

OK TEDI MINING LTD: MINE WASTE MANAGEMENT PROJECT - SOCIO-ECONOMIC MONITORING
**REPORT ON THE SURVEY OF LOWER OK TEDI
VILLAGES, MAY - JUNE 1998**

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EXECUTIVE SUMMARY

1. The Socio-Economic Monitoring Project is part of the Lower Ok Tedi Dredging Trial. Included in this monitoring are surveys of health (by Dr. Taufa of UPNG and OTML medical staff) and of women's concerns (by Dr. Rau). This report concerns a baseline data survey of seventeen Lower Ok Tedi villages (Ambaga, Atkamba, Bige, Bongabun, Dande#2, Demasuke, Dome, Hopanai, Ieran, logi, Kawok, Kokonda, Komokpin, Kwiape, Miamroe, Sarae and Senamrae) which was undertaken between early May and late June, 1998. The survey teams consisted of local landowners, OTML staff and outside professionals from the National Research Institute and the Department of Environment and Conservation. Although there were some gaps in data collected, in general terms the survey was very successful; in particular the records gathered from the Awin villages represent a very thorough survey of considerable, potential historical value.

2. A total of 464 households containing 2757 persons were surveyed. It is believed that approximately 15 households of normal residents were omitted in Ieran and Kokonda and that a further 40 or so refugee households in Dome and logi (who declined to participate) are also not included in these numbers. There were 206 Awin households and 1187 Awin people covered and 258 Yonggom households and 1570 Yonggom people covered.

3. The data in this section, and all following sections up to and including section 9, were derived from a questionnaire administered to all households. One in five houses had galvanised iron roofs. However the figure for the Awin was 29.3 per cent compared with only 13.2 for Yonggom houses. Similarly, while 10.2 per cent of Awin houses had sawn timber floors, only 3.8 per cent of Yonggom houses did; sixteen per cent of Awin households used either kerosene or gas to cook with compared to only 0.4 per cent of Yonggom households; 5.3 percent of Awin households use electricity compared to only 0.8 per cent of Yonggom. It is evident that a significant minority of Awin have been changing some aspects of their life styles in recent years; this does not appear to have been occurring among the Yonggom. It could be argued that this means that the Awin are increasingly more dependent on a cash economy which is itself heavily dependent upon the Ok Tedi mine and could suffer accordingly if (and when) the mine closes.

4. Three types of populations measures matter in the lower Ok Tedi: *de facto* populations are the people actually present at any one moment - in the case of this survey, there were 1171 Awin and 1414 Yonggom present - but these numbers include visitors and exclude normal residents who happened to be away during the count; *de jure* populations exclude visitors and include temporary absentees - in this case there were 1187 Awin and 1570 Yonggom *de jure*; the third measure that matters here is that number of people who the villagers themselves regard as members of their community (i.e. they may regard some residents, like refugees, as non-members and people who don't live in the village as members) - and we know from censuses taken for compensation payments that the *de jure* figures just mentioned represent only 54 per cent and 59 per cent respectively of the Awin and Yonggom communities recognised for compensatory purposes. So, it is very important to remember that the figures reported here exclude people living in Kiunga (and elsewhere) who are recognised community members but who do not live in the villages.

Over 13 per cent of the Awin *de facto* population counted were visitors compared with only 1.6 per cent of the Yonggom. In both communities about twelve percent of the *de jure* populations were temporarily absent. From this (and other evidence) we can conclude that absences from villages are relatively high universally but that in the Yonggom's case those absent are outside the lower Ok Tedi area (mainly Kiunga town), while in the Awin case inter-village movement is common. Males seeking employment with the dredging project at Bige/Kwiape also account for the difference.

Population growth rates since 1990 among the Awin are between 3 and 4 per cent per annum; among the Yonggom they are around 1 per cent. The first figure implies some immigration (mainly people returning from Kiunga); the second figure implies some emigration since across the two communities natural growth rates are likely to be in the region of 2 per cent per annum.

5. There is little intermingling between the Yonggom and the Awin. Very few inter-group marriages have occurred and only one per cent of the two populations claim to understand the other's language. In the past the most commonly understood, introduced language was Hiri Motu but today English is more widely used with Pidgin growing quickly.

6. The Awin are somewhat better educated than the Yonggom (among those still resident in the village). If we score nil education as 0, grades 1-3 as 1, completed grade 6 as 2 etc. then Awin males aged fifteen or more have an average score of 2.18, Yonggom males 1.62, Awin females 1.37 and Yonggom females 1.12. Thirty five per cent of Awin females and 45 per cent of Yonggom females have had no education at all.

However, it is evident that getting an education does not have the same results for all students. If we divide the number of people employed by the number of people who have completed elementary education then we obtain the following ratios: Awin males 1.19 (i.e. there are more Awin males in paid employment than there are Awin males who have completed elementary education), Yonggom males 0.75, Awin females 0.36 and Yonggom females 0.23.

7. Nearly one-third of all Awin males aged fifteen or more now have paid employment compared with only one in ten of Yonggom males (female proportions are under four and just over one per cent respectively). Today, only just over half of Awin males reported themselves as being subsistence farmers. Of the 170 persons reported as employed, OTML and related companies accounted for more than 100. Of the remainder, government employment accounted for nearly half. Very few people are self-employed. In the Awin villages a youth unemployment problem is beginning to emerge.

8. Across both communities approximately three in ten people of all ages reported that they had been sick enough to need treatment in the preceding month. There was little noticeable difference between Awin and Yonggom. However, it was noticeable that whilst Awin went primarily to Senamrae Aid Post - which people in the area want upgraded (justifiably in our view) - many Yonggom from the southern part of the Ok Tedi go all the way to Kiunga, since Atkamba's health services seem to be in severe decline.

9. The differences between the Awin and Yonggom are also evident in food consumption. People were asked what they had eaten for the preceding night's evening meal. Among the Awin 35 per cent reported eating rice compared to 14 per cent of Yonggom. Figures for other foods include: tinned fish 20 and 6; tinned meat 13 and 2; fresh fish 8 and 2; fresh meat 13 and 5; tea with milk 24 and 13. About two-thirds of all people, from both groups, ate sago. The average expenditure per fortnight by Awin on food was K19 per person compared to K10 among the Yonggom. Interestingly, about one-quarter of both groups had had some success hunting in the preceding month. Forty per cent of Awin and twenty five per cent of Yonggom households had caught fish in that period.

10. The remaining data were collected from a sample of one-in-five households. The Awin have fifty per cent more gardens per person than have the Yonggom. There appear to be some signs of food shortages among the Yonggom. However, there appear to be few differences in the quantities of consumer goods between the two groups. The one exception is that fifteen per cent of Awin households surveyed had access to motor vehicles compared to only three per cent of Yonggom.

11. Per capita incomes per month appear to be approximately K80 for the Awin and K50 for the Yonggom. OTML payments account for 59 per cent of Yonggom incomes but only 20 per cent of Awin incomes. Wages constitute half of all Awin incomes and only one-fifth of those for the Yonggom. By contrast, sources of income which have little or no relation to OTML activities (garden produce plus rubber, even though the latter is subsidised by OTML) account for a mere two per cent of both groups' incomes.

12. Expenditures amount to K61 and K52 per person per month respectively for the Awin and Yonggom. This implies a certain amount of saving among the Awin households surveyed and full (or greater) expenditure of all income among the Yonggom. Two thirds of all Awin expenditure and half of all Yonggom expenditure was reported to go on food. More interestingly perhaps, one third of all Yonggom expenditure went on brideprice and compensation compared with only thirteen per cent among the Awin.

13. Borrowing and lending is far more common among the Awin. Two thirds of households reported borrowing money while nearly all households reported lending money. Among the Yonggom very few households surveyed reported borrowing but two thirds claimed to have lent funds. Each Awin household had, on average, 1.47 savings accounts with a bank; the figure for the Yonggom was 0.26. Similarly shareholding was five times as common among the Awin.

14. An important feature of the questionnaire was the plumbing of people's opinions on a wide range of issues. The results included: concern about land shortage is quite strong, especially - and perhaps surprisingly - among the Awin. Village opinion is that most social problems are not increasing: people were equally divided over whether or not drunkenness is becoming worse and, overall, were of the belief that gambling was not now more of a problem. The one big social problem in people's minds, especially among the Awin who do not host any refugees, was that posed by refugees. People are not sanguine about the chances of dredging doing anything to improve the existing environmental situation along the lower Ok Tedi; the Yonggom especially seem to believe it to be a waste of time.

In general, the Yonggom hold much stronger and much more negative views than the Awin on most matters. For example (given a maximum possible score of + or -1), when asked whether the quality of their lives had improved or deteriorated since 1981 the Yonggom score was -.87 compared with an Awin score of -.45; on future prospects the two figures were -.92 and -.13 respectively. The Yonggom appear literally hopeless as well as very bitter. Asked to assess OTML's performance they scored it at -.66 compared to the Awin who gave a score of -.36.

The Awin were even more severe in assessing the government's performance; they gave it a score of -.81 compared to the Yonggom's -.47. The Yonggom have almost no faith in OTML. Whereas the majority of Awin, if facing a problem with OTML, would still go first to see the Public Affairs section of the company, the Yonggom would go almost anywhere else except that group.

The Yonggom on the whole are indifferent to whether OTML closes or not - they want it to restore their environment before it closes, however. The Awin, as might be expected logically from the fact that they have begun to enter the cash economy in a number of ways, are rather more concerned about the implications for them of closure.

A number of beliefs are widely held which will cause trouble for everyone in the area. The demands people have of OTML in total make very little sense - OTML simply cannot afford to meet them all or even in part. The most widely held of such demands is that OTML should fulfil *its promise* to build new houses for everyone in the area. How this belief has originated and spread is unclear, but it is almost universally held. Has OTML so promised? If OTML believes it has not done so, then it should explain. But such explanation will be difficult so widely held is the belief, even if it is obvious that even if all compensation funds agreed to were devoted to it there would not be sufficient funds to house present families, let alone newly forming families and the next generation and let alone the access tracks to new sites which the people imagine they will be getting.

The unfortunate presence of strongly negative attitudes in some areas and deep misunderstandings should not, however, be taken to mean that all is lost. The Yonggom are still willing to talk - and will be more willing if they saw some local development. A renewed effort, better co-ordinated with other OTML sectional activities and government and more closely attended to by management, on the part of Public Affairs would not be a waste of time.

15. The Yonggom people - at least those who have stayed on in the villages - remain extremely alienated from OTML. Perhaps even worse, they are very discontented about the outcome of the court case and sections of them are nearly as embittered against their own leaders (and leading plaintiffs in the court case) as they are against the company and government. Ironically, they are almost wholly dependent upon OTML for their cash income; many of those with the skills to earn a living have moved to Kiunga. By contrast, the Awin - although they are by no means uncritical of OTML - are more optimistic, have hopes for the future and are aware of the importance of OTML's operations to them even though they are far less directly dependent upon the company's compensation and other payments to them.

16. Monitoring of future changes should involve two time scales: three monthly intervals and annual surveys. The former should include water supply monitoring as well as such things as trade store prices, house numbers, iron roofs etc (for full lists see body of report). The latter should include population surveys of this sort. However, the survey showed that village leaders are capable of many sorts of monitoring on their own and it is recommended that villagers now become part of the design and implementation teams for all future monitoring including those of a 'scientific' nature. Each village should be visited by a team from OTML (preferably combined with a government team) at least every three months on a formal scheduled basis both to undertake quarterly monitoring tasks and for public meetings with villagers.

17. Monitoring on its own will be of very little value - least of all to the villagers- even if, when done efficiently, it should give OTML and anyone else who has access to its results a good idea of changing circumstances in the area. It is possible that, if the results are widely disseminated and then understood by villagers, monitoring alone could raise people's awareness of the issues facing them. However, it felt that, ideally, monitoring must feed into a planning process and hierarchy which has its roots in individual villages and local level government units. Self-evidently the development of such a process and structure will be essentially political and OTML cannot undertake this on its own - or even, ideally, play a lead role.

Even with such a planning process in place then there must also be an implementing agency in place. Here OTML has a major role to play, through the FRDT and/or the Tax Credit Scheme. The problem to date of these agencies is that there has been no locally based political process at work which can legitimate their activities. The successful future development of the lower Ok Tedi area - indeed of the region as a whole - will depend on monitoring (involving the community as partners), planning processes (led by PNG political structures) and implementing agencies (including OTML especially) all working together.

Introduction

This document reports the results of a survey of seventeen villages in the lower Ok Tedi valley carried out as part of the baseline studies associated with OTML's dredging trials in the Bige area. A copy of the questionnaires used in the survey is attached as an appendix to the report.

Methodological matters

The data on which the following report and analysis are based were collected between May 12 and June 20, 1998. Thus data collection cannot be strictly described as a census since it was possible for the same individual(s) to appear more than once in it; we do not believe that this occurred however. Although basic data were collected on both all individuals present in the village on the night preceding the day of data collection as well as on persons normally resident but absent on that day, detailed information collection was restricted to those normally resident (whether present or temporarily absent at the time of interview). This was done deliberately in order to try to describe village characteristics as they are on an every day basis. It is well-known that many people who regard themselves (and are regarded by other members of their community) as members of the villages, actually live elsewhere almost all the time; this survey deliberately wished to exclude them. Consequently, most of the data presented here refer only to normally resident individuals. This means that population totals quoted here are generally much lower than those arrived at by many other surveys in the area – such as the counts made by OTML for the purposes of land compensation. When making comparisons between different population totals over time, therefore, it is important to remember that the different surveys included and excluded different sets of individuals.

Collection of data took the following steps: First, in March 1998 the first draft of the questionnaire was drawn up. Its design went through several iterations. An initial draft was circulated to several specialists within OTML, within Papua New Guinea and to some overseas. Richard Jackson then joined the project and, with the assistance of comments received on this early draft, drew up an entirely new format and set of questions. This new draft was again circulated for comment. The original intention had been to undertake a fairly detailed survey of a 20 percent sample of the seventeen villages' population. By this stage it was instead decided to attempt a 100 percent coverage for basic information (by means of the short questionnaire or SQ) as well as implementing a much more detailed questionnaire (the long questionnaire or LQ) with one fifth of all households selected randomly. Second, in late April/early May attempts were made to ensure that all lower Ok Tedi villagers were aware that the survey was going to take place and what its purpose was. A letter was composed in English for this purpose.

The language choice was deliberate since Hiri Motu – the previous language of inter-group communication in the region – was now understood, we believed, only by older men while Tok Pisin – although increasingly spoken by younger people – is by no means universal. Moreover, with the spread of education in the region we guessed that English might be the most widely spoken of the introduced languages. A key issue, which was heavily stressed in the letter, was that the survey was not concerned with compensation. This was a vital point since almost all the frequent surveys undertaken in the lower Ok Tedi area in recent years have been focussed on compensation. Absentees with land rights have generally either flocked back to their villages in order to ensure that their names have been registered (something we wanted to avoid with our goal of describing the villages as they are normally) or submitted their names to government land officers, some of whom are landowners themselves, for forwarding to OTML. The letter was delivered by hand by Richard Jackson and Jeff Ransley to all the Awin villages. Unfortunately, time constraints restricted its circulation among Yonggom villages to only Kawok, Atkamba, Bongabun, Ieran, Dome and Ambaga. Thirdly, prior to the start of the survey proper, the questionnaires were examined by the groups who were to administer them in briefing sessions in Tabubil. Several questions were amended, deleted or added as a result. The questionnaire was then field-tested at Bige village by all team participants on 12th May. As a result of that field testing one major and several minor amendments were made: the major one was the addition of a section wherein all respondents had the opportunity to express their hopes and concerns. Fourthly, the survey was undertaken in May and June by three teams: one dealt solely with all Awin villages (except Kokonda) and the other two teams dealt with all Yonggom villages plus Kokonda. Each team was made up of one OTML employee, one or more landowners and one external consultant.

The purposes of the survey were multiple but fundamentally boiled down to two. First, it was to provide a snapshot of existing conditions in the lower Ok Tedi villages. Ideally, this snapshot should have been best taken before any substantial compensation payments arising out of the court action against OTML had been paid and before other mitigatory measures, like dredging, had begun. This ideal could not be met because of the urgency of the need to pass on some financial benefits to affected villagers in 1997. Thus, with three million kina paid out in compensation alone (and other funds being paid as a result of other agreements), this survey cannot be said to constitute a truly baseline study. Already major elements of change were in place even if the survey was undertaken prior to the first of the Lease for Mining Purposes payments to landowners in the dredging trial area being made. Secondly, the survey aimed at identifying ways in which future socioeconomic changes in the lower Ok Tedi villages might be monitored.

The survey itself was on a large scale, took six months to complete (planning began in February and the final draft report was submitted in August) and was expensive in human resources if not of funds. Whilst repeatable, it would obviously be desirable to identify indicators of change which could be more readily and cheaply monitored; it was hoped the survey would assist in doing this. Recommendations on future monitoring are included in the report.

The questionnaire aimed to collect several different sorts of information. For all households, information was gathered on housing conditions and facilities (Section A in the questionnaires) as well as on the age, sex, marital status of all normally resident individuals and visitors and the lifetime mobility, education levels, occupation, languages spoken and general health of the normally resident individuals (Section B). Sections A and B were administered to all households which were occupied at the time of the survey. All remaining questions were asked only of one in five households. An attempt was made to measure the day to day mobility of individual household members (Section C). This may require some explanation. Not only is it known generally that large numbers of lower Ok Tedi people now reside, more or less permanently, in Kiunga, but, as a result of similar mobility surveys undertaken elsewhere in Papua New Guinea (especially those of Dr. David King under the auspices of UPNG's Unisearch consultancy), it is known that mining activity tends to increase mobility quite sharply. Thus, it was thought that a measure of mobility might provide one of the desired indicators of future change. Next, for the selected one in five households the ownership of and access to garden land and sago groves were sought. Additionally, a series of questions on foods (whether bought or grown/raised by the household) were asked to get some idea of villager diets. Nutrition, in a strict sense, is very difficult to measure with any accuracy in the absence of extremely detailed research. However, it was hoped that some useful information could be gathered by noting what the households stated that they had consumed (Section D). It should be noted that a separate health and nutrition survey under Drs. Taufa (UPNG) and Frew (OTML) has also been undertaken but that the results of their survey were not available at the time of writing of this report. Next, the opinions of villagers on a number of issues were sought (Section E). The manner of eliciting such opinions varied. One set of questions was framed so that respondents could simply strongly agree, agree, disagree, strongly disagree with or have no view concerning them. A second set of issues were raised in the form of questions which had no pre-determined framework for their answers. Thirdly, respondents were invited to raise issues that concerned them and which the questionnaire itself had not raised or given the respondents an opportunity to comment upon. (As a result of field testing this last mode of eliciting opinions was applied to all households, not just restricted to the one in five sample.) Finally, Section F attempted to gather information on household incomes and expenditures.

The team, in advance of interviewing, was not sanguine about the possibility of obtaining useful results from this portion of the questionnaire. It was thought that questions about money might result in either high refusal rates or grossly inaccurate information. Additionally we were not optimistic, given the general level of bitterness raised not only by the court case but by internal village arguments over the distribution of OTML payments to date (which is the responsibility of the villagers themselves) and given what was expected to be a general secretiveness about anything to do with money or wealth, that interviewers would receive anything other than a fairly hostile reception when they asked these questions. To minimise any roll-on effect from this, these questions were deliberately placed at the end of the interview. We also placed the opinions section just before these questions in the hope that respondents had had the opportunity to get some of any hostility they felt out of their system before the income/expenditure questions were put to them.

No specifically gender-based questions were asked in this survey even if, in the analysis data were examined -where possible- on a gender (and age and ethnic) basis. OTML has recognised the specific problems of women in the area as a result of a survey of women's opinions and issues undertaken by Dr. Monica Rau. The draft results of her survey were taken into account when analysing the data collected in the course of this survey and when making the recommendations on monitoring presented later in this report.

