</td>
<td>31</td>
<td>31,172.60</td>
</tr>
<tr>
<td>Hides Line</td>
<td>5</td>
<td>6,878.00</td>
</tr>
<tr>
<td>Open pit compensation</td>
<td>152</td>
<td>1,331,707.20</td>
</tr>
<tr>
<td>Northern waste dump compensation</td>
<td>76</td>
<td>431,476.20</td>
</tr>
<tr>
<td>Highway compensation</td>
<td>27</td>
<td>8,206.30</td>
</tr>
<tr>
<td>Pangalita limestone compensation</td>
<td>6</td>
<td>10,270.00</td>
</tr>
<tr>
<td>Pangalita limestone royalty</td>
<td>9</td>
<td>26,304.00</td>
</tr>
<tr>
<td>Waile Creek Rd and dam compensation</td>
<td>3</td>
<td>39,351.40</td>
</tr>
<tr>
<td>Starter dump 'C' compensation</td>
<td>5</td>
<td>787,510.00</td>
</tr>
<tr>
<td>Paiela Bypass Rd compensation</td>
<td>66</td>
<td>162,576.20</td>
</tr>
<tr>
<td>PA 60 compensation</td>
<td>4</td>
<td>1,904.90</td>
</tr>
<tr>
<td>PA 860 compensation</td>
<td>10</td>
<td>16,833.30</td>
</tr>
<tr>
<td>SML occupation fees 1989</td>
<td>20</td>
<td>34,842.60</td>
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<tr>
<td>SML occupation fees 1991–92</td>
<td>20</td>
<td>61,187.90</td>
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<tr>
<td>Hides Power Line occupation fees 1992</td>
<td>61</td>
<td>94,450.38</td>
</tr>
<tr>
<td>Other occupation fees 1989–92</td>
<td>142</td>
<td>33,668.80</td>
</tr>
<tr>
<td>Total</td>
<td>785</td>
<td>3,309,356.18</td>
</tr>
</tbody>
</table>

Source: PJV/Department of Enga records.
temporal variations are broken down by location, the pattern is one of a dynamic, continuously changing flux, with different parts of the valley experiencing large cash inflows at different times.

Table 3.1 provides a breakdown of compensation by area and type of payment in 1992. It is important to note that 'one-off' payments for 'improvements' and areas of bush made up the bulk of these payments. This had been the case for each year following the start of construction. The implication was that once the mine and its waste dumps were fully established, compensation would drop dramatically as a source of income for the valley.

The remaining big compensation payments would have been for the lower Porgera and Kaiya river systems, which were expected to be made in 1994, and some ongoing additions to the open-pit and waste dumps. It was expected that the value of compensation would stabilise at around K700,000 per annum after this, comprising general compensation, occupation fees, and ongoing payments linked to volumes of tailings and incompetent waste rock placed in the Anjolek and Anawe failing dumps. Landowners in the Kaiya and lower Porgera would also have additional compensation-derived income from the trust funds set up to manage the compensation paid for the loss of alluvial gold in these areas. While these payments would provide a reasonably regular source of income for a limited number of landowners in one or two communities, the real 'boom years' of compensation were almost over.

**Porgeran wage income from the PJV**

Employment records started late in 1989, with the exception that the origin of Operations staff was not reported regularly until July 1990—the explanation for a statistical 'hollow' in Porgeran employment in early and mid 1990 (see Figure 3.2).

Since I do not have direct figures for the total wage income received by Porgerans, I have estimated this by multiplying figures for the average numbers of Porgeran employees over the year by an estimate of the average wages paid to them. In 1992, a random sample of 50 of the PJV Operations staff between January and November 1992 had an average income of K6,925 per annum. Making the assumption that wage levels had grown at 10 per cent a year, through wage increases and increasing skill levels within the local workforce, Table 3.2 sets out my calculations for previous years, and gives an approximation of the total value of Porgeran wage income (after tax).
Within the Porgera Valley, employment was relatively evenly spread, as shown in Table 3.3, though the company acknowledged that their records, based on information provided by the employees themselves, might not be completely accurate.

The figures for the sample of 50 PJV employees for 1992 show a high employee turnover rate, with 18 of the sample having being employed for less than the full 11 months. Table 3.4 shows that, of the total workforce at 18 November 1992, over 65 per cent had been with the company for less than two years. These figures undoubtedly over-estimate the turnover of staff, as a number of employees had been re-employed several times. The implication is, however, that few Porgeran staff were realising the benefits (promotion, pay rises and so on) of long-term service. This is important, as it casts doubt on the ability of the company to meet local expectations in regard to the localisation of senior positions within the company.7

In addition to the formal employment figures cited above, there were a large number of casual labourers employed for short periods who do not appear in these tables. These included people employed on small road maintenance and upgrade contracts for the road.
between Porgera and Wabag, contracts for the construction of new
gardens for relocation (worth over K600,000, all to locals), and
labour-only contracts let through the Community Affairs Division
(over K10,000 for the September–December 1992 quarter). In total
these would have contributed up to K10,000 a month to the local
economy.\(^8\)

A small survey of non-Porgeran PJV employees (both PNG
nationals and expatriates) revealed, as expected, that these employees
did not spend money in the local economy while on site. Even the few
families on site (16 at December 1992) did the bulk of their shopping at
Mount Hagen on a monthly basis, and thus made no significant
contribution to the local economy.

