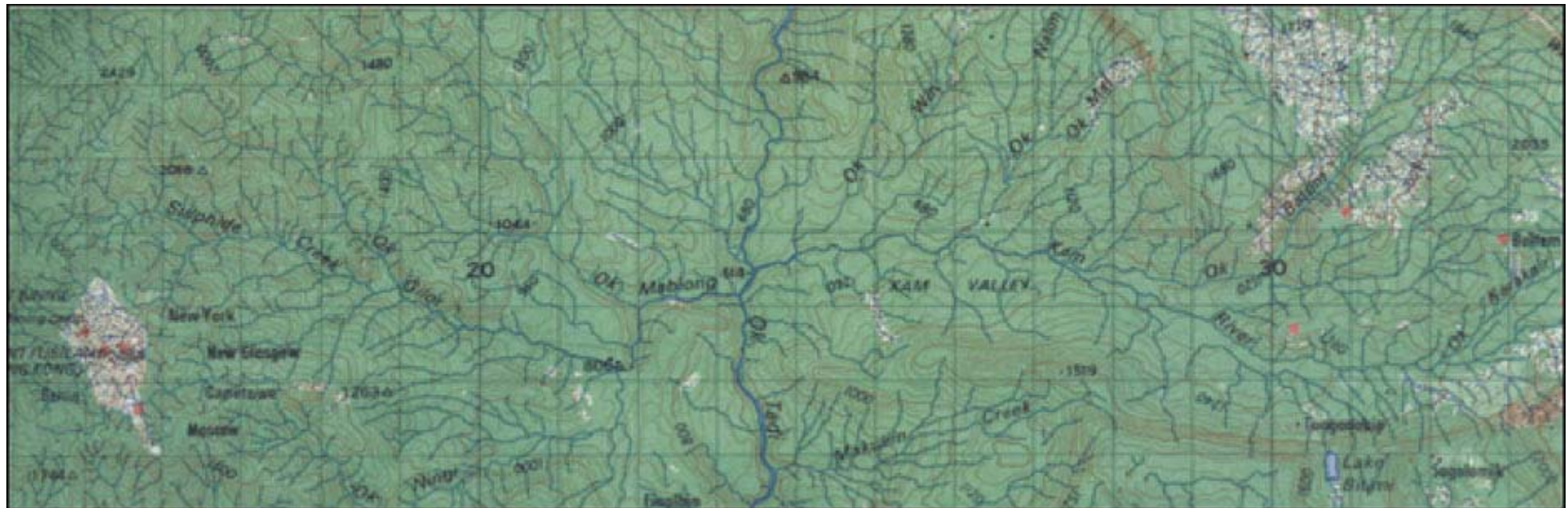




MINING AND SUSTAINABLE DEVELOPMENT

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CONTENTS

[HOW TO FOLLOW THIS CASE STUDY](#) (BLUE TEXT)

[GENERAL ISSUES](#) (MAUVE TEXT)

[INTRODUCTION](#)

THE REASON FOR A TWO-WAY APPROACH

THE CONTEXT

PAPUA NEW GUINEA

GENERAL ISSUE No. 1

EXPLORATION & DEVELOPMENT STAGE OF A MINING PROJECT - VIABILITY

The Initial Planning to Develop the Ok Tedi Mine

GENERAL ISSUE NO. 2

THE DEVELOPMENTAL STAGE - PREDICTING IMPACTS ON LOCAL COMMUNITIES AND PLANNING THE DIRECTION OF CHANGE

Planning and Predicting How Ok Tedi Would Develop and Who Would Be Affected

GENERAL ISSUE No. 3

ESTABLISHMENT STAGE - CORPORATE RELATIONS WITH LOCAL COMMUNITIES DURING THE CONSTRUCTION PERIOD

Constructing the Ok Tedi Mine and Associated Infrastructure in the Star Mountains

GENERAL ISSUE No. 4

OPERATIONAL STAGE - CORPORATE RELATIONS WITH GOVERNMENT ONCE THE MINE IS IN PRODUCTION

OTML's relationship with the PNG Government

GENERAL ISSUE No. 5

OPERATIONAL STAGE - CORPORATE RELATIONS WITH LOCAL COMMUNITIES AND OTHER INTERESTED PARTIES ONCE THE MINE IS IN PRODUCTION

How the Mine's Operation Actually Began to Impact on Local Communities

GENERAL ISSUE No. 6

SHORT TERM SUSTAINABILITY DURING THE OPERATION OF THE MINE

The Way Ok Tedi has Impacted on Local Life Styles and Life Chances

GENERAL ISSUE No. 7

LONG TERM SUSTAINABILITY FOLLOWING THE CLOSURE OF A MINE Probable Long Term Legacies from Ok Tedi's Presence in Western Province

GENERAL ISSUE NO. 8

CONCLUSION - PROMOTING ACCOUNTABLE AND RESPONSIBLE RELATIONSHIPS IN FUTURE PROJECTS

Suggested questions relating to this case study

QUESTIONS

BIBLIOGRAPHY

RELATING TO OK TEDI

BIBLIOGRAPHY

WEBSITES RELATING TO RESOURCE DEVELOPMENTS/DECISION-MAKING AND CONFLICT RESOLUTION

HOW TO FOLLOW THIS CASE STUDYCASE STUDY (BLUE TEXT)

This study specifically traces some developments of the mine at Ok Tedi in the Western Province of Papua New Guinea, and considers some of the outcomes to date, and how they relate to short term and long term sustainability.

GENERAL ISSUES (MAUVE TEXT)

The General Issues provide a framework to assist readers, stage by stage, appreciate the context in which mining projects develop. This framework is then applied to each stage of the Ok Tedi project. It can also be applied to other mining projects. The framework offers:

- a broad structure which can account for the complexities and interrelating developments associated with mining in remote regions
- an understanding of when, where and how planning about change, uncertainty and risk takes place
- a means to review whether all relevant decisions, actions and influences are being taken into account to assess consequential outcomes and responses
- a means to review whether those managing mining projects are making the most effective use of resources to establish local community development programs which deal with change and simultaneously create a sustainable future
- a means for considering what opportunities may present themselves for rectifying mistakes/unworkable outcomes in the light of what has gone before.

Readers can follow the **Case Study** through on its own, the **General Issues** on their own, or both simultaneously. The way the story of Ok Tedi is presented ties in with the structure of the General Issues. Overall, it offers a guide and a starting point for considering how this type of analysis might be applied to other mining projects, to:

- identify parallel issues and dynamics in other mining projects in remote regions both within the Asia/Pacific region and beyond
- trigger constructive thinking about some barriers and difficulties that need to be addressed to promote sustainability in future mining projects
- consider the present capacity and constraints on different stakeholder groups to deal with change, continuity, conflict and cohesion
- appreciate the wider context in which planning about change takes place so that complex issues are not reduced to the motivations, intentions or goals of one particular player or another
- appreciate how understanding the complexities of projects becomes particularly critical when troubles begin to emerge and protagonists take up defensive or adversarial positions.

The bibliography may assist readers to further develop their understanding about the Ok Tedi project and keep informed of developments there. It will also provide additional references relating to environmental problem-solving.

INTRODUCTION

THE REASON FOR THIS TWO-WAY APPROACH

Public Disclosure

There are many mining projects being undertaken in the Asia Pacific region about which we know very little. Most have much less publicly accessible information available about them than Ok Tedi. Often this limitation makes it difficult to understand exactly how and why projects have proceeded along a certain path. Limited disclosure makes it difficult to identify the correlations between project planning put in place along the way by corporations, governments and local communities, and the actual outcomes of these decisions. The reasons for not disclosing details can be to do with the competitive nature of mining, the competitiveness of claims between different local groups, or contradictory policies between different government agencies or factions. These dynamics make it difficult to trace the correlations between predicted outcomes and actual outcomes. However, it is through understanding these links and relationships that better processes can be put into effect which promote and bring about sustainable development. It can be as important to appreciate where there are gaps in our understanding about what has happened as it is to critically evaluate what information is accessible. It is often the case that the issues that are most newsworthy relate to apportioning blame, recriminations about environmental degradation/human rights abuses, or backlash expressed by local communities. All of these issues put groups on the defensive, and it can then be difficult to get to the information that will even allow us to learn from hindsight.

The Ok Tedi project generated significant publicity both within PNG and overseas. It prompted broad international interest, and that interest has itself fostered the consequent motivation for the corporation and others to fund research which gives even more detailed information about this complex project. Most significantly, it has drawn to the attention of a wider public information about the monitoring for sustainable outcomes that are being put in place as the mine moves toward closure.

Scale

While large-scale mining corporations have become targets for a great deal of community pressure and concern about adverse consequences of development in the third world, it is often the scale of their operations that suggest they are the worst offenders. However, in each regional context, the performance of a large-scale mining project undertaken in a remote area needs to be assessed from two directions. Firstly, their performance needs to be evaluated in the light of the corporation's own code of conduct and its performance in its home country, and secondly, it needs to be evaluated against the performance of other local companies in the host country, or companies controlled by newly industrialised countries. Large corporations are realising that they present the most identifiable target in a very complex web of influences associated with development in third world countries that lead to unsustainable change and/or environmental degradation. The same is also true in 'fourth world' situations in developed countries. Large corporations will continue to incur more pressure than many other small to medium sized mining companies operating in similar circumstances which do not attract media attention, but it is likely that large corporations will ultimately provide the resources and the incentive to lead the way toward seeking better outcomes.

THE CONTEXT - PAPUA NEW GUINEA

Papua New Guinea

Papua New Guinea consists of a mainland and a collection of islands of varying size covering a land area of some 474,000 square kilometres. It forms the eastern part of the island of New Guinea. The western part is the Indonesian Province of Irian Jaya. The dominant feature of the mainland is a central spine of high mountain ranges intersected by valleys and plateaux. It has a generally hot and humid climate but because of the mountainous topography and prevailing air streams, conditions vary greatly from one area to another. Rainfall is the characteristic that differentiates the seasons, but the timing varies from one area to another. In the highlands, climatic variations are most striking, and distinct 'micro-climates' are evident from valley to valley.

Approximately 3.6 million people live in Papua New Guinea. English is the official language. Pidgin and Motu are the other main languages, but there are approximately 700 different languages or dialects. There is a multiplicity of clan groupings with a wide variety of physical features and cultural styles, but all are generally described as Melanesian. The main concentrations of population are in the rural highland valleys, although over the last few decades there has been a drift toward towns and cities. Compared to the population of, say Java, or other countries in Asia, the overall population density is very low. This is due mainly to the fact that the tropical rain-forest soil is poor in nutrients. There is no prospect of high fertility in areas where vital minerals are washed out by tropical rainfall. The tropical rain-forest conditions present some health problems for local communities. Malaria and respiratory illnesses are endemic, and the low nutrient levels in the soil restrict the availability of protein-rich food crops. Protein is usually derived from fish, game or kept livestock, such as pigs.



Before the arrival of Europeans, a higher density was only possible in the fertile regularly flooded areas along white-water rivers, in hill-forests, upland areas or on volcanic soils. Diversity is one evolutionary response to shortages of plant nutrients in the soil. This is reflected in indigenous social arrangements, and the multiplicity of plant species. Even as recently as a decade ago, plant diversity was underestimated by a factor of ten.

Subsistence agriculture remains the dominant economic activity. Indigenous land use involves food gathering in the forests, the cultivation of rotating 'gardens' which produce mainly high-starch crops such as yams, and production of protein-rich foods, particularly from pigs, to meet family and

community needs. This simple commodity production is an unexpanded form of exchange that is geared toward maximising family wealth and well being. It is distinguishable from capitalist commodity production where the goal is to maximise profit or surplus. Simple commodity production involves complex local exchanges of wealth, organised through cultural systems of exchange. However, many people also produce plantation crops such as coffee, tea, cocoa and copra for cash. Most land in Papua New Guinea is owned in a complex and traditional system of clan ownership that has been legalised into a national land ownership system. Individuals and clans own all but 5% of the land in Papua New Guinea. In most Papua New Guinean languages, people's relationship to land is not normally expressed in terms of alienable, commodifiable possession but rather in terms of an unalienable or familial association. In the customary conceptual framework, it is as difficult to imagine the buying or selling of ground as a commodity as it would be to imagine buying or selling one's mother or child, or a piece of one's own body.