Villages covered by the survey were: on the Awin side, Bige, Dande #2, Demasuke, Hopanai, Kokonda, Kwiape, Miamroe, Sarae and Senamrae and, on the Yonggom side, Ambaga, Atkamba, Bongabun, Dome, Ieran, logi, Kawok and Komokpin.

How robust are the data presented here? There are several possible sources of weakness. Each is discussed here in turn. First, the questionnaire which was administered almost certainly omitted consideration of some issues which may be or which may turn out later to be important ones. Obviously, we are not in a good position to assess this point since we thought the questionnaire was quite thorough prior to its implementation (otherwise we would have changed it) and also because in the course of administering and analysing it no obvious major new topics worth investigation turned up. However, time will probably prove us wrong.

Second, inadequacy of coverage could weaken the data's robustness. It did happen that some small settlements were not covered by our survey. For example the small settlement offshoot of Kokonda, to its south at GR170375, was omitted. More importantly, the two refugee settlements at Dome and logi were not covered.

This did not come to light until the analysis stage. Non-coverage arose from a combination of circumstances: the external advisor (and most experienced field worker) with the team covering these two villages was unable to present at the survey's briefing sessions and was unaware of the survey's need to cover them - that is there was a lapse in internal communications between project staff members. But additionally, neither local villagers were keen for the refugee settlements to be covered (in case this gave the refugees greater claims to community membership) nor were the refugees themselves happy to be included unless a representative of government from Kiunga were present. So, the absence of data from these two areas is a weakness. By contrast one group (the people at Birimkamba) was included which is not part of either LOTA or of the dredging trial LMP. Birimkamba's position is an ambiguous one because although it is located on the Ok Tedi/Birim banks it has only re-emerged recently (it was one of the first settlements in the area recorded on Patrol Officers' maps) as a settlement of any size; for many years its members lived at Ambaga. There are disputes between Birimkamba and Ambaga over the distribution of OTML compensation payments and, obviously, the Birimkamba people feel that they should have separate recognition in formal agreements. However, currently they do not and thus the data collected there has been omitted from this report - but this is not a source of weakness for the survey.

A third potential source of weakness would lie in the accuracy of the responses provided and the thoroughness of the interviewing teams. Throughout the analysis which follows, there are significant differences between the Awin and Yonggom village data sets. There were also significant differences in the receptions given to the survey teams. On the Awin side, almost every village - despite their varied complaints about the mine project - welcomed the survey team as providing them with a useful opportunity to express their opinions. The Awin team also had the advantages of easy access to the Bige camp, provision of facilities by LOTIC, simple logistical needs and the presence on the team of two highly respected local leaders. Moreover, the team worked exceptionally well together. All in all the results for the Awin can be regarded as very reliable indeed. The team(s) dealing with the Yonggom were faced with several problems. Their reception by villagers was lukewarm at best - and in some places verbally hostile or very indifferent. They also had to put up with difficult logistics while one well-known local leader (who also had had considerable personal experience of conducting censuses) who was originally part of the team had to pull out at short notice because of other commitments. The team's response to these circumstances was not unreasonable: they undertook the survey as quickly as possible so as to minimise any further cause for discontent their presence might give the respondents. This meant that they did not have the time their Awin team-mates had to mull over each day's responses so as to be able to go back to respondents to check on ambiguous or missing answers. In analysing the completed questionnaires, this was evident and this analyst had to interpolate answers in perhaps one in six cases from answers provided elsewhere on the questionnaire.

Despite the fact that the Yonggom data did contain lacunae, the answers themselves are internally consistent. It is this writer's belief that the Yonggom data are slightly less reliable than those for the Awin but that since those latter reflect as thorough and accurate a survey as he has ever been associated with this does not mean that the former are weak.

Acknowledgments

The willingness of the Director of the National Research Institute (Dr.Boeha) and the head of the Department of Environment and Conservation (Dr.Iamo) to release staff members to act as outside, consulting survey experts is gratefully acknowledged. The contributions of Billai Laba, Rodney Kameata, John Michael and the other staff released were extremely valuable. The survey also deliberately used the local knowledge and skills of landowners as an integral part of its work from the original briefing sessions right through to commenting on the first drafts of this report as well as being members of the interviewing teams in the field. A large number were ultimately involved all of whom did well but special thanks must go to Ketu Nuri (of Kwiape), Rickson Kwe (of Senamrae) and Michael Aniap (of Dome) whose fieldwork and skills in getting the questionnaires filled in legibly, thoroughly and accurately were quite outstanding. OTML staff made up the remainder of the teams and special thanks go to Don Yakuma, Nick Bunn and Thomas Kevara. The very difficult logistics for the survey were organised successfully by Jeff Ransley whilst data preparation was expertly undertaken by Denna Jiap and John Kezi. I am especially grateful to Denna for help throughout the project on all aspects of it. The inputs of, in particular, David King, Alex Maun and Robin Ette are also gratefully acknowledged as is the strong support to this project given throughout its duration by Ken Voigt.

THE SURVEY RESULTS

Housing conditions

Housing structures:

Data were collected from all households which were occupied at the time of the survey: that is 258 Yonggom houses and 206 Awin. Information was collected on the materials of which houses were constructed, the number of rooms in each house, the type and location of kitchens and assessment (subjectively by the interviewers) of housing quality overall. Interviewers tended to be generous in the last item since the mean score turned out to be above 'average'.

Iron roofing is possessed by one fifth of all houses in the lower Ok Tedi area. The proportions vary from 52 percent at Kwiape (the only village with more than half its houses iron-roofed) to zero at Demasuke and Sarae. Although perhaps not as aesthetically pleasing or as cool as the more commonly used woven sago thatch, iron has the advantages of being longer lasting and providing a means of domestic water supply collection. Iron roofing is more than twice as common among Awin villages (despite Demasuke and Sarae) than it is among Yonggom villages, the respective group percentages being 29.3 and 13.2. One of the most commonly voiced concerns of villagers was that it was becoming increasingly difficult to obtain sago for roofing, so it might be considered that iron roofs are not necessarily an indicator of greater material prosperity but rather one of a growing scarcity of building materials and increasing demand. It is most likely to be an indicator of both. The fact is that it is the poorer communities that have the greatest proportion of sago roofing. From the viewpoint of monitoring change, iron roofs are very easily observed and, as will be seen, are closely associated with other housing improvements which are not so readily visible.

Walling materials show very little variety. Only twelve houses had walls of manufactured materials – fibro or hardboard. The traditional walling material, black palm, is almost universal. However, a few (23) households, most notably in poorer villages (especially Ambaga), still use split sago trunks for walling. Because of this lack of variety and because walling material is neither structurally significant nor has much impact on the life of the house, they are considered, for the moment, not a good indicator of change.

Floor materials are also generally uniform with only thirty five of the 464 households surveyed not using the slender variety of black palm. As a monitoring indicator it is of little use especially since it is far less easily observed than roofing. The use of sawn timber for flooring is increasing.

Every house with sawn timber flooring (save one) also had an iron roof, although the reverse is not always true. Moreover, once a household has adopted timber flooring, it generally has to build a separate kitchen in place of the fireplace that is set into the floorings made of black palm. So, the house plan tends to change if sawn timber floors are introduced.

This is why *houses raised off the ground* are the norm – the traditional sago/black palm house was originally raised for defensive purposes and the fireplace built into the floor. The latter feature means that, even if the defensive design feature is now obsolete, houses must be raised. Only one house (built originally for other purposes by the FRDT) was found that was not raised.

The *number of rooms* in a house does not appear to be a useful indicator of change. Many high quality houses had only a single room; others of lower quality on many occasions had five or six rooms. There is nothing to suggest that the number of rooms in a house is connected to changing economic circumstances or is more than minimally connected to housing size.

Housing quality was assessed by the interviewing teams. Only 8 percent of the 464 houses examined were considered as poor or very poor. When one correlates overall housing quality with roofing type there is an r value of +0.74; thus, roofing is not only easily observed but is a useful indicator of all round quality.

Table 1: Iron roofs, timber floors and housing quality

| VILLAGE | % HOUSES WITH: | | ASSESSED HOUSING QUALITY* |
|-----------------------|----------------|---------------|---------------------------|
| | IRON ROOFS | TIMBER FLOORS | |
| Ambaga | 3 | 0 | +0.1 |
| Atkamba | 25 | 8 | +0.5 |
| Bige [^] | 7 | 0 | +0.4 |
| Bongabun | 11 | 0 | +0.4 |
| Dande [^] | 22 | 13 | +0.1 |
| Demasuke [^] | 0 | 0 | -0.1 |
| Dome | 16 | 7 | +0.4 |
| Hopanai [^] | 15 | 0 | +0.2 |
| Ieran | 11 | 0 | 0 |
| logi | 7 | 0 | +0.4 |
| Kawok | 11 | 0 | +0.3 |
| Kokonda [^] | 6 | 0 | +0.1 |
| Komokpin | 6 | 3 | +0.3 |
| Kwiape [^] | 52 | 17 | +0.8 |
| Miamroe [^] | 22 | 17 | +1.2 |
| Sarae [^] | 0 | 0 | 0 |
| Senamrae | 49 | 14 | +0.5 |

[^] Awin village * mean for the village where very poor = -2, poor = -1, average = 0, above average = +1 and good = +2

CORRELATIONS: IRON ROOF:TIMBER FLOOR = +0.80; IRON ROOF:QUALITY = +0.74; TIMBER FLOOR:QUALITY = +0.71.

Other housing features

Ownership: the overwhelming bulk of houses are owned and were built by their occupants (93 percent). The only exceptions are houses occupied by teachers and other government or mission employees.

Toilet facilities: twenty households (4 percent of the total) had no facilities at all, using nearby bush. All the remainder used their own pit latrine. It is of interest to note that, in the comments section of the questionnaire, not a single respondent mentioned improvement of these facilities as being of interest.

Drinking water is, by contrast, a matter of almost universal and chronic concern to villagers. No-one has piped water and no-one drinks from the Ok Tedi; between these two extremes are a number of other alternatives. Nearly sixty percent of respondents depend upon FRDT-built water tanks. The rest rely on creeks (10 percent), wells (20 percent) and roof collection. Trust tanks are widely criticised – they are said to be in need of repair (and when in that state are also said to be breeding grounds for mosquitoes) or to have been inadequate during the recent drought. However, it is interesting to note that those villages that do not have an FRDT-provided tank, such as Dande, are rather keen to get one despite neighbouring villages' complaints. On average, villagers walk 250m to obtain their drinking water.

Problems with drinking water appear to be especially severe at Kwiape and Bige and are exacerbated there by the fact that just nearby are the dredging camps which supply excellent water to their occupants. To the average outsider, a solution to Kwiape and Bige's worries on this issue might not seem too difficult to find.

Given the genuine anxiety created throughout the area over the safety of drinking water and the prominence given to this issue in respondents' unsolicited comments, it is evident that monitoring of drinking water to ensure a constant and safe supply should become an essential feature of OTML's ongoing community relations effort. It is suggested that such monitoring should actually involve the community directly so that they understand what it entails.

Water for bathing and laundry is, for sixty percent of households, drawn from local creeks or, for a further one quarter, from FRDT-built shower blocks. On average people walk 220m to obtain supplies.

Cooking is, in ninety percent of households, done inside the house in fireplaces sunk into the floor of the house. In almost all houses with timber floors and in several with traditional floors but iron roofs, a separate kitchen has been built next to the house. The survey found only one Yonggom household using anything – in this case, a kerosene stove – other than firewood for cooking. However, among the Awin, up to fifteen percent of households now use kerosene. The Awin also contained the only two recorded users of gas stoves for cooking.

Electricity, provided by small household generators, is unusual and found in only 13 households – of which seven alone were in Kwiape village and all but two of the remainder in other Awin villages. Use of kerosene for cooking or of generators, providing such use could be readily monitored, would probably make for good indicators of change in the villages. However, one wonders whether electricity will be something which villages will be able to afford after mine closure.

Lighting is overwhelmingly provided by kerosene (88.7 percent of households) but in 8.3 percent vatica (or damar) gum is still used. Interestingly it is somewhat more common among the Awin.

Population

Introduction:

At first sight, the population of a village is easy enough to measure. Yet a little reflection will show how complicated this all-important and basic measure of a society can be – and especially so in the setting of the lower Ok Tedi where populations moving to and fro have long been a feature of life. Therefore, before presenting and analysing the results of this survey, it is important to note some difficulties that arise in measuring a population and some cautions to be applied when interpreting the data presented later.

If, at any moment in time, one tries to count how many people live in a village, one will almost always find that some of the people present when one counts are simply visiting and are not usually to be found there. One will also find that some of the people who normally live in the village are out of the village when the counting takes place. Thus, in any count of population, there will generally be:

- Persons present who are normally present (normally resident and present)
- Persons who are not usually present (visitors), and
- Persons who are usually there but away when counting occurs (normally resident, temporarily absent).

In official censuses, such as that taken by the PNG National Statistics Office, the problems presented by these different groups are overcome by referring to two sets of population at any one location covered by their census:

- The de facto population – normally resident and present persons plus visitors, and
- The de jure population – normally resident and present persons plus normally resident but temporarily absent persons.

However, there arises another problem: how long does one have to be a visitor in a place before one becomes 'normally resident' and how long away before one ceases to be 'temporarily' and becomes 'permanently absent'? Censuses usually set limits to define these matters. For example, a census might set a guideline whereby someone who has not slept in the village for the past three months is no longer just temporarily absent or that anyone who has slept here for the past three months cannot be a visitor but must be 'normally resident'. In the first case this might mean that a university student or a contract worker may be classed as not normally resident, but a primary school child who stays with a relative each week-night but returns at weekends or a government worker from another part of the country whose work is in the village will be classed as 'normal residents'. In this survey, visitors were defined as persons who had been in the community for less than two months (excluding infants born within the last two months to parents normally resident in the village) and a 'temporary absence' was defined as anything up to two months absence.

These issues are not just academic matters in the lower Ok Tedi. In the mid-1970s, well before construction work for Ok Tedi began it was quite common for villagers in the region to have two houses – one in the village and one on the outskirts of what was then the very small 'town' of Kiunga. Once Ok Tedi got under way in 1980/1, this phenomenon grew rapidly as villagers, especially those from areas with poor access to the new Kiunga – Tabubil road, moved to Kiunga, increasingly on a semi-permanent and then a permanent basis. This is what many of the Yonggom did. It applied less to the Awin villages near the Ok Tedi because they had access to the new road but it did apply to Kokonda people whose road link to Kiunga was completed only in 1993/4 (by which time most of its people had left).

This is of considerable importance to this study. This is because, from a census taker's viewpoint, the migrants in Kiunga are residents of the town, not of the village. But from the villagers' viewpoint – and from that of the migrants themselves – the census taker's attitude is wrong; they are members of the village community because even if they do not live there, they have land there. Of course, the Lower Ok Tedi Agreement (LOTA), the Revised Eighth Supplementary Agreement (R8SA) and associated compensation have given an extra incentive to such migrants to continue to claim full membership of the village community.

One might wonder: how long do migrants have to be away before they cease to be members of the community as far as the community itself is concerned? There is some evidence that villagers regard urban migrants as having lesser claims than their own to compensation in so far as village leaders, when distributing payments to the community as a whole, have tended to give smaller per capita payments to the families of urban migrants. In other ways, the migrants have continued to assert their full right to compensation and, in general, these have been acknowledged by those remaining in the villages. Thus, what the villagers regard as the village population (and therefore what OTML recognises as the population for purposes of compensation) differs rather sharply from what the census taker (and this survey) thinks it is. This is why comparisons between the figures contained here and those reported in OTML compensation patrols are fairly meaningless.

However, population issues in the lower Ok Tedi are even more complicated than this. Not only are what a census would call permanent absentees regarded as village members, but many persons who are by almost any census definition normally resident in the villages are regarded as visitors. The region's location on the border with Indonesian New Guinea, which has seen more or less continuous migration across it over the past six decades, has complicated matters further. Moreover, in recent years there has also been a return to the area of migrants and/or their descendants who left for areas of Western Province - other than Kiunga - decades ago.

The Yonggom of PNG are part of a much bigger grouping of people, the bulk of whom still live across the border in Irian Jaya, where they are referred to as the Muyu (or Moejoe/Mojo). It is certain that the Yonggom are descended from splinter groups of Muyu who moved into what is now PNG in the past two or three centuries. Some groups have moved in within living memory; the Kawok villagers are known to have crossed over in 1944. Interestingly, no-one refers to the Kawok people as 'refugees' or 'border crossers'; they are firmly established as 'traditional' landowners. Yet at Ambaga where at least half the population was either born in Irian Jaya (and crossed over in 1972) or born of Irian Jaya-born parents, that section of the village's population is regarded by the rest of the villagers as 'border crossers' who should not have full communal rights.

On several occasions in the period from 1962 (when Holland relinquished its control over what was then called West Papua or Dutch New Guinea) to a culmination in 1984 when tens of thousands of people crossed into PNG, there have been numerous peaks of border crossers. Many of these movers and their children remain in the Yonggom territory.

Some have married pre-existing settlers – where the husband is from the ‘traditional owner’ group then marriage means assimilation but where it is the wife who marries a border crosser there is a strong likelihood that she will be regarded as having moved out of the ‘traditional landowner’ group. These border crossers have exacerbated an already complicated land ownership problem. In the 1960s, when the de facto takeover of Irian Jaya by Indonesia occurred (the de jure takeover only occurred once the UN left after the 1969 Act of Free Choice), the then Australian colonial administration very strongly encouraged the Yonggom to create new nucleated settlements close to the Ok Tedi out of what had previously been hamlets of one or two houses, often built high up in trees and scattered throughout the forest to the west of the river and across into Irian Jaya. This meant that even many of the ‘traditional’ landowners among the Yonggom were (and are) settled on the territory of others and have (and still do) cultivated other people’s land. The more recent border crossers have only added to the complex mix of ‘true landowners’ and ‘landusers who are not identified as border crossers’. The simple outcome of all this is that many people who would be regarded by any census taker as normal residents of a village are often regarded by their ‘fellow villagers’ as not being members (or at least full members) of the community.

In passing, it should be noted that village nucleation (also from previously scattered hamlets) was also taking place among the Awin in the 1950s and 1960s. Consequently, there are underlying tensions between the ‘true landowners’ and the ‘land users’ in the Awin villages also. This does not impinge as severely on the census taker’s work however, since the ‘landowners’ do accept for most purposes that the land users are part of the village, even if there will be occasions when their right to full community membership will be challenged.

There is one final complication which affects some Awin villages (especially Hopanai) as well as some Yonggom ones (notably Ambaga). Some of the Yonggom from the Ambaga area migrated south to Lake Murray three or more generations back. Given recent events in the lower Ok Tedi, some of the descendants of these individuals have returned (and been accepted back into the community). Some of those who have not returned have also been accepted as land owners. Similarly, one group of Awin from the communities which now make up Hopanai appear to have migrated south to the Suki area fifty years or so ago as a result of internal disputes. Some of these people and their descendants have recently returned. In other Awin villages close to Hopanai (Miamroe and Senamrae), recent return migration from Kiunga also appears to have occurred.

One point touched on earlier needs further emphasis here. ‘Censuses’ have become virtually an annual event in the lower Ok Tedi as a result of the need to keep an up-dated list of all compensation recipients.

As noted earlier, this means that this survey's results are not compatible with those derived from compensation surveys. However, this is not without its uses since the difference between the population numbers discussed here and those of the OTML surveys will give us a rough idea, at least, of how many members of the village-recognised communities normally live outside the village. It is only 'rough', however, since we cannot be certain how many of those normally resident in the villages (and therefore captured by this survey) are excluded by the village communities themselves as being eligible for compensation (and therefore not included in the OTML surveys).