**Royalties**

Under the agreements between the national and provincial
governments and the SML landowners signed in 1989, 23 per cent of
the royalties from the mine were to go to landowners in the Porgera
Valley. This was to be split three ways—8 per cent to SML landowners,
5 per cent to the Porgera Development Authority, and 10 per cent to an
investment fund set up for the children of SML landowners.\(^9\) The
direct royalties were paid by the company to the national government,
and the landowner share was then redistributed by the Department of
Enga. This process meant that the quarterly payments were often
several months late. For example, the second quarter 1992 payment
was made in late November 1992. Payments were divided amongst
SML landowners on the basis of the proportion of the lease area they
owned. Payments were made to 192 nominated SML representatives,
either in cash or by cheque. The only exception to this was the January
1992 payment of K40,470.77, which was used to send a delegation to
Port Moresby for discussions with the Prime Minister. The exact
amount paid each quarter varied depending on the value of gold
produced, with a maximum quarterly payment of K143,710.58 for the
third quarter of 1991.

All the sources of income discussed above can be added to show
the total cash benefits to the community arising from the mine. More
than K10 million a year made its way into the community in the peak
years of compensation payouts during the construction phase.
Depending on future compensation assessments and Porgeran
participation in the PJV workforce, the annual flow was likely to settle
at K6–8 million a year during the operation phase (Table 3.5).
Table 3.2  Wages paid to Porgeran employees, 1989–92 (estimated)

<table>
<thead>
<tr>
<th>Year</th>
<th>Employees (average)</th>
<th>Average wage (kina)</th>
<th>Total wages (million kina)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>285</td>
<td>5,263</td>
<td>1.50</td>
</tr>
<tr>
<td>1990</td>
<td>488</td>
<td>5,717</td>
<td>2.79</td>
</tr>
<tr>
<td>1991</td>
<td>639</td>
<td>6,371</td>
<td>4.07</td>
</tr>
<tr>
<td>1992</td>
<td>585</td>
<td>6,925</td>
<td>4.06</td>
</tr>
</tbody>
</table>

Source: PJV records.

Table 3.3  Distribution of PJV employment within the Porgera Valley

<table>
<thead>
<tr>
<th>Village name</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apalaka/Yarik</td>
<td>46</td>
</tr>
<tr>
<td>Yokolama</td>
<td>13</td>
</tr>
<tr>
<td>Kulapi</td>
<td>24</td>
</tr>
<tr>
<td>Anawe</td>
<td>39</td>
</tr>
<tr>
<td>Mungalep</td>
<td>38</td>
</tr>
<tr>
<td>Yuyan</td>
<td>41</td>
</tr>
<tr>
<td>Politika</td>
<td>27</td>
</tr>
<tr>
<td>Yanjakale</td>
<td>22</td>
</tr>
<tr>
<td>Suyan</td>
<td>31</td>
</tr>
<tr>
<td>Paiam</td>
<td>47</td>
</tr>
<tr>
<td>Kairik</td>
<td>25</td>
</tr>
<tr>
<td>Tipinini</td>
<td>33</td>
</tr>
</tbody>
</table>

Source: PJV records.

Table 3.4  Porgeran PJV employees by length of service as of 18 November 1992

<table>
<thead>
<tr>
<th>Start year</th>
<th>Service</th>
<th>Employees</th>
<th>(per cent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>&lt;1 year</td>
<td>151</td>
<td>(31.9)</td>
</tr>
<tr>
<td>1991</td>
<td>1 year</td>
<td>168</td>
<td>(35.5)</td>
</tr>
<tr>
<td>1990</td>
<td>2 years</td>
<td>79</td>
<td>(16.7)</td>
</tr>
<tr>
<td>1989</td>
<td>3 years</td>
<td>53</td>
<td>(11.2)</td>
</tr>
<tr>
<td>1988</td>
<td>4 years</td>
<td>16</td>
<td>(3.4)</td>
</tr>
<tr>
<td>1987</td>
<td>5 years</td>
<td>3</td>
<td>(0.6)</td>
</tr>
<tr>
<td>1986 or earlier</td>
<td>&gt;6 years</td>
<td>3</td>
<td>(0.6)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>473</td>
<td>(100.0)</td>
</tr>
</tbody>
</table>

Source: PJV records.
Business contracts

The role and contribution of PJV business contracts to the economy was a controversial topic at both the local and national level. Unlike the compensation, wages and royalties discussed above, they were not direct cash payments made to the community, although they tended to be discussed in these terms. The local community repeatedly questioned the figures presented by the PJV at meetings with the government, on the basis that these over-emphasised the value of business contracts for Porgerans. These figures included joint ventures between Porgeran companies and national or international companies, and community representatives argued that the bulk of the profits from these (generally) large joint ventures did not accrue to the community.

Table 3.6 shows the breakdown of contracts by origin compiled from PJV Quarterly Reports to the Department of Trade and Industry. This shows that national companies (including joint ventures) won over half of the construction contracts, while the size of the Porgeran share (K27.96 million to September 1992) is also significant. For the operations contracts, which were generally ongoing (unlike the construction contracts), Engan contractors (including joint ventures) had picked up the greatest share to date, with the Porgeran share again being significant (K6.59 million). On a per capita basis, the contracts were worth K3,455 for Ipili speakers against K180 for other Engans. As with the labour figures, there are also a number of small contracts which were not included in the formal figures. The PJV Quarterly Report for the period to September 1992 noted that K191,774 was expended on plant contracting, but it is not clear whether this was included in the above contracts, or what proportion was accounted for by Porgeran contractors.