GENERAL ISSUE No. 1 - EXPLORATION & DEVELOPMENT STAGE OF A MINING PROJECT - VIABILITY

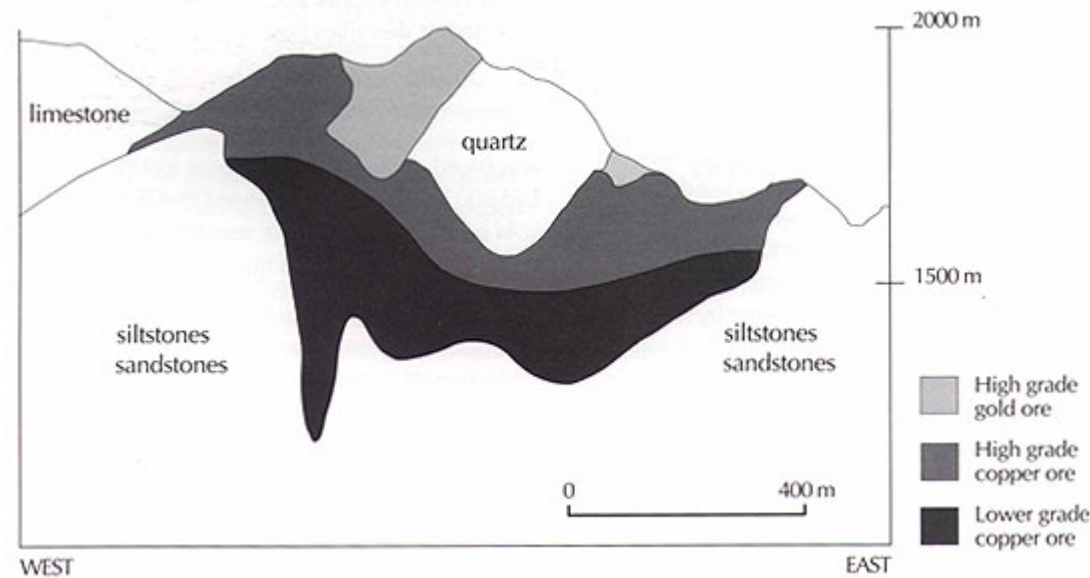
The initial negotiations to introduce a large-scale mining project takes place between top level corporation managers and representatives of a host government. Together these representatives set out their priorities and goals and consider broadly whether their interests are compatible. The negotiations between corporations, consortiums and national governments have a strong focus on the macro-economic advantages that could be derived from the project. Corporations estimate the expenditure and match that against predicted revenue, insuring that investment will return a profit after payments for infrastructure costs, taxes, royalties, compensation, loan repayments etc. Government analysis focuses on both national and regional predicted impacts and risks associated with the development, and plan how they will measure and distribute benefit against relative costs. They will agree to proceed to the planning stage of the project if biophysical data and other determinants within the global and national economy predict a viable outcome. Community liaison may be undertaken at the earliest phase of exploration, or it may be deferred until the corporation, its financial backers and the government have developed their preliminary plans and financial arrangements.

The Initial Planning to Develop the Ok Tedi Mine

In 1968, Kennecott Exploration (Australia) Ltd., a subsidiary of the transnational mining giant, Kennecott, discovered an ore deposit at Mt. Fubilan near the Ok Tedi River in the Star Mountains in Western Province. The site is located in a precipitous mountain range in one of the wettest places in the world, about 10 metres of rainfall annually. It falls within the Fly River drainage system of approximately 75,000 square kilometres. The Fly River carries off about 200,000 million tonnes of water each year, and carries with it 100 million tonnes of soil and silt to the Gulf of Papua. It ranks with the Mississippi, the Amazon and the Yangtze as one of the world's major rivers. It is 1,100 kilometres long and 65 kilometres wide at the sea where it becomes a maze of channels flowing between low-lying islands. The region was virtually totally undeveloped in western terms. There was virtually no significance given to the international border between the Australian-controlled territory of Papua New Guinea and the former territory of Western Papua, now the Indonesian province of Irian Jaya. The other large-scale mining projects, which have since been developed in the region, including Porgera in Enga Province and Freeport in Irian Jaya, had not been initiated at that time. When the ore body was first discovered, the national government, still under Australian administration, had little interest in developing these resources. Western Province was at that time still a very remote region within PNG. The copper mine on Bougainville island was being established as the primary resource development project. After independence in 1975, however, the PNG Government established the Ok Tedi Development Company to carry out further explorations, which revealed the full magnitude of the mineral wealth of the area.

The government sought foreign investment to develop the site. In 1976 appointed Broken Hill Pty Ltd., Australia, and (BHP) to conduct a feasibility study and form an investor consortium. This consortium comprised Standard Oil of Indiana, a subsidiary of Amoco Minerals Inc., and a group of four West German companies entitled Kupferexplorationgesellschaft. They completed the proposal in 1979. They planned to mine in three stages. The first was production of gold bullion, followed by production of gold bullion and copper concentrates, and finally, production of only copper concentrates. It also proposed that the PNG Government take up a 25 per cent equity option and provide assistance worth A\$180 million.

Diagram 1: Cross section of the Mt Fubilan ore-body



GENERAL ISSUE No. 2 - THE DEVELOPMENTAL STAGE - PREDICTING IMPACTS ON LOCAL COMMUNITIES AND PLANNING THE DIRECTION OF CHANGE

If a project appears viable, the corporation and/or the government initiate programs to interest, inform, persuade and reassure groups in the locality of the proposed mine how they could derive micro-economic benefit from the development. Corporations, because of their considerable wealth, will usually hold the strongest bargaining position in negotiations. It is at this time that corporations have to consider how they will confront the potentially ethical dilemmas associated with their relationship with local communities. On the one hand, they need to institute public relations campaigns to gain the necessary local support for projects. However, simultaneously, they must institute processes to negotiate fair and equitable exchanges and formally binding settlements with communities within the region, demonstrating that they have addressed and will account for an appropriate range of community needs and goals brought to light in relation to the proposed changes. Simultaneously they:

1. promote and offer benefits of 'development' in exchange for natural resources and
2. prepare to accommodate, address, and 'manage' diverse local, regional, national and international concerns, opinions, anxieties and uncertainties about the predicted mine development, including some which are directly opposed to the project, or the role government will play in the establishment of the project.

The tension between these two aspects of 'external relations' is particularly critical and challenging when projects are being established in remote regions, where local communities maintain small-scale premodern modes of production. One of the most profound dilemmas for corporations is that 'agreements' with local communities

who have a different social system, culture and sense of belonging cannot assume the same fixed degree of certainty that underlie agreements in the 'modern' sense of the word. Ongoing review and modification to accommodate local issues will be necessary as projects move from the **planning** stage into the **establishment** stage and then to the **operational** stage, and prepare for post-mining sustainable development when the mine closes.

This issue is most significant with respect to how different groups hold an **interest in land**. There are no straightforward preordained answers as to how corporations should institute processes to acquire land. Each circumstance will be unique to its own time and place, yet the issue of how local people belong to and use land will remain a continually relevant feature which is integral to most aspects of planning for a sustainable future. It needs to be accounted for in every aspect of mining in remote projects. In the light of each particular set of circumstances, corporations are increasingly required to carefully plan how they will negotiate and campaign to deal effectively with:

1. acquisition of land in the vicinity of the project, including the relevant issues of relocation and compensation, and
2. undertake to inform all local groups who may be affected by the impact of mining about the significance of anticipated outcomes.

If a project is being established in a remote region, there may be few precedents that suggest how all the relevant stakeholders will deal with environmental change. There will be a continuing tension as to how the corporation and the government prioritise and guide processes for addressing both short and long-term sustainable outcomes, taking into account how the uncertainties associated with large-scale projects will bring profound and sometimes irreversible change. They must correlate and integrate these factors with their need to be competitive and alleviate costs by avoiding delay in getting projects under way.

'**Community liaison**' and negotiation ranges across and between a wide range of sectoral and cultural groups, and power bases, involving various sections of the corporation itself, its partners and subsidiaries, various government agencies and different communities. The task of coordinating and integrating planning across different levels and sections of a large corporation is always complex. The task is profoundly compounded when the project being undertaken is in a remote region where many issues relating to social risk and social cohesion are unprecedented. The project will involve complex management, negotiation and diplomacy skills as the corporation plans to establish the necessary infrastructure for the mine and structure compensation packages, services and functions. Many of these will be offered as a direct benefit to local communities. The offered benefits can include road links, shipping links, provision of medical, educational and communications services for people living within the locality. Corporations undertake to establish them primarily for their own purposes, but when the infrastructure is being established in a remote region, it simultaneously represents one form of regional and national direct development benefit. The corporation must provide a level of services and functions which meets the expectations of their own personnel. It is less straightforward to determine the level of services and functions which the corporation should be liable to provide for local communities over the many years of the project and beyond. This becomes a critical issue for long-term accountability and sustainability when a mine is introduced into a remote region. In such cases, a corporation becomes an interim 'surrogate' provider of services that traditionally would be provided by government. The corporation will have to contend with the issue of justifying differences in 'standards' between the home country and host country. Legally enforceable standards of the host country may not entail the same environmental and social responsibilities that are in place in the corporation's home country, or in the corporation's own code of conduct. Projects which entail a surrogacy function can present many problematic 'grey areas' about responsibility and accountability between the corporation and other interested groups who feel they have a stake in local issues.

An understanding of local ecological adaptations, social attributes and local forms of governance which are relevant within the locality of the mine become the basis for the corporation's promises to offer micro-economic 'development' benefits. These promises have to merge and accord with the macro-economic agreements made with regional and national governments. They have to express a responsibility for **micro-economic arrangements as well as the formal macro-economic agreements** made with national governments. Corporations must synthesise within their own organisation the necessary management responsibilities and skills, drawing from both the 'social' as well as the 'physical' sciences, so that community development aligns workably with the corporation's own material goals. The integration of information and ideas about how different groups express their power and legitimacy at local, regional and national level, and how this relates to the corporation's own power and decision-making processes, will be profoundly different when developing a project in a less developed country than it would be if the corporation undertook a similar project in their home country. Corporations tend to express their responsibilities in accordance with institutional requirements in place

in 'modern' countries and the modern global economy; however, third world host countries may not have equivalent institutional processes in place, and the supporting bureaucracy may not maintain the same levels of experience and expertise that are in place in a developed industrialised country. Corporations therefore cannot necessarily assume that all institutional functions will be as straightforward or determined in the host country. Ultimately the corporation will be judged as to whether it has fulfilled its responsibilities, including the responsibility to respectfully acknowledge and address the project's impact on local social systems. This makes it critical for corporations to consider carefully whether the information and the assumptions on which they are basing decisions is reliable and consistent, and is regarded as legitimate and useful by all concerned. Agreements to proceed with mining need to be based on appropriate information and decision-making skills to establish how local people themselves perceive their present or desired lifestyle and how they are prepared to deal with change.

Articulating Responsibility -The outcome of negotiations is to achieve settlements so that corporations can fulfil their specific material goals, but entailed in settlements is the issue of clarifying how change will impact on sustainability. Corporations will find it increasingly challenging to define areas of responsibility concerning their relationship with local social systems, senses of belonging to land, and local forms of governance throughout the different stages of the mine. They have to simultaneously balance this responsibility with a responsibility to acknowledge national government legislation and policies, and responsibilities to their shareholders and financial backers. There will be an ongoing dissonance between macro-economic national agreements and micro-economic interactions with local communities. National governments may be either unable or unwilling to accept full responsibility for the range of new dynamics that come with the establishment of a project in a remote region. They will, however, still be concerned to retain influence over the direction of community development programs and development issues. The corporation has to contend with local realities, and the way other groups perceive these realities, being sensitive to create development programs that are not misinformed, unrealistic or paternalistic. The impact a corporation's activities have on a remote region will require management to **continually monitor** whether programs for which they will be deemed responsible are workable and sustainable for local communities, and to what degree development programs can be sustained once support and subsidies from the corporation cease.

As planning for the mine develops, the **delineation of physical impact areas** becomes critical. Delineations for developing the mine infrastructure have to workably integrate with the complexity of other ways that people understand the area. Planning has to take account of ethnic boundaries, how all local people 'belong' to an area and understand and use its resources, the scientific understanding of the ecosystem, and government boundaries. Corporations make predictions about the extent of physical impacts, and then merge these predictions with their understanding of how the changes will impact on the region. This is a critical issue because, even though there are inherent uncertainties associated with predictions, the preliminary decisions which settle the boundaries of impact, will also set in place fixed delineations of responsibility and accountability. The impacts will take place over many years, and will profoundly influence the life style and life chances of people living in the immediate and intermediate vicinity of the mine.

Planning and Predicting How Ok Tedi Would Develop and Who Would Be Affected

In the planning stages in 1978, the BHP consortium asserted that, in the interests of minimising costs, the tailings produced as a result of the copper concentration process should be dumped directly into the Ok Tedi River. They argued that any toxic materials would be diluted downstream, given the extremely high rainfall. The government, however, was concerned that once the tailings were dumped, there would be no way of controlling or monitoring their movement. Being aware that uncontrolled dumping had created extensive environmental damage and profound local dissatisfaction on Bougainville, there was a strong argument against free dumping, and this was backed up by feasibility studies. In 1979 during the planning and developmental stage, gold prices began to increase and the prospect of better returns provided the incentive to abide by the conclusions of the feasibility study, calling for the construction of a permanent tailings dam and waste dumps. In 1982 Maunsell & Partners prepared an environmental study to assess the potential environmental impact and establish environmental standards. On the strength of these reports, agreements were made between individual shareholding companies, OTML and the PNG government. They served as the basis for regulating compensation claims to the Min people living in the area at that time and defining the liability of the corporation. Special mining leases, held by the PNG government and sublet to OTML, were granted. The leases covered the minesite area and surrounding predicted impact areas, including the site on which the township of Tabubil was to be developed, as well as the hydro-electricity station and the tailings dam and waste dumps. The leases and agreements were drawn up on the

assumption that a tailings dam would be built.