Estimated Populations:

In surveys undertaken by OTML staff for the purposes of payments to be made under the R8SA, the seventeen villages of the lower Ok Tedi area were recorded (in 1995) as having a population of 4,866 persons. In the present survey only 57 percent as many people were enumerated (59 percent of those recorded in Yonggom villages and 54 percent of the Awin). This implies that, overall, more than forty percent of those recognised as part of the village communities are not regularly resident in those villages. In one case, Kokonda, at least 87 percent of those counted in the R8SA survey appear not to be normally resident. Indeed that settlement is in some danger of dying away – except as an occasional dormitory for its previous residents now living in Kiunga. Its population has spread out along the road to Kiunga and in Kona 7. We should note that, since the R8SA data were gathered in 1995, the actual proportion of the 1998 population living elsewhere should be higher than the numbers just mentioned. A similar situation appears, in milder form elsewhere: more than half the R8SA populations registered at Ieran, logi, Kawok and Kwiape were not enumerated in this survey.

Table 2 Enumerated populations

| VILLAGE | De facto population | | | Visitors | | | Temporarily absent | | | De jure population | | |
|----------------|---------------------|-------------|-------------|------------|-----------|------------|--------------------|------------|------------|--------------------|-------------|-------------|
| | M | F | T | M | F | T | M | F | T | M | F | T |
| Ambaga | 108 | 120 | 228 | 2 | 3 | 5 | 36 | 20 | 56 | 142 | 137 | 279 |
| Atkamba | 165 | 170 | 335 | 4 | 2 | 6 | 21 | 18 | 39 | 182 | 186 | 368 |
| Bige | 45 | 23 | 68 | 15 | 2 | 17 | 5 | 9 | 14 | 35 | 30 | 65 |
| Bongabun | 17 | 31 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 31 | 48 |
| Dande 2 | 63 | 47 | 110 | 11 | 2 | 13 | 4 | 2 | 6 | 56 | 47 | 103 |
| Demasuke | 43 | 45 | 88 | 3 | 5 | 8 | 12 | 12 | 24 | 52 | 52 | 104 |
| Dome | 153 | 145 | 298 | 1 | 0 | 1 | 13 | 15 | 28 | 165 | 160 | 325 |
| Hopanai | 65 | 50 | 115 | 0 | 0 | 0 | 13 | 3 | 16 | 78 | 53 | 131 |
| Ieran | 25 | 27 | 52 | 3 | 1 | 4 | 3 | 3 | 6 | 25 | 29 | 54 |
| logi | 71 | 64 | 135 | 0 | 0 | 0 | 11 | 9 | 20 | 82 | 73 | 155 |
| Kawok | 43 | 28 | 71 | 3 | 0 | 3 | 7 | 5 | 12 | 47 | 33 | 80 |
| Kokonda | 29 | 16 | 45 | 0 | 0 | 0 | 6 | 5 | 11 | 35 | 21 | 56 |
| Komokpin | 131 | 116 | 247 | 3 | 1 | 4 | 9 | 9 | 18 | 137 | 124 | 261 |
| Kwiape | 98 | 80 | 178 | 19 | 5 | 24 | 11 | 6 | 17 | 90 | 81 | 171 |
| Miamroe | 114 | 107 | 221 | 12 | 11 | 23 | 13 | 8 | 21 | 115 | 104 | 219 |
| Sarae | 32 | 31 | 63 | 6 | 4 | 10 | 2 | 0 | 2 | 28 | 27 | 55 |
| Senamrae | 147 | 136 | 283 | 18 | 17 | 35 | 14 | 21 | 35 | 143 | 140 | 283 |
| Totals | 1349 | 1236 | 2585 | 100 | 53 | 153 | 180 | 145 | 325 | 1429 | 1328 | 2757 |
| Awin | 636 | 535 | 1171 | 84 | 46 | 130 | 80 | 66 | 146 | 632 | 555 | 1187 |
| Yonggom | 713 | 701 | 1414 | 16 | 7 | 23 | 100 | 79 | 179 | 797 | 773 | 1570 |

It is more appropriate to compare the population data collected in this survey with those obtained during the 1990 PNG Census, which similarly dealt with the resident population. Three lower Ok Tedi villages do not appear in the figures published by the NSO (Bige, Demasuke and Sarae – the last two were probably incorporated into Mimingiri and Matkomnai respectively). For the rest, some comparisons are possible.

Table 3 Populations at different dates

| VILLAGE | Census 1990 | R8SA 1995 | Our survey 1998* | Percent missing 1995 cf 1998 | Percent increase 1998 cf 1990 |
|---------------|--------------|-------------|------------------|---------------------------------|----------------------------------|
| Ambaga | 254 | 359 | 279 | 22 | +9.8 |
| Atkamba | 388 | 607 | 368 | 39 | -4.6 |
| Bige | n.a. | 60 | 65 | (8) | n.a. |
| Bongabun | 46 | 68 | 48 | 29 | +4.3 |
| Dande | 120 | 145 | 103 | 29 | -19.8 |
| Demasuke | n.a. | 132 | 104 | 21 | n.a. |
| Dome | 263** | 478 | 325 | 32 | +23.6 |
| Hopanai | 115 | 186 | 131 | 29 | +13.9 |
| Ieran*** | 93 | 114 | 54 | 52 | -41.9 |
| logi | 172** | 404 | 155 | 62 | -9.9 |
| Kawok | 65 | 160 | 80 | 50 | +23.1 |
| Kokonda | 173 | 482 | 56 | 88 | -67.7 |
| Komokpin | 180 | 456 | 261 | 43 | +45.6 |
| Kwiape | 143 | 372 | 171 | 54 | +19.6 |
| Miamroe | 149 | 397 | 219 | 45 | +47.0 |
| Sarae | n.a. | 96 | 55 | 43 | n.a. |
| Senamrae | 171 | 350 | 283 | 19 | +65.5 |
| TOTALS | 2332+ | 4866 | 2757 | 43 | +8.6++ |

NOTES: * De facto population; ** citizen population only - in 1990 Dome had 499 non-citizens and logi had 220;

*** our survey appears to be an underestimate (see text); + this omits Bige, Demasuke and Sarae;

++ allows for the absence of 1990 data on Bige, Demasuke and Sarae,

For the eight Yonggom villages population growth appears to have been at less than one percent a year which implies that outmigration from them has been taking place, since natural growth rates could confidently be expected to be close to or above two percent a year. The fact that over 700 non-citizens (almost all refugees) were separately identified in the 1990 Census complicates matters in the area; they have been set aside in the calculation of the one percent increase mentioned above.

Among the Awin villages which were individually identified in 1990, population growth to 1998 seems to have been much more rapid at between three and four percent per year. This suggests in-migration to these villages; this is especially so when one considers that Kokonda, which has suffered heavy population losses since 1990, is included in the above calculation. It is, however, the only Awin village to have, apparently, so suffered.

The contrast between the Yonggom and Awin villages is also strong in terms of overall population structure.

The Yonggom villages had very few visitors at the time of our survey - only 1.6 percent of the de facto population - whilst the Awin villages had many more, 11.1 percent of their population. Since 13.2 percent of the de facto male population was visitors (compared to 8.6 percent of the female), some of these are job seekers - but not all. By contrast, both sets of villages had similar proportions of absentees - 11.4 percent of the Yonggom de jure population and 12.3 percent of that of the Awin. In simple terms, this implies that whereas population comes and goes in Awin villages (implying a certain degree of liveliness there) in the Yonggom villages the population just goes, reflecting a certain stagnation there. Connected to this issue are the villages' sex ratios. As elsewhere in PNG, so in this region males tend to migrate in greater proportions than females. Thus, the sex ratio (the number of males per 100 females) is often a good proxy measure of the state of a local economy - providing that basic health services are in place, because a high male to female ratio in remote areas is usually indicative of high mortality rates among women during their child-bearing years. In Awin villages overall, the ratios are 119 (de facto) and 114 (de jure) while they are much lower among the Yonggom (102 and 103 respectively) implying - as other data have suggested - that male in-migration has been occurring among Awin villages and male emigration has been the lot of the Yonggom.

Age and sex structure

Table 4: Age cohorts by gender, de jure and de facto populations

MALES

| Age | Yonggom | | | Awin | | |
|--------------|------------|------------|------------|------------|------------|------------|
| | De facto | De jure | Difference | De facto | De jure | Difference |
| <1 | 26 | 29 | -3 | 15 | 13 | 2 |
| 1-4 | 102 | 108 | -6 | 66 | 68 | -2 |
| 5-9 | 126 | 128 | -2 | 76 | 78 | -2 |
| 10-14 | 69 | 81 | -12 | 97 | 99 | -2 |
| 15-19 | 71 | 83 | -12 | 67 | 72 | -5 |
| 20-29 | 129 | 155 | -26 | 132 | 130 | 2 |
| 30-39 | 85 | 87 | -2 | 80 | 74 | 6 |
| 40-49 | 53 | 60 | -7 | 36 | 32 | 4 |
| 50-59 | 37 | 41 | -4 | 27 | 27 | 0 |
| >60 | 21 | 21 | 0 | 33 | 29 | 4 |
| TOTAL | 719 | 793 | -74 | 629 | 622 | 7 |

FEMALES

| Age | Yonggom | | | Awin | | |
|--------------|------------|------------|------------|------------|------------|------------|
| | De facto | De jure | Difference | De facto | De jure | Difference |
| <1 | 17 | 18 | -1 | 6 | 5 | 1 |
| 1-4 | 83 | 87 | -4 | 63 | 63 | 0 |
| 5-9 | 94 | 100 | -6 | 70 | 69 | 1 |
| 10-14 | 98 | 112 | -14 | 76 | 84 | -8 |
| 15-19 | 65 | 73 | -8 | 56 | 68 | -12 |
| 20-29 | 162 | 179 | -17 | 104 | 103 | 1 |
| 30-39 | 74 | 86 | -12 | 61 | 62 | -1 |
| 40-49 | 59 | 68 | -9 | 51 | 51 | 0 |
| 50-59 | 38 | 41 | -3 | 22 | 23 | -1 |
| >60 | 10 | 10 | 0 | 25 | 27 | -2 |
| TOTAL | 700 | 774 | -74 | 534 | 555 | -21 |

Mean age (years)

21.9

23.2

Given the extreme variation of population counts in recent years in this area, the presence of border crossers and the large proportions of the every village's population living in nearby Kiunga who could at any time return to live in their villages, forecasting future populations is extremely difficult. To a small extent, such forecasting may be assisted by a close examination of age and sex structures since these give an idea of likely future fertility relative to the population as a whole.

First, it is noticeable that among the Yonggom males absenteeism is highest between the ages of 10 and 29; among females, absenteeism is high at all ages between 10 and 49. Among the Awin, absenteeism is very low for males and only significant among females in the 10 to 19 years age group, presumably because of absences for education.

Table 5 Sex ratios by age cohort (males per 100 females)
(de jure population)

| AGE GROUP | YONGGOM | AWIN |
|----------------|------------|------------|
| 0-4 | 130 | 119 |
| 5-9 | 128 | 113 |
| 10-14 | 72 | 118 |
| 15-19 | 114 | 106 |
| 20-29 | 87 | 126 |
| 30-39 | 101 | 119 |
| 40-49 | 88 | 63 |
| 50-57 | 100 | 117 |
| >60 | 210 | 107 |
| Overall | 103 | 112 |

Second, sex ratios overall for the Yonggom are close to being in balance (i.e. close to 100) except among the very young and the old. Among the Awin and with one exception (the 40-49 year cohort) males consistently outnumber females. This is a reflection of the fact that not only has semi-permanent migration of both sexes from Yonggom villages been high, but even among those supposedly permanently resident there is a high proportion of absenteeism. By contrast there is an artificially high sex ratio among the Awin not only because of some in-migration, but because whatever emigration there is, is evenly balanced between males and females. (Note: the sex ratios quoted are based on de jure populations - they would be even higher if we included the male visitors in the villages around the location of the dredging project.) Consequently, the Yonggom exhibit somewhat larger proportions of their populations aged 9 years or less. On the other hand, the Awin villages are home to a higher proportion of elderly residents.

Table 6: Age cohorts as proportions of total population (de jure)
(figures are percentages)

| Age Cohort | Yonggom | | Awin | |
|-------------------------|-------------|--------|-------------|--------|
| | Male | Female | Male | Female |
| 0-4 | 17.3 | 13.5 | 13 | 12.3 |
| 5-9 | 16.1 | 12.9 | 12.5 | 12.4 |
| 10-14 | 10.2 | 14.5 | 15.9 | 15.1 |
| 15-19 | 10.5 | 9.3 | 11.6 | 12.3 |
| 20-29 | 19.5 | 23.1 | 20.9 | 18.6 |
| 30-39 | 10.9 | 11.1 | 11.8 | 11.2 |
| 40-49 | 7.6 | 8.8 | 5.1 | 9.2 |
| 50-59 | 5.2 | 5.3 | 4.3 | 4.1 |
| >60 | 2.6 | 1.3 | 4.7 | 4.9 |
| Dependency ratio | 0.79 | | 0.83 | |

Migration

Knowing where respondents were born and their present residence, tells us a starting and finishing point for their lifetime migration, although it does not tell us anything about any intermediate moves they may have made. This survey also asked the whereabouts of all people over eight years of age at the time of the 1990 national census thus giving us one such intermediate point.

Slightly more males than females were both in the village in which they were enumerated. This is because, as in many parts of the world, close to half of all marriages involve the female spouse moving, upon getting married, to the place where her husband lives.

However, this situation is reversed when we look at the 1990 figures: more females than males were registered as being in the same place in 1990 as they were in 1998, implying that once they are married females move less often than males.

A second point of note is that very few Awin village residents were either born in or resident (in 1990) in a Yonggom village and the same is true in reverse. There appears to be very little intermingling of the two groups - a point which reappears when we examine language use.

There is however one 'group' with whom the Yonggom do have strong links. One in seven of those living in Yonggom villages were born in Irian Jaya and the proportion is much higher for females than for males. When one adds to these the children born of Irian Jaya-born parents, the proportion of the population with immediate Irian Javan ancestry rises to at least one in three. This is itself probably an underestimate since there are several good reasons why one might wish to conceal being born in Irian Jaya, especially in a survey like this that, whatever

Table 7a): Place of residence at time of birth (de jure population)

| | AWIN | | | | YONGGOM | | | |
|------------------------|------------|----|------------|----|------------|----|------------|----|
| | MALE | | FEMALE | | MALE | | FEMALE | |
| | n | % | n | % | n | % | n | % |
| Same village | 364 | 58 | 273 | 49 | 513 | 64 | 443 | 57 |
| Other Yonggom | 4 | 1 | 3 | 1 | 87 | 11 | 107 | 14 |
| Other Awin | 149 | 24 | 181 | 32 | 11 | 1 | 10 | 1 |
| Other North Fly | 60 | 9 | 52 | 9 | 59 | 7 | 46 | 6 |
| Other Western Province | 34 | 5 | 26 | 4 | 31 | 4 | 23 | 3 |
| Other PNG | 16 | 3 | 24 | 4 | 14 | 2 | 18 | 2 |
| Irian Jaya | 0 | - | 1 | - | 70 | 9 | 122 | 16 |
| Other | 0 | - | 0 | - | 0 | - | 0 | - |
| Not stated | 0 | - | 0 | - | 12 | 2 | 4 | 1 |
| Total | 627 | | 560 | | 797 | | 773 | |

Table 7b) Place of residence at time of 1990 Census (de jure population)

| | AWIN | | | | YONGGOM | | | |
|------------------------|------------|----|------------|----|------------|----|------------|----|
| | MALE | | FEMALE | | MALE | | FEMALE | |
| | n | % | n | % | n | % | n | % |
| Same village | 294 | 66 | 287 | 69 | 426 | 74 | 452 | 77 |
| Other Yonggom | 2 | - | 2 | - | 18 | 3 | 34 | 6 |
| Other Awin | 69 | 15 | 64 | 15 | 7 | 1 | 13 | 2 |
| Other North Fly | 44 | 10 | 29 | 7 | 80 | 14 | 52 | 8 |
| Other Western Province | 23 | 5 | 21 | 5 | 30 | 5 | 24 | 4 |
| Other PNG | 5 | 1 | 6 | 1 | 10 | 2 | 11 | 2 |
| Irian Jaya | 0 | - | 2 | - | 0 | - | 0 | - |
| Other | 0 | - | 0 | - | 0 | - | 0 | - |
| Not stated | 10 | 2 | 4 | 1 | 3 | 1 | 3 | 1 |
| Total | 447 | | 415 | | 574 | | 589 | |

the protestations of the interviewers, one suspects may have something to do with land rights and compensation.

A fourth significant feature arising out of Table 7 is the importance of movement between Kiunga and both Awin and Yonggom villages (Kiunga is grouped under 'other North Fly' in the table). For example, of those enumerated at Kwiape aged over eight years, nearly one-third were, in 1990, resident in Kiunga; this applies to a quarter of the Miamroe population. These figures suggest that a return migration to these villages of some importance has taken place since 1990. Similarly, the survey has identified pre-1990 return migration flows from Lake Murray by Buseki Yonggom to Komokpin (13 percent of the 1998 population excluding children born since the return) and from Suki to Hopanai (11 percent). There are very good reasons why one might have reasonably expected some sort of return flows to Kwiape, Miamroe and Hopanai given the establishment of the dredging project and the job opportunities villagers expect it to create for them. A key issue in future will be whether (a) such expectations are fulfilled and (b) whether any such return flow might continue. This will require monitoring and may best be achieved by both a simple regular count of houses and regular consultation with village leaders.

Food and Diet

It is not possible in a simple questionnaire survey of this sort to obtain the range of details of diet that are necessary to determine nutrition levels in a community. That requires very detailed observation and record keeping over a period of time.

However, some information on food intakes was gathered, first, from a question asked of all households as to the contents of their preceding evening meal (this was on the short questionnaire). Secondly, we asked on the long questionnaire what foods had been bought, raised or caught in the preceding week. These data, even if they are only indicative, are of considerable interest.

The data obtained from the short questionnaire clearly show that, in general, the villages can be divided into two clusters: those which seem to have lower starch and higher animal protein intakes (Kwiape, Bige, Kokonda, Senamrae, Miamroe and Kawok in descending order of meat intake - in all these places half or more people ate meat or fish on the preceding evening) and those that have very limited animal protein intakes and a more varied set of sources of starchy foods. It will be noted that all but Kawok of the first group are Awin villages, even though Demasuke, Sarae, Dande and Hopanai (also Awin) fall into the group apparently eating little animal protein.

It could be argued that where meat/fish are not available or affordable then an attempt might be made to make up for this deficiency by varying the number of types of starchy foods consumed. However, it is also important to note that meat consumption, except in Kawok's case, is strongly associated with rice consumption ($r = +0.57$). That is meat is associated with cash economy. Meat eating is also negatively associated with consumption of sago ($r = -0.54$). Rice eating and sago consumption are negatively associated ($r = -0.49$) which suggests that they are substitutes for each other.

A further point of interest in Table 8 is that (even when Bongabun is omitted - its figures look unduly low), the Yunggom villages not only have lower intakes of meat/fish but they form a best fit curve (which, if the note above about meat/starch substitution is valid, would effectively be an indifference curve) at somewhat lower values on both meat and starch

Table 8: Percentage of de facto population eating selected foodstuffs at evening meal

scales than do the Awin. The implication of this would be that the Yunggom have lower food intakes all round than do the Awin.

Figure 1 Relationship between starch and meat consumption

However, since we did not actually ascertain how much food was eaten (let alone weigh it or calculate its calorific or protein components) this must remain a tentative suggestion. What is certain is that, except for Kawok, all the big protein consumers are Awin villages and that all but one of the Awin villages which are not big protein consumers (the exception being Hopanai) eat a wider variety of starch foods than any Yonggom village.