The figures given in Table 3.6 are for work completed to date. The estimated value of committed costs on Porgeran contracts current in September 1992 was K8.08 million. When combined with the value of work to date from the above table (K34.55 million), the total value of contracts awarded to Porgeran companies (including joint ventures) totalled K42.63 million. This was the figure publicised by the company and criticised by some of the landowners, as they believed that the big Porgeran contracts included here were all joint ventures, with the profits going mainly to the other partners. However, because profits from contracts are generally a small component of their total value (between 6 and 10 per cent was likely in the Porgeran setting), a large
Table 3.5  Cash inputs into the local economy originating with the PJV, 1989–92 (kina)

<table>
<thead>
<tr>
<th>Year</th>
<th>Wages</th>
<th>Compensation</th>
<th>Royalties</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>1,499,977</td>
<td>3,444,228</td>
<td>-</td>
<td>4,944,205</td>
</tr>
<tr>
<td>1990</td>
<td>2,794,589</td>
<td>7,725,918</td>
<td>-</td>
<td>10,520,507</td>
</tr>
<tr>
<td>1991</td>
<td>4,072,651</td>
<td>8,769,395</td>
<td>279,703</td>
<td>13,131,748</td>
</tr>
<tr>
<td>1992</td>
<td>4,056,713</td>
<td>3,309,356</td>
<td>483,464</td>
<td>7,849,533</td>
</tr>
<tr>
<td>Total</td>
<td>12,423,930</td>
<td>23,248,897</td>
<td>763,167</td>
<td>36,445,993</td>
</tr>
</tbody>
</table>

Source: PJV/Department of Enga records.

Table 3.6  Value of contracts by origin of contractors, 1990–92 (million kina)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Porgera</td>
<td>13.71</td>
<td>10.14</td>
<td>4.11</td>
<td>27.96</td>
</tr>
<tr>
<td>Enga</td>
<td>19.92</td>
<td>10.86</td>
<td>2.36</td>
<td>33.14</td>
</tr>
<tr>
<td>Other PNG</td>
<td>52.29</td>
<td>34.77</td>
<td>13.20</td>
<td>100.26</td>
</tr>
<tr>
<td>Overseas</td>
<td>10.48</td>
<td>1.98</td>
<td>1.96</td>
<td>14.42</td>
</tr>
<tr>
<td>Sub-total</td>
<td>96.40</td>
<td>57.75</td>
<td>21.63</td>
<td>175.78</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Porgera</td>
<td>0.46</td>
<td>2.33</td>
<td>3.80</td>
<td>6.59</td>
</tr>
<tr>
<td>Enga</td>
<td>0.32</td>
<td>1.02</td>
<td>10.29</td>
<td>11.63</td>
</tr>
<tr>
<td>Other PNG</td>
<td>0.07</td>
<td>1.75</td>
<td>6.17</td>
<td>7.99</td>
</tr>
<tr>
<td>Overseas</td>
<td>0.18</td>
<td>0.10</td>
<td>2.73</td>
<td>3.01</td>
</tr>
<tr>
<td>Sub-total</td>
<td>1.03</td>
<td>5.20</td>
<td>22.99</td>
<td>29.22</td>
</tr>
</tbody>
</table>

Source: PJV records.

proportion of the value of these contracts, in particular through local wages, probably did accrue to local interests. Although it is impossible to put a figure on this, my survey of the larger local businesses (discussed below) gives some idea of the contribution of PJV-related work to the local economy.

**Indirect and secondary sources of income**

The PDA was established under the Mining Development Contract, using K4 million from the PJV’s Community Facilities Grant. Ongoing income included an annual K0.5 million unconditional grant from the Enga provincial government, and a 5 per cent share of mineral royalties. In 1992, spending in the Porgera area was approximately
K3.5 million. The bulk of this was spent on infrastructure development—roads, community schools and aid posts. The PDA employed 20 Porgerans in primarily unskilled positions.

Donations from the PJV to schools, organisations and individuals were worth well over K100,000 a year. However, their impact on the Porgeran economy was limited for two reasons: they were largely to groups or individuals outside Porgera, and they were usually earmarked for goods or services from outside Porgera, so their value very quickly left the Porgera area. Thus, while they served an important community and public relations role, their local economic impact was minimal.

The Infrastructure Tax Credit Scheme, which was instituted during 1992, was largely focused on projects outside Porgera. The scheme enabled the PJV to get tax deductions from the national government for infrastructure projects which it funded within Enga Province, as approved by the provincial government. In 1992, around K250,000 of this funding had been spent in Porgera, with another K900,000 worth of projects planned for the local area—K80,000 for the College of Distance Education, K400,000 for road sealing near Paiam, and a K400,000 contribution to the Porgera–Paiela road.

A final source of money for the local economy was alluvial gold earnings. Although it is very difficult to put a figure on this, 13 (15 per cent) of the 87 households we interviewed in Apalaka/Yarik, Mungalep and Anawe reported earnings from alluvial mining over the previous 12 months. Average reported earnings were K1,400. Given that there were approximately 1,200 households in the whole valley (John Burton, pers. comm.), there were probably 900 households in the upper part of the valley with potential access to the alluvial areas. On this basis, it was likely that current production was still worth K189,000 per annum.

**Circulation**

Once the direct cash payments from the company entered the local community, the money was used for a number of purposes. It could be invested (inside or outside Porgera), used for consumption, or for traditional exchange purposes. The results of the household survey and the income and expenditure survey give some indication of the extent of these alternative uses. The household survey covered 122 households, concentrated in four areas. The demographics of the sample are described statistically
in Table 3.7. Of note in the table are the lower household size in Tipinini compared to the rest of the valley, the higher proportion of Porgeran born people in Apalaka than elsewhere, the relatively consistent proportion of children in the households (between 39 and 46 per cent), and the consistent male bias in the sex ratio. On the basis of these figures, the following trends can be inferred.

- The SML area had a higher proportion of people of Porgeran origin, probably as a result of the relocation agreement negotiated between the SML landowners and the PJV, which largely excluded non-Porgerans from relocation areas.
- There had been a movement of people within the valley towards the mine area, borne out by the fact that Apalaka and Mungalep both had higher proportions of households with ‘other relatives’ staying with them (41 and 44 per cent respectively, compared to 26 per cent for Tipinini).
- The male/female ratio may have been a result of the influx of males to the valley in search of employment and other benefits, or it may reflect the under-reporting of females as a result of the predominantly male-male interviews carried out (though under-reporting of children does not appear to have occurred). A greater number of males is the reverse of what one would expect in a polygamous society.\(^\text{10}\)

From previous studies of the Porgeran population (John Burton, pers. comm.), it appears that the sample was demographically representative of a cross-section of the population. On this basis, the results of the household survey can be treated as a 10 per cent sample of the whole population (given that there are approximately 1,200 households in the valley).