The compensation arrangements negotiated with landowners living within the mine lease areas were based on the prediction that this was the locality that would experience the greatest physical and social disturbance. The local population of Min peoples from the mountain ranges in Western province, trace descent from a common ancestress, and share a set of closely related dialects and cultural practices. In the forest environment of the Star Mountains where the soil is poor in nutrients, Min clans did not maintain permanent settlements. They derived their living primarily through hunting and gathering in a semi-nomadic pattern within the forest. In many other ecological niches within Papua New Guinea, groups derive a higher proportion of their sustenance through cultivating root crops, sago and taro and other staples.

The newly independent state of Papua New Guinea was, at the time of the establishment of the Ok Tedi mine, attempting to define a fixed system of land ownership. However, in regions such as Western Province there had previously been little need for a nationwide bureaucratic commodification of land. Landholding between the diverse indigenous groups maintaining subsistence modes of production was expressed mainly in terms of local social relations. Indigenous landholding was not static and fixed, it was a very complex, dynamic and fluid sense of belonging to particular areas of land that changed over time. The concept of entitlement to a fixed delineated area of land was unprecedented in the region.



The communities in the mountain areas were the major focus of OTML's planning to institute programs mitigating social change. These landowners were offered 30% of the anticipated mine royalties. The agreements granted a further 70% of royalties to the provincial government as well as a support grant from the national government. The Lower Ok Tedi/Fly River did not fall within the lease area. The river communities therefore did not feature extensively in the planning of community development programs. It was anticipated that they would not incur great physical and social disturbance.

OTML had to structure their community planning programs, and settle upon certain definitions of ethnicity. OTML's community relations policies with landholders and local populations were developed in conjunction with national government's new land ownership system, still being formulated at that time. One local ethnic sub-group, the Wopkaimin, were considered by the state to be the legally appointed holders of land at the mine site and township. This group would be allocated royalties from the mine. Another sub-group, the Faiwolmin, from the nearby mountains, did not receive the same entitlements, royalties or employment opportunities at the site, despite their continued claim over the leased land, based on what they insisted was a common cultural and linguistic heritage. The Faiwolmin did not derive the same benefit from their status as landholders as the Wopkaimin, and they held a more peripheral position in the regional economy created through the impact of the mine. The imposed structure set in place a 'reality' constituted at one particular point in time, created to be relevant to the context of the development of the mine. It dictated which groups of Min would or would not receive capital directly in the form of royalties and revenue from the mine. These formal arrangements created their own new expressions of power and status, and a consequent contention between local populations. The new structures brought forth new definitions of the past, as well as the present and the future.

The negotiations to acquire land for the Ok Tedi triggered new ways that Min people could think about 'belonging' to one particular place, one particular ethnic sub-group at one particular time. The negotiations themselves created new concepts of 'inclusion' or 'exclusion', particularly in respect of predicted environmental damage, relocation and compensating benefits in the form of royalty payments and community programs. The negotiating teams based their policies for allocating compensation and benefit on their predictions relating to changes in the biophysical landscape. The relatively fixed boundaries delineating impact became the basis for lease agreements between the PNG government and OTML. However, the notion of fixed ownership of territory was not a concept that was familiar to local people. The delineation of impact areas and ethnic group boundaries dictated which groups would be entitled to benefit, and dramatically and decisively also dictated how and with whom the consortium was legally bound to negotiate, and to whom they owed responsibility. The corporation's negotiations about compensation and social programs were based on their understanding of predicted physical impacts. This became a particularly critical and troublesome issue as the problems of waste management increased during the **operational** stage of the mine. Later in the case study, it will become apparent that a great deal of contention developed as to who should have assumed responsibility for the social and environmental problems which the tailings dam issue brought to the Awin, Ningerum, Yonggom people and other linguistic groups living further down the Ok Tedi and Fly Rivers.



GENERAL ISSUE No. 3 - ESTABLISHMENT STAGE - CORPORATE RELATIONS WITH LOCAL COMMUNITIES DURING THE CONSTRUCTION PERIOD

To acquire land and establish the minesite and associated infrastructure, corporations invest a great deal of their own equity capital. They do so on the basis that it can be recouped once mining begins and generates income many years later. To be viable, projects need to proceed for the entire predicted life of the mine. Once the mine is established and becomes operational, revenue then offsets the vast corporate expenditure and a competitive profit will be realised for investors. The **establishment** stage is a time when there is a sense of urgency for both the corporation and the national government to get the operation developed quickly for their mutual benefit.

When construction of the vast infrastructure gets under way, corporations and their subsidiaries, become heavily involved with budgeting, scheduling and co-ordination issues. Vast amounts of borrowed capital and government capital are tied up in projects. They will only bring the ultimate macro-economic returns once the mine is well into its **operational** stage. Both the corporation and the government will be placing a great deal of importance on the macro-economic imperatives driving the project. How the establishment of infrastructure immediately impacts on micro-economics at local and regional levels becomes only one of many interrelating factors within the overall plan to get the mine established. The **construction** stage is the culmination of years of complex and sophisticated planning by teams, both within the corporation, and within subsidiary construction companies, who have specific expertise about mining undertaken in different countries worldwide. It is during the **construction** stage that mine managers, construction company managers, incoming workers and local workers actually become a tangible physical

presence in the locality. It is at this time that many ideas and attitudes are formed, and new relationships and new local economies develop between incomers and local landholding groups.

Corporations have to make decisions about how they will prioritise their expenditure of investment capital at this time of crucial scheduling and coordinated planning, including how they coordinate policies to address changing local community needs. There may be uncertainties associated with construction that make it difficult to predict how to most effectively implement community development programs, or what issues will take the highest priority in the establishment of local programs. For local people experiencing the first impacts of change, however, the **establishment** stage is the time when the scale of environmental and resource damage begins to be understood as a physical presence. It is a time when local people will be considering whether they welcome the changes, and whether they are satisfied with how the corporation allocates and distributes capital funds to offset the environmental and social changes, particularly the significant changes it brings to local economies. The dramatic influx of capital, goods and services can bring sudden and unsustainable material and economic change. It is a time when changing circumstances can trigger new local rivalries. The advent of the mine also puts pre-mining issues within the context of the new development, so that both old and new problems become relevant to the impact of the mine. For local people, changes, by design or luck, create new interpretations of gaining or losing. The vast changes bring many new definitions of identity, status and power, particularly through inflowing capital and compensating programs.

Constructing the Ok Tedi Mine and Associated Infrastructure in the Star Mountains

In 1981, a further joint venture was formed to develop the mine under the name of Ok Tedi Mining Ltd. (OTML). This consortium comprised BHP (30%) Amoco (30%) Kupferexplorationgesellschaft (20%) and the PNG Government (20%). The US-based construction company Bechtel-WKE was appointed to develop the infrastructure for the mine. The terrain of Western Province is geologically unstable. The construction project was hindered by delays caused by landslides and drought. By the time costs had overrun by US\$300 million, relations between all the interested parties were becoming strained. There were tensions between Bechtel and OTML because the establishment of the infrastructure was overrunning the predicted 'budget'. This created the need to obtain large amounts of additional funding to complete the **construction** stage. There were tensions between the OTML partners compounded because of uncertainty about the world price of copper, and how this would impact on their investments. This in turn created tensions between the PNG government and the foreign partners. Metallgesellschaft, working with the Bank of America obtained the additional funding to complete construction.

Based on a cultural impact study commissioned by the PNG Government in 1983, the ethnographer Fredrik Barth maintained that community life and local tradition among Min people would be cataclysmically disrupted if there was an exodus of migrants from the nearby mountains to the mine. OTML made public its efforts to monitor the effects of the mine on local populations in the light of the impact assessment and national government policies. The policies the corporation developed were protectionist insofar as they sought to culturally manage, contain and control local indigenous populations. This was reflected in OTML's employment and housing policies. Barth's suggestion was that the company refrain from housing mountain families, in the hope that many would instead take a stronger interest in small-scale commercial agriculture in the mountains. Agricultural programs were promoted by both the government and the company. In an attempt to keep mountain villagers not directly employed at the mine in their home locality, OTML maintained a policy whereby Faiwolmin mine workers from the nearby mountain region were deemed to be single men, entitled only to camp accommodation. However, migrant families of 'single' men were attracted to Tabubil. Although there was a real presence of different Min people within the vicinity of the mine, Faiwolmin people did not share an equal social standing with Wopkaimin people, who were deemed by both the company and the government to be the holders of the leased land, and therefore the immediate beneficiaries of compensation.

Establishing the mine was a massive undertaking. The infrastructure developed for the mine in the early 1980's in the extremely remote and inaccessible region of Western Province included 170 km of roads, establishment of the township of Tabubil and treatment facilities for the copper ore, construction of a hydro-electric power station, and a tug and barge system with full port facilities to operate over 1300 km of river and sea.



This stage of the project forged many new economic, political and cultural relationships between local people who lived in the vicinity of the mine. Those most profoundly affected were local groups who had to be relocated because their land was needed to establish the minesite and infrastructure. These groups felt the impact directly on their local subsistence lifestyle. The company provided through the new township a range of services available for mine personnel and relocated local people. The introduction of a cash economy and new food supplies were accessed primarily through compensation funds or through wages. Compensation became an issue that was important to all local people. Access to capital became an issue that was directly relative to local people's cultural connectedness, whether a person was affiliated with a group entitled to compensation. OTML set up policies and practices to manage and control the direction of change, and sought to bring about the most compatible means of accommodating local custom within the context of their own specific interests in the area. Based on ethnographic advice, government and local participation, they implemented extensive community development programs.



There is always an ongoing correlation between community development programs and environmental impacts. This is integral to the story of Ok Tedi and concerns two distinct localities and two distinct sets of relationships between the corporation and groups of local people. The first, which came about when the mine was in its **establishment** stage, concerns how issues and ideas relating to sustainable outcomes for the people of the Star Mountains were implemented as community programs. The other set of relationships, which emerged in the later **production** stage, concerns the unanticipated environmental outcomes associated with the mine's impact on the Ok Tedi and Fly River systems and the people who derive a good

proportion of their living from the rivers. The differences between anticipated outcomes and actual outcomes hinges around the collapse of the tailings dam while it was still under construction. The people of the Star Mountains who lived within the mine lease area became the beneficiaries, in one sense, of a disproportionate share of the capital earmarked for compensation, insofar as the environmental impact relating to the holding and treatment of waste material, did not eventuate according to the earlier plans and predictions for waste treatment. The earlier plans were, however, the basis for agreements between the government, the corporation and leasing landholders. The issue of how to deal with the waste treatment was not an issue with which the Min people had to contend. However, the very presence of the mine within their region did bring significant and profound material and social change. Local communities have become progressively less self sufficient, and in some cases this can be attributed to the takeover of land. This part of the rainforest could no longer provide the resources from which they derived a living hunting game, fishing and food gathering from the forest, supplemented by growing staples, such as taro and potato. The township through its very creation, triggered responses from people from a much wider area to 'drift' toward the township from mountain regions. This is a trend which has also occurred in other parts of PNG in recent decades. In either case, more food is supplied through local stores and there is more reliance on a cash economy. There are also higher expectations with regard to community services such as schools and medical facilities. A high proportion of local people presently use the amenities and services provided by the corporation to distribute wealth and well being throughout communities.

GENERAL ISSUE No. 4 - OPERATIONAL STAGE - CORPORATE RELATIONS WITH GOVERNMENT ONCE THE MINE IS IN PRODUCTION

The viability of a project depends on the degree of profit which will be realised from the vast expenditure once a mine is actually operating. Mine outputs allow corporations to start recouping profit and offset previous expenditure by repaying loan capital and initiating revenue payments to the government. Theoretically, at this time, compensation payments by the corporation to local communities to mitigate environmental damage and social change are phased out. They are superseded by government payments, usually in the form of revenue distributed as an agreed representative share of the wealth accrued from the project. It is a time when the payment of 'compensation' to local communities is superseded by royalty payments which represent the way that local 'development' benefits will be realised for a sustainable future. The corporation's responsibility shifts toward overseeing and maintaining the mining operation, and the government assumes a greater share of responsibility for maintaining community development.

Many problems can arise at the time of this transfer of responsibility from corporation to government for capital payments to indigenous communities who can no longer fully maintain their previous traditional mode of production. They can arise between national, regional and local interests about which arm of government should take responsibility for the allocation and distribution of revenue. It can be a period characterised by procedural problems about distribution, misunderstandings about agreements, and inappropriate or inadequate decision-making and problem-solving. Conflicts of interpretation can develop between local communities and the mining corporation; between different levels of government; and among landowning groups over compensation and revenue payments. The following are two ways that uncertainties associated with large-scale projects can become serious 'development' problems for governments.