Overall, two-thirds of the population ate sago, a third ate bananas, a quarter ate rice , a quarter ate sweet potato, a quarter ate another starchy food, a third ate some sort of meat and one-fifth ate vegetables (the fractions add up to more than one since most people ate several types of food). Tea is the favoured drink of just under one-fifth of the population; hardly anyone uses coffee. Fifty people, all in Yonggom villages, reported eating nothing on the preceding evening (given the nature of the question we cannot be sure whether or not this means they ate nothing at all the previous day).

The second source of data within the survey arose from a question in the LQ on food purchases in the preceding week which applied to 46 Awin and 35 Yonggom households (two Awin and two Yonggom households covered by the LQ gave incomplete answers to this section of the LQ). This data set is somewhat less useful but it generally does confirm the findings from the SQ.

As can be seen from Table 9 there were few differences for most foodstuffs between the two sets of villages. However, the Awin reported consuming significantly more fresh fish, tinned meats, fresh meats (note that a fairly high proportion of households ate meat caught by hunting) and bought vegetables. Amongst the households interviewed in this part of the survey, the total fortnightly expenditure on food was K10 per person for Yonggom respondents and K19 for those from Awin villages. Evidently, households in all villages rely to some degree on the cash economy for the supply of their food needs, but this reliance is much more deeply ingrained in the Awin villages than it is among the Yonggom, and it is especially apparent in the villages which immediately neighbour the dredging project. It would seem that this is likely to be a recent phenomenon occurring once the Bige to Dande road was gravelled (in early 1996).

Table 9: Percentages of households buying/producing selected foodstuffs in the preceding week

| Food type | Yonggom (n = 35) | Awin (n = 46) |
|----------------------------|-------------------------|----------------------|
| Tinned fish | 77 | 85 |
| Fish - caught | 17 | 43 |
| Fish - bought | 9 | 24 |
| Tinned meat | 51 | 76 |
| Fresh meat - bought | 14 | 13 |
| Fresh meat - caught/raised | 8 | 37 |
| Eggs - raised/bought | 6 | 6 |
| Sago - bought | 6 | 17 |
| Sago - produced | 89 | 80 |
| Rice - bought | 80 | 87 |
| Kaukau - produced | 86 | 83 |
| Bananas - produced | 77 | 80 |
| Other starch - produced | 60 | 65 |
| Vegetables - produced | 86 | 78 |
| Vegetables - bought | 11 | 36 |
| Coconuts - produced | 57 | 57 |

Education and Training

Prior to the commencement of OTML operations, old established schools in the lower Ok Tedi area were located at Atkamba and Kungim while a new one had just been opened at Senamrae in 1975. Before the opening of the last, students in the Awin villages went either to Matkomnai or Rumginae. It is a little surprising therefore to find that, on average, the people in Awin villages are somewhat better educated than the Yonggom. A quarter of all Yonggom males and close to half all Yonggom females have had no education at all ; the comparative figures for the Awin are one in nine males and just over one-third of females.

Table 10: Highest level of completed education achieved
(in percentages)

| Level | YONGGOM | | AWIN | |
|---------------------|-------------|-------------|-------------|-------------|
| | Male | Female | Male | Female |
| Nil | 27.8 | 44.9 | 11.1 | 34.8 |
| Grades 1-3 | 7.2 | 7.9 | 8.5 | 8.2 |
| Grades 4-6 | 47.7 | 40.5 | 51.7 | 44.6 |
| Grades 7-9 | 4.7 | 2.3 | 8.3 | 7.2 |
| Grades 10-12 | 8.4 | 3 | 18.2 | 3.9 |
| Post-secondary | 1.4 | 0.7 | 1.1 | 0.0 |
| Not stated | 2.8 | 0.7 | 1.1 | 1.0 |
| Total (n) | 428 | 434 | 352 | 307 |
| Mean score * | 1.62 | 1.12 | 2.18 | 1.37 |

* where Nil = 0, 1-3 = 1, 4-6 = 2, 7-9 = 3, 10-12 = 4, PS = 5

For those currently at school the significance of the figures is less clear. This is partly because until education is actually completed we will not know what the highest level attained will be and partly because, since there is no secondary school in the area, many of the area's children are not residents here. However, it is interesting to note that among the Yonggom there are more females than males at all levels of education and even among the Awin there is close to being a balance between the sexes.

Table 11: Completed education score* by village and sex

| | AWIN | | | YONGGOM | |
|----------|------|--------|----------|---------|--------|
| | Male | Female | | Male | Female |
| Demasuke | 2.56 | 1.74 | Bongabun | 1.8 | 0.89 |
| Miamrae | 2.37 | 1.36 | Dome | 1.78 | 1.40 |
| Senamrae | 2.30 | 1.56 | logi | 1.77 | 1.00 |
| Sarae | 2.30 | 1.27 | Atkamba | 1.64 | 1.21 |
| Bige | 2.24 | 1.13 | Kawok | 1.63 | 1.05 |
| Kwiape | 2.16 | 1.27 | Komokpin | 1.62 | 1.08 |
| Dande | 2.09 | 1.19 | Ambaga | 1.34 | 0.87 |
| Holpanai | 1.68 | 1.15 | Ieran | 1.08 | 1.00 |
| Kokonda | 1.57 | 1.14 | | | |

* See Table 10.

By weighting the levels of education achieved, an average score for education by village can be calculated. It is noticeable that for males, every Awin village except Hopanai and Kokonda, receives a higher score than any Yonggom village. However, the fact is that despite progress the level of education across the area remains low for the simple reason that the majority of those villagers who have received a secondary education no longer remain in the village but have moved to Kiunga or beyond to other PNG centres.

Training received after the completion of school also strongly favours the Awin. (Note that post-school training here includes training at the Kiunga Vocational Centre and at the Boys' Town vocational training centre at Kiunga run by the Montfort Catholic Mission; part of their training includes some elements of the secondary school academic syllabus.) Of Awin males 15 years or older, 38 percent (and of females 8 percent) have received such further training. The comparative figures for the Yonggom are 16 and 2 percent respectively. It is evident, once more, that the Yonggom village populations are much less involved in the modern economy - even if one suspects that this is because any one in those villages who wishes to partake in that economy has to leave in order to do so whilst Awin people, with better road access, have a slightly greater choice in this matter.

Occupations and Employment

The overwhelming bulk of the population aged fifteen years and over in the area is engaged in subsistence farming; this is especially so for females.

However, once more, this is somewhat less true of the Awin than of the Yonggom. One-third of all Awin adult males are in employment. It is probably a consequence of this that one in eight Awin women class themselves as housekeepers, compared to one in twenty Yonggom women. Paralleling the growth of employment, the first signs of unemployment are first appearing among the Awin. Although it affects only 22 persons in our survey, it nevertheless seems significant that just over 6 percent of Awin males can probably be classed as unemployed in the sense that they do not list themselves as having any occupation and they also appear to have completed their formal education. If one expressed unemployment in terms of a proportion of the non-subsistence sector, then this rate would be 13.5 percent. Almost all these 'unemployed' people are males and young.

Table 12: Occupations of those aged 15 years and over
(in percentages)

| | YONGGOM | | AWIN | |
|------------------------|---------|--------|--------|---------|
| | Male | Female | Male | Female |
| Subsistence farmers | 80.5 | 84.9 | 54.2 | 73.6 |
| Employed/self employed | 10.3 | 1.3 | 32.5 | 3.6 |
| All others* | 9.2 | 13.8 | 13.3** | 22.8*** |
| n | 447 | 457 | 354 | 334 |

* Includes housekeepers, retired, handicapped, still at school, unemployed, other and not state

** Includes 6.2% unemployed *** Includes 12.1% housekeepers

The proportion of females employed for wages is extremely low. This is by no means solely a function of their lower levels of education. There were 63 Yonggom and 97 Awin males who were both over 15 years of age and who had completed Grade 7 or better education; of the total over 15 year old males in the two communities, 46 Yonggom and 115 Awin were employed. If we divide the percentage of the population with both the basic education and the age by the proportion who are employed we get a measure of any group's probability of getting employment. For Awin males we get a figure of 119. If we then express this as a base figure of 100, we find that the chances of a male resident of a Yonggom village being employed compared to those for an Awin male are 63. Evidently an Awin male has a much better chance of getting employment - even if we take education into account. For females the comparative figures are: Awin 30 and Yonggom 19. So we can say that it is about three times as hard for a woman, whether Awin or Yonggom, to get employed as it is for a male of equal education in the same ethnic group; but it is half as hard again for a Yonggom (male or female) than an Awin. This latter fact may reflect the reality that the great majority of Yonggoms with education who come from the Ok Tedi villages have actually migrated to Kiunga whereas many of the Awin with education are still in their villages.

It should be pointed out that whilst outsiders from societies which in recent years have begun to regard it as a bad thing if women do not have the same employment opportunities as men might regard the preceding figures as clear evidence of discrimination against women in employment, it is by no means clear that village leaders would agree with this conclusion.

OTML and companies closely associated with it, such as Dredeco, KCS, Poons, KT Plumbing and Tabubil Engineering, as well as LOTIC (whose existence is dependent upon OTML compensation payments) account for the greater part of employment in the region. Of the 170 persons enumerated in our survey as being employed, over 100 are employed by these companies. It should be noted that, with the one exception of LOTIC - which hires cleaners-, none of these, including OTML itself, was employing a single woman at the time of the survey. Of the remainder of the 170 jobs in the region, government accounts for just under half.

If one has employment, one needs to live within daily commuting distance of the place of work. Consequently, since there is no employment on the Yonggom side of the river - apart from at a few government and mission service points - it is unlikely that many Yonggom working at Bige, other OTML sites or in Kiunga will actually be resident in their villages. Thus, even though this survey showed that of the de jure populations only 15 Yonggom compared to 43 Awin had jobs with OTML, one cannot conclude from this that Awins necessarily get more employment. All one can say on the basis of this data is that if a Yonggom chooses to stay in the village they are much less likely to get work than an Awin who also chooses to reside in the village.

The monitoring of employment by OTML should be a relatively simple job given that OTML keeps its own records and could readily obtain parallel records from its contractors. However, it is not clear that given the present system of categorising the company's labour force employees individual villages could be identified, or their ethnic affiliation.

Language Use

Although seemingly of fairly minor importance in the short term, language use and its variations and changes are one of the most significant long term indicators of cultural (and therefore social) change. It is likely that in the limited time available for this survey the figures presented here overstate fluency in languages. This is because our data are entirely dependent upon what respondents claimed to be able to speak or be familiar with - without any objective testing on the part of the interviewers. Nevertheless they are of interest in several ways.

Table 13: Language understood by person aged 5 years and over
(in percentages)

| | YONGGOM | | AWIN | |
|---------------------|---------|--------|------|--------|
| | Male | Female | Male | Female |
| Yonggom | 99 | 99 | 1 | 1 |
| Aekyom (Awin) | 0 | 1 | 98 | 97 |
| English | 41 | 33 | 74 | 59 |
| Pisin | 39 | 19 | 57 | 32 |
| Hiri Motu | 16 | 6 | 25 | 12 |
| Bahasa (Indonesia) | 4 | 9 | 0 | 0 |
| Others | 1 | 1 | 5 | 6 |
| n = | 661 | 660 | 552 | 487 |
| Language per person | 2.00 | 1.68 | 2.60 | 2.07 |

* Percentage of each column; since individuals usually speak/understand more than one language column totals exceed 100.

Firstly, to outsiders, it may be surprising that very few Yonggom speak or understand Aekyom¹ and very few Awin understand Yonggom. 'Surprising' because the two groups live right next to each other. Yet - as the data on birthplace and migration also show - there appears not only to have been very little intermarriage between the two groups, but little social contact of any sort between them prior to the introduction of outside languages. It is these latter which have become the lingua franca of the lower Ok Tedi. Secondly, the presence of outsiders, as teachers and other government servants, plus some newly in-married brides from elsewhere in Papua New Guinea, means that there are resident individuals who do not speak the relevant local language in many villages.

Thirdly, the Awin claim to speak rather more outside languages than do the Yonggom. Whilst, on average, Yonggom males claim to be able to speak 2.0 languages, Awin males claim 2.6; the corresponding figures for females are 1.7 and 2.1. Evidently women are slightly less familiar with external languages than men. If familiarity is an indicator of frequency of contact, then we might also conclude that the Yonggom's greater physical isolation is reflected in their language use. Fourthly, the lingua franca of the area have changed over time. In the early part of this century, Bahasa Indonesia was in use as a trade language introduced by bird of paradise hunters from the west. When Australian rule extended to the area, Hiri Motu followed it as the language of officialdom. Today, Motu usage is generally restricted to older people. Almost all children who have gone through school claim English rather than Motu as their first non-local language.

¹ Aekyom is what the Awin call themselves. 'Awin' is the name for them among the Yonggom which has been adopted mainly because the first Europeans to come to the area first met the Yonggom. Had it been the other way round we might refer to the Aekyom and the 'Gome' - which is the Aekyom word for the Yonggom.

Migration to the towns of the area by other Papua New Guineans has also led to the rapid spread of Tok Pisin, very much more so among males than females at this point. Consequently, English seems to be the most widely understood language among women, but Pisin is nearly as widely understood as is English among men. Fifthly, it seems likely that the proportion of the Yonggom who can speak Bahasa may be understated given the proportion of the population that was born in Irian Jaya. Nearly 100 persons claimed knowledge of Bahasa in Yonggom villages - of whom two-thirds were female. Among the Awin only two persons, both women, claimed familiarity.

It seems likely that language use is currently undergoing very rapid, intergenerational change. We may expect, with some confidence, that the proportions of the population claiming fluency in Motu will continue to decline sharply and that use of Pisin (especially) and English (among those who are educated) will increasingly dominate inter-group communication. There is, however, very little sign of Yonggom or Aekyom being displaced in everyday household use (which was also a question of the SQ). Thus the level of real fluency of use of these non-local languages, notably English, is likely to remain low.

Health

All *de jure* respondents were asked whether they had been sick in the month preceding the survey and, if so, where, if anywhere, the illness had been treated. Three in ten reported having been sufficiently sick to warrant treatment of some sort. There were no significant differences in the proportions reporting being ill between the Yonggom and Awin, except among males over thirty where Awin males were noticeably more likely to report having been ill. This may, however, be a reflection of the fact that, among the Awin, there is twice as high a percentage of males aged 60 or more as there is among the Yonggom.

Table 14: Proportion of the whole population who were sick in the preceding month
(percentages by age & gender)

| | YONGGOM | | | AWIN | | |
|--------|-------------|---------|-----|-------------|---------|-----|
| | Age : 0 - 9 | 10 - 29 | >30 | Age : 0 - 9 | 10 - 29 | >30 |
| Male | 36% | 18% | 35% | 35% | 15% | 48% |
| Female | 37% | 21% | 41% | 33% | 19% | 43% |

Of the 800 or so cases of illness recorded, six percent went without any formal treatment and only just over half were treated at health facilities within the area covered by the survey.

The remaining forty percent were treated at Kiunga (14 percent), Rumginae (10 percent), Kungim (7 percent), Matkomnai (6 percent), Ningerum, Tabubil and Ienkenai (one percent or less each). Within the area, Senamrae was easily the most heavily used centre accounting for 22 percent of all cases treated and drawing patients from Hopanai, Kwiape, Bige and Kokonda as well as from Senamrae itself. The clinic at Dome services only Dome and logi and dealt with 13 percent of all cases. Komokpin serves only that village. A most interesting feature was that half of the cases reported at Atkamba were actually treated at Kiunga (or Rumginae) which indicates not only how Atkamba's health facilities have declined in recent years (in absolute as well as relative terms) but also how individual mobility - even for the sick - has increased.

THE LONG QUESTIONNAIRE

Introduction

It was originally hoped that one in five (20 percent) of households and people would be covered by the more detailed questions of the long questionnaire. In the event, this target was not achieved because of the under-sampling in Yonggom villages.

Table 15. Long Questionnaire Sampling

| | Occupied houses | De jure population | LQ houses | | LQ population | |
|----------------|-----------------|--------------------|-----------|-------------|---------------|-------------|
| | | | n | % total | n | % total |
| Yonggom | 258 | 1570 | 38 | 14.7 | 240 | 15.3 |
| Awin | 206 | 1187 | 47 | 22.8 | 270 | 22.7 |
| Overall | 464 | 2757 | 85 | 17.3 | 510 | 18.5 |

Similarly, on the Awin side (except for Kokonda) all interviewees, whether covered by the LQ or the SQ, had opinions and concerns individually recorded. On the Yonggom side, the field survey teams decided to record general opinions in overall community terms rather than on a household-by-household basis. This means that the details available on people's opinions are much more specific for the Awin than for the Yonggom.

Although this survey was intended as a baseline survey prior to the commencement of dredging and to any impacts that might have, it should be pointed out that it was undertaken after substantial payments of compensation had occurred during 1996 and 1997. These included, but were not restricted to, payments made a) under the terms of the Revised Eighth Supplementary Agreement (R8SA) which pays, in current terms, an increasing per capita sum annually to all villages party to that agreement - in 1996 this was worth K123 per person; b) under the terms of the Lower Ok Tedi Agreement, compensation for general damages to village lands and c) compensation for specific damages; d) by the Fly River Development Trust which up to 1966 both paid out monies under its Village Development Fund and undertook communal infrastructure projects in villages along the Ok Tedi and the Fly River; the VDF was dropped in 1996.

All in all during 1996 or early 1997, these various funds paid out over K5.5million to fifteen of the villages covered by this survey; Dande and Hopanai were not parties to the foregoing agreements. The moneys were paid out to all those who were acknowledged by the community to have either ownership or user rights to land along the Ok Tedi. These numbered 4,535 for the surveyed villages - which figure is 80 percent larger than the number of people enumerated in this survey as de jure normal residents of the villages. So, effectively we know that roughly K3m was paid out to those normally resident over about fifteen months. In cash terms this works out at around K75 per person per month.

Such payments ought to have had a reasonably substantial impact on the area prior to the commencement of dredging - and certainly in advance of our survey. It will be noted that, overall, payments to the Yonggom villages were sixty percent larger than those made to Awin villages. This was partly because some villages were not eligible for some categories of compensation. In all villages which did receive compensation, the sums paid - by rural PNG standards - were substantial. Given that the mean size of household in the villages, from our survey, is 5.9 persons, then the mean household receipts would have been in the vicinity of K7,000 from the various sources mentioned. The lower Ok Tedi people may not have benefitted greatly - especially in terms of direct cash payments - from the Ok Tedi project previously, but as a result of these agreements they are now amongst the most substantial beneficiaries.

Table 16: Payments derived from OTML to Lower Ok Tedi villages, 1996.

(in thousands of kina)

| | Compensation | LOTA | R8SA | FRDT | Total | * Population 1995 | Kina/person |
|------------------|-----------------|-----------------|---------------|---------------|-----------------|-------------------|-----------------|
| YONGGOM | | | | | | | |
| Ambaga | - | 154.80 | 44.20 | 29.40 | 228.40 | 359 | 636.00 |
| Atkamba | 405.40 | 660.00 | 74.70 | 26.30 | 1,166.40 | 607 | 1,921.00 |
| Bongabun | 85.80 | 39.90 | 8.40 | 5.20 | 139.30 | 68 | 2,050.00 |
| Dome | 229.10 | 241.70 | 58.80 | 29.90 | 559.50 | 478 | 1,170.00 |
| Ieran | 162.30 | 252.40 | 14.00 | 8.00 | 436.70 | 114 | 3,831.00 |
| Iogi | 162.80 | 152.10 | 49.70 | 20.60 | 385.20 | 404 | 953.00 |
| Komokpin | 387.40 | 155.50 | 56.10 | 16.80 | 615.80 | 456 | 1,351.00 |
| Sub-total | 1,432.80 | 1,656.40 | 305.90 | 136.20 | 3,531.30 | 2,486 | 1,420.00 |
| AWIN | | | | | | | |
| Bige | 67.00 | 70.40 | 7.40 | 7.40 | 152.20 | 60 | 2,536.00 |
| Dande | - | - | - | - | - | 145 | - |
| Demasuke | - | 41.80 | 16.20 | 1.50 | 59.50 | 132 | 451.00 |
| Holpanai | - | - | - | - | - | 186 | - |
| Kokonda | - | 404.70 | 59.30 | 17.30 | 481.30 | 482 | 998.00 |
| Kwiape | 179.80 | 308.20 | 45.80 | 11.10 | 544.90 | 372 | 1,464.00 |
| Miamrae | 147.80 | 124.60 | 48.90 | 17.30 | 338.60 | 397 | 853.00 |
| Sarae | - | 52.70 | 11.80 | 4.50 | 69.00 | 96 | 719.00 |
| Senamrae | 139.70 | 125.60 | 43.10 | 18.40 | 326.80 | 350 | 934.00 |
| Sub-total | 534.30 | 1,128.00 | 232.50 | 77.50 | 1,972.30 | 2,220 | 888.00 |
| TOTAL | 1,967.10 | 2,784.40 | 538.40 | 213.70 | 5,503.60 | 4,706 | 1,179.00 |

* This was the population registered by OTML staff as being eligible for payments. It is most IMPORTANT to note that, as seen elsewhere, close to half these persons are not permanent resident in the villages. Thus, when considering household incomes and expenditures as recorded by this survey, it is important to remember that a substantial portion of these funds did not go to persons studied in this survey.