<table>
<thead>
<tr>
<th>Location</th>
<th>Total h'holds</th>
<th>Relocated h'holds</th>
<th>Total persons</th>
<th>Mean h'hold</th>
<th>Mean no. of children</th>
<th>M/F ratio</th>
<th>% with wantoks</th>
<th>% born in Porgera</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apalaka</td>
<td>32</td>
<td>23</td>
<td>228</td>
<td>7.1</td>
<td>2.9</td>
<td>120:100</td>
<td>40.6</td>
<td>93.0</td>
</tr>
<tr>
<td>Mungalep</td>
<td>23</td>
<td>8</td>
<td>177</td>
<td>7.7</td>
<td>3.7</td>
<td>130:100</td>
<td>43.5</td>
<td>81.4</td>
</tr>
<tr>
<td>Anawe</td>
<td>24</td>
<td>7</td>
<td>164</td>
<td>6.8</td>
<td>2.7</td>
<td>135:100</td>
<td>33.0</td>
<td>72.0</td>
</tr>
<tr>
<td>Tipinini</td>
<td>35</td>
<td>0</td>
<td>198</td>
<td>5.7</td>
<td>2.6</td>
<td>133:100</td>
<td>26.5</td>
<td>84.6</td>
</tr>
<tr>
<td>Total</td>
<td>122</td>
<td>41</td>
<td>832</td>
<td>6.8</td>
<td>3.0</td>
<td>125:100</td>
<td>36.4</td>
<td>82.9</td>
</tr>
</tbody>
</table>

Source: Porgera household survey.
The income and expenditure survey involved interviewing 231 individuals aged over 16 years, and questioning them as to sources of income and patterns of expenditure over the previous two weeks. The aim was to carry out as many of these interviews as possible, and, as a result, the demographic section of the questionnaire was kept small. The sample included 180 individuals who lived permanently in Porgera (or 3 per cent of the adult Porgeran population), and 51 who, for one reason or another, were visiting. The latter group included some national PJV employees, but most were individuals who had come from other parts of the highlands and were interviewed at the government station on a pay Wednesday. This combination of interviews was intended to show how much money the permanent residents contributed to the local economy, and whether the ‘visitors’ carried significant amounts out of the area. There were 129 Porgeran-born people in this sample, and 99 who were born elsewhere; there were 198 males and 32 females; and there were 144 household heads as against 86 non-household heads. The average household size reported was 7.96, slightly higher than in the household survey.

Sources of income

Sources of income for the local population can be determined from a mixture of the household and income and expenditure survey results. Table 3.8 shows the distribution of income from various sources reported in the household interviews. Given that the sample represented around 10 per cent of the population (122 households surveyed from an estimated 1,200 households), the validity of the PJV payments reported in the interviews could be cross-checked with the amounts documented in the company and government records. The PJV’s figures for compensation payments (which included occupation fees) came to around K3 million, while a scaled-up estimate from the compensation payments and occupation fees reported in the interviews amounted to K2.49 million. Likewise, the documented royalty payments for 1992 came to K483,463, while the interview findings would suggest a total of K413,080. These approximations lend a similar level of confidence to the other survey findings.

There are some anomalies in the data (for example, all those who received royalties should presumably also have received occupation fees), but these are unlikely to affect the overall figures, given the sample size. The picture that emerges from Table 3.8 is largely what one would expect: people in Apalaka received the bulk of the
royalties, compensation and occupation fees, while those in Tipinini receive none. The latter engaged in more sales of produce (though incomes from this source appeared to be low), while involvement in business was relatively evenly spread throughout the valley.\textsuperscript{12}

Figures 3.3 and 3.4 show the sources of fortnightly income and their value, as revealed by the income and expenditure survey. Several points are worthy of note.

- **Wantoks (outside the household)** were the most common source of income, although Figure 3.4 shows that this source of income was very small in monetary terms. For 54 (23.4 per cent) of the sample, income from household members or other wantoks was the only source of income.

- **PJV wages**, the second most common source of income, accounted for 34 per cent of the value of income, the highest from any source. The role of PJV inputs (in this case wages) in driving the local economy is again highlighted, as they were virtually the only money entering the system from outside—all the other sources relied on redistribution (even ‘other wages’, as discussed below).

- **Sales of goods and produce**, and money from other members of the household, were the third and fourth most common sources of money in the previous two weeks, accounting for 15 and 12 per cent respectively. However, the value of both these sources was relatively small, just 9 and 4 per cent respectively.

- Forty-one individuals (17.7 per cent) reported no income for the previous two weeks, and another 25 (10.8 per cent) reported less than K10.

- There were great inequalities in income across the sample, with the top 10 per cent of the sample earning 58.8 per cent of the income, and the bottom 50 per cent earning just 2 per cent of the income.