Firstly there is the issue that disastrous environmental, and therefore social, consequences bring unwelcome and unsustainable change for local people. If **serious environmental problems** arise, the basis for prior agreements may be called into question. Complex problems and complex agreements can be over-simplified or reinterpreted, as groups re-consider what benefit they will, or will not, derive from the project. Disputes about the bases for initial agreements then begin to be overlaid over the issue of how and who will tackle the actual problems of rectification. This can bring to the surface a range of uncertainties that were not settled, or were not able to be settled, in the planning stages of the project. This is usually the stage when projects begin to attract adverse media attention, or intervention by watchdog organisations highlighting environmental problems. At this stage, simmering slow-fuse issues and problems begin to be openly expressed as dissatisfactions, and groups start to take up defensive positions. The most immediate way that local communities can raise claims about liability and 'force' either the corporation or the government to respond to environmental problems is through legal channels. However, it may be that local communities will have to contend with strong government opposition to claims for further compensation to rectify environmental problems, particularly if civil action could threaten macro-economic outcomes. In some cases

other scrutineers will want to assume the right to intervene and assess project outcomes independently, such as insurance company assessors, UN agencies, or international courts.

Secondly, there are issues of uncertainty associated with unpredictable factors generated well beyond the locality of the mine which also have the capacity to undermine the project's macro-economic viability. Many external factors, such as the world price of other export commodities, can force governments to rely more heavily on large scale resource extraction projects. Factors such as global interest rates, exchange rates, and market commodity prices are crucial to maintaining a trade balance. Fluctuations can influence the profitability and viability of projects, and put pressure on governments to reconsider national interests over regional interests or local community interests.

While a corporation's **risk** is underwritten through insurance companies, third world countries have to rely on international agencies such as the World Bank and the International Monetary Fund if investment in development projects contributes to the risk of serious national economic problems. If there is a slowdown in the global economy, developing countries can experience economic shocks due to reductions in demand for commodity and mineral exports and consequently falls in commodity prices and net barter terms of trade. This can lead to an increase in interest and debt service payments in part attributable to a rise in real interest rates, and a fall in development assistance in the form of aid and other capital flows. This can present serious consequences for economic, social and political stability through inflation and disequilibrium in government finances. There are underlying contradictory explanations of economic crisis, and therefore the usefulness of international assistance from agencies such as the IMF to help governments maintain stability as they attempt to administer broad social, economic and political transformations. The IMF's monetarist model emphasises the role of the national balance of payments in achieving equilibrium between the demand and supply of money. Real income is usually assumed to be fixed at full capacity level of output, so that changes in nominal income involve changes in prices rather than output. The IMF's model suggests that balance of payments deficits are attributable primarily to domestic policy 'mistakes' over control of the money supply, internal factors, rather than the external shocks over which individual countries have little control. Conversely, however, the United Nations Conference on Trade and Development (UNCTAD) promote a structuralist view of macroeconomics. The structuralist view maintains that crises in internal economies of less developed countries are largely caused by global factors over which individual countries have little control, and that application of the monetarist theoretical model does not adequately consider the lack of balance between different supplies and demands in different sectors of internal economies and between different groups where many people maintain premodern modes of production and there are other exchange values operating besides cash. From a structuralist perspective, problems such as inflation result from attempts to bring about rapid economic growth when there are profound constraints in the existing economic, institutional and socio-political structures. While both views concede that changes in money supply occur in response to political factors, the debate is whether the changes permit or are the actual cause of negative outcomes, such as inflation, within internal economies. Given these uncertainties, it becomes very difficult to predict whether social and environmental 'costs' offset capitalist economic benefits. The IMF can impose conditions and structural adjustments on loans to rectify what they perceive to be domestic policy 'mistakes' over control of the money supply. This can force indebted governments that have become heavily reliant on the revenue from large-scale projects to review their original plans to plough benefit back to affected communities. Decreases in predicted revenues can restrict the ability of government to assume responsibility for maintaining local community development programs set in place by corporations.

OTML's relationship with the PNG Government

The mining for high grade gold ore on the cap of Mt. Fubilan, which overlays the larger copper/gold ore body, went into production in 1984 and operated until late 1986. The second stage of mining for both copper and gold production then went into operation, with gold production ending in September 1988. OTML had produced nearly 60 tons of gold from the cap. In its last full year of gold production, the mine produced profits of K77 million. The project then started on its third stage, for the long term production of copper concentrate. Disputes about the allocation of revenue from the Panguna mine on Bougainville had been one of the factors which precipitated the dramatic halting of copper production there in 1989. By 1991 the Ok Tedi mine accounted for all of Papua New Guinea's copper exports and 18% of its gold exports. Export sales in 1991 earned Papua New Guinea K441 million, or 34% of the total export earnings for the year. The challenge was whether the vast sums of investment capital that were finally being returned to the government as profit could be directed toward regional sustainability in Western Province, and avoid a repetition of the dissatisfactions that had been

expressed on Bougainville. Mining operations are highly import-dependent, and substantial capital still has to go toward offsetting the cost of imports of equipment, supplies, fuel, spares and wages. Additionally a substantial amount of the revenue had to go toward repaying debts accrued throughout the difficult establishment stage of the project. Unanticipated engineering problems had extended the **construction** stage and therefore the costs considerably.



In 1984 during the construction stage, mud slides had made it impossible to proceed on the site that had been cleared for the tailings dam. Concerns were raised by environmental agencies within the PNG government about pollution issues. However, there was also resistance from within the government to a scheme to push ahead with gold production, and abandon copper production altogether once the gold had been extracted. The government had heavily invested 'development' capital in the project. The world price of other exports, such as cocoa and copra slumped drastically in the 1980's, and the government had become increasingly reliant on the anticipated revenue from the mine to fulfil its nation-wide development programs. The government's ultimate reaction to OTML's proposal to abandon the later copper production phase was an ultimatum which threatened to stop gold production just as it was beginning. In 1984, therefore, the government allowed OTML to use an interim tailings system to return the sand fraction of tailings to the Ok Ninga valley.



As the first gold-producing phase was drawing to a close in 1986 the PNG Department of Environment and Conservation applied pressure on OTML to set their environmental objectives for the Fly River, and work toward an acceptable particulate level to protect fisheries, provide an 'early warning' monitoring system for policy makers and prescribe impact levels that must not be exceeded. The government suspended the requirement to construct tailings facilities and waste dumps, pending the outcome of the environmental study. However, the definition of what constituted the 'river system' in terms of OTML's environmental responsibilities was ambiguous. In accordance with agreements between OTML and the PNG government, they were not required to carry out any environmental monitoring studies in the Ok Tedi River itself, only in the Fly River below the confluence of the Ok Tedi and the Fly River at D'Albertis Junction. In 1988 due to the difficulties associated with tailings separation in the copper mining process, the government allowed OTML to stop using any interm tailings sytem, and to dump their tailings and waste directly into the river system.

The emerging independent state of PNG was founded, like its previous Administrator, Australia, on a Westminster system of government. However, the number of parties and groupings reflects the fragmentary, small-scale nature of PNG society, and elected members tend to represent territories rather than ideologies. The outcome is that no single party dominates, and government is invariably by loosely-knit coalitions involving changing party loyalties. Papua New Guinea politicians frequently claim that their clan, tribal, regional or party followers expect them to flourish by fair means or (by Westminster standards) foul, but the end result, traditional group prosperity in particular, is to varying degrees considered to justify the means. The PNG government, since independence, increasingly faced difficulties in establishing linkages between the mining sector and other sectors of the economy. While mining activity was bringing benefit in the form of infrastructure, such as roads, airstrips, harbours, schools, hospitals, employment training, jobs and some small business development, it was also bringing a set of social costs including damage to the environment, disruption to communities and life styles

and threats to traditional values and customs, over which the question of compensation and distribution of revenue remained contentious. The notion of state authority over minerals conflicted directly with general notions of traditional land ownership or custody within Melanesian society. This was generating a great deal of debate between national government legislation which controls the granting of leases for mining purposes and an indigenous culture dominated by subsistence production land-usage practices.

This political climate had a profound impact on how project developments were implemented, and how threats posed to particular communities were represented. In Papua New Guinea, dissatisfactions can lead to a range of protests, expressed as despair, frustration, migration or gang activity, and in other cases, such as Ok Tedi, in a greater collective insistence by landowners over matters of compensation and ecological responsibility. The dissatisfactions expressed by the river communities, their efforts to have their claims for rectification and compensation addressed by the corporation, through the courts in Papua New Guinea, and subsequently through the courts in Australia, have to be appreciated within the context of a void in state mechanisms for dispute settlement and conflict control where local tribal means of dispute resolution no longer prove adequate or appropriate.

The national government, given that the country was embroiled in a major economic crisis, was anxious to avoid a drastic decrease in revenue from Ok Tedi. It had become dependent on the entire long term return on the project. The government was also a major stakeholder in the mine itself. The decision had been made to raise a loan and acquire a substantial share in the venture to ultimately provide benefit which could be ploughed into nation-wide development projects. The investment in Ok Tedi had diverted funds which might have been used in other ways to foster national development. From 1984 when the mine started producing, the PNG government's share of the mine received no direct returns. Their declared profits went overseas to service the debt incurred to initially invest in the mine. It was only in 1990 that the PNG government received K19 million profit from the overall annual profit of around K450 million. This requirement to serve the foreign debt meant that there was far less capital being directed toward national development projects which might have distributed wealth more equitably across the country as a whole. As the Ok Tedi copper mining processing costs and problems escalated, the difficulties were compounded by a worldwide decline in copper prices. The government could not expect significant returns in the form of royalties and taxation until the operation had been running for many more years. In fact, profits from Ok Tedi decreased from K77 million in 1987 to K20.7 million in 1988, just at the time when the government was facing an economic crises due to world fluctuations in export crop prices. The government faced a situation where they could not afford to jeopardise production from the Ok Tedi mine, despite the fact that it was discharging huge amounts of waste into the Fly River system.

The internal economic destabilization which came about in 1989 forced the government to seek the help of the World Bank. To fall in line with World Bank and IMF 'structural adjustment and stabilisation programs, the government devalued the currency by 10%, cut public expenditure by K80 million, created a pay freeze and curtailed credit growth. Subsequently, the government agreed to a letter of intent with the IMF in line with these measures and was granted a loan of K82 million plus a further US\$50 million from the World Bank. In May 1990, the government was also promised further loans totalling K676 million which were conditional on additional adjustment and stabilisation measures, such as the removal of import levies, the lifting of import bans, and the introduction of a 3% processing tax on the sale price of domestically produced products, all of which were directed toward a liberalization of the economy and exposure to international competition, the promotion of capital-intensive modernisation and a switch to indirect taxes and levies as a source of government revenue. It is questionable whether the national government would have necessarily taken these actions to offset its problematic relationship with international capital through devaluation, import liberalisation, credit controls, public spending cuts, raising indirect taxation, etc. if the world price of its export crops had not fallen. The outcome of the structural adjustment program meant that PNG could no longer direct its path toward development as it has originally intended.

In 1990 OTML established the Lower Ok Tedi-Fly River Development Trust. The reason given by the company for its establishment was that they realised royalties paid to the government were not reaching village people living downstream from the mine either as compensation or as direct benefit. The purpose of the Trust was to allocate funds to establish development programs. K2.5 million per year was to be paid to help villagers adjust to a life without their customary uses of the river, including fresh water and fish. However, it did not serve as a two-way channel for negotiation. Calls through

petitions to both the national government and OTML by representatives of the river communities to actually stop the dumping of tailings into the river system were ignored. So was a claim taken to the International Water Tribunal, which condemned the way the operation was being managed. Although payment of compensation to the river communities did not form part of the original agreements made between the corporation and the government, establishing the Trust was a means of alleviating dissatisfaction, and a threatened shut down of the entire Ok Tedi project, which would have resulted in a cataclysmic decline in foreign exchange for Papua New Guinea and an undermining of international confidence in Papua New Guinea as a minerals exporter.