Mobility

Work in other parts of Papua New Guinea has shown that movement by villagers increases very substantially once cash starts to enter the economy. Does this apply among the people of the lower Ok Tedi? Since this, as far as we know, is the first survey of mobility in the area we cannot yet answer the question authoritatively. However, from what we know of other differences between the Awin and Yonggom we can hazard a guess. Clearly, Awin villagers move around much more frequently than do the Yonggom. However, we should remember that the Awin have good access to the main Kiunga-Tabubil road whereas the Yonggom have no road access at all.

It is therefore difficult to conclude that increased income (or in this case differences in income) alone accounts for the differences displayed in mobility. Moreover, the real difference between the two groups' data sets is not that the Awin make more trips to district centres (i.e. Kiunga) than do the Yonggom but that they visit each others' villages frequently while the Yonggom do not. One of the implications of the data is that the Yonggom - already identified as being more isolated from the rest of the region than the Awin - are also more isolated from one another.

Table 17: Trips made by respondents in preceding week

| | YONGGOM | AWIN |
|--------------------------|---------|------|
| Total Households | 38 | 47 |
| Total Trips | 28 | 80 |
| Trips per household | 0.74 | 1.7 |
| Population Total | 240 | 270 |
| Person trips | 52 | 103 |
| PT/person | 0.21 | 0.37 |
| % of all trips to Kiunga | 100 | 48 |

Possessions and Assets

Respondents to the LQ were asked to list not only their available garden land, sago groves and livestock but their possession of a number of items we can associate with the cash economy.

Table 18. Land & Animals

| | YONGGOM | AWIN |
|--|---------|------|
| Gardens /Household | 2.5 | 3.2 |
| Gardens /Person | 0.4 | 0.6 |
| % Household making sago* | 74 | 77 |
| % Household hunted* | 45 | 38 |
| % Household hunted of which successful | 59 | 67 |
| % Household fished* | 32 | 55 |
| % Household fished of which successful | 83 | 73 |
| Pigs per household | 0 | 0.21 |
| Chickens per household | 3.6 | 9.2 |
| Cassowaries per household | 0 | 0.06 |
| Cattle per household | 0 | 0.4 |
| Other livestock per household** | 0 | 0.1 |

* in previous week

** Crocodile

Per person the Awin have fifty percent more gardens per person than the Yonggom.

They are at least as well provided for the Yonggom in terms of access to sago groves (or, more correctly, no worse off than the Yonggom). They hunt as much do the Yonggom; perhaps a little surprisingly, both groups had about one-quarter of households who had successfully hunted in the past two weeks. Moreover, they are more frequent fisherfolk; about 27 percent of Yonggom households had caught fish in the past two weeks compared to 40 percent of Awin households. In terms of domestic, commercial animals the Yonggom appear to have virtually none whilst there are a few of all types listed among the Awin. We might conclude that in no area of the agricultural economy are the Awin worse off than the Yonggom and that in most they are considerably better off. (Note that rubber growing is included in the Income and Expenditure data below.)

Such differences are not apparent when we examine the distribution of 'modern' possessions.

Table 19. Possession of selected "modern" consumer Items

| | YONGGOM | AWIN |
|----------------|----------------|-------------|
| Watches | 39% | 49% |
| Radio | 74% | 57% |
| Sewing Machine | 53% | 43% |
| Motor Vehicle | 3% | 15% |
| Canoe | 55% | 72% |
| Outboard Motor | 18% | 2% |

Given the recent and large compensation payments it is not surprising to find a reasonably wide distribution of modern consumer goods in most villages. It will be noted, however, that for the Yonggom, who are effectively without any road access, possession of or access to an outboard motor is very much more important than it is to the Awin. For the latter, access to motor vehicle transport is very much more important and the fairly high frequency of vehicle ownership helps explain the relative high degree of mobility exhibited by the Awin and discussed above.

Incomes and Expenditures

Questions on incomes and expenditures were deliberately placed in the final section of the questionnaire since there existed some doubt in the minds of the survey team whether the detail involved in these questions would not irritate respondents. Rather than risk being unable to complete other sections of the schedule, this was placed last. However, there is little doubt that, almost without exception, respondents were happy to answer the questions.

Given our ability to cross-check the answers with a knowledge of funds available from compensation payments and, on at least one occasion, to cross-check answers in one part of the section with those in another we also think the answers were honest and as accurate as could reasonably be expected.

However, there is also reason to believe that the figures on income are likely to be less accurate than those on expenditure. This is because it is evident from the answers given that many people were not entirely accurate in their recollection of R8SA payments (most referred to the payments supposed to have been made in 1995). Expenditure questions asked people to recall payments made only in the past month (except for bride price and compensation payments made by villagers in the past year). It is likely that this made them easier to answer than questions on income which required a longer term recall.

Food expenditure

In an earlier section it was shown that, on average, the Yonggom spent about K10 per person per fortnight on food and the Awin K19. Those figures were derived from the answers to the LQ. It is important to remember that given the size of sample (very small) for individual settlements, we cannot rely on the data to tell us much about differences between villages. However, when we aggregate them they are reasonably reliable indicators of contrasting conditions between the two groups: Awin and Yonggom. Generally, in this section individual villages will not, therefore, be mentioned. However, providing one does not read too much into the values shown, it may be of interest to note that the villages can be categorised according to broad groups in terms of expenditure on food;

* low expenditure (under K10/person/fortnight): Ambaga, Kokonda, Komokpin, Kawok and Atkamba

* medium expenditure (between K10 and K20/person/fortnight): Demasuke, Bige, Dande, Dome, Hopanai, Bongabun, Ieran and logi

* high expenditure (over K20/person/fortnight): Sarae, Miamroe, Kwiape and Senamrae.

Of these expenditures overall, 17 percent was spent in village trade stores - 29 percent among the Yonggom and only 10 percent among the Awin, who have better access to urban stores. The remainder was spent in towns: 78 percent at Kiunga and 5 percent at Tabubil. If these figures are representative and accurate, then the lower Ok Tedi villages as a whole were spending roughly K42,000 each fortnight on food of which around K33,000 was being spent in Kiunga. Such a level of expenditure would translate into an annual expenditure of nearly K1.1 million. That is twenty percent of all compensation moneys paid out by OTML in 1996 (payments in late 1997 and early 1998 will have been less).

Elsewhere in the questionnaire (see below) a second set of questions checked on this particular form of expenditure; as we shall see, the correspondence between the two data sets is close enough to inspire confidence in the accuracy of the estimates just given.

Income

The mean monthly income/person is calculated at K81 for the Awin and K46 for the Yonggom; individual household incomes ranged from under K10 per person per month to over K300. This is despite the fact that the 38 Yonggom households surveyed had received, on average, over K6400 per month in 1996 from OTML-related compensation payments whereas the 47 Awin households reported receiving only K4360 per month in the same year. The apparent contradiction is explained by a simple fact: the Yonggom largely depend on those payments for their income whereas the Awin have other substantial sources of income. Ironically, the Yonggom who, as will be seen (see the sections on people's opinions), take a more negative view of OTML than do the Awin, are extremely dependent on the company payments. Just under 60 percent of all reported income among the Yonggom came from OTML sources compared with only one-fifth for Awin incomes.

Table 20. Monthly incomes for LQ households

| Source | YONGGOM+ | | | AWINX | | |
|-----------------------------|---------------|------------|----------------|---------------|------------|----------------|
| | Kina | % of Total | Recipients (n) | Kina | % of Total | Recipients (n) |
| OTML Fees | 3,506 | 32.4 | 26 | 330 | 1.5 | 6 |
| OTML Compensation | 2,906 | 26.8 | 33 | 4,030 | 18.3 | 38 |
| Personal Business | 1,780 | 16.4 | 2 | 5,350 | 24.3 | 10 |
| Market Sales | 210 | 1.9 | 3 | 75 | 0.3 | 3 |
| Other Crop Sales | 46 | 0.4 | 3 | 230 | 1.1 | 12 |
| Wages | 2,172 | 20 | 3 | 10,870 | 49.4 | 18 |
| Remittances | 85 | 0.8 | 5 | 145 | 0.6 | 13 |
| Others | 120 | 1.2 | 3 | 950 | 4.3 | 5 |
| Total | 10,825 | | | 21,980 | | |
| Income /person/month | 45.00 | | | 81.00 | | |
| Income sources/household | | | 2.0 | | | 2.20 |

+ 38 households; 240 persons

x 47 households; 270 persons

This is because more Awin have waged jobs or have set up in business than have the Yonggom. Wages account for almost half Awin incomes and business accounts for a further quarter. Note, however, that this automatically must mean that inequalities of incomes between households are considerable. Only three, of 38, Yonggom households had wage earners; yet wages account for one-fifth of all Yonggom household incomes.

The much wider spread of employment among the Awin means that the inequalities are not so stark.

The fact that the Awin are less dependent on direct payments from Ok Tedi should not lead one to conclude that they are less dependent on OTML overall. This is because most of those earning wages, as noted earlier in the employment section, are employed by OTML or its contractors and most businesses indirectly depend on OTML-sourced cash flows. The only money raising activities that are not strongly linked to OTML's presence (market and crop sales) account for a mere 2.3 and 1.4 percent of Yonggom and Awin incomes respectively.

Expenditure

Expenditures per person per month are shown in Table 21.

Table 21: Monthly expenditures by households in LQ.

| FORM OF EXPENDITURES | | | | | | | | |
|----------------------|-----------|-------------|-----------|--------|------------------------------|----------|----------------|-------|
| | Food | Other Goods | Education | Health | Compensation n Brideprice | Other | Total / person | |
| Awin | | | | | | | | |
| - Kina | 10,874.00 | 1,068.00 | 435.00 | 118.00 | 2,170.00 | 1,635.00 | 16,400.00 | 61.00 |
| - % | 66.5 | 6.5 | 2.7 | 0.7 | 13.3 | 10 | | |
| Yonggom | | | | | | | | |
| - Kina | 6,477.00 | 848.00 | 215.00 | 187.00 | 3,797.00 | 920.00 | 12,444.00 | 52.00 |
| - % | 52 | 6.8 | 1.7 | 1.5 | 30.5 | 7.5 | | |

The first point to note is that the gap between the two group's expenditure is much narrower than that between their incomes. Whereas the Awin reported incomes per person 80 percent higher than the Yonggom, their expenditures are only 17 percent higher. There are several reasons why this might be and the most worrying, from the point of view of the survey, would be that the reported figures are wrong; more specifically, since the expenditure figures for the Yonggom actually exceed the reported income numbers, that incomes among the Yonggom are under-reported, or, conversely, that expenditure figures are over-stated. There is not a great deal of evidence elsewhere to suggest large discrepancies in the data, although it is possible that lumpiness of expenditures could lead to their being greater than incomes when averaged out (as will shortly be seen). A rather more comforting possibility (to the survey taker) is that the Awin are saving and investing. This is a distinct possibility since, for the Awin, reported expenditures per capita are K20 per month less than reported incomes (see immediately following section on savings).

Secondly, the patterns of expenditure do fit reasonably well other indications of difference identified elsewhere in this report. Two-thirds of the expenditure of the Awin (but only half their income) is on food. Note that this compares very well with our earlier estimate, derived from a separate set of questions, of K19 per fortnight or K38 per month on food which translates into 62 percent of K61 expenditure/month or 47 percent of K81 income. By contrast, only 52 percent of Yonggom expenditure (but 58 percent of income) is spent on food. Only one other item shows any significant difference in terms of expenditure: a very much higher proportion of Yonggom total expenditure goes on bride-price (and compensation) than of Awin expenditure. This is significant for two reasons. Firstly, because it may provide an explanation of the problem just canvassed: why is Yonggom expenditure apparently higher than income? Brideprice payments are very lumpy items indeed. Thus, if the sample households even had one or two more of them than the Yonggom average, they would push a balanced budget into apparent debt. This looks possible. Secondly, however, it suggests that bride-price payments, the ages old form of personal and group investment, are far more important nowadays to the Yonggom than to the Awin. This sits comfortably with this survey's other findings which all generally point to greater economic, educational and cultural change among the Awin. In fact, if the difference between the two groups' expenditure in this area is removed from the equation then the balance between their incomes and expenditure is restored. This leaves the question, then, of what - if anything - has replaced bride-price as an Awin investment?

Thirdly, from the data presented in Table 21 we can extrapolate and make estimates of annual expenditures and their likely impact on the region. It would appear, given expenditures of K61 and K52 per person per month for the Awin and Yonggom respectively, that annual expenditure of all residents of the seventeen lower Ok Tedi villages would be around K1.9m of which K1.1m is on food and K0.4m is on bride-price and other traditional compensation payments. If all the balance between income and expenditure is saved (which is very unlikely), then the Awin might be saving as much as K20 per person per month which totals just over K280,000 per year. Although substantial, this sum comes nowhere near the total funds which would be required to meet the Awin's expectations from future development of infrastructure. The Yonggom appear to save nothing at all if these calculations are anything to go by. We can now, therefore, turn to the data collected on savings.

Savings, borrowings and lendings

Respondents were asked whether they had any outstanding debts or loans to others.

Table 22: Lending and Borrowing

| | Borrowing | | Lending | |
|----------------|-----------|--------|---------|--------|
| | Yes | No | Yes | No |
| YONGGOM | 1 3% | 37 97% | 10 26% | 28 74% |
| AWIN | 15 32% | 32 68% | 21 45% | 26 55% |

The answers cause a minor problem: if our sample was representative, then the proportions of borrowers and lenders in either group ought to be similar - unless flows of cash were to and from outsiders which, as we shall see, they are not. The conclusion must either be that the sample is not representative (and there is no great evidence of that elsewhere) and/or that respondents are far more likely to report loans to others than borrowings from others.

This problem aside, the data reveal a major difference - the Awin are far more likely to lend or to borrow than are the Yonggom. In overall terms they are three times more likely to be borrowers/lenders. This is yet another indication of how much more deeply the cash economy and its values have penetrated the Awin villages; in this case, in the important cultural respect of acceptance of the idea that loans and debts are integral part of commercial life. Even so, it is worth pointing out that the majority, even of the Awin, do not lend or borrow. Moreover, of the 47 cases of reported borrowing and lending, 42 were between relatives. Of the remaining five, three were loans (by Yonggom) to 1984 refugees, one was from an employer and one from a government business development agency. None were from banks or other former financial agencies. This would be difficult to describe as globalisation in full swing.

Table 23: Savings Accounts, shareholdings and other investments (numbers).

| | | Saving Accounts | Shareholdings | Other Investments |
|----------------|----------|-----------------|---------------|-------------------|
| YONGGOM | (n = 38) | 10 | 8 | 4 |
| AWIN | (n = 47) | 69 | 45 | 12 |

The same contrast between the Yonggom and the Awin is repeated, even more strongly, when the extent and means of savings are examined. Only ten passbook savings accounts were recorded among the 38 Yonggom households surveyed, while seven times that number were recorded in the 47 Awin households.

Thirteen of the 47 did not have any account but several households had four or five each. Thus there are significant inequalities not only between the Yonggom and Awin but within each group.

In other ways too, the Awin clearly are more commercially oriented than their neighbours as shown by their shareholdings and other investments. The very much higher levels of savings (at least as represented by the number of passbooks etc. rather than their value which remains unknown) finally clear up questions asked earlier in this section: the surplus cash identified in the income and expenditure tables does appear to be saved and the Awin seem to be inclined to switch their investments away from bride price into newer forms of speculation.

Overall financial position

Given the nature of the data collected and the errors which are undoubtedly contained within them, when we come to assessing whether a household is better off or poorer than the average, we can only use very broad guidelines. From the individual household LQ answers, the present writer assigned households into a 'better off' category (see Table 24) only if income exceeded expenditure by at least 50 percent and if the household also had more than the average number of assets/possessions and/or savings accounts. Those designated 'poor' had to have incomes which fell short of reported expenditures by at least one-third and also to exhibit, in answer to other questions, no obvious signs of being well off. The results arrived at using these guidelines can then be compared with the self-assessments made by the villagers themselves of their relative financial standing within their own village.

Table 24: Comparative financial status - external and self-assessment
(numbers of households)

| | Yonggom | | | Awin | | |
|---------------------|------------|------|------|------------|------|------|
| | Better off | Same | Poor | Better off | Same | Poor |
| External Assessment | 6 | 19 | 12 | 14 | 18 | 14 |
| Self Assessment | 3 | 29 | 5 | 3 | 37 | 6 |

Essentially, those assessed externally as being better off are those households with a successful business and/or with either more than one regular wage earner or with a single wage earner but a small family. The poor tend to be those who reported no (or very limited) income from OTML payments and no wage income. It is evident when we compare the external and self-made assessments that villagers see themselves as being more equal to one another than did the external assessor - the better off (as externally defined) rarely describe themselves as such, and neither do the poor.

Investment advice

All respondents to the LQ were asked whether or not they would welcome advice on investments. The great majority said yes (although at least two people wanted to know what 'investment' was).

Table 25: Would you like investment advice?

| | Yes | No |
|---------|-----|----|
| Yonggom | 31 | 6 |
| Awin | 44 | 2 |

OPINIONS OF THE RESPONDENTS

Introduction

A variety of means were used to elicit villagers' opinions on a wide range of topics. First, two types of closed questions were asked - one set asked for measures of agreement or disagreement which could then be expressed numerically (on a Likert scale) and a second asked people who they would see if faced with a specified problem. The second type was intended to try and tell us whether hierarchical structures put in place by government and OTML were actually being recognised and being seen as useful by villagers. Second, a number of rather more open-ended questions were posed; that is, the question was put by us but we did not consciously put in place a framework to constrain the possible range of answers. Some of these questions, however, did yield answers which could be roughly classified so as to give a numerical response. The foregoing types of questions were asked of LQ respondents. All respondents were given the opportunity to raise their own opinions in completely unstructured ways (i.e. they were asked what they thought were the big issues facing them and their communities without any further prompting from the interviewers). This third type of answer is also reported on here.

Closed questions (using Likert scale)

Here respondents to the LQ were read a statement and asked how strongly they agreed or disagreed with it. Various scoring measures are used to arrive at a numerical mean. In our case we assigned scores as follows: strongly agree = +2, agree = +1, no opinion or neutral = 0, disagree = -1, strongly disagree = -2.