Significantly for the purposes of the economic modelling exercise, there was a total of K200 reported for alluvial gold earnings, K209 reported for compensation (though respondents did not specify if this was PJV compensation), and K451 reported for royalty payments. Given that the sample was approximately 3 per cent of the adult population in the valley, these equate to total annual figures of K173,333 for alluvial gold, K181,133 for compensation, and K390,866 for royalties. Both the alluvial gold earnings and the royalty payments
<table>
<thead>
<tr>
<th>Income source</th>
<th>Apalaka (32)</th>
<th>Mungalep (23)</th>
<th>Anawe (24)</th>
<th>Tipinini (35)</th>
<th>Various (8)</th>
<th>Total (122)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Royalties</td>
<td>30,500 (25)</td>
<td>2,048 (8)</td>
<td>6,400 (6)</td>
<td>-</td>
<td>2,360 (4)</td>
<td>41,308 (43)</td>
</tr>
<tr>
<td>Occupation fees</td>
<td>4,979 (20)</td>
<td>1,170 (5)</td>
<td>1,645 (4)</td>
<td>-</td>
<td>660 (4)</td>
<td>8,454 (33)</td>
</tr>
<tr>
<td>PJV compensation</td>
<td>167,500 (16)</td>
<td>3,300 (4)</td>
<td>12,900 (5)</td>
<td>3,050 (2)</td>
<td>54,500 (5)</td>
<td>241,250 (32)</td>
</tr>
<tr>
<td>Cash cropping</td>
<td>570 (5)</td>
<td>3,180 (10)</td>
<td>834 (9)</td>
<td>1,240 (15)</td>
<td>230 (2)</td>
<td>6,054 (41)</td>
</tr>
<tr>
<td>Alluvial mining</td>
<td>3,350 (6)</td>
<td>7,200 (4)</td>
<td>7,040 (2)</td>
<td>-</td>
<td>560 (2)</td>
<td>18,150 (14)</td>
</tr>
<tr>
<td>No. in business</td>
<td>7</td>
<td>8</td>
<td>4</td>
<td>7</td>
<td>4</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: Porgera household survey.
Figure 3.3  Numbers of individuals reporting income from different sources, 1992 (N = 231)

Source: Porgera income and expenditure survey.

Figure 3.4  Value of fortnightly income sources, 1992 (total K42,395)

Source: Porgera income and expenditure survey.
correspond well with the figures calculated earlier. The compensation figure, however, is well short of the annual total of approximately K3 million for 1992. This relative absence of PJV compensation payments in the sample is not surprising, given the small number of payments which had been made (631 for the first 11 months of 1992). The additional K2.8 million in compensation would have been equivalent to about K14 per adult per fortnight.

Average fortnightly income reported in the income and expenditure survey was K183.53 per adult. When the figure for PJV compensation is added to this average, adult income rises to K197.53 per fortnight. By highlands standards, this figure is very high, and can be directly attributed to the presence of the mine. However, as previously noted, the income distribution was highly skewed. Clearly, the presence of the company had greatly increased cash incomes for a minority of the local population, while the bulk were still dependent on the subsistence sector and on relatives for their survival.

**Expenditure patterns**

Expenditure patterns were addressed through both the household and income and expenditure surveys. The household survey questioned respondents on household assets, investments, and contributions to traditional exchange ceremonies. Table 3.9 shows the distribution of respondents in the different areas reporting ownership of various items, and for comparison, the figures found by Jackson (1987) and Wohlt (1986). The latest figures show no increase (even a slight decrease) over Jackson’s figures, but a definite increase over those presented by Wohlt.

The latest figures do not show the pattern which might have been expected within the valley, with those who have received the bulk of the compensation and other direct benefits having a greater number of material items. Apalaka only showed a significantly higher score in the case of watch ownership. Thus, while the distribution of income was unequal, this did not manifest itself in the obvious material status of householders. Clearly, levelling factors were at work. Exactly what these were and how they operated is open to further inquiry. Cultural traits could, in part, be responsible, with customary obligations to redistribute compensation and other income among family and wantoks. Likewise, people may have been unwilling to invest in material items which they knew would have demands for use placed on them by relatives. A high attrition rate may also have been partly
responsible for the results. For most items (excluding cars and videos), even Tipinini ranked alongside the other areas.

Table 3.10 shows the pattern of investments (largely passbooks and IPI shares) held by people within the areas covered in the household survey. The value of investments per household matches the expected pattern, with Apalaka having the highest score. However, it is worth noting that Mungalep was only a short way behind, which may have represented a legacy of the alluvial mining boom, and that the figure for Tipinini was higher than that for Anawe, the former having a

<table>
<thead>
<tr>
<th>Table 3.9 Percentage of households with particular assets, 1992</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>This study (1992)</td>
</tr>
<tr>
<td>Apalaka</td>
</tr>
<tr>
<td>Mungalep</td>
</tr>
<tr>
<td>Anawe</td>
</tr>
<tr>
<td>Tipinini</td>
</tr>
<tr>
<td>Various</td>
</tr>
<tr>
<td>Jackson (1986–87)</td>
</tr>
<tr>
<td>Alipis</td>
</tr>
<tr>
<td>Anawe</td>
</tr>
<tr>
<td>Mungalep</td>
</tr>
<tr>
<td>Suyan</td>
</tr>
<tr>
<td>Wohlt (1986)</td>
</tr>
</tbody>
</table>

Source: Porgera household survey.

<table>
<thead>
<tr>
<th>Table 3.10 Patterns of household investment, 1992</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Apalaka</td>
</tr>
<tr>
<td>Mungalep</td>
</tr>
<tr>
<td>Anawe</td>
</tr>
<tr>
<td>Tipinini</td>
</tr>
<tr>
<td>Various</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Source: Porgera household survey.
greater number of people with lower value investments against the latter's smaller number with larger investments.

One other surprising feature of these figures is a lack of correlation, at the household level, between cash benefits from the mine (compensation and royalties) and levels of investment—with a very low correlation coefficient (r) of 0.09. This poses two further questions: what happened to the compensation payments, and where did the investors get their funds? The answer to the second question may be related to the Mount Kare gold rush, or to earlier compensation payments which were not recorded by this survey, either because interviewers did not go far enough with their questions or because respondents were unwilling to reveal the payments. But the answer to the first question is partially answered by another part of the household survey, which asked about contributions to traditional exchange (brideprice, compensation) in the last 12 months, as well as to national election expenses. Table 3.11 shows that people living closer to the mine spent more money on both types of contribution, and that Tipinini spent much less than the rest. This is not surprising, as one might expect greater demands to be placed on those who had received cash from the mine. The relationship between cash benefits received and cash contributions made (r = 0.26) was closer than with levels of household investment, though it was still not statistically significant. On the other hand, the proportion of households engaged in such contributions was much the same in all four areas.