GENERAL ISSUE No. 5 - OPERATIONAL STAGE - CORPORATE RELATIONS WITH LOCAL COMMUNITIES AND OTHER INTERESTED PARTIES ONCE THE MINE IS IN PRODUCTION

The distributional problems which arise once a mine is **operating** and begins to produce the promised capital benefits are often expressed most profoundly at local level. Problems and tensions are critically linked to what safety nets for sustainability will be possible in the immediate and intermediate vicinity of the mine, given that communities in these areas experience dramatic and unprecedented changes in their lifestyle. There may be confusion as to how traditional patterns of life can be adapted when there is a rapid growth in infrastructure. Inflowing capital benefits from the mine, either from the corporation or from the government, may not necessarily integrate well in the short term with pre-existing small-scale patterns of resource use and distribution. As well as the construction attracting a workforce, it also attracts people from a wide area around the mine who have no certainty of benefiting from the operation. This can destabilise existing regional demographics and can create disparities and frictions between local people and new arrivals. An area that previously supported small sustainable communities can become subject to overpopulation. Fringe communities develop, and this can be where the greatest contradictions are expressed between local cultural values and introduced values and behaviours. Traditional values expressed through transmission of an oral culture for a specific set of circumstances may not provide guidance for appropriate behaviour in the changing circumstances, and some cultural values may carry diminished legitimacy. The introduction of a cash economy can inflate the cost of living and destabilise the value of income derived from traditional activities. Communities both in the immediate vicinity of the mine, and in neighbouring areas, will start to draw conclusions as to whether there has been adequate benefit from the project. Either the corporation or the government may not structure the distribution of revenue from the mine in such a way that expectations of earlier promises are realised in the light of changes. Local landholders may not feel that the degree of dislocation, disadvantage or disorder experienced during the **establishment** stage of the mine has brought worthwhile realities. Many unforeseen disadvantages or distributional problems can offset the anticipated direct benefit. Rivalries and conflicts can develop between different ethnic or social groups. The corporation may perceive that government agencies should ultimately assume responsibility for regulating and resolving factional dissatisfactions, disputes and discrepancies within the region overall. Dissatisfaction can be expressed in a range of ways including apathy, confusion, internal conflict and in extreme cases open hostility, all of which have a potential risk for jeopardising continuing good relations between the corporation and different local communities.

How the Mine's Operation Actually Began to Impact on Local Communities

By 1988 when the second stage of mining had begun to extract copper as well as gold, the communities who lived at the lower level of the mountain range where the river slows down, began to feel the full impact of the waste material from the copper mining in the river system.



The impact was far more significant than had been previously predicted. Life-forms in the river began to react to the silting and pollution problems in the Ok Tedi and Fly Rivers.



At times of heavy rain when the river flooded, the increased sediment from the mine was deposited as mud in local food-producing gardens, sago swamps and forests. It destroyed areas previously rich with diverse flora and fauna. It was at this stage that the problems came to the attention of the Australian Conservation Foundation, and publicity was generated in Australia and elsewhere about the problems.

OTML responses raised two pertinent issues. In 1989, the corporation indicated that the cost of a new dam would make the project non-viable. Viability

did not mean there would not be enormous long-term profits. It would mean, however, that, because the estimated cost of a new large tailings dam would be as much again as the initial outlay for establishing the mine itself, the joint venture would have to accumulate the funds for a further capital outlay by justifying the environmental necessity and the subsequent overall reduction to profit levels from the mine to their overseas lenders. This was one of the problems they faced in attracting further funding. A decade of experiencing the 'unpredictability' of the local terrain, meant that estimators were now more accurately able to predict the real costs and difficulties associated with a tailings dam. The second issue OTML raised was that the high rainfall in the mine area caused frequent landslips, as the mine was situated on a fault line of geologic plates. Their engineers considered that a large dam was not advisable due to the threat of sudden destruction by earthquake. If this happened, all the waste material would collapse into the river system at one time with catastrophic outcomes. A consultancy report prepared by OTML in 1989 for the government indicated that free dumping in the Fly River could cause a 70 per cent reduction of the fish catch 155 kilometres downstream of the mine, a 30 per cent reduction 600 kilometres downstream, and an unknowable effect at the time on the delta and the Gulf of Papua. These predictions were based on the impact of mine sediments, not the mine-generated copper levels in the river system. The environmental monitoring focused only on fish survival, not that of any other aquatic organisms, terrestrial life or human life.



The land owned by the communities who lived along the river did not fall within the Mine Lease Area. There had been no formal agreements drawn up between these landowners, the corporation and the government. Few social impact assessments had been carried out or contingency plans put in place to take account of adverse impacts on river communities. The preliminary planning had predicted that the sediment level in the Ok Tedi River would be low. However, these early estimates proved to be very inaccurate. By 1994 the sediment levels were 100 times higher than had been predicted.

In 1992 some landowning groups who lived along the river system and the Western Provincial Government sought legal advice to restrain the corporation from further pollution of the Fly River system. They were advised that although they appeared to have a warranted claim, no local law firm had the resources to make the claim against BHP, the managing company. Slater and Gordon, a firm of Australian solicitors, agreed to act on behalf of at least 30,000 people who lived along the banks of the Ok Tedi and Fly Rivers, representing over 500 clan groups in 102 villages, on a fee deferred basis. Writs were lodged against BHP in the Supreme Court of Victoria seeking injunctions to restrain the dumping of tailings into the river system and a range of compensations to alleviate the damage. Victoria was chosen in order to demonstrate to Australians the degree of damage the Australian company had caused to the environment in one of its overseas operations.

In May 1994, Rex Dagi, Alex Maun and two others who derived their living downstream from the Ok Tedi mine, on behalf of approximately 6000 villagers, lodged their claim in the Supreme Court of Victoria, Australia, against BHP Minerals, the managing company and part owner of the OTML, seeking Aus\$2 billion in compensatory damages and \$2 billion in exemplary damages plus an injunction to stop the dumping of tailings. Their claim was that their subsistence livelihood had been severely damaged by pollution of the river on which they depended. Two significant arguments were offered by BHP's solicitors.

The **first** concerned the jurisdiction of the Australian court to hear and determine the issues. While the Judge ruled out some claims founded upon possession of land, he proceeded with claims directed purely at the activities of BHP and OTML. This has set a precedent for bringing actions against a company under the laws of the company's home country. BHP's response to the claim was that the mine operates in compliance with Papua New Guinea law, and that their actions were further validated because the national government was in fact a shareholder in the joint venture. Throughout the two year period prior to the compensation claim coming to court, BHP strongly maintained the importance of its compliance with Papua New Guinea law.

In August 1995 the 'Eighth Ok Tedi Agreement' was drawn up. It differed from previous agreements which had been drawn up directly between the corporation and the government, insofar as this new agreement specifically required the compliance of Ok Tedi and Fly River landowners as well as compliance from groups in the mine lease area in the vicinity of the mine. The Agreement offered a A\$15.8 million lump sum and A\$4.5 million each year for the next 15 years of mining operations for the river dwellers. OTML claimed that the long-term impact on the river system was reversible in time and ultimately environmental damage would be mitigated by natural regeneration. The Agreement was linked to legislation that effectively prohibited further legal action by any landowners against BHP or any other Ok Tedi partner. The Australian solicitors for the landowners in their claim against BHP claimed that the Agreement denied the landowners access to due process in court and abrogated the fundamental democratic rights of citizens in disregard of international treaties and the PNG Constitution. The draft bill to go before the PNG government to enact the Agreement, while providing automatic compensation to local people for changes to their environment, also reiterated the stipulations preventing landowners from making legitimate claims for damages. The allegation was made by Slater and Gordon that BHP lawyers contributed to the drafting of the Agreement in an attempt to block legal actions coming before the courts in Australia. Justice Philip Cummins ruled that BHP were in contempt by interfering with the administration of justice when they collaborated with the PNG government to draft the Agreement and enable the passing of legislation to end the massive environmental damages claim. Slater and Gordon further applied for a restraining order to stop BHP consenting to the legislation. BHP elected not to give its consent to the bill.

The **second** significant argument put forward by BHP's solicitors with regard to the claim of compensation due to negligence was that, because the villages were subsistence dwellers, and because there was no monetary loss, there could not have been economic loss, and thus the claim should be struck out. Slater and Gordon's argument was that the environment did provide a benefit which could be assessed in monetary terms, because of the value that could be placed on the provision of the elements of their subsistence which would have to be replaced because of the environmental damage. This was upheld by the Judge.

In carefully worded advertisements in prominent Australian newspapers, BHP sought to counter the adverse publicity, concentrating on the benefits that BHP's involvement in the region had brought in health, education and services. However, they did not adequately explain how the benefit was distributed, and whether the people whose livelihoods depended on the Ok Tedi and Fly Rivers were being appropriately compensated for ongoing pollution and damage to the river system. The advertisements provoked a complaint to the Advertising Standards Council by the Australian Council for Overseas Aid, the Australian Conservation Foundation, and the Australian Consumers Association. The finding for contempt of court was subsequently struck out in the Court of Appeal on a procedural technicality, but the compensation claim was to proceed.

In June 1996, BHP opted to settle the case before it went to court. The key issue of the resolution had been to seek a firm commitment to find an alternative tailings dump for the mine waste. BHP as managing company in OTML undertook to work with the community to pipe the tailings to unused land and dredge the Ok Tedi River. The cost of these measures could total \$A450 million. As well as the \$A110 million compensation deal reached with some villagers in 1995, another \$A40 million would also be paid to people in the worst-affected areas, particularly along the Ok Tedi River, and to move villages and develop new business opportunities where people had been deprived of a living by the pollution. The BHP settlement costs also included the villagers' legal bill of \$A7.6 million. All of these costs will have to be met from future earnings from the mine which recorded a profit of \$A250 million in 1995.

The PNG Government increased its stake in the mine from 20 to 30 per cent to apply the extra 10 per cent equity directly for the benefit of the people of the Western Province.

GENERAL ISSUE No. 6 - SHORT TERM SUSTAINABILITY DURING THE OPERATION OF THE MINE

During the **operational** stage of long term projects, problems can arise which undermine local adjustments and community development programs. Land acquisition settlements or compensation agreements are usually drawn up through fixed legal frameworks appropriate for a particular set of circumstances at a particular time. Corporations have to consider whether the initial agreements allow them to deal appropriately with changes in local circumstances, particularly given that initial agreements are based on predictions, and not on actualities. Realities may differ from predictions in a number of ways that affect sustainability. They mostly relate to the shift from a traditional lifestyle toward more centralised permanent settlements and more reliance on a cash economy. Projects impact dramatically on small-scale traditionally based social systems where power, status, wealth and legality are not immutably fixed. With the passing of time, the very presence of the mine brings change within traditionally-based expressions of power and rights to hold and use land. Some people who feel they deserve recompense may have missed out on receiving benefit. Capital payments provided to original claimants may not be realised as a benefit where it is most needed. Capital may also not be available as a benefit by those who inherit the land in the next generation, but who will inherit the damage to the land that has to be lived with. If the modern legal system predominates as the basis for agreements to the extent that it overrides premodern processes for settling issues, groups who express dissatisfaction with projects, or particular aspects of a project, can become marginalised or ignored by decision-makers. As social relations regarding land use, power and local allegiance change and re-form over the term of a project in the light of new circumstances, those managing the mine may no longer see how, within the 'modern' legal agreements that have been set in place, they can provide workable solutions for new problems. Some of these elements contributed to the dissatisfactions expressed on Bougainville which led to the rebellion in 1989.

In Papua New Guinea and in other third world countries, backlash from local communities has been a contributing factor to a shift toward decision-making and authority being taken up by provincial and local governments. This shift alone will not necessarily alleviate the tendency for corporations and national governments to control change by attempting to eliminate or reduce conflict, based on the notion that groups who hold most power are usually in the best position to look for the best solutions. The basis for this assumption is that conflict is antithetical to teamwork and productivity. From the perspective of planners and managers seeking to maintain the mining project's schedule to stay competitive in the global economy, local factional rivalries or the emergence of unexpected problems which affect local communities can come to be seen as a risk which threatens their schedule, rather than being an integral component of the scheduling. There has been a tendency for

corporations and governments to manage negotiations primarily through channels where they have most compliance. However, if existing local powerful factions are 'harnessed' by decision-makers in order to gain compliance as quickly as possible, a situation can develop whereby some groups are denied the right and the means to define themselves, their rights, and their own way of dealing with ongoing and new problems. 'Managing' how individuals should respond to changing circumstances can drift toward 'coersion'.

The issues of compliance, agreement and disclosure are at the heart of promoting short term and long term cooperative relations, and consolidated planning about sustainability within an entire region. Long term planning and commitment to sustainability will require corporations to develop new management skills and new bases for agreements which realistically define their own, and others' responsibilities in appropriately broad terms, so they are empowered to respond realistically to gradual adaptations to change which actually take place within local communities. This can avoid the sudden emergence of new claims, interpretations, or demands where corporate managers no longer perceive that they have the means or the responsibility to make a response.

How the Corporation Extended its Areas of Responsibility for Community Development

BHP, as the corporation with managerial responsibility over OTML, responded to the adverse publicity about the environmental damage by justifying the corporation's performance, responsibilities and liabilities in terms which are more meaningful to audiences who take for granted the benefits of a modern lifestyle. The public relations material did not present a balanced appraisal of how the pollution problems were actually impacting on sustainability. Their focus was to report on the amount of money that was being invested in community development programs, rather than explicitly specifying how the compensation was being distributed.