Using such a scoring system means that the range of possible answers is between -2 (everyone without exception strongly disagrees with the statement) and +2 (everyone without exception strongly agrees with the statement), whereas a score close to zero can mean either than most people don't have feelings one way or the other or that opinion is divided between those strongly agreeing and those strongly disagreeing. Thus, where scores hover around zero one must examine the details of the score to see which of these two alternatives scenarios is operative. Note also that under such a scoring system if, of ten people, nine persons strongly agreed and only one eccentric strongly disagreed the overall score would be only +1.6; if seven strongly agreed and three had no opinion the score would be +1.4. In other words any score larger than plus or minus one can be interpreted (especially in a large sample) as an overall strong view. Finally note that in order to interpret the answer (whether positive or negative, strong or weak) one must always refer back to the original question and its precise wording. It is usual to ensure that the questions have a mix of negatively and positively phrased question (e.g. negatively phrased: 'Refugees are not a problem' or positively phrased: 'It is better to live in Kiunga ...') so as to ensure that the respondent actually listens carefully to the statement.

In using this type of question, the team undertaking the survey was worried, prior to the survey, that villagers might not discriminate very carefully between negative and positive questions; or might be largely indifferent to the questions - having no view at all; or might all insist on having exactly the same strong views, one way or the other, as everyone else in the village. It is fair to say that the answers, listed below, showed that all these concerns were unsubstantiated in fact. Villagers discriminated very clearly between styles of questions, very few were indifferent to those posed and, perhaps most interestingly, on a number of issues strong differences of opinions within the same two groups (Awin and Yonggom) as well as between them were apparent.

Table 26 'There is not enough land for everybody in this village'

| | Strongly Agree | Agree | No View/ Neutral | Disagree | Strongly Disagree | Score |
|---------|----------------|-------|---------------------|----------|-------------------|-------|
| Yonggom | 6 | 15 | 4 | 10 | 2 | +0.35 |
| Awin | 10 | 22 | 3 | 11 | 0 | +0.67 |
| Overall | 16 | 37 | 7 | 21 | 2 | +0.53 |

Concern about land availability is reasonably strong everywhere but especially among the Awin. Notice that here (as will be apparent on many issues) the majority opinion is disagreed with by a reasonably sized minority. Also note that few people are neutral on this issue.

Table 27 'It is better to live in Kiunga than to live in the village'

| | Strongly Agree | Agree | No View/ Neutral | Disagree | Strongly Disagree | Score |
|---------|----------------|-------|------------------|----------|-------------------|-------|
| Yonggom | 6 | 2 | 2 | 20 | 7 | -0.54 |
| Awin | 0 | 0 | 2 | 24 | 20 | -1.39 |
| Overall | 6 | 2 | 4 | 44 | 27 | -1.01 |

Since this question was asked of people living in the village a positive answer would obviously be a mark of a very frustrated person. Since the majority of people living in the village themselves have experience of living in Kiunga, this is a question on which they are well qualified to pass judgment. Among the Awin there is a virtually unanimous opinion that village life is preferable; the feeling is somewhat less strong among the Yonggom.

Table 28 'Nowadays, more and more people get drunk in the village'

| | Strongly Agree | Agree | No View/ Neutral | Disagree | Strongly Disagree | Score |
|---------|----------------|-------|------------------|----------|-------------------|-------|
| Yonggom | 5 | 7 | 1 | 21 | 3 | -0.27 |
| Awin | 6 | 21 | 2 | 15 | 2 | +0.30 |
| Overall | 11 | 28 | 3 | 36 | 5 | +0.05 |

In both communities there are substantial numbers both for and against this proposition and, it is worth noting, very few people have no opinion or a neutral one. The Yonggom overall are weakly in disagreement with the statement and the Awin weakly in favour of it. This may reflect a genuine difference in social conditions in the villages; after all, we have already identified how much more cash-oriented the Awin are and how there appears to be an emerging issue of youth unemployment. However, it is just as possible that the differences between the two arise out of the more simple fact that perhaps there are more people with strong teetotaler views in the Awin villages.

Table 29 'Gambling is on the increase in the village'

| | Strongly Agree | Agree | No View/ Neutral | Disagree | Strongly Disagree | Score |
|---------|----------------|-------|------------------|----------|-------------------|-------|
| Yonggom | 2 | 5 | 3 | 21 | 6 | -0.65 |
| Awin | 1 | 11 | 9 | 21 | 4 | -0.35 |
| Overall | 3 | 16 | 12 | 42 | 10 | -0.48 |

Although the feeling is by no means unanimous, it is generally felt that gambling is not on the increase. In view of the large inflows of cash that have occurred in the past two years, the fact that there is some doubt about increasing drunkenness and general, if weak, agreement that gambling has not increased suggests that this flow has not (at least, not yet) had some of the more obvious negative impacts one might expect.

Table 30 'More people have guns today than before'

| | Strongly Agree | Agree | No View/ Neutral | Disagree | Strongly Disagree | Score |
|---------|----------------|-------|------------------|----------|-------------------|-------|
| Yonggom | 2 | 4 | 1 | 24 | 7 | -0.79 |
| Awin | 1 | 7 | 8 | 29 | 1 | -0.48 |
| Overall | 3 | 11 | 9 | 53 | 8 | -0.62 |

Since there certainly appears to be more cash around today, the fact that there is reasonably strong unanimity that guns are harder to come by suggests that gun control and licensing may be rather strong in the region. Given the security risks which are chronic in an area next to the border this may not be surprising. It is also interesting that this issue is still regarded as important. One might have imagined that the need for guns for hunting would be on the decline; as shown earlier, however, hunting is still a very widespread and reasonable successful occupation.

Table 31 'It is harder to get schooling for children now than before'

| | Strongly Agree | Agree | No View/ Neutral | Disagree | Strongly Disagree | Score |
|---------|----------------|-------|------------------|----------|-------------------|-------|
| Yonggom | 7 | 15 | 0 | 14 | 1 | +0.35 |
| Awin | 1 | 24 | 0 | 16 | 4 | +0.04 |
| Overall | 8 | 39 | 0 | 30 | 5 | +0.18 |

This question (like some others) has a clear weakness which was not observed prior to the administering of the questionnaire: 'before' what? It was intended to mean 'before OTML arrive' since the objective evidence is clear that the region as a whole does now have better schooling facilities, even if, with the relative decline of the school at Atkamba which was - in the 1970s - the region's best school, may make the statement truer there than elsewhere. Opinion on the issue is very sharply split; a handful of those strongly agreeing with the statement in Ambaga and Atkamba were responsible for the positive Yonggom score.

Table 32 'The presence of refugees in the region is not a problem'

| | Strongly Agree | Agree | No View/ Neutral | Disagree | Strongly Disagree | Score |
|---------|----------------|-------|------------------|----------|-------------------|-------|
| Yonggom | 3 | 6 | 4 | 17 | 8 | -0.55 |
| Awin | 1 | 1 | 4 | 15 | 25 | -1.35 |
| Overall | 4 | 7 | 8 | 32 | 33 | -0.99 |

Only the question on the relative merits of living in the village or Kiunga elicited a less unambiguous response than this question: people feel strongly that refugees are a problem. It is ironic that the Awin have especially strong views on the topic when, in fact, they host no refugees at all. Of course, since our Yonggom sample certainly contained families which have within them people who, at one stage or other in their lives, have been refugees, it is very likely that the slightly greater ambiguity in the Yonggom response reflects this and that if these were omitted the Yonggom response would be equally strong and negative.

Table 33 'Dredging will help to solve the problem of silting of our land'

| | Strongly Agree | Agree | No View/ Neutral | Disagree | Strongly Disagree | Score |
|---------|----------------|-------|---------------------|----------|-------------------|-------|
| Yonggom | 1 | 2 | 7 | 17 | 10 | -0.89 |
| Awin | 0 | 7 | 25 | 10 | 4 | -0.24 |
| Overall | 1 | 9 | 32 | 27 | 14 | -0.53 |

This question elicited the strongest negative response to any question from the Yonggom and was the only one to which so many Awin gave a no opinion response. The Awin are adopting a wait-and-see attitude; the Yonggom have already decided the scheme is a waste of time. As work progresses, therefore, it will be interesting to see which way Awin opinion turns and whether Yonggom opposition wanes at all. This questions seems to the writer to be one that should play a role in future monitoring of the project. Note that in other questions, very few 'no response/opinions' were received so we can be fairly confident that the large number recorded here actually represent a considered response rather than one of indifference.

Table 34 'The number of people in the village getting sick is decreasing'

| | Strongly Agree | Agree | No View/ Neutral | Disagree | Strongly Disagree | Score |
|---------|----------------|-------|---------------------|----------|-------------------|-------|
| Yonggom | 7 | 19 | 0 | 9 | 2 | +0.54 |
| Awin | 2 | 21 | 4 | 17 | 1 | +0.13 |
| Overall | 9 | 40 | 4 | 26 | 3 | +0.32 |

On the one hand facilities in the Awin villages have improved, if only a little in recent years; on the other hand those available at Atkamba have deteriorated whilst new facilities have been provided at Dome and Komokpin. Facilities at Kiunga have definitely improved and we have already noted how many people use those facilities. It is interesting therefore that the Yonggom mildly agree with the statement (one might have expected those in the south to strongly disagree with it) while the Awin are neutral overall. The neutrality is certainly connected to the fact that in almost all the villages around Senamrae, large numbers of people pressed, when asked for their opinions, elsewhere in the questionnaire for the Aid Post facility there to be upgraded. As noted earlier is certainly centrally located and well patronised.

Closed questions (sources of assistance)

Respondents were asked who they would consult in the case of particular problems. The purpose of this set of questions was to see whether or not there are structures in place (whether formal or not) and recognised by villagers as being useful to them in tracking problems of everyday life.

Table 35 'Who would you see about a land dispute'

| | Yonggom | Awin | All |
|--------------------------|----------------|-------------|------------|
| Councillor | 16 | 5 | 21 |
| Lands Officer | 3 | 18 | 21 |
| Other government officer | 6 | 8 | 14 |
| Clan elders | 0 | 11 | 11 |
| Others | 4 | 0 | 4 |
| Unsure/no response | 9 | 5 | 14 |

Despite what has been said earlier about the relatively greater influence of the modern economy of the Awin it is noted here that they turn to the clan elders to some degree still in solving land disputes. The 'unsure/n.r.' rate is quite high and no one channel for advice stands out even if lands officers are called in (it is one of their jobs) in about one-quarter of cases.

Table 36 'Who would you see if you had a financial problem'

| | Yonggom | Awin | All |
|------------------------|----------------|-------------|------------|
| Relatives | 8 | 17 | 25 |
| OTML | 0 | 12 | 12 |
| Bank | 0 | 8 | 8 |
| Government | 5 | 8 | 13 |
| Others | 1 | 0 | 1 |
| No-one/don't know/n.r. | 24 | 2 | 26 |

These opinion questions were asked before the questions on income/expenditure/borrowing etc. It is interesting how well they reinforce the answers given to those later questions. Two-thirds of the Yonggom found the question baffling or irrelevant; almost none of the Awin did. Most of the Yonggom appear, despite hefty compensation payments, to remain well outside the boundaries of a true cash economy. However, even among the Awin (as seen in answers to the questions on borrowing and lending) it is relatives to whom the majority would first turn. It is a little worrying that OTML would be their second choice ahead of banks.

Table 37 'Who would you consult if you had a problem with the government'

| | Yonggom | Awin | All |
|-------------------|----------------|-------------|------------|
| Councillor | 21 | 32 | 53 |
| Council President | 0 | 9 | 9 |
| OTML | 2 | 2 | 4 |
| Government | 2 | 0 | 2 |
| NGOs | 2 | 0 | 2 |
| Others | 3 | 0 | 3 |
| Don't know/n.r. | 8 | 4 | 12 |

The faith of villagers in the council (local level government) is, if these figures are anything to go by, strong in all areas but strongest of all here. The Ningerum Council (whose President, Russell Waiduma, is from Bige) has people's respect. There is very little evidence here (or elsewhere) that people regard OTML as either the effective or alternative government of the area.

Table 38 'Who would you consult if you had a problem with OTML'

| | Yonggom | Awin | All |
|----------------------------|----------------|-------------|------------|
| Public Affairs | 2 | 29 | 31 |
| Government | 8 | 8 | 16 |
| Village Planning Committee | 2 | 5 | 7 |
| NGO5 | 0 | 5 | 2 |
| DEC | 5 | 0 | 5 |
| Others | 1 | 11 | 3 |
| Don't know/n.r. | 6 | 4 | 10 |

Recent events in the Lower Ok Tedi, notable the court case, have had differing impacts. The majority of the Awin had no hesitation in saying they would first of all go to see Public Affairs if such a problem arose - but hardly any of the Yonggom would. In an ideal world, presumably Public affairs would hope that it was always first port of call in such matters, but among the Yonggom, considerable distrust of Public Affairs was expressed. But instead the Yonggom have no single alternative. Many choose groups who they say will be opposed to OTML (they see NGOs and DEC in this light). This is the one area where Councilors do not figure largely and the recently formed Village Planning Committees are not yet seen as an appropriate and effective channel. It is also interesting that the Alice River Trust or LOTIC hardly got a mention anywhere in this set of questions.

Open-ended questions

As second series of questions were then asked in which responses were not restricted.

'How might OTML improve its relations with villagers?'

Overwhelmingly, the response to this question was that OTML must make more, and more regular, visits to the villages. Indeed, almost no other means of improving relations was even mentioned. However, the specifics of this main suggestion were varied. Among the Yonggom (other than Ambaga people who simply wanted more visits), the emphasis was that visits must be followed up by implementation. Among the Awin, the emphasis was on the planning of visits (the implication being that currently visits are not as useful as they could be if they were better planned) and on coordinating such visits with village leaders - although a number of respondents added that while leaders should be involved, OTML should also talk directly to villagers. It was of interest that no-one came up with wholly negative responses to this issue - that is, everyone thought they could see a way of improving relations, even though many of the other comments made in several villages were rather hostile to OTML. In other words, even in those villages where there is considerable distrust of OTML, the pathway to improved relations, though overgrown, is still identifiable.

'How have life styles changed since 1981 and how might they change in future?'

Respondents were asked how their lives had changed since OTML's arrival and how they might change as a result of the signing of the Lower Ok Tedi Agreement. The answers to these questions were, on the whole, both negative and gloomy:

Table 39

| YONGGOM | | | | | | AWIN | | | | | |
|------------|------|-------|-----------|------|-------|------------|------|-------|-----------|------|-------|
| Since 1981 | | | In Future | | | Since 1981 | | | In Future | | |
| Better | Same | Worse | Better | Same | Worse | Better | Same | Worse | Better | Same | Worse |
| 1 | 3 | 34 | 0 | 5 | 35 | 8 | 10 | 29 | 11 | 19 | 17 |

Awin respondents were somewhat less negative about both past changes and putative future changes but even those who answered the question of the future positively did so only because they generally assumed that certain improvements which they wanted to occur would actually happen. In this writer's mind, those assumptions were by no means very realistic.

The data present a problem. It is impossible to contradict the overwhelming views of a group of people even if, on balance, the concrete evidence of change in life expectancy, educational opportunities, cash incomes, business opportunities, illness etc. point to the very opposite conclusion.

The gloominess of people's views about the future do have one positive aspect: they are so widespread and so gloomy that they can hardly deteriorate any further among the Yonggom. But among the Awin things could get worse if expectations are not met. One of the most commonly - even universally - voiced of these expectations is that OTML is going to build new houses for everyone. This belief has a long history since many respondents referred back to visits from Kennecott personnel in the late 1960s as having been the first ones which presaged such housing improvements. However, it largely related to what most Awin think (rather than know) is the substance of the Lower Ok Tedi Agreement. Even if OTML did carry out this house building - and there is absolutely no evidence that they will or that they have agreed to it separately from the general compensation provisions of LOTA - it would remain a complex issue since so many Awin landowners, as well as Yonggom, are presently living on other people's land. They want these new houses to be built on their own land, often many kilometers distant from the present house and requiring some form of new road access which OTML is expected to provide. It is this writer's understanding that OTM does not believe that it has at anytime promised to build any such new housing even if some of its staff believe that if the total compensation package agreed to under LOTA were devoted to the housing (but not the associated access) issue, there might just be enough funds to complete this one project, with nothing left over for anything else. There is a serious lack of mutual understanding on this issue and it is this misunderstanding that may unfortunately account for the more positive stance of the Awin on this question.

'Are villagers concerned about the closure of OTML planned for 2009?'

OTML, on planned projections, should cease operations in 2009. It is possible that closure could be earlier in this writer's view. For everyone who has benefited from the project so far, closure should be a matter of concern - unless they have already made alternative plans. Since, however, the answer to the previous question showed that most villagers think they have lost from the project and that they see little chance of things getting better in the remaining years of the project's life, then one might logically expect them to be either unconcerned or positively looking forward to the project's closure.

Table 40

| | YONGGOM | AWIN | ALL |
|-------------|----------------|-------------|------------|
| Concerned | 18 | 27 | 45 |
| Unconcerned | 13 | 12 | 25 |
| No view | 7 | 8 | 15 |

In this writer's view, almost all the Awin villagers do have considerable cause for concern unless they have taken the unlikely step of safeguarding their post-2009 futures by means of investments. This is because they are already increasingly involved in the cash economy created by OTML's presence and so strongly dependent on it. This involvement is not only at a personal, individual level but also is closely tied into the regional infrastructure which is equally heavily dependent for its maintenance on funds which are either directly or indirectly sourced from OTML. While the Yonggom villagers may feel they would lose very little by OTML's departure, since very few of them have jobs, they have no roads for OTML to maintain and OTML's sediment has damaged some of their land, even they could be wrong. What, for example, will happen to all their relatives and neighbours currently residing in Kiunga? Or to school and health funding? Would the former return and place even more demands on village land which many think is already in short supply?

A small majority overall (and a large minority of Yonggom) are concerned about closure which, at first sight, might appear to contradict their pessimism about their own futures. In most cases, however, this is not a contradiction since people stated that the reason for their concern was that OTML might not compensate them enough and/or rehabilitate their lands previously damaged. This opinion is widely held and worrying since, as far as OTML are concerned (and even more so as far as the government of Papua New Guinea is concerned), the agreements already in place cover all possible compensation and mitigation measures. Another clash of perceptions with potential for future problems is evident here.

'Are the villagers satisfied with the government's performance in their area?'

(Note: the lack of any distinction between levels of government in this question was deliberate.)

Table 41

| | YONGGOM | AWIN | ALL |
|-----------------|----------------|-------------|------------|
| Satisfied | 6 | 3 | 9 |
| Dissatisfied | 24 | 41 | 65 |
| No view/neutral | 8 | 3 | 11 |

Awin villagers are even more dissatisfied with the government's work in its area (notwithstanding the fact that we already know that they have some respect for local level government) than are the Yonggom despite the fact that government services are much more in evidence among the former. The basic cause for complaint goes like this: 'government never even comes to our village so how can I be satisfied' or 'this is a stupid question because I never see anyone from government' or 'before the [Australian] government did look after us, now they just come around at election times'.

As with other opinions noted earlier, one could certainly argue with some of these views (for, example, at the time of the Australian administration there were virtually no government services at all - almost every facility of the very few available was provided by the missions) but it is difficult to contradict what people believe to be true.

‘Are villagers satisfied with OTML’s performance in their area’”

Table 42

| | YONGGOM | AWIN | ALL |
|-----------------|----------------|-------------|------------|
| Satisfied | 4 | 11 | 15 |
| Dissatisfied | 29 | 28 | 57 |
| No view/neutral | 5 | 8 | 13 |

OTML fares little better than government (and worse among the Yonggom) on this score even though many villages commented positively that OTML visited their villages far more often than did government officers. Many, however, thought these visits were for show (‘just smiles’) and consequently reacted more negatively to them than if they had not be made. It is clear that, once again, while there is scope for OTML’s reputation among the Awin to decline further, there is very much greater scope, among both groups for it to improve greatly.