Expenditure patterns revealed by the income and expenditure survey are illustrated in Figures 3.5 and 3.6.

<table>
<thead>
<tr>
<th>Area</th>
<th>Total value of contributions</th>
<th>Value per household</th>
<th>Per cent households contributing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apalaka</td>
<td>70,500</td>
<td>2203.13</td>
<td>62.5</td>
</tr>
<tr>
<td>Mungalep</td>
<td>68,840</td>
<td>3129.01</td>
<td>63.6</td>
</tr>
<tr>
<td>Anawe</td>
<td>78,320</td>
<td>3263.33</td>
<td>62.5</td>
</tr>
<tr>
<td>Tipinini</td>
<td>11,903</td>
<td>340.09</td>
<td>57.1</td>
</tr>
<tr>
<td>Various</td>
<td>39,163</td>
<td>4895.38</td>
<td>87.5</td>
</tr>
<tr>
<td>Total</td>
<td>268,666</td>
<td>2202.18</td>
<td>63.1</td>
</tr>
</tbody>
</table>

Source: Porgera household survey.
Figure 3.5  Number of people reporting expenditure by category, 1992

Source: Porgera income and expenditure survey.

Figure 3.6  Expenditure patterns by value, 1992

Source: Porgera income and expenditure survey.
• Taken together, household members and other wantoks were very significant expenditure sinks, accounting for almost a quarter of all reported expenditure by category and by value: 37 per cent of the sample had given money to household members, and 30 per cent to other wantoks.
• Over 50 per cent of the sample had bought food at a trade store, and a third had bought food at the local markets. Such purchases accounted for 12 per cent of the total expenditure.
• Almost 20 per cent of the sample reported gambling in the previous two weeks, though this accounted for just 2 per cent of the total expenditure, while 21 per cent reported that they had invested money in the alluvial gold mining, accounting for 22 per cent of total expenditure.

Compensation funds

A series of interviews was carried out with known recipients of 20 large compensation payments made during 1992, in order to try and establish if there were any general patterns in their use of the money. In total, these payments accounted for almost 60 per cent of the compensation paid during that year. During the interviews, several of the respondents also gave details of how they had spent earlier payments, while some actually denied having received any payments in 1992. All but one of those interviewed distributed the bulk of their payments to family members (up to 80 per cent in one case), retaining amounts which ranged from K15,000 to K165,000. This redistribution, based on cultural expectations, presumably reduced the funds available for investment, rather than immediate consumption. A significant (though unquantified) proportion of this redistribution was directed to ‘wantoks’ living outside Porgera—mainly in the neighbouring Paiela area or in Southern Highlands Province.

Of the money which they retained, most recipients had invested some in a range of businesses—there were at least five trade stores and PMVs, three contracting businesses, a sawmill, a signwriting business, and a service station. Most of these required a minimum investment of K10,000–15,000. Most of those interviewed also stated that they had invested some of their cash in the alluvial gold mining, and one still held the whole of his payment in this form (mainly in interest-bearing deposits). Five had purchased vehicles (one had bought two), and most had contributed to campaign funds for wantoks during the 1992 national election.
Several interviewees stated that they believed the other members of their family had used their share of the payments for consumption: 'they drank their money in Tari, Hagen and Moresby', 'men spent their money on prostitution, sleeping in hotels in Hagen and drinking alcohol in Tari', 'the others consumed their money in beer and women', and 'others spent their money on vehicles that are now run-down, and on brideprice for more wives, and on alcohol—they have spent it all'. Only three of those interviewed admitted to practicing this kind of consumption themselves—'I ate them up', as one put it.13

From this set of responses, we may derive an approximate picture of the way in which the compensation money was used.

- 10–15 per cent was invested with alluvial gold mining
- 25–30 per cent was invested in local businesses
- 10–15 per cent was consumed by the primary recipient (including vehicles, brideprice, etc.); and
- 40–55 per cent was redistributed, of which 75–80 per cent was consumed.

With the redistribution and consumption, our primary concern was with how much of this money left Porgera. Consumption primarily involved buying goods originating outside Porgera, although a small proportion was retained (as profit) when purchases were made within the area. Much of the redistributed money passed through several pairs of hands, following traditional obligation networks, and was eventually consumed or passed out of the area.

Given the assumption that smaller amounts are more likely to be used for consumption than for investment, it is thus possible to estimate the final use made of the total compensation funds (K23 million) which had so far been paid by the PJV

- 5–10 per cent (between K1.625 million and K2.3 million) had been invested with alluvial gold mining
- 20–25 per cent (between K4.6 million and K5.75 million) had been invested in local business; and
- 65–75 per cent (between K14.95 million and K17.25 million) had been consumed directly, redistributed and consumed, or redistributed to relatives outside Porgera.

The estimate of alluvial gold mining deposits corresponds closely with the figure of K2.1 million derived from the household survey.
Local businesses

Directly or indirectly, the PJV had certainly stimulated local business development in the Porgera area. In general, these businesses depended either on trade generated by PJV inputs (wages, compensation and royalties), or on direct dealings with the PJV. As an indication of the latter, PJV figures for April 1990 show there were an additional 354 Porgerans employed by contractors to the mining company.\(^1\) Assuming that wages for local contractors would have been lower than those offered by the PJV—say an average of K3,500 per annum—this would have amounted to K1.2 million annually.

Five of the largest businesses in Porgera were investigated in terms of their role in the Porgeran economy, their current levels of employment, and their dependence on the PJV.