Tabubil, which by this time had a population of over 10,000, had been subsidised to become the largest regional centre in the western part of Papua New Guinea, providing many services for local communities, non-government and government agencies. The corporation had made vast contributions toward this local infrastructure, establishing primary and secondary schools, churches, a hospital and an extensive health program, a supermarket, open markets and a large number of locally owned businesses which in various ways were connected to the presence of the mine. The Min people, particularly the immediate lease landowners, had been the predominant beneficiaries of programs to establish entrepreneurial businesses. OTML through its community relations teams have worked to address and respond to many of the openly expressed and more covert new rivalries between groups, as people from other tribal groups, including the river communities, have been attracted to the town and have attempted to emulate the business opportunities being developed by Min people. Before the court case, one of the unresolved issues was whether the corporation or the government should assume ultimate responsibility and develop processes to deal with troubling and conflicting perceptions of unequal development throughout the overall region of Western Province. Given that the mine was into the **production** stage, there was contention as to whether the corporation or the national government was contractually obliged to provide capital realised as revenue from the mine for obviously-needed compensation to landowners who lived outside the legally-defined mine lease area. The majority of the corporation's community development budget continued to provide benefit to those who were legally entitled to it, those who lived within the mine lease area.

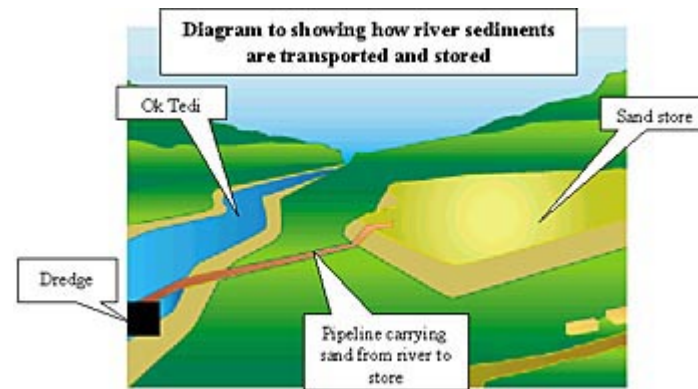
Because the tailings dam was not built, landowners within the mining perimeter did not have to contend with the significant issue of waste disposal. While the establishment of the mine undoubtedly brought profound dislocation, and therefore impacted directly on the lifestyle of Min peoples, the corporation had been offsetting this disadvantage and assisting groups with cultural and social transformations through development programs for many years. The environmental impact, which was a direct hazard to health, well-being and personal security, was felt most severely by the villagers who lived further down the Ok Tedi and Fly Rivers who were not accounted for in former formal agreements originally drawn up between the corporation and the government.



The priority for the Ok Tedi and Fly River landowners was to stop tailings from entering their river system. It had caused considerable disruption to their traditional lifestyle, and offered them very few of the perceived advantages offered to Min groups. Their decision to take their claims through the Courts both in Papua New Guinea and Australia has resulted in a significant precedent for actions concerning environmental pollution. Of equal importance and significance, it provided the catalyst and the opportunity to create a new working arrangement with the corporation. OTML agreed to extend the scope of the Fly River Development Trust in order that all groups can now receive benefit from the mine in a spirit of co-operation. The litigation provided recognition that the rights and needs of people from subsistence lifestyles can not be relegated in importance, and that they can have adequate standing to pursue claims for social justice through courts. The litigation also prompted significant motivation for change in corporate culture which had previously taken the attitude that it is enough to adhere to standards, regulations and processes instituted by the host country. It set a precedent that transnational corporations can be made accountable in their home country, both through the legal system and through public opinion, once relevant information is accessible which would not necessarily be publicly disclosed or debated. The initial agreements had not incorporated the rights of traditional owners as an important **starting point** for negotiations. The responses of the communities who subsequently made claims both against the corporation and the government were treated as 'problems' to be resolved and dealt with by those whose primary concern was to maintain the mine as a viable means of returning a benefit on their vast investment.

Recitification

A community consultation program has been established to keep stakeholders informed of current scientific research work to mitigate the environmental degradation. In 1997 a compensation agreement was made for the use of land where a dredging trial would be set up. Although the trial is not yet complete, studies suggest it will deliver only limited environmental benefits.



Dredging entails digging a slot two kilometres long, 140 metres wide and eight metres deep in the river bed. The slot traps sediment, and the dredge removes it in a continuous operation. With less sediment in the river, the channel downstream should gradually erode down toward its original bed level, and gradually decrease the flooding frequency. The sediment removed by the dredge is being placed onshore within one-kilometre-square sediment embankments.



This operation has so far removed at least 10 million tonnes of sediment from the river bed. The chemical characteristics of the waste material will change when removed from the water. The embankments will be revegetated and monitored for toxicity levels in consultation with local people. The corporation assert that the river water consistently shows copper concentrations are within World Health Organisation drinking water standards, and that where fish still live in the river, they are safe to eat, but local people remain doubtful that the water is safe.

OTML have investigated more than fifty alternative waste disposal schemes, but have not been able to devise any system that will successfully and reliably retain mine waste. It is apparent that no one action will resolve all the issues which allow the mine to operate workably without polluting the river over the remaining ten years of mine life. Early mine closure would provide the most straightforward environmental solution, but at this stage it would also have the greatest adverse social impact. Immediate closure would not allow the necessary time and funds to more gradually put in place compensatory economic programs, given that many people now rely on a cash economy which is heavily dependent on the mine, and there are presently no other significant modern economic activities in Western Province.

GENERAL ISSUE No. 7 - LONG TERM SUSTAINABILITY FOLLOWING THE CLOSURE OF A MINE

The General Issues in this case study work through some of the inter-related issues that arise in relation to different stages of a mining project. The very first stage relating to preliminary agreements appears to be the most straightforward. However, the complexities of the subsequent stages all relate back to underlying assumptions held by top level managers who draw up the initial agreements. Corporations are driven by an imperative to secure land and begin to recoup profit as quickly as possible. It is one of the single most important features of both their own and a national government's timetable in terms of financial flows and security for

the venture. This pressure can contribute to short-sighted settlements between groups who hold the most power and influence, and share common ideological and economic aspirations. One of the underlying problems with 'development' programs where the goal is to inject vast amounts of money into a region is that the distribution of money in itself does not create a capitalist economy, and this is particularly so when there are ideological and practical gaps in how that money can be directed toward capitalist enterprises equitably.

The Way the Mine has Impacted on Local Life Styles and Life Chances

Two different stories emerge about Ok Tedi and sustainability.

1. The first consideration is whether the development programs and infrastructure planned and put in place during the **establishment** stage for Min people living in the vicinity of the mine lease area can be sustained once the mine closes. The economic activity and development programs introduced throughout the last two decades have injected vast amounts of capital and modern infrastructure into the region. The goal has been to offset the social and environmental change incurred by the Min people who can no longer rely on their traditional land for subsistence.

A major development program has been to provide health services. Tabubil Health Centre has a 24-bed hospital, a 10-bed isolation unit and an outpatients department. It was primarily established to provide facilities for its workforce and mine lease villages, but it treats more than 12,000 patients a month. The medical services cover medicine, surgery, obstetrics, maternal and child health clinics, family planning, cervical cancer testing, dental laboratory, X-ray, occupational health, community health and public health. Mass X-ray screening is undertaken for tuberculosis, respiratory disorders and heart disease. There is also an internationally recognised malaria control and research program. This has, according to OTML, brought the following changes since the project started:

- Infant mortality down from 300 per thousand to less than 15 per thousand.
- Average life span up from 30 years to more than 50
- Incidence of malaria among village children down to less than 15% from 70%, and among adults to 6% from 35% (in about a 40km radius of the mine).

The health services may not be maintained at this high level by government or non-government agencies if the town cannot maintain its role as a modern regional centre with amenities such as shops and supporting community services which maintain public health in an urban environment. It is also questionable whether the government or non-government agencies will be able to maintain the present range of other services to the area, including communications, transport and educational facilities. The Ok Tedi mine still has a ten year life, but if it closes earlier, it is debateable whether the Min people, and other groups who have been drawn to the town, will actually still have available the physical and economic infrastructure necessary to continue to participate in the cash economy in a sustainable way.

2. The second consideration is whether the adverse affects on the river system , and the belated development of compensatory programs now being put in place will provide a sustainable future for the Awin, Ningerum, Yonggom people and many other linguistic groups living further down the Ok Tedi and Fly Rivers. Through the Fly River Development Trust which was established in 1990, OTML have initiated some community development enterprises. The corporation has established aid posts, tanks for the storage of clean water, clinics and health sub-centres in strategic villages along the Ok Tedi/Fly River system, access roads for some villages, ferries and bridges. Some commercial enterprises now provide employment, most of which is dependent on Tabubil, but other enterprises could continue if alternative markets can be found after the mine closes and the township diminishes. The advantage for the people living along the rivers is that, even allowing for the disruption that the

environmental pollution has brought, they can develop enterprises while still essentially retaining their traditional village based social system. They have experienced far less social and economic dislocation than those groups who live closer to the minesite.

The advent of Ok Tedi, and other mines in the western region of Papua New Guinea, including Porgera in Enga Province, and the Freeport in Irian Jaya have prompted rapid transitions as people who had previously maintained small-scale subsistence lifestyles in relative isolation shifted toward an urbanised lifestyle using modern amenities emanating from the township of Tabubil. The introduced infrastructure relies for its very existence on the vast resources of the corporation and its financiers in the global economy. The economic driving force that created Tabubil will ultimately be re-directed to serve the next mining project when Ok Tedi closes. It will create a similar cultural and social enclave elsewhere, designed primarily to serve the modern needs and expectations of mine workers and their families.

The mine presently employs 18000 people, 90% of whom are Papua New Guineans. Another 1000 work for contractors and service providers. Many send part of their earnings to local villages throughout PNG. These jobs generate Kina 18 million in wages and related revenue. Another Kina 20 million is paid to the national government in taxes. OTML has contributed Kina 300 million in community infrastructure and local business and agricultural programs. When the mine no longer operates, there is great uncertainty as to how the different tribal groups will perceive the developments that the mine has brought to their region, and how they will relate to each other, the regional and national government, and other resource development corporations.

Reporting About Development and Sustainability

Most of what outsiders know about the impact of change on the local communities comes through media reporting or community relations material from the corporation. Many representations about changes the operations have brought are at odds with one another, because they belie the complexities of the project over time and place. It is unlikely that many of the stories and issues that local people are contending with would be so well known if the tailings dam issue had not generated such broad and controversial publicity abroad. Since the settlement of the claims which came before the Australian courts, OTML offer a far more balanced representation of the issues associated with Ok Tedi. However, like most large organisations, they are inclined to present issues selectively. Publicity for audiences who take for granted the benefits of a modern lifestyle represent the contrasts of a corporation bringing rational and scientific culture to a 'timeless' traditional landscape. The corporation also presents images that in subtle ways contradict this image of a 'backward' people, because they also represent the common commitment and the active, vibrant and meaningful participation by local people who have been keen to adapt their skills and contribute significantly to work on the project. These seemingly contradictory representations are all part of the reality for local people coping with practical adjustments to a contemporary situation.

Rather than whether the representations are 'true' or 'false', the key issue is how the corporation exercises its **degree of control** over public images and perceptions of local people, whose lives are now inextricably enmeshed with the project. There is no doubt that the story of the Ok Tedi mine tells of a massive planning and engineering feat. However, until the court case, local people had little opportunity to express some major contradictions they felt about the corporation. The way modern technology and scientific expertise was applied within the physical, political and social climate of the region entailed many significant shortcomings. Until OTML and BHP were forced by public opinion in Australia and elsewhere to make broader disclosures, there was an unwillingness to concede that predictions about the mine's impact on the regional eco-system had been grossly inaccurate, and in fact some disclosures were inaccurate or biased to the point of misrepresentation. The corporation and the national government sought to maintain control over how the mine's impact on the regional eco-system, and therefore on the lives of local people, was reported. It was biased to promote how the corporation had given 'backward' people opportunities to reap the benefits of modernity. However, the underlying contradiction that is now evident is that modern technology cannot offer solutions to rectify the vast environmental damage and consequential social upheaval, due primarily to unanticipated levels of pollution created by the mine. Affected stakeholders had a right to be informed and express their concern about how the corporation would work through the inherent difficulties of operating in challenging tropical rainforest conditions. Given the vast scale of the project, and the fact that many

of the early predictions relating to the mine's impact on the eco-system were based on inaccuracies, some of the long-term outcomes for the river system, the Gulf of Papua, and for Australian coastal zones, such as the Barrier Reef, at this time must be unknowable.