Opinions expressed voluntarily

In addition to the answers to questions specifically aimed at villagers’ opinions on particular issues (which answers have been discussed above), it was hoped to gather general opinions from all households surveyed on topics of concern to the respondents. These are reported on here. Three sources have been used to compile this section: comments supplied by respondents answering either the LQ or the SQ are used and those compiled by two of the external professional consultants (Rodney Kameata and Billai Laba). The first type (LQ answers) derive from questions which asked the respondents what, in their view, were the main problems facing, first, their own household and ,second, their village. This source of opinion covers all the villages surveyed. The second type of information comes from the SQ. It is largely restricted to Awin villages (excluding Kokonda) because the survey teams operating among the Yonggom decided to provide summaries of views presented to them whereas the Awin team recorded, in detail, individual responses. These last provide extremely valuable personal insights by the respondents. Of course, it is important that, having elicited these views - some of which are strongly expressed - this report should anonymise them to protect the confidence entrusted in the interviewers by the respondents. It is equally important that these records be preserved securely. The filled-in questionnaires as a whole, but particularly those sections of it dealing with people’s views, are valuable historic documents.

The comments of the Yoggom respondents summarised by the interviewing team may be less detailed and individual, but remain valuable. The third source of information are the outside consultants' observations. Obviously, these do not entirely or solely derive from the individuals who wrote them : they also reflect the views of the teams of which they were members. More than this, they represent the villagers' views as interpreted by the interviewing teams.

Opinions from all these sources are presented here village by village. This means that there is some repetition. However, this is thought desirable on three grounds: considerable effort and thought was put into the comments by the respondents and they thus deserve effort and thought by the reader; the repetition, especially of thinking critical of OTML, may be difficult to accept by company staff but the very fact of repetition will show how widespread these views are; third, despite similarities each village has different problems and will each require different approaches to their solutions.

It should be stressed that, as we have noted on the responses to other sections of the questionnaire, the respondents were remarkably open in giving information which other societies might be more circumspect in providing. Views are expressed uncompromisingly. In reporting, and sometimes quoting them verbatim, here this report will doubtless irritate groups which are criticised in these views. Such irritation will be understandable: after all, those criticised have been given no forum in which to reply. Nevertheless, one of the objects of this survey was to establish what the lower Ok Tedi people really think. The report would not be doing its job properly if it did not pass on those opinions.

Yoggom villages

Ambaga: Individuals responding to the LQ emphasised their concern over health matters (two members of one household had recently died), housing problems and what they said were food shortages. As far as overall village problems were concerned, attention focussed on the need for the village to have road access if it was to experience any economic development and on internal village land disputes (between landowners and the 1972 border crossers). It was also felt (by land users) that land users were not being properly compensated.

The comments and opinions recorded and summarised by the interviewing team include the following:

'Villagers wanted to know what will be done with the information collected by the survey; they anticipate that action will follow information collection. At times expatriates visit the villages and the people think that they are better and will deliver something to them.

When Papua New Guineans come, the villagers think that since the visitors and they are compatriots, the visitors are certain to help them. Visits from OTML personnel in community relations raise the expectation that something will be delivered but these expectations have not been realised (i no karim kaikai).

On compensation, the complaint was that despite the special census for this when moneys were paid out, there were people who received nothing. Villagers have become tired of walking to the community relations office in Kiunga to put their case.

Ambaga has a problem with transport and access to public services. Tradestore goods have to be portered from the Alice Pit via Birimkamba. All the villages from logi south can use river transport so they have no problem. They would like to see a road link to Kungim [where there is an airstrip]; a bridge across the Ok Tedi has a lower priority for them but it should come later.

They had the expectation that Independence would mean that development would occur. Now they believe the government has 'ignored' them and is not interested in rural development; they say they do not trust the government. Intending politicians, they say, often come around and promise such things as dinghies, but they are never delivered. Village councillors do a great deal of work in the village in getting up ideas for development; the people meet, discuss them and approve them - but then nothing happens. OTML ignores the border villages while the government 'probably think they are Indonesian villages'.

On dredging, they believe it will not work and is a waste of time and money. On compensation payments, they want to know why Ambaga 2 people received no lease payments or land use payment. They do not understand the R8SA system of payment: 'why did Don Cooper say they'd get K335 per year when the payments have been, in successive years, K335, K115, K118?' Evidently, they either do not fully understand the way in which R8SA moneys were to be paid (since the figures quoted are, in fact, exactly the right ones) or they were trying, via the interviewing team to get the agreed figures changed. Finally they want to know when the proposed housing scheme is going to be implemented.

Atkamba (including Bongabun): Individual responses were all directed at one single concern: lack of food in the household. Respondents' views of village problems focussed on three items: the need for clean water and for road links across the Ok Tedi were especially emphasised while internal disputes over land were also seen as a problem.

More than at any other village, Atkamba was especially hostile to OTML and to the surveyors. The villagers were angry that the survey was being undertaken for two reasons: first, because they stated they needed a full explanation of the survey's purposes and, second, a lot of information and views have already been collected in the past but nothing had ever come of this. Like Ambaga villagers, they felt they had been lied to; 'the housing scheme is not going ahead' was a particularly bitterly held view (and a very unfortunate one since there is no evidence available to this writer that OTML has ever said, let alone promised, that it would pay for such a scheme even if that possibility has been mooted widely by others). 'The real need of the village is a road from Atkamba up to Kungim with a bridge across the Ok Tedi' was an opinion widely expressed as was the view that 'business development officers are confusing people because even though business plans have been submitted there has been no satisfactory response. As a result the people don't have any faith in the village planning committee'.

Agricultural development also concerns the village: they claim not to be visited by any agricultural officer whether from OTML or the government. They allege that employment at the dredging project is for outsiders; promises for training and local development from the project have disappeared. 'With all these experiences, we want to know whether this survey is really going to assist us or not. If not, there is no point in coming back here the next time'.

Dome: individual households, once more, were focussed on food shortages, especially during the recently ended drought. The wider village problem was seen, also again, by everyone as the lack of road access to the east bank of the Ok Tedi. The interviewing group's collective summary on opinions included:

'Mine impact: dredging will not improve matters to bring back resources like the river bank gardens and trees, or highly regarded fish species (*on arim, kori, dutkum, biao, arok, biwin* and *demet*). Most canoe trees (*aat keenem, arik, murut and kunum*) have also been destroyed. Not only will Dredeco's work not succeed but they are creating even more damage in new areas for storing tailings which will affect future generations.

Non-implementation: activities they believed had been promised had not been implemented. These included infrastructure development (road), village relocation and housing scheme, business development and social development. These should have been carried out along the lines suggested by Stuart Kirsch (see end of this section).

Land pressure: due to a high level of population growth from border crossers and due to die-back land and building materials are in short supply. Posts for house support are now more than 10 km away.

The species of black palm, *nirak*, used for flooring is now very difficult to find as are the canes (*mimnong*) used for tying the palm to the floor. *Omaim wit* which provides the special sago fronds used for roofs is equally hard to find now. Villagers also say that their intakes of meat are falling (see earlier sections on food consumed).'

leran: Here individual households reported problems of access to building materials whilst the overall village problem, as seen by respondents, was the shortage of garden land.

logi: Households complained of shortage of housing materials and food and felt that land shortage as a result of sedimentation was the biggest problem of the community as a whole. The comments made by villagers to the team here were very extensive:

The OTFRDT: its projects are 'mere window dressing'. However, they want the solar pump to be repaired and also wonder what has happened to the funds previously distributed under the VDF component of the Trust. Since 'Solomon's' move to Tabubil, business development and agriculture people seem not to visit them.

The Lower Ok Tedi Agreement: John Grubb personally signed this, yet implementation has not occurred even though they say K23m of the K40m has been set aside for use in projects. They acknowledged that the village received K297,000 in 1997 but want to know what the arrangements are for funding and implementation. In particular they wish to know when the new housing scheme will proceed. They have carefully considered what might be the most suitable type of houses. Moreover, what has happened to the village plans talked of during the LOTA awareness patrol?

Alice River Trust: what criteria does the Trust use for project selection? They seem too rigid. What exactly are the regulations that govern the operations of the Trust?

Other matters: Food and resource scarcity is a major problem. This is made worse at both Dome and logi where, they say, refugees now outnumber the original population. A bridge across the Ok Tedi is required. The schools at Dome and logi need to be built of permanent materials as do health facilities and health workers' and teachers' houses. Women were especially concerned that education facilities require improvement.

Kawok: Both individual and village problems here were seen in a much milder form than elsewhere among the Yonggom. The biggest problem seemed to be transport to Kiunga, even though the bulk of households had canoes and outboards and had chosen to site Kawok in its present location by moving away from their old village site which was much closer to Kiunga.

The villagers are also less outright in their condemnation of all other agencies; the signing of LOTA is seen as a good thing which has improved relations, even if this has to be confirmed by implementation. They are doubtful of the usefulness of dredging especially since they believe too much employment is going to outsiders. This village was one of the few which did not pay much attention to the 'housing scheme' and was the only one of the Yonggom villages that wanted to see more surveys of this type involving co-operation between company, landowners and outsiders.

Komokpin: Housing material availability is seen here as being the major problem both of households and the village as a whole, according to LQ respondents. The survey team was not especially welcome here for the usual reason: 'we've had enough surveys; we want some action'.

Here the villagers feel that after signing LOTA, Martin Paining, by leaving and going to Lihir, has let them down. They want to know what the pattern of dredging activities will be - will the dredge just sit at Bige, or come upstream towards Komokpin, or go downstream towards Atkamba?

Opinions over the court case remain strong here. The villagers stated that Rex Dagi and Alex Maun persuaded them to accept the out-of-court settlement by saying that dredging will solve the problem of environmental degradation and by promising that not only would the people get permanent housing but would be 'sitting on money'. However, they also claim that such promises were made when the case started and that they were not informed when either about the decision to accept an out-of-court settlement or that agreement's contents. In particular they did not agree with the idea of dredging and allege that Rex and Alex 'misled the people' on this matter. Equally, they believe that OTML/BHP are 'controlling LOTIC through Glenson' and, as at some other places, alleged that the leading plaintiffs in the case had all been bribed by OTML to accept the out-of-court settlement. They blame the variations in compensation payments - which actually arise out of the formula adopted - on Rex and Alex also. Perhaps at the basis of this is another claim: that villagers funded the lawsuit on the understanding that they would be repaid proportional to their contributions if the suit was successful and they state that whereas Dome put in K1000 and Atkamba put in K4000, Komokpin's contribution was K5000. They now state forthrightly that the lawsuit against BHP was a waste of time.

COMMENT BY THE PRESENT WRITER:

It is difficult not to shake one's head in disbelief at some of the views expressed but it is obviously imperative that dialogue has to be entered into in an attempt to correct some evidently erroneous and dangerous impressions as well as to explain very carefully such matters as: what exactly is in LOTA, the terms of the out-of-court settlement (and in doing that someone will eventually have to explain that, since that is denominated in kina, its true value has fallen catastrophically since it was signed) and how LOTIC operates. It is alarming to observe that the lives of Rex Dagi and Alex Maun are in some danger from some villagers. It is remarkable how widely the idea has spread that OTML has promised to build new houses for everyone (although, as noted, in one village that promise is believed to have come from Rex and Alex) when the briefest scan of the moneys available and the cost of modern house construction in such a remote area would indicate that there is no way that the two can be matched - let alone build new roads, bridges, schools and health facilities. Finally it is also alarming that so many people reported 'shortage of food' as being their chief concern. This survey has only touched on diets and food intakes but its results, presented earlier, do not contradict those reports.

The Yonggom villages exhibit the classic signs of dependency on OTML which have been noted for other projects by other observers: Colin Filer invented the term 'project dependency syndrome' for the situation where the mine is both the source of all a people's problems *and* the only source of any solutions to those problems. Certainly OTML seems to have this status for the Yonggom. As noted in earlier sections, the Yonggom appear to be far more dependent - and more directly dependent - on OTML for their incomes than are the Awin, and yet they are very much more hostile to the company. The dilemma which appears to face Alex Maun and Rex Dagi is also by no means unique. At the Mining and the Community Conference held in Madang in late July 1998 Ron Brew observed that those who signed agreements on behalf of landowners at the Lihir project did so very reluctantly and only at the last minute because they were aware of how much danger they were placing themselves in - they would be blamed for anything in the agreement their fellow villagers did not, in future, like.

Awin villages

Bige: The overwhelming concerns of Bige are focussed upon the shortage of both building materials and land. It is generally believed in the village that a new village is going to be built for them by OTML. Bige people, surrounded by sediment and the dredging project, have been affected more than any other village, yet their attitudes towards OTML are not as strongly negative as those reported for the Yonggom. They are very much aware of their sudden dependence on the cash economy: 'we must develop businesses if we cannot grow enough sago or catch enough fish'.

In particular they wish to open a store to service the Bige camp next door to them. They are very anxious also to have their water supply re-established - it was not working at the time of the survey because the reclamation/infill work going on right next to the village had severed the pipe.

Dande: In Dande individuals expressed the greatest concern over access to housing materials and the need to earn cash. For the village as a whole, most respondents were worried about internal divisions created by land disputes. Dande people frequently expressed their puzzlement over the nature of the various agreements that have been reached (and their own exclusion from some of them). Like all the other Awin they wanted to know when the housing 'promised' by OTML was going to be built. Unlike most of their neighbours, Dande people want a health facility to be built in their village (everyone else wanted the existing Aid Post at Senamrae upgraded) because, as they rightly point out, it has good access and is central. As a road village not contained in the LOTA they also feel neglected by OTML.

Demasuke: It should be borne in mind that Demasuke people are split between their bush village and their settlement on the fringes of Matkomnai, but that they were interviewed at the former place. Individual households' problems all concerned house building materials; all respondents thought that the main problem of their village was that of access to it from the main road. Indeed, it is evident that - as in all villages - a great deal of thought has gone into what might be the best route for this road even if aspects of costing seem to have been relatively neglected.

Hopanai: Roofing materials shortages were the main concerns of individual households. The village as a whole was seen to have many problems: inadequate compensation, a clean water supply, improved health facilities, employment for youths and its own school figured most prominently. Most individuals have long lists of what they think the company should supply; one respondent argued that 'the company should provide initiative to local people' which must represent the ultimate stage of Filer's dependency syndrome. However, the two dominant issues are: the village lacks a clean and reliable water supply and either the Senamrae Aid Post must be upgraded to Sub-Health Centre status or Hopanai should have its own Aid Post.

Kokonda: Regrettably, the views of villagers were not collected.

Kwiape: Whilst the list of complaints from Kwiape was long, the comments of respondents - even those of the most critical - also contained suggestions for the solution of these problems (as did those from Senamrae and Miamroe).

Individuals were most worried about access to building materials and generating enough cash so as to survive in changed conditions. Village problems were seen as water supply and indiscipline among young people. Many were mistrustful of OTML's community relations efforts : 'they send nice men to see us but then nothing happens'. Some despair at the village's future: 'OTML have taken away our basic rights'. But most have directly practical complaints: 'projects started are not completed or not maintained - look at our water supply, nowadays it is very good at breeding mosquitoes.' 'Cannot the company do something about the dust on the road?' (it is situated right next to the access road to the Bige camp.

Perhaps the most contentious issue is: when is the relocation going to occur? It is evident that the belief that OTML is going to rehouse everybody (and, in doing so, build the new houses on their land with new access roads) is almost universally held by both the Yonggom and the Awin. Kwiape people are adamant that it is supposed to occur quite soon.

Miamroe: Individual concerns focus on housing; the village's main problem is water. Almost all informants placed the need for a clean, safe water supply at the top of their list although some older people (as in other Awin villages) placed their own desire for the company to help them buy food a close second. While many villages elsewhere complain about the OTFRDT solar pumps' breaking down, Miamroe would like one since their present water supply is genuinely poor. The new housing 'promised' by OTML, according to Miamroe informants, is in fact only the latest of a series of promises on this matter. One informant claimed that Bob Diamond (who worked for Kennecott) visited Miamroe in 1969 and promised everyone new houses. Three others all mentioned Charlie Cole (who worked for Kennecott and later OTDC and OTML) as having done the same in the early 1970s. One other grievance is that some in Miamroe feel that OTML should be paying royalties for the material it is dredging out of the river.

Sarae: Individuals here were worried about indiscipline among village youth and housing materials. For the village as a whole they were most concerned about the supposed relocation scheme and their water supply. This community has already got hopes that when the 'new housing scheme' comes along their new village will be at Km53 on the highway where the land belongs to one group from the village. This group is somewhat like Demasuke insofar as some people have a bush house towards the Ok Tedi but all have residences on the edge of Mimingiri - except their bush settlement is much smaller than Demasuke's. The tensions between Sarae and Mimingiri have been quite strong in the past and so the push for relocation has considerable internal logic for Sarae people. They, like other Awin, are growing a little anxious that the housing scheme seems to be delayed.

Senamrae: Individuals are nearly all concerned first and foremost with their future or present housing needs. As far as the village's main problems were concerned several people thought the greatest was a land dispute between the Hore and Hmya Tupo.

Throughout the Awin villages there were repeated requests from individuals for an explanation of the various agreements recently put in place. It could be argued that such individuals are simply being difficult but this must be doubted since on all other issues involved in the survey they were not difficult at all - even when hostile to OTML activities. Senamrae (along with Kwiape and Miamroe) is probably one of the more sophisticated of lower Ok Tedi villages yet here too most people wanted to know more about the agreements. Here too, as almost everywhere else, just about everyone is convinced that OTML has promised to build new houses for everyone and relocate the village. Equally, the most common question is : 'When is LOTA going to be implemented?' Our understanding is that it is already being implemented. Villagers here are gentle in their criticisms of OTML (they are somewhat harsher in berating the government) but this is largely because, although they do not seem to understand very well what is going on, they retain some trust for the company.

SUMMARY BY THE AWIN INTERVIEWING TEAM

The following comments are those of the members of the (all male) interviewing team who attempted to draw from all the individual responses they gathered the major themes of those answers.

'Women and the older members of the communities expressed uncertainties and admitted a lack of awareness over spin-off benefits, village based development projects and other aspects of the various agreements. The lack of female involvement and participation is probably connected to local cultural practice in which they have no major influence over male leaders. Gender inequality is an obstacle in the women's struggle for equal participation in development. Their general opinion is that they would like female business development or community agricultural officers to work with them.

People feel they have been cheated over compensation and not paid fair prices for the things they have lost. The issue of losses of sago groves, gardens and the environment is a pressing one around which possible conflicts could emerge in future both between the company and the people and within different clan/family groupings.

Tied to this, the loss of terrestrial and aquatic flora and fauna is felt deeply. The immediate remedial actions proposed by the people include the establishment of nurseries of local plant species for rehabilitating the sand-banks in die-back and dredged areas.

The creation of a conservation area is also suggested by the people who think that this would be a good way for future generations to have a chance of seeing cassowaries, birds of paradise and other culturally important animals. Since the area is directly north of the wetlands area of the Fly Plains it could be important to migratory bird species.

The research team feels some alarm at the rapid population growth being experienced in the area. The population of the area is young and quite healthy, its health needs being serviced.'

COMMENT BY THE PRESENT WRITER:

Earlier in this report some emphasis was given to significant differences between Awin and Yonggom village conditions. To some degree these differences are also observable in the nature and tone of the comments given by villagers - the Awin are less hostile to OTML and more likely to suggest solutions to the problems they see (rather than simply list the problems as is a tendency among some Yonggom comments). But one can overdo these differences. Both communities have a major and identical misconception about the specifics of the LOTA - that OTML is going to relocate and rebuild their villages. Both communities show clear signs of not knowing a great deal about the numerous agreements that have been made which concern them - though the Awin tend to ask for further explanation rather than blood. In both communities there are large numbers of people who have entirely unrealistic expectations of how much cash is available for the area's development - even if the sums are large compared to those available elsewhere in the North Fly. Finally, although elsewhere in this report the Awin/Yonggom differences have been highlighted, in fact it is clear that several Awin villages - Kokonda, Demasuke, Sarae and (less so) Dande have characteristics very much like those of the Yonggom villages. The core of change is in the area immediately adjacent to the dredging project.