- Ipili Porgera Investments is the company formed in 1983 to act as an umbrella company through which local landowners could take advantage of the opportunities offered by the mine. Shareholding in the company was reserved exclusively for Porgerans, but the exact details of the shareholding were not obtained. After a period of serious financial difficulties, IPI had been reduced to a core of four activities: the IPI Supa Store in Porgera, the Mountain Lodge accommodation, some plant hire to the PJV (which was leased to Kulapi Holdings), and a 30 per cent share of the IPI/Poons Joint Venture. Employment in 1992 (excluding Poons) was around 80, with over half of these being Porgerans. The Supa Store was the largest store in Porgera, and acted as a wholesaler for many of the smaller trade stores. Turnover was reputedly up to K10,000 on pay Wednesdays, and the store carried around K400,000 in stock.

- The IPI/Poons Joint Venture won the tender for the supply of catering services to the PJV camps in mid 1992. Employment totalled 229 in December 1992, 121 of these being Porgeran. The value of the three-year contract was in excess of K1 million. Figures provided by Poons show that the bulk of their supplies were sourced through PNG companies. K17,000 was spent on local vegetable supplies during 1992, though this figure includes some supplies from other parts of Enga. K30,000 was spent on Australian sourced goods, around 10 per cent of the total.
• Kulapi Holdings was owned and managed by Yanis Polopa and family, local Porgerans who began operations in 1989. Initially, Kulapi was involved in plant hire contracts for the PJV, and then expanded into freight (again for the PJV) and servicing of heavy vehicles (through Porgera Motors). More recent diversifications had included a fuel depot, a mechanical spare parts retail section, investment in Port Moresby real estate, a building and civil works section, and helicopter services (with a leased helicopter). The company had 120 employees at the end of 1992, including 39 Porgerans. Turnover for 1991 was K1.5 million, increasing to a projected K5.5 million for 1992.

• The Porgera Bakery was a (50/50) joint venture between a local business group and Golding and Company of Australia. The company began as a gold-refining business in 1988, and became a bakery in 1990. Due to alleged misappropriation and the deportation of the Australian partner, the local partners were trying to establish full ownership in 1992. In that year, 17 Porgerans and six non-Porgerans were employed. Goods were sold throughout the valley, and efforts were being made to extend supply to other parts of Enga and to the Southern Highlands.

• Kumbi Enterprises was registered in 1989 by an expatriate married to a local Porgeran woman. The primary activity of the company was a laundry service for the PJV, and for this they employed 23 staff, 19 of them Porgerans. Kumbi had an associated company, Porgera Catering, which supplied catering services to the PJV Tipinini camp, and employed another ten people, eight of them Porgeran.

In total, these five businesses employed 308 Porgerans and a substantial number of non-Porgerans who lived permanently in the valley (unlike the PJV’s non-Porgeran employees). In addition, the PDA employed 20 Porgerans and 20 non-Porgerans, and other government departments accounted for approximately 20 additional staff. On a conservative estimate, these people would have accounted for at least K100,000 a fortnight in wages, or another K2.6 million per year in total. Much of this income, however, represented the redistribution of money initially spent by the PJV.15

In addition to these large businesses, small business appeared to be flourishing in Porgera. A count revealed almost 150 operating trade
stores in the valley, excluding Yuyan and Tipinini. The bulk of these were owner-operated, and most served a socio-cultural function in addition to an economic one—indeed, several owners told us they were not running their stores for the money. Turnover ranged from a few kina a day for smaller operations up to several thousand kina a day for the IPI Supa Store. Of those surveyed (around thirty), the average daily turnover was approximately K100. Many of the smaller ones, however, were only open two or three days per fortnight, so a more realistic figure may be K350 per week, giving a total annual turnover for the valley of K2.5 million. This approximates the figure from the income and expenditure survey. A more comprehensive survey by the PJV Business Development Office in early 1991 found 103 stores with an average turnover of K622 per week, or a total annual turnover of K3.3 million. This higher figure ties in with the anecdotal evidence that trade store owners felt people were buying less in 1992 than they had done in the past. This could have been due to increasing competition (due to a greater number of stores), or to the substantially lower amount of compensation money entering the local economy, or simply a romantic view of the past.

A quick survey of owners indicated that soft drinks, tinned fish, rice, coffee, sugar and cigarettes were the biggest sellers. Some of the more sophisticated stores also offered hot food. All trade store goods were imported from Mount Hagen, Lae or Port Moresby, and the markup on prices at Porgera was high—in most cases at least 100 per cent over the cost of similar goods in Lae or Port Moresby. This meant that half of the value of sales was the wholesale cost, and on average a further 25 per cent represented transport costs for the store owner. Both these cost components were lost to Porgera when the store owner restocked. Most of the other 25 per cent (the profit) tended to be spent on consumer goods, food from trade stores, and meeting demands from family members and wantoks.

The markets were another form of small-scale business activity of some importance in the area. Surveys were carried out of sellers at both the main Yanjakale market at Porgera Station, and several of the smaller markets in the area. In total, 116 sellers were interviewed. Average reported daily income was K62.90, ranging between K5 and K400. On pay Wednesdays, it was not uncommon to have 200 sellers at the main markets, and another 200 spread across the other half-dozen markets in the valley. If we assume that these Wednesday markets accounted for around half of the total market activity for the
fortnight, then the total value of market sales must have been around K1.3 million a year, which also agrees with the figure obtained from the income and expenditure survey. Of the sellers interviewed, 25 per cent were local Porgerans, almost 60 per cent were from other parts of Enga, and the remainder came from as far away as Goroka and Tari. The average reported daily sales of Porgerans (K30) were less than those of non-Porgerans (K73), so these sales must have represented a direct leakage of at least K1 million from the local economy.

Even less formal activities included roadside sellers (usually betelnut, cigarettes and greens), small-scale petrol sales (30 seen between Karik and Anawe Police Station), firewood sellers, 'bakeries' (selling deep fried flour balls for 10–20 toea a piece), poultry sellers (buying chicks from Mount Hagen and selling 8–10 weeks later for K10–12), and the cooking and sale of 'lambflaps'.