There was also a profound contradiction felt by local people about the decision-making processes adopted by corporate management. The corporation, with its enormous wealth and ability to impose changes over an entire region, 'managed' community relations within a vast hierarchical structure. This meant that decisions which directly affected local people were made by people who did not and would not in the future have to live with the outcomes in the region, and many lived outside Papua New Guinea. Local people had been used to small-scale traditionally based lifestyles. Decisions which directly affected their lives, and the lives of future generations in the region, were being taken by top-level managerial people within the corporation who had only a 'filtered' version of local people's experiences coping with the adjustments to the consequences of the mining operation. From a local perspective, the shift away from inclusive small-scale social processes to a relatively impersonal hierarchical structure for making decisions about local resources itself presented a major contradiction. Despite earlier assurances that the mine would bring benefits, the reality that prompted the river communities to seek redress through the courts was that they were not even being compensated for unanticipated severe disadvantages caused by pollution. There were few actual 'advancements' in the way scientific and rational culture was being applied. In fact, because the corporation controlled most reporting of the project, local people had been disempowered and marginalised.

Sustainability will ultimately rely on holistic, inclusive decision-making processes, and more open and transparent reporting procedures. BHP Managing Director and CEO, Mr Paul Anderson, commented in August 1999 that the reports, considered as a whole, illustrate the difficulty of finding a way forward for the mine. "There are no easy answers offered by these reports for BHP, the other shareholders in the project or for Papua New Guinea. But we are determined to find the best answer. Having considered the environmental and social reports, we feel the responsible course of action is for the mine to continue to operate while the PNG Government, shareholders and local communities decide on the longer term future for the mine.

"Obviously, the PNG Government and the local communities will need to find how to best balance their short term and long term interests with the environmental impact of the mine. The future of the mine is ultimately their decision. The PNG Government and local communities have so far indicated that they do not want the mine to close. From BHP's perspective as a shareholder, the easy conclusion to reach, with the benefit of these reports and 20/20 hindsight, is that the mine is not compatible with our environmental values and the Company should never have become involved. That is the easy conclusion. The difficult issue we face is where to go from here. More than 50 000 people depend on the economic activity the mine generates."

"BHP will need to decide what its future involvement with the mine should be. In doing so, and recognising that OTML will be consulting local communities and affected landowners, BHP will seek the views of the PNG Government, the Australian Government, the World Bank and non-government organisations."

One of the major issues facing the people of Western Province, according to the Minerals Council of Australia, is that there is a "shortage of human capital and skills". There are underlying biases, contradictions and gaps in this representation of the issues. It assumes that the particular 'public' being addressed need only concern itself with 'modern' skills and opportunities. What is being denied is an equal representation of how people in Papua New Guinea express, and have expressed for thousands of years, their human capital and skills. This is part of the perceptual problem that is at the heart of changing decision-making processes to ensure sustainable futures.

The Probable Long Term Legacies of Ok Tedi's Presence in the Region of Western Province

Since the court case, OTML has extended its community programs to encompass the needs of both Min peoples and river communities. A Food Security Working Committee which has input from OTML, local and provincial governments and local communities, are developing:

- development of the Star Mountain Clothing Factory in Tabubil, a wholly locally owned enterprise combining local talent and training skills provided by the Tropical North Queensland Institute of TAFE.
- Community-based training programs in crop production and livestock management, breeding and distribution of poultry, rabbits and goats and food crop research, the development of superior crop varieties, including local staples and introduced crops such as rice. They are also developing studies as to the viability of other sustainable cash crops, such as pineapples, chillies and other spices. The programs are also introducing agricultural resource packets into local schools.
- Through the Fly River Development Trust, they have established North Fly Rubber Limited in partnership with OTML. Another company, Team Rubber, has also been established near the port of Kiunga, which is an alliance between OTML, Western Province Division of Agriculture and Livestock and North Fly Rubber Limited.
 - Commercial fishing enterprises have been developed. The produce is presently sold to catering and food outlets in Tabubil. OTML have constructed and installed freezer storage facilities at Obo and Manda.

GENERAL ISSUE NO. 8 - CONCLUSION - PROMOTING ACCOUNTABLE/RESPONSIBLE RELATIONSHIPS IN FUTURE PROJECTS



The development of more sophisticated and universally accepted social and environmental impact auditing mechanisms, such as those being developed within the UN (see references), are leading the way for projects to be evaluated not only for the quality and quantity of initial social assessment material, but the quality of **processes** which corporations and relevant government agencies institute to apply their understanding of local circumstances in decision-making. Impact assessments are articulating why it is not enough for corporations simply to express a high respect for traditional ideologies, values, protocols, and decision-making mechanisms; they must go further and set in place processes which address all groups rights and responsibilities in the light of changes that projects actually bring to the lives of local people. Broader-based cross-sectoral and cross-cultural decision-making processes will help to accommodate traditional attributes and uphold all people's rights to be clearly understood and able speak on their own behalf. This would articulate a clearer recognition of the stresses that indigenous communities undergo as they attempt to identify potential advantages and disadvantages in micro-economic terms. They will be attempting to identify and weigh up the significance of offered incentives against the social change that will result from the mining activity which impacts on their lifestyle and their sense of belonging. If a 'modern' approach toward managing cross-cultural change predominates, those in control can lose sight of the fact that the goals of local people will be far more

ambiguous, complex and profound. Local people will be making comparisons between past, present and future uses of land and life style choices. There is a long way to go toward overcoming the inherent contradictions between the rights of local communities to benefit from development and the rights of both corporations and governments to participate competitively within the global economy.

Large corporations are adapting to think more strategically about the balance they control between 'persuasion' and 'coercion', and how this is integral to their relationship with both national governments and local communities. Backing out of eco-catastrophes is becoming increasingly more complex and costly for corporations. Adverse perceptions of corporate management are beginning to be expressed through networks which actually support the mining industry, such as insurance companies, as well as in the way that 'global risk' is being politicised through international agencies such as the UN or through environmental movements. People who work in the mining industry are confronted with an increasingly more apparent moral dilemma, as in many different localities, resource development projects fail to fulfil promises to maintain adequate environmental standards and help alleviate poverty and provide access to the benefits enjoyed by wealthy countries. One way of coping with this dilemma is to account for environmental problems that occur in third world countries through relativist ethics, whereby a corporation's actions and ensuing problems are interpreted as having been determined by the state of the system at a particular time. Limiting responsibility through such justifications means that the problems of poor or less powerful people can be abandoned, and this can also extend to abandoning poor countries. This approach to the politics of social/environmental problems has been dubbed 'eco-Fascism'. However, in first world countries such as Australia, as a higher number of environmental officer positions, and even senior management positions, are filled by people whose understanding and skills are drawn from outside the conventional corporate recruitment pools, the debate about environmental ethics is being more meaningfully incorporated into the cultures of organisations.

The requirement to actually demonstrate environmental accountability is prompting corporations to confront and modify accepted conventions about public disclosure. In some circumstances, disclosures about environmental performance are being represented as a facet of corporate competitive advantage. However, it still remains challenging to imagine how corporations could make equivalent disclosures as to how they address social impacts. What may at least be possible in the future are more meaningful disclosures about the actual **processes** that have been instituted by the various stakeholders to deal with the complexity of cross-sectoral and cross-cultural problems, agreements that are not simply based on systems that serve the legitimate purposes of the most powerful groups. A corporation which can specify the processes they have adopted to address sensitive and complex social issues is in a better position to articulate accountability for social outcomes.

To benefit from organisational innovation, corporations are beginning to think and act holistically, rather than outsourcing functions which were formerly considered beyond the scope of conventional corporate managers. Participatory processes which empower local communities and allow them to share control for monitoring and responding to change is still somewhat alien within existing corporate culture, but increasingly there is a recognition that sharing power can be a way of staying competitive and profitable. It is less straightforward to envisage what incentives will induce government agencies to similarly share power. Their focus is control, so they have less incentive to share power, and this issue becomes more critical and prone to stress in third world countries. It therefore still remains challenging to gauge how the trend will develop to build into the relationships between organisations the ethics which address social change, unequal development and sustainability.

The fundamental question that needs to be addressed relating to long term sustainability is what type of training and problem-solving skills are being developed within mining corporations and other associated organisations to bring about alternative non-coercive change which does not simply suggest, for either corporations or local indigenous people, a world of local self-sufficiency based upon small communities. The hope is that better intermediary skills will prompt participants from different backgrounds and ideologies to address change which looks for modifications within present systems - means which are not necessarily anti-technology, but against the social relations that lead to technology being used as an instrument of control.

Suggested Questions Arising from this Case Study

1. 'Why' and 'when' do events turn a mining project into a social and/or environmental drama.

2. Which groups are experiencing the consequences most severely?
3. How are they presently coping and how are they likely to cope in the future?
4. Who is providing the information about these issues?
5. Who has made the important decisions, why were they taken, and who is taking responsibility for them?
6. Who else is experiencing consequences from the project?
7. Why is an understanding of the sequence of decision-making important for dealing effectively with rectifying environmental problems?
8. What is the regional, national and international scope of the project?
9. What is the regional, national and international scope of the problem-solving?
10. What practical skills and processes will help to address unequal development?
11. How does OTML describe 'benefits'?
12. What time frame do the benefits cover?
13. Do local people describe benefits differently?
14. Who do you think should control the distribution of benefit?
15. If you refer to the web pages, which ones do you think offer large organisations new intermediary skills which can be applied in real-life situations?
16. How would you describe the dilemma about responsibility for rectification of the Ok Tedi/Fly River? It is primarily:
 - A North-South issue, a conflict about legal/illegal actions?
 - An issue of control over natural resources?
 - An issue to retain or enhance a way of life?
 - A conflict over broader religious, moral and environmental issues?

BIBLIOGRAPHY RELATING TO OK TEDI

Barth, Fredrik and Unni Wikan, (1982) *Cultural Impact of the Ok Tedi Project: Final Report*. Boroko: Institute of Papua New Guinea Studies. 56pp.

Barth, F., (1983) 'Cultural Impact Study of the Ok Tedi Project' in *Bikmaus*, Vol. 4, No. 1, pp. 56-65.

Broken Hill Proprietary Co. Ltd., *BHP and Ok Tedi: The Facts*, September 1995, 7pp. BHP Melbourne.

BHP Websites: <http://www.bhp.com.au/environment/oktedi/oktedi.htm>

http://www.bhp.com.au/press/bhp_press/data/19990811a.htm

Brunton, Brian D. (1988) 'The Miners Strike at Tabubil' *Times of PNG* 20-26 October 1988

Burton John E. (1991) *The Ningerum LGC Area. Ok-Fly Social Monitoring Project Report No. 2*. Report for OTML. Waigani: Unisearch PNG

Burton, John E., (1993) *General Overview and 1992 Advance Report Summary for Ningerum-Awin Area Study*. Report for Ok Tedi Mining Ltd. Ok-Fly Social Monitoring Project Report No. 3, Waigani: Unisearch PNG.

Burton, John E. 1994 'Local-level Mining Benefits in a Mal-Administered Regional Economy: The Case of Western Province, PNG' Paper delivered at Workshop on

Mining in the Asia-Pacific Region, ANU, 18-20 September 1994 18pp.

Byrne, G.M., Ghiyandiwe M.M. and James, P.M. (1978) *Ok Tedi Landslide Study*, GSPNG Report

Donaldson, T., (1991) 'Multinational Corporate Ethics: Rights and Norms' in (eds.) Sethi, S.P., Steidlmeier, P. & Falbe C.M., *Scaling the Corporate Wall*, Prentice Hall, New Jersey.

Dorney, S., (1989) 'Earnestness and Exotica: A Foreign Correspondent and the Elections' in King, P., (Ed.) *Pangu Returns to Power: The 1982 Elections in Papua New Guinea*, Political and Social Change Monograph 9, Department of Political and Social Change, Research School of Pacific Studies, Australian National University, Canberra. pp. 51-58.

Durkin, P., (1995) 'Scrutiny of Australian Companies Operating in Asia: Is There a Need for Greater Home Government Appraisal?' in *Australian Environmental Law News*, No. 4, pp. 51-58.

Filer, C., (1996a) 'The Melanesian Way of Menacing the Mining Industry', in B. Burt (ed) *Environment and Development in the Pacific*, National Centre for Development Studies, Australian National University, Canberra.

Filer, C., (1996b) 'The Dialectics of Negation and Negotiation in the Anthropology of Mineral Resource Development in Papua New Guinea' Papua New Guinea National Research Institute, University of Papua New Guinea.

Gerritsen R. & MacIntyre, M., (1991) 'Dilemmas of Distribution: The Misima Gold Mine, Papua New Guinea' in (eds.) Connell, J. & Howitt, R., *Mining and Indigenous Peoples in Australiasia*, Sydney University Press

Gordon, J., (1996) *Environmental Litigation: The Ok Tedi Example*, address to the Environmental Defender's Office Perth. Slater & Gordon, Barristers and Solicitors, Melbourne & Perth.

Hughes, P.J. & Sullivan, M.E., (1992) *The Environmental Effects of Mining and Petroleum Production in Papua New Guinea*, University of Papua New Guinea.

Hyndman, David C., 1987, 'Mining, Modernization and Movements of Social Protest in Papua New Guinea', *Social Analysis* 21:20-38

Hyndman, David C. (1988) 'Ok Tedi: New Guinea's Disaster Mine' *The Ecologist* 18(1): 24-29

Hyndman, David C. (1988) 'Melanesian Resistance to Ecocide and Ethnocide: Transnational Mining Projects and the Fourth World on the Island of New Guinea; In J.H. Bodley (ed) *Tribal Peoples and Development Issues*, California: Mayfield Publishing Co.