MONITORING FUTURE CHANGES

Introduction

The field survey has indicated, reasonably clearly, many aspects of existing conditions in the villages of the lower Ok Tedi more or less at the time when dredging started. Over the life of the dredging trial - and, if it is proceeded with, tailings retention operations - changes will continue to occur in these villages. What strategy should be adopted not only to keep track of those changes but to deal with problems arising from them?

It is proposed that rather more than the monitoring of readily observable and measurable indicators will, ideally, be required. Rather, a set of structures needs to be put in place aimed at long term development for the region. Many of the elements for such a set of structures already exist in the region but they are currently unarticulated. Moreover, one must also bear in mind that the lower Ok Tedi villages are only one geographic portion of a much bigger impact region that also requires the introduction of a similar but more wide-ranging set of structures. That is, although the proposal here concerns itself in detail only with the lower Ok Tedi area, it is difficult to see this area going ahead on its own without being fitted into a regional monitoring and planning system for the North Fly as a whole (at the least) and possibly for the Western Province in its entirety. On the other hand it could be argued that to try and set up such a province- , or sub-province- , wide system might be too difficult a task and would take, even if successful, a dangerously long time during which the real problems of the lower Ok Tedi would get worse; this argument would go further and propose that it might be preferable to try to get a local planning system in place in one area, to try and get it working in the lower Ok Tedi and then try to expand it to other areas. I will leave this argument aside as not being immediately relevant to the aims of this report, but stress that it is important.

Three elements for future monitoring, within a useful planning scenario, in the lower Ok tedi seem to be desirable. The first element is monitoring itself - which can be broken down into two distinctive sets of operations; the second is a set of planning structures; and the third is the existence of an agency capable of implementing planned development projects. Monitoring is 'scientific', planning structures are 'political', implementing agencies are 'technical' in essence - but all three need tying together.

Monitoring needs to consider both measurable and observable material change in the villages but also to take into account the opinions and beliefs of the people.

This survey has indicated some consistent differences between the Yonggom and the Awin in terms of population structures, in physical habitat, in incomes and expenditures and in attitudes. But all these different parameters are linked to one another; for example, the more benign attitudes of the Awin towards the mining project can be linked to their somewhat more optimistic view of their existing and possible future living conditions which can, in turn, be linked to a measurably better set of economic circumstances as well as to differences in demographic and educational conditions. Thus it would seem wise to try and select indicators, both quantitative and qualitative, from as wide a set of different aspects of village life as available resources will allow and not to place too much reliance on one or two easily measured indicators - even if the latter are very useful. In making the suggestions which follow, the analysis of the survey results has been used to identify indicators which have apparently the most linkage with others and to suggest time intervals between monitoring events.

Quantitative indicators

These are of three types - those readily observable, those which can only be monitored by means of intensive personal interviews and those already being recorded as part of the ongoing work of another part of the Ok Tedi project or of a government agency. From the survey, it is evident that housing materials and specifically roofing material (use of galvanised iron) are a prime indicator of material change which can be monitored at very low cost and very high frequency. On the other hand, income and expenditure levels - which appear fundamental to an understanding of people's attitudes in general - depend very much on careful, intensive and face-to-face interviews. An example of the third type of possible indicators would be the records already collected by school authorities of their students or by OTML personnel department of employees.

Further, the survey results point in some cases to the need to undertake quantitative surveys of a more specialist type - a survey of nutrition levels would appear to be the most urgently needed. This sort of survey would generate its own set of more readily observable indicators.

Suggested indicators and their frequency of monitoring are:

- a) Accurate counts of houses, specifying whether occupied or not at the time of survey, at three monthly intervals; monitoring to take the form of village mapping. No interviews required.
- b) Use of roofing iron - shown on map in a). Easily done each three months.

c) Sources of drinking water - also shown on map in a). However, this should also be accompanied by monitoring of water quality. Needs to be done each three months and MUST involve villager participation (see below on roles of Village Planning Committees).

d) Households using electricity - this requires household interviews and so is probably best monitored annually.

e) De jure and de facto population - as with d); additionally however, since the villages themselves recognise a community which is defined differently from either of these two widely used 'census' style definitions it is highly desirable that this third type of measure also be made. Obviously, such a measure can be labour consuming in its making. However, if monitoring is community-based then annual measures may be possible - and not expensive.

d) Education - there should really be no need to include 'highest level of education' questions in every census in order to measure the general level of education in the region, providing that accurate records from each school in the area (of students by grade, sex and village of residence *and* of affiliation - i.e. where they live *and* the village community of which they are considered a member/potential or actual landowner) are collected. In fact, the Provincial education authorities already do gather most of such information - grade and sex. With a small increase in the work of school authorities in gathering such data and with a much greater use of that data in the overall planning process, the question in censuses need only be asked every five years.

f) Occupations - few issues generate as much animosity among villagers as that of 'who is or is not being employed by OTML or other firms associated with the dredging project?' The fact that the project is on Awin land, specifically on that of Kwiape village but with access roads running through the land of several others, makes the Awin feel that they should have priority and particularly so because there is an emerging problem of youth unemployment among their villages. On the other hand, the Awin resident in the villages have greater access to the commercial economy and non-OTML jobs than do the Yonggom still resident in theirs. This is a matter which is best dealt with, not by survey monitoring but, by very careful liaison between village leaders and OTML and LOTIC; although the task of recruitment is, under LOTA, in the hands of LOTIC the facts are that, first, OTML has to take the bulk of villager resentment if LOTIC does not recruit in ways villagers think fair and, second, LOTIC is in danger of losing villager support altogether - especially among the Awin.

g) Language use - in many ways this is one of the most fundamental measures of socio-cultural change. However, significant change is likely to be slow in occurrence and might be best measured at wide intervals, say every five years.

h) Health - like education, existing record collection occurs and could be made greater use of, especially if those records included a note of all patients' village of residence. It should be the subject of specific monitoring, moreover. That is, regular health patrols throughout the lower Ok Tedi area may be required which included nutritional surveys. Even so, one of the most revealing (and both easily asked and answered) questions in the survey was 'what did the household eat last evening?' and I suggest that it might usefully supplement such specific health patrols if it were to be asked annually.

l) Agriculture - the majority of the questions on agriculture in this survey did not provide very useful answers; they were probably too general in their formulation, even if this was deliberately done so as to emphasise to respondents that this survey was not about land compensation. Accurate information on actual gardening practice probably requires a specific survey of its own although given the sensitivity of compensation matters it will be difficult to do. However, the two questions on frequency/success of fishing and hunting did give very interesting and useful answers - because they do not require a map of land or measurement in the field (which will arouse controversy) for them to be obtained. These can be retained in annual surveys.

j) Incomes and expenditures surveys - the questions asked in this survey require some further refinement, but nevertheless they provided reasonably accurate information of very considerable value. Including questions on items bought in the past week or fortnight also provides a secondary check on diets. Given that the questions are relatively sensitive they are probably best left as questions asked of only a sample of the population. They should ideally be asked yearly. However, just as, for example, roofing materials were a good and easily measured indicator of overall housing conditions, so the survey indicated that the extent and frequency of savings accounts held were a good, if rough, guide to borrowing, lending and of incomes in general. If such information were readily available from other sources - such as bank records - then this would form an extremely useful and simple indicator of economic change.

k) Retail trade - the number of trade stores, the range of goods sold therein and the prices of goods are good indicators of economic conditions. The number of active stores alone is closely associated with general economic prosperity, the range of goods tells us much about the extent of the penetration of the cash economy into people's lives and the prices of goods gives a good idea of how the market operates in these rural communities as well as giving a clear indication of the differences in living costs between villages and towns. Despite the many gaps in the data collected during this survey, such information is very easily and quickly obtained. It should be monitored every three months.

l) Mobility - the results obtained in the survey were not as valuable as was hoped even though they indicated distinctly different patterns of movement for the two groups. From such other answers as where people went to for health treatment or for shopping we got similar information although the mobility questions did pick out social trips (which indicated how strong networks for such things as sport are becoming) which no other question picked up. I would suggest that this option in the questionnaires is not of top priority but might usefully be followed up on an annual basis. An alternative or possibly supplementary source of information in this area would be the use of data on registration of vehicles and the sales of outboard motors.

m) Other sources of quantitative information beyond the scope of the survey implement should not be ignored. It may be that I did not understand OTML's system of collecting information very well and have misinterpreted it. However, it struck me as being difficult to lay my hands on data concerning three matters internal to OTML but of direct relevance to the lower Ok Tedi villages. First, as far as I could establish the villages to which PA employees belong are no longer recorded on the personnel computer print outs. Although there were lots of inaccuracies in the system which was in use a few years ago, that system did record that information. I feel it should not be too difficult or expensive to record it once more - preferably with greater accuracy than previously. It would obviously be extremely useful to know where workers come from so as to estimate the amount of money from wages (which as shown in the survey are almost certainly the biggest single source of village income) going into each village. Even with contractors this ought to be possible - it is certainly, in my view, worth OTML's while to know exactly the employment its operations (including those of its contractors) generate since so much heat is generated locally on this issue.

Secondly, it was interesting that although the records of compensation payments, VDF (under the older FRDT system) and R8SA payments were nearly all eventually located it took a great deal of effort to do so notwithstanding the extremely helpful assistance given in the search by all concerned (especially the financial services section and the FRDT office in Kiunga). However, it would appear to me desirable - and not just for the purposes of this exercise - for there to be a consolidated register of all lease/compensation/ex gratia and other payments prepared and maintained under the names of various villages, or at least a database of such payments that could be manipulated to produce a list of village by village, year by year payments. For the day to day dealings of community affairs staff it might prove especially useful.

Thirdly, and this point overlaps with the 'qualitative' monitoring to be dealt with shortly, it would be useful if a register of all visits to villages and all meetings with community or government leaders was kept. Such a register should record who visited what village, on what date, for how long, for what purpose, who was met with, a digest of matters discussed and any outcome reached. Whenever possible - and in the case of any formal meeting that should be on every occasion - the records entered in the register should bear the signatures of the OTML officer(s) involved and those of non-OTML participants indicating their agreement with and acceptance of the accuracy of the record. There are several reasons for this suggestion - even if it will seem to many staff as if it is an unnecessarily bureaucratic one. First, because nothing like this seems to exist at the moment - yet all other aspects of OTML operations are recorded in even greater detail. Second, because it is virtually impossible for OTML right now to refute the oft-made claims that 'no-one ever visits us' let alone rebut or even understand claims that 'so-and-so promised that OTML would do such-and-such'. Thirdly, because in other parts of the world such a keeping of records of community liaisons is not only now considered to be part of best practice in this key area of mining operations but is legislated for by governments. Fourthly, because although very few things are more useful in community relations than the deep personal knowledge possessed by experienced individuals, few things are less useful than community relations efforts which are less than fully informed about other aspects of a company's activities; one of the purposes of keeping such a record of events is to ensure that the collective memory of OTML on community matters is retained. Such a record makes concrete the efforts of community affairs staff, not only in the sense of achievements in the field but in ensuring that everyone is aware of the efforts being made by the very many individuals involved in such efforts.

Qualitative indicators

The borderline between quantitative and qualitative indicators is not always sharp. As shown in the survey it is possible to express some opinions as numbers. However, we will assume that opinions are all qualitative. One of the most heartening outcomes of this survey was the fact that although many Yoggom expressed the view that they were tired of answering questions that led to nothing they nevertheless answered while the Awin often expressed great pleasure that the survey canvassed their opinions. If serious note is taken of such opinions - and that does not mean satisfying the myriad of individual demands, but simply showing that they are listened to and properly considered - there is little doubt in this writer's mind that relations can be improved.

Qualitative indicators are slightly more difficult to define than quantitative ones and, at first sight, more difficult to interpret. This latter difficulty is, however, only superficial because often the interpretation of numerical facts is rather more complicated than one assumes - in other words, all interpretations are difficult!

Effectively, most qualitative indicators will be concerned with people's opinions and perceptions. As noted in the survey, on most issues of importance there will be divisions of opinion even in the same small community even if, sometimes, a general tendency may be discerned. It is suggested that from OTML's viewpoint the one opinion that really matters is: are people happy with the way in which OTML operations are affecting them? However, since there is fairly good evidence to believe that anything that goes wrong in the lower Ok Tedi (or perhaps also anything that goes right - but since so few things have gone right we cannot be sure of this) will tend to be reflected in a negative attitude towards OTML, other questions will be of importance. The strong feelings about refugees shown in the survey, for example, need to be followed up as does the apathy people display towards government services and frequency of government officer visits. In the present survey, as explained earlier, one vitally important area - largely in the qualitative area - was omitted since it was the subject of a separate survey: women's concerns. This must take a prominent role in future monitoring.

The fact that most qualitative indicators will concern opinion raises two further points: first, some opinions are better informed than others and few seemed to be particularly well-informed in the course of this survey - no matter how well expressed they were. Thus, any measures of such indicators will need to be compared against any efforts made in the diffusion of information programmes (the whole question of how such information programmes shall be organised is left aside here). Secondly, even though it is well documented that leadership among both the Awin and the Yonggom is somewhat fragile and fleeting, a political hierarchy of sorts does exist and both the passing of information into, and the gathering of opinions from, communities will need to reflect the different levels within these levels. Thus, qualitative indicators are intimately tied into the political and structural aspects of the overall monitoring process.

Suggested topics for qualitative monitoring include:

Degree of satisfaction with OTML's operations;

Degree of satisfaction with government services;

Views on the effectiveness of dredging;

Degree of optimism (all round) about future community progress;

Extent of concern over presence of refugees;

Extent of interest in greater participation by women in economic and political affairs;

Extent of concerns over changing orientation of village youth;

However, qualitative monitoring need not be aimed at answering specific questions: one other important goal for it will be to provide early warning of shifts in existing issues or the emergence of new ones. Many community relations personnel within OTML already do such 'monitoring' simply by talking to people in the area. These efforts must continue but they need reinforcing in the following ways: first, as mentioned earlier they need to be recorded systematically; second, community relations staff need to regularly meet to discuss amongst themselves social trends; thirdly, OTML staff might take up the suggestion coming from many individual villagers in this survey that they have regular, formal three-monthly meetings in each village - quite aside from any other work they do - so as to discuss matters specific to that village (these could be combined with surveys of views on the specific qualitative issues listed earlier and updated at regular intervals); fourthly, senior management in all sections of OTML need to have clear channels of communications to the reports and to be able to act upon them. (None of these suggestions should be taken to imply that action along these lines is not already being undertaken.)

What to do with indicators?

Monitoring indicators is of very little use in itself. Indicators need to be tied to and determined by a society's goals. In this case, where there is no society plan, the indicators suggested earlier are either so basic as to be essential to the goals of any society or are attempts at guessing what villagers might choose as things worth monitoring. It would obviously be far preferable if there existed a system of planning in the area through which lower Ok Tedi society could identify its own indicators. For monitoring to become much more useful, the development of such a system seems essential. In the next two, brief sections this development is considered. But, the fact that no such system currently exists is not a valid excuse for doing nothing in the meantime.

The uses of the monitoring exercises for the moment appear to be at least two. First, it is to be hoped that simply undertaking monitoring accurately and ensuring that the results arising from it are widely disseminated to and discussed with the relevant communities will increase awareness within the villages of the desirability of establishing a planning system. But while that process is hopefully occurring, in the meantime existing organisations with a role in and responsibility for planning as it currently operates need to be fully informed of the results of monitoring. These include OTML, members of the Alice River Trust, Provincial Government officers, missions and local level governments.

At the moment, the exercise has been initiated solely by OTML, although similar exercises are being undertaken and/or planned by authorities in Kiunga (which raises the need for OTML and Provincial authorities to liaise and co-ordinate). For OTML's own purposes, it is suggested that the chief use of monitoring will be to forge closer and better relations with the villagers of the lower Ok Tedi many of whom, at the moment, are misinformed about OTML's activities and either suspicious of or openly hostile to them. Whether or not the wider goals envisaged here, of establishing a regional planning system, are achieved the company can greatly improve its relations with villages by better planned and implemented liaison, of which monitoring can be a part. An immediate goal for OTML would be both get villagers themselves to suggest what things should be monitored and then to work with them to do such monitoring.

Planning structures

All the above can be undertaken by OTML and the lower Ok Tedi villagers acting together without particular reference to any other agency - and, indeed, even if what follows never comes to pass, should be undertaken. However, it would obviously be highly desirable - and for any of these monitoring activities to extend beyond the life of the mine it would be essential - that they took place within an overall planning structure in which all levels of government played a major role. Moreover, as the mine closure approaches that role should expand and OTML's should diminish. The extent of OTML's role in such a process is obviously vital - at the moment OTML is doing a great deal but after 2009 it will be gone. Thus, a key issue is to work out how this phase out can be achieved with minimal damage to (indeed, whilst achieving great improvement in) the communities involved.

There seem to be two major problems of integrating the types of activities OTML and villagers can do together with the activities of government: first, OTML community relations staff have to deal with lots of different groups whose membership is defined by a plethora of different agreements that have arisen over time to meet the changing needs of the company's relations with these different communities. For example, there are SML communities, highway communities, LOTA communities, R8SA villages, FRDT villages (and others) many of which overlap. Thus, the first problem is the co-ordination of planning for these different groups within OTML itself. Second, the groups defined by the different agreements bear almost no relationship to the basic units of government planning as laid down under the provincial government reforms. The areas covered by Local Government Councils, for example, may include villages in several groups and some villages outside all of them. Consequently, if LGUs are to play a major role in future planning, as is essential, considerable adjustments will be necessary.

Among the lower Ok Tedi villages, Village Planning Committees have been set up. In some villages the VPCs operate, in others they are already defunct. Where they do operate they are seen by many as working with OTML, not with anyone else. However, VPCs can, if fostered, prove to be the foundations of a future planning system; they should be incorporated in all aspects of the monitoring process - including water quality testing every three months and annual census taking exercises. Moreover, eventually (and sooner rather than later) it must be hoped that all villages in the North Fly should possess a VPC which is incorporated within the LGU planning system.

The Local Level Governments ought to increasingly become the link between VPCs and regional planning authorities. If this is agreed, then the institutional strengthening of this lowest level of formal government must be a high priority. The question arises, however: who should be responsible for such strengthening? OTML staff over the years have been expected to take on roles that have virtually nothing to do with mining and are, as the survey showed, looked upon by many villagers as the people who should do virtually everything in the region. Given that closure is now on the horizon, it would seem desirable that LLG strengthening should not be OTML's responsibility - a number of international organisations, including the World Bank have considerable interest in such matters and should be approached.

An implementing agency

OTML established the Ok Tedi and Fly River Development Trust partly to bring basic developments to riverine villages. It both undertook construction of basic services in villages and, until 1996, paid out cash in the form of a Village Development Fund. The Trust, however, has been attacked as being a sort of poor substitute for true compensation (since achieved as a result of the out-of-court settlement and the R8SA), as using inappropriate materials or substandard construction methods and inadequate maintenance, and as undermining the role of government (we will not go into the merits of these accusations). Some four or so years after the Trust's establishment in 1988 (?), the Porgera Joint Venture went ahead with its Tax Credit Scheme which also aimed at providing basic services in the region of that mine's operations (and beyond). This scheme was fiercely opposed by some Engan Provincial authorities but has won wide acceptance and is now also participated in by OTML. It is not clear to outsiders (including most villagers and, certainly, this consultant) what is the relationship between the Trust and the TCS or how the two might be consolidated in future. Nor is it at all clear how Provincial authorities, with their responsibilities for development, or LOTIC and ART might participate in the implementation (as well as planning) of development projects.

In short, considerable thought needs to go into how such an implementation agency can be established in such a way so as to both create efficient use of resources and see the gradual strengthening of local capabilities in implementation prior to the general wind-down of OTML" activities in the next decade.

Conclusion

Evidently, the above recommendations, even if only those referring specifically to the monitoring of indicators are accepted, create considerable new work for community relations staff. However, it is clear by now that in most parts of the world mining's biggest challenges are not really geological but political and social; community relations are certainly now at the centre of successful mining practice.