All of the above activities—from redistribution to trade store and market sales—point to a very low multiplier effect, with little capital accumulation in the Porgera Valley, as money was shifted rapidly out to other parts of the province and the country. It must be stressed that this is likely to occur in any remote area with a limited population base. However, the effect was highlighted at Porgera due to the large amounts of money which had been injected into the economy over a short period of time.

Conclusions

This review of the Porgeran economy in 1992 points to significant continuities with the pre-mine situation. This is not to say that nothing had changed in the area: clearly the value of cash inputs had increased significantly. However, many features of the local economy had seen little change since the start of production. The bulk of the population was still dependent on the subsistence sector for survival; consumption patterns were still focused on food, drink and gambling; bisnis aspirations were still dominated by trade stores, PMVs and machinery; and there were still significant patterns of inequality within the valley.

Although the surveys focused primarily on male household heads, significant gender differences showed up in the income and expenditure survey. Average female income for the fortnight was K60, compared to just over K200 for males. The primary source of income for women was sale of goods and produce (38 per cent of the total), with over 50 per cent of women reporting sales ranging between K5
and K300 for the fortnight. Eight per cent of male income came from the same source. Money from household members was more important for women than men (16 and 3 per cent of income respectively), while PJV wages and business profits accounted for 3 and zero per cent for women, compared to 36 and 29 per cent respectively for males. There were few differences in terms of expenditure patterns, the most significant being a smaller proportion being banked by women (23 per cent against 9 per cent), and a larger proportion still being held (31 per cent against 13 per cent).

As previously noted, differences in access to cash earning opportunities were established in the Porgera Valley prior to the arrival of the PJV. As early as 1948, people in the lower part of the valley had the advantage of access to alluvial gold, and Mungalep and particularly Yuyan developed as major centres of the local cash economy. Jackson (1987) found that households in Mungalep and Alipis had significantly greater values of possessions than those in Anawe and Suyan, and attributed this to the emphasis on independent gold panning in these communities. Our own surveys show that, since the arrival of the PJV, the focus had shifted further up the valley and was now centred on the SML. This came out most clearly in the household survey: Apalaka had received over 70 per cent of compensation and the bulk of other direct PJV payments, while Tipinini had received virtually none. On the other hand, there was no simple relationship between the amount of compensation received and household assets, investments, or contributions to traditional exchange obligations. Clearly, Tipinini was lagging behind the other parts of the valley in terms of cash earning opportunities, but its residents appeared to make good use of the smaller incomes to which they had access. It is also important to note that, although there were significant differences between the various communities surveyed, there were more marked differences within each of these communities. In other words, inequality was greater at the level of the individual or household than at the level of the community.

Another feature of the local economy was the marked fluctuations in inputs over time, dominated by those sourced with the PJV. Compensation payments peaked in 1991 at K8.77 million, but were more than K5 million down from this peak in 1992. The records for 1992 also show that roughly half the compensation for the year was paid in the three-month period from May to July. Royalties were being paid approximately each quarter, while business contracts were
awarded on an irregular basis. The most visible fluctuation was the 
fortnightly payment of PJV wages, which injected over K100,000 into 
the economy on a regular basis. For two or three days a fortnight, this 
drew people to the area from other parts of Enga, and stimulated 
market and trade store activity. These patterns were significant for the 
long-term development prospects of the local economy, because the 
irregular variations made forward planning difficult.

Notes

1 This chapter is concerned primarily with the economy of the 
Porgera Valley, though reference is occasionally made to 
contributions at the provincial, regional and national levels.
2 These interviews were largely carried out by Ben Imbun and five 
male students from the University of Papua New Guinea, in either 
Enga or Tok Pisin.
3 One of the more successful businessmen interviewed as part of this 
survey reported alcohol sales of K1,500 in the past fortnight.
4 Unfortunately, Jackson’s report was not sighted until the fieldwork 
for this chapter was already under way, which was too late to 
directly influence the methodology used, though there is no major 
inconsistency between the two.
5 This section deals almost exclusively with the cash economy at 
Porgera, in keeping with the objectives of this stage of fieldwork 
and the methodology adopted. See Chapter 5 for discussion of the 
subsistence and non-cash economy around the mine.
6 This section includes reference to some data collected during my 
second trip to Porgera in June 1993, when I was able to complete 
the records of compensation payments made in 1992, and to 
consult the detailed compensation registers and code books for the 
whole period from 1987 to the end of 1992. These sources had their 
own problems—illegibility, clerical errors and alterations—but 
were a better source than the aggregated records which I had 
consulted during my first field trip (see Banks 1993).
7 A similar situation existed at Ok Tedi (Jackson 1993).
8 Employment created by the PJV through local contractors was also 
significant, but this is discussed in the subsequent section on 
business contracts.
9 The Porgera SML Landowners’ Children’s Investment Fund was 
set up to administer the 10 per cent share of the royalties which 
were to go to the children of the SML landowners. By the end of 
1992, the value of this share was around K1 million, and the fund 
was expecting to start paying out benefits to 7–18 year olds in 1995 
(with some small payouts during 1993 and 1994 to 19–21 year olds).
10 The number of polygamous households was greatest at Apalaka 
(five, or 15.6 per cent), and averaged 8 per cent across the valley.
11 These figures do not add up to 231 because the occasional survey form omitted the relevant information.
12 No figures were collected on business turnover or profitability in this survey (see Chapter 7 for further discussion).
13 The focus on consumption of gold money has parallels in Clark's (1993) account of Huli involvement in the Mount Kare gold rush, and may have occurred for similar cultural reasons.
14 Figures had not been kept by the company since that date.
15 Direct purchase of Porgeran goods by the PJV was minimal, reflecting both the specialised needs of the mine and the lack of local suppliers. However, the September 1992 Business Development Office's quarterly report noted that 32 per cent of purchases made by the warehouse were sourced from within Papua New Guinea.