Hyndman, David C. (1991) 'Wopkaimin Landowners, the Ok Tedi Project and the Creation of the Fly River Socio-Ecological Region' In D.Lawrence and T.Cansfield-Smith (Eds) pp. 355-365.

Hyndman, David C. (1991) 'Zipping Down the Fly on the Ok Tedi Project' In (Eds) John Connell and Richard Howitt, *Mining and Indigenous Peoples in Australiasia*, Sydney University Press pp. 77-90

Hyndman, David C. (1995 *Ancestral Rainforests and the Mountain of Gold: The Political Ecology of the Wopkaimin of New Guinea*, Boulder, Westview Press.

David Hyndman - Changing relations of production in the creation of the Ok Tedi mining enclave in Papua New Guinea
<http://coombs.anu.edu.au/Depts/RSPAS/RMAP/hyndman.htm>

Jackson, Richard T. (1988) 'The Australian Colonial Experience in Papua New Guinea; In R.L. Heathcote (ed.) *The Australian Experience: Essays in Australian Land Settlement and Resource Management*, Melbourne: Longman Cheshire, pp. 292-304.

Jackson, Richard T. (1993) *Cracked Pot or Copper Bottomed Investment? The Development of the Ok Tedi Project 1982-1991, A Personal View*. Townsville: Melanesian Studies Centre, James Cook University of North Queensland

Jackson, Richard T. (1991) 'Not Without Influence: Villages, Mining Companies and Government in Papua New Guinea' In (Eds) John Connell and Richard Howitt, *Mining and Indigenous Peoples in Australiasia*, Sydney University Press. pp. 18-33

Jorgensen, D. (1990 'The Telefolip and the Architecture of Ethnic Identity in the Sepik Headwaters' In B. Craig and D. Hyndman (Eds) *Children of Afek: Tradition and Change among the Mountain-Ok of Central New Guinea*, Oceania Monograph 40, Sydney: University of Sydney pp. 151-160.

Ka'au, J. (1993) 'Hear the Landowners – They are the Solution' In Community Aid Aborad/Freedom from Hunger *Papua New Guinea and Australia – Towards 2000: Conference Papers*, Fitzroy, Vic. pp. 37-42

King, David, (1993) *Ok-Fly Social Monitoring Project: Statistical Geography of the Fly River Development Trust*. Report for Ok Tedi Mining Ltd. Waigani: Unisearch PNG Pty. Ltd.

King, Peter (1982) *Papua New Guinea: 1981* AJPH 28(3):465-470

Kirsch, Stuart, 1989 'The Yonggom, the refugee camps along the border, and the impact of the Ok Tedi mine', *Research in Melanesia* 13: 30-61

Lamb, K.P., 1977 'Copper Mining on the Ok Tedi and Upper Fly Rivers' in John H. Winslow (ed.) *The Melanesian Environment* Canberra: ANU Press

Lindenbaum, S., (1994) 'Reflections on the Production of Identity in Papua New Guinea in an Australian Mirror' *Identities* 1(1):85-88

Lourie, J.A., (1985) 'Physical characteristics and nutritional status of the Wopkaimin of the Star Mountains, Papua New Guinea' *Journal of Anatomy* 142(8):230

Maun, A., (1994) 'Ok Tedi Mining: Human and Environmental Tragedy' in (ed.) Schoell H., *Point: Development and Environment in Papua New Guinea. An Overview*, Kristen Press, Madang, PNG.

Minerals Council of Australia, 1996, *Code for Environmental Management*, Minerals Council of Australia, Dickson, ACT

Minerals Council of Australia Websites: http://www.minerals.org.au/schools/ok_tedi.asp
http://www.minerals.org.au/schools/ok_tedi2.asp

McGill, S.C., (1983) 'Project financing Applied to the Ok Tedi Mine- A Government Perspective' *Natural Resources Forum* 7(2):115-129

Maunsell & Partners, (1982) *Ok Tedi Environmental Study*, 7 vols. Melbourne: Maunsell & Partners Pty.Ltd. for Ok Tedi Mining Limited.

Minewatch, (1991) 'Ok Tedi', *Minewatch Briefing* No. 13.

Nurse, G., (1990) 'The Dynamics of Changes in Health Status in the Ok Tedi Impact Area' *Research in Melanesia* 14:1-21.

Ok Tedi Mining Limited Website
<http://www.oktedi.com/home.htm>

Polier, N. (1994) 'A View from the "Cyanide Room" in Politics and Culture in a Mining Township in Papua New Guinea' in *Identities* Vol. 1 No. 1, pp. 63-84.

Rosenbaum, H., (1995) *Principles for the Environmental Management of Australian Mining Companies Operating in Papua New Guinea*. A Discussion Paper, Australian Conservation Foundation, Fitzroy, Vic.

Rosenbaum, H., & Krockenberger, M., (1993) *Report on the Impacts of the Ok Tedi Mine in Papua New Guinea*, Australian Conservation Foundation, Fitzroy, Vic.

Standish, W., (1994) 'Papua New Guinea: The Search for Security in a Weak State' in Thompson, A., (ed.) *Papua New Guinea. Issues for Australian Security Planners*, Australian Defence Studies Centre, ADFA, Canberra.

Standish, W., (1995) 'The State of Politics in Papua New Guinea' presented at the Australian Institute of Political Science Conference: *Politics, Business and the State in Melanesia*, , Sydney, 4 Aug.1995.

Taylor, P. J. (1995) *The Way the Modern World Works*, John Wiley & Sons, Chichester, UK

Taylor, P. J. (1993) *Political Geography; World-Economy, Nation-State and Locality*, Longman Group UK Limited, Harlow, UK

Taylor, P. W., (1986) *Respect for Nature. A Theory of Environmental Ethics*, Princeton University Press, Princeton, NJ.

Waiko, J. D., (1993) *A Short History of Papua New Guinea*, Oxford University Press Australia, South Melbourne.

BIBLIOGRAPHY OF INFORMATIVE OR INTERESTING WEBSITES RELATING TO RESOURCE

DEVELOPMENTS/DECISION-MAKING AND CONFLICT RESOLUTION

Asia Pacific Research Institute at Macquarie University

<http://www.aprim.net/>

Australian Centre for Mining Environmental Research

<http://www.emiaa.org.au/emiaaw/acmer.htm>

Berghof Research Center for Constructive Conflict Management, Germany

<http://www.b.shuttle.de/berghof/index.htm>

Bibliography of Consensus Decision Making

<http://au.spunk.org/texts/biblio/sp000880.txt>

Canadian Government Peacebuilding Network with links to The Canadian International Development Agency (CIDA)

<http://www.dfait-maeci.gc.ca/peacebuilding/index-e.asp>

Centre for Conflict Resolution, South Africa

<http://ccrweb.ccr.uct.ac.za/>

Centre for International Development and Conflict Management, University of Maryland

<http://www.bsos.umd.edu/cidcm/>

Centre for Creativity, Strategy and Change, Warwick Business School

incorporating Corporate Citizenship

<http://www.wbs.warwick.ac.uk/school/research.htm>

Centre for Rural Development and Training, University of Wolverhampton

<http://www.wlv.ac.uk/crdt/indexm.htm>

Centre for Social and Environmental Accounting Research, University of Dundee

<http://www.dundee.ac.uk/accountancy/csear/>

Centre for Sustainable Design

<http://www.cfsd.org.uk/>

Community Aid Abroad – Indonesian Project

<http://www.caa.org.au/pr/1998/ptkem.htm>

Conflict Resolution Consortium, University of Colorado, Boulder

<http://www.Colorado.EDU/conflict/>

International Online Training Program On Intractable Conflict of specific interest

<http://www.colorado.edu/conflict/peace/>

Contemporary Conflicts in Africa

<http://www.synapse.net/~acdi20/welcome.htm>

Corporate Watch – Report on Freeport Mine in Irian Jaya

<http://www.corpwatch.org/trac/feature/freeport/enviro.htm>

CSIRO Exploration and Mining

<http://www.dem.csiro.au/>

CSIRO Minerals – Ok Tedi Research

http://www.minerals.csiro.au/public/work/stories/pr_okt.htm

Earthwatch Australia

<http://www.earthwatch.org/australia.htm>

Economic Strategy Institute

<http://www.econstrat.org/>

Eldis – A Gateway to Development Information from the UK

<http://www.ids.ac.uk/eldis/>

Environment Australia Online

<http://www.environment.gov.au/index.htm>

<http://www.environment.gov.au/epcg/esd/nsesd/conflict.htm>

The Environmental Technology and Public Policy Program, MIT, USA

<http://web.mit.edu/dusp/etpp/index.htm>

Five E's Website – Ecologic Economic Equity Evaluation Education

<http://www.eeeee.net/>

Florida Conflict Resolution Consortium

<http://www.ispa.fsu.edu/consensus.htm>

Foundation for Business and Sustainable Development, Norway

<http://challenge.bi.no/default.htm>

Freeport Mine, Irian Jaya - Report

<http://www.cs.utexas.edu/users/cline/papua/mines.htm>

Global Vision – Communicating Sustainability

<http://www.igc.apc.org/glencree/gvtrust.htm>

Institute for Global Communications (IGC)

<http://www.igc.org/igc/gateway/about.htm>

International Cooperative for Environmental Leadership

<http://www.icel.org/>

International Centre for the Environment and

Mining and Environmental Research Network

<http://www.bath.ac.uk/ICE/>

International Centre for Trade and Sustainable Development, Geneva

<http://www.ictsd.org/default.htm>

International Institute for Asian Studies - Dutch Resources

<http://ias.leidenuniv.nl/index.htm>

International Institute for Environment and Development

<http://www.oneworld.org/iied/index.htm>

International Institute for Negotiation and Conflict Management, School of Law, University of Technology, Sydney

<http://www.law.uts.edu.au/iincm/index.htm>

Kalimantan – John Land Report

<http://jinx.sistm.unsw.edu.au/~greenlft/1998/305/305p17.htm>

Mining and Sustainable Development in the Americas

http://www.idrc.ca/mpri/index_e.htm

Mining & Petroleum Info Page - Gateway to Australian mining & petroleum companies on the world wide web

http://www.oberon.com.au/Mining_InfoPage/

Mining in Indonesia

<http://www.kalimantan.com/indonesiamap.htm>

Organisation for Security and Cooperation in Europe - The Economic and Environmental Dimension

<http://www.osce.org/indexe-gi.htm>

Participation in International Development

<http://trochim.human.cornell.edu/gallery/katsumot/shuzo.htm>

Peace Science Society (International)

<http://pss.la.psu.edu/>

PEACE Foundation, (Planning Education Agriculture Community Environment) University of Natal

<http://www.medimage.co.za/und/peace/peace.htm>

People, Land Management, Environment and Change

<http://202.253.138.133/Scripts/dbml.exe?TEMPLATE=/ENV/PLEC/index.dbm&type=1>

Program on Negotiation, Harvard University

Executive Education Series – Creating and Managing International Business Relationships. New Strategies for Preventing and Resolving Conflicts with Foreign Partners

<http://pon.execseminars.com/international/index.htm>

Program on Nonviolent Sanctions and Cultural Survival, Harvard University

<http://data.fas.harvard.edu/cfia/pnscs/>

Research Institute for International Technical and Economic Cooperation

<http://www.rwth-aachen.de/fiz/Ww/English/Research/Forsch.htm>

Research School of Pacific and Asian Studies - Departments

<http://rspas.anu.edu.au/depts.htm>

Research School of Pacific and Asian Studies – Resources via Coombsweb

<http://coombs.anu.edu.au/>

John Rivers - Building Trust Between Landowners and Mining Companies for Community Development

<http://rspas.anu.edu.au/melanesia/rivers.htm>

Resolve - Center for Environmental and Public Policy Dispute Resolution

<http://www.resolve.org/Default.htm>

Society for Professionals in Dispute Resolution
<http://www.spidr.org/>

SustainAbility
<http://www.sustainability.co.uk/sustainability.htm>

ToBi – NGO Taskforce on Business and Industry
<http://www.coopamerica.org/isf/isfmain.htm>

United Nations Conference on Trade and Development
<http://www.unctad.org/en/hopebook/main.en.htm>

United Nations Social and Economic Policy Forum
<http://www.globalpolicy.org/socecon/>

World Bank Research
<http://www.worldbank.org/research/>
<http://www.worldbank.org/html/fpd/mining/index.htm>

World Bank – The Economics of Civil War, Crime and Violence
<http://www.worldbank.org/research/conflict/projparticip.htm>

Worldwatch
<http://www.worldwatch.org/>

Dimo Yagcioglu – Conflict Resolution and Ethnicity Home Page
<http://www.geocities.com/Athens/8945/>

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